



Ref.:PB:SL

**STATE OF HAWAII**  
**DEPARTMENT OF LAND AND NATURAL RESOURCES**

P.O. BOX 621  
HONOLULU, HAWAII 96809

AQUACULTURE DEVELOPMENT  
PROGRAM  
AQUATIC RESOURCES  
BOATING AND OCEAN RECREATION  
CONSERVATION AND  
RESOURCES ENFORCEMENT  
CONVEYANCES  
FORESTRY AND WILDLIFE  
HISTORIC PRESERVATION  
LAND DIVISION  
STATE PARKS  
WATER RESOURCE MANAGEMENT

**JUN 13 2000**

MEMORANDUM

To: Genevieve Salmonson, Director  
Office of Environmental Quality Control  
From: *for* *Maureen E. Unger*  
Dean Y. Uchida, Administrator  
Land Division

Subject: Final Environmental Assessment and Finding of no  
Significant Impact (FONSI) to the Environment for the  
Subdivision of Olowalu Lands, Olowalu, Maui

The Department of Land and Natural Resources has reviewed the Final Environmental Assessment for the above-mentioned project. The Land Division has determined that the project will not have significant environmental effects on conservation resources. We hereby issue a FONSI for the action.

We note for the record that that the project only minimally affects Conservation lands. In the mauka area, some conservation land would be affected by water line installations. In the makai area, the number of parcels in the Conservation District would be reduced. The remainder of the project is located within the State Agricultural District and involves the creation of a subdivision, interior roadways and utilities.

Please publish notice of availability for this project in the next available OEQC Environmental Notice.

We have enclosed a completed OEQC Bulletin Publication Form and four (4) copies of the application. It is our understanding that an electronic copy of the publication form will be transmitted by e-mail to you. Please contact Sam Lemmo of our Land Division's Planning Branch at 587-0381 should you have any questions.

Attachments

Cc: Milton Arakawa  
Robert Horcajo

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# ***Final Environmental Assessment***

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**\*SUBDIVISION OF  
LOWALU LANDS\***

Prepared for:

May 2000

Olowalu Elua Associates, LLC

MUNEKIYO, ARAKAWA & HIRAGA, INC.

***Final Environmental  
Assessment***

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**SUBDIVISION OF  
OLOWALU LANDS**

Prepared for:

May 2000

Olowalu Elua Associates, LLC

  
MUNEKIYO, ARAKAWA & HIRAGA, INC.

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# **Chapter 1**

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## ***Project Overview***

## **I. PROJECT OVERVIEW**

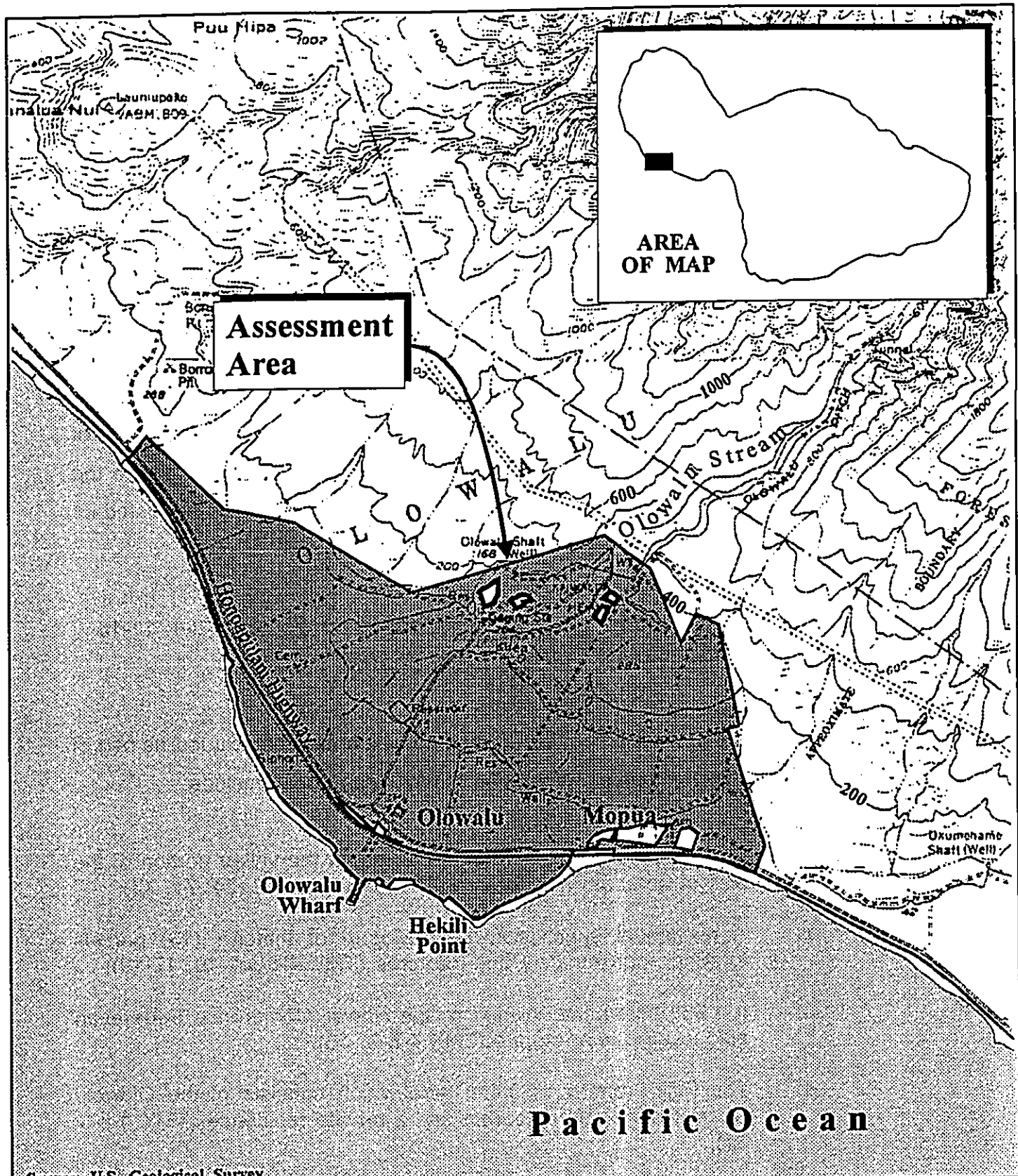
### **A. BACKGROUND**

Olowalu Elua Associates, LLC proposes to consolidate and resubdivide lands at Olowalu, Maui, Hawaii to create agricultural lots for fee simple sale. See Figure 1. The area which is the subject of this environmental assessment ("assessment area") consists of 732.98 acres, of which 659.963 acres are mauka of Honoapiilani Highway and 73.017 acres lie makai of the highway. The assessment area is comprised of 49 existing tax map parcels. See Figure 2 and Figure 3. On the lands mauka of Honoapiilani Highway, there are 38 existing tax map parcels. On the makai lands, there are 11 tax map parcels. These parcels are listed as follows:

**Mauka lands:** TMK 4-8-3: 10, 50-70, 73-82; 4-8-4: 11-16  
**Makai lands:** TMK 4-8-3: 5, 41-49 and 84

There are several properties in the area which are not included as part of the assessment area. Within the mauka area, these include:

1. Five (5) parcels, totalling 3.806 acres, in the valley portion of the project near Olowalu Stream (TMK 4-8-3:11, 12, 24, 71, 72);
2. A residential subdivision near Mopua of thirteen (13) parcels totalling approximately five (5) acres (TMK 4-8-4:1-10, 17-19);
3. A 1.988 acre parcel owned by the Hawaii Conference Federation also located near Mopua (TMK 4-8-3: 18);
4. The Fujii property of 0.498 acre which consists of the Olowalu Store, Chez Paul restaurant and a private residence (TMK 4-8-3: 31);
5. The Nahooikaika property consisting of 0.11 acre located approximately 650 feet to the north of the Fujii property (TMK 4-8-3: 26); and



Source: U.S. Geological Survey

**Figure 1** Subdivision of Olowalu Lands  
Regional Location Map

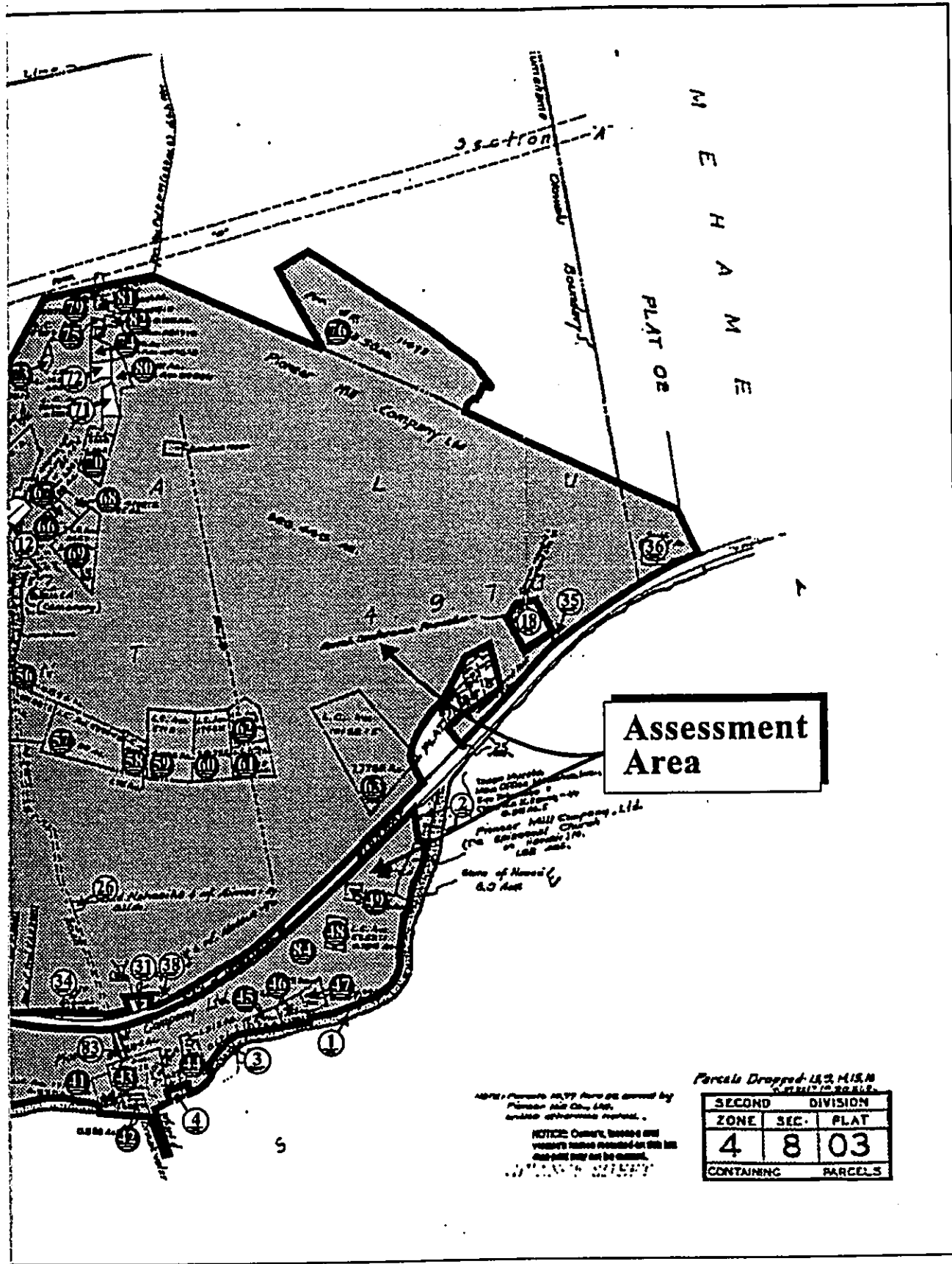


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Prepared for: Olowalu Elua Associates, LLC







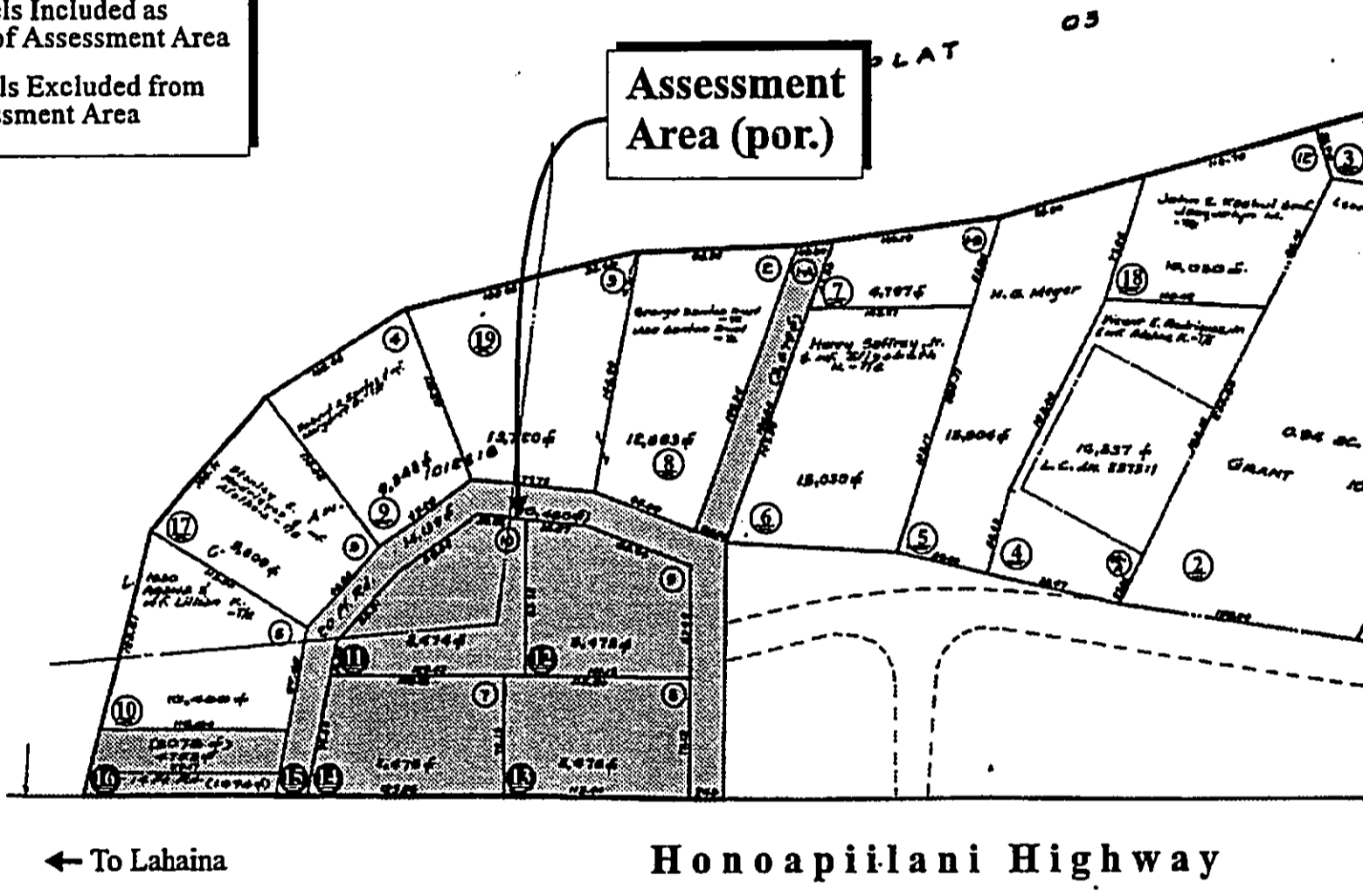
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**KEY**

- ⊕ Parcels Included as Part of Assessment Area
- ⊖ Parcels Excluded from Assessment Area



DEPARTMENT OF THE TAX COMMISSIONER		
TAXATION MAPS BUREAU		
TERRITORY OF HAWAII		
TAX MAP		
SECOND		DIVISION
2000	SEC.	PLAT
4	8	04
CONTAINS		PARCELS

OLOWALU SUBDIVISION, OLOWALU, LAHAINA, MAUI.

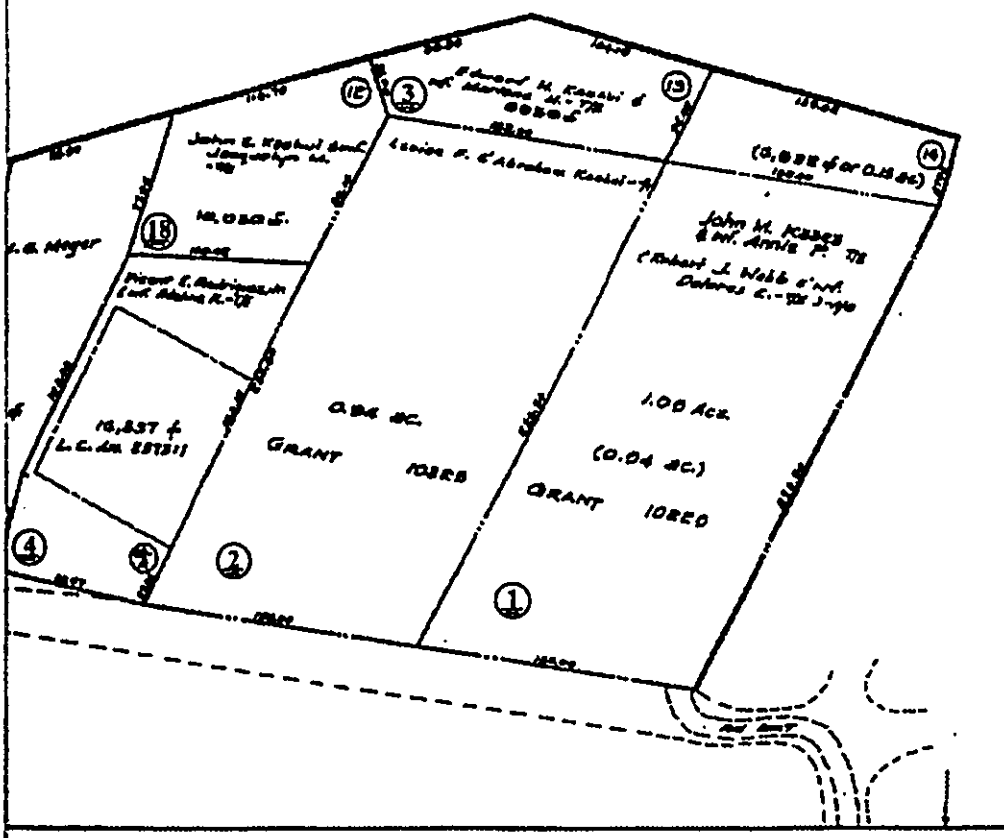
Figure 3

Subdivision of Olowalu Lands  
TMK 4-8-4



Prepared for: Olowalu Elua Associates, LLC

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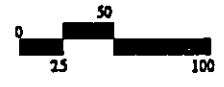
Highway

To Wailuku →

03

Note: All lots owned by Pioneer Mill Co., Ltd. unless otherwise noted.

ulu Lands



MUNEKIYO, ARAKAWA & HIRAGA, INC.

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6. Honoapiilani Highway, as well as abutting remnant parcels, totalling 0.778 acre (TMK 4-8-3: 34, 35, 36, 38).

Within the makai area, there are also several exclusions which are noted as follows:

1. A Government Beach Reserve extends approximately 100 feet from the shoreline along most of the assessment area's makai boundary (TMK 4-8-3: 1, 3, 4, 6);
2. A private residence at the extreme eastern end of the makai area (TMK 4-8-3:2); and
3. A 50 feet wide State-owned right-of-way which provides access from Honoapiilani Highway to residences near the Olowalu Wharf (TMK 4-8-3: 83).

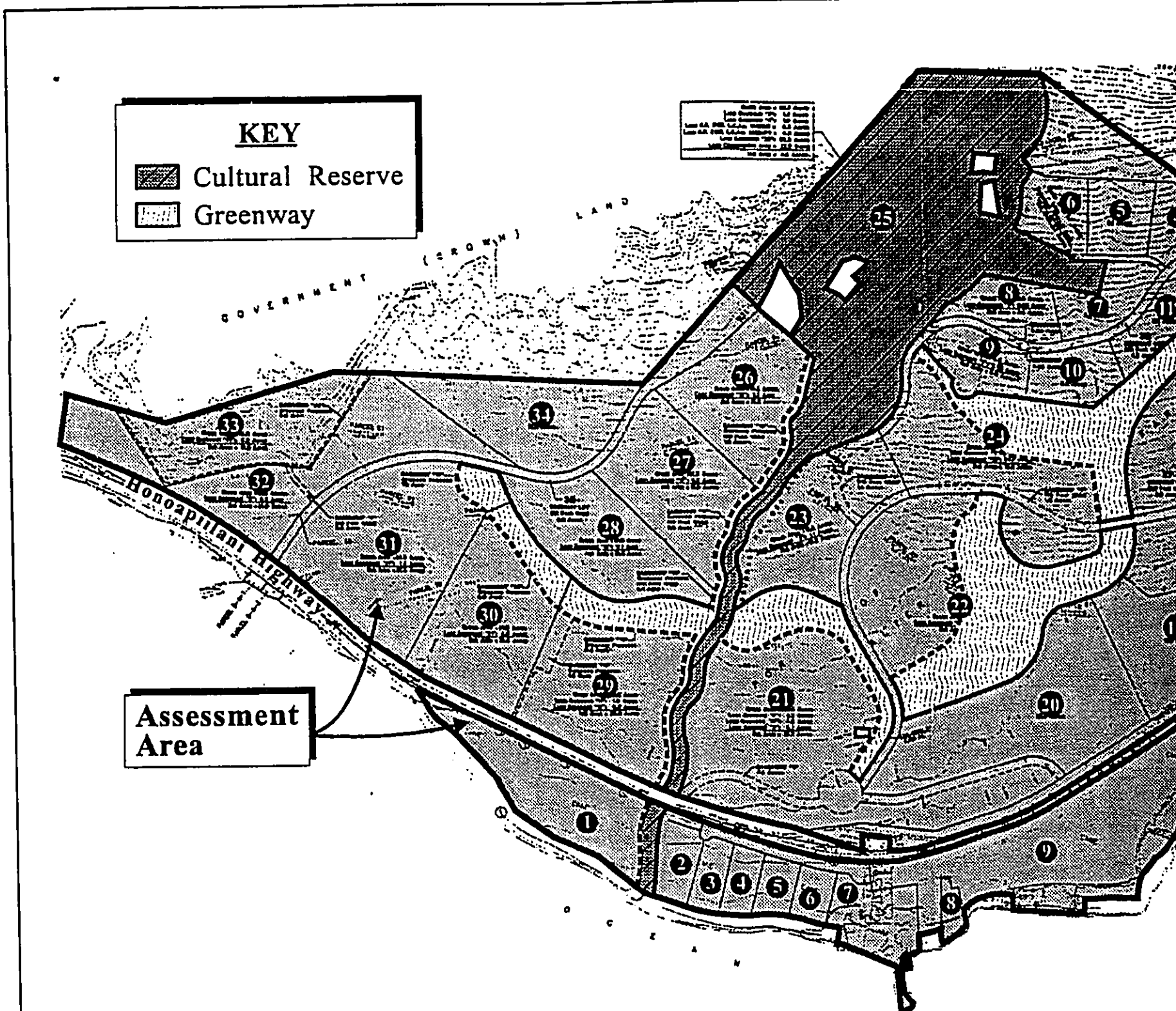
The assessment area was formerly owned by Pioneer Mill Company, Inc. and was utilized for its sugar growing operations. The applicant acquired the property from Pioneer Mill Company, Inc. in 1998.

**B. PROJECT DESCRIPTION**

Olowalu Elua Associates, LLC is proposing the consolidation and resubdivision of lands resulting in 41 agricultural parcels. See Figure 4.

Thirty-four (34) of these parcels are on lands located mauka of Honoapiilani Highway, which is the maximum allowed under the County Agricultural District zoning provisions. The lot sizes for the mauka subdivision range from approximately 3.2 acres to 86.7 acres. Five (5) roadway parcels are also proposed.

Seven (7) of the parcels are on the makai lands. With the addition of two (2) existing makai parcels (TMK 4-8-3: 44 and 84), the total lot count for the makai lands is nine (9), which is the maximum allowed under the



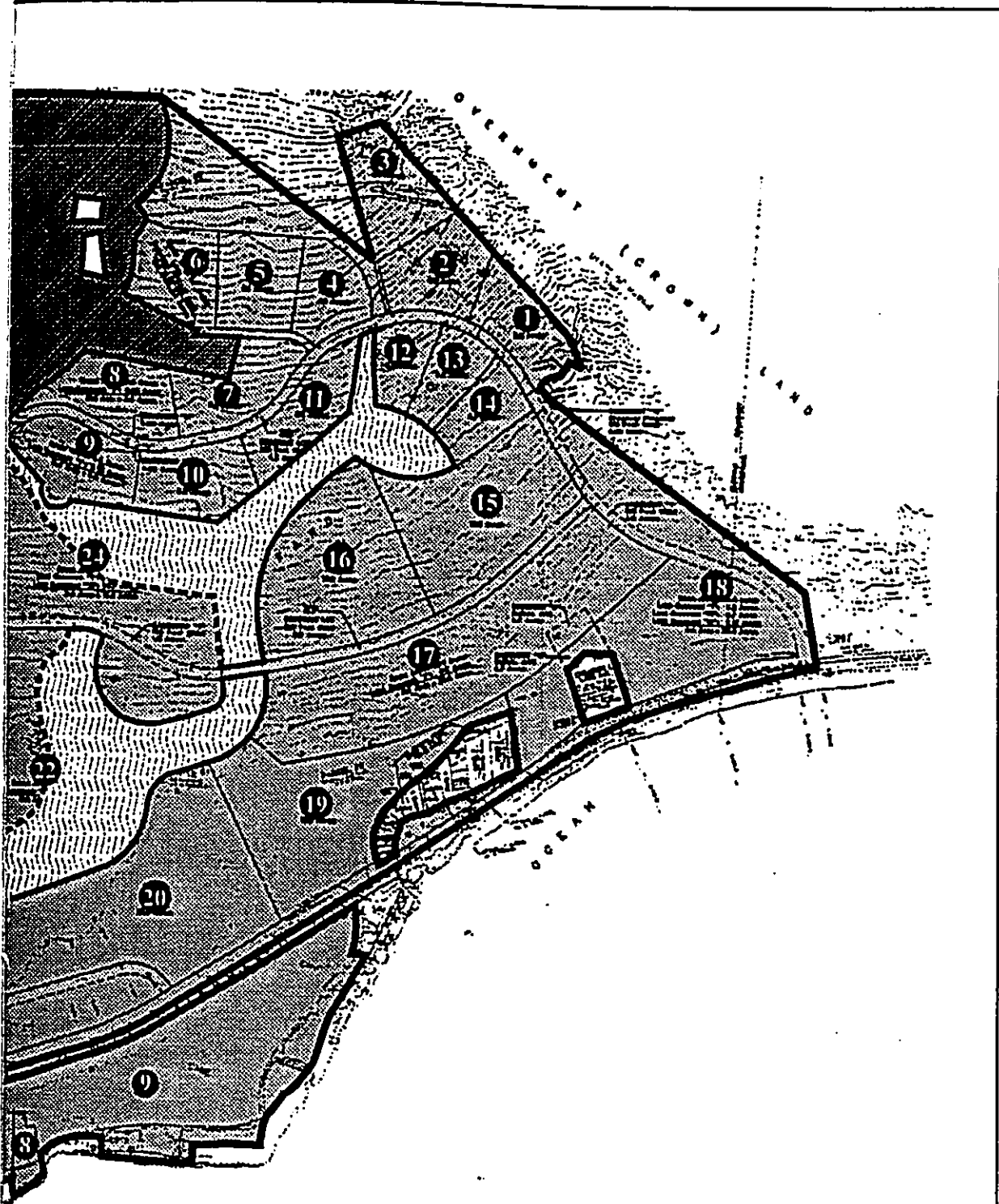
Source: R.T. Tanaka Engineers, Inc.  
 Ronald M. Fukumoto Engineering, Inc.

Figure 4

Subdivision of Olowalu Lands  
 Site Plan



Prepared for: Olowalu Elua Associates, LLC



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County Agricultural District zoning provisions. The makai subdivided lots range in size from approximately 2.0 acres to 14.67 acres.

A cultural reserve surrounding Olowalu Stream is being set aside. This reserve provides an additional buffer between agricultural and other development activities from Olowalu Stream. However, no improvements are proposed as part of the present action. A separate non-profit entity has been formed to guide activities and improvements within the cultural reserve.

The cultural reserve has been designated within the mauka reaches of the project in the valley portion of the project area. As the stream extends makai, the cultural reserve is approximately 100 feet wide on the eastern side of the stream. A 50 feet wide greenway extends along the western side of the stream. In the makai area, the cultural reserve is approximately 100 feet wide. The cultural reserve encompasses approximately 54 acres.

The area of the cultural reserve is being leased to a recently created private non-profit corporation called the Olowalu Cultural Reserve (OCR). The lease has been executed for 99 years at \$1.00 per year. The OCR was recently established with the following mission statement:

"to perpetuate traditional and customary practices of "kanaka maoli" of these Hawaiian Islands and to regain the spiritual connection of "malama aina" of our ancestors by ensuring these beliefs and customs are passed down to future generations. To accomplish this purpose, the organization will provide educational experiences of traditional and customary practices within a traditional "ocean to mountain" ahupua'a land system."

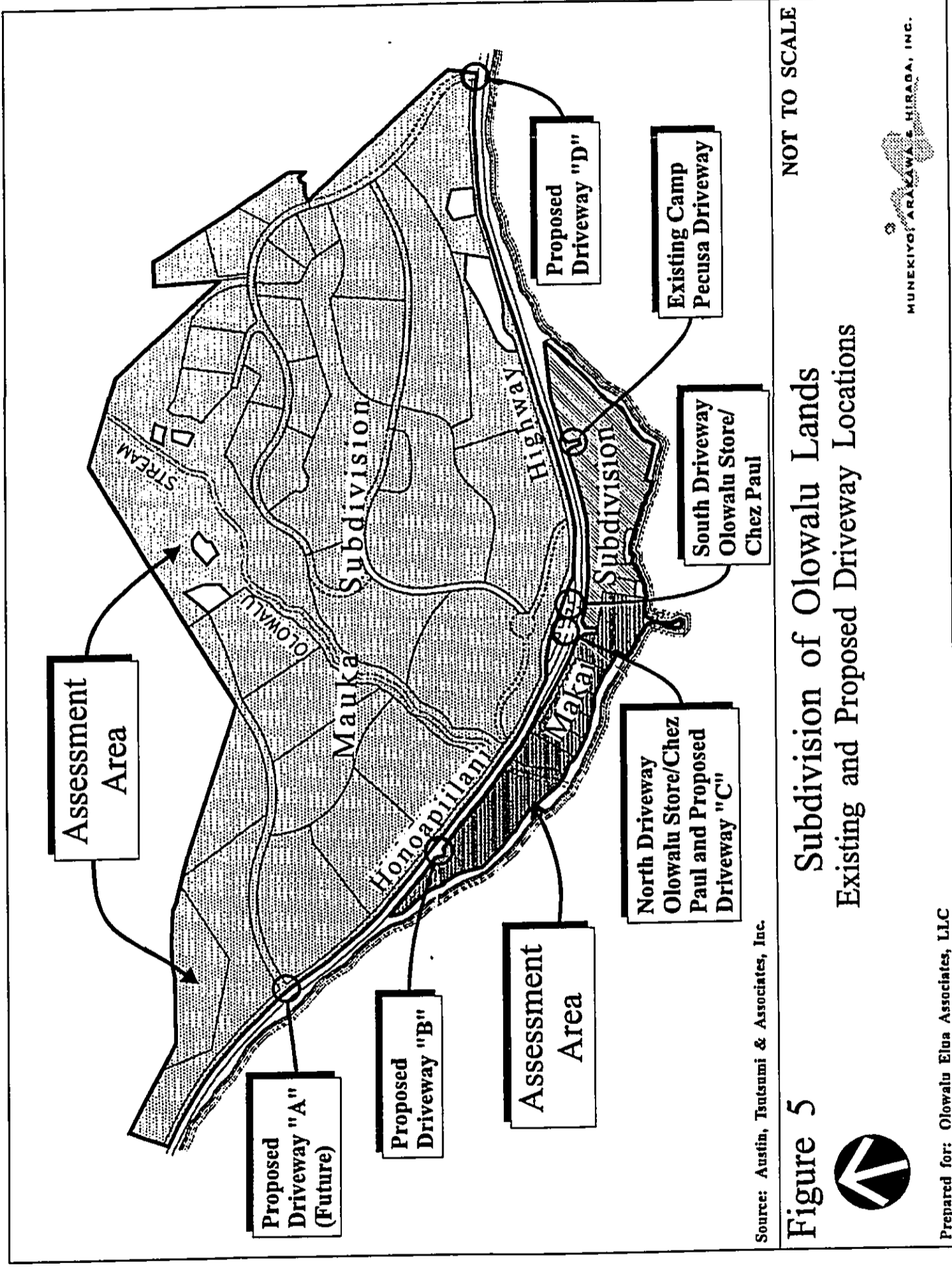
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The activities within the cultural reserve will be dictated by the OCR but within the bounds of their mission statement. The board of OCR is currently completing the strategic plan for the cultural reserve which would formalize any planned activities to include a projected implementation program.

Greenways are also proposed to be established within the mauka area. In total, there are approximately 59.91 acres of greenways established as part of the project. The greenways are proposed to be maintained by the homeowners' association.

The Mauka Subdivision is proposed to access Honoapiilani Highway via two (2) new driveways, labeled as Driveway A and Driveway D. See Figure 5. It is anticipated that access on Honoapiilani Highway for Driveway A will be requested only if needed in the future. An existing private road, which served as access for Pioneer Mill properties, is located on the mauka side of Honoapiilani Highway and runs parallel to the highway. The 34 lots in the Mauka Subdivision will be able to utilize this private road to conduct trips internally within the mauka area without traveling onto Honoapiilani Highway. The Makai Subdivision will be served by two (2) driveways, one on each side of the Olowalu Stream. A single lot on the north side of the Olowalu Stream will have a separate access, which is referred to as Driveway B. Access to the other lots in the Makai Subdivision will be at an existing driveway situated opposite of the north driveway of the Olowalu General Store/Chez Paul restaurant parking lot, labeled as Driveway C. The Makai Subdivision also contains an existing camping facility (Camp Pecusa) which is accessed by a separate, unofficial driveway. The camping facilities are mainly utilized by local groups during the weekends. Presently, there are no plans to change the Camp Pecusa facilities or alter its driveway.





Source: Austin, Tsutsumi & Associates, Inc.

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**Figure 5**  
 Subdivision of Olowalu Lands  
 Existing and Proposed Driveway Locations



Prepared for: Olowalu Elua Associates, LLC

MUNEKIYOI ARAKAWA S. HIRAGA, INC.

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Water system improvements are also proposed as part of the subject action. An approved Public Water System (No. 209) previously serviced the residents of Olowalu through a surface water filtration system. An upgrade to the system involves the installation of a new well, a chlorinating system, booster pumps, and new storage tanks. See Figure 6. There are three (3) phases of water improvements which are involved. Phase I involves the implementation of the well and waterline linking with existing Storage Tanks 2 and 3. At that point, the existing distribution system will be used to service current users. The Phase I improvements, which recently have been implemented, are intended to upgrade the existing water system from a surface to groundwater source and are accessory to the existing system. The implementation of the Phase I improvements were necessary in order to continue service to existing users since filters for the surface water filtration system have been discontinued. Phase II involves installation of a 50,000 gallon water tank near the well site and a waterline which extends from Storage Tanks 2 and 3 in an easterly direction. Waterline improvements then proceed in a southwesterly (makai) direction. Near Honoapiilani Highway, the waterline extends toward the Olowalu Store vicinity then crosses Honoapiilani Highway to the makai properties. A network of 12-inch and 8-inch transmission and distribution waterlines are proposed. The second phase services new users on makai lands as well as current and future users on the mauka lands. Phase III involves the construction of an approximately 100,000 gallon water tank near the highest point of the property. This would service lots developed on the higher elevations of mauka lands and serves as additional storage capacity.

Proposed waterlines cross the State Conservation District near the Olowalu Stream along the mauka reaches of the project. This action would require a Conservation District Use Application. Lands near the

**KEY**

- Existing Potable Water System
- ..... Proposed Potable Water System
- .-.-.- New Waterline
- Lands in State Conservation District
- Lands in Agricultural District

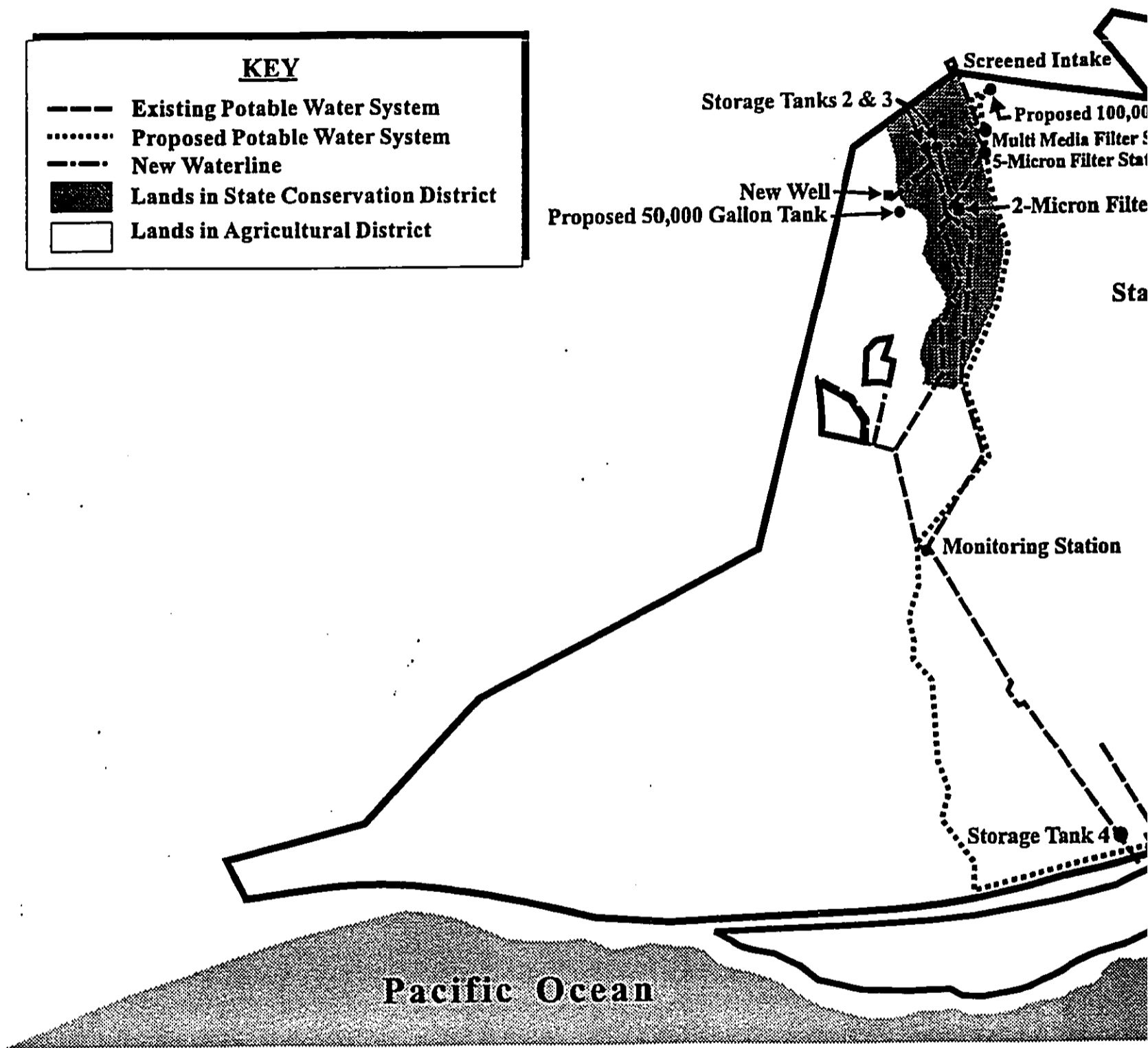
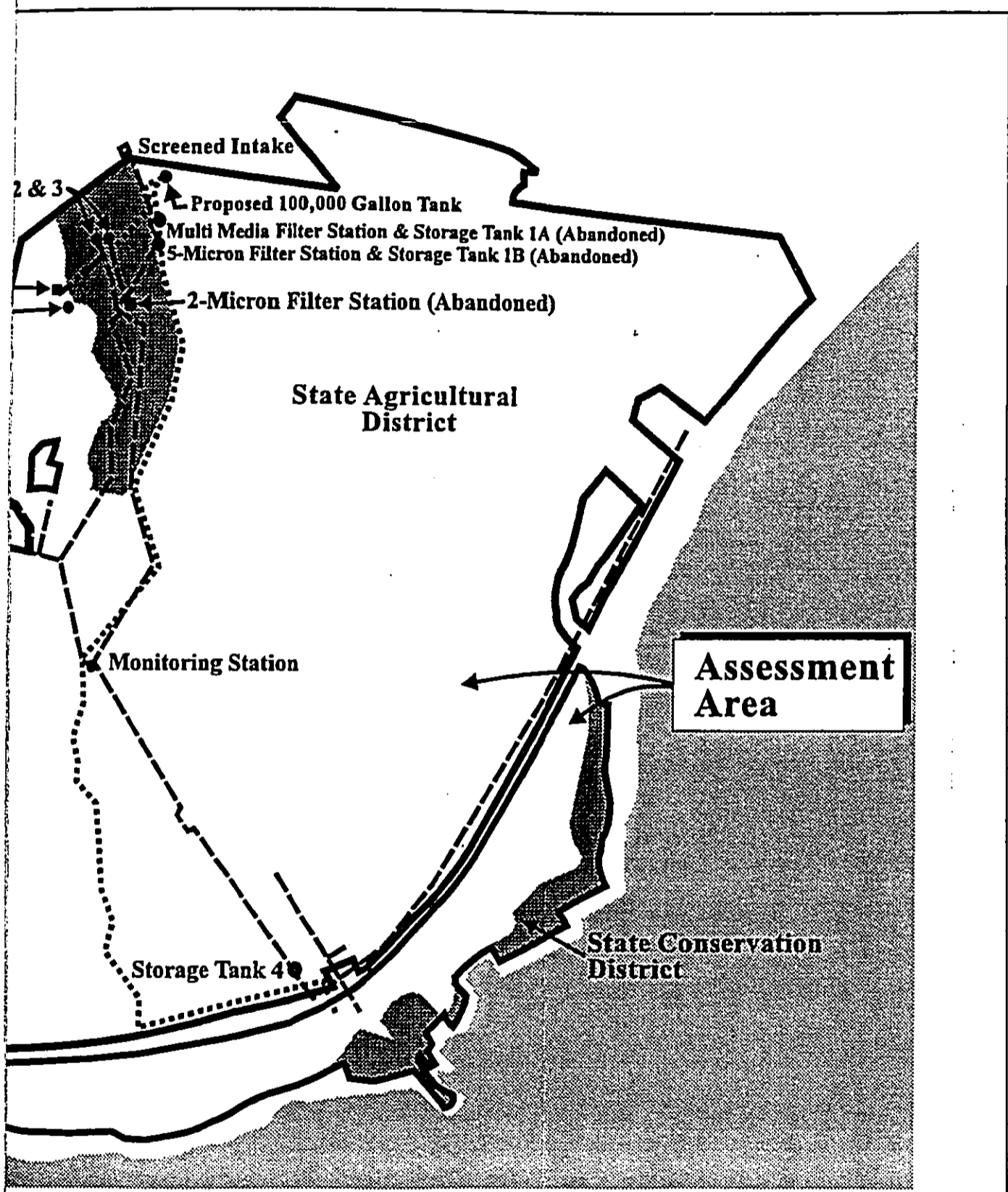


Figure 6

Subdivision of Olowalu Lands  
Existing and Proposed Water System



Prepared for: Olowalu Elua Associates, LLC



walu Lands  
Water System

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shoreline are also classified within the Conservation District, but there will be a decrease of lots and density within the Conservation District. A waterline and other utility lines crossing under the Honoapiilani Highway, which is a State highway, are also proposed to provide service to the makai lands.

Because the proposed mauka waterline within the Conservation District and crossing of a State highway will trigger review through Chapter 343, Hawaii Revised Statutes, an Environmental Assessment is being prepared.

Mauka and makai portions of the property are in the County Special Management Area (SMA). Accordingly, a SMA Use Permit Application is being filed to address the subdivision action, including the provision of roadway and utility improvements which fall within the SMA boundaries.

Construction of the assessment action is anticipated to commence upon receipt of all necessary regulatory permits and approvals. Construction of the subdivision improvements is expected to be completed in the Year 2000. The estimated construction cost is \$4.5 million. Improvements on the parcels would be completed by individual purchasers.

# **Chapter II**

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***Description of the  
Existing Environment***

## **II. DESCRIPTION OF THE EXISTING ENVIRONMENT**

### **A. PHYSICAL SETTING**

#### **1. Existing and Surrounding Land Use**

The assessment area is located adjacent to the shoreline, along the south or leeward shores of West Maui. Honoapiilani Highway, a major State highway, traverses the assessment area, near the coast. The property is located approximately 14.5 miles from Wailuku and 5.5 miles from Lahaina.

Along the slopes of the West Maui Mountains, Pioneer Mill Company, Inc. had cultivated significant acreages in sugar cane from the foothills to the shoreline. With the recent conclusion of sugar cane cultivation, other alternative crops are being considered. Sugar cane had been cultivated on lands to the northwest and southeast of the assessment area. Immediately to the northwest of the property, however, there is a closed landfill, a portion of which is currently a refuse transfer station.

To the northeast or mauka of the assessment area are State Forest Reserve lands. On the makai side is the Pacific Ocean.

The assessment area is 732.98 acres. Small farmers have started to prepare their land on a portion of the mauka lands, however, most of the area is currently fallow agricultural lands formerly used for sugar cane cultivation. These lands are located mauka and makai of Honoapiilani Highway.

Within the mauka area, a paved frontage road which parallels Honoapiilani Highway was primarily utilized by Pioneer Mill vehicles. Various dirt roads traverse the property which provided

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access to the sugar fields. The various dirt roads also provide access to five (5) parcels located in the valley and a single parcel mauka of Olowalu Store which are not a part of this application.

Olowalu Stream extends through the mauka and makai areas of the assessment area. At its mauka reaches within the assessment area, land slopes upward at its sides in a valley configuration. However, the valley floor is relatively flat and a portion has been utilized for sugar cane cultivation. As the stream proceeds makai, the slopes of adjacent lands flatten in relation to surrounding lands.

Along the southern extent of the makai area near Hekili Point, there is an unmaintained buffer strip extending approximately 100 feet to 300 feet from the shoreline. The government beach reserve, which is not a part of the assessment area, extends approximately 100 feet from the shoreline along most of the project's makai boundary.

Camp Pecusa, located to the northeast of Hekili Point, is partially within the assessment area and the government beach reserve. The campsite has been leased by the Episcopal Church of Hawaii. The camp consists of six (6) cabins, a social hall, and a manager's office.

The central portion of the makai area consists of three (3) residential dwellings and the former plantation manager's house. The ruins of the Olowalu sugar mill are located approximately 100 meters southeast of the manager's house. A pier and breakwater, formerly used for the loading and unloading of sugar into barges, extend from the shoreline in this vicinity.



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2. Climate

Like most areas of Hawaii, Olowalu's climate is relatively uniform year round. This stability is attributed to its tropical latitude, its position relative to storm tracts and the Pacific anticyclone, and the surrounding ocean. Variations in climate among different regions, then, are largely left to local terrain.

Wind patterns affecting the islands are typically out of the northeast which occurs 90 percent of the time during the summer, and 50 percent of the time in the winter.

Recorded temperatures in Lahaina, located approximately 5.5 miles to the north of Olowalu, range from an average high temperature in the high 80's to an average low temperature in the low 60's. Rainfall in the vicinity of the assessment area ranges between 15 to 20 inches per year.

3. Topography

The assessment area ranges in elevation from sea level to approximately 400 feet above sea level. The site is gently sloping with an average gradient of 7 percent.

The topography of the site reflects the general topographical patterns of the West Maui region. Lands near the shoreline are flat to slightly sloping. The assessment area has a 2 to 5 percent gradient from the shoreline to the 40 foot contour. At the slightly higher elevations in the foothills of the West Maui Mountains, the gradient increases slightly. There is an average 10 percent gradient between the 200 foot and 400 foot contours. Lands above

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the Forest Reserve line outside of the assessment area contain steeper gradients with slopes exceeding 50 percent.

Within the mauka portions of the assessment area, the Olowalu Stream Valley is located at a lower elevation than surrounding lands.

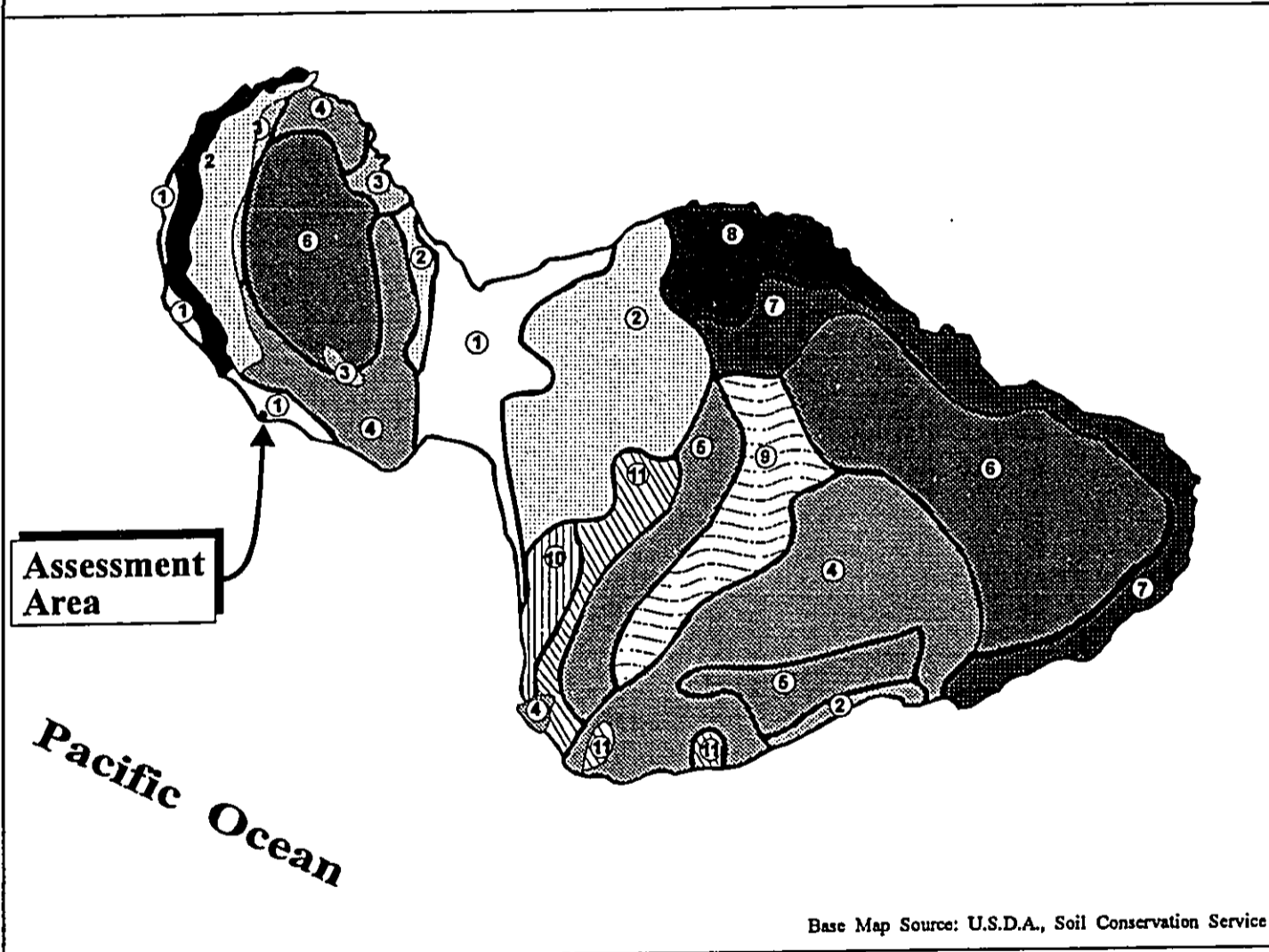
4. Soils

Underlying the assessment area is the Pulehu-Ewa-Jaucas association. See Figure 7. This series consist of well-drained soils on alluvial fans and stream terraces and in basins. These soils were developed in alluvium washed from basic igneous rock. The soil types specific to the assessment area consist of Pulehu clay loam, 0 to 3 percent slopes (PsA); Pulehu cobbly clay loam, 0 to 3 percent slopes (PtA); Pulehu cobbly clay loam, 3 to 7 percent slopes (PtB); Pulehu silt loam, 0 to 3 percent slopes (PpA); Jaucas sand, 0 to 15 percent slope (JaC); Stony alluvial land (rSM); Rough Broken and Stony Land (rRS); Kealia silt loam (KMW); Ewa silty clay loam, 0 to 3 percent slopes (EaA); Wainee extremely stony silty clay, 7 to 15 percent slopes (WyC); and Beaches (BS). See Figure 8.

Pulehu clay loam (PsA) is a dark brown loam underlain by dark brown, dark grayish brown and brown, massive and single grain, stratified loam, loamy sand, fine sandy loam, and silt loam. Permeability is moderate, runoff is slow, and the erosion hazard is no more than slight. Pulehu cobbly clay loam, 0 to 3 percent slopes (PtA), is similar to Pulehu clay loam except that it is cobbly. On Pulehu cobbly clay loam, 3 to 7 percent slopes (PtB), runoff is slow and erosion hazard is slight. Pulehu silt loam (PpA)

## LEGEND

- |   |   |
|---|---|
| <ul style="list-style-type: none"> <li><span style="border: 1px solid black; padding: 2px; display: inline-block; width: 20px; height: 10px; margin-right: 5px;">①</span> Pulehu-Ewa-Jaucas association</li> <li><span style="border: 1px solid black; padding: 2px; display: inline-block; width: 20px; height: 10px; margin-right: 5px;">②</span> Waiakoa-Keahua-Molokai association</li> <li><span style="border: 1px solid black; padding: 2px; display: inline-block; width: 20px; height: 10px; margin-right: 5px;">③</span> Honolulu-Olelo association</li> <li><span style="border: 1px solid black; padding: 2px; display: inline-block; width: 20px; height: 10px; margin-right: 5px;">④</span> Rock land-Rough mountainous land association</li> <li><span style="border: 1px solid black; padding: 2px; display: inline-block; width: 20px; height: 10px; margin-right: 5px;">⑤</span> Puu Pa-Kula-Pane association</li> <li><span style="border: 1px solid black; padding: 2px; display: inline-block; width: 20px; height: 10px; margin-right: 5px;">⑥</span> Hydrandepts-Tropaquods association</li> </ul> | <ul style="list-style-type: none"> <li><span style="border: 1px solid black; padding: 2px; display: inline-block; width: 20px; height: 10px; margin-right: 5px;">⑦</span> Hana-Makaalae-Kailua association</li> <li><span style="border: 1px solid black; padding: 2px; display: inline-block; width: 20px; height: 10px; margin-right: 5px;">⑧</span> Pauwela-Haiku association</li> <li><span style="border: 1px solid black; padding: 2px; display: inline-block; width: 20px; height: 10px; margin-right: 5px;">⑨</span> Laumaia-Kaipoi-Olinda association</li> <li><span style="border: 1px solid black; padding: 2px; display: inline-block; width: 20px; height: 10px; margin-right: 5px;">⑩</span> Keawakapu-Makena association</li> <li><span style="border: 1px solid black; padding: 2px; display: inline-block; width: 20px; height: 10px; margin-right: 5px;">⑪</span> Kamaole-Oanapuka association</li> </ul> |
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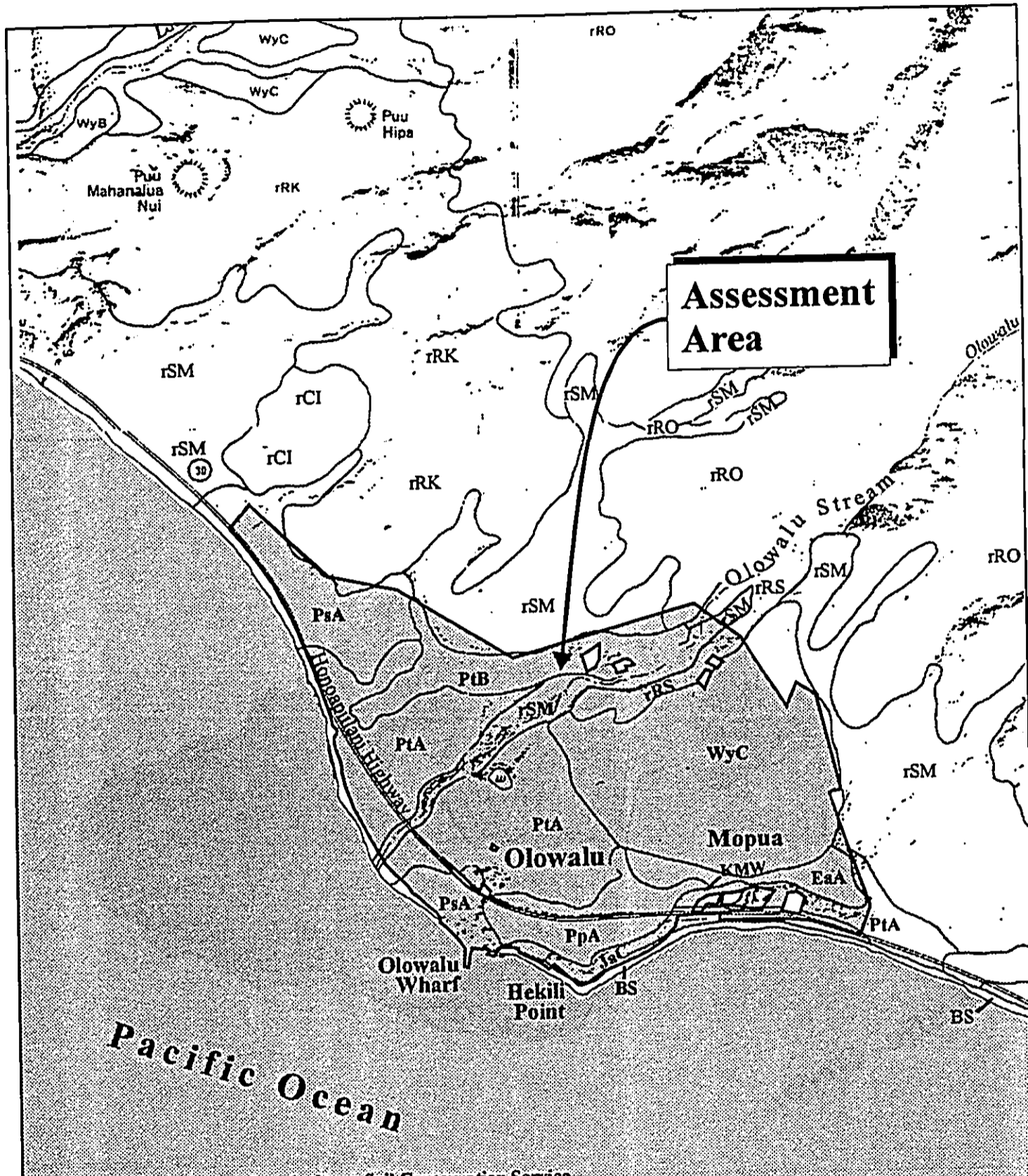
Base Map Source: U.S.D.A., Soil Conservation Service

**Figure 7**      **Subdivision of Olowalu Lands**      **NOT TO SCALE**  
**Soil Association Map**



MUNEKIYO, ARAKAWA & HIRAGA, INC.

Prepared for: Olowalu Elua Associates, LLC



Source: U.S. Department of Agriculture, Soil Conservation Service

**Figure 8** Subdivision of Olowalu Lands  
Soil Classifications



MUNEKIYO, ARAYAWA & HIRAGA, INC.

Prepared for: Olowalu Elua Associates, LLC

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possesses similar characteristics as Pulehu clay loam, 0 to 3 percent slopes (PtA), except that its texture is silt loam.

The Jaucas sand (JaC) soil type is single grain, pale brown to very pale brown, sand, and more than 60 inches deep. Permeability is rapid and runoff is very slow to slow. The hazard of water erosion is slight, but wind erosion may become severe where vegetation has been removed.

Stony alluvial land (rSM) consists of stones, boulders and soil deposited by streams along the bottoms of gulches and on alluvial fans.

Rough Broken and Stony Land (rRS) consists of very steep, stony gulches. Runoff is rapid and the geologic erosion is active. The soil material is generally less than 20 inches deep over saprolite or bedrock. About 3 to 25 percent of the surface is covered with stones, and there are a few rock outcrops.

Kealia silt loam (KMW) is a poorly drained soil which has a high content of salt. Ponding occurs in low areas after a heavy rain. When the soil dries, salt crystals accumulate on the surface. The soil has a brackish water table that fluctuates with the tides. In a representative profile, the surface layer is dark reddish-brown silt loam about 3 inches thick. Below this are stratified layers of silt loam, loam, and fine sandy loam. A brackish water table occurs at a depth of 12 to 40 inches. The subsurface layers are dark reddish brown to dark reddish gray in the upper part and dark grayish brown to black near the zone of the water table. The soil has a high concentration of salts and is moderately alkaline. Permeability

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is moderately rapid. Runoff is slow to very slow. The hazard of water erosion is no more than slight, but the hazard of wind erosion is severe when the soil is dry and the surface layer becomes loose and fluffy.

The Ewa series of soils consist of well-drained soils in basins and on alluvial fans. These soils developed in alluvium are derived from basic igneous rock. In a representative profile, Ewa silty clay loam, 0 to 3 percent slopes (EaA) has a surface layer of dark reddish-brown silty clay loam about 18 inches thick. The subsoil, about 42 inches thick, is dark reddish-brown and dark red silty clay loam that has a subangular blocky structure. The substratum is coral limestone, sand or gravelly alluvium. The soil is neutral in the surface layer and subsoil. Runoff is very slow and the erosion hazard is no more than slight.

Wainee extremely stony silty clay, 7 to 15 percent slopes (WyC), is moderately sloping and occurs on smooth alluvial fans. In a representative profile, the surface layer is dark reddish-brown silty clay about 12 inches thick. Stones make up 10 to 15 percent of the volume. The subsoil, 24 inches thick, consists of dark reddish-brown silty clay that has a subangular blocky structure. Gravel, cobblestones, and stones make up 30 to 80 percent of the volume. The substratum is dark-brown silty clay. As much as 80 to 90 percent of this layer is gravel, cobblestones and stones. This soil is neutral in the surface layer and subsoil. Permeability is moderately rapid. Runoff is slow to medium, and the erosion hazard is slight to moderate.

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Beaches (BS) occur as sandy, gravelly, or cobbly areas. They are washed and rewashed by ocean waves. The beaches primarily consist of light colored sands derived from coral and seashells.

The University of Hawaii Land Study Bureau establishes a classification system which rates lands on a scale of "A" to "E", reflecting agricultural land productivity characteristics. Lands designated "A" are considered to be of highest productivity, with "E" rated lands ranked lowest. Most of the lands underlying the assessment area are designated "A" and "B". Lands adjacent to Olowalu Stream are designated "E". Also, slivers of land near the boundary of the mauka area are designated "E".

The State Department of Agriculture has established three (3) categories of Agricultural Lands of Importance to the State of Hawaii (ALISH). Utilizing modern farming methods, "prime" agricultural lands have the soil quality, growing season, and moisture supply needed to produce sustained crop yields economically, while "unique" agricultural lands possess a combination of soil quality, location, growing season, and moisture supply currently used to produce sustained high yields of a specific crop. "Other" important agricultural lands include those which have not been rated "prime" or "unique".

As indicated by the ALISH map, areas extending around the lower reaches of Olowalu Stream and a portion of property near the southeastern boundary are classified "Other" important agricultural land. Areas near the northwestern boundary of the project area are classified "Prime". The central and southern portions of the makai area, as well as areas around Mopua, are also classified

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"Prime" agricultural land. Other remaining lands are unclassified. See Figure 9.

5. **Flood and Tsunami Hazards**

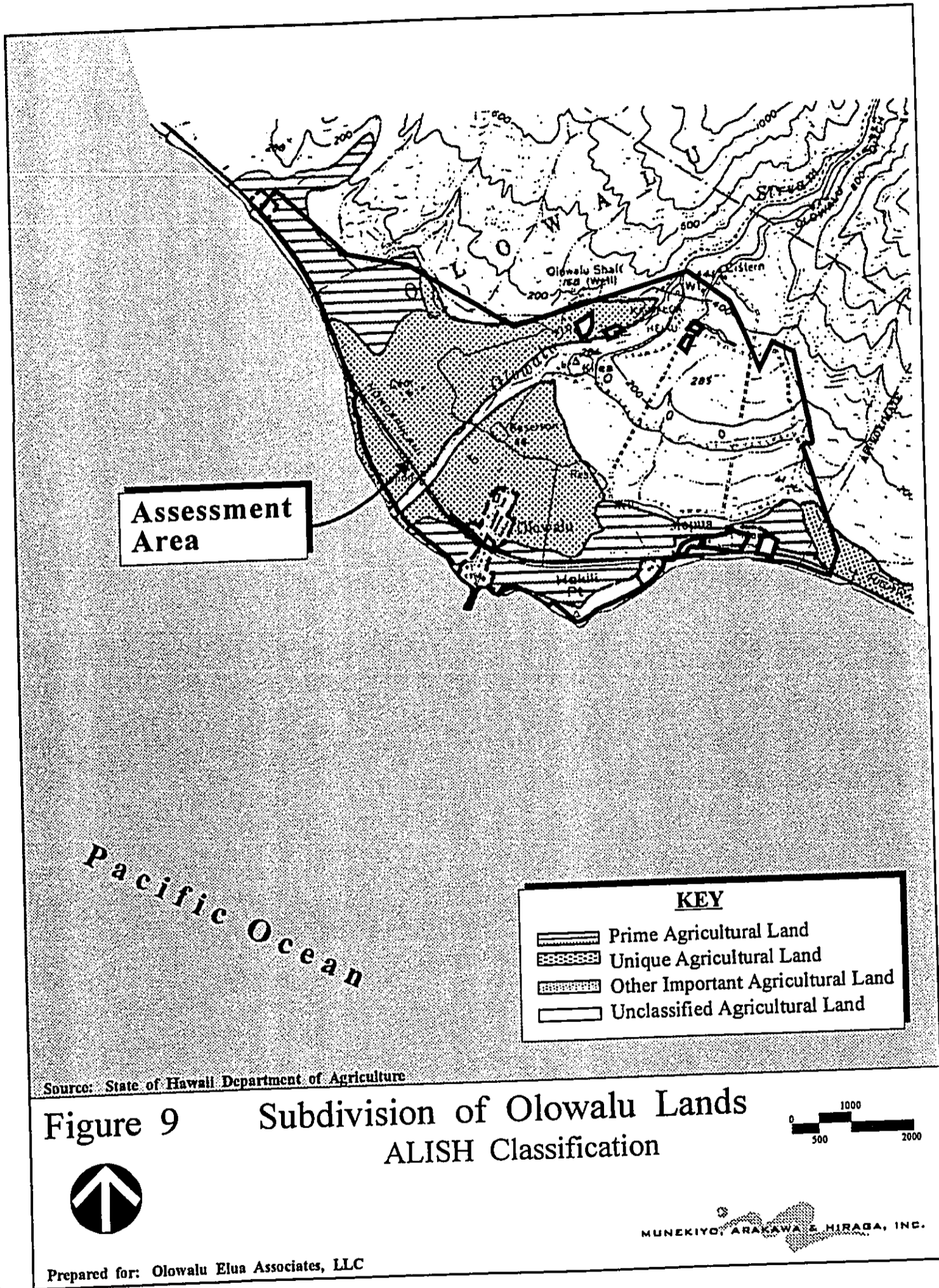
Most of the assessment area is located within Zone C, an area of minimal flooding. See Figure 10.

Areas around Olowalu Stream are designated as Zone A4, areas of the 100-year flood with base flood elevations ranging from 34 feet to 73 feet above sea level. As the stream trends lower, areas designated as Zone AO fan out near Honoapiilani Highway. These are areas of 100-year shallow flooding, to a depth of 1 foot. Strips of land abutting the above-noted flood zones are designated as Zone B, areas between limits of the 100-year flood and 500-year flood.

Portions of the assessment area close to the shoreline are designated as Zone A4. Shoreline areas along the western portion of the assessment area and near Olowalu Wharf are designated as Zone A4 with base flood elevations of 8 feet. Areas along the eastern portion of the assessment area, near Honoapiilani Highway, are designated as Zone A4, areas of the 100-year flood with base flood elevations of 5 to 6 feet.

Areas around an unnamed gulch located to the northeast of Hekili Point are designated as Zone AO, areas of 100-year shallow flooding, to a depth of 1 foot.





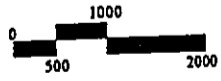
**Assessment Area**

*Pacific Ocean*

KEY	
	Prime Agricultural Land
	Unique Agricultural Land
	Other Important Agricultural Land
	Unclassified Agricultural Land

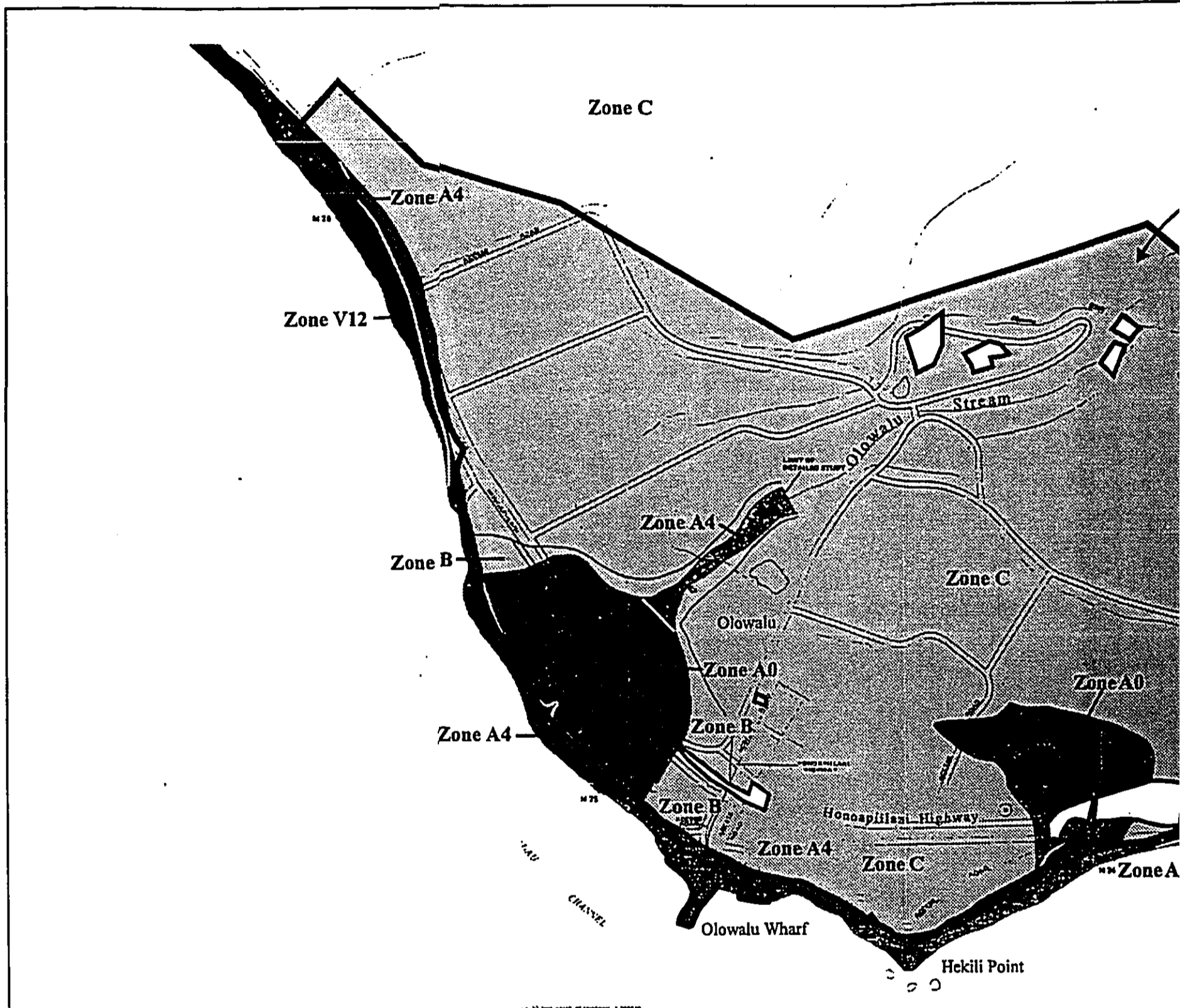
Source: State of Hawaii Department of Agriculture

**Figure 9** Subdivision of Olowalu Lands  
ALISH Classification



Prepared for: Olowalu Elua Associates, LLC

MUNEKIYO, ARAKAWA & HIRAGA, INC.



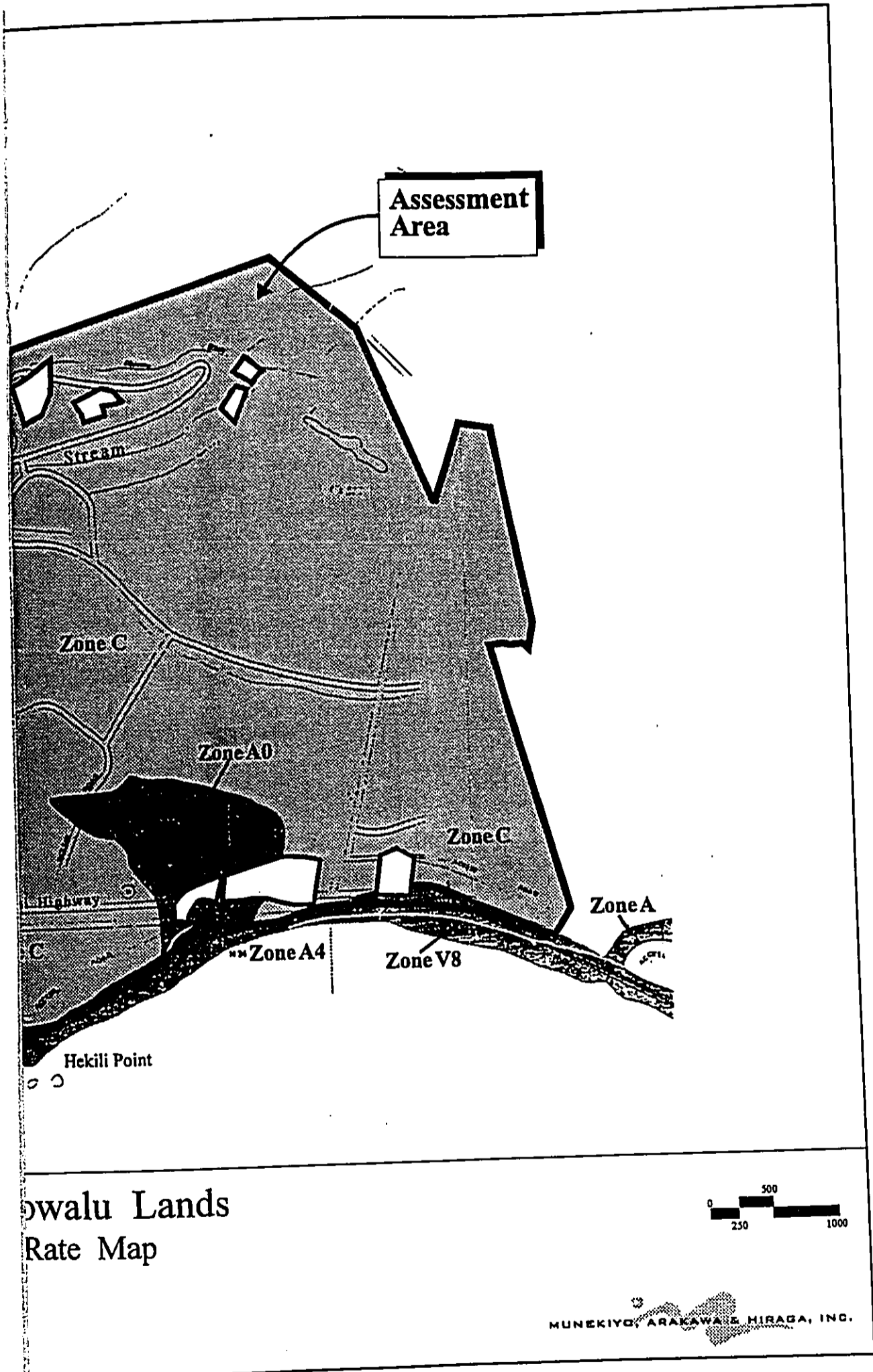
Source: Federal Emergency Management Agency

Figure 10

Subdivision of Olowalu Lands  
Flood Insurance Rate Map



Prepared for: Olowalu Elua Associates, LLC



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6. **Flora and Fauna**

A botanical survey of the property was conducted by Char and Associates. See Appendix A. Five (5) general vegetation types are recognized on the assessment area. These are the coastal vegetation, sugar cane fields, irrigation system vegetation, gulch vegetation, and the kiawe/buffelgrass community.

**Coastal Vegetation:**

Coastal vegetation occurs as a narrow band along the seaward front of the makai parcel. Immediately behind this narrow band of vegetation are the formerly cultivated sugar cane (Saccharum officinarum) fields.

On the western half of the makai parcel, the beaches consist of rounded, waterworn basalt and bleached coral rubble. In places, a few pockets of grayish-colored, fine sand are found along the black and white colored cobble beaches. The coastal vegetation on this type of substrate consists of low, scattered mats of pohuehue or beach morning glory (Ipomoea pes-caprae) with clumps of buffelgrass (Cenchrus ciliaris), a few small wind-pruned trees of kiawe (Prosopis pallida) and 'opiuma (Pithecellobium dulce), and small mixed patches of swollen fingergrass (Chloris barbata), 'uhaloa (Waltheria indica), koa haole (Leucaena leucocephala), and sourbush (Pluchea carolinensis). Where the Olowalu Stream nears the ocean, there is a berm of basalt boulders and coral rubble. A small pond surrounded by scattered patches of Australian saltbush (Atriplex semibaccata) and a few shrubs of hau (Hibiscus tiliaceus) and sourbush are found here.

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Along the eastern half of the makai parcel, the substrate along the coastline is primarily grayish colored, fine sand with scattered pockets of cobble beach. Kiawe trees form a dense belt along the coastline down to the water's edge. Vegetation under the trees is sparse due to the heavy shade and consists of small patches of sourbush, buffelgrass, Bermuda grass (Cynodon dactylon), Australian saltbush, etc., along the margins of the treeline. Near the plantation manager's house, there are a few trees of monkeypod (Samanea saman) and Livistona sp. tucked in among the kiawe trees.

**Sugar Cane Fields:**

The former sugar cane fields occur on level to moderately sloping, well-drained soils on alluvial fans and stream terraces. This covers the majority of the property. Recently harvested fields support a few patches of weedy species such as Bermuda grass, nutgrass (Cyperus rotundus), Boerhavia coccinea, 'uhaloa, swollen fingergrass, castor bean (Ricinus communis), and hairy horseweed (Conyza bonariensis). Some fallowed fields support a few seedlings of kiawe, 'opiuma, and koa haole, especially along the margins of the fields.

Other weedy species found in the former sugar fields are: little bell or pink bindweed (Ipomoea triloba), buffelgrass, Guinea grass (Panicum maximum), Natal redtop grass (Melinis repens), hairy spurge (Chamaesyce hirta), Mexican fireweed (Euphorbia heterophylla), and coat buttons (Tridax Procumbens).

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#### **Irrigation System Vegetation:**

This vegetation type occupies only a small portion of the assessment area and is associated with the irrigation ditches, reservoirs, and small overflow areas. A number of plant species are restricted to or are more abundant along the irrigation system.

Along the walls of the ditches, tussocks of moss and small clumps of ferns and mostly annual species are found. These include hairy sword fern (Nephrolepis multiflora), pteris (Pteris vittata), Maui pamakani (Ageratina riparia), Fimbristylis dichotoma, molasses grass (Melinis minutiflora), and rabbit's foot grass (Polypogon monspeliensis). A number of wetland indicator species, such as primrose willow or kamole (Ludwigia octovalvis), Job's tears (Coix lachryma-jobi), California grass (Brachiaria mutica), honohono (Commelina diffusa), and jungle rice (Echinochloa colona) also occur here.

The reservoirs on the site are ringed by a dense scrub composed of koa haole, California grass, castor bean, a few trees of Java plum (Syzygium cumini) and 'opiuma, and a varied assortment of weedy species. Elodea (Egeria densa), a submerged aquatic flowering plant, is abundant in the two (2) larger reservoirs. Ducks and other waterbirds eat the plants. The two (2) larger reservoirs provide feeding and nesting habitat for the endangered 'Alae Ke'oke'o or Hawaiian Coot (Fulica americana alai).

#### **Gulch Vegetation:**

Portions of the Olowalu Stream gulch is characterized as dense forest. For about a third of its length, where the gulch enters the property on the mauka end near a flume and down past Kilea pu'u,

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the vegetation along the gulch is composed of large trees of 'opiuma, 45 to 50 feet tall and 2 to 3 feet in diameter. Along the lower two-thirds of the gulch, the vegetation is a mix of tall kiawe trees and 'opiuma trees with smaller scattered stands of Java plum. In places, the kiawe may be locally abundant.

Scattered here and there along the stream banks are a few trees of kukui nut (Aleurites moluccana). Other woody components found occasionally on the gulch floor include Chinaberry (Melia azedarach), koa haole, lantana (Lantana camara), guava (Psidium guajava), kolomona (Senna surattensis), and sourbush. Ground cover is somewhat open and patchy with sourgrass (Digitaria insularis) and panicgrass (Panicum maximum var. trichoglume) in the shadier areas, and buffelgrass in the sunnier, open areas. The native 'ilie'e (Plumbago zeylanica), a sprawling shrub with clusters of white flowers, can be found in the rockier areas along the gulch.

The stream along the gulch bottom is dry except for where it enters the property and is diverted into the irrigation system. Waterworn stones and boulders with pockets of barren soil characterize the bottom of the stream. In a few places, the damp and shaded banks support clumps of hairy sword fern, wood-fern (Christella parasitica), gold fern (Pityrogramma calomelanos), pteris, Australian maidenhair (Adiantum hispidulum), maidenhair fern (Adiantum raddianum), and mosses.

**Kiawe/Buffelgrass Community:**

The uncultivated areas along the mauka boundary of the assessment area support a kiawe/buffelgrass plant community or

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vegetation type. These areas were grazed in the past as there are old fence lines where it adjoins the sugar cane fields.

Where this plant community abuts the sugar cane fields in areas with deeper soils, the kiawe trees are 20 to 30 feet tall and form a somewhat closed-canopy forest with tree cover about 60 percent. Buffelgrass occurs as a dense cover, 2 to 3 feet tall, between the trees. Prickly shrubs of lantana are common in these areas.

In the areas with rock outcrop and rock land, the kiawe trees are more widely spaced, about 10 to 30 percent tree cover, and are 5 to 20 feet tall. The buffelgrass cover is somewhat patchy and rocky outcroppings are frequent. Scattered shrubs of koa haole and klu (Acacia farnesiana) are frequently observed. Rocky outcroppings support native plants such as pili grass (Heteropogon contortus), 'a'ali'i (Dodonaea viscosa), 'ilima (Sida fallax), and 'uhaloa. A few trees of wiliwili (Erythrina sandwicensis) also occur here. Other species which occur here in small numbers include virgate mimosa (Desmanthus pernambucanus), wild zinnia (Zinnia peruviana), running pop (Passiflora foetida), bristly foxtail (Setaria verticillata), smooth rattlepod (Crotalaria pallida), Natal redtop, and hairy merremia (Merremia aegyptia).

Kilea, a small rocky hill or pu'u (elevation 264 feet) near Olowalu Stream, also is covered by a kiawe/buffelgrass community. The large rock faces on the western portion of the pu'u are noted for their large collection of petroglyphs. About three (3) dozen plants of nehe (Lipochaeta lavarum), a native shrub with silvery gray leaves and large daisy-like flowers, are found on the northwestern



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slopes of Kilea. The native poppy or pua kala (Argemone glauca) is found near the summit of the pu'u.

The region's wildlife include a host of introduced species, including the Japanese White-eye (*Zosterops japonicus*), Zebra-dove (*Geopelia striata*), spotted dove (*Streptopelia chinensis*), and common Myna (*Acridotheres tristis*). The Hawaiian hoary bat (*Lasiurus cinereus semotus*) was sighted outside of the assessment area near Mopua in 1989 (conversation with Mike Richardson, USFWS, September 29, 1999). Other mammals common to this area include rats, mice and mongoose.

7. **Archaeological Resources**

Archaeological inventory surveys for the mauka and makai areas comprising the assessment area were conducted by Xamanek Researches. See Appendices B and B-1. Correspondence from the State Historic Preservation Division is included in Appendix B-2.

The bulk of the overall project area is located in the Olowalu ahupua'a, while a 5-acre portion at the southeastern end of the study area lies within the ahupua'a of Ukumehame. Olowalu was an important agricultural area in pre-contact times. As long as water was available, the hot climate was ideal for producing taro.

In the post-contact period, the Olowalu area was notable for the infamous Olowalu Massacre which took place in 1790. This involved a cultural misunderstanding which resulted in tragic consequences.

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As foreign influence became more pervasive following the unification of the Hawaiian Islands under Kamehameha, Lahaina became the center for West Maui because of favorable conditions for sailing craft. An 1832 missionary census showed the population of Lahaina at 4,028; Olowalu at 832; and Ukumehame at 573.

Following the Great Mahele in 1848, there were 46 individual Land Commission awards granted in the ahupua'a of Olowalu. The majority are in the upper reaches of the property, along Olowalu Stream. The distribution of land awards and a review of late 1800's and early 1900's plantation maps suggest that the stream was channeled in a general, straighter north-south direction sometime after the Mahele. This was probably done to control flooding of agricultural fields.

The Olowalu Sugar Company is said to have been an enterprise of King Kamehameha V, who reigned from 1863 to 1872. He began the operation sometime during his reign. It was incorporated as the Olowalu Sugar Company in May 1881 and eventually was sold to Pioneer Mill Company, Ltd. in 1931. The Olowalu Mill was probably constructed in the 1870's located adjacent to the wharf. A two-foot gauge railroad was built parallel to the old government road. The plantation manager's house, located approximately 100 meters to the northwest of the Mill, was built somewhere from 1910 to 1915. There are also three (3) other houses between the Mill and the highway, which may have been built around the same time.

#### Results of Surveys

Xamanek Researches conducted an archaeological inventory survey for the project area mauka of Honoapiilani Highway. A

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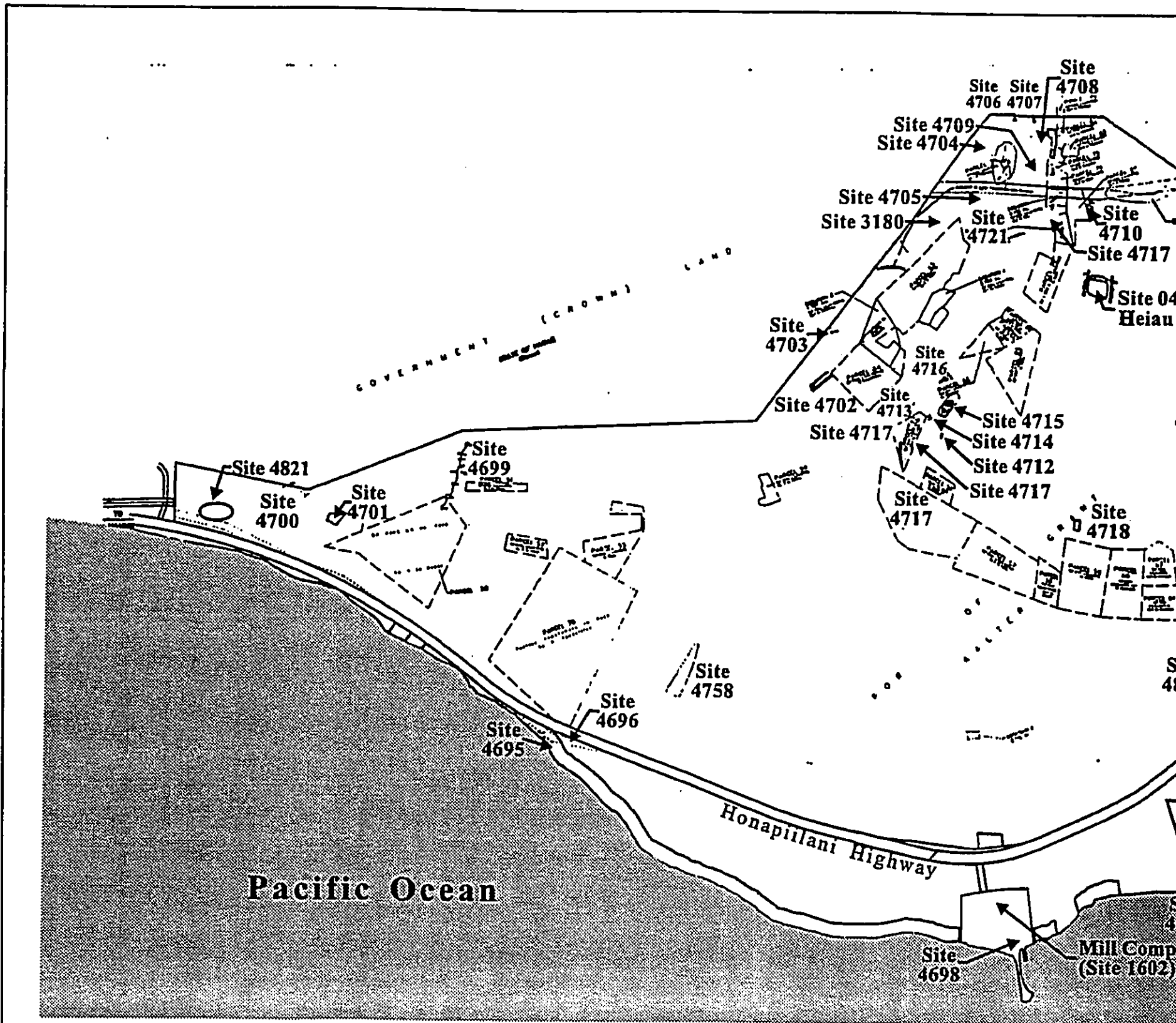
separate inventory survey was done for the project area makai of Honoapiilani Highway.

Field work was carried out in two (2) phases. An initial reconnaissance survey was conducted in October 1998. Inventory level field work was subsequently performed during December 1998 and in January, February and March 1999. Field checks, mapping and site evaluation were carried out in April and May 1999. A total of 34 archaeological sites have been identified. Six (6) of these are known sites, while 28 had previously not been recorded.

The known cultural resources in the mauka area include Kawaialoa heiau (Site 50-50-08-04), the Olowalu Petroglyph Complex (Site 1200), the Olowalu Petroglyph Rock Shelter (Site 1201), the Hawaiian Protestant Church (Site 1603), an ahupua'a boundary wall (Site 3180), and a plantation era irrigation ditch (Site 3172).

The newly identified cultural resources include an unnamed heiau, thought to have been destroyed after Walker's survey in 1930 (Site 4718); temporary habitation areas and rock overhang shelters; agricultural terraces; a possible heiau; a pre- and post-contact burial ground; a probable burial cave; boundary walls; retaining walls; two (2) petroglyph panels; a severely impacted possible ceremonial site; plantation era retaining walls, ditch irrigation system; and a plantation hydropower generation facility.

Table 1 lists function and age of each site in the mauka area, as well as its component features. See Figure 11.



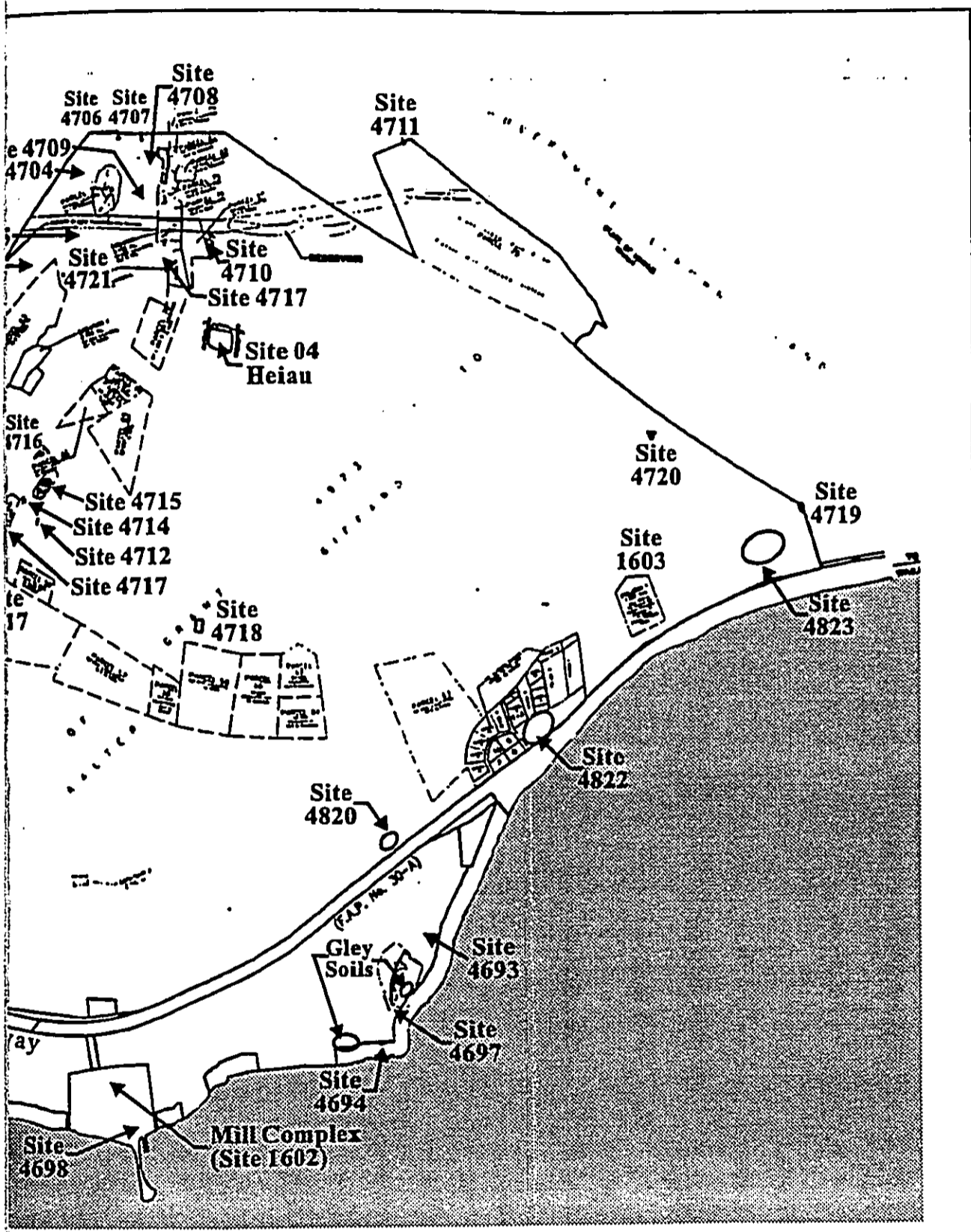
Source: Xamanek Researches

Figure 11



Prepared for: Olowalu Elua Associates, LLC

Subdivision of Olowalu Lands  
Location of Archaeological Sites



of Olowalu Lands  
Archaeological Sites

NOT TO SCALE

Table 1

SITE FUNCTION AND AGE					
Site number	Features	Description	Function	Age	Remarks
04	Many	Kawalaloa Heiau	Ceremonial	Pre-contact	Structure in very good condition
1200	Area 1	Petroglyph panel	Ceremonial	Pre-contact	Located on sheer face of Pu'u Kilea-dozens of pictographs
	Area 2	Petroglyphs on large rocks	Ceremonial	Pre-contact	Pictographs placed on large boulders <i>makai</i> of Pu'u Kilea
1201	1	Rock overhang	Temporary habitation	Pre-contact	Associated with petroglyph panel in Area 1
1603	1	Old stone church	Religious/cemetery	Plantation era	Church not located on property, but casket burial located on project
3172	1	Concrete ditch	Irrigation	Plantation era	Located during MECO transmission line monitoring
3180		Rock wall	boundary marker	Plantation era	Located during MECO transmission line monitoring
4699	A-H	Rock shelters	Temporary habitation	Pre-contact	
	D	Rock shelter	Probable burial	Pre-contact	<i>Lauhala</i> matting recovered
	I	Modified outcrop	Agricultural	Pre-contact	Possibly a dry-land plot
4700	A, C-I	Rock shelters	Temporary habitation	Pre-contact	Feature C - 150 +/- 70 BP Feature E - 450 +/- 50 BP Feature F - 200 +/- 60 BP
	B	Rock wall, C-shape	Observation Point (?)	Pre-contact (?)	
	J	Rock wall	Boundary marker (?)	Pre-contact (?)	
4701		Platform	Ceremonial/habitation	Pre-contact	Impacted by bulldozer
4702		Rock wall	Boundary marker	Early post-contact to 1850s	Possibly associated with an LCA <i>kuleana</i>
4703	A	Rock enclosure	Unknown	Pre-contact (?)	Function and age are not certain
	B	Wall remnant	Unknown	Pre-contact (?)	Function and age are not certain

SITE FUNCTION AND AGE					
Site number	Features	Description	Function	Age	Remarks
	C	Rock alignment	Temporary habitation (?)	Pre-contact (?)	
4704	A	Petroglyph panel	Ceremonial	Pre-contact	Over 27 separated images present
	B-C	Terraces	Ceremonial/habitation	Pre-contact	Terraces directly below petroglyph panel
	D-G	Terraces	Agricultural/habitation	Pre-contact	
4705	A-B	Rock shelters	Temporary habitation	Pre-contact	
4706		Rock shelter	Temporary habitation	Pre-contact	Radiocarbon date- 290 +/- 50 BP
4707	A	Wall alignment	Boundary marker (?)	Pre-contact (?)	Features A and B appear to be associated.
	B	Rock mound	Possible burial	Pre-contact (?)	Needs data recovery work.
4708	A	Platform	Ceremonial	Pre-contact	Large boulder has petroglyphs on it.
	B	Terrace complex	Agricultural	Pre-contact	With later historic usage
4709	A-D	Concrete structures	Irrigation system	Plantation era	
4710	A	Terrace with Enclosure	Habitation	Pre-contact	Portion of site impacted by field clearing
	B	Terraces	Habitation	Pre-contact	Radiocarbon date - 200 +/- 50 BP
	C	Enclosure	Habitation	Pre-contact with historic use	Radiocarbon date - 60 +/- 50 BP
	D	Enclosure remnant	Part of complex	Pre-contact	
	E	Oval alignment	Possible burial	Pre-contact	
	F	Terrace	Part of complex	Pre-contact	
	G	Terrace	Undetermined	Pre-contact	
4711	A	Rock alignment	Undetermined	Pre-contact	
	B	Terrace	Possibly agriculture	Pre-contact	
4712	A	Terrace	Unknown	Pre-contact	

SITE FUNCTION AND AGE					
Site number	Features	Description	Function	Age	Remarks
	B	Rock pile	Possible burial	Pre-contact	
4713	1	Rock shelter	Temporary habitation	Pre-contact with historic use	
4714	1	Rock shelter	Temporary habitation	Pre-contact	
4715	1	Complex of burial mounds, platforms and markers	Cemetery	Pre- to Post-contact	Located on the summit of Pu'u Kilea, above the petroglyph panel
4716	A	Terrace	Habitation	Pre-contact	
	B	Rock wall	Boundary marker(?)	Pre-contact (?)	
4717	A-E	Retaining walls	Flood control	Plantation era	
4718	A	Heiau remnant wall alignment	Ceremonial	Pre-contact	This is the unnamed heiau mentioned by Walker
	B	Rectangular stone outline with pavement	Burial marker	Pre-contact	
	C	Rectangular stone outline with pavement	Burial marker	Pre-contact	
4719	1	Rock wall	Boundary marker	Plantation era	
4720	1	Retaining wall	Road crossing	Plantation era	
4721	1	Platform	Habitation	Plantation era	
4758	1	Tombstones, stone outlines, wooden grave markers	Japanese Cemetery	Plantation era	
4820	1	Surface scatter of human remains		Pre-contact	Secondary deposit of human skeletal material
4821	1	Surface scatter of human remains		Pre-contact	Secondary deposit of human skeletal material
4822	1	Pond	Fishpond	Pre-contact (?) Into historic times	Identified as Kaloko o Kapa'ike by informant
4823	1	Marsh/lagoonal soils	Gleyed soils	Pre-contact	May contain pollen and charcoal dating from early human settlements



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Within the makai area, there were a total of seven (7) archaeological sites. The known site is the Olowalu Mill Complex (Site 1602). Six (6) previously unrecorded sites were found.

These include three (3) surface, two (2) subsurface sites, and a burial area. Site 4693 is interpreted as a burial ground, probably dating from the pre-contact period. Site 4694 consists of a coastal rock structure with an associated subsurface cultural deposit. Site 4695 is a stone platform/terrace structure at the shoreline near the western end of the makai area. Site 4696 consists of a segment of the old Government Road. Site 4697 appears to be an early post-contact habitation area that lies in the vicinity of the Site 4693 burial ground. The last site (Site 4698) located in the makai area is interpreted as a late pre-contact habitation area.

8. **Air Quality**

There are no point sources of airborne emissions within close proximity of the assessment area. Smoke and dust from sugar cane harvesting and cultivation operations formerly caused an intermittent impact to the region's air quality. However, since Pioneer Mill Company, Inc. has ceased its sugar growing operations, this temporary air quality impact will also cease.

Although minimal, airborne pollutants are largely attributable to vehicular exhaust from traffic along the region's roadways, as well as dust from unplanted or recently plowed fields. However, sources are intermittent and prevailing winds quickly disperse particulates generated by these temporary sources.

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9. **Noise**

Vehicular noise from traffic travelling along Honoapiilani Highway are the primary sources of noise at the assessment area. Other ambient noise conditions are generally attributable to natural conditions such as ocean waves, wind and rain.

10. **Scenic and Open Space Resources**

The property offers views and vistas of the Pacific Ocean as well as the islands of Lanai and Kahoolawe. The Kihei-Makena coastline and the islet of Molokini are also visible from this locale. The West Maui Mountains and Olowalu Valley can be seen to the northeast of the property. The property is not part of a significant view corridor.

A government beach reserve provides an open space buffer between most of the assessment area and the shoreline. The width of the beach reserve varies with shoreline accretion and erosion but generally is approximately 100 feet in width. These lands are open to the public.

Near the northwestern boundary of the property, the shoreline is comprised of a sand beach of predominantly detrital sediments. The shoreline segment in the middle of the assessment area abutting TMK 4-8-3:5 is comprised of cobble and shingle ('ili'ili) beaches. Olowalu Beach located to the east of the assessment area, is also a sand beach of predominantly detrital sediments.

11. **Streams**

Olowalu Stream contains a ditch diversion at its upper reaches outside of the assessment area, as well as a second diversion near

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the upper elevations of the assessment area. Water from the diversions had been utilized for sugar cane irrigation purposes and domestic purposes by Olowalu residents and businesses. The stream flows intermittently downstream of the diversion.

Stream survey documentation contained in the Hawaii Stream Assessment (HSA) indicates that native aquatic species have been observed in Olowalu Stream. The presence of 'O'opu nakea (*Awaous stamineus*) and 'O'opu alamo'o (*Lentipes concolor*) are the basis for the HSA's ranking of Olowalu Stream as "substantial" in terms of aquatic resources.

There is an unnamed intermittent stream designated in the United States Geological Survey map which traverses near the eastern edge of the assessment area. This gulch serves as a drainageway during storm events and is not considered significant in terms of aquatic or riparian resources.

With regard to wetland features, the National Wetland Inventory map (prepared by the U.S. Department of the Interior) for the Olowalu area identifies Olowalu Stream as a riverain ecological system. In addition, the inventory identifies the nearshore waters off Hekili Point as a subtidal reef.

## **B. SOCIO-ECONOMIC ENVIRONMENT**

### **1. Population**

The resident population of the West Maui Community Plan region has demonstrated a substantial increase over the last two decades. Population gains were especially evident in the 1970's as the rapidly developing visitor industry attracted many new residents.

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The current population of the Lahaina District is estimated at 14,574 (Community Resources, Inc., 1994). A projection of the resident population for the years 2000 and 2010 are 18,555 and 22,633, respectively.

Growth at the County level exhibits a similar pattern. The County's 1980 resident population of 71,000 has since grown to the present 100,000. The estimated County population in 2010 is 145,872 (Community Resources, Inc., 1994).

2. **Economy**

The economy of Maui is heavily dependent upon the visitor industry. The dependency on the visitor industry is especially evident in West Maui, which is one of the State's major resort destination areas. The Kaanapali Resort includes a number of hotels, including the Maui Marriott Resort (720 rooms), Hyatt Regency Maui (816 rooms), the Westin Maui (761 rooms), and the Sheraton Maui (510 rooms).

West Maui's visitor orientation is reflected in the character of Lahaina Town, which serves as a center for visitor-related retail outlets, as well as visitor-related activities.

In terms of the agriculture industry, Pioneer Mill Company, Inc. recently ceased sugar cane cultivation on its lands. Of its 6,700 acres, approximately 500 acres are currently utilized for the growing of coffee. Other crops, such as seed corn, are being planned. Additionally, Maui Land and Pineapple Company's pineapple fields in the Honolua region are an important component of the region's agricultural base.

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**C. PUBLIC SERVICES**

**1. Solid Waste Disposal**

Single-family residential solid waste collection service is provided by the County of Maui on a once-a-week basis. Residential solid waste collected by County crews is disposed at the County's 55-acre Central Maui Landfill, located four miles southeast of the Kahului Airport. In addition to County-collected refuse, the Central Maui Landfill accepts commercial waste from private collection companies.

To facilitate solid waste collection services for the West Maui region, a refuse transfer station has been established at the former County landfill site which is located to the north of the subject properties.

**2. Medical Facilities**

The only major medical facility on the Island is Maui Memorial Hospital, located approximately 16 miles from Olowalu, midway between Wailuku and Kahului. The 194-bed facility provides general, acute, and emergency care services.

Regular hours are offered by private medical practices in Lahaina, which include the Maui Medical Group, Lahaina Physicians, West Maui Healthcare Center, and Kaiser Permanente Lahaina Clinic.

**3. Police and Fire Protection**

The assessment area is within the Lahaina Police Station service area, which services all of the Lahaina district. The Lahaina Station is located in the Lahaina Civic Center complex at Wahikuli, approximately 7.5 miles from the assessment area. The Lahaina

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Patrol includes 54 full-time personnel, including one (1) captain, one (1) lieutenant, police officers, public safety aides, and administrative support staff (telephone conversation with Greg Takahashi, Maui Police Department, February 1996).

Fire prevention, suppression and protection services for the Lahaina District are provided by the Lahaina Fire Station, also located in the Lahaina Civic Center and the Napili Fire Station, located in Napili. The Lahaina Fire Station includes an engine and a ladder company, and is staffed by 30 full-time personnel. The Napili Fire Station consists of an engine company including fifteen (15) full-time fire fighting personnel (telephone conversation with Cindy Kagoshima, Maui Fire Department, February 1996).

4. **Educational Facilities**

The West Maui area is served by four public schools operated by the State of Hawaii, Department of Education: Lahainaluna High School; Lahaina Intermediate School; King Kamehameha Elementary School; and Princess Nahienaena Elementary School. All of the public schools are located within the Lahaina Town area.

5. **Recreational Facilities**

West Maui is served by numerous recreational facilities offering diverse opportunities for the region's residents. There are seventeen (17) County parks and three (3) State beach parks in West Maui. Approximately one-third of the County parks are situated along the shoreline and are excellent swimming, diving, and snorkeling areas.

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In addition, Kaanapali and Kapalua Resorts operate world-class golf courses which are available for public use.

**D. INFRASTRUCTURE**

**1. Roadways**

Honoapiilani Highway is a two-lane major State highway linking Central Maui with West Maui. In the vicinity of the project, Honoapiilani Highway has two (2) 12-foot wide travel lanes with paved shoulders of varying widths. Channelization, including left turn bays and acceleration and deceleration lanes, exists at selected intersections. The project is located in a rural area with a speed limit of 45 miles per hour, which is reduced to 35 miles per hour in the vicinity of the Olowalu Store.

The parking lot to the Olowalu General Store and Chez Paul restaurant is paved and accessed by two (2) driveways from Honoapiilani Highway. The north driveway forms a cross intersection with Honoapiilani Highway and a driveway for Pioneer Mill residences on the makai side of the highway. Separate left turn lanes are designated for the northbound and southbound directions of the Honoapiilani Highway. Guardrails are also situated along the highway at this intersection.

Several of the large street trees in this area were noted to restrict sight distance for motorists exiting the parking lot on the mauka side of the highway. In order to obtain a better or longer distance before entering the highway, it appears that many motorists were using an open, gravel area to enter Honoapiilani Highway. The gravel area is contiguous to the Olowalu paved parking lot and is situated to the north of the parking lot's north driveway.

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The south driveway at the Olowalu General Store/Chez Paul restaurant parking lot is an unpermitted access utilized by many large, northbound trucks. The south driveway forms an unsignalized T-intersection with Honoapiilani Highway. The Honoapiilani Highway northbound left turn storage lane/taper for the intersection with the Pioneer Mill residences/north parking lot driveways extends past the south parking lot driveway. None of the southbound highway traffic entered at the south driveway during the period when manual traffic counts were being taken.

The Olowalu General Store serves as a convenience stop. During the weekdays, Olowalu General Store is open from 6:00 a.m. to 6:30 p.m. The Chez Paul restaurant serves only dinner and is officially opened at 6:30 p.m. A structure is situated on the south side of the restaurant. However, the structure appears to be vacant and none of the motorists utilizing the parking lot were observed to enter or exit the structure.

A private road is situated on the mauka side of Honoapiilani Highway. This private road parallels the highway and served as an access road for Pioneer Mill property/cane land. Private homes are located mauka of the store and these residents also utilize the driveways for the Olowalu General Store and Chez Paul Restaurant parking lot.

2. **Water**

The County of Maui Department of Water Supply presently does not service the Olowalu area. Water supply for the limited number of residential and commercial uses in the Olowalu area is provided through treatment of surface water. To meet the Federal Clean



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Water Act, the former owner, Pioneer Mill Company, Inc., developed a multi-stage filtration system that was accepted as Public Water System No. 209 in 1996. Pioneer Mill also developed an extensive irrigation infrastructure which includes stream intakes, ditch systems and reservoirs.

3. **Wastewater**

Individual wastewater disposal needs in the Olowalu area currently are addressed either by cesspools or septic tanks. There are no County operated wastewater disposal facilities in the vicinity.

4. **Drainage**

Other than existing culverts which convey drainage beneath Honoapiilani Highway, the assessment area contains no other drainage improvements. Runoff generally sheet flows from the northeast to southwest collecting in various swales and gullies. The assessment area contains no engineered drainage systems.

5. **Electrical and Telephone Considerations**

Electrical power is provided to the area by Maui Electric Company, Ltd. (MECO), via overhead poles. MECO's 69 kilovolt overhead transmission lines from Central Maui to the Lahaina-Kapalua area extend through the mauka portion of the property. Telephone hookup is available through GTE Hawaiian Telephone Company.

# ***Chapter III***

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## ***Potential Impacts and Mitigation Measures***

### **III. POTENTIAL IMPACTS AND MITIGATION MEASURES**

#### **A. PHYSICAL ENVIRONMENT**

##### **1. Existing and Surrounding Land Uses**

The proposed action involves the subdivision of agricultural lots which is consistent with the property's underlying zoning. A cultural reserve area is also proposed which abuts Olowalu Stream. This reserve area provides an additional buffer to the stream and an opportunity for preservation of cultural resources. A greenway also provides additional visual relief and open (green) space.

In a regional context, Olowalu has historically been a plantation settlement. Currently, there is scattered development in the area evidenced by the Olowalu General Store, Chez Paul Restaurant, the Mopua residential subdivision, the four (4) residential dwellings which include the former manager's house, Camp Pecusa, a single residential dwelling adjacent to Camp Pecusa, the Nahooikaika residence, and a farm and residence in the valley. On the Lahaina side of the assessment area, lands are in a fallow state being formerly planted in sugar cane. Towards the Wailuku side, lands are also fallow. Vacant lands extend along the mauka and makai sides of Honoapiilani Highway towards the town of Maalaea.

The proposed action is not contrary to the existing and surrounding land uses.

##### **2. Topography and Landform**

The proposed action is not anticipated to result in significant earthmoving activities. To the extent practicable, finished contours

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will follow existing grades to minimize earthwork costs and maintain existing drainage patterns.

**3. Flood and Tsunami Hazards**

Most of the assessment area is located in Zone C, areas of minimal flooding. However, makai areas of the site near Olowalu Stream and Mopua are Zone A4, areas of the 100-year flood, Zone A0, areas of 100-year shallow flooding, and Zone B, areas between the limits of the 100-year and 500-year flood. Areas abutting the shoreline are located in Zone A4.

Any structures built on the individual lots will be required to conform with applicable flood hazard area development standards and finish floor elevations of all habitable structures will be constructed above the applicable base flood elevation.

Minimal earthwork is envisioned on parcels makai of Honoapiilani Highway which are located in Zones A4, A0, and B. Required amounts of fill utilized to raise finish floor elevations to comply with flood area hazard regulations are intended to be limited to the area of the structure itself. A minimum 100 feet setback has been established on the applicant's lands abutting the shoreline to minimize the risk of damage from coastal erosion and other coastal hazards. For other lands within the assessment area, the applicant intends to comply with applicable flood hazard regulations.

**4. Flora and Fauna**

Between 85 to 90 percent of the assessment area has been under sugar cane cultivation, or has been used to support sugar cane related activities (plantation village, manager's residence, wharf

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facilities, etc.). The steeper kiawe and buffelgrass-covered slopes on the mauka portion of the property were used for grazing cattle at one time. On the uncultivated portions of the property, introduced species, such as kiawe, buffelgrass, 'opiuma, koa haole, and lantana, are the dominant components of the vegetation.

Of a total of 115 plant species inventoried within the assessment area, 94 (82 percent) are introduced or alien species; 5 (4 percent) are originally of Polynesian introduction; and 16 (14 percent) are native. See Appendix A. Of the natives, 13 are indigenous, that is, they are native to the Hawaiian Islands and also elsewhere, and 3 are endemic, that is, they are native only to the Hawaiian Islands. The 3 endemic species are the nehe (Lipochaeta lavarum), wiliwili (Erythrina sandwicensis), and pua kala (Argemone glauca). None of the plants inventoried on the site is a threatened and endangered species or a species of concern (U.S. Fish and Wildlife Service 1997). All of the plants can be found in similar dry, lowland habitats throughout the main Hawaiian Islands. A recent botanical survey for the Ma'alaea to Lahaina 69 kilovolt transmission line (Char 1993) included portions of the mauka parcel and recorded similar findings.

A long time resident of Olowalu also noted four other plants naturally occurring in the area. The ma'o is endemic to Hawaii while the ohelo kai, akulikuli and kipukai are all indigenous plants.

Present plans envision a cultural reserve for the Olowalu Stream gulch and Kilea pu'u. Activities within the cultural reserve would be administered by a community-based non-profit corporation.

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The botanical survey recommends that two (2) larger reservoirs be retained since they provide habitat for the endangered Hawaiian Coot ('Alae Ke'oke'o). The intent is to continue usage of the reservoirs for irrigation water storage. Several other endangered birds or mammals, such as the nene, use the existing reservoirs as a resting spot. It has also been suggested by the Department of Forestry and Wildlife (DOFAW) that the greenway system could create temporary or permanent sites for these birds or mammals. If needed, coordination with DOFAW for the creation of a management plan will be implemented.

The botanical survey also recommends that native plants which occur on the drier portions of West Maui be used for landscaping. There are a number of native and Polynesian plants which are proposed as part of the project landscaping. These include species such as hao, 'ohe makai, and lama along the internal roadways of the project. Along the Honoapiilani Highway, ko (sugar cane), hau, kukui, and u'ulei are proposed. Along the shoreline, other species such as naupaka, 'akulikuli, pohuehue, and 'llima are proposed.

5. **Archaeological Resources**

Regarding site significance and proposed mitigation recommendations for the 34 sites identified in the mauka area, eight (8) are considered no longer significant, either having been severely impacted or largely destroyed, or they have provided adequate information.

Twenty-six (26) sites are still considered to be significant. Eleven (11) are recommended for preservation, one (1) is recommended

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for both data recovery and preservation, nine (9) are recommended to undergo data recovery, two (2) are recommended to be monitored, and the remainder require no further archaeological work.

Preservation is the recommended mitigation treatment for Site 04-Kawaialoa heiau; the Feature D burial cave at Site 4699; the petroglyph panel and associated terraces of Site 4704; Site 4708-possible religious structure and taro lo'i; Site 4710-habitation complex with possible burial; Site 4715-burial ground/cemetery on summit of Pu'u Kilea; Site 4718-heiau remnant with burials; Site 4758-the Japanese cemetery, and Sites 1200 and 1201-the Olowalu Petroglyph Complex. In addition, the burial associated with Site 1603 located on the subject property will be preserved in a large preservation area.

Data recovery is the recommended mitigation for several sites, and/or site features that need to have more information to make age and function determinations. These would include Features B and J of Site 4700, Site 4701, Site 4707, Site 4712-Feature B, and Site 4716-Feature B. Data recovery is recommended for Site 4704, if it is going to be impacted by future development.

Data recovery, in the form of a complete inventory of the petroglyph images at Site 1200, was recommended by archaeologists conducting the statewide inventory of historic places survey in 1973. The developers are committed to preservation of the site. If the site is to be for interpretative exhibit, data recovery on the images should be undertaken.

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Two (2) sites that are in the eastern part of the project area, represent the pond (Site 4822) and lagoonal/marsh lands (Site 4823) subsurface deposits. These may contain information on chronology relating to climatic and vegetation changes that have taken place in Olowalu, and should undergo data recovery in the form of subsurface testing. Site 4822 is located in an area of the property that has been designated as "open space".

Interpretative preservation is further recommended for Kawaiāloa Heiau (Site 04), the heiau remnant (Site 4718) and, possibly, the ceremonial platform and agricultural complex (Site 4708). Interpretive preservation is also considered appropriate for the Olowalu Petroglyphs-Site 1200, and possibly the other petroglyph panel and terrace complex of Site 4704. The Native Hawaiian community should be consulted about the appropriateness of interpretive preservation for any of these latter sites.

Site 3172 is an operating water delivery system and it is suggested that continued usage would be an appropriate mitigation for this site. No further archaeological work is needed, however.

There were two (2) areas in which human remains were found on the surface during backhoe testing. One (1) area was in the western portion of the study area, between Backhoe Trenches 139 and 140 (Site 4821). The other area was in the cane field east of Olowalu Village near Backhoe Trench 121 (Site 4820). Because of the presence of human remains, monitoring should accompany any earthmoving activities that are undertaken in these areas, in an effort to recover other skeletal materials that may be present.



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Monitoring is also the recommended mitigation treatment for portions of land in the vicinity of significant sites. It is recommended that a master monitoring plan be formulated for the mauka project region, identifying the culturally sensitive areas that need to be afforded special attention during development. Input should be sought from native Hawaiian groups and concerned individuals in identifying these culturally sensitive areas. An ongoing oral history project is being undertaken by Olowalu Elua Associates, in which this kind of information will be forthcoming.

The site significance and proposed mitigation recommendations for the mauka area are shown in Table 2.

Table 2

SIGNIFICANCE EVALUATIONS FOR MAUKA AREA - PROPOSED MITIGATION						
SIHP No. 50-50-08	Significance Criterion	Components/ features	Status <sup>1</sup>	Condition <sup>2</sup>	Age <sup>3</sup>	Proposed Mitigation
04	C, D, E	Helau	U	Very Good	I	Interpretive preservation <sup>4</sup>
3180	D	1	A	H	I	NLS <sup>5</sup>
4699	D and E	9	varies	G	I/H	Preservation
4700	D	9	U	G	I	Preservation - DR on Features B, J
4701	D	1	A	F	I	DR to determine function
4702	D	1	A	G	H	NLS
4703	D	3	A	varies	?	NLS
4704	C, D, E	7	U	G	I	Preservation - DR if impacted
4705	D	2	U	G	I	Passive preservation
4706	D	1	U	G	I	Passive preservation
4707	D, E	2	A	F-P	I	DR to ascertain age and function
4708	D	2	A	G	I/H	Interpretive preservation
4709	C, D	4	A	G	H	NLS
4710	D, E	7	A	G-F	I	Preservation
4711	D	2	U	G-P	I	NLS
4712	D	2	A	G	I	DR to ascertain if burial present
4713	D	1	U	G	I/H	Passive preservation
4714	D	1	U	G	I	Passive preservation
4715	D, E	cemetery	U	G	I/H	Preservation
4716	D	2	A	F	I/H	DR to determine function and age
4717	D	5	U	G-P	H	NLS
4718	C, D, E	3 (helau)	A	P	I	Preservation
4719	D	1	A	P	H	NLS
4720	D	1	A	G	H	NLS
4721	D	1	A	F	H	NLS
4758	D, E	cemetery	U	F	H	Preservation
1200	C, D, E	petroglyphs	A	F	I	Preservation

SIGNIFICANCE EVALUATIONS FOR MAUKA AREA - PROPOSED MITIGATION						
SIHP No. 50-50-08	Significance Criterion	Components/ features	Status <sup>1</sup>	Condition <sup>2</sup>	Age <sup>3</sup>	Proposed Mitigation
1201	D	1	A	F	I	Preservation as part of complex
1603	D, E	burials	A	F	H	Preservation <sup>6</sup>
3172	D	Water delivery system	U	G	H	Preservation as an operating water system
4820	D, E	Surface scatter of human remains	A	P	I	Monitoring to recover remains
4821	D, E	Surface scatter of human remains	A	P	I	Monitoring to recover remains
4822	D	Pond sediments	A	P	I/H	DR-pollen samples, C14 dates
4823	D	Marsh deposits	U	G	I/H	DR-pollen samples, C14 dates

<sup>1</sup> A=altered; U=unaltered  
<sup>2</sup> G=good; F=fair; P=poor  
<sup>3</sup> I=indigenous; H=historic  
<sup>4</sup> Consultation with Native Hawaiian community recommended prior to implementation.  
<sup>5</sup> NLS=No longer significant-sufficient information has been collected.  
<sup>6</sup> Although the parcel on which this church is located is outside the property boundary, the portion in which at least one burial was found is within the project area. This will be preserved.

Within the makai area, five (5) sites are recommended for preservation. These include Sites 4693 (burial ground), 4694 (coastal habitation site) and 1602 (Olowalu Mill), habitation sites 4697 and 4698. There is also an area of gleyed soils which are recommended to undergo data recovery. Two (2) sites, 4695 and 4696, are considered to be "no longer significant" and do not require further work.

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Site 4693 is the most significant site in the study area for its traditional cultural value. Permanent preservation is the recommended mitigation for this site.

Site 4694 lies on Hekili Point to the southwest of Site 4693. This structure is within the Beach Reserve. Preservation is the recommended mitigation for this cultural resource.

Site 4697 seems to represent an early post-contact habitation area. Since its location near the Burial Preserve will not allow future development, preservation is the recommended alternative.

Site 4698 is interpreted as a pre-contact temporary habitation area. This site also lies in an area that is not planned for development. The owners have agreed to place it in passive preservation.

There is also an area of gleyed soils around the former mouth of the stream on the eastern portion of the makai area. Refer to Figure 11. While gleyed soils were present in a few of the backhoe trenches, it was not possible to ascertain if they were associated with taro pondfields or fishponds. However, these soils may contain important paleoenvironmental information on Hawaiian history in the area, and are considered to be significant finds.

The significance evaluations and proposed mitigation for the makai area are summarized in Table 3.

Table 3

SIGNIFICANCE EVALUATIONS FOR MAKAI AREA - PROPOSED MITIGATION						
SIHP Site # 50-50-08	Significance Criterion	Components/ Features	Status <sup>1</sup>	Condition <sup>2</sup>	Age <sup>3</sup>	Proposed Mitigation
4693	D and E	Burials (5 minimum)	A	G-P	I	Preservation
4694	D	Structure and deposit	A	F	I	Preservation (in Beach Reserve)
4695	D	Wall/terrace	A	F-P	H	No longer significant <sup>4</sup> (in Beach Reserve). No further work
4696	D	Old Government Road	A	P	H	No longer significant (in Beach Reserve). No further work
4697	D	Cultural Deposit	A	F-P	H	Preservation
4698	D	Cultural Deposit	A	F	I	Preservation
1602	A, D	Olowalu Mill Complex	A	F	H	Interpretive preservation
Gleyed soils	D	Subsurface			I	Data recovery

<sup>1</sup> A=altered; UA=unaltered  
<sup>2</sup> G=good; F=fair; P=poor  
<sup>3</sup> I=indigenous; H=historic  
<sup>4</sup> No longer significant because adequate information has been collected.

Both the makai inventory survey and mauka inventory survey have been found "complete" by the State Historic Preservation Division (SHPD). Presently, the Mitigation and Preservation Plans for both makai and mauka lands are being prepared for approval by SHPD. The Maui/Lanai Island Burial Council, at its August 26, 1999 meeting, approved the Preservation Plan for the makai burial preservation area (Site 4693). Currently, the Burial Council is reviewing and discussing the proposed Preservation and Treatment

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Plan for all the other burial sites, both known and recently discovered. Input from lineal descendants and cultural descendants from the Olowalu area is a part of this process.

Access to all significant archaeological and cultural sites are a part of the Mitigation and Preservation Plan. These accesses are expected to be pedestrian in nature, however, specifically for major significant sites such as the Kawaialoa (Kaiwaloa) Heiau and the Pu'u Kilea Complex, provisions are being made for vehicular access.

6. **Air Quality**

Air quality impacts associated with the project include dust generated by short-term construction-related activities. Site work, such as grading and grubbing as well as excavation and fill, will generate airborne particulates. Regular watering and sprinkling will be implemented to minimize fugitive dust. Revegetation will be implemented as soon as practicable in order to minimize the time which graded areas are left exposed.

In the long term, there will be no significant increase in vehicular emissions due to traffic associated with the assessment action.

7. **Noise**

As with air quality, ambient noise conditions will be impacted by subdivision roadway and utility construction activities. Noise from construction activities will be unavoidable during the construction period. To aid in the mitigation of noise impacts, construction activities will be conducted only during daylight hours.

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In general, the project will not generate adverse long-term noise conditions as ambient noise levels are not expected to be significantly affected.

8. **Scenic and Open Space Resources**

Most of the assessment area was formerly utilized for sugar cultivation and is now fallow. Near the shoreline, the topography is generally flat to slightly sloping. Proceeding mauka, the land slopes gently higher to the foothills of the West Maui Mountains. Olowalu Stream has carved a valley at the mauka portions of the assessment area. As the stream proceeds makai, the landform around the stream becomes flatter. Puu Kilea is also located just makai of the Olowalu Stream Valley.

The project involves the provision of agricultural lots. Development on the lots would be subject to County Agricultural District zoning provisions. In addition, there is a cultural reserve proposed around Olowalu Stream. A greenway system is also proposed to provide a recreational amenity and visual relief. Both the cultural reserve and greenway are considered "open space" resources. Native and Polynesian plants are intended to be the dominant plant material in both areas. As an example, as one walks along the stream within the cultural reserve, there will be interpretive signage of plants significant in Hawaiian culture. The greenway is intended to be a passive walking area but will also serve as a visual barrier or relief. While there have been concerns about the introduction of new plant materials in the area, the intent is to "re-introduce" plants and eventually remove the alien plant materials (kiawe, opiuma, java plum, etc.) introduced during the cattle and sugar cane cultivation days.

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Views from the shoreline should be maintained since there is an existing government beach reserve along most of the property's makai boundary. Other portions of the property are subject to applicable shoreline setback provisions. Makai views from Honoapiilani Highway in this vicinity have traditionally been of sugar cane fields.

The proposed subdivision is in keeping with the aesthetic and visual character of the area. Construction of any boundary walls along Honoapiilani Highway shall be fronted by landscape screening. Boundary walls are limited to four feet in height within the setback areas which will help to minimize visual impacts. Makai view corridors are intended to be preserved at the entrance to Olowalu Landing and Olowalu Stream. Also, only 10 percent of the total lot area is developable for dwelling purposes while the remaining areas should be left for cultivation or open land, with the exception of farm structures that support agriculture. Landscaping is proposed along Honoapiilani Highway as an aesthetic enhancement and is not anticipated to have an adverse impact upon the visual character of the surrounding area.

9. **Streams**

Olowalu Stream traverses the mauka and makai areas. No work is proposed within the stream as part of this project and there is a cultural reserve designated adjacent to the stream. Along its upper reaches, the cultural reserve encompasses the portion of Olowalu Stream Valley located within the assessment area as well as Puu Kilea. Any work within the cultural reserve will be coordinated by a community-based non-profit corporation.



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Drainage improvements proposed within each individual lot will be required to maintain or decrease the extent of runoff after the development of improvements. Thus, the project should not have an adverse effect on Olowalu Stream.

**10. Shoreline Access**

From the original grant in 1906, the State reserved a "right of way, 50 feet in width (or so much of said 50 feet as may be deemed necessary for public use), extending from Government Belt Road to Olowalu Landing". Although plantation and government records indicate several different paths to the landing, none indicate a defined location of said access. The fact that there were private parcels between the highway and the landing, to include the pier itself, complicates the matter. In acknowledging the public's right of access, the landowners created a parking area and pedestrian path east of the existing homes, on lands that were part of the original grant, and also within one of the historic accesses to the landing. The State DLNR is in the process of reviewing historical records with the intent of defining an access location.

Existing government beach reserves provide lateral shoreline access along most of the shoreline. Pedestrian easements have and will be created to provide a continuous lateral shoreline access. Accesses to the government beach reserve are currently available through both the eastern and western ends where the reserve meets the Honoapiilani Highway, and through the access to the Olowalu Landing. The applicant has created a temporary parking area near the Landing. The intent is to provide a permanent parking area in this vicinity to improve shoreline access.

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Any future "park" along the shoreline will also provide access to the beach reserve.

**11. Access to Mauka Lands**

Being that the cultural reserve area is within the valley floor, it is expected that this area will be the major access path. Discussions with several community groups, private owners within the valley and government departments, such as Na Ala Hele of DLNR, have taken place. It is expected that a Management Plan will be created with the input of any interested groups or people. The intent of the Management Plan is to ensure responsible management that recognizes native gathering rights, rights of private landowners within the valley, rights to perform religious practices and which does not significantly affect the operations of the Cultural Reserve.

**B. IMPACTS TO COMMUNITY SETTING**

**1. Population and the Economy**

On a short-term basis, the project will support construction and construction-related employment. Accordingly, the project will have a beneficial impact on the local economy during the period of construction.

In the long term, subdivision residents will contribute to the support of the local economy through sales and purchases of agricultural products, goods and services as well as contribute to State and County general fund revenues through the contribution of taxes.

The assessment action is not anticipated to have an adverse impact upon population parameters. In the long term, the

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assessment action is viewed as an economic benefit for the West Maui region.

2. **Agriculture**

With regard to the agricultural suitability of the lands within the assessment area, the applicant has consulted with Pioneer Mill Company (PMCo.). Although PMCo. has discontinued sugar cane cultivation, it has experimented with other diversified crops for a number of years such as coffee at Kaanapali and alfalfa on Kauai. Currently, they are growing seed corn and sweet corn on some Kaanapali lands. According to PMCo., the major disadvantage of Olowalu lands is its rockiness and occasional strong winds. Pasture and orchard type crops would be crops where these negative conditions would have the least impact. Mangoes, bananas, papayas and avocados currently exist at Olowalu so they could be considered good orchard crops. Although truck farming would be affected because of the rocky conditions, the amount of rockiness varies throughout the property. Thus, truck type crops such as peppers, eggplant and others may thrive in certain portions of the property. Lastly, specialty crops such as dryland taro, noni, awa and sweet potatoes, crops which existed at Olowalu in the past, would be suitable crops.

As to the economic viability of new diversified products, it is hoped that this opportunity for smaller entrepreneurs will yield positive results. Some land has been leased to agricultural entrepreneurs. It is noted that guidelines as to what can and cannot grow at Olowalu will be established over time.

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**C. PUBLIC SERVICES**

**1. Solid Waste Disposal**

A Solid Waste Management Plan will be developed in coordination with the Solid Waste Division of the County Department of Public Works and Waste Management (DPWWM) for the disposal of clearing and grubbing material during construction.

**2. Police, Fire and Medical Services**

Police, fire protection and medical services are not expected to be adversely impacted by the assessment action. The project will not extend existing service area limits.

**3. Educational and Recreational Resources**

The assessment action results in a consolidation and re-subdivision of 49 parcels to 41 agricultural parcels. Although many of the existing parcels are uninhabited, the proposed action does represent a reduction in number of agricultural lots. The resulting 41 lots are not anticipated to adversely affect educational and recreational services and facilities.

It is noted that a portion of the makai area owned by Olowalu Elua Associates, LLC is designated as a future park site in the West Maui Community Plan. It is noted that the proposed subdivision of land in the makai area does not include land designated as "park". Thus, the proposed action does not preclude the future establishment of a park in the area. It is emphasized that the almost 60 acre greenway (open space) system is considered a recreational resource for hiking and possibly biking. Portions of the almost 54 acres of cultural reserve are also considered a recreational resource for hiking purposes. The roadway system will

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also have provisions for hiking and biking. As noted in a previous section on "Shoreline Access", improvements are being made on lateral access as well as through the property to Olowalu Landing.

**D. INFRASTRUCTURE**

**1. Roadways**

The traffic impact analysis report (TIAR) conducted by Austin Tsutsumi & Associates, Inc. analyzed future base year 2005 traffic conditions without and with the project traffic. It is noted that the TIAR addresses potential subdivision activities on the lands mauka of Honoapiilani Highway as well as makai of the highway. With this approach, the potential cumulative traffic impacts of both the mauka and makai subdivisions have been considered to address traffic impacts to the future year 2005. See Appendix C.

**a. Existing Conditions**

Traffic on Honoapiilani Highway operates at Level of Service (LOS) E with volume/capacity (v/c) ratios of 0.63 and 0.78 during the morning and afternoon peak hours of traffic, respectively.

Overall, the intersection of the Olowalu General Store north driveway and Honoapiilani Highway is at LOS A. The northbound left turn movements are at LOS A during the morning peak hour of traffic and at LOS B during the afternoon peak hour of traffic. The southbound left turn movements are at LOS B during the morning and afternoon peak hours of traffic. The traffic exiting from the north parking lot driveway is at LOS C during the morning and afternoon peak hours of traffic. The traffic exiting from the

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makai driveway (Pioneer Mill residences) is at LOS C during the morning peak hour of traffic and at LOS E during the afternoon peak hour of traffic.

b. *Future Base Year 2005 Traffic Conditions Without Project Traffic*

Traffic on Honoapiilani Highway would operate at LOS E at a v/c ratio of 0.71 during the morning peak hour of traffic, and at LOS E at a v/c ratio of 0.88 during the afternoon peak hour of traffic.

The overall traffic conditions at the Olowalu General Store north driveway would be at LOS A. The southbound left turn movement into this driveway would operate at LOS B during both peak hours of traffic. The northbound left turn movement into the makai driveway (Pioneer Mill residences) would operate at LOS A during the morning peak hour of traffic and at LOS B during the afternoon peak hour of traffic. The traffic exiting from the north parking lot driveway would be at LOS C during the morning and afternoon peak hours of traffic. Traffic exiting at the makai driveway for the Pioneer Mill residences would be expected to experience longer delays at LOS D during the morning peak hour of traffic and at LOS F during the afternoon peak hour of traffic. The traffic volumes exiting the north parking lot driveway do not meet the warrants for traffic signals.

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c. **Future Year 2005 Traffic Conditions with Project-Generated Traffic**

The Makai Subdivision would generate 4 vehicular trips during the morning peak hour of traffic and 6 vehicular trips during the afternoon peak hour of traffic. The Mauka Subdivision would generate 15 vehicular trips and 21 vehicular trips during the morning and afternoon peak hours of traffic, respectively.

For the two-lane highway analysis, the results would be similar to future base traffic conditions without the project. The Honoapiilani Highway traffic would operate with a v/c ratio of 0.72 at LOS E during the morning peak hour of traffic and a v/c ratio of 0.89 at LOS E during the afternoon peak hour of traffic.

The results for the four (4) intersections in this study would be similar to the future base conditions without the project at the Olowalu General Store north driveway intersection. The overall intersection operations at the four (4) intersections are expected to remain at LOS A. The Honoapiilani Highway left turn movements into the north parking lot driveway and the project driveways would be at LOS B, except for the left turn movements into Project Driveway B and Project Driveway C (former Pioneer Mill residences) which would be at LOS A during the morning peak hour of traffic. Traffic exiting the north parking lot driveway would operate at LOS C during the morning peak hour and afternoon peak hours of traffic. Traffic exiting from Driveway C and from Driveway B would be at LOS C during the morning peak hour of traffic

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and LOS F during the afternoon peak hour of traffic. The traffic exiting at Driveway A and at Driveway D would experience longer delays at LOS D and LOS F during the morning and afternoon peak hours of traffic, respectively. The traffic volumes at the Honoapiilani Highway intersections with parking lot and project driveways do not meet the warrants for traffic signals. In the Maui Long Range Land Transportation Plan (MLRLTP), the widening of Honoapiilani Highway is recommended for the time period between Year 2006 and Year 2020.

**d. Recommendations**

The following roadway improvements are recommended to accommodate the traffic generated by the proposed Olowalu Makai and Mauka Subdivisions:

- For Driveways A, C (serving makai lands) and D, left turn bays and deceleration and acceleration lanes for right turn movements into and out of the project driveways should be provided at these project driveways so project traffic turning into and out of the project driveways does not delay motorists in the through lanes. The storage length of the left turn bays should be adequate to accommodate at least two (2) vehicles, exclusive of taper. For the Honoapiilani Highway T-intersections with Driveways A and D, a refuge lane in the median should be provided. Left turn movements from the project driveways onto Honoapiilani Highway would use the refuge lane as a shelter or to accelerate to merge with through traffic; the refuge lane would allow the left-turning movement to be executed in two (2) steps and reduce delays for the project traffic.
- For Driveway B, a left turn bay with storage length for a single vehicle should be provided. Deceleration and



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acceleration lanes are not recommended for this single lot driveway.

The following recommendation would allow Honoapiilani Highway to be improved to serve the future growth in regional highway traffic volumes expected beyond Year 2005:

- Adequate right-of-way should be reserved along the Honoapiilani Highway corridor to allow for the future widening of Honoapiilani Highway from Lahaina to Olowalu, as identified in the MLRLTP. The widening of Honoapiilani Highway would be needed for the future conditions with or without the proposed Olowalu Makai and Mauka Subdivisions. The MLRLTP indicates that the widening would be required between Year 2006 and Year 2020.

It is noted that the proposed subdivision includes an 80 feet road widening setback on lands owned by the present owner on the mauka side of Honoapiilani Highway. Upon the formulation of a comprehensive plan for highway improvements, this would provide an alternative for widening or relocation of the highway further mauka which reduces the risk of damage from coastal erosion and other coastal hazards.

Specific recommendations and comments by the Department of Transportation (DOT) during its review of the Draft EA have been addressed by the applicant. Subject to review and approval of construction plans and proposed mitigation measures, the DOT feels the applicant has satisfactorily addressed their concerns.

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2. Water

A surface water system which serviced existing residents and businesses in Olowalu, utilized Olowalu Stream as its source. In order to comply with the Federal Clean Water Act, the previous owner, Pioneer Mill Company, Inc., developed a multi-stage filtration system which was accepted as Public Water System No. 209 in 1996. The filters used in the existing system, however, have been discontinued.

The present owner, Olowalu Elua Associates, LLC, has recently switched to a groundwater source. An on-site well permit and pump installation permit have been granted for a well in the upper reaches of the property. An application to utilize the well as a potable water source has been approved by the State Department of Health.

Water system improvements include storage tanks, chlorination, booster pumps, and distribution improvements.

Irrigation water is being addressed by the existing surface source. Since the property had been cultivated in sugar cane, the irrigation infrastructure still is in place. The extent of irrigation demand for individual crops may vary. However, a more important factor is the amount of irrigated acreages in diversified agriculture which may be less than sugar cane acreage. Thus, in general, the extent of surface water utilization is likely to be less than sugar cane.

Computed water demand is approximately 160,000 gallons per day.

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3. **Wastewater Systems**

Existing uses in the Olowalu area are serviced by cesspools or other individual wastewater systems. Wastewater disposal for the assessment action would be addressed either through individual treatment systems or septic tanks and leach field type of individual wastewater systems.

4. **Drainage**

The assessment action will not alter the natural drainage patterns of the area. The existing drainage facilities crossing Honoapiilani Highway will be evaluated and incorporated into the project drainage plan.

The mauka subdivision incorporates a generous amount of greenways and cultural reserve areas. These areas will provide natural overland flow corridors to maintain the natural drainage patterns. Drainage retention/recharge basins will be developed immediately mauka of Honoapiilani Highway to provide capacity and environmental controls.

Grading and roadway improvements within the makai subdivision will be limited to the area immediately makai of Honoapiilani Highway. This plan, along with the required shoreline setbacks provide for spacious planting areas between the developments and the shoreline. Furthermore, a berm exists within the government shoreline reserve which discourages and filters runoff before entering the near shore waters. Grading within the flood inundation limits and floodways will not have an adverse impact on the flood patterns or flood heights.

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Since the existing cane fields are presently barren, there would be a decrease of surface runoff generated from the site after development (900 cfs predevelopment to 600 cfs post development). Comparing the formerly planted cane fields as the predevelopment benchmark, however, results in an increase of about 100 cfs (510 cfs predevelopment to 600 cfs post development).

The surface runoff generated as a result of the subdivision improvements will be addressed by drainage improvements incorporated with the development and will have no adverse effect on the adjoining properties or near shore waters.

Development of the project will not result in any significant increase in peak flow rates or runoff volumes. The addition of impervious areas such as subdivision roads, and future building roofs is minimal. The "flat" graded planting areas consistent with this type of development, together with the abundance of greenways and cultural reserves will reduce the flow velocity encouraging infiltration and reducing surface runoff to offset the developed hard surfaces. Detention/recharge basins incorporated into the development will provide further drainage controls and keep surface runoff to predevelopment levels. These basins will also serve an environmental function to reduce sediment discharge into the ocean. Therefore, the development of these agricultural lots will improve the drainage system in the area and will have no adverse effects on adjacent and downstream properties.

Based on the extent of grading, normal erosion control measures should be sufficient to prevent excessive soil loss during

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construction. Specific measures which may be implemented include:

- a. Minimize time of construction.
- b. Retain existing ground cover until the latest date to complete construction.
- c. Provide temporary gravel apron(s) (approximately 50 feet long by 12 feet wide) at point(s) of connection to existing paved streets to prevent tracking of sediments onto streets.
- d. Install good neighbor barriers (dust screens) where needed. Inspect barrier weekly and after storms.
- e. Install silt fences where needed. Inspect fences weekly and after storm events. Remove sediment when it reaches a height of 8 inches at the fence, and stabilize the fence.
- f. Maintain erosion control measures during construction and immediately make necessary repairs.
- g. Control dust by sprinkling with water wagons or other suitable methods. Graded areas shall be thoroughly watered after construction activity has ceased for the day and on weekends.
- h. Use temporary berms and cut-off ditches, where needed, for control of erosion.
- i. Construct permanent erosion and drainage control features as early as possible. All cut and fill slopes shall be sodded or planted immediately after grading work has been completed.
- j. Maintain erosion control measures until the establishment of grass and landscape planting.

5. **Electricity, Telephone and CATV Systems**

Maui Electric Company, Ltd. (MECO) and Hawaiian Telephone Company (Hawaiian Tel) maintain overhead lines along Honoapiilani Highway. MECO and Hawaiian Tel can provide

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additional services for the area. Hawaiian Cablevision's system does not currently service the Olowalu area. However, a service area expansion is planned and can provide cable service to the area.

**E. REGIONAL ISSUES RELATING TO SUBDIVISION OF FORMER SUGAR CANE LANDS**

Pioneer Mill Company's closing of its sugar business has resulted in excess lands which the company no longer requires for its agricultural program objectives. It is in this context that the opportunity for sale of these lands and their potential for subdivision requires consideration in terms of cumulative regional impacts. However, it is difficult to address the impacts relating to the potential for subdivision of former sugar cane lands on a regional basis, since future disposition of these lands is uncertain. It is nonetheless, appropriate to consider subdivisions which have been undertaken or which have been proposed in the area surrounding the Olowalu vicinity.

In this regard, subdivisions implemented or in process include the following:

1. **Subdivision of 50 lots at Launiupoko.** This subdivision known as Mahanalua Nui Subdivision is located mauka of the Launiupoko Wayside Park and involves the creation of 50 lots from 433 acres. Thirty-six of these lots range in size from two (2) to four (4) acres and the remainder of fourteen (14) lots range in size from eleven (11) to 37 acres.

Of the 31 lots initially sold, 27 were purchased by residents of West Maui and two from residents currently living in Central Maui. Of the other two (2) lots, no construction activity is anticipated in the immediate future.

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2. **Subdivision of 12 lots at Kauaula.** This subdivision proposes the creation of twelve (12) lots mauka of Honoapilani Highway, in the vicinity of Puamana (south of Lahaina Town). The total area involved in the subdivision is 250 acres. Eleven (11) lots are approximately five (5) acres in size and the remainder lot is approximately 185 acres.

The intent is to market the eleven (11) 5-acre lots upon receiving subdivision approvals, which is anticipated to occur within a year.

3. **Subdivision of 12 lots at Ukumehame.** This subdivision involves the creation of twelve (12) lots from 450 acres, ranging in size from 20 to 90 acres.

The intent of the subdivision is strictly for retention by the partners with no immediate home construction related activity. Therefore, the regional impacts relative to schools, traffic and public services are expected to be minimal.

With the 41 lots proposed at Olowalu, therefore, there are a total of 115 agricultural lots being created under current subdivision actions and proposals.

Regional issues associated with the change in economic base from a large single crop industry to a diversified agricultural environment characterized by smaller scale farming endeavors as evidenced by the new agricultural subdivisions, include those related to land ownership patterns, infrastructure systems, visual character, public service and potentially, land use.

1. **Land Ownership Patterns**

The sale of excess lands and subdivision of said lands have or will result in smaller agricultural parcels which will include new owners, each having unique agricultural objectives. The termination of sugar operations, as with other regions on the island of Maui and in the State of Hawaii, therefore represents a structural change

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which will result in larger number of landowners for those parcels previously owned by Pioneer Mill.

2. **Infrastructure Systems**

The larger number of landowners is anticipated to result in demands placed on infrastructure systems different than what was otherwise required under a single landowner format. These differences would be attributed to landowners potentially residing on their individual parcels, thereby requiring consideration of impacts to traffic, domestic water, domestic wastewater and drainage systems. While it is beyond the scope of this document to address each individual subdivision's infrastructure requirements, the following points are noted:

**Water:** New domestic water systems will be required for each of the subdivisions. These new systems may be in the form of new wells which must be drilled or via existing surface systems which would be required to meet drinking water standards of the State Department of Health. Each subdivider is responsible for providing their own water system which is to be privately owned and operated. Presently, there are no plans or proposals for an integrated regional domestic water system for the area between Ukumehame and Kauaula.

**Wastewater:** As with the Olowalu subdivisions, each of the other subdividers are responsible for installing individual wastewater systems to service lots with dwelling units. Individual wastewater systems would need to comply with the Department of Health's Administrative Rules, Chapter 11-62, "Wastewater Systems". There are no plans or proposals for extending the County's collection system to the south, beyond its current Lahaina service area.

**Drainage:** Each subdivision shall be responsible for designing and installing the necessary drainage improvements to meet County drainage standards and requirements. Small scale agricultural operations are also expected to implement best management practices relating to drainage control to ensure that storm runoff is



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adequately handled by the respective subdivision drainage systems. Each of the subdivisions noted above are situated in different drainage basins and there are no drainage impacts from one subdivision upon any of the others.

**Traffic:** The subdivision of lands which were previously under a single landowner will create a need for new access provisions to ensure that each of the subdivided lots are accessible. Impacts of new access points are principally related to connections at Honoapiilani Highway. For example, traffic improvements for the Mahanalua Nui Subdivision at Launiupoko (as recommended by that project's traffic study) included the provision of a left turn storage lane for south bound traffic, as well as acceleration and deceleration lanes for northbound traffic on Honoapiilani Highway. The traffic study for this 50-lot subdivision indicates that the morning peak hour trip generation to be 47 trips with the afternoon peak hour trips at 59.

The trip generation for the Olowalu Subdivisions will result in an estimated morning peak hour trip load of 19 and a 27 afternoon peak hour trip count.

Traffic studies for both the Mahanalua Nui and Olowalu subdivisions address specific mitigation measures required at each locale. While there were no traffic studies reviewed for the 12-lot Kauaula and the 10-lot Ukumehame subdivisions, it is expected that area specific mitigation measures would be recommended in coordination with the State Department of Transportation. From a cumulative perspective, the trips generated by the four (4) subdivisions, given their geographic separations, are not anticipated to significantly affect operations on Honoapiilani Highway.

### 3. **Visual Character**

The termination of sugar operations will alter the physical landscape of the region. Sugar fields will be replaced by diversified agricultural crops and individual dwellings and farm structures. While this represents a change from the many years of sugar operations in the region, it is not considered to be adverse. While addressing the impacts of landscape design proposals for the other subdivisions are beyond the scope of this assessment, it is the

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intent of Olowalu Elua Associates to implement landscaping plans designed to provide a smooth visual blending of subdivision roads with the surrounding natural and agricultural landscape.

4. **Public Service**

The creation of new agricultural lots and the attendant dwelling units will require consideration of population impacts upon schools, recreational facilities and emergency services. School facility impact of new residents will require coordination with the State Department of Education to determine whether new facilities will be needed as lots become available incrementally over time.

With regard to recreational facilities, each subdivision will be required to address the provisions of the County of Maui's parks and playground assessment. From a regional standpoint, the West Maui Community Plan provides for park lands at Olowalu.

The establishment of dwelling units on agricultural lots between Lahaina and Ukumehame will extend service areas for emergency vehicles such as police, fire and ambulance services. Geographic conditions notwithstanding, each subdivision shall be required to provide the necessary infrastructure systems (e.g., fire protection system, roadways) to facilitate access and operations for emergency vehicles.

5. **Land Use**

The transition from one economic base to another, as presented by the shifting of lands out of sugar, represents an opportunity to examine alternative land uses which may be suitable on former agricultural lands. The implementation of alternative land uses

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must be viewed from a broad-based community planning perspective. In reviewing proposals for land use changes, socio-economic, infrastructure, and environmental parameters must be analyzed. Such analysis would be undertaken in the context of proposed Community Plan amendments and the attendant environmental review process as provided under Chapter 343, Hawaii Revised Statutes. There are no proposals for amending land uses and related spatial patterns under the subdivisions noted herein.

# **Chapter IV**

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***Relationship to Governmental  
Plans, Policies and Controls***

#### **IV. RELATIONSHIP TO GOVERNMENTAL PLANS, POLICIES AND CONTROLS**

##### **A. STATE LAND USE DISTRICTS**

Chapter 205, Hawaii Revised Statutes, relating to the Land Use Commission, establishes four (4) major land use districts in which all lands in the State are placed. These districts are designated "Urban", "Rural", "Agricultural", and "Conservation". The subject project encompasses lands classified "Agricultural" and "Conservation". See Appendix E.

The subject project is compatible with provisions of the State Agricultural District. Agricultural lots are being proposed with a provision that agricultural activity be provided.

Lands within the State Conservation District are under the jurisdiction of the Department of Land and Natural Resources. Title 13, Hawaii Administrative Rules, establishes rules and procedures which regulate land use in the Conservation District. Title 13 establishes subzones within the Conservation District. These subzones are designated "Protective" (P), "Limited" (L), "Resource" (R), "General" (G), and "Special" (S).

Portions of the assessment area near its upper reaches around the Olowalu Stream Valley are in the "Resource" subzone. The objective of the "Resource" subzone is to develop, with proper management, areas to ensure sustained use of the natural resources of those areas.

New waterlines are proposed within the State Conservation District. The first phase of improvements, which has already been implemented to service existing users of the system, consists of an approximately 400 lineal foot waterline segment from the groundwater well located outside

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of the Conservation District to Storage Tanks 2 and 3 within the Olowalu Stream Valley. Approximately 40 lineal feet of waterline is laid underground from the well to an existing ditch. This segment falls within the State Agricultural District. The remainder, which has been laid within or attached to an existing ditch, is within the Conservation District. The purpose of this waterline segment is to upgrade existing potable water service from a surface to groundwater source. This Phase I segment has been approved as an accessory improvement to the existing system.

The second phase of waterline improvements includes an additional 400 lineal foot segment within the Conservation District, as well as additional distribution lines within the State Agricultural District. The purpose of the second phase is to service the proposed mauka and makai subdivisions. Phase II waterline improvements may be considered a public purpose use (D-2) which requires a Board permit. A description of the public purpose use (D-2) is as follows:

Transportation systems, transmission facilities for public utilities, water systems, energy generation facilities utilizing the renewable resources of the area (e.g., hydroelectric or wind farms) and communication systems and other such land uses which are undertaken by non-governmental entities which benefit the public and are consistent with the purpose of the conservation district.

Accordingly, an application for a Conservation District Use Permit for the Phase II waterline improvements has been prepared in accordance with Title 13.

A consolidation of properties also affects Conservation District lands in the Olowalu Stream Valley which are within the assessment area. All or portions of 12 parcels (TMK 4-8-3: 10, 66-70, 74, 75, 79-82) are located

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within the State Conservation District. The proposed action involves the consolidation of these parcels into one (1) parcel which includes lands within the Olowalu Stream Valley as well as makai stream areas outside of the Conservation District. Refer to Figure 4.

Within the makai area, lands abutting the shoreline are within the State Conservation District. As it pertains to makai lands within the Conservation District, the proposed action would result in portions of two (2) parcels within the Conservation District.

Conservation District lands makai of Honoapiilani Highway in this vicinity are classified in the "Limited" subzone. The objective of the "Limited" subzone is to limit uses where natural conditions suggest constraints on human activities.

With the exception of the foregoing waterline improvements, no construction on either the mauka or makai Conservation District lands is planned. The parcels within the Conservation District were recently created to designate existing Land Commission Award properties as tax map parcels.

The proposed subdivision actions in the mauka and makai areas may be considered under Subdivision or Consolidation of Property (C-2). A description of Subdivision or Consolidation of Property (C-2) is as follows:

Consolidation of property into a lesser number of legal lots of record currently existing and approved, which furthers the objectives of the subzone. Consolidation followed by resubdivision shall constitute a subdivision.

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A C-2 use requires a Departmental Permit. However, a Board permit application is being prepared in accordance with Section 13-5-33(b), HAR, which is noted as follows:

In those applications whose identified land uses require a combination of board permit(s) and departmental permit(s), a board permit shall be required covering all of the proposed uses.

Thus, with regard to the proposed action's consistency with the purpose of the Conservation District, the following criteria are discussed:

1. **The proposed land use is consistent with the purpose of the Conservation District:**

The proposed waterline and subdivision actions are permissible within the Conservation District and are not contrary to the purpose of conserving, protecting and preserving important natural resources of the State.

2. **The proposed land use is consistent with the objectives of the subzone of the land on which the use will occur:**

The assessment action is consistent with the objectives of the Resource and Limited subzones. Waterline construction would not result in any adverse effect on natural resources of the area. Other than waterline installation activities, consolidation and subdivision actions do not involve any construction activities and would not affect natural resources and conditions.



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3. **The proposed land use complies with provisions and guidelines contained in Chapter 205A, HRS, entitled "Coastal Zone Management," where applicable:**

The proposed action complies with provisions and guidelines in Chapter 205A, HRS. Refer to Section IV.E. (pages 83 to 96).

4. **The proposed land use will not cause substantial adverse impact to existing natural resources within the surrounding area:**

The assessment action involves the implementation of approximately 760 lineal feet of waterline within the Conservation District, most of which will be within or strapped to an existing ditch. No other subdivision actions will involve any construction within the Conservation District. No adverse impact to existing natural resources within the surrounding area are anticipated.

5. **The proposed land use, including buildings, structures and facilities, shall be compatible with the locality and surrounding areas, appropriate to physical conditions and capabilities of the specific parcel or parcels:**

Construction within the Conservation District is limited to the installation of the new waterline. In this regard, there will be no significant changes to the environment within the Conservation District as a result of the project.

6. **The existing physical and environmental aspects of the land, such as natural beauty and open space characteristics, will be preserved or improved upon, whichever is applicable:**

Upon completion of the project, the existing land uses along the waterline corridor are anticipated to remain as open space. The project will result in minimal effect upon the existing landscape.

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The intent is to preserve the natural beauty and open space characteristics of the area.

7. **Subdivision of land will not be utilized to increase the intensity of land uses in the conservation district:**

The proposed action involves a decrease in the number of lots within the Conservation District. Within the total project area, there is also a decrease in the number of lots.

8. **The proposed land use will not be materially detrimental to the public health, safety and welfare:**

The assessment action enhances the public's health, safety and welfare by upgrading the domestic water system.

**B. MAUI COUNTY GENERAL PLAN**

The Maui County General Plan (1990 Update) sets forth broad objectives and policies to help guide the long-range development of the County. As stated in the Maui County Charter:

"The purpose of the General Plan is to recognize and state the major problems and opportunities concerning the needs and the development of the County and the social, economic and environmental effects of such development and set forth the desired sequence, patterns and characteristics of future development".

The proposed action is in keeping with the following General Plan objective and policy:

**Objective:**

To preserve for present and future generations existing geographic, cultural and traditional community lifestyles by limiting and managing growth through environmentally sensitive and effective use of land in

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accordance with the individual character of the various communities and regions of the County.

**Policy:**

Provide and maintain a range of land use districts sufficient to meet the social, physical, environmental and economic needs of the community.

**C. WEST MAUI COMMUNITY PLAN**

The project is located in the West Maui Community Plan region. This region is one (1) of nine (9) Community Plan regions established in the County of Maui. The Community Plans establish regional planning guidelines.

The West Maui Community Plan Land Use Map designates most of the assessment area as Agricultural. Mauka portions of the project around the Olowalu Stream Valley are considered Conservation. Areas closest to the shoreline are Open Space except for the shoreline area adjacent to Camp Pecusa which is designated Park. See Figure 12.

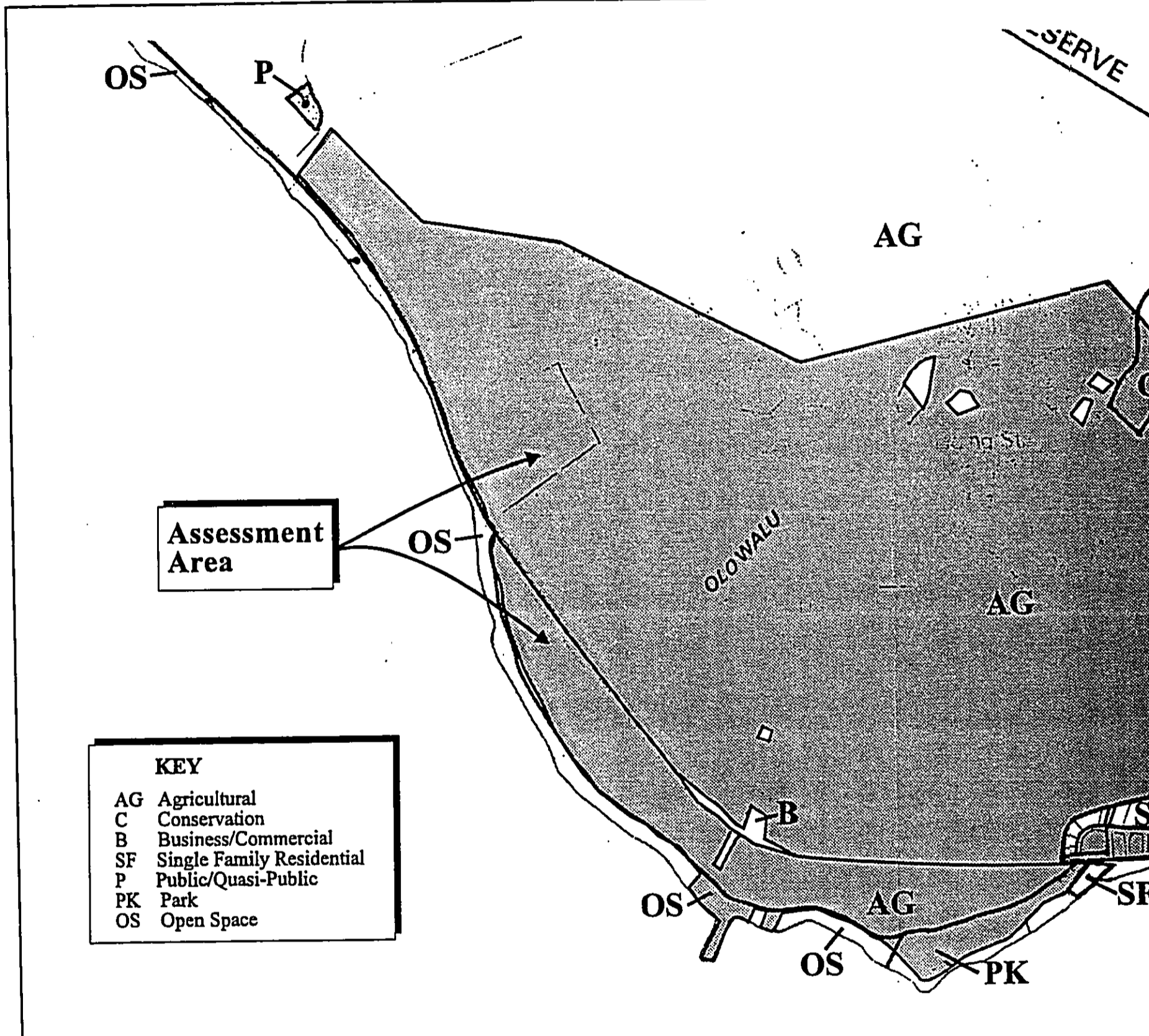
The assessment action implements the following goals, objectives and policies of the West Maui Community Plan.

**LAND USE**

**Goal**

An attractive, well-planned community with a mixture of compatible land uses in appropriate areas to accommodate the future needs of residents and visitors in a manner that provides for the stable social and economic well-being of residents and the preservation and enhancement of the region's open space areas and natural environmental resources.

**Response:** Most of the assessment area has been utilized for large lot sugar cultivation for over a century. With the recent closure of Pioneer Mill Company, Inc. and the discontinuation of large lot sugar cultivation in the



Source: County of Maui, Department of Planning

Figure 12

Subdivision of Olowalu Lands  
West Maui Community Plan



Prepared for: Olowalu Elua Associates, LLC



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area, the proposed action would help to foster the continuation of agricultural activity in the area, albeit with smaller lots. The proposed action involves the subdivision and sale of parcels to individual owners with the intent to encourage diversified agriculture in the area. The proposed action provides for the stable social and economic well-being of residents and the preservation and enhancement of the region's open space areas and natural environmental resources.

**Objectives and Policies**

Preserve and enhance the mountain and coastal scenic vistas and the open space areas of the region.

**Response:** With the continuation of low density agricultural use in the area, mountain and coastal scenic vistas and open space areas of the region should be maintained.

Ensure that appropriate lands are available to support the region's present and future agricultural activities.

**Response:** The proposed action does not involve a change in use. Although large scale agricultural activities on the property have ceased, the proposed action provides the opportunity to continue agricultural activity in the area. The intent is to comply with all applicable County Agricultural District zoning regulations.

Preserve the current State Conservation District and the current Agriculture District boundaries in the planning region in accordance with this Community Plan and its land use map. Lands north of Kapalua and south of Puamana to the region's district boundaries should ensure the preservation of traditional lifestyles, historic sites, agriculture, recreational activities and open space.

**Response:** Conservation and Agricultural District boundaries will not be altered by the proposed action. The project also includes the establishment of a cultural reserve which supports the preservation of

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traditional lifestyles. Appropriate mitigation of historic sites will be coordinated with the State Historic Preservation Division. Small lot agriculture is being encouraged by the proposed action. Recreational and open space parameters are being enhanced and increased.

Provide for specific criteria for the subdivision of lands designated for agricultural use in order to control the potential loss of productive agricultural lands and the open space resource.

**Response:** The proposed subdivision would comply with all applicable provisions of State land use district, West Maui Community Plan, and County Agricultural District zoning provisions.

Provide and maintain parks and beach access for the present and future needs of residents and visitors. For the areas outside Lahaina town, establish or expand parks and public shoreline areas to include but not limited to the following:

\* \* \*

- b. The development of a public beach park at Olowalu near Camp Pecusa for camping and ocean-related recreational and educational activities. The final boundaries of this park shall be determined in consultation with the landowner. However, if agricultural in the area is decreased by 50 percent, 20 acres of park land shall be considered for addition to the 10 acres of park land currently designated in the Land Use Map.

**Response:** The proposed action does not propose a subdivision of lands which are designated Park on the community plan land use map. It is also noted that the proposed action does not result in a decrease in agriculture in the area. Thus, the assessment action does not preclude future establishment of a park in the area.

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## **ENVIRONMENT**

### **Objectives and Policies**

Preserve agricultural lands and open space with particular emphasis on natural coastal areas along major highways.

**Response:** The proposed action preserves use of the land for agricultural purposes. This should encourage retention of agriculture and open space resources along the portion of Honoapiilani Highway traversing the assessment area.

## **ECONOMIC ACTIVITY**

### **Objective and Policy**

Provide for the preservation and enhancement of agriculture.

- a. Maintain the land acreage required to sustain present and future agricultural operations and open space.
- b. Prevent urbanization of agricultural lands to the greatest extent possible.
- c. Encourage maintenance and development of water sources for agricultural activities which do not conflict with domestic demand for potable water.
- d. Discourage use of agricultural lands for non-agricultural purposes.
- e. Adopt ordinances to establish standards for agricultural lands.

**Response:** The acreage and use of agricultural lands and open space are being maintained by the proposed action. The proposed action does not involve any urbanization of agricultural lands. The proposed action involves the continuation of the plantation irrigation system which utilized a surface water source. This does not conflict with the source of potable water which is a new groundwater well. The proposed action complies



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with the recent establishment of County Agricultural District zoning (Ordinance No. 2749).

### **CULTURAL RESOURCES**

#### **Objectives and Policies**

Preserve and protect significant archaeological, historical and cultural resources that are unique in the State of Hawaii and Island of Maui.

**Response:** Archaeological inventory surveys were conducted for the mauka and makai portions of the project area. Based on the archaeological assessment, a number of mitigation actions for significant sites are being recommended. These included preservation, interpretative preservation, avoidance, archaeological monitoring and data recovery.

General site types and areas that should be flagged for possible preservation include the following:

- a. Ancient trails/old government roads
- b. Fishponds
- c. Landings
- d. Nearshore marine cultural resources
- e. Stream valley areas
  1. habitation complexes (shoreline and interior)
  2. lo'i and 'auwai
  3. terraces
- f. Significant native vegetation zones
- g. Plantation ditch systems
- h. Religious structures (shrines, churches and heiau)
- i. Old bridges
- j. Plantation camps
- k. Plantation era structures and homes
- l. Petroglyphs
- m. Burials

**Response:** There are a number of site types which are proposed for preservation. For instance, these include the Olowalu Landing and the plantation manager's home which are part of the Olowalu Mill Complex

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(Site 1602), a habitation complex and possible burial (Site 4710), Kawaialoa Heiau (Site 04), and petroglyphs and burials at Pu'u Kilea (Site 1200 and 1201). The applicant is working with the State Historic Preservation Division in completing the significance assessments for all sites within the project area.

Important site types and areas in the West Maui region include but are not limited to the following:

- a. Lahaina Pali trail
- b. Olowalu Church ruins
- c. Olowalu heiau
- d. Stream valley sites
- e. Plantation ditch system
- f. Sites and structures within the National Historic District
- g. Plantation buildings
- h. Lo'i terraces and 'auwai
- i. Ukumehame complex
- j. Launiupoko complex
- k. Moku'ula Island
- l. Camp Pecusa
- m. Honolua archaeological district
- n. Honokohau Valley
- o. Olowalu petroglyphs
- p. Pioneer Mill
- q. Lahainaluna High School
- r. Olowalu Landing
- s. Mala pre-contact burials

**Response:** There are a number of important site types mentioned in the West Maui Community Plan located within the project area which are proposed to be preserved. These include the Olowalu heiau (Kawaialoa Heiau - Site 04), a Stream valley site (petroglyph panel and associated terraces - Site 4704), plantation buildings and the Olowalu Landing (which are part of the Olowalu Mill Complex - Site 1602), and Olowalu petroglyphs (Olowalu Petroglyph Complex - Sites 1200 and 1201).

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**D. ZONING**

Portions of the assessment area within the State Conservation District are under the jurisdiction of the State Department of Land and Natural Resources and are not zoned by the County of Maui.

Ordinance No. 2749 established a County Agricultural Zoning District. The ordinance, which took effect on December 31, 1998, states in part that lands designated as Agriculture in the Community Plan were automatically zoned as Agricultural. Since most of the assessment area is community planned Agricultural, these portions have been zoned Agricultural as a result of Ordinance No. 2749.

There are several other remnant portions of the site which are not community planned Agricultural but are within the State Agricultural District. The zoning for these areas was enacted prior to the establishment of State land use districts for the area. Ordinance No. 297 was adopted on May 10, 1961 for portions of the assessment area. Portions of the assessment area are zoned R-2 and R-3 Residential District, and A-3 Apartment District. See Figure 13.

**E. SPECIAL MANAGEMENT AREA OBJECTIVES AND POLICIES**

Pursuant to Chapter 205A, Hawaii Revised Statutes, and the Rules and Regulations of the Planning Commission of the County of Maui, actions located within the SMA are evaluated with respect to SMA objectives, policies and guidelines. A portion of the assessment area mauka and makai of Honoapiilani Highway is located within the County SMA. See Figure 14.

Within the makai area, a subdivision request is being processed under Ordinance No. 2372. This involves the consolidation of four (4) lots (TMK

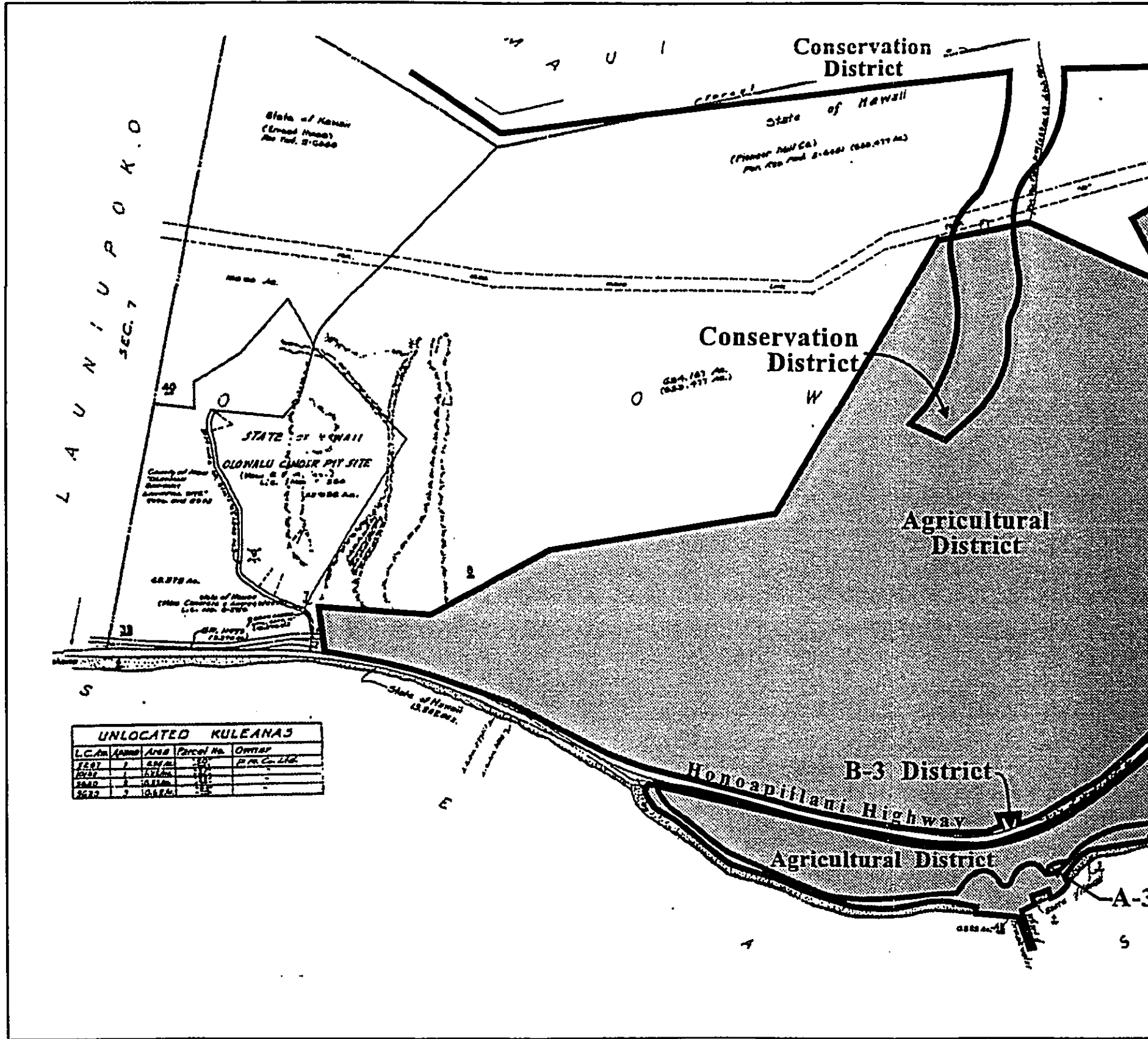
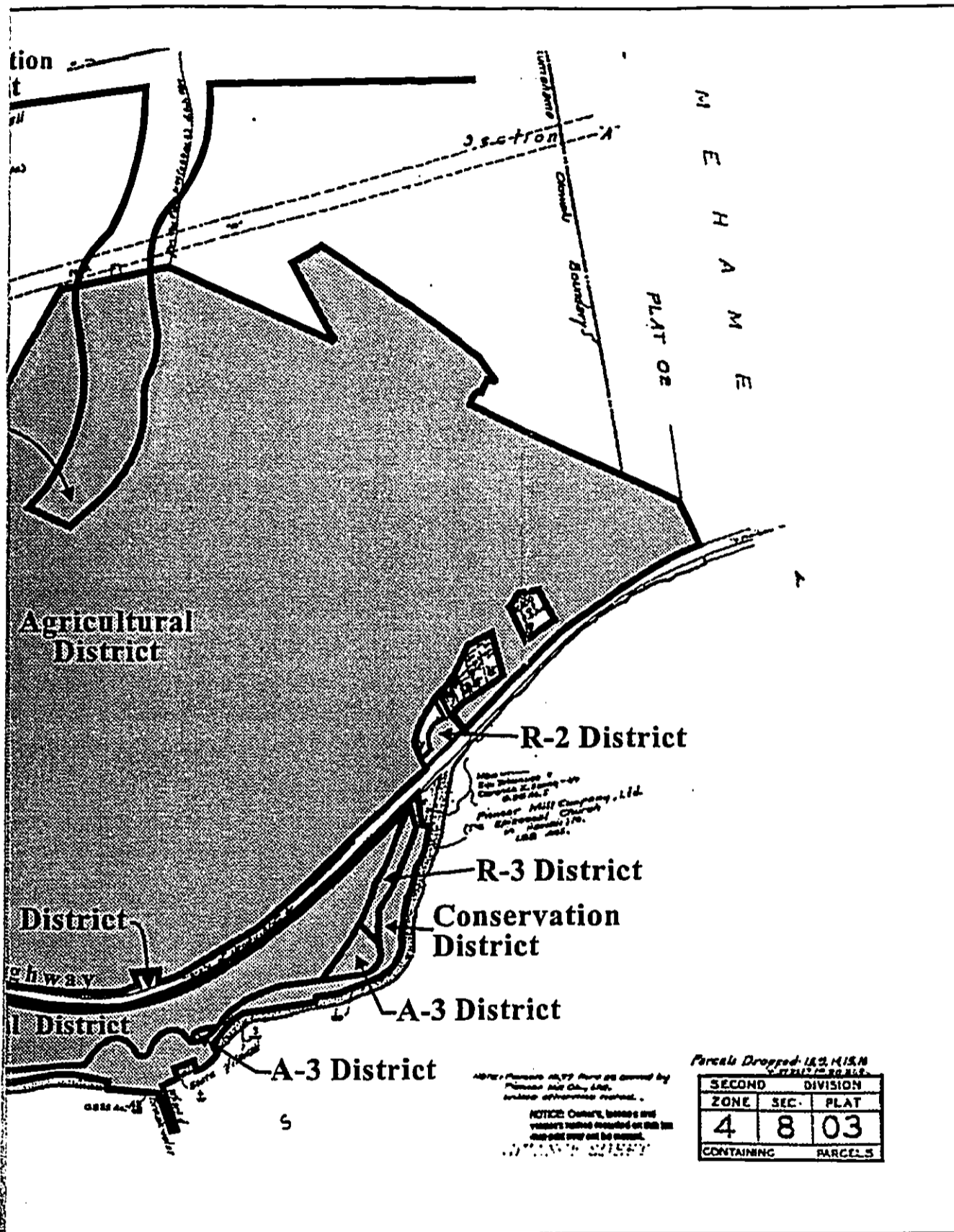


Figure 13

Subdivision of Olowalu Lands  
Existing Zoning



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lowalu Lands  
oning

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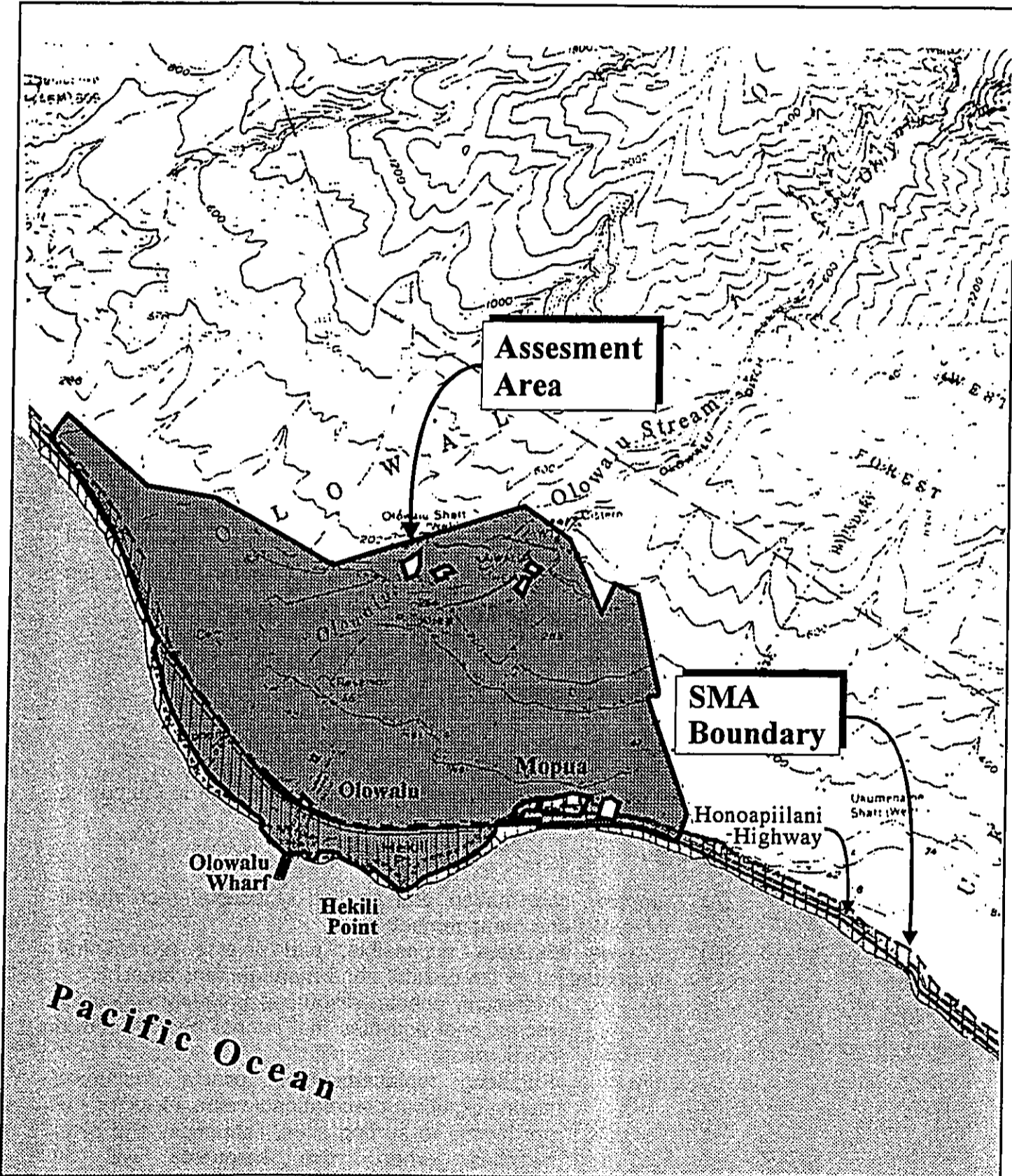
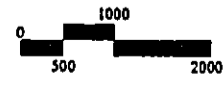


Figure 14 Subdivision of Olowalu Lands  
Special Management Area Boundary



MUNEKIYO, ARAKAWA & HIRAGA, INC.  
INC.

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4-8-3:41, 42, 43 and portion of 5) and resubdivision into four (4) lots. See Figure 15. This initial action does not involve any construction activity and is not considered a "development" under Section 205A-22, HRS.

The second action which is subject to SMA review involves a portion of TMK 4-8-3:5. This action involves the subdivision of one (1) lot into four (4) lots. See Figure 16.

Mauka parcels falling within the SMA boundaries are TMK 4-8-03:10 (por.), 50 (por.), 78 (por.), 63 (por.) and TMK 4-8-04:11-16.

This section addresses the project's relationship to applicable coastal zone management considerations, as set forth in Chapter 205A and the Rules and Regulations of the Maui Planning Commission.

**(1) Recreational Resources**

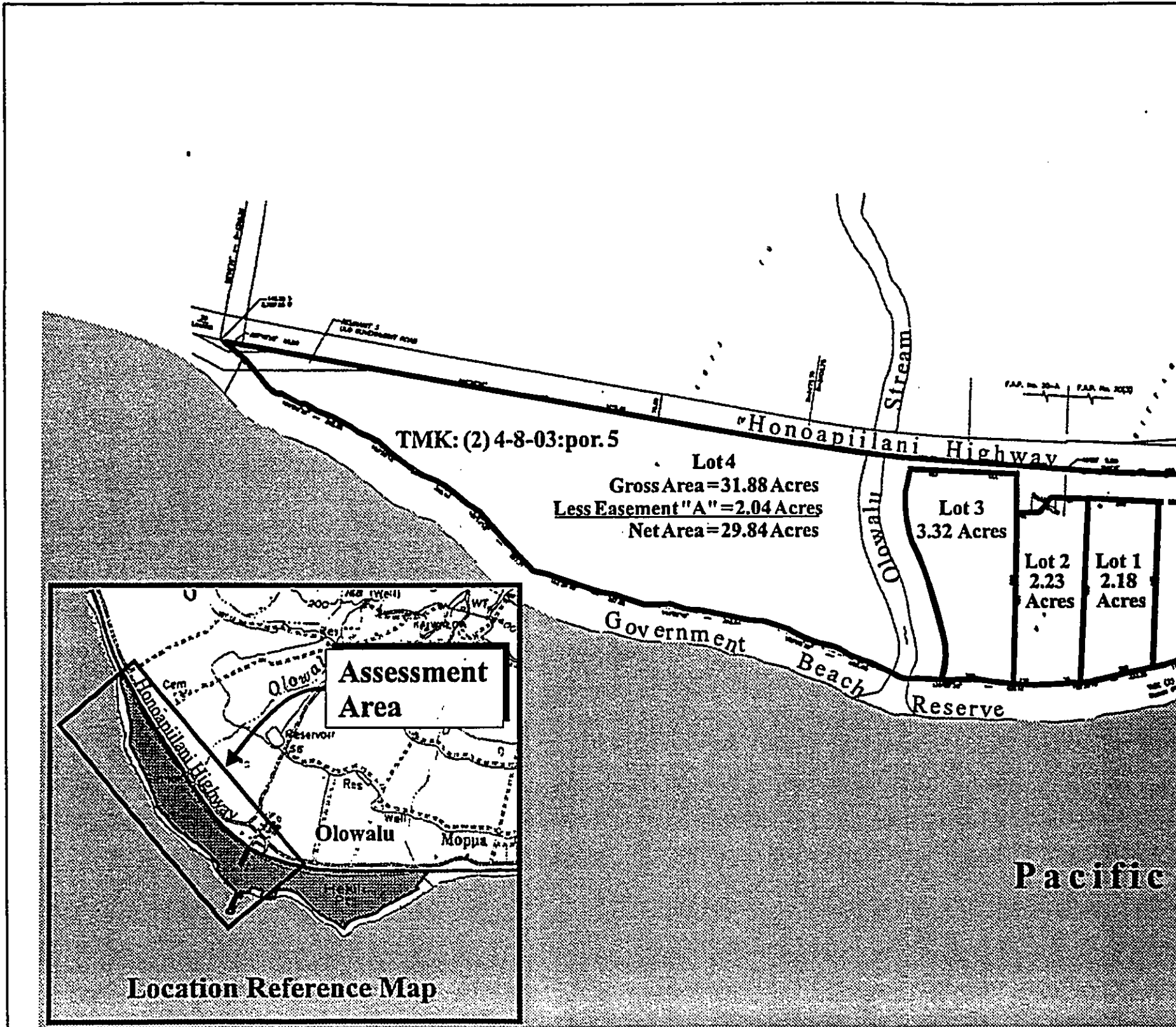
**Objective:**

Provide coastal recreational opportunities accessible to the public.

**Policies:**

- (A) Improve coordination and funding of coastal recreational planning and management; and
- (B) Provide adequate, accessible, and diverse recreational opportunities in the coastal zone management area by:
  - (i) Protecting coastal resources uniquely suited for recreational activities that cannot be provided in other areas;
  - (ii) Requiring replacement of coastal resources having significant recreational value, including but not limited to surfing sites, fishponds, and sand beaches, when such resources will be unavoidably damaged by development; or requiring reasonable monetary compensation to the state for recreation when replacement is not





Source: R.T. Tanaka Engineers, Inc.

Figure 15

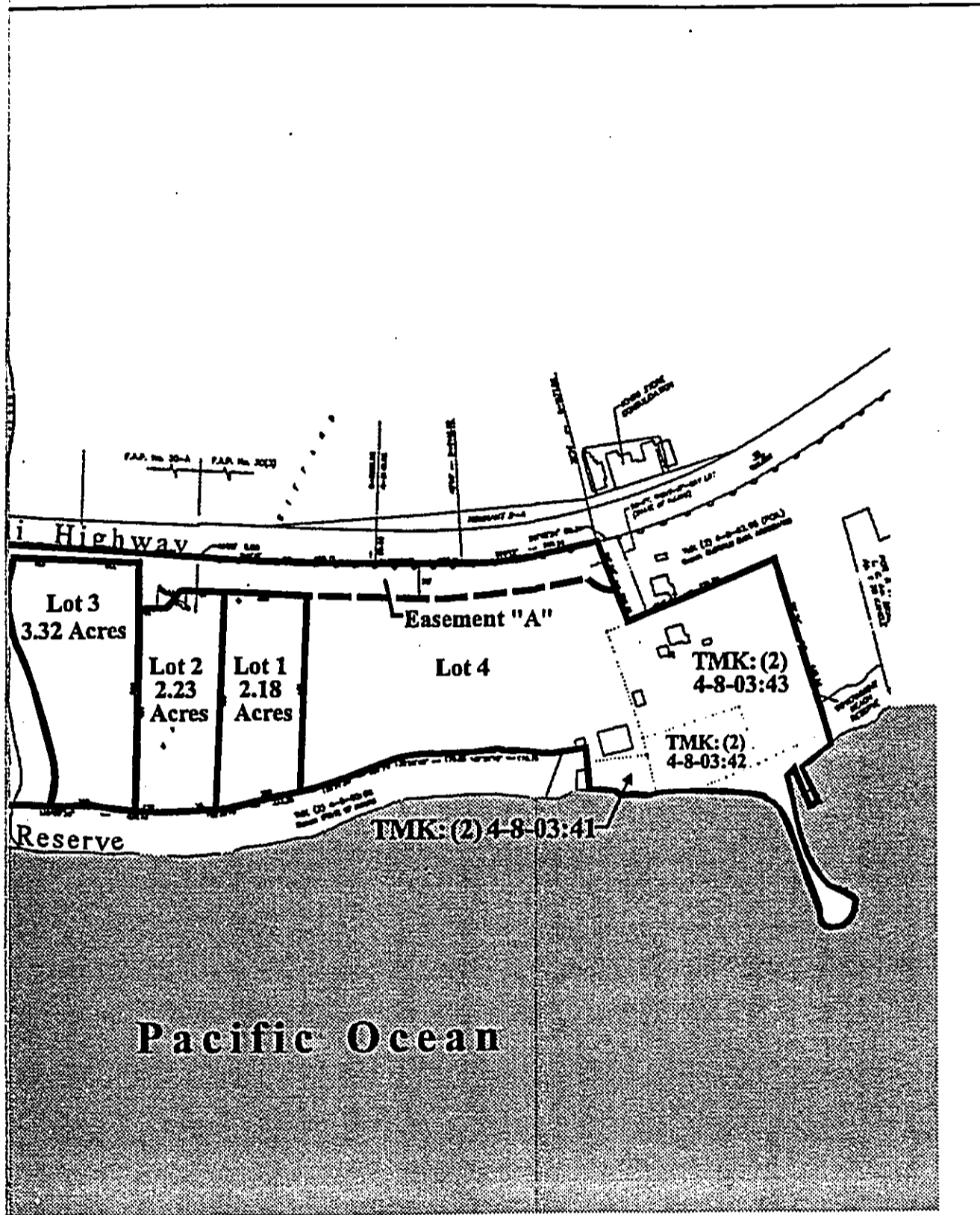
Subdivision of Olowalu Lands  
Makai Area Four Lot Subdivision (Lots 1-4)



Prepared for: Olowalu Elua Associates, LLC



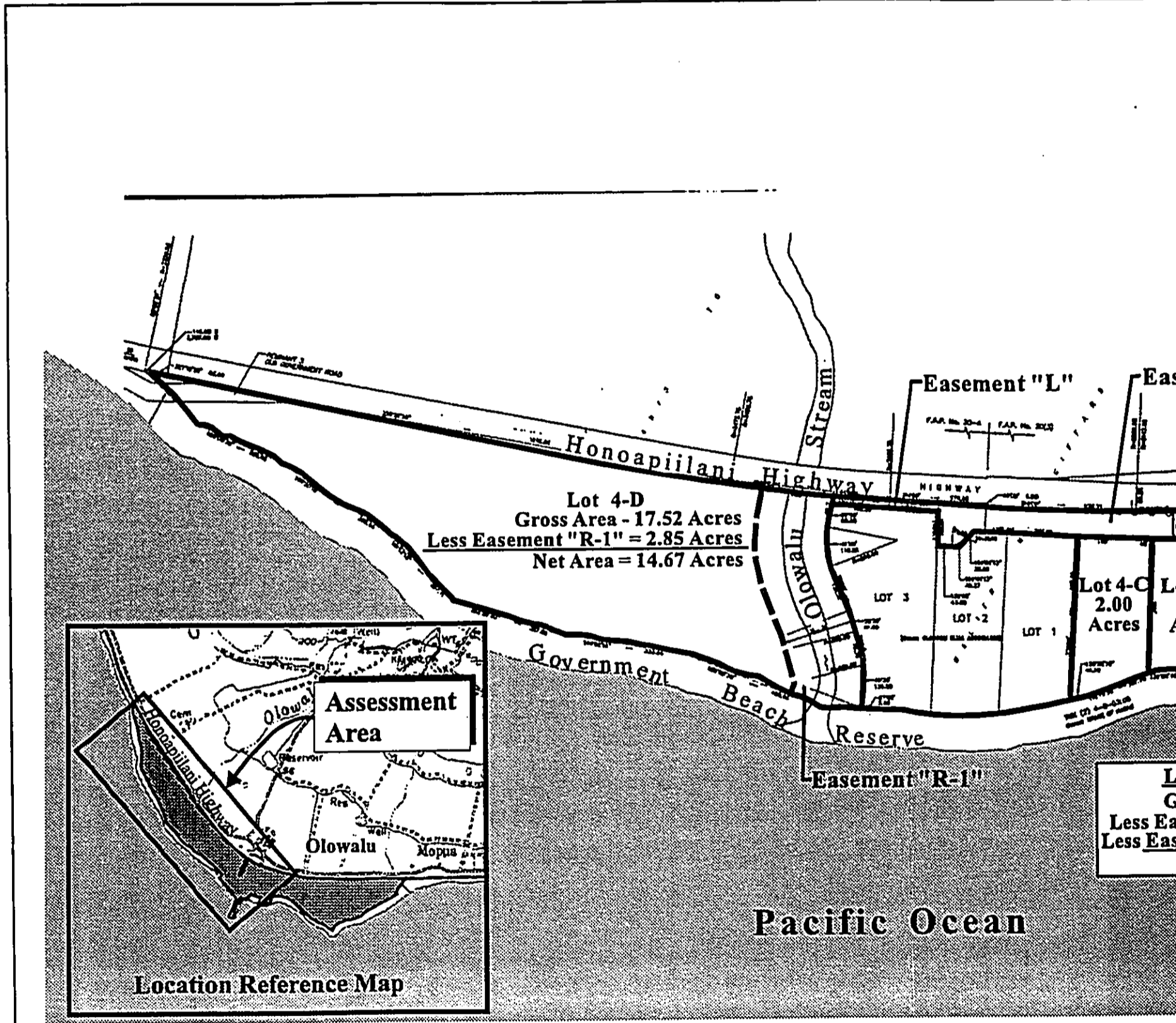
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lowalu Lands  
bdivision (Lots 1-4)

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Source: R.T. Tanaka Engineers, Inc.

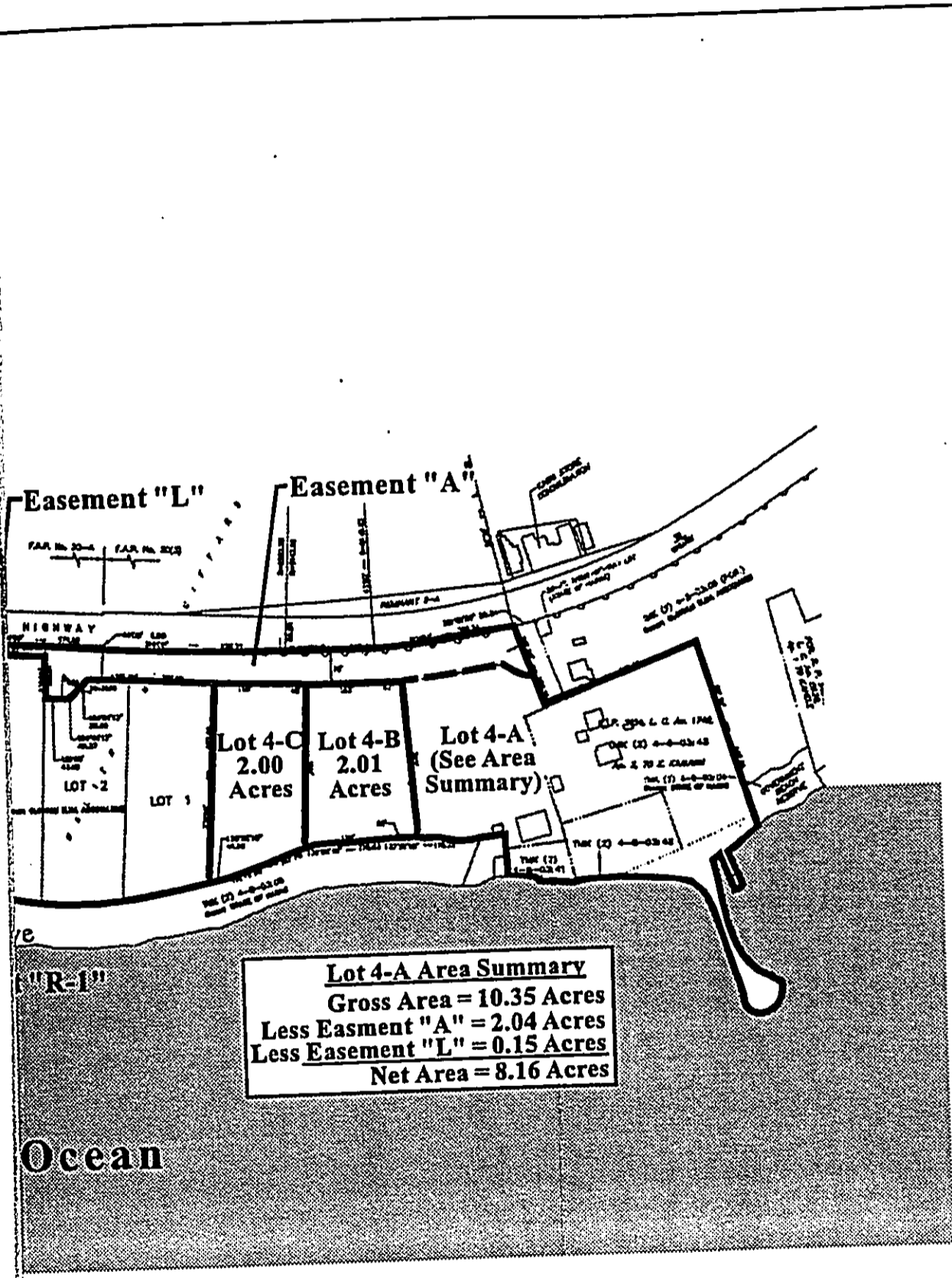
Figure 16

Subdivision of Olowalu Lands  
Makai Area Four Lot Subdivision (Lots 4-A to 4-D)



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sion (Lots 4-A to 4-D)

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- (iii) feasible or desirable; Providing and managing adequate public access, consistent with conservation of natural resources, to and along shorelines with recreational value;
  - (iv) Providing an adequate supply of shoreline parks and other recreational facilities suitable for public recreation;
  - (v) Ensuring public recreational use of county, state, and federally owned or controlled shoreline lands and waters having recreational value consistent with public safety standards and conservation of natural resources;
  - (vi) Adopting water quality standards and regulating point and non-point sources of pollution to protect, and where feasible, restore the recreational value of coastal waters;
  - (vii) Developing new shoreline recreational opportunities, where appropriate, such as artificial lagoons, artificial beaches, and artificial reefs for surfing and fishing; and
  - (viii) Encouraging reasonable dedication of shoreline areas with recreational value for public use as part of discretionary approvals or permits by the land use commission, board of land and natural resources, county planning commissions; and crediting such dedication against the requirements of Section 46-6, HRS.

**Response:** The proposed action will enhance coastal zone recreational opportunities. The government beach reserve will not be affected by the proposed action. In order to enhance lateral shoreline access, easements are proposed across private property. Public access to the Olowalu Landing also has improved.

(2) **Historic resources**

**Objective:**

Protect, preserve and, where desirable, restore those natural and manmade historic and prehistoric resources in the coastal zone

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management area that are significant in Hawaiian and American history and culture.

**Policies:**

- (A) Identify and analyze significant archeological resources;
- (B) Maximize information retention through preservation of remains and artifacts or salvage operations; and
- (C) Support state goals for protection, restoration, interpretation, and display of historic resources.

**Response:** An archaeological inventory survey has been conducted for the mauka and makai areas. A number of new sites were found and new information on existing sites were discovered. Mitigation recommendations include preservation, avoidance, monitoring, data recovery, and interpretive preservation for the various sites. The intent of the applicant is to comply with these recommendations. Should human remains or cultural materials be inadvertently discovered during earth moving activities for other aspects of the project, work shall cease at once in the immediate area of the find, and the find shall be protected from further damage. In addition, the SHPD shall be immediately notified and procedures for the treatment of inadvertently discovered human remains or cultural materials shall be followed pursuant to Chapter 6E, HRS.

(3) **Scenic and open space resources**  
**Objective:**

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

**Policies:**

- (A) Identify valued scenic resources in the coastal zone management area;

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- (B) Ensure that new developments are compatible with their visual environment by designing and locating such developments to minimize the alteration of natural landforms and existing public views to and along the shoreline;
  - (C) Preserve, maintain, and, where desirable, improve and restore shoreline open space and scenic resources; and
  - (D) Encourage those developments which are not coastal dependent to locate in inland areas.

**Response:** The assessment action will not adversely impact scenic or open space resources. The assessment action will not involve significant alteration to the existing topographic character of the site. A cultural reserve along Olowalu Stream is proposed to ensure protection of a mauka-makai open space resource. Moreover, a greenway system is proposed in the mauka area which enhances scenic and open space parameters.

(4) **Coastal ecosystems**

**Objective:**

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

**Policies:**

- (A) Improve the technical basis for natural resource management;
- (B) Preserve valuable coastal ecosystems, including reefs, of significant biological or economic importance;
- (C) Minimize disruption or degradation of coastal water ecosystems by effective regulation of stream diversions, channelization, and similar land and water uses, recognizing competing water needs; and
- (D) Promote water quantity and quality planning and management practices which reflect the tolerance of fresh water and marine ecosystems and prohibit land and water uses which violate state water quality standards.

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**Response:** Appropriate erosion control measures will be implemented to minimize the effects of stormwater runoff during construction of the project and to ensure that coastal ecosystems are not adversely impacted. In the long term, the project should not result in any significant increase in peak flow rates and runoff volumes.

(5) **Economic uses**

**Objective:**

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

**Policies:**

- (A) Concentrate coastal dependent development in appropriate areas;
- (B) Ensure that coastal dependent development such as harbors and ports, and coastal related development such as visitor facilities and energy generating facilities, are located, designed, and constructed to minimize adverse social, visual, and environmental impacts in the coastal zone management area; and
- (C) Direct the location and expansion of coastal dependent developments to areas presently designated and used for such developments and permit reasonable long-term growth at such areas, and permit coastal dependent development outside of presently designated areas when:
  - (i) Use of presently designated locations is not feasible;
  - (ii) Adverse environmental effects are minimized; and
  - (iii) The development is important to the State's economy.

**Response:** The assessment action will have a beneficial short-term impact on the local economy during construction by providing

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construction-related employment. In the long term, the project does not adversely affect the region's long-term economic stability.

(6) **Coastal hazards**

**Objectives:**

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

**Policies:**

- (A) Develop and communicate adequate information about storm wave, tsunami, flood, erosion, subsidence, and point and nonpoint source pollution hazards;
- (B) Control development in areas subject to storm wave, tsunami, flood, erosion, hurricane, wind, subsidence, and point and nonpoint pollution hazards;
- (C) Ensure that developments comply with requirements of the Federal Flood Insurance Program;
- (D) Prevent coastal flooding from inland projects; and
- (E) Develop a coastal point and nonpoint source pollution control program.

**Response:** Coordination with the County of Maui will be undertaken prior to construction to ensure compliance with applicable flood hazard area development standards.

Appropriate erosion control measures will be implemented during construction to minimize soil loss and erosion hazards.

(7) **Managing development**

**Objective:**

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



**Policies:**

- (A) Use, implement, and enforce existing law effectively to the maximum extent possible in managing present and future coastal zone development;
- (B) Facilitate timely processing of applications for development permits and resolve overlapping of conflicting permit requirements; and
- (C) Communicate the potential short and long-term impacts of proposed significant coastal developments early in their life-cycle and in terms understandable to the public to facilitate public participation in the planning and review process.

**Response:** All aspects of development will be conducted in accordance with applicable State and County requirements. Opportunity for review of the proposed action is offered through the Conservation District Use Application (CDUA) and Special Management Area (SMA) permit process.

**(8) Public participation**

**Objective:**

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

**Policies:**

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

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**Response:** The assessment action is subject to Environmental Assessment (EA), CDUA and County of Maui SMA proceedings. Opportunities for public awareness, education, and participation in coastal management are provided through the EA, CDUA and SMA review and approval process. Also, various meetings with community members from the Sierra Club, Lahaina Open Space Society, Na Kupuna O Maui, Maui Tomorrow and private homeowners in Olowalu have provided valuable input.

(9) **Beach protection**

**Objective:**

Protect beaches for public use and recreation.

**Policies:**

- (A) Locate new structures inland from the shoreline setback to conserve open space and to minimize loss of improvements due to erosion;
- (B) Prohibit construction of private erosion-protection structures seaward of the shoreline, except when they result in improved aesthetic and engineering solutions to erosion at the sites and do not interfere with existing recreational and waterline activities; and
- (C) Minimize the construction of public erosion-protection structures seaward of the shoreline.

**Response:** On the makai side of most of the assessment area, there is an approximately 100-foot wide government beach preserve. In addition, lands near the shoreline are included within the State Conservation District. The assessment action does not involve any construction seaward of the shoreline setback.

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(10) **Marine Resources**

**Objective:**

Implement the State's ocean resources management plan.

**Policies:**

- (A) Exercise an overall conservation ethic, and practice stewardship in the protection, use, and development of marine and coastal resources;
- (B) Assure that the use and development of marine and coastal resources are ecologically and environmentally sound and economically beneficial;
- (C) Coordinate the management of marine and coastal resources and activities management to improve effectiveness and efficiency;
- (D) Assert and articulate the interests of the State as a partner with federal agencies in the sound management of ocean resources within the United States exclusive economic zone;
- (E) Promote research, study, and understanding of ocean processes, marine life, and other ocean resources in order to acquire and inventory information necessary to understand how ocean development activities relate to and impact upon ocean and coastal resources; and
- (F) Encourage research and development of new, innovative technologies for exploring, using, or protecting marine and coastal resources.

**Response:** Best management practices will be incorporated during construction to support the policies of effective management of marine resources. These policies will be further advanced through effective site planning of a low density use for this area.

# **Chapter V**

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***Summary of Adverse  
Environmental Effects  
Which Cannot be Avoided***

**V. SUMMARY OF ADVERSE ENVIRONMENTAL EFFECTS WHICH CANNOT BE AVOIDED**

The proposed development will result in unavoidable, construction-related impacts as described in Chapter III, Potential Impacts and Mitigation Measures.

Potential effects include noise-generated impacts occurring from site preparation and construction activities. In addition, there may be temporary air quality impacts associated with dust generated from construction activities, and exhaust discharged by construction equipment. It should be noted, however, that these impacts are anticipated to be minimized through the implementation of appropriate mitigative measures identified in Chapter IV.

Accordingly, the assessment action is not anticipated to create any significant, long-term adverse environmental impacts.

# **Chapter VI**

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## ***Alternatives Analysis***

## **VI. ALTERNATIVES ANALYSIS**

### **A. NO ACTION ALTERNATIVE**

Most of the site has been in sugar cane cultivation by Pioneer Mill Company, Ltd. However, large scale cultivation of sugar cane has been phased out by Pioneer Mill Company, Ltd. Since the applicant is not positioned to continue large area crop cultivation and the demand for large lot crop cultivation is significantly less than the supply of available agricultural land, the no action alternative would leave the site in a fallow and unmaintained condition. In this regard, the no action alternative is not deemed to be a feasible consideration.

### **B. PROPOSED ACTION**

The subject action would involve the development of a low density agricultural subdivision alternative. There would be 34 agricultural lots in the mauka area and nine (9) lots in the makai area, resulting in a continuation of agricultural use in the area. Moreover, there are currently 38 lots in the mauka area and eleven (11) lots in the makai area. The consolidation and resubdivision results in a smaller number of lots which will meet current County subdivision standards.

### **C. ALTERNATIVE SUBDIVISION LAYOUTS**

Various subdivision layouts were reviewed in the context of Chapter 19.30A of the Maui County Code, relating to the Agricultural District. In particular, lot placement and size delineations considered requirements set forth by Section 19.30A.030(G) relating to the maximum number of lots permitted. The proposed layout was deemed to be optimal in terms of addressing district standards, while respecting land use and environmental parameters.

# **Chapter VII**

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## ***Irreversible and Irrecoverable Commitments of Resources***



## **VII. IRREVERSIBLE AND IRRETRIEVABLE COMMITMENTS TO RESOURCES**

The development of the assessment action is anticipated to result in the irreversible and irretrievable commitment of land and fiscal resources. Other resource commitments include energy, labor and material resources.

In addition, the assessment action is not anticipated to require a substantial commitment of government services or facilities. In general, the proposed action is not anticipated to place significant additional requirements on police, fire, medical and social services.

# **Chapter VIII**

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## ***Findings and Conclusions***

## **VIII. FINDINGS AND CONCLUSIONS**

The "Significance Criteria", Section 12 of the Administrative Rules, Title 11, Chapter 200, "Environmental Impact Statement Rules", were reviewed and analyzed to determine whether the assessment action will have significant impacts to the environment. The following analysis is provided:

1. **No Irrevocable Commitment to Loss or Destruction of any Natural or Cultural Resources Would Occur as a Result of the Proposed Project**

The project will not result in any adverse environmental impacts. There are no known, rare, endangered or threatened species of flora or fauna located within the assessment area. The endangered Hawaiian Coot has been known to utilize two (2) existing reservoirs on the site. These would continue to be utilized for irrigation water storage.

The applicant intends to work with the State Historic Preservation Division in implementing applicable mitigation measures for the recently discovered significant sites and previously existing sites. An archaeological monitoring plan is intended to be formulated for applicable portions of the mauka area.

Should any cultural materials be identified during construction, work will cease in the immediate vicinity of the find and the State Historic Preservation Division will be consulted to establish an appropriate mitigation strategy.

2. **The Proposed Action Would Not Curtail the Range of Beneficial Uses of the Environment**

The assessment action and the commitment of land resources would not curtail the range of beneficial uses of the environment.

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3. **The Proposed Action Does Not Conflict with the State's Long-term Environmental Policies or Goals or Guidelines as Expressed in Chapter 344, Hawaii Revised Statutes**

The State's Environmental Policy and Guidelines are set forth in Chapter 344, Hawaii Revised Statutes and were reviewed in connection with the assessment action. The assessment action is in consonance with the following guidelines:

**Environmental Policy:**

Creating opportunities for the residents of Hawaii to improve their quality of life through diverse economic activities which are stable and in balance with the physical and social environments.

**Guideline:**

Establish, preserve and maintain scenic, historic, cultural, park and recreation areas, including the shorelines, for public recreational, educational, and scientific uses.

4. **The Economic or Social Welfare of the Community or State Would Not Be Substantially Affected**

The assessment action would allow for the consolidation and resubdivision of agricultural lots which would provide additional economic opportunity. The social welfare of the community should not be negatively affected by the assessment action.

5. **The Proposed Action Does Not Affect Public Health**

No impacts to the public's health and welfare are anticipated as a result of the assessment action.

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6. **No Substantial Secondary Impacts, Such as Population Changes or Effects on Public Facilities are Anticipated**

The assessment action should have a negligible effect upon the island's population base. With implementation of required intersection improvements, the assessment action is not anticipated to have a significant effect upon the area's roadways. The applicant has their own well to provide a water source for the project. The applicant will comply with applicable State and County provisions in the areas of wastewater and drainage. The project is not expected to adversely impact public services such as police, fire and medical services. The impacts upon educational, recreational and solid waste parameters are also negligible.

7. **No Substantial Degradation of Environmental Quality is Anticipated**

As the assessment action is implemented, appropriate environmental mitigation measures will be used to ensure that adverse environmental effects are minimized. If any, such effects are anticipated to be limited to temporary construction-related activities. Thus, no substantial degradation of environmental quality resulting from the assessment action is anticipated.

8. **The Proposed Action Does Not Involve a Commitment to Larger Actions, Nor Would Cumulative Impacts Result in Considerable Effects On The Environment**

The proposed action includes the formation of 34 agricultural lots in the mauka area and the resulting nine (9) lots in the makai area. There is no larger action nor would cumulative impacts result in considerable effects on the environment.

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9. **No Rare, Threatened or Endangered Species or Their Habitats Would Be Adversely Affected By The Proposed Action**

The endangered Hawaiian Coot has been known to utilize two (2) existing on-site reservoirs. One (1) reservoir will be retained as part of a cultural reserve administered by a community-based non-profit corporation. The other reservoir is intended to be utilized for storage of irrigation water. This would enable continuation of the existing habitat for the Hawaiian Coot. There are no other known significant habitats or rare, endangered or threatened species of flora and fauna at the assessment area. The removal of existing flora and the displacement of fauna from the area due to construction activities are not considered a negative impact upon these environmental features.

10. **Air Quality, Water Quality or Ambient Noise Levels Would Not Be Detrimentially Affected By The Proposed Project**

Appropriate environmental mitigation measures will be used during construction to ensure that adverse environmental effects on air quality and noise are minimized.

In the long term, the assessment action is not anticipated to have a significant impact on air quality, water quality or noise parameters.

11. **The Proposed Project Would Not Affect Environmentally Sensitive Areas, Such as Flood Plains, Tsunami Zones, Erosion-prone Areas, Geologically Hazardous Lands, Estuaries, Fresh Waters or Coastal Waters**

The project will comply with applicable flood hazard provisions. No tsunami inundation hazards apply to the assessment area. Soils of the assessment area are not erosion-prone. There are no geologically hazardous lands or estuaries within or adjacent to the assessment area. A cultural reserve is proposed for the portion of Olowalu Stream which

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traverses the assessment area. This designation would help in minimizing any impacts to the stream. The project will not result in any significant impacts to coastal waters.

**12. The Proposed Action Would Not Substantially Affect Scenic Views and Viewplanes Identified in County Plans or Studies**

The assessment area is not identified as a scenic vista or viewplane. However, the subdivision results in a low density land use pattern which will respect views and viewplanes.

**13. The Proposed Action Would Not Require Substantial Energy Consumption**

The assessment action is not anticipated to require substantial energy consumption.

Based on the foregoing findings, it is concluded that the proposed action will not result in any significant impacts.

# ***Chapter IX***

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***Agencies/Organizations  
Contacted During the  
Preparation of the  
Environmental Assessment  
and Responses Received***



**IX. AGENCIES/ORGANIZATIONS CONTACTED DURING THE PREPARATION OF THE ENVIRONMENTAL ASSESSMENT AND RESPONSES RECEIVED**

The following agencies were contacted prior to or during the preparation of the Draft Environmental Assessment.

1. Neal Fujiwara, Soil Conservationist  
Natural Resources Conservation Service  
U.S. Department of Agriculture  
210 Iml Kala Street, Suite 209  
Wailuku, Hawaii 96793-2100
2. Linda Hihara-Endo, Acting Chief  
Department of the Army  
U.S. Army Engineer District, Hnl.  
Attn: Operations Division  
Bldg. T-1, Room 105  
Fort Shafter, Hawaii 96858-5440
3. Robert P. Smith  
Pacific Islands Manager  
U. S. Fish and Wildlife Service  
P.O. Box 50167  
Honolulu, Hawaii 96850
4. David Blane, Director  
State of Hawaii  
Office of Planning  
Department of Business, Economic,  
Development and Tourism  
P.O. Box 2359  
Honolulu, Hawaii 96804
5. Herbert Matsubayashi  
District Environmental Health  
Program Chief  
State of Hawaii  
Department of Health  
54 High Street  
Wailuku, Hawaii 96793
6. Timothy Johns, Director  
State of Hawaii  
Department of Land and Natural  
Resources  
P. O. Box 621  
Honolulu, Hawaii 96809
7. Don Hibbard  
State of Hawaii  
Department of Land and Natural  
Resources  
State Historic Preservation Division  
601 Kamokila Blvd.  
Kapolei, Hawaii 96707
8. Kazu Hayashida, Director  
State of Hawaii  
Department of Transportation  
869 Punchbowl Street  
Honolulu, Hawaii 96813
9. Clayton Ishikawa, Chief  
County of Maui  
Department of Fire Control  
200 Dairy Road  
Kahului, Hawaii 96732
10. Floyd Miyazono, Director  
County of Maui  
Department of Parks and  
Recreation  
200 South High Street  
Wailuku, Hawaii 96793
11. John Min, Director  
County of Maui  
Department of Planning  
250 South High Street  
Wailuku, Hawaii 96793
12. Tom Phillips, Chief  
County of Maui  
Police Department  
55 Mahalani Street  
Wailuku, Hawaii 96793

- 
13. **Charles Jencks, Director**  
County of Maui  
**Department of Public Works  
and Waste Management**  
200 South High Street  
Wailuku, Hawaii 96793
  14. **David Craddick, Director**  
County of Maui  
**Department of Water Supply**  
200 South High Street  
Wailuku, Hawaii 96793
  15. **Greg Kauhi**  
**Maul Electric Company, Ltd.**  
P.O. Box 398  
Kahului, Hawaii 96732
  16. **Olowalu Homeowners**  
c/o Mrs. Adelaide Rodrigues  
P.O. Box 837  
Wailuku, Hawaii 96793
  17. **Lahaina Open Space Society**  
P.O. Box 11898  
Lahaina, Hawaii 96761
  18. **West Maui Taxpayers Association**  
P.O. Box 10358  
Lahaina, Hawaii 96761

JLF U 7 1777



DEPARTMENT OF THE ARMY  
U. S. ARMY ENGINEER DISTRICT, HONOLULU  
FT. SHAFTER, HAWAII 96858-5440

REPLY TO  
ATTENTION OF

September 7, 1999

Regulatory Branch

Mr. Milton Arakawa  
Munekiyo, Arakawa & Hiraga, Inc.  
305 High Street, Suite 104  
Wailuku, Hawaii 96793

Dear Mr. Arakawa:

This letter responds to your letter dated August 26, 1999 requesting a review of the Subdivision of Olowalu project summary. The consolidation or re-designation process will not require a Department of the Army (DA) permit; however, any construction or other activity which results in a discharge of dredged or fill material into Olowalu Stream or other waters of the United States, including wetlands, will require a DA permit.

If you have any questions concerning this determination, please contact William Lennan of my staff at 438-6986, and reference File No. 990000466.

Sincerely,

A handwritten signature in cursive script that reads "George P. Young".

George P. Young, P.E.  
Chief, Regulatory Branch

BENJAMIN J. CAYETANO  
GOVERNOR



STATE OF HAWAII  
DEPARTMENT OF HEALTH  
MAUI DISTRICT HEALTH OFFICE  
54 HIGH STREET  
WAILUKU, MAUI, HAWAII 96793

September 8, 1999

lm

SEP 10 1999

BRUCE S. ANDERSON, Ph.D., M.P.H.  
DIRECTOR OF HEALTH

ALFRED M. ARENSDORF, M.D.  
DISTRICT HEALTH OFFICER

Milton Arakawa  
Project Manager  
Munekiyo, Arakawa &  
Hiraga, Inc.  
305 High Street, Suite 104  
Wailuku, Hawaii 96793

Dear Mr. Arakawa:

Subject: Subdivision of Olowalu Lands  
TMK: (2) 4-8- 03: 05,10,41-82, 84 and 4-8-4: 11-16

Thank you for the opportunity to provide early comments on the general overview of the proposed consolidation and subdivision of the parcels. We have no comments to offer at this time.

Sincerely,

A handwritten signature in black ink, appearing to be "H. Matsubayashi", enclosed in a hand-drawn oval.

Herbert S. Matsubayashi  
District Environmental Health Program Chief



SEP 10 1999

United States  
Department of  
Agriculture

Natural  
Resources  
Conservation  
Service

210 Ima Kala St.  
Suite 209  
Wailuku, HI 96793

*Our People...Our Islands...In Harmony*

DATE: September 9, 1999

Mr. Milton Arakawa, A.I.C.P.  
Munekiyo, Arakawa, & Hiraga, Inc.  
305 High Street, Suite 104  
Wailuku, Hawaii 96793

Dear Mr. Arakawa.

SUBJECT: Subdivision of Olowalu Lands

I have reviewed the summary of the subject lands and have the following comments:

Olowalu presently have one major drainage outlet and couple smaller drainage ditches. Unfortunately, the major drainage outlet, Olowalu Stream, provides drainage for the smaller piece of land while the larger piece has virtually no effective outlet. I believe there are several culverts crossing Honoapiilani Highway which were constructed to provide drainage from the upper lands. These culverts should be included in the drainage scheme of the subdivision. There also may be a need to provide drainage easements through various parcels of the subdivision for proper farming use.

Temporary BMPs are needed on these lands to prevent or lessen the chance of runoff, sedimentation and dust.

Please call me at 244-3729 ext. 107 if you need to discuss this subject any further.

Sincerely,

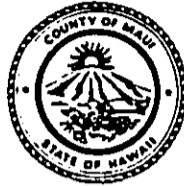
Neal S. Fujiwara  
District Conservationist

cc. Mr. David Nobriga, WMSWCD w/attch.

JAMES "KIMO" APANA  
Mayor

JOHN E. MIN  
Director

CLAYTON I. YOSHIDA  
Deputy Director



COUNTY OF MAUI  
**DEPARTMENT OF PLANNING**

September 23, 1999

SEP 27 1999


Mr. Milton Arakawa  
Munekiyo, Arakawa & Hiraga, Inc.  
305 High Street, Suite 104  
Wailuku, Hawaii 96793

Dear Mr. Arakawa:

RE: Preliminary Consultation for Preparation of an Environmental Assessment for Subdivision of Lands in Olowalu, Maui

The Maui Planning Department has reviewed the above-referenced project and has the following comments:

1. The project documentation should identify the existing property boundaries and acreage prior to consolidation and resubdivision. Although the project summary states there are 51 existing tax map parcels, how many of these are developable parcels (water and roadway access is currently available or the lots are of a size and shape that make them readily developable) or conforming parcels located within the County Agricultural District? The draft Environmental Assessment (EA) should address the impacts associated with any increase in developable lots resulting from the consolidation and resubdivision.
2. The project documentation should identify the State District boundaries applicable to the project including, but not limited to a map and land use allocation. Of particular interest is the applicability of State permits on the subdivision request (i.e., Conservation District Use permits). Although the summary indicates that the total area of the property is 734.972 acres, are all of this acreage located in the State Agricultural District? In previous communications to the Department, the property owner indicated that approximately 22 acres of the mauka lands in the Olowalu Stream gulch area was in the State Conservation District. Further, a portion of the lands along the shoreline is also within the



Mr. Milton Arakawa  
September 23, 1999  
Page 2

State Conservation District. It should be noted that the conservation lands have non-agricultural designations on the West Maui Community Plan (i.e., parks, open space, and conservation).

3. The project documentation should identify the Community Plan land use boundaries applicable to the project, including a map and land use allocation. Besides the land use boundaries, the documentation should address compliance to the Maui County General Plan and the West Maui Community Plan documents.

Relative to the land use map, the Community Plan includes the "development of a public beach park at Olowalu near Camp Pecusa for camping and ocean-related recreational and educational activities. The final boundaries of this park shall be determined in consultation with the landowner. However, if agriculture in the area is decreased by 50 percent, 20 acres of park land shall be considered for addition to the 10 acres of park land currently designated on the Land Use Map." The draft EA should address park lands and the impacts on recreational resources of the area (i.e., camping, swimming, fishing, etc.) and compliance with the Community Plan policy.

The draft EA should also address the goals, objectives and policies relating to the preservation of prime Agricultural lands identified in the community plan. It should include a summary of how the proposed development complies with the following community plan goals, objectives and policies:

**Land Use**

Preserve and enhance the mountain and coastal scenic vistas and the open space areas of the region.

Ensure that appropriate lands are available to support the region's present and future agricultural activities.

Preserve the current State Conservation District and the current State Agriculture District boundaries in the planning region in accordance with this Community Plan and its land use map. Lands north of Kapalua and south of Puamana to the region's district

Mr. Milton Arakawa  
September 23, 1999  
Page 3

boundaries should ensure the preservation of traditional lifestyles, historic sites, agriculture, recreational activities and open space.

Provide for specific criteria for the subdivision of lands designated for agricultural use in order to control the potential loss of productive agricultural lands and the open space resource.

#### Environment

Preserve agricultural lands and open space with particular emphasis on natural coastal areas along major highways.


#### Economic Activity

Provide for the preservation and enhancement of agriculture

- a. Maintain the land acreage required to sustain present and future agricultural operations and open space.
- b. Prevent urbanization of agricultural lands to the greatest extent possible.
- c. Encourage maintenance and development of water sources for agricultural activities which do not conflict with domestic demand for potable water.
- d. Discourage use of agricultural lands for non-agricultural purposes.
- e. Adopt ordinances to establish appropriate standards for agricultural lands.

Of particular concern is the termination of Pioneer Mill's sugar cane operation which utilized large tracts of cultivated lands and water resources which kept much of the West Maui mountains in open space. The parcelization of these large tracts of prime





Mr. Milton Arakawa  
September 23, 1999  
Page 4

agricultural lands into smaller parcels will have an effect on the continued agricultural productivity of these lands. What types of alternative crops or farming operations are being contemplated on these smaller farm parcels and what is their economic potential? In addition to the parcelization of these large tracts into smaller farms, is the potential for additional "farm dwellings". On large plantation tracts, the lands were used primarily for sugar cane cultivation. What are the impacts resulting from the potential for more dwelling units in the Olowalu area on our resources? These issues should be addressed in the draft EA.

4. Further, the proposed Olowalu subdivision is one of several subdivision proposals on former sugar cane lands in the West Maui area. The following Agricultural Subdivisions are currently under review:
  - a. Ukumehame: 435 acres
  - b. Launiupoko: 430 acres (under construction)
  - c. Kauaula: 400 acres
  - d. Olowalu (makai and mauka): 735 acres

With the closure of Pioneer Mill Company, there is also the potential of another 2,600 acres being sold and subdivided.

To the extent possible, cumulative impacts on the West Maui Community should be addressed in the draft EA. What are the regional cumulative impacts on the agricultural economy of the West Maui area with parcelization occurring on these large acreage from Launiupoko to Ukumehame? Included should be the regional impacts on public services, open space and recreational resources, population, historic and cultural resources, etc. In addition an analysis on the impacts on the Lahaina community should be included with the creation of new agricultural communities south of Lahaina.

5. The project documentation should identify the Zoning District boundaries applicable to the project including a map and land use

Mr. Milton Arakawa  
September 23, 1999  
Page 5

allocation. The draft EA should address the applicable provisions of the County Agricultural District as it pertains to the proposed subdivision. Several of the lots in the proposed subdivision are bisected by roadways. Of particular concern is how this design will affect the utility of these lots for future agricultural use. The draft EA should address how the proposed subdivision (lot layout, roadway configuration, location and size of lots, etc.) complies with Maui County Code (MCC), Subsection 19.30A.010B.1-4. The draft EA should also demonstrate how the proposed subdivision configuration supports and implements MCC, Subsection 19.30A.010.A.2-4; including the relationship between lot layout and the economic feasibility of agricultural use of the site.

Pre-application review of the proposed subdivision indicated that of the 657 acres of the mauka lands, a total of 635 acres were zoned County Agricultural District. Of the 73 acres of the makai lands, a total of 56.7 acres were zoned County Agricultural District. A total of nine two-acre lots would be permitted in the makai lands. Of the 635 acres, a total of 34 lots would be permitted; fourteen two-acre lots, eleven 15-acre lots, six 25-acre lots, and three 40-acre lots, subject to a metes and bounds description.

It should be noted that the property owner was informed that once a consolidation and resubdivision is initiated, the lots created pursuant to the consolidation and resubdivision must conform to the applicable district standards. As such the lots must conform to the "sliding scale" of the County Agricultural District. If the proposed subdivision is only for a portion of the maximum allowable lots then the potential undeveloped lots should be identified by size category.

6. The makai portion of the subdivision ocean-side of Honoapiilani Highway is located within the Special Management Area of the Island of Maui. The Coastal Zone Management Law and Special Management Area (SMA) Rules of the Maui Planning Commission should be addressed in the draft EA. The proposed makai subdivision is subject to the SMA assessment process.

Mr. Milton Arakawa  
September 23, 1999  
Page 6

7. Archaeological, cultural and historic resources should be addressed in the draft EA. Said resources are not limited to the Hawaiian culture but should also include references to the plantation era and Pioneer Mill Company (i.e., dwellings, Olowalu mill, irrigation ditches/features, etc.). Such structures as the former manager's home and supervisor homes, remnants of the Olowalu mill and pier are historic properties that are significant to the Olowalu community and the history of West Maui and shall be included in your evaluation of cultural and historic resources. Further, although much of the area has been cultivated, there are still vacant undisturbed lands, especially along Olowalu Stream gulch and the shoreline within the project area, that will require an archaeological inventory survey. Issues such as native Hawaiian burials should also be addressed by the draft EA. As part of any review process, the Maui County Cultural Resources Commission should be contacted for its recommendation.
8. The draft EA should also address traditional access between the ocean and mountains that may be applicable to the project site. Within this context, continued public access to the ocean and the mountains should be addressed.
9. Relative to the subdivision plans, infrastructure resources and services should be addressed in the draft EA. Currently water is provided through a private system which was managed by Pioneer Mill, Company. The draft EA should address the water sources and system that will be necessary to provide both potable and irrigation water to the proposed subdivision. Regarding irrigation, with parcelization of the cane lands, how will the current plantation irrigation system be utilized or will it be discontinued and a new system installed for the agricultural uses? Also, the draft EA should address the use of individual wastewater systems or a private treatment facility to handle wastewater from the proposed subdivision and its potential impacts on resources in the area especially groundwater sources and infiltration into the nearshore waters.

Transportation impacts and mitigative measures should be identified in the draft EA. The potential for more farm dwellings will affect the flow of traffic in the area as well as potential egress

Mr. Milton Arakawa  
September 23, 1999  
Page 7

and ingress impacts from the subdivisions. Improvements to Honoapiilani Highway including future connections from the subdivision should be included in the draft EA. It is noted that

Honoapiilani Highway currently operates at below an acceptable level of service which should be addressed in the draft EA.

Further, portions of Honoapiilani Highway are being impacted by shoreline erosion which has necessitated the construction of revetments (i.e., Launiupoko) to protect the roadway. As shoreline erosion continues in these areas including Olowalu, consideration should be given to the relocation of the highway further mauka. The existing cane haul road is parallel to the highway. With the termination of sugarcane cultivation, the cane haul road is a viable alternative route for relocation. The draft EA should address these issues.

With the establishment of an agricultural residential community in the Olowalu area, the draft EA should address other public services that will be necessary to support this new community. The minimum density allowed in the agricultural district is two dwellings per agricultural lot. With the potential for 43 lots, at least 86 dwellings can be built in the area. This potential increase in residential use within the Olowalu area should be addressed in the draft EA.

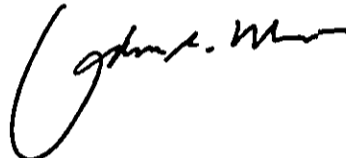
10. Relative to the layout of the subdivision, it appears that the subdivision is being planned as a future urban development. The roadway widths (60 ft.) proposed are based on urban standards and not agricultural roadways. It is also unclear whether underground utilities will also be constructed which is an urban standard. The individual layout of the larger lots appear to be future development sites with easements further dividing these lots into development sites. If the ultimate intent is to urbanize the property, then that process should be initiated through the appropriate land use amendments.
11. The applicant is also advised to contact members of the local native Hawaiian Community, current and former residents of the Olowalu community, and environmental groups for public input.

Mr. Milton Arakawa  
September 23, 1999  
Page 8

Early consultation with these groups and individuals will aid in the planning process and help to identify the issues and concerns of the community and appropriate mitigation measures proposed.

Thank you for the opportunity to comment. If additional clarification is required, please contact Ms. Colleen Suyama, Staff Planner, of this office at 270-7735.

Very truly yours,



JOHN E. MIN  
Planning Director

JEM:CMS:cmb

c: Clayton Yoshida, AICP, Deputy Planning Director  
Charles Jencks, Director, Department of Public Works and Waste Management  
Floyd Miyazono, Director, Department of Parks and Recreation  
Aaron Shinmoto, Planning Program Administrator  
Ralph Nagamine, Administrator, LUCA  
Colleen Suyama, Staff Planner  
Timothy Johns, Director, DLNR  
Don Hibbard, DLNR, SHPD  
James Nakatani, Chairman, Department of Agriculture  
Kazu Hayashida, Department of Transportation  
Project File  
General File  
(S:\CMS\olowalu3)

October 21, 1999

John E. Min, Director  
Department of Planning  
County of Maui  
250 South High Street  
Wailuku, Hawaii 96793

SUBJECT: Subdivision of Olowalu Lands

Dear Mr. Min:

Thank you for your letter of September 23, 1999 pertaining to our request for early consultation comments for the Environmental Assessment (EA) on the subject project. We would like to address your comments as follows:

1. The Draft EA will include a graphic of tax maps which show the location and configuration of the parcels. We would like to clarify that there will be 49 tax map parcels comprising the request. All tax map parcels which comprise the subject request are developable. A private water system currently services approximately 55 residents in the Olowalu area and connection to the system is available. All of the parcels have existing roadway access or prescriptive access rights. With regard to parcel size, 17 existing parcels conform to the minimum lot size of two acres. The remainder are nonconforming. There will be no increase in the amount of developable lots as a result of the proposed action.
2. In the Draft EA, we will include a map which delineates the Conservation District and Agricultural District boundaries. A Conservation District Use Application (CDUA) is being submitted to the Department of Land and Natural Resources for processing in addition to a County Special Management Area (SMA) Use Permit application.
3. In the Draft EA, we will include a map which delineates Community Plan land use boundaries, as well as compliance with applicable General Plan and West Maui Community Plan goals, objectives and policies.

With regard to the community plan policy pertaining to the development of a public beach park at Olowalu, we would like to note that the proposed action does not affect lands in Olowalu which are designated as Park on the Community Plan

John E. Min, Director  
October 21, 1999  
Page 3

9. A new potable source of water is being provided by a well at the upper reaches of the property. A potable water distribution system is being implemented to service the agricultural lots. The intent is to retain, as well as modify the use of the plantation irrigation system, as appropriate.

Wastewater needs are intended to be addressed by individual treatment systems or septic tanks and leach field type of individual wastewater systems. Department of Health regulations will apply to the construction of these systems.

A traffic impact analysis report will be included in the Draft EA.

With regard to issues of shoreline erosion, it is noted that an 80 feet setback is proposed on the resulting parcels mauka of Honoapiilani Highway. The old Pioneer Mill frontage road parallels Honoapiilani Highway on its mauka side. This could provide a possible alternative route for relocation. However, we believe that any contemplated relocation of the highway in a mauka direction should be based on a comprehensive plan for its relocation.

10. Wider roads are being proposed within the subject project to allow for additional landscaping and bike routes. The proposed action does not involve urbanization of the property.
11. Early consultation input is being solicited from a number of governmental agencies, as well as community groups in accordance with applicable provisions of Chapter 11-200, Hawaii Administrative Rules.

If you have any questions, please feel free to call me.

Very truly yours,



Milton Arakawa, A.I.C.P.  
Project Manager

MA:to  
olowalu/makaleub/planning.ltr

# CORRECTION

THE PRECEDING DOCUMENT(S) HAS  
BEEN REPHOTOGRAPHED TO ASSURE  
LEGIBILITY  
SEE FRAME(S)  
IMMEDIATELY FOLLOWING



John E. Min, Director  
October 21, 1999  
Page 2

land use map. Moreover, we note that the proposed action would be in conformance with the provisions of County Agricultural District zoning. There is no "decrease" in agriculture in the area resulting from the proposed action.

With the closure of Pioneer Mill Company, Inc. and discontinuation of large lot sugar cultivation in the area, we believe that the proposed action would foster the continuation of agricultural activity in the area, albeit on smaller lots. The proposed action involves the subdivision and sale of parcels to individual owners with the intent to encourage diversified agriculture in the area. Decisions on alternative crops or farming operations will be made by the individual owners. Impacts from the potential for more dwelling units in Olowalu will be addressed in the Draft EA.

4. The proposed action relates to a subdivision of lands in Olowalu. Other actions in Ukumehame, Launiupoko, and Kauaula are considered separate projects, are physically distinct and are proceeding independently of the proposed action. Thus, the Draft EA will be limited to an analysis of the proposed action.
5. With regard to the size and configuration of the proposed parcels, we would like to note that the intent is to comply with all applicable requirements of the County Agricultural District, including provisions on size and configuration of parcels.
6. We acknowledge that the project site makai of Honoapiilani Highway is within the County SMA. A discussion of SMA objectives, policies and guidelines will be included in the Draft EA.
7. Archaeological inventory surveys for the mauka and makai portions of the project area will be included in the Draft EA. The surveys include a description and assessment of pre-contact and post-contact archaeological, cultural and historic resources.
8. With regard to issues of traditional access, it is noted that the proposed action includes the establishment of a cultural reserve which encompasses Olowalu Stream as it traverses through the subject property. At the mauka portions of the project area, the cultural reserve also includes the Olowalu Stream Valley. The government beach reserve extends along most of the shoreline area and would continue to provide public access. A public access from the State of Hawaii access driveway (TMK 4-8-3: 83) to the Olowalu Wharf area will also be provided.

John E. Min, Director  
October 21, 1999  
Page 3

9. A new potable source of water is being provided by a well at the upper reaches of the property. A potable water distribution system is being implemented to service the agricultural lots. The intent is to retain, as well as modify the use of the plantation irrigation system, as appropriate.

Wastewater needs are intended to be addressed by individual treatment systems or septic tanks and leach field type of individual wastewater systems. Department of Health regulations will apply to the construction of these systems.

A traffic impact analysis report will be included in the Draft EA.

With regard to issues of shoreline erosion, it is noted that an 80 feet setback is proposed on the resulting parcels mauka of Honoapiilani Highway. The old Pioneer Mill frontage road parallels Honoapiilani Highway on its mauka side. This could provide a possible alternative route for relocation. However, we believe that any contemplated relocation of the highway in a mauka direction should be based on a comprehensive plan for its relocation.

10. Wider roads are being proposed within the subject project to allow for additional landscaping and bike routes. The proposed action does not involve urbanization of the property.
11. Early consultation input is being solicited from a number of governmental agencies, as well as community groups in accordance with applicable provisions of Chapter 11-200, Hawaii Administrative Rules.

If you have any questions, please feel free to call me.

Very truly yours,

  
Milton Arakawa, A.I.C.P.  
Project Manager

MA:to  
olowalu/makaisub/planning.tr

SEP 29 1999



**DEPARTMENT OF BUSINESS,  
ECONOMIC DEVELOPMENT & TOURISM**

**BENJAMIN J. CAYETANO**  
GOVERNOR  
**SEIJI F. NAYA, Ph.D.**  
DIRECTOR  
**BRADLEY J. MOSSMAN**  
DEPUTY DIRECTOR  
**DAVID W. BLANE**  
DIRECTOR, OFFICE OF PLANNING

**OFFICE OF PLANNING**

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

Telephone: (808) 587-2848  
Fax: (808) 587-2824

Ref. No. P-8288

September 24, 1999

Mr. Milton Arakawa, A. I. C. P.  
Project Manager  
Munekiyo, Arakawa & Hiraga, Inc.  
305 High Street, Suite 104  
Wailuku, Hawaii 96793

Dear Mr. Arakawa:

**Subject: Subdivision of Olowalu Lands**

The Office of Planning (OP) has reviewed the proposal by Olowalu Elua Associates, LLC, to consolidate and re-subdivide certain lands in West Maui and offers the following comments.

The lands affected consist of 734.972 acres located on either side of Honoapiilani Highway in Olowalu. The property has historically been used for the cultivation of sugarcane and the last crops were expected to be harvested by the end of August 1999.

The re-subdivision will include the addition of two (2) makai parcels resulting in a total of 43 agricultural parcels ranging in size from 2.18 to 86.7 acres. The proposed subdivision is within the State Agricultural and Conservation Land Use Districts. The property includes approximately 41 acres of Conservation land. Olowalu Stream traverses the property.

The property is bounded on all sides by State owned lands. OP's maps indicate that approximately 8.5 acres of State land is included within the property's northeastern boundaries. The Maui Community Land Use Plan for West Maui indicates Conservation, Agricultural, Open Space and Park uses for the property.

Mr. Milton Arakawa, A.I.C.P.  
Page 2  
September 24, 1999

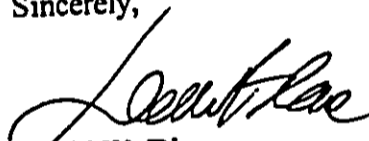
The project summary does not provide any information on the future planned uses for the re-subdivided lots. The applicant should provide more information on agricultural activities and associated structures. Figure 2 is difficult to read and should be enlarged.

On the makai southeastern boundary of the property, a 1.02-acre parcel identified as Camp Pecusa is within the proposed subdivision. Objectives and policies for the West Maui Region include the following reference to Olowalu:

"The development of a public beach park at Olowalu near Camp Pecusa for camping and ocean-related recreational and educational activities. The final boundaries of this park shall be determined in consultation with the landowner. However, if agriculture in the area is decreased by 50 percent, 20 acres of park land shall be considered for addition to the 10 acres of park land currently designated in the Land Use Map."

We have no further comments at this time. Thank you for the opportunity to comment on the subject proposal. If you have any questions, contact Judith Henry at 587-2803.

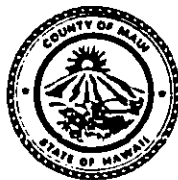
Sincerely,



David W. Blane  
Director  
Office of Planning

cc: Ms. Esther Ueda, LUC

JAMES "KIMO" APANA  
MAYOR



SEP 30 1999

CLAYTON T. ISHIKAWA  
CHIEF

FRANK E. FERNANDEZ, JR.  
DEPUTY CHIEF

**COUNTY OF MAUI**  
DEPARTMENT OF FIRE CONTROL

200 DAIRY ROAD  
KAHULUI, MAUI, HAWAII 96732  
(808) 243-7561  
FAX (808) 243-7919

September 28, 1999

Mr. Milton Arakawa, A I.C.P.  
Munekiyo, Arakawa & Hiraga, Inc.  
305 High Street, Suite 104  
Wailuku, HI 96793

RE: Subdivision of Olowalu Lands

Dear Mr. Munekiyo,

Thank you for the opportunity to comment on the subdivision of Olowalu Lands.

A fire hydrant system shall be installed in accordance with NFPA 24, Installation of Private Fire Service Mains and Their Appurtenances, 1995 Edition. Fire flow shall be provided with hydrants to provide 100 gallons of water per minute for a 1 hour duration, with hydrants spaced not more than 500 feet apart.

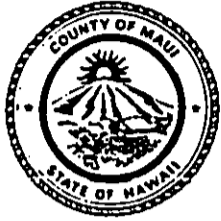
If you have any questions, direct them in writing to the Fire Prevention Bureau, 21 Kinipopo Street, Wailuku, HI 96793.

Sincerely,

A handwritten signature in black ink, appearing to read "Leonard F. Niemczyk".

LEONARD F NIEMCZYK  
Captain, Fire Prevention Bureau

001 0 4 1999



DEPARTMENT OF  
PARKS AND RECREATION  
COUNTY OF MAUI

1580-C Kaahumanu Avenue, Wailuku, Hawaii 96793

JAMES "KIMO" APANA  
Mayor

FLOYD S. MIYAZONO  
Director

ELIZABETH D. MENOR  
Deputy Director

(808) 243-7230  
FAX (808) 243-7934

September 30, 1999

Mr. Milton Arakawa, A.I.C.P.  
Project Manager  
Munekiyo, Arakawa & Hiraga, Inc.  
305 High Street, Suite 104  
Wailuku, Hawaii 96793

Dear Mr. Arakawa:

SUBJECT: SUBDIVISION OF OLOWALU LANDS

We have no comments provided that the developer comply with the park dedication requirements of the subdivision ordinance.

Thank you for the opportunity to comment on this matter. Should you have any questions, please call Patrick Matsui, Chief of Planning and Development, at 270-7387.

Sincerely,

FLOYD S. MIYAZONO  
Director, Department of Parks & Recreation

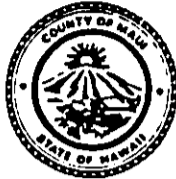
c: Patrick Matsui, Chief of Planning and Development  
p:\ltr\85

JAMES "KIMO" APANA  
Mayor

CHARLES JENCKS  
Director

DAVID C. GOODE  
Deputy Director

Telephone: (808) 270-7845  
Fax: (808) 270-7955



COUNTY OF MAUI  
**DEPARTMENT OF PUBLIC WORKS  
AND WASTE MANAGEMENT**  
200 SOUTH HIGH STREET  
WAILUKU, MAUI, HAWAII 96793

001 0 / 1999  
RALPH NAGAMINE, L.S., P.E.  
Land Use and Codes Administration

RON R. RISKA, P.E.  
Wastewater Reclamation Division

LLOYD P.C.W. LEE, P.E.  
Engineering Division

BRIAN HASHIRO, P.E.  
Highways Division

ANDREW M. HIROSE  
Solid Waste Division

October 1, 1999

Mr. Milton Arakawa  
Munekiyo, Arakawa & Hiraga  
305 High Street, Suite 104  
Wailuku, Hawaii 96793

Dear Mr. Arakawa:

SUBJECT: EARLY CONSULTATION  
SUBDIVISION OF OLOWALU LANDS  
MAUKA LANDS: TMK:(2) 4-8-003:010, 050-082  
TMK:(2) 4-8-004:011-016  
MAKAI LANDS: TMK:(2) 4-8-003:050, 041-049, & 084

We reviewed the subject application and have the following comments.

1. Olowalu Stream should be kept under private ownership and maintenance.
2. The following subdivisions are in progress:

Olowalu Makai-Komohana Subdivision - LUCA File No. 4.758

TMK: (2) 4-8-003:041, 042, 043, & Por. of 005  
Processing under Ordinance 2372  
Preliminary approval granted on March 12, 1999  
Consolidation of 4 lots and resubdivision into 4 lots;  
Lots 1, 2, 3, and 4.

Olowalu Makai-Komohana Subdivision - LUCA File No. 4.760

TMK: (2) 4-8-003:Por. of 005  
Preliminary approval granted on March 26, 1999  
Subdivision of Lot 4 (LUCA File No. 4.758) into 6 lots; Lots 4-A to 4-F

Mr. Milton Arakawa  
October 1, 1999  
Page 2

Olowalu Mauka Subdivision - LUCA File No. 4.766

TMK: (2) 4-8-003:010, 050-070, & 073-082  
TMK: (2) 4-8-004:011-016  
Processing under Ordinance 2372  
Preliminary approval granted on August 23, 1999  
Consolidation of 38 lots and resubdivision into 34 lots and 5 roadway  
lots

If you have any questions, please call David Goode at 270-7845.

Sincerely,



DAVID GOODE  
Deputy Director of Public Works  
and Waste Management

DG:msc/mt

S:\LUCA\CZM\olowalu.wpd



# ***Chapter X***

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***Draft EA Review Comments  
Received and Applicable  
Responses***



STATE OF HAWAII  
OFFICE OF HAWAIIAN AFFAIRS  
711 KAPOLANI BOULEVARD, SUITE 530  
HONOLULU, HAWAII 96813

December 14, 1999

Mr. Dean Y. Uchida, Administrator  
Land Division  
Department of Land and Natural Resources  
P.O. Box 621  
Honolulu, Hawaii 96809

Subject: Conservation District Use Application (CDUA) and  
Draft Environmental Assessment (DEA) for the  
Consolidation and Re-subdivision of  
Parcels and Proposed Waterline, Olowalu Elua Estates Subdivision  
Olowalu, Maui TMK: 4-8-3-5, 41-49, 84

(PA #341)

Dear Mr. Uchida,

Thank you for the opportunity to comment on the above referenced CDUA and DEA. Olowalu Elua Associates, LLC proposes the consolidation and resubdivision of lands resulting in a total of 43 agricultural parcels. In addition, three different stages of waterline improvements are being proposed for the project. The Office of Hawaiian Affairs (OHA) offers the following comments below.

The Olowalu Stream runs through the proposed project area. In general, streams were utilized in many ways by the Hawaiian community. Drinking water, irrigation and gathering were some of the most common uses. Very often, villages could be found along the sides of streams. Thus, the potential to find remains of Hawaiian culture along the sides of streambeds is quite likely. Many traditional gathering practices continue in streams depending on the resources available. Native aquatic species such as the 'Opu nakea and 'Opu alam'o have been observed in Olowalu Stream.

According to Section 174C-101, Hawaii Revised Statutes (HRS), persons of Hawaiian ancestry have preferential rights to water pursuant to the Hawaiian Homes Commission Act, 1920, as amended and pursuant to traditional and customary rights.

Mr. Dean Y. Uchida, Administrator  
Land Division  
Department of Land and Natural Resources  
December 14, 1999  
Page Two

The traditional rights include gathering rights to 'opae, hihwai and 'o'opu, which require streams with sufficient water to allow them to thrive, and the appurtenant water rights guarantee water sufficient to produce taro and provide for other traditional kuleana uses. Every effort should be made to ensure that the proposed project will have no adverse impacts to these rights.

In addition, a total of 30 archaeological sites have been identified in the project site, of which 24 were previously unrecorded. According to the archaeological survey, 18 of the 30 sites are precontact, 8 sites contain burials, 22 features are temporary habitation shelters, 8 sites are interpreted as agricultural and/or habitation features, and three sites have unidentified functions.

OHA is opposed to any potential damage to (prehistoric) archaeological sites that the construction of the proposed subdivision may cause. According to OHA's Master Plan, OHA is mandated, "To assist and encourage the conservation and culturally responsive management of historic and culturally significant Hawaiian sites and natural resources to prevent further destruction." Monitoring by the SHPD should accompany any earth moving activities that are undertaken on the project site.

Moreover, we suggest that you require the preparation of a cultural impact statement for the proposed project area. We further suggest that the cultural expert chosen to work on the statement be someone recognized within the Hawaiian community for his/her cultural expertise. The concerns of the community will not be addressed if the cultural impact statement contains information and analysis provided solely by a person whose knowledge of Hawaiian culture is limited to a study of archaeology or anthropology.

According to the botanical survey within the DEA, 16 of the 115 plant species surveyed on the project site are native, 13 are indigenous and 3 are endemic. OHA urges that appropriate mitigative efforts be taken to preserve Hawaii's native plant species.

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DIVISION OF  
LAND MANAGEMENT  
DEC 20 05 55 AM '99









*ha'aha'i Iao Iao o Olowalu* "(The hair-leaf tearing wind of Olowalu. A gusty wind).

#### GENERAL POST-CONTACT HISTORY OF OLOWALU:

Of the nine districts in the moku of Maui, Lahaina was probably considered the most prominent politically, economically and socially. Kabekihii, one of the greatest kings of Maui, maintained his home and royal court in Lahaina until his death in 1794. Both Kamehameha the Great and Kamehameha III (Prince Kaunitzouli) also established homes and their seat of government in Lahaina.

At the time of Captain Cook's arrival in 1778, the wars between chiefs were still ongoing, until Kamehameha the Great united all the islands around 1795 with the help of foreign weapons and knowledge. This beginning of western contact brought about many changes to the native culture. From the missionaries who arrived in 1820 to spread their religious dogma, to the whalers and traders who brought their business but left their diseases, to the sugar capitalist who initiated the western land tenure system, all these had a profound effect on the lifestyle and lives of the native people.

One of the sad historical facts of Olowalu includes the 1790 "Olowalu Massacre" of more than 100 people by Captain Simon Metcalf from the boat Eleanora. The theft of a small boat by Kaopuiki of Olowalu and the death of a watchman sleeping in the boat when the Eleanora was anchored off Homus'ula (present day Kihel), so infuriated Captain Metcalf that he lured the natives out to the ship to trade and then fired upon them at point blank range. Historians Abraham Formander and Samuel Kamakau both recount "and the dead were heaped on the sands of Olowalu."

History is full of twists however, as one of the sailors from the Eleanora, John Young and one of the sailors, Isaac Davis from a sister ship, the Fair American, proved valuable in the service of Kamehameha in his battles to unite the islands. It is said that one of the cannons from the Fair American was used in the Battle of Kepanui, where Kamehameha defeated the warriors of Kabekihii in 1790. Attacking from Iao Valley, Kabekihii's warriors were slaughtered and those that escaped did so by climbing down into Olowalu Valley. It is noted that although the Iao/Olowalu Pass trail fell into disuse as people moved out of Olowalu, records show that the federal government financed the clearing of the trail in 1933, after about 16 years of non-use. Although past residents of the Olowalu and Ukumehame area, such as Sonnie Waiohu, remember traversing that trail constantly in earlier years, it has since been blocked by landslides and disuse.

At the time of the Great Mahele, the significance of Olowalu was obvious as it was kept as part of the king's personal lands. Although much of the King's land was sold off, Olowalu was retained by the Alii, until the Organic Act of 1900, when it became part of the Government Lands. With the need to sustain their expanding budget, the government started leasing and then selling off these government and crown lands.

Maui was no different than the other islands in the desire to start sugar cane production. Officially, it is said that the first commercial operation started in Koloa, Kauai in 1835, but records indicate sugar cane harvesting as early as 1802 on Lanai by a Chinese man. The first record of sugar cane production in Olowalu is from 1864 when King Kamehameha V, along with Ferdinand Hutchison and James Makee, founded the West Maui Sugar Association. The sugar cane was processed at a mill in Lahaina Town. After the king's death in 1872, records note that a Phillip Milton started leasing government land in Olowalu and Ukumehame from about 1875 as well as leasing kuleana in Olowalu and Ukumehame. He and Goodale Armstrong formed the Olowalu Plantation in 1876, and along with Franklin Pratt and two other men, incorporated Olowalu Sugar Company in 1881. In 1880, the Olowalu Plantation harvested 700 tons of sugar and employed 150 workers. More and more fields were added with the mauka fields included around 1929, when Olowalu Sugar Company secured a lease from the State of Hawaii for the stream intake and rights to install and operate a ditch on state land.

In 1876, the Reciprocity Treaty with the United States took effect, when sugar could be exported duty-free; the desire for land for sugar cane became insatiable for some. From July 1875, Philip Milton personally started purchasing kuleana in the Olowalu and Ukumehame areas followed by Olowalu Sugar Company's purchase of most of the remaining kuleana from 1882 until about 1930. Olowalu Sugar Company was sold to Pioneer Mill Company in 1931 and several other kuleana were purchased by Pioneer Mill Company or exchanged for other lands, such as lots in the existing Olowalu Village. PMCo cleared title to seven (7) parcels in 1989 and 1990 and one parcel in 1998. Of the 11 kuleana makai of the highway that were included in the purchase by OEA, two (2) were considered "clouded" (RP 6285 LCAw 3772.1 to Alapai and RP 6620 LWAw 3888 to Paniai). In May of 1999, OEA located an "exchange deed" dated August 19, 1942 between the Territory of Hawaii and PMCo where portions of both parcels were exchanged to the Territory for road and park purposes. Upon confirming the validity of the document, Title Guaranty of Hawaii confirmed that OEA did not have an interest in said parcels. Also at time of closing the purchase, three (3) mauka kuleana were noted as "clouded," one of which was already being settled by PMCo with the defendants being represented by the Native Hawaiian Legal Corp. (RP 3344/3881 LCAw 8668 to Kaiwi). Although a settlement was signed





As an example, the access to the top of Pu'u Kilea was originally blocked with a cinder berm, but since the purchase of the property by OEA, a chain gate was installed. A meeting was set up with the families known to have family burials on the Puu (Kary Nahina family, Puha family and the Naho'oihaika family) and burials in the Kawailoa Heiau (Katy Nahina family), and a member of the Burial Council (Leslie Kuloioio), the project archaeologist (Eric Frederickson of Xamanek Researches) and the Project Manager, Bob Horrajo. Only Kary Nahina and her family attended the meeting. The purpose of the meeting was to acknowledge the burials, acknowledge that nothing will happen to the burials, discuss issues of access to the burials on the Puu, and to discuss the Nahina family desire to clear the Kawailoa Heiau of brush. It was agreed that in the interest of security, given the wide open access to the Kawailoa Heiau, it was best to leave it alone for now. However, when work for the removal of brush is planned, the family would be called and asked to participate. It should be noted here that Katy Nahina feels the true name of the heiau is "Kaiwaloa", meaning "long line of chiefs." Her feeling is that several chiefs are buried at that heiau. The Nahina family agreed that it was best to control vehicular access to the top of the Pu'u, so the locked gate at the southern base of the Pu'u was agreeable to them. As the only one present, they were given the combination to the lock and use the roadway to the top of the Pu'u often. The only people expected to have vehicular access to the top of the Pu'u would be the families with burials or if the need arises for any maintenance vehicles.

Access to the burial ground on the makai eastern end of the property is a part of the Archaeological Preservation Plan approved by the Mami/Lanai Island Burial Council meeting on August 26, 1999. There is also a Government Beach Reserve that runs parallel to the shoreline and adjoins this makai burial ground, providing another access to the burial area. It should be mentioned here that various inquiries were made to kupuna regarding the location of the infamous Olowalu Massacre, but recollections ranged from the mouth of the Olowalu Stream in its original location (in the vicinity of these makai burials), directly across from the current village (because of its safe harbor), or directly in front of the current wharf (because of the deep draft). Also, Somie Waiohu and Adefine (Kaahui) Rodrigues, both of whom were raised in Ukauehame but also lived in Olowalu, and Kary Nahina remember their kupuna speaking of "kinipaki", a small and dark skinned people from the Gilbert Islands, buried in the area where the makai burials were located. Adelaide "Kuumu" Sylvia, who was born in Olowalu but left at the age of five does not remember the "kinipaki," but her husband, Frank Sylvia, distinctly remembers kupuna speaking of the "kilipaki" (different spelling) but does not feel they were buried in the area. So, although it would be nice to have more knowledge of these makai burials, this is all the accounting known at present.

Access to the supposedly burials in the newly rediscovered small heiau is either vehicular via a roadway lot or pedestrian via the Greenway System within the project. For the other cultural sites not within the Cultural Reserve, access provisions have been made either via the roadway or greenway system.

Access to the shoreline is mainly controlled by the State of Hawaii. From the original grant in 1906, the government reserved a strip of land 100 ft wide along the shoreline. There are portions of the shoreline that were not owned by the government (kuleana) but OEA intends to link these government beach reserves with easements to provide the public with a complete lateral shoreline access. In the original grant, the government also reserved a 50 ft (or as deemed necessary) right of way for the public to get from the highway to Olowalu Landing. Although the government did not officially own a continuous reserve to get to and including the Olowalu Landing, the public has a right to get there. OEA has created a parking area close to the shoreline and has improved the area of the old sugar mill and landing to improve access.

The majority of the cultural sites however, are located in what is being called a "Cultural Reserve." This reserve encompasses approximately 54 acres, 52 acres of which are located mauka of the highway, and approximately 2 acres makai of the highway. This Cultural Reserve runs along the eastern boundary of Olowalu Stream from the ocean side to the top of subject property, including the whole valley of subject property, Puu Kilea and Kawailoa Heiau. The Cultural Reserve will be leased to a private non-profit corporation, called Olowalu Cultural Reserve (OCR). The group has already been formed and is currently finalizing the Strategic Plan for the reserve. The mission statement of the OCR is as follows: *to perpetuate traditional and customary practices of "kanaka maoli" of these Hawaiian Islands and to regain the spiritual connection of "malama aina" of our ancestors by ensuring these beliefs and customs are passed down to future generations. To accomplish this purpose, the organization will provide educational experience of traditional and customary practices within a traditional "ocean to mountain" ahupua'a land system. The lease provides that the OCR will be consulted as "cultural specialist" for the remaining lessor's land as will have the first "option" to perform and regulate any Hawaiian cultural activity proposed by lessor within any public area. The lease also recognizes the inherent right to water for traditional and customary practices and "native gathering rights". The purpose of the Cultural Reserve is to foster traditional and customary practices such as the cultivation of taro, and the lease recognizes the right to water for such practices. The use of stream water for other current and future agricultural uses on lessors remaining lands and rights of existing kuleana is also recognized. Accordingly, it is*

expected that OCR, the Lessor and other users will develop a fair water distribution system. Old stories speak of the "luna wai" who is in charge of distributing the water to all the various lo'i so it is not unrealistic to expect discussion on this important matter.

Regarding Native gathering rights, the public access rights in general and the rights to archaeological cultural sites will not in any way diminish. The specific location of paths will need to be developed in a way however, that allows access without compromising the integrity of the function of the Cultural Reserve. Given the size of the Cultural Reserve and the importance of this access issue, definition of the specific access parameters is not expected to be a problem. OEA has had initial discussions with Na Ale Hele of DLNR, DLNR-Land Management Division, Sierra Club and various other interested parties and is expected to formalize a working group involving these and any other interested parties once the lease is formalized with OCR.

Regarding specific access to private parcels, the existing private parcels have documented access easements. Should the two "clouded" parcels within the cultural reserve prove to have multiple claimants, provisions will be made to access said parcels. At this time, it is expected that it will be used by the Cultural Reserve in the restoration of lo'i and other traditional practices.

The right for water to the existing three parcels in the valley is not considered an issue. Only one parcel currently has a small patch of lo'i and obtains water from the stream/ditch system. Of the other two parcels, the family of one parcel does intend to restore the lo'i on their property and knows where the tap is from the existing ditch system. Currently, the remaining parcel has a home, and although the occupants use the stream/ditch water system, it is not for lo'i. Incidentally, according to W.M. Walker (Archaeology of Maui, 77), the existing ditch is the location of the original auwai system.

OEA has already made a commitment to the Maui County Cultural Resources Commission to preserve all historic and cultural Hawaiian sites, both within and outside the Cultural Reserve. The State Historic Preservation Division (SHPD) is still completing its review of the archaeological inventory surveys but this condition will be a part of the Mitigation and Preservation Plan to be processed through SHPD. The OCR will be apprised of the rules regarding archaeological sites and is expected to be highly sensitive to this issue.

#### CONCLUSION:

OEA has taken many steps to ensure that cultural sites are respected and preserved and that access to cultural sites is created in a non-threatening manner. The rights of native tenants to "gather" has not been diminished in any way and is actually being improved. The inherent right to stream water and the distribution of this water has been acknowledged by OEA, OCR and the existing private owners in the valley. It is expected that as in the past, the settlement of distribution will be constantly changing depending on the amount of users, the needs of users and the desired survival of streamlife in Olowalu Stream. Because the planning of the Olowalu area is in its infancy stage, to include the physical layout of the Cultural Reserve, it is expected that further refinement to all these issues will be necessary.

Lastly, as part of the education experience of the Cultural Reserve, the cultural history, and especially the "kanaka maoli" history of Olowalu is expected to be completed by OCR. Given the fact that some families have left their ancestral homes over a hundred years ago, a respectful and thorough accounting of Olowalu's past will take some time. The sharing of information will come freely from some families and very reluctantly from others. The hope is that the acceptance of the Cultural Reserve by "kanaka maoli" from Olowalu and from other areas will be the window of opportunity to ask for their participation to share their "mana o" on Olowalu.





Thank you for providing comments on our SMA application. If there are questions or additional information is needed, please do not hesitate to call.

Very truly yours,

*Robert L. Horcajo*

Robert L. Horcajo  
Project Manager

Cc: John Min, Director, Maui County Planning Department  
Office of Hawaiian Affairs, Maui Office  
Mike Munekyo, Munekyo, Arakawa & Hiraga, Inc.

RECEIVED  
DEPARTMENT OF LAND AND NATURAL RESOURCES



STATE OF HAWAII  
DEPARTMENT OF LAND AND NATURAL RESOURCES  
COMMISSION ON WATER RESOURCE MANAGEMENT

P.O. BOX 221  
HONOLULU, HAWAII 96822

December 15, 1999

TO: Mr. Dean Uchida, Administrator  
Land Division

FROM: Linnel T. Nishikawa, Deputy Director  
Commission on Water Resource Management (CWRM)

SUBJECT: Obvahu Eua Estates CDUA

FILE NO.: CDUA MA-2963

Thank you for the opportunity to review the subject document. Our comments related to water resources are marked below.

In general, the CWRM strongly promotes the efficient use of our water resources through conservation measures and use of alternative non-potable water resources whenever available. Feasible and there are no harmful effects to the ecosystem. Also, the CWRM encourages the protection of water recharge areas which are important for the maintenance of streams and the replenishment of aquifers.

- We recommend coordination with the county government to incorporate this project into the county's Water Use and Development Plan.
- We recommend coordination with the Land Division of the State Department of Land and Natural Resources to incorporate this project into the State Water Projects Plan.
- We are concerned about 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 compliance of any resulting requirements related to water quality.
- A Well Construction Permit and/or a Pump Installation Permit from the Commission would be required before ground water is developed as a source of supply for the project.
- The proposed water supply source for the project is located in a designated water management area, and a Water Use Permit from the Commission would be required prior to use of the source.
- Groundwater withdrawals from this project may affect streamflows which may require an increase flow standard amendment.
- We recommend that no development take place affecting highly erodible slopes which drain into streams within or adjacent to the project.
- If the proposed project includes construction of a stream diversion, the project may require a stream diversion works permit and amend the minimum flow standard for the affected stream(s).
- If the proposed project alters the bed and banks of a stream channel, the project may require a stream channel alteration permit.

OTHER:

A new well (Obvahu Eua Well No. 4976-41) has been constructed for this project, fully completed and approved by the Department of Health as public water supply source. The geology appears to mitigate potential contamination and to assure high quality water due to a 20-foot layer of dense and relatively impermeable lava (diabrock).

If there are any questions, please contact the Commission staff at 587-0251.

RECEIVED  
DEPARTMENT OF LAND AND NATURAL RESOURCES  
COMMISSION ON WATER RESOURCE MANAGEMENT

DEC 15 2 41 PM '99

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31




To further conserve water resources, the applicant should refer to the attached documents and consider these measures:

- Eliminate Single-Pass Cooling:** Single-pass, water-cooled systems should be eliminated per Maui County Code Subsection 14.21.20. These units pass water once-through for cooling, and then dispose of the water into the drain. Although prohibited by code, single-pass water cooling is still manufactured into some models of air conditioners, freezers, and commercial refrigerators.
- Utilize Low-Flow Fixtures and Devices:** Maui County Code Subsection 16.20.675 requires the use of low flow water fixtures and devices in faucets, showerheads, urinals, water closets and hose bibs. Water conserving washing machines, ice-makers and other units are also available, and can help cut back on water bills.
- Maintain Fixtures to Prevent Leaks:** A simple, regular program of repair and maintenance can prevent the loss of hundreds or even thousands of gallons a day. Refer to the attached handout, "The Costly Drip". The applicant should establish a regular maintenance program.
- Prevent Over-Watering By Automated Systems:** Provide rain-sensors on all automated irrigation controllers. Check and reset controllers at least once a month to reflect the monthly changes in evapotranspiration rates at the site. As an alternative, provide the more automated, soil-moisture sensors on controllers.

If you have any other questions or need additional information, please call our Water Resources and Planning Division anytime at (808) 270-7199.

Sincerely,

  
David Craddick  
Director  
emb

cc: engineering division  
Munekiyo, Arakawa & Hiraga Inc.

attachments:

- "The Costly Drip"  
Ordinance 2108 - An ordinance amending Chapter 16.20 of the Maui County Code, pertaining to the plumbing code"
- "A Checklist for Water Conservation Ideas for Cooling"
- "A Checklist for Water Conservation Ideas for the Home"

*By Water All Things Find Life*



70 JUN 11 AM 51

DEPT. OF WATER SUPPLY  
COUNTY OF MAUI

DEPARTMENT OF WATER SUPPLY  
COUNTY OF MAUI

P.O. BOX 1109  
WAILUKU, MAUI, HAWAII 96793-6109  
Telephone (808) 270-7816 • Fax (808) 270-7833

1949 - 1999 Celebrating 50 Years of Service

January 7, 2000

Mr. John Min, Director  
County of Maui  
Planning Department  
250 South High Street  
Wailuku, Maui, Hawaii 96793

Re: I.D.: SM1 990021

TMK: 4-8-003:5, 10, 41-70, 73-82, and 84, 4-8-004:11-16

Project Name: Olowalu Lands Subdivision

Dear Mr. Min,

Thank you for the opportunity to comment on this application. We provide the following information.

The Department of Water Supply does not presently service the project area. The 1996 West Maui Community Plan lists policies and objectives for water and utilities. One of these objectives include, "Study the feasibility of integrating all regional water systems into a public water system to be managed and operated by the County". Integration of water systems may provide improved emergency back-up, reliability and system hydraulics. System integration feasibility can best be explored through a comprehensive review of water use patterns, climatological anomalies and infrastructure system characteristics in the West Maui Community Plan region. Accordingly, the Department of Water Supply seeks the cooperation of major land owners and private water service providers, to facilitate the definition of an appropriate and acceptable feasibility study framework for system integration.

The proposed 41 lots would allow for 82 dwellings with a potential residential water use of 50,000 gallons per day based on State per unit standards. Based on state per acre standards, potential agricultural water demand for the project site excluding greenways and cultural reserve could be roughly 3,095,000 gpd. The applicant is developing a well and 150,000 gallons storage to meet demand for proposed agricultural use and fire protection. The applicant states that the proposed action involves continuation of the existing plantation irrigation system. Discussions with the applicants suggest that the potential surface system capacity is 10 MGD, with an average flow of 2.5 - 3.5 MGD. Water demand will depend on the future mix of residential and agricultural land use.

111







Department of Land and Natural Resources  
Division of Conservation Enforcement 12-16-99 MA-00-290

Department of Land and Natural Resources  
Division of Conservation Enforcement 12-16-99 MA-00-290

JAN 23 2000

Olowalu Elua Associates, LLC  
173 Hokena Street - Suite 201  
Kahala, HI - 96732

Phone 808-877-2434  
Fax 808-877-9409

GENERAL COMMENTS

Case: File number 2963 MA-000000  
Initiator: Olowalu Elua Associates  
Location: TMK (2) 4-4-3-05,41-49,84 Olowalu, Maui, HI  
Assignment: On 12-15-99, underdog was assigned to a field inspection of above site. Site was revisited on 12-16-99.

January 21, 2000

Patricia Edwards, Acting Investigator  
Division of Conservation and Resources Enforcement  
1151 Punchbowl Street, Room #311  
Honolulu, Hawaii 96813

RE: CDUA (MA-2963), Consolidation and Resubdivision of Parcels and Proposed Waterline at Olowalu, Maui, Hawaii by Olowalu Elua Associates (TMK 4-4-3-5, 41-49, 84)

Dear Ms. Edwards:

We have received a copy of your December 22, 1999 memorandum to Dean Uchida of the Land Division pertaining to the subject project. Also attached to your memorandum are general comments from Officer Stanley Okamoto. We would like to provide the following responses.

We acknowledge that dogs and cats, as well as human disturbance, may cause a problem for endangered species. We intend to work with the Department in controlling or restricting the dog and cat population as well as appropriate measures to minimize human disturbance should this become problematic.

We also acknowledge the possibility of increased illegal hunting, possibility of deer problems and an increase of endangered species such as Nene utilizing the area. Disclosures to prospective purchasers on the possible issuance of damage control permits will be made. Purchasers will also be made aware that there is a proposal to establish abouting state land as a Game Management Area for public game bird hunting. Our intent is to continue to coordinate with the Department on appropriate mitigative measures relating to these issues.

We hope that the foregoing responses adequately address your comments. If additional information or clarification is required, please inform us in writing by February 7, 2000. A copy of your letter should also be sent to Ed Henry of the Land Division. Thank you for your consideration.

Very truly yours,

OLOWALU ELUA ASSOCIATES, LLC

*Robert L. Hortajo*  
Robert L. Hortajo  
Project Manager

RLH/jc

cc: Mr. Ed Henry, Land Division  
Mr. Mike Munekiyo, Munekiyo, Arakawa & Hiraga, Inc.

General Comments:

My concern is that the applicant list "greenery" to be maintained by the homeowner association. (page 7)  
Question: The CDUA, request does not fully explain what is the "green way." There is a drawing in the applicant's CDUA request of what it would look like. This is where my main concern exists.

(1) Page #26: Two large reservoirs provide feeding and nesting habitat for the endangered Hawaiian Coot. In section VIII, page 100, it states, Hawaiian coot utilize two existing reservoirs.

(4) As the company subdivides the property into agricultural lots, people move in, homes are built and usually animals (pigs) accompany homeowner. What if anything will be done to protect existing habitat and endangered species from introduced predatory type animals (dogs and cats).

(7) Improvement of Habitat

(4) As you improve the area, especially the greenery, are you prepared for the possibility of increased illegal hunting, possibility of deer problems and more endangered species (animals) to move into the area.

(1) Page 103, 89 Section VIII, There are no other known significant habitat or rare, endangered or threatened species or flora and fauna at the project site.

(4) Request that this be confirmed with Wildlife Division. Presently there are eight to ten Nene Geese that fly from the Uluohane Fring range to the Kanaoia Sewage Treatment plant.

As you improve the habitat, especially in the "greenway" does Nene Geese may make it their home. What action if any are to be taken if these Nene Geese decide to stay in the greenway?

Submitted as requested.

*Stanley Okamoto*  
Stanley Okamoto



## Division of Forestry & Wildlife

1151 Punchbowl Street, 3rd Fl. • Honolulu, HI 96813 • (808) 587-0166 • Fax: (808) 587-0160

December 28, 1999

### MEMORANDUM

TO: Ed Henry, Planner  
Division of Land Management

THRU: Dean Uchida, Administrator  
Division of Land Management

FROM: Michael G. Buck, Administrator  
Division of Forestry and Wildlife

SUBJECT: Request for Comments of CDUA, MA-2963 Consolidation and Resubdivision of Forests and Proposed Waterline at Olowalu, Maui, Hawaii by Olowalu Elua Associates, TMK: 4-4-3-5, 41-49, 84.

We have reviewed this request and provide the following comments.

1. Access to the West Maui Forest Reserve and the Lihau Natural Area Reserve east of the subdivision requires consultation and coordination with the DLNR-DOFAW Maui District Office. Plans for access to the maui State lands are to be developed primarily for management purposes.
2. Agricultural lot development may attract and encourage increasingly large numbers of game birds and game mammals that could represent crop damage and other nuisances. This may require issuing damage control permits which would involve the use of firearms.
3. The proposed Greenway area may establish a temporary of permanent home for Nene that have developed a flyway from Lahaina to Ukumehame. Problems may include nesting in these areas and the development of an unprotected population of Nene within the subdivision.
4. Proposed ponds and existing reservoirs may enhance waterbird populations in the area which may include endangered and native species. Past annual waterbird surveys have indicated that the Hawaiian Coots and Black Crowned Night Herons use the Olowalu reservoir.

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DIVISION OF FORESTRY & WILDLIFE  
DEC 29 1999

Ed Henry  
Page 2.

5. If endangered species frequent the subdivision, domesticated dogs and cats, together with human disturbance may present major concerns.
6. Assurances must be made that public access to State lands mauka and makai of the project will not be impeded by the project development.
7. The State land abutting the mauka portion of the project have been proposed as a Game Management Area for public game bird hunting. If the intent of the subdivision development is "residential/agricultural" disclosure must be made about the use of firearms in the neighboring Olowalu Game Management Area.
8. Access to the State Beach Reserve lands makai of the project should also be preserved in consultation with DOFAW, and in keeping with the requirements of Maui County Subdivision Ordinance Title 18, Chapter 18.16.200 "Pedestrian ways" and 18.16.210 "Shoreline and other access rights-of-way."
9. Care should be given to determining the existence of any government roads and trails subject to the Highways Act of 1892. Often these lands, unless surrendered or otherwise formally disposed of by the Territory or by the State, are left out of title searches although they remain owned in fee-simple by the State.

Thank you for the opportunity to comment.

C: DOFAW, Maui Branch Office

JAN 25 2000

**Olowalu Elua Associates, LLC**

173 Hohensta Street • Suite 201  
Kauai, HI • 96732

Phone 808-877-2434  
Fax 808-877-9409

January 21, 2000

Michael G. Buck, Administrator  
Division of Forestry and Wildlife  
Department of Land and Natural Resources  
1151 Punchbowl Street, Room 325  
Honolulu, Hawaii 96813

RE: CDUA, MA-2963 Consolidation and Resubdivision of Parcels and  
Proposed Waterline at Olowalu, Maui, Hawaii by Olowalu Elua Associates  
(TMK 4-8-3-5, 41-49, 84)

Dear Mr. Buck:

We have received a copy of your December 28, 1999 memorandum to Ed Henry of the Division of Land Management pertaining to the subject project. We have met with Bob Hobby of the Maui branch office on the issues discussed in the memorandum, and we would like to provide the following responses (which are numbered to correspond with each of the nine comments set forth in the December 28th memorandum):

1. We intend to work cooperatively with the Department on issues of access to mauka state lands. We would like to note, however, the establishment of a cultural reserve on the portion of the subject property abutting Olowalu Stream. The cultural reserve extends from the Olowalu Stream Valley at the mauka reaches of the property to the shoreline. A nonprofit organization has been formed to regulate the activities and uses within the cultural reserve. Thus, we would like to preserve and enhance the integrity of the cultural reserve as well as upstream areas by discussing specific terms, conditions and controls on access.
2. We acknowledge that agricultural lot development may attract and encourage increasingly large numbers of game birds and game mammals that could cause crop damage and other nuisances. Disclosures to prospective purchasers on the possible issuance of damage control permits will be made.
- 3 & 4. We acknowledge that the gateway may provide a temporary or permanent home for Nene. Should this occur, we would work with the Department in implementing appropriate mitigation measures. Likewise, there are four reservoirs on the property which may provide accommodations for waterbirds including endangered and native species. The intent is to continue to coordinate with the Department to ensure that endangered and native waterbirds are not harmed.
5. It is understood that dogs and cats as well as human disturbance may cause a problem for endangered species. We intend to work with the Department in controlling or restricting the dog and cat population as well as appropriate measures to minimize human disturbance should this become problematic.

Michael G. Buck, Administrator  
January 21, 2000  
Page 2 of 2

6. We note that there are existing public accesses from Honoapiʻani Highway to mauka state lands from both sides of the subject property. Our intent is to work cooperatively with the Department to address mauka and makai access issues.
7. Disclosures will be made to prospective purchasers about the proposal to establish abutting state land as a Game Management Area for public game bird hunting.
8. It is noted that public access will be extended makai from Honoapiʻani Highway along the 50-foot-wide state-owned right-of-way (TMK 4-8-3-83), then through the subject property to the Olowalu Landing. Existing government beach reserve lands provide lateral shoreline access along most of the property frontage. Along those subject properties which extend to the shoreline, the intent is to provide a gateway along the shoreline. This would result in a continuous lateral shoreline access in this vicinity.
9. We have reviewed highway maps from 1881 and 1906. These maps show the old coastal highway generally in the same location as the present Honoapiʻani Highway. Although there are highway remnants located in close proximity to Honoapiʻani Highway, there are no other known government roads and trails.

We hope that the foregoing responses adequately address your comments and concerns. If additional information or clarification is required, please inform us in writing by February 7, 2000. A copy of your letter should also be sent to Ed Henry of the Land Division. Thank you for your consideration.

Very truly yours,

OLOWALU ELUA ASSOCIATES, LLC



Robert L. Horcajo  
Project Manager

RLH:jc

cc: Mr. Bob Hobby, Maui Branch Office  
Mr. Ed Henry, Land Division  
Mr. Mike Munekeyo, Munekeyo, Arakawa & Hiraga, Inc.

JAN 0 6 2000

AMES 'KIMOK' APANA  
Mayor

JOHN E. JEN  
Director

CLAYTON I. YOSHIDA  
Deputy Director



COUNTY OF MAUI  
DEPARTMENT OF PLANNING

January 4, 2000

Mr. Dean Y. Uchida, Administrator  
January 4, 2000  
Page 2

Mr. Dean Y. Uchida, Administrator  
Department of Land and Natural Resources  
Land Division  
P. O. Box 621  
Honolulu, Hawaii 96809

Dear Mr. Uchida:

Re: Conservation District Use Application for the Consolidation and  
Resubdivision of Parcels and Proposed Waterline at Olowalu,  
Island of Maui, Hawaii (File No. CDUA MA-2963)

The Maui Planning Department (Department) has reviewed the above-referenced  
subject application and has the following comments:

1. The portions of the project essentially makai of Honoapiilani Highway, including the makai conservation lands, are located within the Special Management Area (SMA) of the Island of Maui and is, therefore, subject to the permit requirements of the SMA Rules of the Maui Planning Commission (MPC). The applicant, Olowalu Elua Associates, LLC, on November 9, 1999, filed an application for an SMA Permit for the proposed subdivision which is currently under review. The decision on the SMA application will be acted upon by the MPC at a later date, after a public hearing has been conducted.

The Department notes that the Certified Shoreline Survey Map (March 25, 1999) included in the SMA application, is incomplete and covers only a portion of the makai lands (wharf area) affected by the subdivision. Certified Shoreline Survey Maps of the entire makai shoreline affecting the subdivision, will be required. Portions of the mauka lands in the areas where Honoapiilani Highway is close to the shoreline, is also located within the SMA boundaries and are subject to the SMA application requirements.

2. The applicant does not provide, in their application, a copy of the enclosed letter dated November 1, 1999, sent in response to their October 21, 1999 letter regarding the preconsultation on the Draft Environmental Assessment (DEA). The Department finds that the letter of October 21, 1999, does not adequately address the issues and concerns raised in its September 23, 1999 letter. These issues and concerns should be addressed prior to finalization of the Final EA. The Department does not believe the concerns and issues cited in its letters have been addressed in the DEA, such as, potential cumulative impacts in relation to the parcelization of Pioneer Mill Company's agricultural lands, agricultural and recreational resources.

3. Relative to the new waterline improvements, additional clarification should be provided. The plans indicate that the two new storage tanks will have a total added capacity of 150,000 gallons of potable water (100,000 and 50,000 gallon storage tanks). The current fifty-five (55) users of the existing potable water system would be served through the existing storage capacity. Clarification should be provided as to the number of new users that will be served by the improved water system and the methodology (i.e., calculations) used to determine the users and the need for 150,000 gallons of new storage capacity (160,000 gpd identified as the need), assuming that nonpotable sources would be used for agricultural cultivation. Further, although the report identifies the lineal feet of new waterlines, it does not indicate the pipe sizes of the new lines (6 inch, 8 inch, 12 inch, 18 inch, etc.). If the system is being constructed over the capacity necessary for the agricultural subdivisions and for future urban development of the lots, then potential impacts of such uses should be included in the application.

Although the application describes the potable system, it does not identify the agricultural water requirements for the agricultural subdivisions that are to be created. The assumption is that the existing sources and irrigation system of Pioneer Mill Company will be utilized for the agricultural lots created. Confirming information should be included in the report or a description of the source of

irrigation water, its system and whether the change from cultivated sugar cane fields to other agricultural cultivation/uses will increase or decrease the water demand of the properties. Potable water from well sources should not be used for irrigation purposes when other alternatives are available, such as, surface sources.

4. Relative to the project description of the proposed subdivisions, the Department confirms that a total of forty-one (41) agricultural lots would be allowed in the County Agricultural District. On the makai portion, a total of nine two-acre lots would be allowed. On the mauka portion, a total of thirty-four (34) lots would be allowed as follows: 1) fourteen two-acre lots, 2) eleven 15-acre lots, 3) six 25-acre lots, and 4) three 40-acre lots.

5. Relative to the Archaeological Inventory Survey for the mauka and makai lands, the Maui County Cultural Resources Commission (MCCRC) is currently reviewing the reports. A site inspection has been scheduled with the MCCRC on January 5, 2000, with action on its recommendation to follow at their regular meeting on January 6, 2000. Upon completion of the MCCRC's review, a copy of its action will be sent for your information and record.

6. The applicant is also advised to obtain recommendation and comments from the Maui County Arborist Committee for the proposed landscaping for the subdivision streets and greenways/bikeway areas. Of particular concern is the change in landscape for the area from kiawe and irrigated sugar cane fields to a dry land forest which is contrary to the agricultural intent of the lands and cultivated fields. Although it is commendable that the applicant proposes to use native plants in its landscaping, there is concern whether the choice of landscape materials is appropriate for Olowalu and the intended agricultural use of the lots. The applicant should provide additional information as to whether such native plants were in the area before the introduction of sugar cane cultivation and whether the plants selected are compatible with future cultivated fields.

7. In addition to the landscape concept proposed, the Department voiced concerns that the standards under consideration for the agricultural subdivisions are urban-type standards. These urban standards for wide-paved landscaped parkways is a change from the unimproved agricultural roadways surrounded by cultivated fields that make up the current landscape of the Olowalu area. The subdivision plans and its roadway systems, easements and large lots have the potential for future urban development of the area. These concerns should be addressed in the application.

Thank you for the opportunity to comment. If additional clarification is required, please contact Ms. Colleen Suyama, Staff Planner, of this office at 270-7735.

Very truly yours,



JOHN E. MIN  
Planning Director

JEM:CMS:osy  
Enclosure

cc: Clayton Yoshida, A.I.C.P., Deputy Planning Director  
Aaron Shimamoto, P.E., Planning Program Administrator (2)  
Colleen Suyama, Staff Planner  
~~Milton Arakawa, Muneakiyo, Arakawa & Hiraga, Inc.~~  
SMA Project File  
General File  
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NOV 03 1999

JAMES 'KUMU' APANA  
Mayor  
JOHN E. MIN  
Director  
CLAYTON I. YOSHIDA  
Deputy Director



COUNTY OF MAUI  
DEPARTMENT OF PLANNING

November 1, 1999

Mr. Milton Arakawa, Project Manager  
November 1, 1999  
Page 2

Mr. Milton Arakawa, Project Manager  
Munekiyo, Arakawa & Hiraga, Inc.  
305 High Street, Suite 104  
Wailuku, Hawaii 96793

Dear Mr. Arakawa:

Re: Preliminary Consultation for Preparation of an Environmental  
Assessment for Subdivision of Lands in Olowalu, Island of  
Maui, Hawaii

The Maui Planning Department (Department) is in receipt of your letter dated October 21, 1999, regarding the above-referenced subject project. The Department finds that your response does not adequately address the issues and concerns raised in its letter of September 23, 1999. The Department hopes that the Draft Environmental Assessment (DEA) will address these matters in more detail. In general, some of the points the Department would like to make are as follows:

1. Although you state that there are forty-nine (49) tax map key parcels, are these parcels developable? A developable parcel is one which has access and is not currently landlocked; has adequate area for the uses permitted; the configuration and topography of the lot lends itself to development; and services may be available to develop. These points are not addressed in your letter and should be addressed in the DEA.
2. Relative to the General Plan and Community Plan, the Department finds that the lands in Olowalu include those lands on the makai side identified as Park in the Community Plan. It also includes lands that are recreational resources for the area. A comprehensive review of recreational resources should be addressed in the DEA, including the park site and ocean and mountain recreation.

3. Along with the proposed subdivision, comes a change in the agricultural uses of the lands in question. From large plantation cultivation for sugar cane, the focus is primarily on diversified agriculture. The Department does not believe that it is unreasonable for the DEA to consider the agricultural viability or suitability of the lands in question for such uses. What are the impacts on water resources of the area from diversified agriculture? How do the soils in the area affect crop suitability, as well as insects in the area that may affect crops, or climate and elevation which also affect crops? All these questions and issues should be addressed in the DEA. It is not sufficient to say that the owners of the new parcels would make these decisions.
4. The subdivision of other lands in the West Maui area should be considered with the Olowalu subdivision in terms of cumulative impact on the West Maui Community in the DEA. Your analysis should not be limited only to the project area, but should make a regional analysis of how this project affects the community as a whole to the extent that information on the other planned subdivisions are available.

Thank you for the opportunity to comment. If additional clarification is required, please contact Ms. Colleen Suyama, Staff Planner, of this office at 270-7735.

Very truly yours,

JOHN E. MIN  
Planning Director

JEM:CMS:osy  
c: Clayton Yoshida, AICP, Deputy Planning Director  
Aaron Shirmoto, PE, Planning Program Administrator (2)  
Colleen Suyama, Staff Planner  
Project File  
General File (S:\CMS\olowalu7)



**Olowalu Elua Associates, LLC**

173 Hc Olowalu Street - Suite 201  
Kaneohe, HI 96732

Phone 808-877-2434  
Fax 808-877-9409

February 7, 2000

John E. Min, Director  
County of Maui  
Department of Planning  
250 South High Street  
Wailuku, Hawaii 96793

RE: Conservation District Use Application (CDUA) for the Consolidation and  
Resubdivision of Parcels and Proposed Waterline at Olowalu, Lahaina, Maui, Hawaii (File  
No. CDUA MA-2963)

Dear Mr. Min,

Thank you for meeting with Peter Martin, Michael Munekiyo, Milton Arakawa and myself  
to discuss issues relating to the subject project. As discussed, we are responding to the  
Department's comments raised in both your November 1, 1999 letter and the January 4,  
2000 letter.

Responses to Comments Raised in November 1, 1999 Letter

1. We note that all existing tax map parcels are developable. They all comply with  
the definition of a "developable lot" under the County Code, Chapter 18.04.123.  
Also, all the parcels have existing roadway access or prescriptive access rights. All  
the parcels have adequate area, configuration and topography to conduct  
agriculture activities. There is a private water system available to each parcel  
should the need arise for potable water. Other infrastructure systems such as  
wastewater and drainage can be addressed on an individual parcel basis in  
accordance with applicable regulations.
2. We note that the park site designated in the West Maui Community Plan is located  
on lands owned by Olowalu Elua Associates, LLC (OEA). We note that the  
proposed action does not include land designated "park" in the West Maui  
Community Plan, however, the proposed action does not preclude the future  
establishment of a park in the area. The almost 60 acre greenway (open space)  
system is considered a recreational resource for hiking and possibly biking.  
Portions of the almost 54 acres cultural reserve is also considered a recreational  
resource for hiking purposes. The roadway system will have provisions for hiking

and biking. A government beach reserve provides lateral shoreline access along  
the majority of the shoreline in this vicinity. Our intent is to provide easements for  
public shoreline access along the remaining parcels so that there would be  
continuous lateral shoreline access. Public access to the Olowalu Landing has  
improved with the new ownership and expected to be further improved and further  
defined. The foregoing recreational resources features will be mentioned in the  
Final Environmental Assessment (EA).

3. With regard to the agricultural suitability of lands within the study area, we have  
consulted with Robbie Vorfeld, former manager of sugar cane operations and  
currently manager of diversified agriculture at Pioneer Mill Company (PMCo).  
PMCo has been experimenting with other diversified crops for years such as  
coffee at Kaanapali and alfalfa on Kauai. Currently, they are growing seed corn  
and sweet corn on some Kaanapali lands. According to Mr. Vorfeld, the major  
disadvantage of the Olowalu lands is its rockiness and the occasional strong winds.  
Pasture and orchards type crops would be crops where these negative conditions  
would have the least impact. Mangoes, bananas, papayas and avocados currently  
exist at Olowalu so they would be considered good orchard crops. Although truck  
type farming would be affected the most because of the rocky conditions, the  
amount of rockiness varies throughout the property, so truck type crops such as  
peppers, eggplant and others should do fine. Lastly, specialty crops such as  
dryland taro, noni, awa and sweet potatoes, crops that existed at Olowalu in the  
past, would be suitable crops.

As to the economic viability of new diversified products, OEA hopes this  
opportunity for smaller entrepreneurs will yield positive results. We have started  
leasing land to these agricultural entrepreneurs who feel blessed to have this  
opportunity. Although existing agricultural studies notes the type of crops that  
would be suited for specific soils, we do feel guidelines on what can or cannot  
grow at Olowalu will be established over time. Experimentation with different  
crops with different soils has proven the experts wrong before. Subsistence  
agricultural and agricultural conservation were also practices of kanana maoli.  
These practices are still valid today and recognized in the new agricultural  
ordinance.

The extent of irrigation demand for individual crops may vary. However, a more  
important factor is the amount of irrigated acreages in diversified agriculture which  
may be less than sugar cane acreage. Thus, in general, the extent of surface water  
utilization is likely to be less than sugar cane. There are no known insect colonies  
which would preclude the foregoing crop possibilities.

4. In terms of regional issues, there are other agricultural subdivisions within the  
West Maui region besides Olowalu, which are currently under review. These  
include subdivisions at Ukumehame, Lanipoko (Mahalanui Nui Subdivision)  
and Kaula. Ukumehame involves the creation of 12 lots from 450 acres,  
ranging in size from approximately 20 acres to 90 acres. According to Jack Kean,  
the project coordinator, the intent of that subdivision was strictly for retention by  
the partners with no immediate home construction related activity. Therefore, the

regional impacts relative to schools, traffic and public services from the Ukumehame land is expected to be minimal. The Mahanua Nui Subdivision at Launipoko consisted of 50 lots from 433 acres. Thirty six of these lots range in size from two to four acres and the remainder fourteen lots range in size from eleven to thirty seven acres. Of the 31 lots initially sold, twenty seven were purchased by residents of West Maui and two from residents currently living in Central Maui. Of the other two lots, no construction activity is anticipated in the immediate future. Aside from the immediate and short term home construction activity, most of the regional impacts relative to schools, traffic and public services are minimal because of the makeup of the purchasers. The Kaunala project consists of twelve lots from 250 acres. Eleven lots are approximately five acres and the remainder lot is approximately 185 acres. According to Jim Riley, the project coordinator, the intent is to market the eleven five acre lots upon receiving subdivision approvals, which is expected to occur within a year. Further analysis associated with these actions will be addressed in the Final EA.

#### Responses to Comments Raised in January 4, 2000 Letter

1. As discussed, we will be updating the certified shoreline map for those shoreline lots which are part of the application. For the portions of our property where the highway is close to the shoreline, we agreed at our aforementioned meeting on January 14th, that for the purpose of determination of the SMA boundary line, we would accept that the boundary line to be designated 300 feet from the makai boundary of Honoapiʻilani Highway right of way. For all other areas of our property, the boundary line is as shown on the SMA boundary line map on file with your department.
2. We note that the Department of Planning's November 1, 1999 letter was received after the CDUA and Draft EA was filed (on October 27, 1999) with the Department of Land and Natural Resources. Accordingly, responses to your November 1, 1999 letter have been provide herein. With regard to parcelization of Pioneer Mill lands, the Final EA will address regional issues associated with these actions.
3. Regarding the water systems, the general intent is to provide potable water from the new well and non-potable water through the existing ditch system. The stream intake and ditch system however, begins on State land and is on a month to month revocable permit through the Department of Land and Natural Resources. Also, the possibility of the ditch system becoming inoperable for any length of time is very real, given its history of landslides and the existence of a very tenuous wooden flume portion.  
  
The initial improvements of the new well, a 50,000 gallon tank and chlorinating system are intended to maintain and improve service to existing water users. Currently, the two older water tanks total 23,000 gallons. The projected additional tank of 100,000 gallons was to provide increase storage capacity to the existing and future users, however, the 100,000 gallon capacity was not necessarily a firm amount. This upgraded system is expected to service the existing users

(approx. 55 users) and future users (14 lots mauka, 5 lots makai) and cultural reserve users (10-50 users). Based on our water rules (same as Maui County Water Standards-600 gpd per household, assuming 4 per household) total daily demand is expected to be 72,000 gpd. The intent of OEA is not to sell the larger agricultural lots, therefore, potable water demand for those lots was not considered. This daily demand number however, only pertains to the pump sizing at the new well. Storage capacity pertains to minimum fire flow standards, guided by the standards of the Insurance Services Guide for Determination of Required Fire Flows. As an example, this requires a minimum of 30,000 gallons (250gpm for 2 hours) for agricultural district, 120,000 gallons (1,000 gpm for 2 hours) for residential district and 240,000 gallons (2,000 gpm for 2 hours) for business district. These are minimum standards. To push these amounts of water, line sizing comes into play. For residential, generally this means a minimum of 8 inches and 12 inches for business. Although most of our lands are within the agricultural district, there are also residential and business districts within the Olowalu area. We do have a legal obligation to provide water to the residents of Olowalu and although it is not specifically defined other than "as historically provided", it behooves us to consider their future needs also. This obligation notwithstanding, it is in the best interest of OEA and Olowalu to improve service for current residents. Without any public water service in the vicinity, we are the water provider and will be expected to act responsibly.

As to non-potable water, the intent is to provide water through the existing ditch system and existing irrigation system of PMCo. This system also includes four reservoirs with capacities ranging from 2-5 million gallons. There are also two other wells on the property that provided irrigation water for PMCo. In its optimum condition, the built capacity of the ditch system is supposedly 10 million gallons per day but with a current average of 2.5 to 3.5 mgd. Based on State per acre standards, the potential agricultural water demand excluding greenways and the cultural reserve could be roughly 3,095 mgd. In general, we expect that the total water demand for agriculture will be less than sugar cane. One reason is the decrease in acreage under irrigated agriculture and the expected reduced demand because of type of crops. For example, orchard type crops and pasture would have less demand on the water resources. A crop such as taro would recycle the water back into the system. The desire to provide a consistent stream flow will affect the quantity of water through the ditch system, but with proper management of the total system (i.e. topping of reservoirs with other wells or during excess stream flow), water demands for all agricultural pursuits should be met.

4. We confirm the subject application pertains to the consolidation and resubdivision of lands resulting in 41 agricultural parcels. There are also two (2) existing parcels makai of Honoapiʻilani Highway (TMK 4-8-03:44, 84). Thus, in the area makai of the highway, there are nine (9) lots. The mauka area would contain 34 lots.

5. We have received a copy of the January 12, 2000 letter pertaining to Cultural Resources Commission (CRC) review of the archaeological inventory survey for the project. Our intent is to work with the CRC in addressing their concerns.

6. We will be preparing landscape plans and irrigation plans for presentation to the Arborist Committee. Plant material selected for project landscaping will meet environmental suitability criteria compatible with the Olowahu region. Our consultant for the native plants landscaping, Anna Palomiso, owns a native plant nursery called Hoolawa Farms. She is well respected in the community familiar with native plants. The general intent is to stop the proliferation of exotic plants such as kiawe and opiuma, which has destroyed almost all of the native plants. We hope that the Arborist Committee concurs with this general landscape theory.

7. It is noted that only the roadway on the east side of the mauka area and the makai roadway are being implemented in the short term. As we discussed, wider rights of ways (but minimum pavement of 20 feet) are proposed to allow for additional landscaping and bike routes. Should the County regulations relative to pavement widths and/or type of pavement be changed to reflect a more agricultural/rural environment, OEA would most certainly comply.

We hope that the following response adequately addresses your concerns. If additional information or clarification is required, please inform us in writing by February 24, 2000. A copy of your letter should also be sent to Ed Henry of the Land Division-DLNR.

Very truly yours,



Robert L. Horcajo  
Project Manager

Cc: Ed Henry, Land Division-DLNR  
Mike Munekiyo-Munekiyo, Arakawa & Hiraga, Inc.



## LIFE OF THE LAND

*He Maun Ke Ea O Ke Aiea I Ke Pono*  
Hawaii's own local Community Action Group  
Protecting our Fragile Natural & Cultural Resources  
through Research, Education, Advocacy & Litigation

January 5, 2000

Michael Munekiyo  
Munekiyo, Arakawa & Hiraga, Inc.  
305 High Street, Suite 104  
Wailuku, Hawaii 96793

Ed Henry  
DLNR  
P. O. Box 621  
Honolulu, Hawaii 96809

re: Olowahu Subdivision of Lands

Aloha,

Reviewing the map of the proposed project, the "greenways" designation for a portion of the project stood out. If these proposed lots will be agricultural lots on agriculturally zoned lands which are used for agriculture, why the need for greenways? On the otherhand, if fancy "gentlemen estates" are being designed, greenways would make sense. However, in that case, the whole project would violate the Hawaii Constitution.

What safeguards will be imposed to prevent the lots from being used by non-farmers as "gentleman estates"? Please elaborate extensively on this topic and how your project does or does not fit the gentleman estate concept.

Mahalo  
*Henry Curtis*  
Henry Curtis  
Executive Director

RECEIVED  
DIVISION OF LANDS  
HONOLULU, HAWAII  
JAN 10 10 37 AM '00









JAMES "KIMO" APANA  
MAYOR



**COUNTY OF MAUI**  
DEPARTMENT OF FIRE CONTROL

200 DAIRY ROAD  
KAHULUI, MAUI, HAWAII 96732  
(808) 243-7561  
FAX (808) 243-7919

TO JUN 13 P2:55

DEPT OF PLANNING  
COUNTY OF MAUI  
RECEIVED

CLAYTON T. IISHIKAWA  
CHIEF  
FRANK E. FERNANDEZ, JR.  
DEPUTY CHIEF

January 12, 2000

Miss Colleen Suyama  
Department of Planning  
County of Maui

RE: Olowalu Lands Subdivision, I.D.# SM1 990021, TMK: (2) 4-8-003:5,10,41-70,73-82, 84, and (2) 4-8-004:11-16

Dear Miss Suyama

Thank you for the opportunity to comment of the proposed Olowalu Land Subdivision, Fire Department Requirements are:

**Fire Apparatus Access Road:**

Fire apparatus access roads shall be required for every building hereafter constructed when any portion of an exterior wall of the first story is located more than 150 feet from fire department vehicle access. (Sec. 10.207.a UFC 1988)

**Water Supply:**

An approved water supply capable of supplying the required fire flow for fire protection shall be provided to all premises upon which buildings or portions of buildings are hereafter constructed. When any portion of the building protected is in excess of 150 feet from a water supply on a public street. (Sec. 10.301.c UFC 1988)

Sincerely,

*Scott English*  
Scott English

Lieutenant, Fire Prevention Bureau

**Olowalu Elua Associates, LLC**  
173 He Olowalu Street - Suite 201  
Kahului, HI - 96732

Phone 808-877-2434  
Fax 808-877-8409

February 1, 2000

Scott English, Lieutenant  
Fire Prevention Bureau  
County of Maui  
Department of Fire Control  
200 Dairy Road  
Kahului, Hawaii 96732

RE: Draft Environmental Assessment for Olowalu Subdivision (SM1 990021)

Dear Mr. English:

We have received a copy of your letter dated January 12, 2000 regarding the subject application and would like to take this opportunity to respond.

With regard to fire apparatus, subdivision access shall be provided in accordance with Section 10.207 of the Uniform Fire Code.

Additionally, water system improvements will be provided to meet fire flow requirements.

Thank you for your comments regarding the proposed action. A copy of your comment letter will be incorporated in the Final Environmental Assessment.

Very truly yours,

*Robert L. Horeajo*

Robert L. Horeajo  
Project Manager

Cc: Ed Henry-Land Division-DLNR  
John Min-Director, Maui County Planning Department  
Milton Arakawa-Munekiyo, Arakawa & Hiraga, Inc.







STATE OF HAWAII  
DEPARTMENT OF HEALTH  
P.O. BOX 2278  
HONOLULU, HAWAII 96801

BRUCE S. ANDERSON, Ph.D., M.D., M.P.H.  
DIRECTOR OF HEALTH

BY FAX, PLEASE REFER TO  
PAGE

January 18, 2000

99-254/epo

Mr. Dean Y. Uchida  
January 18, 2000  
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Should you have any questions, please contact the Planning/Design Section of the Wastewater Branch at 586-4294.

Solid and Hazardous Waste Branch

Hazardous Waste Section

TO: Dean Y. Uchida, Administrator  
Land Division  
Department of Land and Natural Resources

FROM: Gary Gill  
Deputy Director for Environmental Health

1) Various agricultural activities are a main concern and source of hazardous waste. Occupants will need to address proper handling of pesticide, herbicide and fertilizer materials. Should these items ever be regarded as unusable products, the owner must determine whether they are either hazardous or non-hazardous and dispose of accordingly. Spent or expired laboratory chemicals used to conduct experiments on vegetation will also need to be managed properly, if considered hazardous wastes. Hazardous waste guidelines must be followed, depending upon generator status.

SUBJECT: CONSERVATION DISTRICT USE APPLICATION

Applicant: Olowalu Ehu Associates  
File No.: MA-2963  
Request: Consolidation and Resubdivision of Parcels and Proposed Waterline  
Location: Olowalu, Maui  
TMK: 4-8-3; 5, 41-49, 84

2) Another major concern is the possibility that maintenance will be performed on agricultural machinery (tractors, trucks). These activities could involve some type of auto body work such as paint touch-ups, oil and filter changes and parts cleaning. If so, the owners will also need to be aware of the proper handling of waste paint, waste solvents/liquors and used oil and, in addition, maintain acceptable cleaning practices of painting equipment and auto maintenance parts. If any hazardous wastes are generated from these auto maintenance tasks, these should be properly managed according to State hazardous waste rules (Hawaii Administrative Rules, Chapters 11-261 through 11-280).

Thank you for allowing us to review and comment on the subject request. We have the following comments to offer:

Wastewater

3) The new owners should also be aware of potential hazardous waste from the old mill site (Olowalu Mill) and other vacated industrial areas. Remedial cleanup must be conducted before any new development occurs.

As there is no existing sewer service system in the area and none will be constructed in the near future, the Department of Health (DOH) concurs with the use of treatment individual wastewater systems on each property site. Preconstruction plans for these wastewater systems must be submitted to the Maui District Health Office for review and approval. Should County sewers become available in the future to the properties in the subdivision, we will require connection to the sewers.

Should there be any questions on these comments, please call Ms. Beryl Ekimoto of the Hazardous Waste Section at 586-4226.

Underground Storage Tank (UST) Section

In the event that USTs are encountered and permanently closed, we have developed a detailed Technical Guidance Manual for Underground Storage Tank Closure and Release Response (August 1992) to assist responsible parties and their consultants and contractors in complying with the federal UST closure requirements and release response requirements as found in Title 40 Part 280 of the Code of Federal Regulations.

Please contact the UST Section at 586-4226 with any questions regarding these comments.

Safe Drinking Water

1. The Safe Drinking Water Branch has approved the engineering report and construction plans for the Olowalu Well.
2. The application indicates that the proposed development will have a dual water system. The potable and nonpotable water systems must be carefully designed and operated to prevent cross-connections and backflow conditions. The two systems must be clearly labeled and physically separated by air gaps or reduced pressure backflow preventers to avoid contaminating the potable water supply. In addition, all nonpotable spigots and irrigated areas should be clearly labeled with warning signs to prevent the inadvertent consumption of nonpotable water.
3. In 1996, Congress amended the Safe Drinking Water Act and added several new programs. One of these new programs was the Source Water Assessment Program (SWAP). The objective of SWAP is to assess the susceptibility of a drinking water source to activities that have significant potential to release contaminants to the source. It is anticipated that Hawaii's SWAP will begin implementation in February 2000. Any new drinking water source for a public water system must then be required to submit the following information for review.

- a. Definition of the assessment area around the drinking water source.
- b. Inventory of the assessment area to identify potential contaminating activities.
- c. Susceptibility of the drinking water source to become contaminated from the identified potential contaminating activities.

If you should have any questions on these comments, please contact Ms. Queenie Komori of the Safe Drinking Water Branch, Engineering Section, at 586-4258.

Water Pollution

1. The applicant should contact the Army Corps of Engineers to identify whether a federal permit (including a Department of Army permit) is required for this project. If a federal permit is required, then a Section 401 Water Quality Certification is required from the State Department of Health, Clean Water Branch.

2. A National Pollutant Discharge Elimination System (NPDES) general permit is required for the following discharges to waters of the State:

- a. Storm water discharges relating to construction activities, such as clearing, grading, and excavation, for projects equal to or greater than five acres;
- b. Storm water discharges from industrial activities;
- c. Construction dewatering activities;
- d. Noncontact cooling water discharges less than one million gallons per day;
- e. Treated groundwater from underground storage tank remedial activities;
- f. Hydrotesting water;
- g. Treated effluent from petroleum bulk stations and terminals; and
- h. Treated effluent from well drilling activities.

Any person requesting to be covered by a NPDES general permit for any of the above activities should file a Notice of Intent with the Department's Clean Water Branch at least 30 days prior to commencement of any discharge to waters of the State.

3. After construction of the proposed facility is completed, a NPDES individual permit will be required if the operation of the facility involves any wastewater discharge into State waters.

Any questions regarding these comments should be directed to Mr. Denis Lau, Branch Chief, Clean Water Branch at 586-4309.

Polluted Runoff Control

We recommend that nonpoint source pollution control concerns be addressed and that there be no increase in polluted runoff from the project. The construction of the subject project will greatly increase the acreage of impervious area, thereby increasing storm water runoff volume. The State has developed Hawaii's Coastal Nonpoint Pollution Control Program Management Plan. This management plan addresses proper planning, design, and use of Best Management Practices to substantially reduce polluted runoff (nonpoint source pollution) generated by different activities. Please refer to the management plan (pages III-101 to III-162) for urban

Mr. Dean Y. Uchida  
January 18, 2000  
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99-254/epo

management measures. The management plan can be obtained from the Coastal Zone Management Program (587-2877) in the Office of Planning, Department of Business and Economic Development & Tourism.

The following are suggested management measures to consider:

1. For New Development

Please refer to *Howell's Coastal Nonpoint Pollution Control Program Management Plan* (pages III-104 to III-108). The New Development Management Measures should be achieved by reducing total suspended solid loadings by 80% once the site is permanently stabilized.

2. For Site Development

- a) Please refer to the management plan, pages III-112 to III-117;
- b) Within the conceptual landscape plan, include open "green areas" that will slow down and retain stormwater runoff. For example, the lands set aside for parks could be constructed as sediment basins which would retain and prevent polluted runoff from entering coastal waters; and
- c) Limit disturbance of natural drainage features and vegetation.

3. For Construction Site Erosion and Sediment Control

- a) Please refer to the management plan, pages III-117 to III-123;
- b) Conduct grubbing and grading activities during the low rainfall months (April-October);
- c) Grub areas sequentially so that only a small portion of the site is bare at any time;
- d) Use vegetation, mulch, gravel, and porous pavement wherever feasible to maximize the acreage of pervious areas; and
- e) Replant or cover bare areas as soon as grading or construction is completed. New plantings will require soil amendments, fertilizers and temporary irrigation to become established. Use high planting and/or seeding rates to ensure rapid stand establishment.

Mr. Dean Y. Uchida  
January 18, 2000  
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Any questions concerning these polluted runoff control comments should be directed to the Clean Water Branch, Polluted Runoff Control Program at 586-4309.

C: WWB  
SIRWB  
SDWTB  
CWDI  
MDHO



January 23, 2000

Department of Land and Natural Resources  
 P. O. Box 621  
 Honolulu, Hawaii 96809-0621  
 Attention: Ed Henry

Subject: Conservation District Use Application for the Consolidation and  
 Resubdivision of Parcels and Proposed Waterline at Olowalu, Island  
 of Maui, Hawaii (File No. CDUA MA-2963)

Aloha:  
 This letter is written on behalf of Na Kupuna O Maui at the request of Patricia Nishiyama. It also  
 represents my views as a resident of Lahaina.

Our joint comments concerning this Application are:

1. The proposed sections are directly opposed to the Land Use objectives and policies for West  
 Maui as set forth at pages 16 and 17 of the West Maui Community Plan effective February 27, 1996.  
 Inter alia, those objectives and policies specifically provide:

"3. Preserve the current State Conservation District and the current  
 State Agriculture District boundaries in the planning region, in  
 accordance with this Community Plan and its land use map. Lands  
 ... south of Puamana to the region's district boundaries should ensure  
 the preservation of traditional lifestyles, historic sites, agriculture,  
 recreational activities and open space."

"7. Provide for specific criteria for the subdivision of lands designated  
 for agricultural use in order to control the potential loss of productive  
 agricultural lands and the open space resource."

"10. .... For the areas outside of Lahaina Town, establish or expand  
 parks and public shorelines areas to include but not limited to the following:

b. The development of a public beach park at Olowalu near  
 Camp Pecos for camping and ocean related recreational  
 and educational activities. .... If agriculture in the area is  
 decreased by 50 percent, twenty acres of park land shall be  
 considered for addition to the 10 acres of park land currently  
 designated in the Land Use Map."

2. The Land Use Map in the 1996 West Maui community Plan (shown as Figure 12 at page 77 of

the Draft Environmental Assessment (DEA)) designates all of the lands in Olowalu as either Agricult-  
 ure, Conservation, Open Space, Park, Single Family, Public/Quasi Public, or Business.

As Maui County Ordinance No. 2479 (County Agricultural Zoning District) provided that all lands  
 designated as Agriculture in Community Plans automatically became zoned as Agriculture, all of the  
 lands in Olowalu designated as Agriculture in the West Maui Community Plan's Land Use Map auto-  
 matically became zoned Agriculture.

Therefore, a portion of the DEA on page 83 (Item IV.D. Zoning) and Figure 13 on page 84 are both  
 wrong and misleading by representing that certain areas in Olowalu are zoned R-2 and R-3 Residential  
 District and A-3 Apartment District.

3. As shown above in item 1, a public beach park at Olowalu is identified in the 1996 West Maui  
 Community Plan and the statement is made in that Plan (and quoted on page 79 of the DEA) that "If  
 agriculture in the area is decreased by 50 percent, 20 acres of park land shall be considered for addition  
 to the 10 acres of park land currently designated in the Land Use Map."

The Response given by the Applicant on page 79 of the DEA is evasive at best. It seems to recognize the  
 10 acre Park designation in the Community Plan while denying that a decrease of agriculture in the area  
 has occurred.

Nevertheless, several other provisions of the DEA clearly acknowledge that agriculture has indeed  
 decreased in the area and decreased by substantial amounts (over 50 percent). Thus, statements appear  
 at page 12 of the DEA, "Most of the area is currently fallow agricultural lands ...."; at page 50 of the  
 DEA, "On the Lahaina side ... lands are in a fallow state .... Towards the Waialuku side, lands are also  
 fallow."; and at page 67 of the DEA "Since the existing case fields are presently barren ...."

It must also be noted that, by the proposed subdivision, the makai portion of Olowalu would contain  
 nine (9) lots. Those nine lots are shown on Figure 4 (page 6) of the DEA, Lot No. 9 in Figure 4 appears  
 to include the area of the ten acre Park designated in the 1996 West Maui Community Plan, but fails to  
 show that ten acre Park. Further, Figure 4 of the DEA does not contain sufficient area for the additional  
 20 acres of park land specified by the 1996 West Maui Community Plan.

By reason of the foregoing, the proposed subdivision is specifically inconsistent with the 1996 West  
 Maui Community Plan.

4. The Certified Shoreline Survey Map in the Special Management Area (SMA) application re-  
 specting the Olowalu area is incomplete as it covers only a portion of the makai lands.

5. Olowalu is but one of four agricultural land areas on the Waialuku side of Lahaina for which  
 subdivision processing is presently proceeding. Each of those four areas (Olowalu, Uluhamehame,  
 Luanihoku, and Kaulaia), if subdivided as proposed, would divide substantial portions of the sugarcane  
 operations heretofore carried on by Pioneer Mill.

Together, those four areas contain some 2,000 acres and their subdivisions would result in hundreds of  
 individually-owned lots with each lot presumably containing two or more residences. Further, this  
 Application reflects that subdivision standards being proposed for the Olowalu project are urban type

**Olowalu Elua Associates, LLC**

173 Ho Olowalu Street, Suite 201  
Kahala, HI 96732

Phone 808-877-2434  
Fax 808-877-9409

standards that have the potential for future urban development of the Olowalu area. The proposed water-line improvements described in this Application also indicate that future urban development is contemplated for Olowalu.

The cumulative impacts of these proposed four (4) subdivisions would be substantial in all aspects of West Maui, including infrastructure, education facilities, medical facilities, safety, natural resources, etc. The Applicants' response to this issue of cumulative impacts was by its letter of October 21, 1999, to the Director of Planning (DEA Chapter IX). This response tersely refused to consider the cumulative impact approach, stating that the four areas "are considered separate projects, are physically distinct, and are proceeding independently."


It is necessary that the cumulative impacts of all four areas be considered together for any meaningful consideration of this Application. All four areas have common human ownership (despite any separate corporate ownership designations), with the result that the task of preparing the cumulative impacts of all four areas together can hardly be described as an unreasonable burden.

6. This Application does not contain provisions to assure the right of present and future Native Hawaiians, in perpetuity, to access the known archeological sites in the Olowalu area (in particular, the heiau, burial and petroglyph sites). In addition, this Application does not contain perpetual rights for access to and use of the seashore, and the rights of makai-manuka passage between the seashore and the mountains, to present and future members of the public and to present and future Native Hawaiians for traditional gathering and ritual group prayer on the shore.

Na Kupuna O Maui and I appreciate the opportunity to comment on this Application. Olowalu is an important and valued area to all people of West Maui. In particular, it is most significant to Na Kupuna O Maui as an area of great cultural history containing significant evidence of the lives and lifestyles of the indigenous peoples of Hawaii before, during and after Western contact.

It is important to preserve the evidence of those lives and lifestyles in the relatively few and small remaining archeological discoveries, but it is also critical that the Olowalu area be respected and the history and practices of its past peoples be preserved for the people of today and the tomorrows to follow.

cc:  
Na Kupuna O Maui  
Olowalu Elua Associates, LLC  
Office of Environmental Quality Control  
Maui County Department of Planning

Withaloha  
  
Buck Buchanan  
416 Alio Street  
Lahaina, HI 96761  
Telephone/Fax: 661-9044

February 3, 2000

Mr. Buck Buchanan  
416 Alio Street  
Lahaina, Hawaii 96761

Subject: Conservation District Use Application for the Consolidation and Resubdivision of Parcels and Proposed Waterline at Olowalu, Island of Maui, Hawaii (File No. CDUA MA-2963)

Dear Buck,

We are in receipt of your letter to Ed Henry of the Land Division-Department of Land and Natural Resources dated January 23, 2000. We would like to offer the following responses to the comments of yourself and on behalf of Na Kupuna O Maui. I hope our meeting yesterday addressed most or all the concerns noted in subject letter. It's unfortunate we did not meet prior to your review of the Draft EA, as I suggested in my letter to Lahaina Open Space Society and Na Kupuna O Maui on November 4, 1999. We understand that it's sometimes difficult to understand the whole scope of a project without spending a lot of time reviewing public files. If there is any other item you or Na Kupuna O Maui want clarification on, please let me know. I do realize that in your letter, some of the comments was quoting policy statements from public documents, so I will respond as best I can.

- 1. Our project does not in any way change the agricultural and conservation district boundaries. We have however, better defined these boundaries. The original conservation district boundary line was not physically defined, likewise with the land use maps enacted by Maui County. For the purpose of determining lot allocation because of the new agricultural ordinance, these boundaries needed to be determined accurately, at least to the satisfaction of the Public Works Department and Planning Department.

Having seen our cultural map and other plans for the area, you have seen that issues of the preservation of historical sites and traditional lifestyles is being addressed in a very proactive and meaningful way. The Cultural Reserve and greenway system (open space) are major components of this plan.





JAN 23, 00

Olowale Elua Assoc., LLC  
173 Ho Ohana St., Suite 401  
Kahului, 96732  
FAX 871/2409

Regarding the Olowale Elua Oct. 99 Draft Environmental Assessment (EA) for a subdivision at Olowale - W. Maui, I have the following comments:

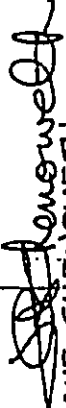
1. Olowale is an important historic & cultural part of Maui. It is a magnificent & treasured Ahupua'a.
2. I am unable to determine from the Draft EA if the proposed subdivision complies with our Maui County Agricultural District, as I find no clear connection between the proposed lots & our County Tax Key Parcel.
3. (a) The '97 Maui Long Range Transportation Plan proposed to widen the Honouliuli Hwy. may cost one-half a billion dollars.  
(b) The Draft EA traffic analysis does not indicate the need for greater additional

Page 1

impact of pending W. Maui timeshare conversions - the Kōamapali Ocean Resort, not the other three ag. subdivisions on either side of Olowale.

4. It will be important for our Maui Planning Director to schedule a hearing so that the public can attend & testify.

Sincerely,

  
DAVE CHENOWETH  
340 FRONT  
LAHAINA, 96761  
661.8327

COPY: O.E.S.C.  
Ed Henry  
John Min

Page 2









grow at Olowalu will be established over time. Supposedly, Native Hawaiian's had one hundred fifty varieties of kō to the few we have today. Today, we have many varieties of kō, because of experimentation and reintroduction. Regardless of what science studies may deduce, experimentation with different crops on different soils and different climatic conditions have proven science wrong many times. Also, subsistence agricultural and agricultural conservation were practices of kanaka maoli. These practices are still valid today and recognized in the new agricultural ordinance.

Regarding recreation, the public demands for access to the mountains is ever increasing. We have discussed this issue with existing owners in the valley, Olowalu Cultural Reserve, Sierra Club, Na Ala Hele, Department of Land and Natural Resources and other interested parties. Issues such as gathering rights, degradation of water resources, introduction of exotic plants, introduction of animals are all concerns. What everyone wants is responsible management with reasonable controls. The State owns and currently controls the land mauka of subject property, but we hope that with a working committee involving these agencies and groups and other interested parties, we can offer a management plan and educational program that is responsible and respectful.

Regarding ocean resources, the demands are even greater by the public as it includes the visitors to Maui. Most of the shoreline at Olowalu is owned by the State as government beach reserves and the ocean resources are controlled by the State. The issue then becomes how one provides access to this resource but minimize its impact. For example, a paved fifty feet vehicular right of way to the Olowalu Landing would benefit the public, but would it not also increase usage which may affect the ocean resources at the Landing that is very historic and a culturally significant area?

As you know, on November 4, 1999, Na Kupuna O Maui was given two copies each of the makai and mauka archaeological inventory surveys for review prior to the Cultural Resources Commission meeting on December 2nd. Two members of Na Kupuna were present at that meeting but only one spoke. She had some specific concerns, such as the makai burial ground, but she was told by the project archaeologist that those particular issues had already been settled and approved by the Burial Council at its August meeting. She also expressed concerns relative to the cave shelters on the western end of the property but she was told the applicant had already agreed to preserve those sites instead of instituting further data recovery as recommended by the archaeologist. She then stated that in general, Na Kupuna was satisfied that the applicant was making a good effort in respecting cultural sites. Both reports mention specific areas where monitoring was recommended and subsequent letters from SHPD have agreed to these monitoring areas. Where we proposed a specific improvement that was not in these specific monitoring areas but we felt needed closer scrutiny was needed (i.e. the new potable well in the valley and our project nursery in the last field closest to the dump site), we discussed this with our archaeologist and got approvals from SHPD.

Page 3 of 4: City Documents\Information\Board Documents\after public hearing\2-3-2000.doc

Native Hawaiian water and gathering rights is one of the most important issues for us as well. As you know, the allocation of water in the past was always in flux given the amount and need of users and the flow of the stream. We do not expect things to be any different. However, the inherent right to water for gathering practices, right to water for the existing properties in the valley is well established and documented. Two private owners in the valley get water through the ditch/stream system and know that, should they expand their lo'i, they can get more water. The vacant lot owner in the valley who will restore his lo'i in the future, knows where his tap is when he needs it. The OCR will also be restoring lo'i, planting wauke and other plantings, and their right to water is documented in the Lease. As the demand for water increases, we expect that with the participation of all the users, an equitable system of water distribution will be developed.

Regarding light pollution, we are glad to see Na Kupuna's concern towards light pollution. As you are probably aware, recent public hearings were held by the County Public Works Department in the adoption process of new lighting standards. These standards need to be approved by the County Council however, and that would be an opportune time for more public discussion with concerned members of the public. As past chairman of the Subdivision Engineering Standards Committee, one of my major goals was the passage of new lighting standards, especially for the rural area. Although it was not enacted before my chairmanship ended and did not include all the new standards we had hoped for, it is a great start. The new standard does not include low pressure sodium lights, but it does include the reduction of street light fixtures and the requirement for fully shielded fixtures. We hope Na Kupuna will offer their support in any variance hearing we have for further reduction of streetlights and light pollution.

Regarding public lands, we have provided whatever maps we have found to our surveyors, dating as far back as 1880. Some of those public lands were exchanged with the adjoining landowner, such as for the realignment of the Honoapiʻilani Highway. The highway lands that were not exchanged are shown as road remnants on the subdivision plats and duly owned by the State. The Olowalu School lot was sold by the government, after the school closed in 1932 and students starting attending Kamehameha School in Lahaina. Regarding the fifty feet (or as deemed necessary) right of way, although the 1906 grant to Giffard confirms the right of the public to Olowalu Landing, the access was not physically defined because the government did not own all the land to the ocean. As you know, we have greatly improved the access opportunities for the public and expect it will be further improved. Perhaps if Na Kupuna has documents or maps they wish to share that might reflect their concerns to the issue of lost government lands, we will bring it to the attention of the appropriate agency.

Regarding the agricultural and economic viability of new diversified products, we hope that this opportunity for smaller entrepreneurs will yield positive results. We have started to lease land to these entrepreneurs who feel blessed to have this opportunity. Although existing agricultural studies notes the type of crops that would be suited for specific soils, we do feel guidelines on what can or cannot

Page 2 of 4: City Documents\Information\Board Documents\after public hearing\2-3-2000.doc

7.

8.

JAN 26 2000

GENEVEVE SALLMONSON  
DIRECTOR



BENJAMIN J. CAVETANO  
DIRECTOR

STATE OF HAWAII  
OFFICE OF ENVIRONMENTAL QUALITY CONTROL  
236 SOUTH MERTZ AVE. 1ST FLOOR  
HONOLULU, HAWAII 96813  
TELEPHONE (808) 584-4195  
FACSIMILE (808) 584-1188

January 24, 2000

Dean Uchida, Administrator  
Department of Land and Natural Resources  
P.O. Box 621  
Honolulu, Hawaii 96809

Attention: Ed Henry

Dear Mr. Uchida:

Subject: Draft Environmental Assessment (EA) for Subdivision of lands at Olowalu, Maui

We have the following comments to offer:

1. **Secondary impacts:** The draft EA states that the subject property, about 733 acres, will remain in agricultural use after the resubdivision is complete and resulting parcels sold to individuals. Will continued agricultural use be a condition of sale of the resultant parcels of land? What kinds and how much of other types of development are allowed on ag parcels? In the final EA describe the secondary impacts these other types of development will have on the area. These include but are not limited to infrastructure, housing, drainage, and traffic and roadways.
2. **Cumulative impacts:** The Maui Planning Department, in its September 23, 1999 letter, points out that the areas of Ukumehame, Launiupoko and Kaula are currently under review for subdivision. The total acreage in question, along with Olowalu, totals 1998 acres. What are the cumulative impacts of a change of use of nearly 2000 acres to the West Maui region?
3. **Archeological and historic features:** Once the subdivision process is completed, and individual parcels sold, who will take responsibility for the archeological and historic sites on these parcels?

9. Regarding notices, I understand that all letters involving our EA and SMA permits are being forwarded to you from the Planning Department.

The Final EA will certainly include all of the concerns Na Kupuua has raised. Should you need further clarification to any of our responses, please feel free to call me at 877-2434.

Yours truly,

Robert L. Horrajo

Cc: Ed Henry-Land Division-DLNR  
John Min, Director-Maui County Planning Department  
✓ Mike Munekiyo-Munekiyo, Arakawa & Hiraga, Inc.

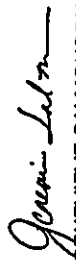
Dean Uchida  
January 24, 2000  
Page 2

4. **State Historic Preservation Office:** Has this office accepted the two archaeological reports and proposed mitigation recommendations by Xamanek? In the final EA document your contacts with SHPO and include copies of all correspondence.

5. **Cultural reserve:** The draft EA notes that 54 acres will be set aside for a cultural reserve, but no other details are given regarding activity. Will this area be used for eco-tourism? If so, in the final EA give a full description of the impacts and related mitigation measures for such an activity.

If you have any questions, call Nancy Heinrich at 586-4185.

Sincerely,

  
GENEVIEVE SALMONSON  
Director

c: Bob Horcajo, Olowalu Elua  
Milton Arakawa

**Olowalu Elua Associates, LLC**

173 He Olowalu Street - Suite 201  
Kauai, HI - 96732

Phone 808-877-2434  
Fax 808-877-9409

February 9, 2000

Genevieve Salmonson, Director  
Office of Environmental Quality Control  
State of Hawaii  
235 South Beretania Street, Suite 702  
Honolulu, Hawaii 96813

RE: Draft Environmental Assessment for Subdivision of Lands at Olowalu, Lahaina,  
Maui

Dear Mrs. Salmonson:

We have received a copy of your January 24, 2000 letter to Mr. Dean Uchida of the Department of Land and Natural Resources pertaining to the subject property. We hope the following response adequately addresses the concerns of your department.

1. Most of the property is within the State Agricultural District and is zoned as County Agricultural District. Although agricultural use is not a condition of sale, each lot will be encumbered with a Subdivision Agreement (Agricultural Use), which outlines the required principal and accessory uses within the agricultural district. For instance, accessory uses are listed in the ordinance and include uses such as farm dwellings, agricultural products stands, farmer's markets, processing of agricultural products, small scale animal keeping and parks. Since all of the principal and accessory uses support or are related to agricultural purposes, secondary impacts of "other types of development" are not anticipated to be significant. Special permit uses are also listed which would require Planning Commission approval. No special permit uses are proposed at this juncture.
2. There are other agricultural subdivisions at Ukaemehame, Launiupoko (Mahanalua Nui Subdivision) and Kauaula, which are under review by the County. Ukaemehame involves the creation of 12 lots on approximately 450 acres. Mahanalu Nui Subdivision involves the creation of 50 lots on 433 acres and the subdivision at Kauaula creates 12 lots on approximately 250 acres. Regional issues associated with these subdivisions will be addressed in the Final EA.





MEMO TO DEAN Y. UCHIDA  
JAN 24 2000

HWY-PS 2.7020

MEMO TO DEAN Y. UCHIDA  
Page 3  
JAN 24 2000

HWY-PS 2.7020

3. LOS condition "F" in the p.m. peak for Driveways A, B, C and D must be mitigated.
4. More detail and a map with a larger scale showing the proposed accesses in relation to all the present road and driveway accesses, both official and unofficial, to Honouliuli Highway must be submitted to the Highways Division for review and approval. The requests for official access, new access, and change in access must be submitted to the Highways Division Right-of-Way Branch.
5. Interior roadways should be designed to provide access to interior parcels for both trucks and makai properties. All accesses to Honouliuli Highway must be channelized with left turn and right turn deceleration lanes and shelter/acceleration lanes for left turning vehicles existing on the subdivision. Alternatives must be presented for Driveway B, which serves only a single parcel. The reasons for not recommending deceleration and acceleration lanes for Driveway B should be stated.
6. The applicant should be advised to contact the Highways Division Right-of-Way Branch at 692-7225 to determine if consideration will be assessed for the accesses and to process any required documentation at the applicant's cost. The process includes appraisal, mapping, documentation and filing, so early contact is advised. Requests for accesses for Driveways A, B, C, D and Camp Vecuna and a request to pin the waterline in the right-of-way must be submitted to the Right-of-Way Branch.
7. Drainage patterns may not be altered even though the development will increase runoff. Increases in runoff must be managed in the development areas. Drainage retention/recharge basins must mitigate increases as well as quality of runoff. Permits are required if runoff from development is discharged through the State highway system. No additional storm water runoff will be allowed onto the State highway right-of-way.
8. The proposed waterline may require NFDUS Permit Dewatering during construction. A drainage study should be submitted during the design stage of the proposal development.
9. The waterline crossing should be documented by easement. A request must be submitted to the Right-of-Way Branch and an appraisal to determine the charge for the easement must be performed at the applicant's cost. Plans for the waterline should show its location in relation to bridge or culvert structures within the State highway right-of-way.
10. Construction plans for the project access connections to the State highway and all work within our highway right of way must be submitted for our review and approval. All required improvements must be built to current State design requirements.

If you have any questions, you may call Ronald F. Truzaki, Head Planning Engineer, Highways Division, at 587-1830.

**Olowalu Eliua Associates, LLC**

173 Ho Onua Street • Suite 201  
Kauai, HI • 96732

Phone 808-877-2434  
Fax 808-877-9409

January 28, 2000

Pericles Mamboas, Administrator  
Highway Divisions  
State of Hawaii Department of Transportation  
869 Punchbowl Street  
Honolulu, Hawaii 96813-5097

Subject: Conservation District Use Application and Environmental Assessment, File  
No. CDUA MA-2963, Olowalu Lands  
Consolidation and Resubdivision and Proposed Waterline, Olowalu Eliua  
Associates, Olowalu, Maui, TMK: 4-8-03:05, 10 etal  
HWY-PS 2.702

Dear Mr. Mamboas,

We are in receipt of your letter dated January 24, 2000 to Dean Y. Uchida of the Land  
Division-DLNR pertaining to the subject project. Our consultant, Ted Kawabigashi of  
Austin, Tsutsumi & Associates, and myself had a meeting with eleven members of your  
department on January 20th to discuss any concerns of your department. This letter is to  
confirm our general discussions at the meeting and offer the following responses to the  
January 24th letter.

1. Before any subdivision plats were submitted to the County of Maui, we had a  
meeting with Mr. Bob Siarot, the District Engineer for Maui. The main purpose of  
the meeting was to discuss any department plans for a bypass highway in the  
Olowalu area. He informed us that the only proposal at that time was for road  
widening. After our initial subdivision submittals on the makai lands, your  
planning department requested a highway setback of 40 ft. We then had another  
meeting with Mr. Siarot where we offered that it might be better to offer an  
80 feet setback on our mauka lands. He agreed that it would offer a better  
highway alignment if the setback was totally on one side of the highway. Our  
mauka subdivision plat includes an 80 feet widening setback roadway lot # 39 of  
22.2 acres.

2. Driveway C as noted on the TIAR actually consists of a makai and mauka roadway  
connection. The proposed action however, only affects the makai portion of

driveway C. Therefore, the TIAR notes highway improvements for the proposed  
subdivision (acceleration and deceleration lanes) from the makai portion only. The  
existing Olowalu Store property to include Chez Paul Restaurant, use a State road  
remnant property for their parking and entrances. We did not expect to be  
responsible for mitigating their traffic. We are willing to block off via fencing the  
ability of vehicular traffic from our mauka lands to effectively use the mauka  
connection of Driveway C. Our future plans also do not include our need to use  
the mauka intersection of Driveway C.

3. Our understanding is that LOS condition "F" exist on Honospillani Highway  
basically from the Lahaina Pali to Lahaina Town. Driveways A, B, C and D offer  
highway improvements such as left turn storage lanes, acceleration and  
deceleration lanes, and in the case of "T" intersections a refuge area for vehicles  
turning left from the side road, to enhance the safety of vehicle movements into  
and out of the side road. Certainly, this, in and of itself, will not remove the LOS  
"F" condition of the side road.

4. A 200 scale map of the mauka subdivision and a 120 scale map of the makai  
subdivision is being transmitted under separate cover to the State Highways  
Division, Planning Branch. Formal requests for new or revisions to existing  
accesses will be submitted to the Highways Division Right-of-Way Branch.

5. Interior roadways will be provided to connect the subdivision lots per the  
development plans for the mauka and the makai subdivisions to consolidate the  
requirements for accesses to Honospillani Highway. In addition, the intersection  
geometrics will include left-turn storage lanes, and acceleration and deceleration  
lanes per the TIAR.

The access on Honospillani Highway at Driveway B will have a left-turn storage  
lane and refuge area for left-turning vehicles out of the driveway. Acceleration  
and deceleration lanes are not recommended because of the speed of the  
Honospillani Highway at this location (35 mph), and the very low volume of traffic  
entering and exiting Driveway B.

6. We will comply with the requirements of the Right of Way Branch pertaining to  
highway accesses.

7. The development will not alter the natural drainage patterns of the area. The  
development incorporates generous amounts of greenways and cultural reserve  
areas providing natural overland flow corridors to drainage detention/recharge  
basins. These basins will maintain or reduce the runoff rates through the existing  
State highway drainage system and provide a detention time to allow settlement of  
suspended solids to improve the quality of runoff. The State Department of  
Transportation will have the opportunity to review the drainage study and  
construction plans for development.

8. The ground elevation along the proposed waterline is high enough that  
groundwater is not anticipated in the general utility excavations, however,

527

groundwater may be encountered at the crossing of existing drainage features. As part of the construction development permits, national pollutant discharge elimination system general coverage permit applications for discharge of construction storm water, hydrotesting water, and construction dewatering will be submitted if applicable. A final drainage study will be prepared during the design development phase and will be appended to the grades construction storm water application and the application for a County grading permit.

- 9. We will comply with the requirements of the Right of Way Branch for the waterline crossing.
- 10. When complete, construction plans will be submitted to your department for your review and approval.

We hope these responses adequately address your department comments and concerns. If additional information or clarification is required, please inform us in writing by February 18, 2000. A copy of your letter should also be sent to Ed Henry of the Land Division. Thank you for your consideration.

Very truly yours,

Robert L. Horrajo  
Project Manager

Cc: Ed Henry-Land Division-DINR  
Mike Munekeyo-Munekeyo, Arakawa & Hiraga, Inc.  
Ted Kawahigashi-Austin, Tsutsumi & Associates



STATE OF HAWAII  
DEPARTMENT OF ACCOUNTING  
AND GENERAL SERVICES  
SURVEY DIVISION  
P.O. BOX 118  
HONOLULU, HAWAII 96810

TO JUN 26 PM 2:05

RAYMOND H. SATO  
SURVEYOR  
COMMISSIONER

FILE NO \_\_\_\_\_

January 25, 2000

MEMORANDUM

TO: Mr. John E. Min, Planning Director  
Maui County Planning Department

ATTN.: Ms. Colleen Suyama, Staff Planner

FROM: Randall M. Hashimoto, State Land Surveyor

SUBJECT: I.D. No.: SHI 990021  
TRK: 4-8-0315, 10, 41-70, 73-82, and 84, 4-8-04:11-16  
Project Name: Olowalu Lands Subdivision  
Applicant: Michael T. Munekeyo, on Behalf of  
Olowalu Eius Associates, LLC

We have reviewed the Special Management Area Use Permit Application for the Subdivision of Olowalu Lands.

Please be advised that our records indicate that there are survey monuments located within the boundaries of the subject properties.

Located within the Hauka Lands is Triangulation Station "Kilaa". Within the Hauka Lands are Triangulation Stations "Olowalu" and "Hehili" and Bench Marks "1 (1925)" and "5" (see enclosed descriptions).

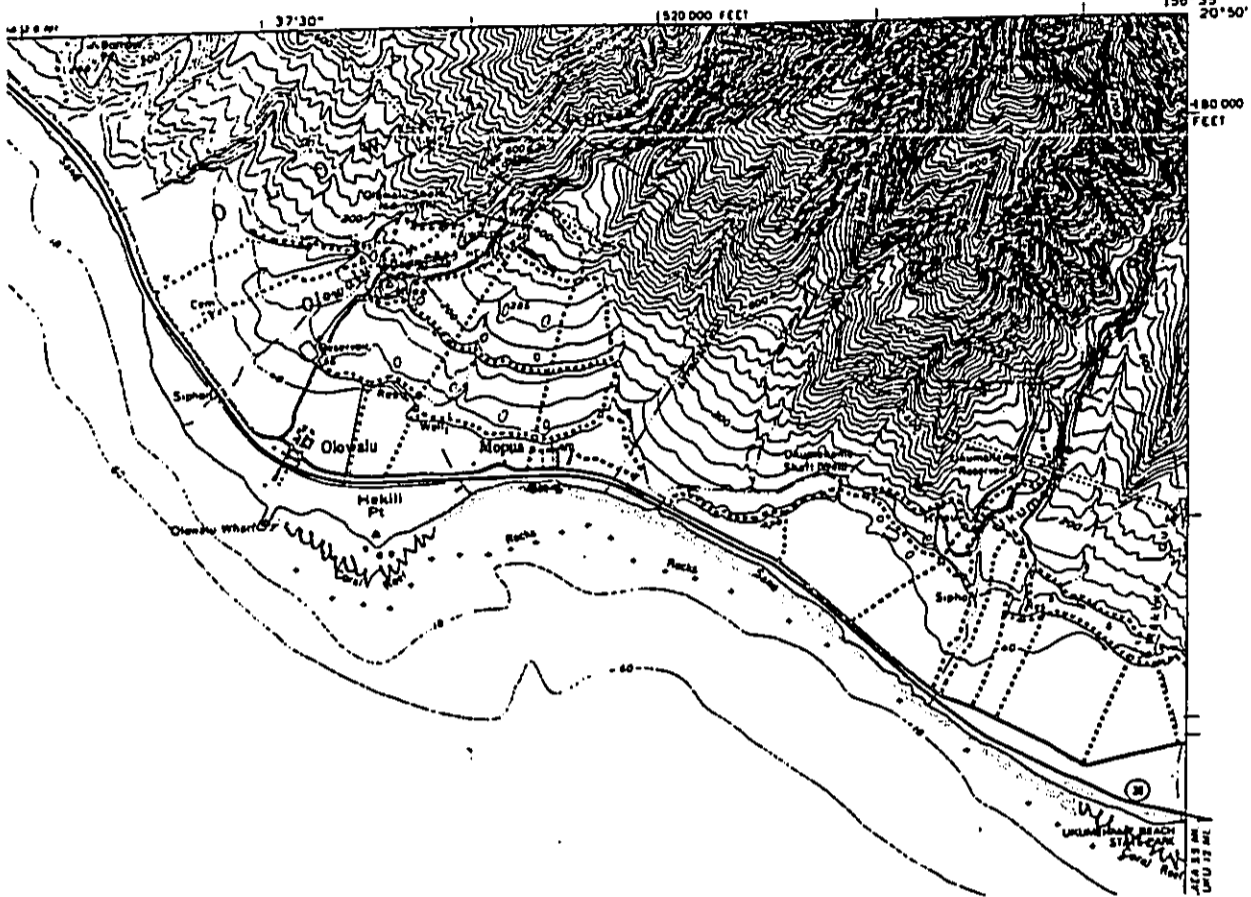
Please be further advised that if there is a possibility that any of the Triangulation Stations or Bench Marks be disturbed or destroyed during the subdivision and development of the properties, the survey monuments must be referenced and eventually replaced. Copies of the field notes descriptions and new values (if applicable) of the replaced monuments should be sent to our office for filing.

*Randall M. Hashimoto*  
RANDALL M. HASHIMOTO  
State Land Surveyor

Enclosures

DOCUMENT CAPTURED AS RECEIVED

LOWALU QUADRANGLE  
HAWAII-MAUI CO.  
ISLAND OF MAUI-LAHAINA DISTRICT  
7.5 MINUTE SERIES (TOPOGRAPHIC)



JUN 1972  
U.S. DEPARTMENT OF COMMERCE  
NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION  
NATIONAL OCEAN SURVEY, NATIONAL GEODETIC SURVEY

HORIZONTAL CONTROL DATA

ROAD JULBOA STATION 1070  
MADRII  
LATITUDE 20° 30' 10" 21" 00"  
LONGITUDE 156° 30' 10" 15" 30"  
MAGNETIC 07 0 50 READ

NO ORIGINAL TEXT

Kila (Maui Island, Hawaiian Government Survey; J. C. Gauger, 1912; R. W. Woodworth, 1923).—Near western coast of Maui, on solitary hill at entrance to Olowalu Valley, near Hahuli Point, base of Olowalu plantation, 1/4 mile north-west of Olowalu Hill. Station is on the west side of the graves on the hill, and is marked by a nail in a 4 by 4 inch redwood post set flush with surface of ground, and a pair of stones piled over it. Old description gives mark as iron pipe.

RECOVERY NOTE, TRIANGULATION STATION

Recovery Note:  
Name of Station: KILA  
Coordinates: 1912  
Recovery Note: 1950  
Checked against to be the Station of the original description, including marks found, description, change made, and other pertinent items.

Station was recovered in good condition. The station has been re-marked by the Pioneer Hills Survey Dept. with a 2 by 7 foot concrete monument 3 feet high with a 2 inch iron pipe in the center of top into which is fitted an iron target. This appears to be at the same location as old station. To reach from the Olowalu Store, go easterly on gravel plantation road for about 0.8 miles, turn right through a gate and circle to top of hill and station. The center of the iron pipe was used as station. No reference marks were set.

(continued on next page)

ADJUSTED HORIZONTAL CONTROL DATA

Name of Station: KILA  
Year: 1912  
Third

Station	20 30 10.000	Station	156 30 10.000
Latitude	156 30 10.000	Longitude	204

Station	Year	Latitude	Longitude	Height
HI 2	1912	20 30 10.000	156 30 10.000	0 00 00

Station	Latitude	Longitude	Height
LAUNIPONO	20 38 09.5	156 37 31	5102

DOCUMENT CAPTURED AS RECEIVED

U.S. DEPARTMENT OF COMMERCE  
NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION  
NATIONAL OCEAN SURVEY, NATIONAL GEODETIC SURVEY

**HORIZONTAL CONTROL DATA**  
By the  
NATIONAL GEODETIC SURVEY  
and NATIONAL OCEAN SURVEY

Sheet 201564 Station 1111  
LATITUDE 20 10 00  
LONGITUDE 156 10 00  
MAGNETIC

KILEA (continued)

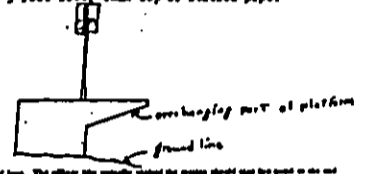
**RECOVERY NOTE, TRIANGULATION STATION**

Name of Station: KILEA  
Established by: J.C. Ganger Year 1912 State: Hawaii  
Revised by: R.C. Hanson Year 1949 County: Maui  
Island: Maui

Number of Old Marks: 1.35  
Number of New Marks: 0

MARK	DESCRIPTION	DATE	BY	STATUS
LABRIPORO (MS) 1879	MS	18.603	18.603	00 00 00.0
M. No. 1	MS	77 21 40		
Majohini Lighthouse, 1930	MS	181 20 13.6		
M. No. 2	MS	205 10 25		

Station mark was recovered in good condition. Two reference marks were established. A complete description follows:  
Station is located about 1/2 mile southeast of Lahaina and 1/2 mile northeast of Oliahi Pt., on a small, brushy hill of 344 feet elevation that has some old stone grave mounds on it, on east side of station.  
To reach station from the post office in Lahaina, go northeast on Popoia St. for 0.2 mile; turn right and go southeast on State Highway 30 for 3.1 miles to Lualaba Pt.; continue ahead for 3.0 miles to sign "OLIAHI POINT". Turn left and follow same road for 0.55 mile to triangulation site; continue ahead on track road for 0.03 mile to left. Take right fork and go 0.1 mile to side road right. Go right on inside road around hillside for 0.1 mile to top of hill and station.  
Station mark is a 1-inch iron pipe projecting 10 inches from the center of a 2 x 2 foot concrete platform that extends 1 foot above ground. It is 19 feet north of a fence corner and 20 feet northeast of end of road.  
Reference mark number one is a standard disk stamped "KILEA 1912 MS 1949", mounted in a drill hole in a 10-inch rock outcrop that projects 1 foot from ground. It is 1 1/2 feet lower than top of station pipe.  
Reference mark number two is a standard disk stamped "KILEA 1912 MS 1949", mounted in a hole in lava boulder that projects 1 foot above ground. It is 3 feet northeast of fence corner, 10 feet south of first grave mound and 2 feet lower than top of station pipe.



Notes at end of page should be located here. The office who actually found the marks should put the name of the end of the survey here.  
NOTE - One of these forms must be used for every station recovered.

JUN 1918  
U.S. DEPARTMENT OF COMMERCE  
NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION  
NATIONAL OCEAN SURVEY, NATIONAL GEODETIC SURVEY

**HORIZONTAL CONTROL DATA**  
By the  
National Ocean Survey  
and NATIONAL OCEAN SURVEY

Sheet 201564 Station 1112  
LATITUDE 20 10 00  
LONGITUDE 156 10 00  
MAGNETIC

**DESCRIPTION OF TRIANGULATION STATION**

Name of Station: KILAU  
Established by: G. J. Drayton  
Revised by: G. J. Drayton  
Year: 1900  
County: Maui  
Island: Maui

MARK	DESCRIPTION	DATE	BY	STATUS
KILAU SOUTH-WEST MARK	MS	00 00 00		
KILAU (MS) 1	MS	04 23 07		
Bench Mark (MS) (KILAU) TIDAL	MS	43.000	23.514	182 20 43
M. No. 1	MS	12.000	1.213	006 00 43
Hydrographic Signal	MS	12.000	1.213	072 10 09

The station is located on the rock filled dock in the village of Oliahi. It lies 50 feet north of the seaward end of the dock.  
The station is a standard disk, stamped KILAU 1900, set in a drill hole in a concrete slab which is 10 feet square and 7 inches with the surface of the soil.  
Reference mark number 1 is a standard disk, stamped KILAU MS 1 1900, set in a drill hole in the concrete sea wall. It is located at about the same elevation as the station.  
The bench mark is a standard U. S. S. bronze disk, stamped 1929, set in a drill hole in the concrete sea wall. It is located at about the same elevation as the station.  
The hydrographic signal is a wooden triangular structure having a base of about 2 feet and a height of about 20 feet. It rests on three concrete foundations which are about 1 foot in height.

**RECOVERY NOTE, TRIANGULATION STATION**

Name of Station: KILAU  
Established by: E.T.H. Year 1930 State: Hawaii  
Revised by: R.J.S. Year 1941 County: Maui  
Island: Maui

The station was recovered in good condition. Reference mark 1 was recovered. It appears that the dock and the wall in the area of the reference mark have been rebuilt and the mark destroyed.  
The "USGS Bench Mark" was recovered. It is a standard Coast and Geodetic Survey Tidal Bench Mark disk on which the stamping is "KILAU". It is upon a Tidal Bench Mark 1, Oliahi, Maui Island, Hawaii. It is dated 1/24/31.  
The hydrographic signal has been torn down. The base timbers are still in place, fastened to the concrete foundations.  
The description is adequate with the above corrections.

(continued on next page)

**ADJUSTED HORIZONTAL CONTROL DATA**

Name of Station: KILAU  
Year: 1900  
County: Maui  
Island: Maui

Observed Latitude	20 58 42.553	Reduction	1.52
Adjusted Latitude	20 57 34.117	Mean	0.2

MARK	DATE	X	Y	Z
MS 1	0102	212.839.01	272.783.97	0 00 00

MARK	DATE	X	Y	Z
LANAUA SE MARK		139 58 17.8	139 57 26	5102

DOCUMENT CAPTURED AS RECEIVED

JUN 1978  
U.S. DEPARTMENT OF COMMERCE  
NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION  
NATIONAL GEODETIC SURVEY

HORIZONTAL CONTROL DATA

By the  
National Geodetic Survey  
Old Hawaiian Datum

Sheet 20156A Station 1111  
LATITUDE 20 10  
LONGITUDE 156 10  
MAGNAN

OLONALI (continued)

RECOVERY NOTE, TRIANGULATION STATION

Name of Station: OLONALI  
Established by: C.T. Huesmeyer, Year 1930  
Recovery Note: R.C. Hanson, Year 1969

Point	Year	Height	Remarks
OLONALI	1930	11.00	Original station
OLONALI	1969	11.00	Recovery station

Station mark and BM No. 2 were recovered in good condition. BM No. 1 has been destroyed, on a new BM, No. 3, was established. A complete description follows:  
Station is located about 6 miles southeast of Lahaina and 1000 feet south-southwest of Olonali Shoals, out on the end of the old Olonali wharf. To reach station from the post office in Lahaina, go south on State Highway 10 for 2.5 miles to junction with State Highway 11; continue on Highway 10 for 0.5 mile to Olonali Shoals. Turn left and go 0.1 mile to end of road by house on right. Walk south along wide trail about 125 yards to wharf, then about 45 yards out onto wharf and station.  
Station mark is a standard disk stamped "OLONALI 1930", mounted in a drill hole in the center of a 9 x 10-foot, concrete disk that projects 1 foot above ground. It is 3.5 feet northeast of the rounded wall at concrete end of the wharf, and 11.7 feet northeast of the center of 1 concrete block which are the foundation of the old hydrographic signal. (Point stamped "1930", mounted in a drill hole in the second, sparsely finished along the northeast edge of the wharf; 30 feet northeast of end of bulkhead, 13.5 feet northeast of the northwest 1 of 2 concrete blocks, and about 15 inches lower than station mark.)  
Reference mark number three is a standard disk stamped "OLONALI 1930 No. 3", mounted in a drill hole in the rough rock and concrete top of the curved portion of wharf bulkhead, 6 feet north of sea edge of the wall, and at same elevation as station mark.

Notes of sheet of points should be examined here. The other notes should also be seen on the end of the recovery note.  
NOTE - One of these forms must be used for every station recovered.

JUN 1978  
U.S. DEPARTMENT OF COMMERCE  
NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION  
NATIONAL GEODETIC SURVEY

HORIZONTAL CONTROL DATA

By the  
National Ocean Survey  
Old Hawaiian Datum

Sheet 20156A Station 1039  
LATITUDE 20 30  
LONGITUDE 156 30  
MAGNAN

NO ORIGINAL TEXT

Name of Station: HELLIS  
Established by: R. W. Woodworth, Year 1925  
Recovery Note: R.C. Hanson, Year 1969

Station was recovered, as described, in good condition. This station was recovered with a standard disk, set in the center of the curved area which was the original station. Sign above the center of the station, a 24 foot pole, on the top of a 24 foot wooden tower was used as an intermediate target. A new description follows:  
The station is located about 600 meters southeast of Olonali, about 600 meters west of the abandoned Olonali Wharf (abandoned in 1921) and about 60 meters northeast of Helli Point in a dense grove of trees.  
The station is a standard disk, stamped HELLIS 1925, set in the top of a concrete post which is about 1 foot with the surface of the ground.  
No reference marks were set at this station.

Name of Station: HELLIS  
Established by: R.W.W., Year 1925  
Recovery Note: R.C.H., Year 1969

Station was recovered in good condition as described by C.T.H. in 1930. The mark was found covered by dirt to a depth of about 2 in. To reach the station, go 0.3 mile south along State Highway 10 to a side road right at sign "Camp Foreman". Turn right onto side road for 0.25 mile. The station is on the left between the road and the beach in a dense growth of Rivea trees.

Notes of sheet of points should be examined here. The other notes should also be seen on the end of the recovery note.  
NOTE - One of these forms must be used for every station recovered.

(continued on next page)

ADJUSTED HORIZONTAL CONTROL DATA

Point	Year	Latitude	Longitude	Height	Remarks
HELLIS	1925	20 30	156 30	11.00	Original station
HELLIS	1969	20 30	156 30	11.00	Recovery station

Point	Year	Latitude	Longitude	Height	Remarks
HELLIS	1925	20 30	156 30	11.00	Original station
HELLIS	1969	20 30	156 30	11.00	Recovery station

DOCUMENT CAPTURED AS RECEIVED

OLOWALU (89)  
 Third Order  
 Book: B 1212

Hawaii  
 Island of Maui  
 Adjusted Elevations

R. M. Wilson, 1921

Latitude 20°42.51 Longitude 156°35.1

(1) FROM THE NORTHWEST CORNER OF MAALAEA QUADRANGLE (88) NORTHWEST ALONG THE COAST INTO THE SOUTH EDGE OF LAHAINA QUADRANGLE (94)

- T.B.M. Olowalu, 2.7 mi. E. of, at second bend in rd. W. of long straight stretch, on S. side of the rd.; copper nail in root of leaning Algeroba tree, painted "5" 4.85
- T.B.M. Olowalu, 2.0 mi. E. of, 200 ft. E. of concrete bridge, copper nail cemented in top of milepost No. 14, 50 ft. from beach, painted "9" 9.51
- P.B.M. Olowalu, 0.8 mi. E. of, about half way between two RR. X-ings, on S. side of rd. and about 30 ft. N. of track; bronze tablet in capping of large concrete culvert, stamped "5" 4.613
- T.B.M. Olowalu, 400 ft. S. of RR. X-ing, on E. side of rd., copper nail in top of milepost No. 16, under large tree, painted "18" 17.37
- T.B.M. Olowalu, 1.5 mi. W. of, on N. side of rd., where rd. runs up over a slight rise; copper nail in second from E. end of a series of large white painted rocks, nearby telephone pole painted "25" 24.94

12/12/60 md  
 M...

JUN 1978  
 U.S. DEPARTMENT OF COMMERCE  
 NATIONAL GEODETIC SURVEY

HORIZONTAL CONTROL DATA  
 by the  
 NATIONAL GEODETIC SURVEY  
 OLD HAWAIIAN ISLANDS

QUAD 501544 STATION 3039  
 LATITUDE 20 42 51  
 LONGITUDE 156 35 01  
 DATUM

MARK (continued)

STATION NAME: OLOWALU  
 DATE: 1921  
 BY: R. M. Wilson

MARK	DESCRIPTION	HEIGHT	REMARKS
1	...	...	...
2	...	...	...
3	...	...	...

NOTES: Compass course (direction from true south) was measured with a Brunton Compass because trees block all lines.

Station mark was recovered in good condition; it was 14 inches below ground surface, but the old tower was still standing, marking the location. The reference mark was established and a witness post was set. A complete description follows:

Station is located about 6 miles southeast of Lahaina, 1/4-mile southeast of Olowalu, and 100 feet west-southwest of Camp Puuoa Circle, Camp, at Olowalu Point. 50 feet west from station, in a dense line of trees, and in a prominent carrying run of stone about 50 feet long, 6 feet wide, and 2 feet high, which is probably an old fence. The stone trees are up to 25 feet high and all lines are heavily blocked.

To reach station from the post office in Wailuku, go south on State Highway 10 for 1.75 miles to sign "CAMP PUUOAO" on left. Turn left fork and go 0.2 mile on track road along edge of stone field to log in road end of track travel. Walk southerly 100 feet to station in trees.

Station mark is a standard disk stamped "NGLS 1921" set in the top of a 6-inch-square, concrete monument 14 inches below ground surface. It is 100 feet south-southwest from log in stone row, 33 feet west of east end of stone row, 10 feet east of angle in stone row, and 4 feet south of a white witness post.

Reference mark number one is a standard disk stamped "NGLS 1921" set in a 3-foot hole in a 3-foot boulder that projects 6 inches above ground. It is set in the stone row, 24 feet east of east end of the row and 2 feet higher than station mark.

Reference mark number two is a standard disk stamped "NGLS 1921" set in a 20-inch hole in a 20-inch boulder that projects 10 inches from ground. It is set in the stone row, 24 feet east from the angle where row changes direction, and is 20 inches higher than station mark.



MAR 01 2000

Olowalu Elua Associates, LLC  
173 Ho Olowalu Street - Suite 201  
Kauai, HI 96732

Phone 808-877-2434  
Fax 808-877-9409

February 29, 2000

Randall M. Hashimoto  
State Land Surveyor  
Department of Accounting and General Services  
P.O. Box 119  
Honolulu, Hawaii 96810

RE: Olowalu Lands Subdivision, I.D. SM1 990021

Dear Mr. Hashimoto,

We have received a copy of your January 25, 2000 memorandum to John E. Min relating to the subject project.

We appreciate your transmittal of information on triangulation stations on the subject property. Should there be any construction which disturbs the triangulation stations or bench marks within the property, we intend to reference and replace the survey monuments.

In you have any questions, please feel free to call me at 877-2434.

Very truly yours,

Robert L. Horrajo  
Project Manager

Cc: John E. Min, Department of Planning  
Eric Yamashige, Ronald M. Fukushima Engineering, Inc.  
Michael Munekiyo, Munekiyo, Arakawa and Hiraga, Inc.

City Document Identification System: <http://www.cityofhawaii.gov/records> 2-29-2000

4/24/51

HAWAIIAN ISLANDS - 9

U. S. COAST AND GEODETIC SURVEY

TIDAL BENCH MARKS

Olowalu, Maui Island  
Lat. 20° 48' 41" Long. 156° 37' 6"

BENCH MARK 1 (1925) is a standard disk, stamped "1 1925", set flush with top of concrete loading face (wall) of rock-filled wharf, near northerly derrick post at village of Olowalu. Elevation: 5.82 feet above mean lower low water. NOTE: It was reported in November 1950 that stamping on disk was not legible owing to matrilation of same. Bench mark was recovered in good condition.

Mean lower low water at Olowalu is based on 5 high waters and 5 low waters, April 27-30, 1925, reduced to mean values. Elevations of other tide planes referred to this datum are as follows:

	Feet
Highest tide (estimated)	3.5
Mean higher high water	2.30
Mean high water	1.80
Half tide level	1.00
Mean low water	0.20
Mean lower low water	0.00
Lowest tide (estimated)	-1.0



Mr. John E. Min  
January 25, 2000  
Page 2

ESTHER UEDA  
EXECUTIVE OFFICER



100 JUN 26 12:06

STATE OF HAWAII  
DEPARTMENT OF BUSINESS, ECONOMIC DEVELOPMENT & TOURISM  
LAND USE COMMISSION  
P.O. Box 2359  
Honolulu, HI 96804-2359  
Telephone: 808-587-3822  
FAC: 808-587-3827

January 25, 2000

Mr. John E. Min  
Planning Director  
County of Maui  
250 South High Street  
Wailuku, Hawaii 96793

Dear Mr. Min:

Subject: Notice of Application  
Special Management Area Use Permit (SM1 990021)  
Project Name: Olowalu Lands Subdivision  
Applicant: Michael T. Munekiyo, on Behalf of Olowalu Elua Associates, LLC  
TMK: 4-8-003: 005, 010, 041-070, 073-082, and 084  
4-8-004: 011-016  
Olowalu, Maui, Hawaii

We have reviewed the subject application forwarded by your transmittal dated December 20, 1999, to establish agricultural subdivision lots on approximately 732.98 acres in Olowalu, Maui, Hawaii. We confirm that the proposed project is designated within the State Land Use Agricultural and Conservation Districts.

Based upon our review of the subject application and discussion with your staff, we have the following comments/concerns/questions:

1. There is no mention of any market study to analyze the demand and feasibility of varied sized parcels for long-term agricultural activities, especially in an area comprised of quality agricultural lands. It is unclear how the consolidation and resubdivision of the existing parcels will ensure that appropriate lands are available for sustaining future agricultural activities. Furthermore, increased traffic projections are based on single family and recreational dwelling units rather than projections relating to agricultural cultivation.

2. In reference to pages 29 through 41 and 53 through 57, numerous historic and cultural sites identified in the project area, but it is unclear who will conduct data recovery tasks or coordinate with local groups, such as Native Hawaiian groups. Also, it is unclear what constitutes interpretive preservation efforts.
3. In reference to pages 49 and 65, the applicant mentions that the existing irrigation water infrastructure will be available for use on the parcels in project area, but it is unclear as to its extent and the nature of its source, such as, is it diverted from the Olowalu Stream or drawn from a non-potable well. If a surface water resource is used then analysis should be done to identify the impacts on the resource's sustainability.
4. In reference to No. 3, the potential increase in the density and activities in the project area may affect the quality of the potable groundwater sources that is planned to replace the existing surface public water system. The 1996 amendments to the Safe Drinking Water Act required all states to assess the potential contamination of public drinking water sources from surrounding land use activities. The change in density and land uses in the area may raise concerns of future groundwater impacts.

We have no further comments to offer at this time. We appreciate the opportunity to comment on the subject application.

Should you have any questions, please feel free to call me or Russell Kumabe of our office at 587-3822.

Sincerely,

ESTHER UEDA  
Executive Officer

EU:aa

**Olowalu Elua Associates, LLC**

173 Ho Ohana Street - Suite 201  
Kahala, HI - 96732

Phone 808-877-2434  
Fax 808-877-9409

February 11, 2000

Ether Ueda, Executive Director  
State of Hawaii  
Department of Business, Economic Development and Tourism  
Land Use Commission  
P.O. Box 2359  
Honolulu, Hawaii 96804-2359

RE: Olowalu Lands Subdivision, Olowalu, Lahaina, Maui  
Special Management Area Use Permit (SM1 990021)

Dear Mr. Ueda,

We have received a copy of your letter dated January 25, 2000 to Mr. John Min of the County of Maui, Department of Planning relating to the subject project. We would like to take this opportunity to provide the following response.

1. With regard to the agricultural suitability of lands within the study area, we have consulted with Robbie Vorfeld, former manager of sugar cane operations and currently, manager of diversified agriculture at Pioneer Mill Company (PMCo). PMCo. has been experimenting with other diversified crops for years such as coffee at Kaanapali and alfalfa on Kauai. Currently, they are growing seed corn and sweet corn on some Kaunapali lands. According to Mr. Vorfeld, the major disadvantage of the Olowalu lands is its rockiness and the occasional strong winds. Pasture and orchards type crops would be crops where these negative conditions would have the least impact. Mangoes, bananas, papayas and avocados currently exist at Olowalu so they would be considered good orchard crops. Although truck type farming would be affected the most because of the rocky conditions, the amount of rockiness varies throughout the property, so truck type crops such as peppers, eggplant and others should do fine. Lastly, specialty crops such as dryland taro, noni, awa and sweet potatoes, crops that existed at Olowalu in the past, would be suitable crops.

As to the economic viability of new diversified products, OEA hope this opportunity for smaller entrepreneurs will yield positive results. We have started leasing land to these agricultural entrepreneurs who feel blessed to have this opportunity. Although existing

agricultural studies notes the type of crops that would be suited for specific soils, we do feel guidelines on what can or cannot grow at Olowalu will be established over time. Experimentation with different crops with different soils has proven the experts wrong before. Subsistence agricultural and agricultural conservation were also practices of kanaka maoli. These practices are still valid today and recognized in the new agricultural ordinance.

Traffic projections include single family farm dwellings or recreational dwelling units that are located on and used in connection with the agricultural lots.

2. Regarding the issue of data recovery, the land owners have stated to the Cultural Resource Commission, Office of Hawaiian Affairs, State Historic Preservation Division (SHPD) and the project archaeologist that sites will be just "preserved" instead of performing further data recovery. Generally however, data recovery is performed by a licensed archaeologist as required by SHPD. Discussions with members of Olowalu families, a Native Hawaiian group and other interested Hawaiian community members have been ongoing since the start of the archaeological inventory survey process that started in October of 1998. The project includes a cultural reserve of approximately 54 acres that is being leased to a private non-profit corporation called Olowalu Cultural Reserve (OCR). The board of OCR consists of Native Hawaiians who will also be consulted on cultural issues.

Any and all preservation measures will be included in the Mitigation and Preservation Plan that requires SHPD approval. Generally, SHPD has established guidelines on mitigation and preservation measures.

3. Regarding the issue on irrigation water, the intent is to provide water through the existing ditch system and existing irrigation system installed by PMCo. for sugarcane operations. The basis for the ditch system is a stream intake on State land approximately one mile mauka of subject property. This stream intake and ditch system on State land was established in 1929 and currently is being used under a month-to-month Revocable Permit through the Department of Land and Natural Resources. This system also includes four reservoirs with capacities from 2 million to 5 million gallons. There are also two other wells on the property that could also be used for agricultural purposes. In its optimum condition, the built capacity of the ditch system is supposedly 10 million gallons per day but with a current average of 2.5 to 3.5 mgd. Based on State per acre standards, the potential agricultural water demand excluding greenways and the cultural reserve could be roughly 3,095 mgd. In general, we expect that the total water demand for agriculture will be less than sugar cane. One reason is the decrease in acreage under irrigated agriculture and the expected reduced demand because of type of crops. For example, orchard type crops and pasture would have less demand on the water resources. A crop such as taro would recycle the water back into the system. The desire to provide a consistent stream flow will affect the quantity of water through the ditch system, but with proper management of the total system (i.e. topping of reservoirs with other wells or during excess stream flow), water demands for all agricultural pursuits should be met.

JAMES 'IMAO' APANA  
Mayor

CHARLES JENCKS  
Director


DAVID C. GOODE  
Deputy Director

Telephone: (808) 270-7245  
Fax: (808) 270-7165

4. We acknowledge the 1996 amendments to the Safe Drinking Water Act. Our intent is to work with the State Department of Health in complying with all current and future requirements.

We hope the foregoing adequately addresses your departments concerns. Please feel free to call me at 877-2434 if you have any questions or need any further clarification.

Very truly yours,

  
Robert L. Horcajo  
Project Manager

Cc: Ed Henry-Land Division, DLNR  
John Min, Director-Maui County Planning Department  
Mike Munekiyo-Munekiyo, Arakawa & Hiraga, Inc.



JUN 31 09 26  
COUNTY OF MAUI  
DEPARTMENT OF PUBLIC WORKS  
AND WASTE MANAGEMENT  
200 SOUTH HIGH STREET  
WAILUKU, MAUI, HAWAII 96793

RALPH NAGAMINE, L.S., P.E.  
Land Use and Code Administration

ROH'R. RUSKA, P.E.  
Wastewater Reclamation Division

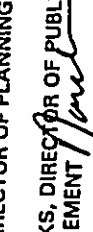
LLOYD P.C.W. LEE, P.E.  
Engineering Division

BRYAN HASHIRO, P.E.  
Highways Division

ANDREW M. HIRROSE  
Solid Waste Division

January 28, 2000

MEMO TO: JOHN E. MIN, DIRECTOR OF PLANNING

FROM:  CHARLES JENCKS, DIRECTOR OF PUBLIC WORKS AND WASTE MANAGEMENT

SUBJECT: SPECIAL MANAGEMENT AREA PERMIT APPLICATION  
LOWALU LANDS SUBDIVISION  
MAUKA LANDS: TMK: (2) 4-8-003:010, 050-082  
TMK: (2) 4-8-004:011-016  
MAKAI LANDS: TMK: (2) 4-8-003:050, 041-049, & 084

We reviewed the subject application and have the following comments.

Advisory Comments

1. The subdivision shall comply with the provisions of Title 18, "Subdivisions" and applicable sections of 19.30 relating to subdivision of agriculturally zoned lands.
2. A detailed final drainage report and site specific erosion control plans shall be submitted with the construction plans for review and approval prior to the issuance of grading permits. The drainage report shall include hydrologic and hydraulic calculations and the schemes for disposal of runoff waters. It must comply with the provisions of the "Rules for Design of Storm Drainage Facilities in the County of Maui" and must provide verification that the grading and runoff water generated by the project will not have an adverse effect on adjacent and downstream properties. The site specific erosion control plan shall show the location and details of structural and non-structural Best Management measures. The applicant shall also be aware of the following grading restrictions for shoreline properties:

Letter to John E. Min  
January 28, 2000  
Page 2

MAR 01 2000

Olowalu Elua Associates, LLC  
173 H. Olowalu Street - Suite 201  
Kauai, HI 96732

Phone 808-877-2434  
Fax 808-877-9408

- a. The use of soil as fill is prohibited within the shoreline setback area, except for clean sand.
- b. Any grading or mining of a coastal dune is prohibited.

If you have any questions, please call David Goode at 270-7845.

DG/msc/mt

S:\UCAL\ZM\olowalu2.wpd

February 29, 2000

Charles Jencks, Director  
Department of Public Works and Waste Management  
200 South High Street  
Wailuku, Hawaii 96793

RE: Olowalu Lands Subdivision, I.D. No. SM1 990021

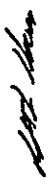
Dear Mr. Jencks,

We have received a copy of your January 28, 2000 memorandum to John E. Min relating to the subject project and would like to provide the following response.

1. We intend to comply with applicable provisions of Title 18, "Subdivisions" and Chapter 19.30 pertaining to the County Agricultural District.
2. We also intend to submit a final drainage report and site specific erosion control plans with the construction plans for the project. We acknowledge grading restrictions for shoreline properties.

If you have any questions, please feel free to call me at 877-2434.

Very truly yours,

  
Robert L. Horeajo  
Project Manager

Cc: John E. Min, Department of Planning  
Eric Yamashige, Ronald M. Fukumoto Engineering, Inc.  
Michael Munekiyo, Munekiyo, Arakawa and Hiraga, Inc.

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JAMES "KIMO" APAHA  
MAYOR

OUR REFERENCE  
YOUR REFERENCE



**POLICE DEPARTMENT**  
COUNTY OF MAUI JAN 31 P1 52

55 MAHALANI STREET, OFFICE BUILDING  
WAILUKU, HAWAII 96793  
(808) 244-4400  
FAX (808) 244-6411 RECEIVED

THOMAS M. PHILLIPS  
CHIEF OF POLICE

DEPUTY CHIEF OF POLICE

TO : THOMAS PHILLIPS, CHIEF OF POLICE  
VIA : WAYNE RIBAO, CAPTAIN, DISTRICT IV  
FROM : KAID K. THOMPSON, P.O. III, DISTRICT IV  
BICYCLE PATROL  
SUBJECT : ASSESSMENT OF OLOWALU LANDS SUBDIVISION

*Ac-OK*  
*1/27/00*

January 28, 2000

MEMORANDUM

TO : DIRECTOR, PLANNING DEPARTMENT  
FROM : THOMAS M. PHILLIPS, CHIEF OF POLICE  
SUBJECT : I.D.: SMI 990021  
TMK: 4-8-003:5, 10, 41-70, 73-82, and 84, 4-8-004:11-16  
Project Name: Olowalu Lands Subdivision  
Applicant: Michael T. Munekiyo, on Behalf of Olowalu Elua Associates, LLC

Sir be advised the following To-From report is in regards to evaluation of the Olowalu Lands Subdivision.

According to the booklet submitted by Olowalu Elua Associates, LLC, and from review of Appendix C page #18 under the MLRTP Considerations, the project would not have adverse impact with the expected highway recommendations. MLRTP proposed changes to the Honopiihoni HWY from two to four lanes between the years 2006-2020. With this increase to Honopiihoni HWY to four lanes I would recommend approval of this project.

However if the highway is NOT increased to four lanes this project would greatly impact the traffic in the area. I feel the existing traffic conditions for Honopiihoni HWY is at it's limit. With any increase with subdivisions and any changes to these subdivisions, it would greatly impact traffic.

Respectfully submitted.

No recommendation or special condition is necessary or desired.

Refer to attachment.

My only concern at this point is in regards to the present exit site, an existing roadway; and will this be adequate for any current use of the proposed subdivision, pending the Highway expansion in the year 2006.  
*Kaid K. Thompson*  
Kaid K. THOMPSON E-0307  
P.O. III, District IV  
Bicycle Patrol  
01/21/00 1100 hours.

NOTED: SGT. BRIS/DE MELLO 7000  
1/21/00 1200 hours

NOTED:

ACCORDING TO ASSIGNED OFFICER & HIS SUPERVISOR, TRAFFIC WILL BE IMPACTED EVENTUALLY BY THESE SUBDIVISIONS, HOWEVER IMPROVEMENT TO HONAPIIHANI HWY SHOULD TAKE CARE OF ANY PROBLEMS

*Noted*  
*H. W. DeSantis*  
*1-21-00*

*Capit. Wayne*  
*01/21/00*

*Ac-OK*  
Assistant Chief Robert Yam Ho  
For: THOMAS M. PHILLIPS  
Chief of Police





United States Department of the Interior

FISH AND WILDLIFE SERVICE  
Pacific Islands Ecotrip  
300 Ala Moana Blvd., Room 3-112  
P.O. Box 50068  
Honolulu, Hawaii 96850

TU FEB -2 P1 04

DEPT OF THE INTERIOR  
COMMUNITY RELATIONS  
RECEIVED  
FEB 1 2000

In reply refer to: DHI

Colleen Suyama  
Staff Planner  
Maui Department of Planning  
250 S. High St.  
Wailuku, HI 96793

Re: Special Management Area Use Permit and Draft Environmental Assessment for  
Residential Subdivision, Olowalu, Maui, Hawaii

Dear Ms. Suyama:

The U.S. Fish and Wildlife Service (Service) has reviewed the application for a Special Management Area Use Permit and Draft Environmental Assessment for a Residential Subdivision at Olowalu (DEA) on the island of Maui. The applicant is Olowalu Elua Associates. The proposed subdivision would be built on approximately 733 acres and would include single family residences on 43 lots ranging in size from 2.0 to 86.7 acres each. The development includes a cultural reserve (approximately 54 acres) as well as extensive green areas. Olowalu Stream, which runs through the proposed project area, will have a greenway/reserve buffer of 50 to 100 feet on each side of the stream. The Service offers the following comments for your consideration.

Based on our review of information contained in our files, including maps prepared by the Hawaii Natural Heritage Program of The Nature Conservancy (HINHP), we believe the DEA adequately describes the primary flora and fauna of the area. No federally endangered, threatened, or candidate species are known to occur directly within the proposed project site. However, the proposed project has the potential to impact certain migratory species (e.g. seabirds) as well as adjacent habitats. Potential project-related impacts are outlined below.

The dark-rumped petrel (*Pterodroma phaeopygia sandwichensis*) is a federally endangered species that is expected to occur seasonally in the vicinity of the proposed project site. Circumstantial observations and experimental evidence have shown that artificial lighting can disorient seabirds when flying between inland nesting areas and offshore feeding grounds. This disorientation is caused by excessively bright outdoor lighting and can result in seabird collisions with man-made structures such as light poles and wires. Injured seabirds that "fall-out" due to such collisions are highly vulnerable to predation by dogs, cats, and mongooses.

SMA/DEA for Olowalu vision  
Olowalu, Maui, Hawaii

The DEA does not note the potential impacts to seabirds that could result from the proposed project and does not describe proposed measures to reduce or eliminate these negative impacts (e.g. special outdoor lighting, light shielding, light poles limited to 25 feet or less in height). Potential solutions to problems associated with seabird "fall-out" are available in a pamphlet published by the Division of Forestry and Wildlife, State Department of Land and Natural Resources (DOFAW). We recommend that you contact the Maui DOFAW office (871-2979) regarding this matter. The final project design should include adequate measures to reduce or eliminate lighting impacts to seabirds and these measures should be adequately described in the final EA.

The DEA notes that a buffer area (greenway and cultural park) will be maintained along both sides of Olowalu Stream. Future activities and improvements to be conducted within this buffer are not identified in the DEA and are to be developed at a later time by a non-profit entity. Future plans for projects or activities within the greenway and cultural reserve should consider the potential impacts that such projects and activities could have on the stream and near shore marine environments, and all such project proposals for this area should be subject to environmental review. Provided that measures will be implemented to minimize potential impacts to seabirds and water quality in Olowalu Stream and adjacent marine habitats, the Service would support a Finding of No Significant Impact for the proposed project.

The Service appreciates the opportunity to review the application and DEA. If you have any questions regarding our comments, please contact Fish and Wildlife Biologist Dave Hopper by phone at (808) 541-3441 or by facsimile at (808) 541-3470.

Sincerely,

Paul Henson  
Field Supervisor  
Ecological Services

cc: DLNR, Honolulu  
DOFAW, Maui  
CZM, Honolulu  
CWB, Honolulu  
DAR, Maui



**Olowalu Elua Associates, LLC**

173 Ho Olowalu Street - Suite 201  
Kauai, HI - 96732

Phone 808-877-2434  
Fax 808-877-9409

February 9, 2000

Paul Henson, Field Supervisor  
Ecological Services  
United States Department of the Interior  
Fish and Wildlife Service  
Pacific Islands Ecoregion  
P.O. Box 50088  
Honolulu, Hawaii 96850

RE: Subdivision of Olowalu Lands, Olowalu, Lihala, Maui (SM1 9900210)

Dear Mr. Henson:

We have received a copy of your letter to Colleen Suyama of the County Planning Department pertaining to the subject project. We would like to offer the following response.

Regarding the effects of lighting on migratory birds, we are very cognizant of this issue and plan to keep night illumination to a minimum. While the proposed project must comply with the County lighting standards, we do plan on seeking variances to further reduce the effects of night lights. We are also aware that the County is considering passage of new lighting standards that calls for the reduction in the number of street lights and the requirement for fully shielded fixtures.

We would like to clarify that the greenway system is proposed to be maintained by the homeowners association. The intent of the greenway system is an "open space" corridor, mainly planted with native and Polynesian introduced plants. Aside for providing drainage relief from storm runoff, it will have walking trails for public use.

The area of the cultural reserve would be leased to a private non-profit corporation, called Olowalu Cultural Reserve (OCR). The mission statement of the OCR is:

"To perpetuate traditional and customary practices of "kama maoi" of these Hawaiian Islands and to regain the spiritual connection of "malama aina" of our ancestors by ensuring these beliefs and customs are passed down to future generations. To accomplish this purpose, the organization will provide education experiences of traditional and customary practices within a traditional "ocean to mountain" ahupua'a land system."

Aside from your comment on the dark-rumped petrel, we have been made aware by the State Division of Forestry & Wildlife (DOFAW) and a private resident of Olowalu that various other waterbirds use the reservoirs at Olowalu. We had previously met with Bob Hobdy, acting administrator at the Maui DOFAW office, on this issue and will continue to work with that office for an appropriate mitigation plan. The homeowners association and the OCR will be included in these discussions.

If you have any questions or need additional information, please feel free to call me at 877-2434.

Very truly yours,



Robert L. Horcajo  
Project Manager

Cc: John Min-Director, Department of Planning  
Ed Henry-Land Division-DLNR  
Mike Munekeyo-Munekeyo, Arakawa & Hiraga, Inc.

Olowalu Elua Assoc., LLC.  
173 Ho Oluaa Street - Suite 201  
Kahala, HI - 96732

Phone 808-877-2434  
Fax 808-877-9409

Linda Nelson  
800 Olowalu Village  
Lahaina, HI 96761

February 7, 2000

Olowalu Associates  
173 Ho Oluaa Street, Suite 201  
Kahala, HI 96732

Re: Draft Environmental Assessment (EA) for the Olowalu Subdivision, West Maui  
Aloha,

As a long-time resident of Olowalu with a deep interest in Hawaiian native plants and wildlife, I would like to add these species to those listed in the October 1999 draft EA for the proposed subdivision. The plants named are those naturally occurring on the property.

Mā'o	<i>Gostypium tomentosum</i> Nutt. ex Seem.	Endemic
Ohelo kai	<i>Lycium sandwicense</i> A. Gray	Indigenous
Aluhikahi	<i>Scaevola portulacastrum</i> (L.) L.	Indigenous
Kipuka	<i>Hectropium curvauvicularum</i> L.	Indigenous

The Endangered Aiea Ke'oke'o or Hawaiian Coot (*Fulica americana alai*) is found in all three of the lower irrigation ponds. For several years, breeding and chick raising have taken place in all three ponds. Currently, one pair is raising four chicks in the pond near proposed lot number 20. Occasional visitors to the ponds and surrounding fields are:

Koloa or Hawaiian Duck	<i>Anas wyvilliana</i>	Endangered
Ae'o or Hawaiian Silt	<i>Himantopus himantopus knudseni</i>	Endangered
Nene or Hawaiian Goose	<i>Branta sandwicensis</i>	Endangered

Two indigenous dragonflies, the Common Green Darner (*Anax junius Drury*) and the Globe Skimmer (*Pantala flavescens Fabricius*), are residents around all ponds on the property.

The very rare endemic damselfly, *Megalagrion pacificum* McLachlan, is an occasional visitor to the pond near the top of the property.

Sincerely,  
*Linda Nelson*

Linda Nelson

February 11, 2000

Linda Nelson  
800 Olowalu Village  
Lahaina, Hawaii 96761

RE: Draft Environmental Assessment (EA) for the Olowalu Subdivision, West Maui

Dear Linda,

Thank you for your February 7, 2000 letter and your comments regarding native plants and wildlife in the Olowalu area. Your interest in native issues plus the fact that you walk the land practically every day is undoubtedly an asset. As discussed, we will send your letter and this response to Ed Henry of the Land Division at the State Department of Land and Natural Resources. They are the reviewing agency for the Environmental Assessment.

As you know, Anna Palomino of Ho'olawa Farms is our consultant regarding native plants. Our intent is that native and Polynesian introduced plants will be the dominant plant material in the areas we consider public in nature (greenways, cultural reserve, roadways, beach reserve). Although the plants you mentioned were not noted in the botanical survey, we would expect that they will be included in any one or more of these public areas.

Regarding wildlife, we have consulted with the State Department of Forestry and Wildlife (DOFAW) and will be working with them on a mitigation plan for the existing wildlife and future wildlife that might occasion the Olowalu area. The Hawaiian Coot and Nene recordings have been documented before but the other wildlife you mention will be included in any mitigation plan. I will extend to DOFAW your willingness to help in any way in identifying the location of any wildlife sightings.

BERNARD J. CAYetano  
GOVERNOR



LOUJANE H. AKIBA  
DIRECTOR  
LEONARD AGON  
DEPUTY DIRECTOR

(11)

STATE OF HAWAII FEB 11 P137  
DEPARTMENT OF LABOR AND INDUSTRIAL RELATIONS  
100 PUNCHBOWL STREET  
HONOLULU, HAWAII 96813  
COMMUNICATIONS SECTION

February 10, 2000

Thank you again for your comments. Please feel free to call me at 877-2434 if you have any questions.

Yours truly,

Robert L. Horcjo  
Project Manager

Cc: Ed Henry-Land Division, DLNR  
John Min, Director, Maui County Planning Department  
Mike Munekiyo, Munekiyo, Arakawa & Hiraga, Inc.

Ms. Colleen Suyama  
Staff Planner  
Department of Planning  
County of Maui  
250 South High Street  
Wailuku, Hawaii 96793

Dear Ms. Suyama:

Thank you for providing us the opportunity to comment on the Special Management Area Use Permit Application for Subdivision of Olowalu Lands. The Department of Labor and Industrial Relations (DLIR) has reviewed the document and has no comments to offer.

If you have any questions or need additional information, please call Ms. Naomi Harada, Chief of DLIR's Research and Statistics Office, at (808) 586-8999.

Very truly yours,

Loujane H. Akiba  
Director

ID: SA11 90021  
TRAC: 4-4-003.5.10.41-70.73-82, and 84,  
4-4-004: 11-18



FEB 17 2000



STATE OF HAWAII  
DEPARTMENT OF LAND AND NATURAL RESOURCES  
LAND DIVISION  
P.O. BOX 571  
HONOLULU, HAWAII 96809

FEB 16 12:33

AGRICULTURE DEVELOPMENT  
PROGRAM  
ADULT RESOURCES  
COUNSELING  
COMMUNITY AND  
RESOURCES ENRICHMENT  
CONSUMER  
COUNSELING  
COURT REPORTING AND INTERPRETING  
LAND DIVISION  
LAND MANAGEMENT  
NATURAL RESOURCES MANAGEMENT

February 15, 2000 DEPT OF PLANNING  
COUNTY OF MAUI  
RECEIVED

LD-NAV  
Ref.: SM1000021.RCM

Honorable John E. Min  
Planning Director  
County of Maui  
Planning Department  
250 S. High Street  
Wailuku, Hawaii 96793

Dear Mr. Min:

SUBJECT: Olowalu Lands Subdivision I.D. SM1 990021  
THK: 4-8-003: 5, 10, 41-70, 73-82 and 84, 4-8-004: 11-16

Thank you for the opportunity to review and comment on the subject matter.

Attached herewith is a copy of our Land Division Engineering Branch's comments on the proposed project. The Department has no other comments to offer on this matter at this time.

Should you have any questions, please feel free to contact Nicholas Vaccaro of the Land Division's Support Services Branch at 808-587-0438.

Very truly yours,

*Dean Y. Uchida*  
DEAN Y. UCHIDA  
Administrator

C: Maui District Land Office

ENGINEERING BRANCH

**COMMENTS**

Project must comply with rules and regulations of the National Flood Insurance Program (NFIP) and all applicable County Flood Ordinances. If there are any questions regarding the NFIP, please contact the State NFIP Coordinator, Sterling Yong, of the Department of Land and Natural Resources at 587-0248. If there are questions regarding flood ordinances, please contact the applicable County representative.

We confirm that the project site, according to FEMA Community - Panel Nos. 150003 0227 B and 150003 0229 B is located in Zones AO, B and C. Zone AO is an area subject to the following conditions:

1. 100-year shallow flooding where depths are between one (1) and three (3) feet.
2. Average depths of inundation are shown, but no flood hazard factors are determined.

Zone B is an area subject to either one of the following conditions:

1. Areas between limits of the 100-year flood and 500-year flood.
2. Certain areas subject to 100-year flooding with average depths less than one (1) foot or where the contributing drainage area is less than one square mile.
3. Areas protected by levees from the base flood.

Zone C is an area of minimal flooding.

Please conduct a detailed drainage analysis (of the land to be developed), by addressing the retention/recharge system's ability to decrease the post-development peak discharges to pre-development levels.

OlowachM2.doc

MAR 01 2000

Maul Electric Company, Ltd. • 211 West Kamekumaha Avenue • PO Box 398 • Kailua, Hawaii, HI 96733-6698 • (808) 871-4461

FEB 23 2000

Olowalu Elua Associates, LLC  
173 Ho Olowalu Street • Suite 201  
Kailua, HI • 96732

Phone 808-877-2434  
Fax 808-877-9409



TO FEB 18 P12:48

DEPT OF PLANNING  
COUNTY OF HAWAII  
RECEIVED

February 29, 2000

Dean Y. Uchida, Administrator  
Land Division  
Department of Land and Natural Resources  
P.O. Box 621  
Honolulu, Hawaii 96809

RE: Olowalu Lands Subdivision, I.D. No. SM1 990021


Dear Mr. Uchida,

We have received a copy of your February 25, 2000 letter to John E. Min forwarding the comments of the Engineering Branch on the subject project.

We appreciate the transmittal of flood insurance information as it relates to the project. The intent is to comply with all applicable County flood ordinances and prepare a detailed drainage report for submittal with construction plans for the project.

If you have any questions, please feel free to call me at 877-2434.

Very truly yours,

  
Robert L. Horcajo  
Project Manager

CC: John E. Min, County Department of Planning  
Eric Yamashige, Ronald M. Fukumoto Engineering, Inc.  
Michael Munekiyo, Munekiyo, Arakawa and Hiraga, Inc.

February 18, 2000

Mr. John E. Min  
Planning Director  
Maui Planning Department  
250 S. High Street  
Waiuku, HI 96793

Dear Mr. Min:


Subject: Olowalu Lands Subdivision  
TMK: 4-8-003-5, 10, 41-70, 73-82 and 84, 4-8-002-11-16  
I.D.: SM1 990021

Thank you for allowing us to comment on the subject project.

In reviewing the information transmitted and our records, we have no objection to the subject project. Due to the significant size of the overall project, it will have a definite impact to our system and related planning. We encourage the developer's electrical consultant to meet with us as soon as practical to verify the project's electrical requirements so that service can be provided on a timely basis.

If you have any questions or concerns, please call Dan Takahata at 871-2385.

Sincerely,

  
Edward L. Reinhardt  
Manager, Energy Delivery



## University of Hawai'i at Mānoa

Environmental Center  
A Unit of the Natural Resources Research Center  
2150 Campus Road - Chancellors 317 - Honolulu, Hawaii 96822  
Telephone: (808) 958-7481 • Facsimile: (808) 958-3000

March 23, 2000  
EA: 00203

Mr. John E. Min  
Director  
County of Maui, Department of Planning  
250 South High Street  
Wailuku, HI 96793

Dear Mr. Min:  
Special Management Area Use Permit  
Environmental Assessment  
Subdivision of Olowalu Lands  
Olowalu, Maui, Hawaii

Olowalu Ehas Associates, LLC proposes the consolidation and re-subdivision of lands at Olowalu, Maui, Hawaii. Including installation of 760 linear feet of wetland within the Conservation District, installation of waterline and other utilities crossing Honouliuli Highway and Consolidation of marua and makai parcels affecting Conservation District lands.

This review was prepared with the assistance of Charles Fletcher, Geology and Geophysics, and Jolie Wanger, UH Environmental Center.

### General Comments

Land in the Olowalu region of west Maui were formerly under single ownership, Pioneer Mill Company, Inc. and has been recently divided among several separate developers. We are now seeing the first of what might be several proposed users of the former sugar cane plantation lands. We believe it will be in the best interest of Maui County to have the Pioneer Mill's owners develop a master plan for the use of its properties now that they will no longer be used for sugar cane cultivation. A master plan would help address the cumulative impacts caused by the shift in land uses.

We found the Special Management Area use permit application to be thorough in the areas it covered. The discussions on vegetation and archeological sites are very complete. One concern our reviewers had in regards to this SMA permit was that it did not discuss the ultimate use(s) of the 41 agricultural lots. It is not clear from the SMA permit or the draft environmental assessment whether the lots are intended to be sold to farmers to be used for small-scale agriculture or to be sold as estates. The SMA permits seems to be focused on the re-subdivision of the land rather than its ultimate use. It is imperative to know how the land will be

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Mr. Min  
March 24, 2000  
P. 2

used after it is sold to individual buyers in order to determine the significance of environmental impacts.

We would also like to know what uses are allowed under the county's Agricultural District zoning provisions. Is there a minimum lot size and can the land be further subdivided if there is land in excess of the minimum lot size? We would like to see a more detailed discussion of the intended use of the land.

### Marine Resources

While the discussion of vegetation is quite thorough, there is no discussion of possible marine resource impacts of the proposed development along the Olowalu shoreline area. Important reef areas exist offshore of Olowalu and need to be considered in any proposed development. Development inevitably leads to some impact on the reef due to sedimentation caused by drainage and runoff. None of the enclosed maps clearly show the shoreline or include coastal resources. We found the analysis to be focused mainly on land-oriented issues with little reference to ocean issues.

It appears that the government beach preserve along the shoreline may provide an adequate buffer from the shoreline, however, lots 3 & 4 don't appear to have such a buffer and considering the sensitive offshore reef ecosystem, developers should take extraordinary measures to preserve water quality and clarity during construction (e.g. prevent all runoff and siltation into the coastal waters). It is of general concern that any development along the shoreline is highly probable to cause a loss of permeability due to paving the surface, which causes rainfall to run off in sheet flow instead of drain into the ground.

### Coastal Erosion and Shoreline Change

There is no analysis of the potential of the makai portion of the proposed development to impact shoreline erosion. Development too close to the shoreline has exacerbated shoreline erosion in other areas of Maui. Will there be adequate buffers between any structures built on the makai lots and the shoreline to insure that accelerated erosion will not occur?

### Flood and Tsunami Hazards

It should be mentioned that the entire Olowalu area is probably characterized by flash flood events over the last hundreds of thousands of years; and, there is geological concern that the Olowalu stream could be subject to such flooding during high rainfall events, which aren't within the statistical realm of prediction.

### Existing and Surrounding Land Uses

We question the statement on page 50 that the "proposed subdivision is not contrary to the existing and surrounding lands." The land was formerly used for sugar cane production and is now fallow. Depending on the type of development that will occur on the 41 separate parcels

Mr. Min  
March 24, 2000  
P. 3

after their sale to individuals, there may be a change in land uses from agriculture to residential. Although the residences may be widely dispersed, they would still present a different "look" than the present land use.

#### Community-Based Non-Profit

At several points in the document, reference is made to a community-based non-profit organization, which will manage activities in cultural reserve. Is this an existing organization or will one be created for the express purpose of managing the reserve? If it is yet to be created, what are the criteria that will be used in organizing this group?

#### Conclusion

We found that the subject matter covered by this document was very well done. There were several topics that did not receive meaningful treatment or were left out of the document entirely. These topics include the ultimate use of the agricultural lots, the impacts on marine resources, and the potential for shoreline erosion. We would like to see these topics discussed in the final document. We would also like to know how the community-based non-profit will manage the cultural reserve.

Thank you for the opportunity to comment on the Special Management Area Use Permit application and Draft Environmental Assessment.

Sincerely,



Peter Rappa  
Environmental Review Coordinator

Cc: Jim Moncur, WRRC  
OEQC  
Michael Munekeyo, Munekeyo, Arabawa & Hinga, Inc.  
Bob Homjo, Olowalu Elua Associates, LLC  
Ed Henry, DLNR  
Colleen Suyama, Staff Planner, Maui DOP  
Charles Fletcher, UH Geology & Geophysics  
Jolie Wangler, Environmental Center

MAR 30 2000

### Olowalu Elua Associates LLC

173 Ho'ouma Street - Suite 201  
Kaua'i, HI 96732

Phone 808-877-2434  
Fax 808-877-9409

March 28, 2000

Mr. Peter Rappa  
Environmental Review Coordinator  
Environmental Center  
University of Hawaii at Manoa  
2550 Campus Road, Crawford Hall 317  
Honolulu, Hawaii 96822

RE: Special Area Management Use Permit; Environmental Assessment;  
Subdivision of Olowalu Lands; Olowalu, Lahaina, Maui

Dear Mr. Rappa:

We have received a copy of your March 23, 2000 letter to John E. Min of the County of Maui Department of Planning regarding the subject application and would like to take this opportunity to respond.

#### General Comments

As you know, Pioneer Mill Company, Inc. sold its Olowalu land holdings to Olowalu Elua Associates, LLC (OEA). Other land holdings at Launiupoko, Kausaula, and Ukumehame have also been sold to other entities. Although sugar cultivation has been discontinued, our understanding is that Pioneer Mill Company, Inc. is continuing its experimentation with diversified agriculture crops. Coffee, seed corn and sweet corn are being grown in the Kaanapali area.

With regard to Olowalu lands, as well as other lands at Launiupoko, Kausaula and Ukumehame, most of the area is currently zoned County Agricultural District. As such, any development in these areas must comply with applicable provisions. Principal uses allowed in the County Agricultural District include:

1. Agriculture;
2. Agricultural land conservation;
3. Agricultural parks, pursuant to Chapter 171, HRS;
4. Animal and livestock raising, including animal feed lots and sales yards;



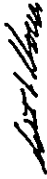


customary practices within a traditional "ocean to mountain"  
ahapua'a land system."

The activities within the cultural reserve will be dictated by the OCR but within the bounds of their mission statement. The board of OCR is currently completing the strategic plan for the cultural reserve which would formalize any planned activities to include a projected implementation program.

Thank you for your interest and comments regarding the proposed action.

Yours truly,



Robert L. Horcajo  
Project Manager

Cc: John Min, Department of Planning  
Michael Munekiyo, Munekiyo, Arakawa & Hiraga, Inc.

05 04 2000 10:10:10 AM

# ***References***

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### References

AECOS, Inc., Maui Coastal Zone Atlas, 1981.

Char & Associates, Botanical Survey, Olowalu Lands, Lahaina District, Maui, March 1999.

Commission on Water Resource Management, and State of Hawaii Department of Land and Natural Resources, Maui County Water Use and Development Plan, Review Draft, February 1992.

Community Resources, Inc., Maui County Community Plan Update Program Socio-Economic Forecast, January 1994.

County of Maui, The General Plan of the County of Maui 1990 Update, 1990.

County of Maui, West Maui Community Plan, February 1996.

County of Maui, Office of Economic Development, Maui County Data Book 1996-97, July 1997.

Department of Geography, University of Hawaii, Atlas of Hawaii, Second Edition, 1983.

Federal Emergency Management Agency, Flood Insurance Rate Map, Panels 227, 229, and 235 of 400, Effective Date: June 1, 1981.

Kaufman, Gregory Dean, and Forestell, Paul Henry, Hawaii's Humpback Whales - A Complete Whale Watchers' Guide, 1986.

Land Study Bureau, Detailed Land Classification - Island of Maui, May 1997.

Mink, John F. and L. Stephen Lau, Aquifer Identification and Classification for Maui: Groundwater Protection Strategy for Hawaii, Technical Report No. 185, done for the Water Resources Research Center, February 1990.

Mobley, Joseph R., Jr., Ph.D., Forestell, Paul H., Ph.D., and Grotefendt, Richard, Results of 1993 Aerial Surveys in Hawaiian Waters, February 20, 1994.

National Park Service, Hawaii Stream Assessment: A Preliminary Appraisal of Hawaii's Stream Resources, Report R84, Prepared for Commission on Water Resource Management, December 1990.

Shallenberger, Robert J., Ph.D., An Ornithological Survey of Hawaiian Wetlands, by Ahuimanu Productions for U.S. Army Engineer District, Honolulu, December 1977. Volumes I and II.

Stearns, Harold T., Geology of the State of Hawaii, 1966.

U.S. Department of Agriculture, Soil Conservation Service, Soil Survey of Islands of Kauai, Oahu, Maui, Molokai and Lanai, State of Hawaii, August 1972.

# ***Appendices***

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# ***Appendix A***

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***Botanical Survey***

**BOTANICAL SURVEY**

- 2) inventory the flora;
- 3) search for threatened and endangered species as well as species of concern; and
- 4) identify areas of potential environmental problems or concerns and propose appropriate mitigation measures.

**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, soil maps, and a recent colored aerial photograph were examined to determine vegetation cover patterns, terrain characteristics, access, boundaries, and reference points. Access was from along the network of cane haul roads which criss-cross the property; the roads provided entry to all parts of the study area.

**BOTANICAL SURVEY  
OLOWALU LANDS  
LAHAINA DISTRICT, MAUI**

by

**Winona P. Char  
CHAR & ASSOCIATES  
Botanical Consultants  
Honolulu, Hawaii**

A walk-through (pedestrian) survey method was used. Notes were made on plant associations and distribution, substrate types, drainage, exposure, disturbances, topography, 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. The less disturbed, uncultivated areas such as the steeper slopes along the northwestern boundary, the coastline, and the stream area were more intensively surveyed as these portions of the property were more likely to harbor native plant communities and, perhaps, rare plants. No survey was made of the residential and recreational camp areas or the former plantation village area.

Prepared for: OLOWALU ELUA ASSOCIATES, LLC

The species recorded are indicative of the season ("rainy" vs.

March 1999

"dry") and the environmental conditions at the time of the survey. A survey taken at a different time of the year and under varying environmental conditions would no doubt yield slight variations in the species list, especially of the weedy, annual plants.

#### DESCRIPTION OF THE VEGETATION

Five general vegetation types are recognized on the Olowalu Lands project site. These are the coastal vegetation, sugar cane fields, irrigation system vegetation, gulch vegetation, and the kiawe/buffelgrass community. An inventory of the plant species found within these vegetation types is presented at the end of the report.

No survey was made of the developed residential areas and the former, now overgrown, plantation camp site behind the store and restaurant. A very large tree (Ficus religiosa), which is on the Maui County's exceptional trees' list, is located mauka of the store, near a water tank.

#### Coastal Vegetation

Coastal vegetation occurs as a narrow band along the seaward front of the makai parcel. Immediately behind this narrow band of vegetation are the actively cultivated sugar cane (Saccharum officinarum) fields. A few homes including the plantation manager's house and a church-run camp are also found along the coastline.

On the western half of the makai parcel, the beaches consist of rounded, waterworn basalt and bleached coral rubble. In places, a few pockets of grayish-colored, fine sand are found along the black and white colored cobble beaches. The coastal vegetation on this type of substrate consists of low, scattered mats of pohuehue

or besch morning glory (Ipomoea pes-caprae) with clumps of buffelgrass (Cenchrus ciliaris), a few small wind-pruned trees of kiawe (Prosopis pallida) and 'opiuma (Pithecellobium dulce), and small mixed patches of swollen fingergrass (Chloris barbata), 'uhaloa (Waltheria indica), koa haole (Leucaena leucocephala), and sourbush (Pluchea carolinensis). Where the Olowalu Stream nears the ocean, there is a berm of basalt boulders and coral rubble. A small pond surrounded by scattered patches of Australian saltbush (Atriplex semibaccata) and a few shrubs of hau (Hibiscus tiliaceus) and sourbush are found here.

Along the eastern half of the makai parcel, the substrate along the coastline is primarily grayish colored, fine sand with scattered pockets of cobble beach. Kiawe trees form a dense belt along the coastline down to the water's edge. Vegetation under the trees is sparse due to the heavy shade and consists of small patches of sourbush, buffelgrass, Bermuda grass (Cynodon dactylon), Australian saltbush, etc., along the margins of the treeline. Near the plantation manager's house, there are a few trees of monkeypod (Samanea saman) and Livistona sp. tucked in among the kiawe trees.

#### Sugar Cane Fields

The sugar cane fields occur on level to moderately sloping, well-drained soils on alluvial fans and stream terraces. The soils on the site belong primarily to the Pulehu and Waine'e soil series (Foote et al. 1972).

The fields of sugar cane in various stages of cultivation or growth cover the majority of the property. Recently harvested fields support a few patches of weedy species such as Bermuda grass, nutgrass (Cyperus rotundus), Boerhavia coccinea, 'uhaloa, swollen fingergrass, castor bean (Ricinus communis), and hairy horseweed



(Coryza bonariensis). Some fallowed fields support a few seedlings of kiawe, 'opiuma, and koa haole, especially along the margins of the fields.

Within the fields which have been planted, the rapidly growing sugar cane plants tend to shade out and exclude other species. Only the nutgrass has adapted well to growing under the sugar cane plants. Most of the other weedy species are found along the margins of the fields where there is more light available. Some of the more frequently observed species found here include little bell or pink bindweed (Ipomoea triloba), buffelgrass, Guinea grass (Panicum maximum), Natal redtop grass (Melinis repens), hairy spurge (Chamaesyce hirta), Mexican fireweed (Euphorbia heterophylla), and coat buttons (Tridax procumbens).

#### Irrigation System Vegetation

This vegetation type occupies only a small portion of the project site and is associated with the irrigation ditches, reservoirs, and small overflow areas. A number of plant species are restricted to or are more abundant along the irrigation system.

Along the walls of the ditches, tussocks of moss and small clumps of ferns and mostly annual species are found. These include hairy sword fern (Nephrolepis multiflora), pteris (Pteris vittata), Maui pamakani (Ageratina riparia), Fimbristylis dichotoma, molasses grass (Melinis minutiflora), and rabbit'sfoot grass (Polypogon monspeliensis). A number of wetland indicator species such as primrose willow or kamole (Ludwigia octovalvis), Job's tears (Coix lachryma-jobi), California grass (Brachilaria mutica), honohono (Commelina diffusa), and jungle rice (Echinochloa colona) also occur here.

The reservoirs on the site are ringed by a dense scrub composed of koa haole, California grass, castor bean, a few trees of Java plum (Syzygium cumini) and 'opiuma, and a varied assortment of weedy species. Elodea (Egeria densa), a submerged aquatic flowering plant, is abundant in the two larger reservoirs. Ducks and other waterbirds eat the plants. The two larger reservoirs provide feeding and nesting habitat for the endangered 'Alae Ke'oke'o or Hawaiian Coot (Fulica americana alai).

#### Gulch Vegetation

In most places along the Olowalu Stream gulch, there is a dense forest; this can be easily seen on the aerial photograph. For about a third of its length, where the gulch enters the property on the mauka end near a flume and down past Kilea pu'u, the vegetation along the gulch is composed of large trees of 'opiuma, 45 to 50 ft. tall and 2 to 3 ft. in diameter. Along the lower two-thirds of the gulch, the vegetation is a mix of tall kiawe trees and 'opiuma trees with smaller scattered stands of Java plum. In places, the kiawe may be locally abundant.

Scattered here and there along the stream banks are a few trees of kukui nut (Aleurites moluccana). Other woody components found occasionally on the gulch floor include Chinaberry (Melia azedarach), koa haole, lantana (Lantana camara), Guava (Psidium guajava), kolomona (Senna surattensis), and sourbush. Ground cover is somewhat open and patchy with sourgrass (Digitaria insularis) and panicgrass (Panicum maximum var. trichoglume) in the shadier areas, and buffelgrass in the sunnier, open areas. The native 'ilic'e (Plumbago zeylanica), a sprawling shrub with clusters of white flowers, can be found in the rockier areas along the gulch.

The stream along the gulch bottom is dry except for where it

enters the property and is diverted into the irrigation system. Waterworn stones and boulders with pockets of barren soil characterize the bottom of the stream. In a few places, the damp and shaded banks support clumps of hairy sword fern, wood-fern (*Christella parasitica*), gold fern (*Pityrogramma calomelanos*), pteris, Australian maidenhair (*Adiantum hispidulum*), maidenhair fern (*Adiantum raddianum*), and mosses.

#### Kiawe/Bufelgrass Community

The uncultivated areas along the mauka boundary of the project site support a kiawe/buffelgrass plant community or vegetation type. These areas were grazed in the past as there are old fence lines where it adjoins the sugar cane fields. This plant community occurs on stony alluvial land ("rSM" on the soil maps -- Foote et al. 1972), rock land ("rRK"), and rock outcrop ("rRO").

Where this plant community abuts the sugar cane fields in areas with deeper soils, the kiawe trees are 20 to 30 ft. tall and form a somewhat closed-canopy forest with tree cover about 60%. Buffelgrass occurs as a dense cover, 2 to 3 ft. tall, between the trees. Prickly shrubs of lantana are common in these areas.

In the areas with rock outcrop and rock land, the kiawe trees are more widely spaced, about 10 to 30% tree cover, and are 5 to 20 ft. tall. The buffelgrass cover is somewhat patchy and rocky outcroppings are frequent. Scattered shrubs of koa haole and klu (*Acacia farnesiana*) are frequently observed. Rocky outcroppings support native plants such as pill grass (*Heteropogon contortus*), 'a'ali'i (*Dodonaea viscosa*), 'ilima (*Sida fallax*), and 'uhaloa. A few trees of wiliwili (*Erythrina sandwicensis*) also occur here. Other species which occur here in small numbers include virgate mimosa (*Desmanthus pernambucanus*), wild zinnia (*Zinnia peruviana*),

running pop (*Passiflora foetida*), bristly foxtail (*Setaria verticillata*), smooth rattletop (*Crotalaria pallida*), Natal redtop, and hairy merremia (*Merremia aegyptia*).

Kiles, a small rocky hill or pu'u (elevation 264 ft.) near Olowalu Stream, also is covered by a kiawe/buffelgrass community. The large rock faces on the western portion of the pu'u are noted for their large collection of petroglyphs. About three dozen plants of nehe (*Lipochaeta lavarum*), a native shrub with silvery gray leaves and large daisy-like flowers, is found on the northwestern slopes of Kiles. The native poppy or pua kala (*Argemone glauca*) is found near the summit of the pu'u.

#### DISCUSSION AND RECOMMENDATIONS

Between 85 to 90% of the project site is or has been under sugar cane cultivation, or has been used to support sugar cane related activities (plantation village, manager's residence, wharf facilities, etc.). The steeper kiawe and buffelgrass-covered slopes on the mauka portion of the property were used for grazing cattle at one time. On the uncultivated portions of the property, introduced species such as kiawe, buffelgrass, 'opiuma, koa haole, and lantana are the dominant components of the vegetation.

Of a total of 115 plant species inventoried on the Olowalu Lands project site, 94 (82%) are introduced or alien species; 5 (4%) are originally of Polynesian introduction; and 16 (14%) are native. Of the natives, 13 are indigenous, that is, they are native to the Hawaiian Islands and also elsewhere, and 3 are endemic, that is, they are native only to the Hawaiian Islands. The 3 endemic species are the nehe (*Lipochaeta lavarum*), wiliwili (*Erythrina sandwicensis*), and pua kala (*Argemone glauca*). None of

the plants inventoried on the site is a threatened and endangered species or a species of concern (U.S. Fish and Wildlife Service 1997). All of the plants can be found in similar dry, lowland habitats throughout the main Hawaiian Islands. A recent botanical survey for the Ma'alea to Lahaina 69 kv transmission line (Char 1993) included portions of the mauka parcel and recorded similar findings.

Present plans envision a nature study/cultural resources park for the Olowalu Stream gulch and Kilea pu'u. It is recommended that native plants which occur on the drier portions of west Maui be used for landscaping. These include the wiliwili, 'ilie'e, nehe, 'ilima, pua kala, etc., which already occur on the property. The two larger reservoirs should be retained since they provide habitat for the endangered 'Alae Ke'oke'o or Hawaiian Coot. The weedy scrub around the reservoirs should be replaced by native trees and shrubs, and bird observation stations can be set up around the reservoirs. The two large reservoirs are close to the gulch and can be easily incorporated into the nature study/cultural resources park.

#### LITERATURE CITED

- Char, W.P. (Char & Associates). 1993. Botanical survey, Ma'alea-Lahaina Third 69KV Transmission Line. Prepared for Demes & Moore, Honolulu.
- Evenhuis, N.L. and S.E. Miller, eds. 1995-1998. Records of the Hawaii Biological Survey. Bishop Museum Occasional Papers Nos. 41-56.
- Foote, D.E., E.L. Hill, S. Nakamura, and F. Stephens. 1972. Soil survey of the islands of Kauai, Oahu, Maui, Molokai, and Lanai, State of Hawaii. U.S. Department of Agriculture, Soil Conservation Service, Washington, D.C.
- Lamoureux, C.H. 1988. Draft checklist of Hawaiian pteridophytes from "Kupukupu O Hawai'i Ne'i". Lyon Arboretum, University of Hawai'i, Manoa.
- U.S. Fish and Wildlife Service. 1997. U.S. Fish and Wildlife Service species list, plants. September 25, 1997. Pacific Islands Ecoregion Office, Honolulu, HI.
- Wagner, W.L., D.R. Herbst, and S.H. Sohmer. 1990. Manual of the flowering plants of Hawai'i. 2 vols. University of Hawai'i Press and B.P. Bishop Museum Press, Honolulu. B.P. Bishop Museum Special Publication 83.

## PLANT SPECIES LIST -- Olovalu Lands

The following checklist is an inventory of all the plants observed on the project site during the field studies. The plant names are arranged alphabetically by families within each of three groups: Ferns, Dicots, and Monocots. The taxonomy and nomenclature of the Ferns follow Lamoureux (1988), while the flowering plants, Dicots and Monocots, are in accordance with Wagner *et al.* (1990). The few recent name changes for the flowering plants follow those reported in the Hawaii Biological Survey series (Evenhuis and Miller, eds., 1995-1998).

For each species, the following information 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:
  - E = endemic = native only to the Hawaiian Islands.
  - I = indigenous = native to the Hawaiian Islands and also 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 = plants originally of Polynesian introduction prior to Western contact, that is, Cook's discovery of the islands in 1778.
  - P? = questionably Polynesian = may be a Polynesian introduction or possibly introduced early in historical times (after 1778).
  - X = introduced or alien = all those plants brought to the Hawaiian Islands by humans, intentionally or accidentally, after Western contact.
  - X? = questionably introduced = date of introduction very early; may possibly be indigenous or of Polynesian introduction.

4. Presence (+) or absence (-) of a particular species within each of five vegetation types recognized on the project site (see text for discussion):

c = Coastal Vegetation  
s = Sugar Cane Fields  
i = Irrigation System Vegetation  
g = Gulch Vegetation  
k = Kiawe/Bufelgrass Community

<u>Scientific name</u>	<u>Common name</u>	<u>Status</u>	<u>Vegetation type</u>				
			<u>c</u>	<u>s</u>	<u>i</u>	<u>g</u>	<u>k</u>
<b>FERNS</b>							
ADIANTACEAE (Maidenhair fern family)							
Adiantum hispidulum Sw.	Australian maidenhair	X	-	-	-	+	-
Adiantum raddianum Presl	maidenhair fern, 'iwa'iwa	X	-	-	-	+	-
HEMIONITIDACEAE (Gold fern family)							
Pityrogramma calomelanos (L.) Link	gold fern	X	-	-	-	+	-
NEPHROLEPIDACEAE (Sword fern family)							
Nephrolepis multiflora (Roxb.) Jarrett ex Morton	hairy sword fern, 'okupukupu	X	-	-	+	+	-
PTERIDACEAE (Pteris family)							
Pteris vittata L.	pteris	X	-	-	+	+	-
THELYPTERIDACEAE (Wood-fern family)							
Christella parasitica (L.) Levl.	wood-fern	X	-	-	+	+	-
<b>FLOWERING PLANTS</b>							
<b>DICOTS</b>							
AMARANTHACEAE (Amaranth family)							
Amaranthus spinosus L.	spiny amaranth, paka'i kuku	X	-	-	+	-	-
ANACARDIACEAE (Mango family)							
Mangifera indica L.	mango, manako	X	-	-	+	-	-
ASTERACEAE (Daisy family)							
Ageratina adenophora (Spreng.) R. King & H. Robinson	Maui pamakani, pamakani haole	X	-	-	+	-	-
Ageratina riparia (Regel) R. King & H. Robinson	Hamakua pamakani	X	-	-	+	+	-
Ageratum conyzoides L.	maile hohono	X	-	+	+	+	-

<u>Scientific name</u>	<u>Common name</u>	<u>Status</u>	<u>Vegetation type</u>				
			<u>c</u>	<u>s</u>	<u>i</u>	<u>g</u>	<u>k</u>
Bidens cynapiifolia Kunth	West Indian beggar's tick	X	-	-	+	+	-
Bidens pilosa L.	Spanish needle, ki, ki nehe	X	-	-	+	+	-
Conyza bonariensis (L.) Cronq.	hairy horseweed, ilioha	X	-	+	-	+	-
Eclipta prostrata (L.) L.	false daisy	X	-	+	+	-	-
Emilia fosbergii Nicolson	pualele	X	-	+	+	+	-
Lipochaeta lamarum (Gaud.) DC	nehe	E	-	-	-	+	+
Pluchea carolinensis (Jacq.) G. Don	pluchea, sourbush	X	+	+	+	+	-
Pluchea indica (L.) Less.	Indian pluchea, Indian fleabane	X	+	-	+	-	-
Sonchus oleraceus L.	sowthistle, pualele	X	-	-	+	+	-
Synedrella nodiflora (L.) Gaertn.	nodeweed	X	-	-	+	+	-
Tridax procumbens L.	coat buttons	X	-	+	+	+	-
Zinnia peruviana (L.) L.	wild zinnia	X	-	+	-	-	+
BATACEAE (Saltwort family)							
Batis maritima L.	pickleweed, 'akulikuli kai	X	+	-	-	-	-
BORAGINACEAE (Heliotrope family)							
Heliotropium curassavicum L.	kipukai, nena	I	+	-	-	-	-
BUDDLEIACEAE (Butterfly bush family)							
Buddleia asiatica Lour.	dog tail, hualo 'i'io	X	-	-	+	-	-
CHENOPODIACEAE (Goosefoot family)							
Atriplex semibaccata R. Br.	Australian saltbush	X	+	-	-	-	-
Chenopodium murale L.	'ahe'hea	X	-	-	-	-	+
CONVOLVULACEAE (Morning glory family)							
Ipomoea alba L.	moonflower, koali pehu	X	-	-	+	+	-
Ipomoea indica (J. Burm.) Merr.	koali 'awahie, koali 'awa	I	-	-	+	+	-
Ipomoea pes-caprae ssp. brasiliensis (L.) Oosttr.	pohuehue, beach morning glory	I	+	-	-	-	-
Ipomoea triloba L.	little bell	X	-	+	-	-	-
Merremia aegyptia (L.) Urb.	hairy merremia, koali kua hulu	X?	-	+	+	-	+

Scientific name	Common name	Status	Vegetation type					
			c	s	i	g	k	
<b>CUCURBITACEAE (Gourd family)</b>								
<i>Lagenaria siceraria</i> (Molina) Standl.	squash	X	-	-	-	+	-	
<i>Momordica charantia</i> L.	wild bittermelon, balsam pear	X	-	-	+	+	-	
<b>EUPHORBIACEAE (Spurge family)</b>								
<i>Aleurites moluccana</i> (L.) Willd.	kukui, tutui	P	-	-	+	+	-	
<i>Chamaesyce hirta</i> (L.) Millsp.	hairy spurge, garden spurge, koko kahiki	X	-	+	+	-	-	
<i>Chamaesyce hypericifolia</i> (L.) Millsp.	graceful spurge	X	-	+	-	-	+	
<i>Chamaesyce hyssopifolia</i> (L.) Small	Mexican fireweed, kaliko	X	-	+	-	-	-	
<i>Euphorbia heterophylla</i> L.	castor bean, koi	X	-	+	+	+	+	
<i>Ricinus communis</i> L.								
<b>FABACEAE (Pea family)</b>								
<i>Acacia farnesiana</i> (L.) Willd.	klu	X	-	-	+	-	+	
<i>Chamaecrista nictitans</i> (L.) Moench	partridge pea, lauki	X	-	+	-	+	-	
<i>Crotalaria pallida</i> Aiton	smooth rattlepod, pikakani	X	-	+	+	-	+	
<i>Desmanthus pernambucanus</i> (L.) Thellung	virgate mimosa, slender mimosa	X	-	+	+	+	+	
<i>Desmodium cajanifolium</i> (Kunth) DC		X	-	+	+	-	-	
<i>Desmodium tortuosum</i> (Sw.) DC	Florida beggarweed	E	-	-	-	-	+	
<i>Erythrina sandwicensis</i> Degener	willwill	X	-	+	-	-	-	
<i>Erythrina variegata</i> L. cv. "Tropic Coral"		X	+	+	+	+	+	
<i>Leucaena leucocephala</i> (Lam.) de Wit	koa haole, ekoa	X	-	+	+	-	-	
<i>Macroptilium latyroides</i> (L.) Urb.	wild bean, cow pea	X	+	+	+	+	+	
<i>Pithecellobium dulce</i> (Roxb.) Benth.	'opiuma	X	+	+	+	+	+	
<i>Prosopis pallida</i> (Humb. & Bonpl. ex Willd.) Kunth	kiawe, algaroba	X	+	+	+	+	+	
<i>Samanea saman</i> (Jacq.) Herr.	monkeypod	X	+	-	-	-	-	
<i>Senna surattensis</i> (N.L. Burm.) H. Irwin & Barneby	kolomona, kalamona	X	-	-	-	+	+	
<b>LAMIACEAE (Mint family)</b>								
<i>Hyptis pectinata</i> (L.) Pott.	comb hyptis	X	-	-	+	-	-	
<i>Leonotis nepetifolia</i> (L.) R. Br.	lion's ear	X	-	-	-	+	-	
<i>Salvia occidentalis</i> Sw.	West Indian sage	X	-	-	-	+	-	

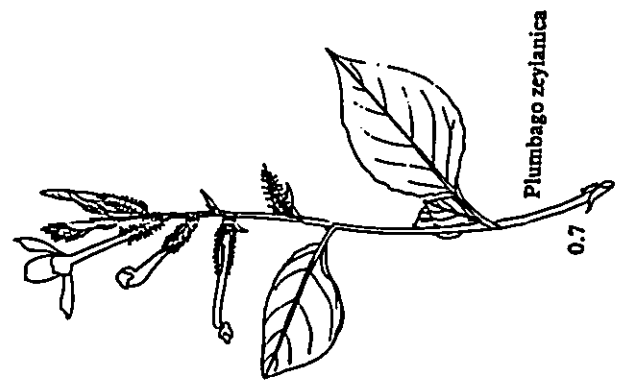
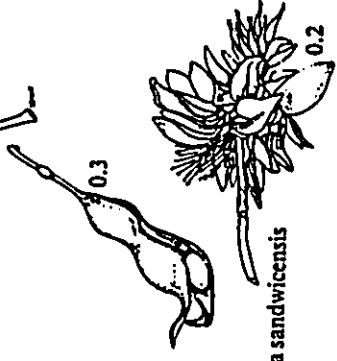
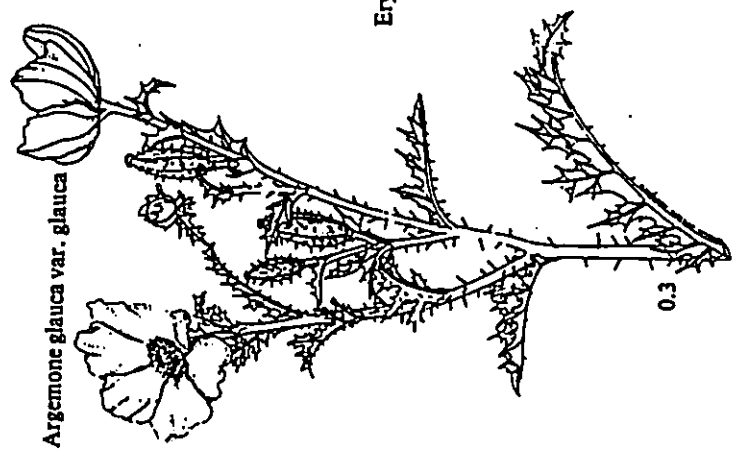
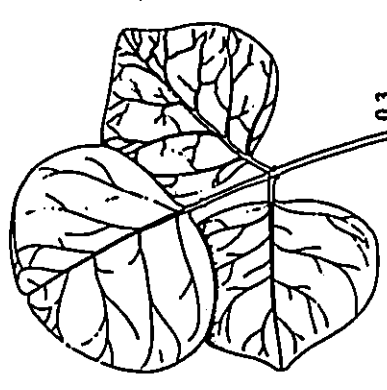
Scientific name	Common name	Status	Vegetation type					
			c	s	i	g	k	
<b>MALVACEAE (Mallow family)</b>								
<i>Abutilon grandifolium</i> (Willd.) Sweet	hairy abutilon, ma'o	X	-	+	+	+	+	
<i>Hibiscus tiliaceus</i> L.	hau	I?	+	-	-	-	-	
<i>Malvastrum coromandelianum</i> (L.) Garcke	false mallow	X	-	-	+	+	-	
<i>Sida acuta</i> ssp. <i>carpinifolia</i> (L.f.) Borssum Waalkes	acute-leaved sida	X	-	-	-	+	-	
<i>Sida fallax</i> Walp.	'ilima	I	-	-	+	-	+	
<i>Sida rhombifolia</i> L.	Cuba jute	X	-	+	-	-	-	
<i>Thespesia populnea</i> (L.) Sol. ex Correa	milo	I?	+	-	-	-	-	
<b>MELIACEAE (Mahogany family)</b>								
<i>Melia azedarach</i> L.	Chinaberry, pride-of-India, 'infa	X	-	-	-	+	-	
<b>MORACEAE (Mulberry family)</b>								
<i>Artocarpus altilis</i> (Parkins. ex Z) Fosb.	'ulu, breadfruit	P	-	+	-	-	-	
<b>MYRTACEAE (Myrtle family)</b>								
<i>Eucalyptus saligna</i> Sm.	Sydney blue gum	X	-	+	-	-	-	
<i>Eucalyptus</i> spp.	gum tree, eucalyptus, 'eukalikia	X	-	+	+	-	-	
<i>Psidium guajava</i> L.	guava, kuawa	X	-	+	+	+	+	
<i>Syzygium cumini</i> (L.) Skeels	Java plum	X	+	+	+	+	+	
<b>NYCTAGINACEAE (Four-o'clock family)</b>								
<i>Boerhavia coccinea</i> Mill.	alena	X	-	+	+	-	-	
<i>Boerhavia glabrata</i> Blume		I	-	-	-	-	+	
<b>ONAGRACEAE (Evening primrose family)</b>								
<i>Ludwigia octovalvis</i> (Jacq.) Raven	primrose willow, kamole	P?	-	-	+	-	-	
<b>OXALIDACEAE (Wood sorrel family)</b>								
<i>Oxalis corniculata</i> L.	yellow wood sorrel, 'ihi 'ai	P?	-	-	-	+	-	
<b>PAPAVERACEAE (Poppy family)</b>								
<i>Argemone glauca</i> (Nutt. ex Prain) Pope	pua kala, kala, native poppy	E	-	-	-	-	+	



<u>Scientific name</u>	<u>Common name</u>	<u>Status</u>	<u>Vegetation type</u>				
			<u>c</u>	<u>s</u>	<u>l</u>	<u>g</u>	<u>k</u>
Saccharum officinarum L.	sugar cane, ko	X	-	+	-	-	-
Setaria verticillata (L.) P. Beauv.	bristly foxtail, mau'u pilipili	X	-	-	-	+	+
Tragus berteronianus Schult.	burgrass, goatgrass	X	-	+	-	-	-
ZINGIBERACEAE (Ginger family)							
Hedychium sp.	ginger	X	-	-	+	-	-

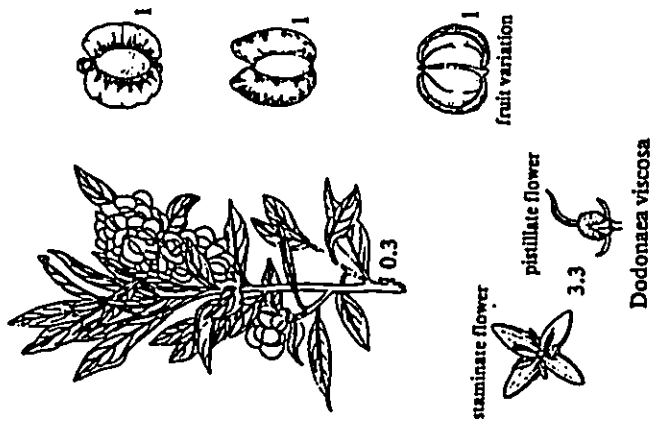


Argemone glauca var. glauca  
Erythrina sandwicensis  
Lipochaeta lamarum  
Plumbago zeylanica



From Wagner et al. (1990).

From Wagner et al. (1990).



*Dodonaea viscosa*

From Wagner et al. (1990).

2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100

# ***Appendix B***

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***Archaeological Inventory  
Survey for Mauka Area***

ARCHAEOLOGICAL INVENTORY  
SURVEY OF MAUKA PORTION OF  
OLOWALU DEVELOPMENT PARCEL  
PHASE 2  
OLOWALU AHUPUA'A, LAHAINA  
DISTRICT, MAUI ISLAND  
(TMK 4-8-3: 10)

ABSTRACT

Xamanek Researches carried out an archaeological reconnaissance survey of the overall project area during October 1998. Phase 1 of inventory level work was undertaken on the 73-acre *mauka* portion of the project area parcel during December 1998 and January 1999, and a draft report on this portion of the inventory survey was submitted in March 1999. The c. 660-acre *mauka* portion of the property was surveyed in March through May 1999, and comprises Phase 2 of the project. While sugarcane has been actively cultivated on much of the subject parcel, a total of 30 archaeological sites are present on the property. Six of these are known sites, while 24 had previously not been recorded.

The known cultural resources include Kawaialoa *heiau* (Site 50-50-08-04), the Olowalu Petroglyph Complex (Site 1200), the Olowalu Petroglyph Rock Shelter (Site 1201), the Hawaiian Protestant Church (Site 1603), an *ahupua'a* boundary wall (Site 3180), and a plantation era irrigation ditch (Site 3172).

The 28 previously unidentified sites include precontact and post-contact cultural resources, and were assigned SHP numbers 50-50-08-4699 through 4721, 4758, and 4820-4823. Precontact sites include rock overhang shelters, platforms, terraces, a petroglyph panel, possible burial mounds, a burial cave, Pu'u Kile'a burial ground, 2 *heiau*, a possible *lo'a*, permanent habitation features, remnant *taro to'i*, other agricultural features, boundary walls, surface scatters of human remains, a fishpond and subsurface marsh soils. Post-contact sites include a coffin burial associated with the Site 1603 stone church cemetery, a Japanese cemetery, retaining walls, property markers, an old hydro-generation facility, and a house platform. All of the cultural resources on the project area are deemed significant under Criterion "D" of the Federal and State historic preservation guidelines. In addition, several sites qualify for significance under multiple criteria. Recommended mitigation measures range from no further work for a few post-contact sites, to data recovery and preservation.

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July 23, 1999  
(Revised February 2, 2000)

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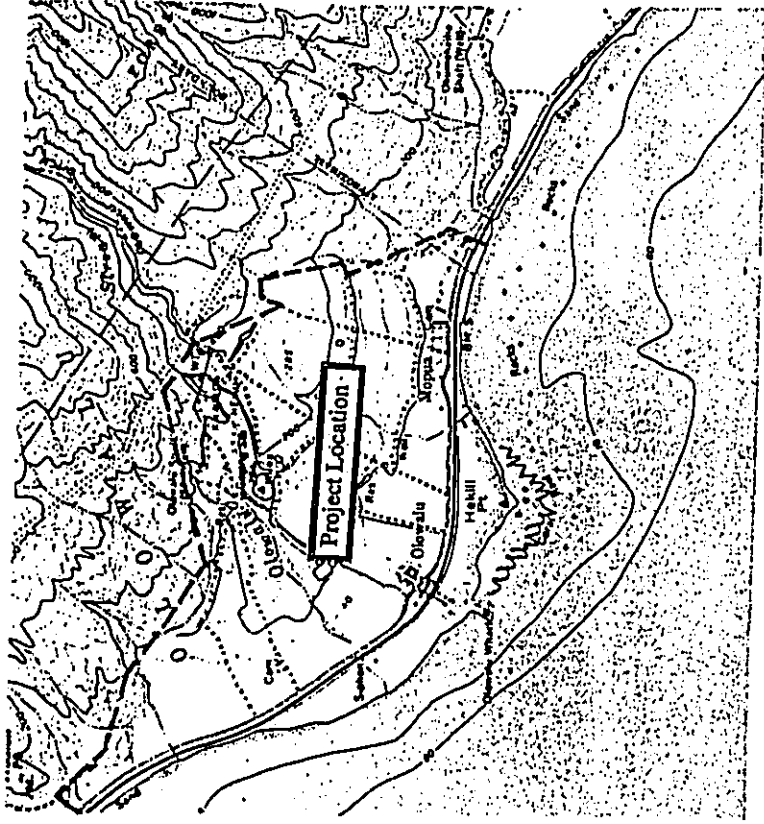
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LOWALU QUADRANGLE  
HAWAII-MAUI CO.  
ISLAND OF MAUI  
7.5 MINUTE SERIES (TOPOGRAPHIC)



TRUE NORTH  
MAGNETIC NORTH  
APPROXIMATE MEAN  
DECLINATION 1983

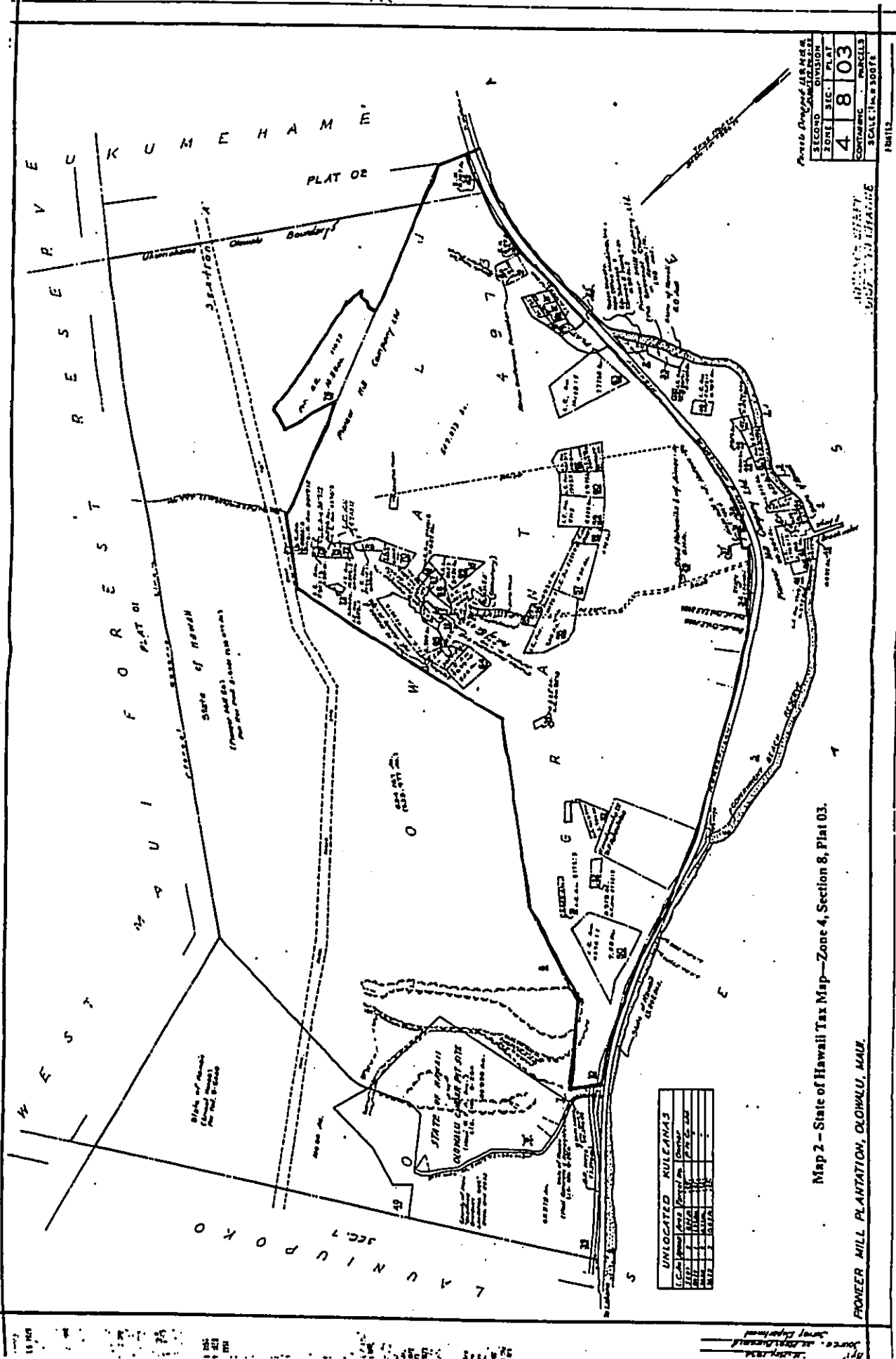
1000 0 1000 2000 3000 4000 5000 6000 7000 8000 9000 10000  
1000 0 1000 2000 3000 4000 5000 6000 7000 8000 9000 10000  
1 KILOMETER

CONTOUR INTERVAL 40 FEET  
DOTTED LINES REPRESENT 20-FOOT CONTOURS  
DATUM IS MEAN SEA LEVEL  
DEPTH CURVES AND SOUNDINGS IN FEET—DATUM IS MEAN LOWER LOW WATER  
SOUNDINGS SHOW APPROXIMATE THE APPROXIMATE LINE OF MEAN HIGH WATER

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Prepared by the U.S. G.P.O.  
 SECOND DIVISION  
 ZONE SEC. PLAT  
 4 8 03  
 CONTINUED PARCELS  
 SCALE 1/4" = 100 FT.  
 1911

Map 2 - State of Hawaii Tax Map - Zone 4, Section 8, Plat 03.

PIONEER MILL PLANTATION, OLOAHU, MAUI.

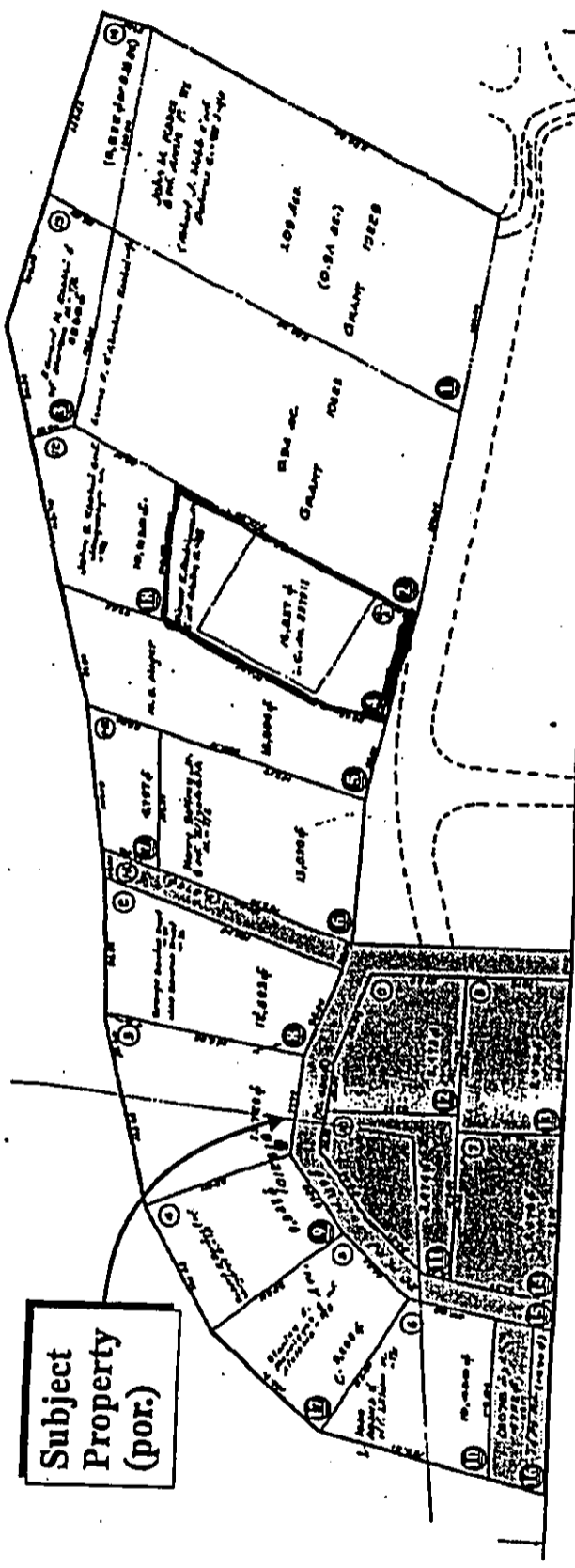
UNLOCATED NUCLEAS

NUCLEAS NO.	OWNER	ACRES	CLASS.
1	STATE OF HAWAII	1.00	100
2	STATE OF HAWAII	1.00	100
3	STATE OF HAWAII	1.00	100
4	STATE OF HAWAII	1.00	100
5	STATE OF HAWAII	1.00	100
6	STATE OF HAWAII	1.00	100
7	STATE OF HAWAII	1.00	100
8	STATE OF HAWAII	1.00	100
9	STATE OF HAWAII	1.00	100
10	STATE OF HAWAII	1.00	100

BY: [Signature] Surveyor General  
 JOHN C. [Signature] Surveyor General  
 1911



PLAT 05



← To Lahaina

### Honoapiilani Highway

To Wailuku →

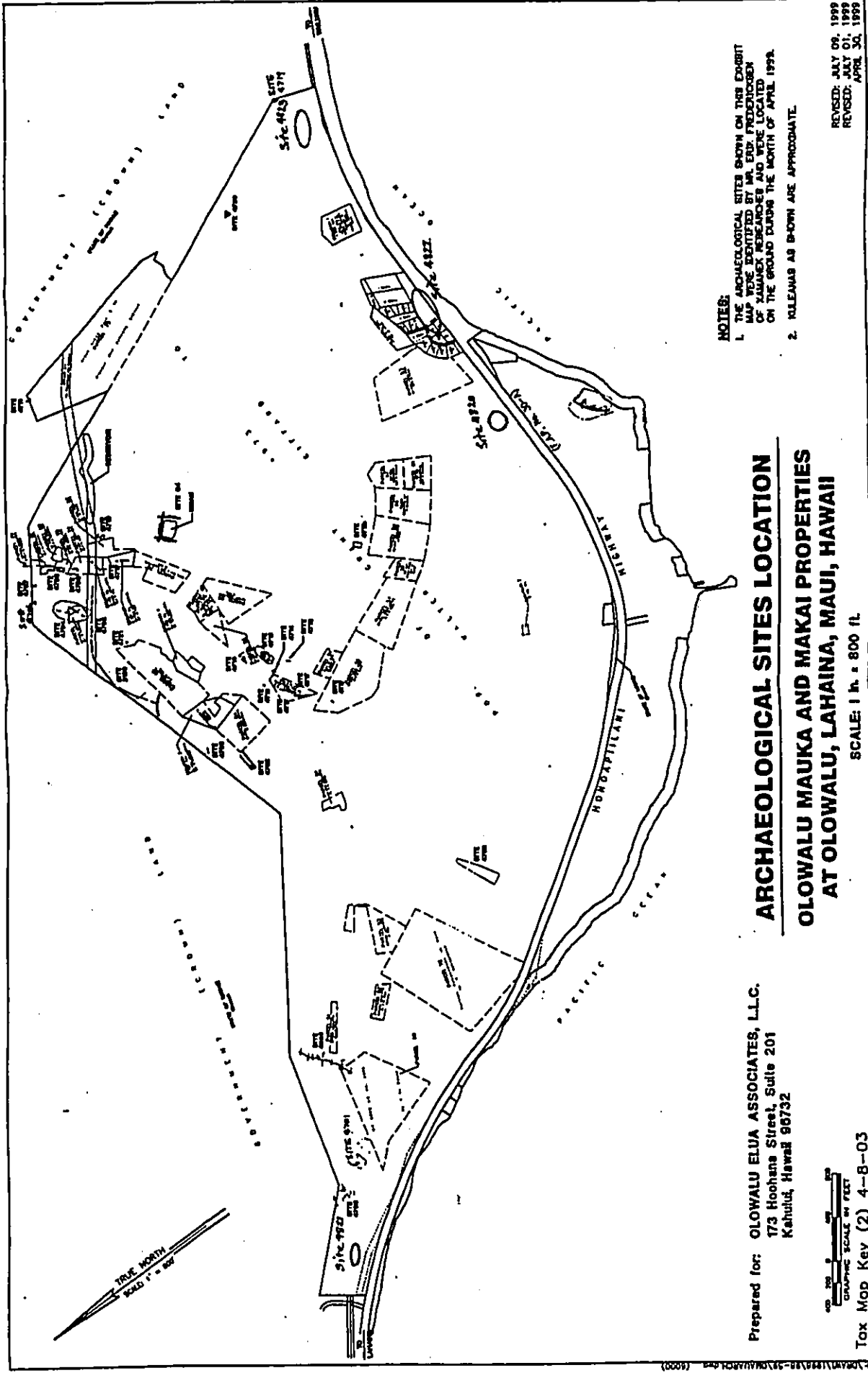
DEPARTMENT OF THE LAND COMMISSION			
TERRITORY OF HAWAII			
TAX MAP			
LINE	BLK.	PTCH.	PLAT
4	8	04	
CLASS			

OLOMAU SUBDIVISION, OLOMAU, LANAI, MAUI.

PLAT 05

Note: All lots owned by owner as shown on this map.

Map 3 - State of Hawaii Tax Map, Zone 4, Section 8, Plat 4.



**NOTES:**  
 1. THE ARCHAEOLOGICAL SITES SHOWN ON THIS EXHIBIT MAP WERE IDENTIFIED BY MR. ERIC FROEHLER OF XANADU RESEARCHERS AND WERE LOCATED ON THE GROUND DURING THE MONTH OF APRIL 1999.  
 2. RELIEF AS SHOWN ARE APPROXIMATE.

REVISION: JULY 09, 1999  
 REVISION: JULY 01, 1999  
 REVISION: APRIL 30, 1999  
 JOB NO. 98-59

**ARCHAEOLOGICAL SITES LOCATION**  
**LOWALU MAUKA AND MAKAI PROPERTIES**  
**AT LOWALU, LAHAINA, MAUI, HAWAII**

SCALE: 1 in. = 800 ft.

Prepared for: **LOWALU ELUA ASSOCIATES, LLC.**  
 173 Hoohana Street, Suite 201  
 Kahului, Hawaii 96732



Tox Map Key (2) 4-8-03

871 KOLU STREET, SUITE 201  
 WAILUKU, MAUI, HAWAII 96793

**R. T. TANAKA ENGINEERS, INC.**  
 Civil & Structural Engineers

## INTRODUCTION

We were contacted in September 1998 by Mr. Robert Horeajo, Project Manager, Olowalu Elua Associates, Kahului, Maui about conducting an archaeological inventory survey on a c. 730-acre portion of land in Olowalu, Maui. This large area consists of lands formerly owned by Pioneer Mill Company, Ltd., a subsidiary of Amifac/JMB Hawaii, Inc.

The bulk of the overall project area is comprised of lands in the Olowalu *ahupua'a*, while a c. 5-acre portion at the southeastern end of the study area lies within the *ahupua'a* of Ukumehame. We were contracted to perform the inventory survey for the overall project in October 1998. Subsequently, we were asked to conduct the inventory survey for the 730-acre project area in 2 phases. Phase 1 was to consist of an inventory survey of the land *makai* (south) of Honoapi'ilani Highway. A draft report for the survey was completed in March of 1999. The second phase—Phase 2—includes the land *mauka* (north) of the highway. The subject property is located approximately 14.5 miles from Wailuku and 5.5 miles from Lahaina.

This report presents the inventory survey level results for Phase 2—the *mauka* portion of the overall project area (TMK 4-8-3: 10).

### Parcels within the *ahupua'a* which were excluded from the study

There are several parcels within the boundaries of the subject property, which were not owned by Pioneer Mill, and therefore were not included in the purchase made by Olowalu Elua Associates, LLC. In all, these amount to 4.877 acres in total area.

Exclusion 1 (1.996 acres) is Grant 9820 to the Board of the Hawaiian Evangelical Association for the Olowalu Hawaiian Protestant Church, which is located in the eastern portion of the property. Site 50-50-08-1603, the ruins of the old church is located on this parcel.

Exclusion 2 (0.110 acre) is the residence of the Nahoikaika family, which lies *mauka* of Olowalu Store along the dirt access road. Exclusion 3 (1.787 acres) is the property of John Ka'ea in the northwestern section of the property. Exclusion 4 (0.982 acres) comprises the Ka'aumoaana property. The total remaining acreage in the *mauka* portion of the study property is 661.955 acres.

## ACKNOWLEDGEMENTS

Xamanek Researches wishes to acknowledge the following individuals for their dedication and cooperation in working towards the successful completion of this project. First of all, thanks to the owners of Olowalu Elua Associates, LLC—including Mr. Peter Martin and Mr. Jim Riley for allowing us to pursue the archaeological objectives of this inventory survey. Secondly, thanks to Mr. Robert Horeajo, project manager for Olowalu Elua Associates, LLC, who not only provided us with information which he had gathered, but generally provided moral support and encouragement as well. We also want to thank the members of the Maui and Lana'i Islands Burial Council—most especially Ms. Dana Nisone Hill, Mr. Leslie Kuloloi and Mr. Charles Maxwell, for their counsel and guidance in dealing with burial issues. Also, thanks to Mr. Brian Ramos, former Maui archaeologist for the State Historic Preservation Division, for his contribution to and participation in the decision-making process. Dr. Ross Cordy, SHPD Archaeological Branch Chief, offered several suggestions in his review, which have been incorporated into this report.

Finally, we wish to extend our thanks to members of the Olowalu community for sharing their knowledge and pointing out areas of interest in the project area—their help and *aloha* were invaluable to us.

## STUDY AREA

The Olowalu project lies along the flank of the West Maui Mountains. West Maui is geologically a single volcano, with rift and fracture zones that radiate north to southeast from the caldera. One ridge separates Lahaina District from the Wailuku District. Erosion of the volcanic basaltic lava flows that came from the ancient volcano, has formed alluvial soils, which are the predominant soils on the property. There is a small cinder cone, roughly in the middle of the property that rests on the alluvial deposits. Kileia Cinder Cone contains microscopic nepheline—similar to features produced in late stage volcanic activity of Oahu and Kauai (Macdonald, Abbott and Peterson, 1983).

The *manuka* portion of the property extends from Honoapiʻilani Highway northeastward into Olowalu Valley to an elevation of c. 400 feet, and encompasses the large alluvial fan created by Olowalu Stream.

### Natural History

#### Botanical

A botanical study was undertaken for the project (Char, March 1999). Ms. Char describes 5 general vegetation types—coastal vegetation, sugar cane fields, irrigation system vegetation, gulch vegetation, and the *kiawe*/buffelgrass community (ibid., p. 3). The four latter types are found on the *manuka* portion of the study area. The sugarcane fields occur on level to moderately sloping, well-drained soils on a large alluvial fan and stream

terrace, and belong predominantly to the Pulehu and Waialeale soil series (see discussion below). Various grasses and weeds thrive on the edges of the fields (ibid., pp. 4-5).

Along the walls and ditches of the irrigation system are found mosses and ferns, while the reservoirs support clusters of *Azoo koole*, castor beans, Java plum, opiuma, grasses and various weeds. Also the reservoirs provide feeding and nesting habitat for the endemic Hawaiian Coot, or "*oʻoae ke ʻoʻe ʻo*" (ibid., pp. 5-6).

The Olowalu Stream gulch supports a dense growth of trees. The presence of numbers of *kūahi* nut trees in the valley indicates that the area was utilized in precontact times.

Finally, around the edges of the property, and in any area not cultivated by sugar cane, there occurs the *kiawe*/buffelgrass community. In areas where soil is relatively deep, the trees reach a height of 20 to 30 feet, while in rocky areas the *kiawe* are limited to 5 to 20 feet in height. Buffelgrass makes up the predominant understory species, and occurs as a dense cover 2 to 3 feet tall beneath the trees. This type of cover tends to obscure archaeological features, and must be cleared in order to investigate possibly significant areas.

#### Soils

Soils on the *manuka* property consist of latosols, which are well-drained, low

humic, and humic ferruginous varieties in low to moderate rainfall regions. The soil depth is typically 30 inches where slopes are less than 35 percent, and very thin or absent in steeper areas (Foots, et al., 1972).

Several soil types are present on the study area. The largest group consists of Waialeale extremely stony silty clay (WyC), which is moderately sloping and occurs on smooth, alluvial fans. Gravel, cobblestones, and stones make up 30 to 80 percent of the volume. Permeability is moderately rapid, runoff is slow to medium, and the erosion hazard is slight to moderate.

Pulehu cobbly clay loam (P1A) is found in the central and western areas of the property, on 0-3 percent slopes. Pulehu cobbly clay loam (P1B) is found along the northwestern boundary on 3 to 7 percent slopes. Pulehu clay loam (P2A), a series of well-drained soils (on 0 to 3 percent slopes), are found in the northwestern area of the property. Pulehu silt loam (PpA) is similar to Pulehu clay loam (0 to 3 percent slopes), but with a somewhat coarser texture, is found on the east side of the property along Honoapiʻilani Highway. Ewa silty clay loam (EwA), 0 to 3 percent slopes is found in the eastern part of the property. A strip of land along Olowalu Stream is composed of Stony Alluvial Land (sSM), which contains stones, boulders, and soil deposited by streams, in places where the slope is 3 to 15 percent. Adjacent to the stony alluvial land, along the *manuka* portion of the stream lies Rough Broken and Stony Land (rRS), which has very steep, stony gulches.

Finally, in the eastern portion of the property, just north the Honoapiʻilani Highway, is an area of Kealia silt loam (KMW), which is poorly drained, and has a high salt content. When the water ponds after a heavy rain, salt crystals appear on the surface as the water evaporates. This area was the location of a precontact fish pond.<sup>1</sup>

<sup>1</sup> Refer to Figure A42, p. 106 of Appendix A for location in 1906.

according to local informants, which was utilized into the 20<sup>th</sup> century before it was filled in.

Rainfall in the project area averages less than 20 inches per year, with the greatest amount occurring between November and March. The average annual temperature in Lahaina—5.5 miles to the north—ranges from 71.5 to 78 degrees Fahrenheit (Atlas of Hawaii, 1998).

The entire project area occupies the large alluvial fan spreading from the mouth of Olowalu Valley to the ocean. It is bisected by Olowalu Stream, which took a more northwest-southeast path in the past.<sup>2</sup> Olowalu Stream is one of 4 major waterways in the Lahaina District—the others being Ukumehame, Launiupoko, and Kaulaʻula—that provided water for the agricultural activity necessary to support a considerable precontact population.

E.S. Craighill and Elizabeth Handy (1972, p. 492) note:

"Lahaina District was a favorable place for the high chiefs of Maui and their entourage for a number of reasons: the abundance of food from both land and sea; its equable climate and its attractiveness as a place of residence; it had probably the largest concentration of population, with its adjoining areas of habitation; easy communication with the other heavily populated areas of eastern and northern West Maui, 'The Four Streams', and with the people living on the western, southwestern and southern slopes of Haleakala; and its propinquity to Lanai and Molokai."

Concerning Olowalu, they continue (Handy and Handy, 1972, p. 492):

"Olowalu, the largest and deepest valley on southwest Maui, had even more

<sup>2</sup> This stream was channelized by the sugar plantation in the late 1800s.

extensive lo'i lands both in the valley and below. Just at the mouth of the valley we found in 1934 a little settlement of five *kanohi* (family homes) surrounded by their flourishing lo'i. There are said to be abandoned lo'i far up in the valley. In and below the next valley, *Lanuiipiko* (sic.) there were no evidences of lo'i, and the people of Olowalu said there had never been any. But we think there must have been a few, although the land is, in general, dry and rough.

While these observations were made in the earlier part of the 20<sup>th</sup> century, there is no doubt that Olowalu was an important agricultural area in precontact times. As long as water was available, the hot climate was ideal for producing *taro*. It was the ability to produce quantities of *taro* that

contributed to a substantial population, and placed West Maui in a position of prominence throughout the island.



Photo 1 - General view to the south—from Pu'u Kilea—East Maui in distance.



Photo 2 - General view of Olowalu Stream to southwest—from Pu'u Kilea.



Photo 3 -- General view to west with Lana'i in background--from Pu'u Kila.



Photo 4 -- General view to the east--from Pu'u Kila.



Photo 5 -- View of piggery, leased from John Ka'aea by Cabanilla family--north of Pu'u Kila.



Photo 6 -- Olowalu shaft--mauka of piggery.

## BACKGROUND RESEARCH

### Precontact to 1850 Times

In precontact times, the largely self-sufficient *ahupua'a* was made up of economic units that provided the necessary food and other resources for the community. These units clustered in the ecological zones within the pie-shaped land division. Internal trails linked the ecological zones. Also necessary, was a coastal-island trail for transportation and communication between *ahupua'a*. The important *makahiki* (annual ritual of tribute collection) involved a clockwise procession around each island (Yonkavich, 1988, pp. A-7 to A-8). According to David Māto (1951, p. 146)— "...during the progress of the Makahiki god, the country on its left, i.e. towards the ocean, was tabu." Yonkavich, p. A-8) notes: "Since the *makahiki* is an ancient tradition connected with chiefly power and control, each island's encircling trail must have originally been constructed about the time of the development of the ranked chiefdom social system." Further discussion concludes that this trail was an ancient and apparently a commonplace feature. It was probably maintained for centuries during precontact times—realigned in places as needed, moved around settlements and generally adapted to a changing cultural landscape. It was usually not mentioned in traditional or post-contact accounts—unless to note unusually bad conditions or major improvements (ibid.).

On Maui the most noted trail improvements were in the 16<sup>th</sup> century—attributed in traditional accounts to paramount chief Kihapiliāni. It is often referred to as the "Piliāni Trail", but Piliāni

was the father of Kihapiliāni and not associated with the trail building in traditional literature (ibid.). The precise alignment and nature of the trail in Olowalu is not known. According Handy and Handy (1972, p. 489), "Travelers were sometimes ferried across streams by canoe or along shore, as between Olowalu and Māālea, around the rough southern tip of West Maui,"—suggesting that the trail did not continue beyond Olowalu. It is generally felt that the 19<sup>th</sup> century *Aupuni* Road or Government Road followed the trail into Olowalu, as it did in other areas of Maui.

An overland trail from Olowalu Valley crossed the top of Mauna Kūkū, the highest point in the West Maui Mountains. It ran along a knife-edge ridge and down a precipitous fall into Waiehu. An account of crossing the fall on this trail is related in Handy and Handy, pp. 490-491).

"One of these trips via Olowalu, was made by the wife of Dr. Gerrit Judd in 1828 (Fleming, 1933, pp. 17-18). Mrs. Judd was carried and helped by a 'company of twenty-five athletic men, trained to bird-catching on the beetling crags of these mountains.... Their toe and finger nails, never cut, grow like claws. Their sole business is to catch the little black birds called the *o'o*, each producing a few yellow feathers under the wings....' From Kukū to Waiehu the 'descent' was almost perpendicular, and we swung down from branch to branch among the trees, our only security being the faithful bird-catchers.

who placed our feet for us and guarded each step..."

### Late Precontact Struggle for Power

Lahaina District became a focal point in the struggle for power between important chiefs, because it had ample resources that supported a large population. While Olowalu is not specifically mentioned, it seems unlikely that it would not have been touched by these episodes of warfare. One of the fiercest battles was between Maui chief Ka-ūhi, and the chief of Hawaii, Alapa'i in the mid-18<sup>th</sup> century. Concerning this war, Samuel Kamakau relates the following:

*A whole year Alapa'i spent in preparation for the war with Maui. It was in 1738 that he set out for the war in which he swept the country. What was this war like? It employed the usual method in warfare of drying up the streams of Kana'ia, Kamaha, and Mahama (which is the stream near Lahainalua). The wet taro patches and the brooks were dried up so that there was no food for the forces of Ka-ūhi or for the country people. Alapa'i's men kept close watch over the brooks of Olowalu, Uhamēhame, Waifak, and Honokawai. When Pēle-ia-holani heard that Alapa'i was at Lahaina he gathered all his forces at Honokahua and at Honolua. At Honokawai an engagement took place between the two armies, and the forces of Alapa'i were slaughtered and fled to Keawawa. There Alapa'i heard that Pēle-ia-holani had landed at Honokahua and had an army stationed at Keawawa, and he disposed his forces, some on sea and some on land. Although Pēle-ia-holani had but 640 men against Alapa'i's 8,440 from the six districts of Hawaii, there were among them some famous warriors.... Pēle-ia-holani intended to unite his forces with those of Ka-ūhi, but*

*Pēle-ia-holani was the ruling chief of Oahu. Maui chief Ka-ūhi sent a present to him and requested his help in defending Maui (Kamakau, p. 74).*

*Alapa'i's men held Lahaina from Uhamēhame to Mala on the north, and in attempting to aid Ka-ūhi, Pēle-ia-holani became involved with the difficulty. The hardest fighting, even compared with that at Napili and at Honokahua in Ka'anapali, took place on the day of the attack at Pu'uhene. Pēle-ia-holani was surrounded on all sides, mauka and makai, by the forces of Alapa'i, led by Ka-lani-'opu'u and Keowa. The two ruling chiefs met there again, face to face, to end the war and become friends again, so great had been the slaughter on both sides...." (Kamakau, 1992, p. 74).*

At the end of this period of warring, Kamehameha-nui became the ruling chief of Maui. Alapa'i returned to Hawaii. There, following the death of Keowa, in 1752, relations between Alapa'i and Ka-lani-'opu'u began to sour, because the latter felt that Alapa'i had some part in causing Keowa's death. Battles were fought between the two rivals, and eventually Ka-lani-'opu'u succeeded in establishing his rule over the entire island of Hawaii in 1754, after he "seized and cruelly put to death and baked" (ibid., p. 78) the son of Alapa'i, Keawe-opala.

In the years from 1775 to 1779 there was constant warfare between Ka-lani-'opu'u and Kahakili, the younger brother of Kamehameha-nui. Ka-lani-'opu'u engaged in battles all around the island of Maui. At Waikapu, he was defeated and routed by the forces of Kahakili in 1776. Still nursing a fierce hatred for Kahakili for his defeat, Ka-lani-'opu'u launched another series of attacks—sailing to Kaupo, Lahaina, and on to Lanai, where his forces ravaged and slaughtered the citizens. When food ran out on Lanai, he moved on to Maui where food was abundant, and fed his soldiers on taro from Honokahua. After this he headed around West Maui for Ko'olau. Upon landing at Hamakualoa, he engaged in battle with Kahakili's forces, who put up such a fierce fight that Ka-lani-'opu'u fled in his canoes. When Ka-lani-'opu'u made

landfall at Ko'olau "he slew the common people and maltreated the captives by urinating into their eyes" (Kamakau, p. 91).

#### Arrival of Europeans

It was toward the last part of this 4-year period of warfare, in January of 1778, that Captain James Cook sailed into the islands—and set in motion a wave of changes that would engulf the Hawaiian people in years to come.

Ka-lani-'opu'u returned to Hawaii from Maui in January of 1779, during Cook's visit in Kealahou. When he saw how many women were prostituting themselves on board Cook's ship, he forbade the women from continuing to visit the vessel. He treated Cook hospitably, however, "giving him hogs, taro, potatoes, bananas, and other provisions, as well as feather capes, helmets, *kahili*, feather leis, wooden bowls beautifully shaped, tapa cloths of every variety, finely-woven mats of Puna, and some especially fine mats made of pandanus blossoms" (Kamakau, p. 101). The most desired trade items, as far as the Hawaiians were concerned, were guns, ammunition, and iron.

In the month of February, Cook sailed away, only to discover that a mast on one of his ships was defective and needed immediate repair. He put back to Kealahou, where developing tensions between the Hawaiians and the *hoole* (foreigners) resulted in the theft of a longboat. When Cook went ashore to retrieve it, he and 4 of his crewmen were killed. The body of the slain Captain was delivered to Ka-lani-'opu'u, who offered it in sacrifice. Afterwards "they stripped the flesh from the bones of Lono. The palms of the hands and the intestines were kept; the remains (*pele*) were consumed with fire. Ka-lani-'opu'u was kind enough to give the bones to the strangers on board the ship, but some were saved by the *kahunas* and worshiped" (Kamakau, p. 103).

family, were at this time living in the village of Olowalu, some fifteen miles from where Metcalf's vessel was anchored. Hearing of the arrival of the trading ship at Honouliuli, Kaopuiki got ready a number of hogs and other produce, and started for Honouliuli to trade for muskets, ammunition, and such other articles. It is not known that Kaopuiki received any bad usage from Captain Metcalf, although others did; but noticing that the ship's boat was left towing astern during the night, Kaopuiki formed the design of getting the boat into his possession. The following night the plan was carried into effect, the boat was set adrift from the vessel, the watchman, who had fallen asleep in her, was killed, the boat towed ashore and broken up for the sake of the iron fastenings, and Kaopuiki and his men returned to Olowalu.

When the loss of the boat and the death of the seaman were ascertained in the morning, Captain Metcalf fired on the people ashore, and took two prisoners, from one of whom belonging to Olowalu it is thought that he received information as to who the party was that had stolen his boat. In a day or two the vessel left her anchorage at Honouliuli and came to off Olowalu."

The account is continued by Kamakau (pp. 145-147):

"...in the morning Ka-lola declared a *tabu* restricting canoes from going out to the ship on pain of being burned to death if they disobeyed. "Filtered grass" (*Nan'umae*) was the name of this law. It belonged to Ka-lola alone and to her children and grandchildren; no other chief could declare such a *tabu*. It lasted three days. On the fourth the *tabu* was ended, and canoes in great numbers went out to trade with the foreigners. Many came from Lahaina as well as from Ka'anapali, Lanai, and neighboring places. The canoes gathered under the ship's sides, the men eager to procure iron, beads, looking-glasses, scissors, muskets for the constant warring going on at the time, red cloth and

other foreign material. Little did they suspect the terrible carnage that was to follow, a carnage without any effort to apprehend and punish the offenders or any pity for the innocent. So these Christians murdered the Hawaiian people without any more mercy than cannibal Nukuhivans show, or people of pagan lands. Canoes that drifted toward bow or stern were compelled by a shower of stones to keep admidships, and when all were clustered together, the captain was pretending to trade, and the people were busily eyeing the objects they desired, just as Aka-kane and another man had climbed upon the deck, the ship opened fire and shot the people down without mercy, just as if they were creatures without souls. Even those who swam away were shot down. John Young was an eyewitness on board the ship and has testified to the great number who were killed at this time. At noon that day the *Eleanor* [sic.] sailed, and the people went out and brought the dead ashore, some diving down into the sea with ropes and others using hooks; and the dead were heaped on the sands at Olowalu. Because the brains of many were oozing out where they had been shot in the head, this battle with the ship *Eleanor* and her captain was called 'The spilled brains' (*Kalolopahu*). It was a sickening sight, as Mahiua and others have reported it: the slaughtered dead were heaped upon the sand; wives, children, parents, and friends came to view and mourn over their dead; and the sound of loud wailing arose."

Formander relates the incident this way (pp. 233-234):

"But Captain Metcalf meditated a terrible revenge for the loss of his boat and the death of his seaman. As the canoes collected around the ship, he ordered the guns and small arms to be loaded, and the unsuspecting natives were ordered to keep their canoes off the waists of the ship, and when any strayed either under the bows or the stern, they were pelted with stones or other missiles until they rejoined the fleet of

Kalola, the widow of Kalamipuna, with her new husband, Kaopuiki, and her



canoes lying off either broadside of the ship waiting for trade to commence. When all was ready, Captain Metcalf mounted on the rail and gave orders to open the ports of the ship, loaded with small shot and grapnel, and the mutiny of the sailors, were fired in the crowd of canoes lying within easy range on both sides. The carnage was immense. Over a hundred natives were killed outright, and several hundred more or less seriously wounded. The confusion, the wailing, the rush to escape was indescribable.

After this cruel and wanton vengeance on an innocent multitude—for the main trespasser, Keopuiki [sic], was not among the slain, and does not appear to have been afloat that day—Captain Metcalf lifted his anchor and proceeded to Hawaii to join his tender, the *Fair American*.

On the morning of March 17<sup>th</sup> the *Fair American* was captured off Kaupulehu in North Kona by Kamehameha, a great chief and supporter of Kamehameha. He had suffered a beating at the hands of the elder Metcalf, and vowed vengeance on the next foreign vessel he could get aboard. The 18-year old captain, Thomas Metcalf, was thrown overboard and drowned, and the other members of the crew were killed. For some reason, the mate, Isaac Davis, was wounded, but his life spared. The vessel was taken ashore and the guns, ammunition and general cargo, along with the wounded Davis, were taken to Kamehameha at Kealahouka.

The *Eleonora* was anchored there at Kealahouka. The boatswain, John Young, and several other men had gone ashore. Young became separated from his fellow crewmembers, and was detained by Kamehameha, since the latter needed a foreigner to show him how to use the newly acquired guns and ammunition (Ibid., p. 233). The *Eleonora* waited for 2 days for Young to return. On the third day when he did not appear, Captain Metcalf sailed away, not knowing the fate of his son.

Davis and Young spent the remainder of their lives in the service of Kamehameha. Their knowledge of foreign technology proved extremely valuable to Kamehameha. One of the cannons which was used in the Battle of Kepanui, where Kamehameha defeated the warriors of Kahekele, in 1790. The Maui warriors were driven into Iao Valley, where they were attacked with the cannon and other firearms, and slaughtered in great numbers. Those that escaped did so by climbing over the steep ridge and down into Olowalu Valley.<sup>4</sup>

Though his warriors on Maui were defeated in this battle, Kahekele still commanded a sizeable army of warriors on the island of Oahu. He was considered to be a very old chief when Vancouver visited him at Lahaina in March of 1793, only a few years later. Kamakau reports (1992, p. 165) that during this meeting Vancouver urged Kahekele to stop fighting and establish friendly relations with the chiefs of Hawaii. Kahekele said that it was not right for the chiefs of Hawaii to raid Maui "and rob and pillage without cause. Kahekele requested Vancouver, if he desired peace, to stay there all the time and guard him against further wars." Vancouver recognized that Kamehameha had superior numbers of chiefs and warriors, and they possessed firearms and the knowledge of their use. Sometime after Vancouver's departure for Oahu, Kahekele died.

With the great chief's passing, Kamehameha moved to bring Maui and Oahu under his rule. In 1796, following the battle of Nu'uuanu, the southern islands were united under one chief for the first time.

<sup>4</sup> According to Handy and Handy (1972, p. 490), the overland trail provided a link between the Lahaina District and the north coast of West Maui, as well as allowing the exploitation of forest resources found at higher elevations. More specifically, this trail extended *mauila* into Olowalu Valley and over the summit at Mt. Haleakala.

Foreign influence became more and more pervasive following the unification of the Hawaiian Islands under Kamehameha. These forces brought commercial, social and religious changes to Lahaina District, as well as to the other islands. Lahaina was the center for West Maui because of the favorable conditions for sailing craft that is found in the Lahaina Roads. The first whaling ships anchored off Lahaina in 1819, and the provisioning of these ships became a lucrative new venture. Following a few years later, missionaries from New England were added to the mix, and the wheels of acculturation turned ever more quickly. By 1832, the missionaries conducted a census which gave the population of Lahaina as 4,028; Olowalu as 832; and Ukumehame as 573 (Schmitt, 1973).

At this time, Lahaina was considered the capital of the Hawaiian Kingdom, primarily because Kamehameha III preferred to reside there rather than in Honolulu. However, by 1845, he agreed to move the capital permanently to Oahu, although Lahaina was still the residence of many important people associated with the Kamehameha line.

#### Mahele awards in Olowalu

Following the Mahele in 1848, there were 42 individual Land Commission Awards granted in the *ahupua'a* of Olowalu, between the years 1852 and 1855. The majority are in the upper reaches of the property, along Olowalu stream. The distribution of land awards,<sup>5</sup> and the present route of the stream suggest that the stream was channelled in a general, straighter north-south direction sometime after the Mahele. This was probably done to control flooding of agricultural fields. The award plots run across the alluvial fan in a northwesterly-southeasterly direction. A 1906 map of the

<sup>5</sup> Please refer to Maps 4 and 5 for the approximate locations and distribution of LCAs within Olowalu *ahupua'a*, Map 6 for land usage, and to historic maps in Figures 1 and 1a.

Olowalu Plantation, made by A. C. Alexander, shows the new, straighter route of the stream (Figure 1a).

There are 45 land grant awards included in the study parcel. Thirty-six are located in the *mauka* portion of the property. Refer to Table 1 and Map 6 for detailed information on the awards. Thirty-three of the grants are *kulepa* located along Olowalu Stream, and were taro lands and houselots. Only 3 grants were for other purposes—the 17,592-acre award granted to Nahaolekua by Kamehameha IV in 1858, the .924-acre parcel granted to the Board of Education for a school at Olowalu 2, and the 16.5-acre Land Patent Grant (Grant 11073) to Pioneer Mill in 1942.

There are 9 awards on the *makai* portion of the property, and it should be noted that several *taro/kaula kulepa* awards in the *mauka* area correspond to houselot awards on the *makai* portion. These include LCA 6728 [Apama 1 for taro; Apama 2 for houselot] to Mahulu; LCA 5952 [Apama 1 for houselot; Apama 2 for taro] to Misamini; LCA 8817 [Apama 1 for houselot; Apama 2 and 3 for taro] to Kanakao; and LCA 1742 [Apama 1 as "land for cultivation" and Apama 2 for houselot] to Z. Kakuwai. There are 5 *apama* listed to E. Maui on the *mauka* portion of the study parcel—Apama 1-kaia; Apama 2-taro land; Apama 3-kaia and taro; Apama 4-kaia; and Apama 5-houselot and kaia (See Table 1 and Map 6).

TABLE 1

Land Commission Awards - mauka parcel*						
TMK	Size in acres	Royal Patent	LCA Number	Year conveyed	Awardee	Nature of use
4-8-03: 11	1.787	7989	5829-E: 1	9/22/1853	Kawehena	Hawaiikeke & Kamani
4-8-03: 50	7.5	6267	4376: 1	3/6/1855	Kaahi	Puukoihohilo Kula at Puukoihohilo
4-8-03: 51	6.18	6285	3772: 3	9/24/1853	Alapai	Kula land
4-8-03: 52	9.19	6285	3772: 2	9/24/1853	Alapai	Kula land
4-8-03: 53	2.704	6946	9906	9/24/1853	Puamaunuu	Houselot and tarp patches
4-8-03: 54	5.25	3810	8573: 2		Kailiula	Taro land
4-8-03: 55	7.0	4041	10128: 3	3/6/1855	E. Maui	Kula and taro
4-8-03: 56	9.24	N/A	R.P.G.R.152	9/20/1882	Board of Ed.	School lot at Olowalu 2
4-8-03: 57	4.5	5183	5829: 2	9/22/1853	Hoole	Taro and kula land
4-8-03: 58	1.75	4041	10128: 4		E. Maui	Kula
4-8-03: 59	4.928	3776	5113	11/1/1852	Kailua	Kula
4-8-03: 60	2.975	2154	1742: 1	9/26/1853	Z. Kaunwai	Land for cultivation
4-8-03: 61	1.655	7989	5829-E: 2	9/22/1853	Kewehena	Hawaiikeke & Kamani
4-8-03: 62	1.813	5468	6038: 3	9/22/1853	Peekauai	Houselot and taro land (opena 3-kula land)
4-8-03: 63	8.638	4041	10128: 5	3/6/1855	E. Maui	Kula land
4-8-03: 64	5.5	7102	5829-D	9/22/1953	Kaaoohema	Houselot and kula
4-8-03: 65	6.5	6287	4376: 2	3/6/1855	Kaahi	Houselot and tarp patches
4-8-03: 66	8.63	6611	10714	11/1/1852	Pohakani	Taro and kula
4-8-03: 67	5.88	N/A	6547	11/1/1852	Hale	Taro and kula
4-8-03: 68	6.25	4041	10128: 2	3/6/1855	E. Maui	Taro land
4-8-03: 69	3.456	6881	8657	9/24/1853	Kitau	Kula, taro land and houselot
4-8-03: 70	2.063	3344/2811	8668	3/6/1855	Kaiwi	Taro and kula
4-8-03: 71	5.81	5183	5829-F: 1	9/22/1853	Hoole	Tarp land
4-8-03: 72	4.56	5187	10592: 2	11/1/1852	Puu	Taro land
4-8-03: 73	3.13	5468	6038: 1	9/22/1853	Peekauai	Taro land
4-8-03: 74	5.06	6267	4376: 3	3/6/1855	Kaahi	Kaumakahi

\* This information was provided by Mr. Robert Horcajo, Project Manager for Olowalu Elua, Associates, LLC, and came from the Bureau of Conveyances archives through Title Guarantees of Hawaii. It was determined in July 1999 that 2 Juluano—LCA 3888, and LCA 3772, Apona 1—located on the mauka project area were not part of Olowalu Elua Associates, LLC property, and have been removed from the above list (Letter from Title Guaranty of Hawaii to Mr. Robert L. Horcajo, July 14, 1999).

4-8-03: 75	.381	5181	5952: 2	9/24/1853	Minamina	Taro land
4-8-03: 76	16.5	N/A	L.P.Gr. 11073	8/21/1942	Pioneer Mill	Portion of crown land of Olowalu
4-8-03: 77	1.282	4041	10128: 1	3/6/1855	E. Maui	Kula
4-8-03: 78	17.592	N/A	Award from Kam. IV	8/21/1858	Nabaelelua	
4-8-03: 79	.146	5468	6038: 4	9/22/1853	Peekauai	Kaumakahi
4-8-03: 80	2.281	4952	6728: 1	9/22/1853	Mahulu	Kamani
4-8-03: 81	.047	7372	8817: 2	9/24/1853	Kanakaole	Kaumakahi
4-8-03: 82	.169	7372	8817: 3	9/24/1853	Kanakaole	Kaumakahi

TMK	Size in acres	Royal Patent	LCA Number	Year conveyed	Awardee	III	Nature of use
4-8-03: 41	.375	7269	7719	9/22/1853	Hala	Maomao	Houselot
4-8-03: 42	8.25	4840	5829-H	11/1/1852	Nahue	Kaluaaha	Houselot
4-8-03: 43	3.386	2154	1742: 2	9/26/1853	Z. Kaunwai	Kaluaaha	Houselot
4-8-03: 44	1.313	5477	5620: 1	3/6/1855	Kabele	Kaluaaha	Houselot
4-8-03: 45	.881	5477	5620: 4	3/6/1855	Kabele	Kaumakahi	Houselot
4-8-03: 46	.913	4952	6728: 2	9/22/1953	Mahulu	Kaumakahi	Houselot
4-8-03: 47	.597		240	8/22/1849	John Clark	Kaluaakaka	Houselot
4-8-03: 48	.792	5181	5952: 1	9/24/1853	Minamina	Kaumakahi	Houselot
4-8-03: 49	.4	7372	8817: 1	9/24/1953	Kanakaole	Kamani	Houselot

The remainder of the *ohupua'a* was crown land, that was originally granted to Kamehameha III. Crown lands became government lands after the annexation of the Hawaiian Islands in 1893.

The following map (Map 6) shows the distribution of land use patterns in the lands awarded within the project area. The LCAs in the upper reaches of the stream are all *taro* lands, while a mix of houselots and

*taro* within a single award appear, beginning at about the same elevation as Kawaihoa *Heiau*. The land awards appear to be on both sides of the stream. The land awards across the middle portion of the *ohupua'a* are *kula*, houselots and taro, and houselots and *kula*. The coastal land awards are all houselot awards—representing permanent habitation (*pa hale*).

\* This information was provided by Mr. Robert Horcajo, and is included in our Phase I archaeological inventory survey of the mauka portion of Olowalu project area (Fredericksen and Fredericksen, 1999 (Draft)).



track. In 1905, a second locomotive from Baldwin Works replaced the original machine. By 1918 another mile had been added, making it a 4-mile line.

The Olowalu Mill was probably constructed in the 1870s. A photograph is reproduced in Maui Remembers (Bartholomew and Bailey, 1994, p. 45). It shows the iron pole, which still remains, that was probably used to guide cables or ropes, to boats tied to the pier. It may be part of a type of loading system that was used in the sugar industry at other mills. Bags of raw sugar were loaded on to the boats via this system. Two additional photos have been found by Mr. Bob Horeajo, and are included in Appendix C. These show both the *manuka* and *makai* views of the mill complex. Unfortunately, they are not dated. The *makai* view of the mill shows a small row-boat headed to shore, and was probably taken from a ship anchored offshore.

Also included in Appendix C are documents referring to census data collected under the authority of the Board of Education in 1878. These data indicate that there were 177 males, and 54 females residing in Olowalu at the time.<sup>16</sup> Of these individuals, there were 27 children of school age, and 16 under the age of 6 years (See Appendix C). There were 86 males listed in the census as "Chinese"—and no females so identified. Other residents included 68 "Native" males, and 50 "Native" females. Also identified are 7 "He haole Amerika" males—American males in managerial jobs. Eighteen heads of households were land freeholders (*He mea kuleana aima*). A total of 150 workers were associated with the plantation in the occupations listed as "Mechanic, Agriculturist, Plantation Laborer, and "other".

Another document (Appendix C) indicates that by 1904, an apparent labor

"problem" was being experienced at Olowalu Plantation. A report by the Honolulu Trades and Labor Council Committee states that "Labor has been rather unsettled; very few would give a fair day's work. A solution of the labor problem would, in my opinion, be effected by introducing or legislating so as to allow Chinese laborers in the Territory." The Chinese are characterized as being "Good labor, capable and very steady"—as opposed to the Japanese, who are described as "Fairly good labor, inclined to be clannish and sulky at times." (Document in Appendix C)<sup>17</sup>

The manager's house, which lies c. 100 meters to the northwest of the Mill, is a one-story wooden structure with a sloping hip roof and ventilated gable ends. A front porch is seven bays long and is marked by a simple balustrade. Rafter ends are left exposed and the house is raised approximately 3 feet above grade (HRTIP, Wright, 1974). A copy of the floor plan is included in Appendix C. It states that the structure was built in 1922. It is considerably larger than the other houses in the Mill Complex, having 3402 square feet of floor space.

There are also 3 other plantation houses located between the Mill and the highway. These 3 houses were built in 1918 for various plantation *luna*. Structure 12 is nearest the ocean—and it is 1600 square feet in area. It served as a home for a "Water Luna". Structure 13, the middle structure, contains an area of 1442 square feet. It was occupied by an unspecified *luna*. Structure 14 has an area of 1523 square feet; it is located nearest the road, and also the home for a water *luna*. The social ranking of occupations within the plantation system, seems to be reflected in the sizes of the dwellings which they occupied, and their proximity to the seashore. Structure 17,

<sup>17</sup> However, the newest wave of migrant workers at the beginning of the 20<sup>th</sup> century came from Japan—an influx which continued for another couple of decades.

located on the *manuka* side of the highway, was one of the larger homes for plantation workers. The square footage of this structure was 632. Again the sizes of the plantation laborers' houses decrease in size and one moves inland. Refer to floor plans and maps in Appendix C.

#### Pioneer Mill Company

In 1931, when the Olowalu Sugar Plantation was acquired by Pioneer Mill Company, all of the railroad equipment transferred to the latter company. By 1933, the Olowalu Mill was being dismantled and the machinery sold to a company in the Philippines (The Maui News, June 15, 1933). This purchase affected land use in Laniupoko to the north. Here a fairly labor intensive system of manual cultivation on a terraced area of 250 acres was abandoned, as the more productive lands of Olowalu and Uluhame became available (Graves, Goodfellow, and Haun, 1998, p. 36). Pioneer Mill Company continued to grow cane on much of this land until fairly recently.

Due to the area's arid conditions, the sugar operations in Olowalu would not have been possible without a water system to irrigate the fields. The water system irrigated the upper cane fields, and supplied drinking water to Olowalu Village. It was a rather small and crude system that had a capacity of 11 mgd<sup>18</sup> and a median of 4.08 mgd (Wilcox, 1996, pp. 134-137).

On the subject of water management in Olowalu, a Honolulu Trades and Labor Council Committee Report of 1904 emphasized the water situation. It states:

*"We get rain on the cane land once or twice per year, and have to depend on gulch water with what the wells give us to tide the crop over the summer months. About two months per year, we get sufficient water from the gulches to supply the*

<sup>18</sup> Million gallons per day.

growing crops, but from August to December inclusive, the wells get (dry) if pumped continuously for 24 hours, and we have to slow down the pumps at night to allow the wells to fill up to a certain extent. Most of our soils being gravelly, require water every seven days." (Refer to Appendix C).

Another reference to the water situation in Olowalu found in the literature is in Walker (1931, p. 77). It notes that:

*"...above Mrs. Naboozika's house are evidences of old taro patches and house sites. The site of the ancient ditch bringing down water from Olowalu Gulch is now used for the modern ditch supplying the cane fields. At the edge of a house platform measuring 13 by 28 feet, is a large flat stone of red basalt used as a *paopao* for the game of *kono*."*

The era of sugar cane cultivation in West Maui ended with the announcement on March 3, 1999, that Pioneer Mill would not replant sugar cane after the current crop has been harvested. In an article in The Maui News (March 3, 1999), a spokesman for Amifac/JMB Hawaii said that sugar was no longer a viable crop, and that the company could not continue to absorb financial losses associated with it. While the crop has been grown for over a hundred years, there was always a problem with obtaining sufficient water. However, a companion article in the same issue of the newspaper laments what will be the loss of the picturesque quality of the green sugar cane fields set against the West Maui Mountain backdrop. Mr. Jim Luckey, former director of the Lahaina Restoration Foundation, recalled an account written in the 1850s that described the incredibly dusty conditions prior to sugar production.

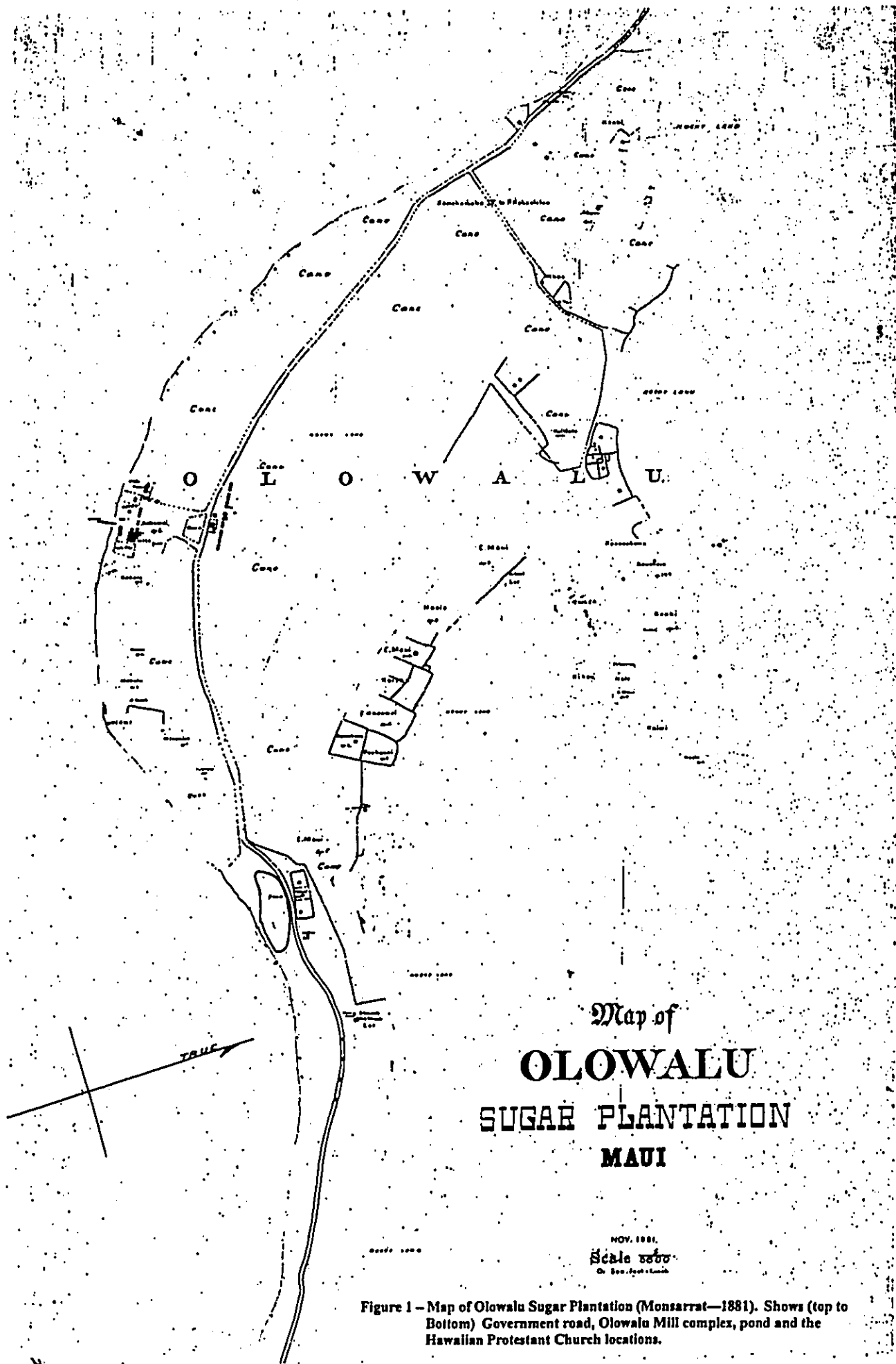


Figure 1 - Map of Olowalu Sugar Plantation (Monsarrat-1881). Shows (top to Bottom) Government road, Olowalu Mill complex, pond and the Hawaiian Protestant Church locations.

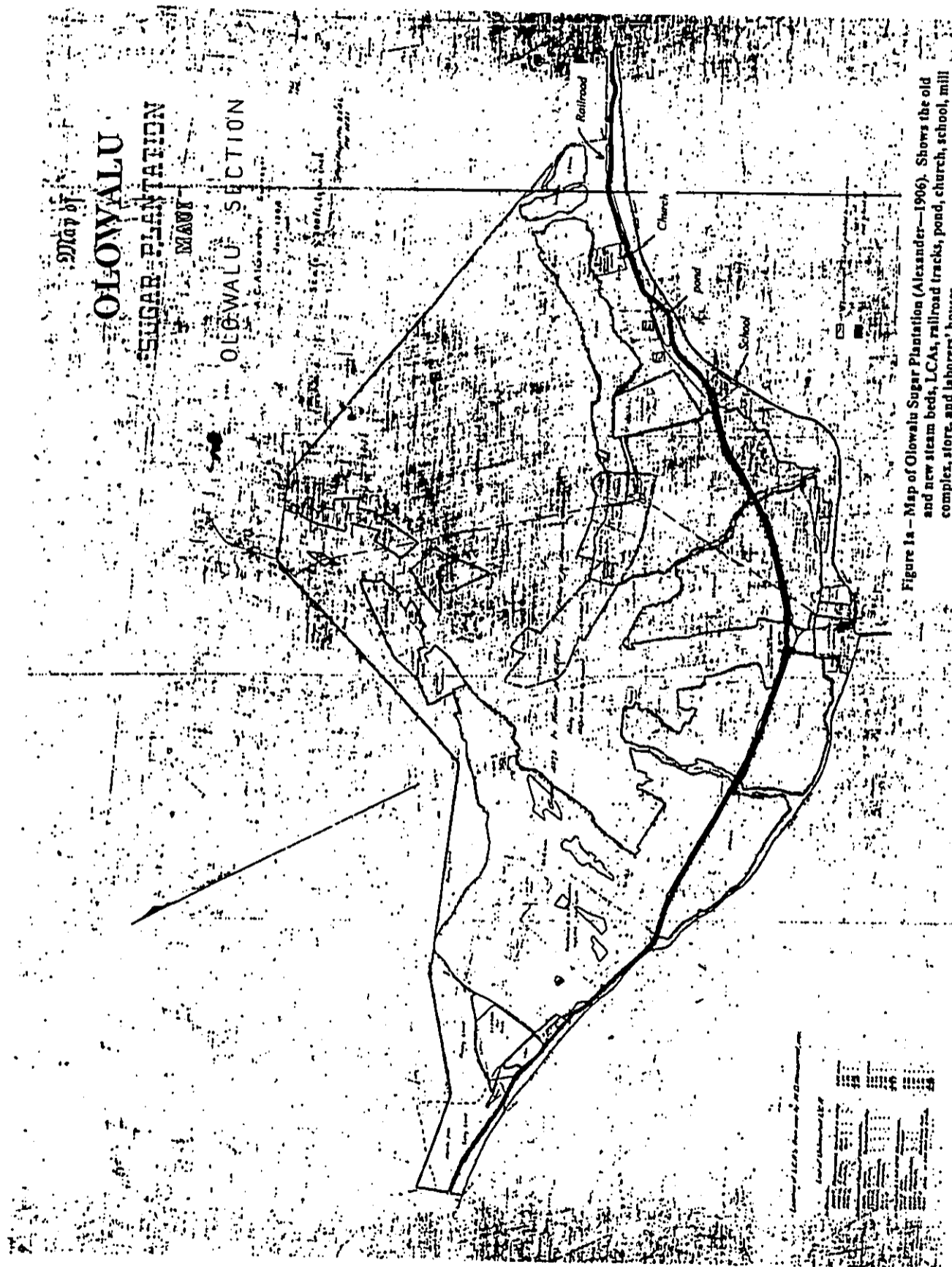


Figure 1a - Map of Olowalu Sugar Plantation (Alexander—1906). Shows the old and new steam beds, LCA, railroad tracks, pond, church, school, mill complex, store, and laborers' houses.

## Oral History Interviews

One of the individuals who is knowledgeable about Olowalu, interviewed by Erik Fredericksen, was resident, John Ka'aea. Mr. Ka'aea was born in 1917 in Ukumehame, and was baptized in 1918 at the Catholic Church, which was located just to the east of the *maka'i* study area. His father was a Japanese contract laborer for Olowalu Sugar Company, and arrived to work there in September of 1897. Mr. Ka'aea is one of 12 children in the Fujishiro family. He changed his name to Ka'aea, but did not specify when. He was educated at the Olowalu School, which he said was on the corner lot next to the Adie (Adeline) Rodrigues' property.<sup>11</sup> Mrs. Mookini was his teacher. In 1930 the school closed, and Mr. Ka'aea continued his education in Lahaina. He moved to Olowalu permanently in 1948.

He started working for Pioneer Mill in 1933, and was a brakeman on field engines used to set portable wooden water flumes in the fields. He worked in the sugar industry for 35 years. In 1940, there was a major effort to clear the fields of large rocks and boulders. Mr. John T. Moir was the supervisor, and the large rock piles that exist today in the *maka'i* portion of the property, were completed under his direction.

Mr. Ka'aea also talked about an old fish pond—Kaloiko o Kapa'ike—which was located on the eastern side of the study parcel. He remembered that the pond was filled in 1950 or 1951, when Honoapi'iani Highway was constructed (Refer to Figure

<sup>11</sup> The reader is referred to Appendix C—an undated photograph that shows the school with the pond in front of it. The school opened in 1881 with 25 students, and studies were taught in the Hawaiian language. In 1889 it switched to an English language school and had 35 students in attendance. The school closed in 1931 when Pioneer Mill purchased Olowalu Sugar Company. The largest enrollment was in 1914 to 1915, when 80 students attended.

1a and Figure A42 in Appendix A, which shows the location of the fishpond in 1906).

According to another informant, Mrs. Adeline Rodrigues,<sup>12</sup> this pond was for the *ali'i* that lived on the same property where she now resides (see Map 3 for location of Rodrigues property—parcel 4<sup>15</sup>). She related that her grandfather had told her that their property had once been the residence of Chiefess Kalola, one of the people involved in the tragic Olowalu massacre incident. Mrs. Rodrigues also said that no one had lived at Heikii Point after 1937.<sup>16</sup>

Next to the Catholic Church, within the *maka'i* survey property, was the major recreation area of Olowalu—the Olowalu Baseball Grounds. Mr. Ka'aea played baseball there until it closed sometime after World War II (1947 or 1948).

Mr. Ka'aea also mentioned the Kawasaki Store, which goes back to the late 19<sup>th</sup> century. Sometime shortly after World War II the Kawasaki Store went out of business and it became known as Olowalu Store<sup>17</sup>—a landmark on the road between

<sup>12</sup> Adeline Kamaiti Ulihuu Kaahui Rodrigues was born in Kapahulu, Olowalu, Lahaina, Maui on December 21, 1929. Her mother was Lily Kemano Kaatahahuna Fujishiro, daughter of Frederick Kasia Kakahuna. Mrs. Rodrigues said her grandfather was buried at Heikii *awa'u* in Ukumehame—the thought around 1897. She is related to John Ka'aea, who was also Fujishiro, but he later changed his name. Mrs. Rodrigues is also the great granddaughter of William Hoopii, a teacher at Olowalu School between 1900 and 1913.

<sup>13</sup> Located within this property is LCA #373, Apens 1 to Kailiulu. LCA #373, Apens 2—referred to as "Luro land"—is located west of Olowalu Stream at between 75 and 85 feet AMSL. It is not known whether Mrs. Rodrigues is a descendant of Kailiulu.

<sup>14</sup> This would have been shortly after the purchase of Olowalu Sugar Company by Pioneer Mill Company.  
<sup>15</sup> This store was then owned by the Hisao Fujii family. A 1998 map shows "the Ichikii Store Consolidation". It is not part of the subject property—not is Chez Paul Restaurant, which is next door to the east. The Old Olowalu Theater is on the Waialua side of the restaurant, and the building was

Waialua and Lahaina. Behind the store was "Japanese Camp" (Figure 2), where the plantation workers of Japanese ancestry lived.<sup>18</sup> [See additional maps in Appendix C].

Behind this camp is a parcel of land, currently owned by the Nahoohikaika family. It is c. 4000 square feet in size. According to information in the Environmental Assessment (Drafak and Campbell, 1998, Independent Source Information, p. 1), Pioneer Mill traded this parcel for the family plot further up the valley. Members of the Nahoohikaika family are buried on Pu'u Kilea, including a brother of Warren Nahoohikaika, who died at a very young age. Further up the road, *maka'i* of Pu'u Kilea is a bridge which crosses Olowalu Stream and the road leads onto the Ka'aea property. Mr. John Ka'aea's residence is here, and he leases space for a pig farm to the Calbarilla family of Lahaina (Photo 5). Above the Ka'aea place is the Kaamoana residence. Mr. L. Kaamoana was a tractor driver for Pioneer Mill Company until his retirement in the 1970s. Mrs. Kaamoana lives there with some of her children on their *kuleana* of 1 to 2 acres (Ibid., p. 2).

A sketch-map (Figure 3) provided by Mrs. Adeline Rodrigues shows the general locations of these homesteads. A handwritten note at the top of the map reads:

"Triangle property was owned by Lolimi Nahoohikaika, who married Alfred Keao who willed property to Alfred Hue Song (grandson) who sold it to J. Kaaka. Adam Puka leased property from Alfred Keao until lease expired. Adam Puka moved to Lahaina Homesteads where he died in 1935. In 1935, property sold to Kaaka. (Adam lived w/maoher Kaia in her own

probably originally part of the Olowalu Sugar Company railroad system.  
<sup>16</sup> This was also called "Olowalu Camp", and was used to house Pioneer Mill employees up until the 1970s. The area is "now overgrown with miscellaneous debris and garbage is spread throughout." (Drafak and Campbell, 1998, p. 12)

home until she died and plantation took over property)."

An area along the cane road, to the west of the Japanese Cemetery is an area called "Puka Camp" according to the map. Directly behind the Olowalu General Store is the area noted as "Old Olowalu Camp". On other maps it is referred to as "Japanese Camp", and was the area where plantation workers lived with their families. Also referenced on the Rodrigues map is the location of the Mormon Church, with the note that it is no longer there. A note above the Japanese Cemetery says that only 1 Hawaiian is buried in the cemetery—a person named Moki Puka.

Two informants mentioned that a group of Gilbert Islanders, referred to as *kini pakī*—had once been associated with Olowalu, but neither knew when this was.<sup>19</sup>

Another informant was Ms. Kaie Nahina, who was born at Pioneer Mill Hospital in Lahaina, and raised in Olowalu. She is a descendant of a family that has lived in Olowalu Valley for many generations. She said that as a child, she used to catch *o'opu* in the stream "by the tanks", and that watercress was grown in the *lo'i* in that area at one time.<sup>20</sup> She graduated from Lahainaluna High School in 1957.

She also reiterated that her grand uncle had told her that the name for Kawailoa *he'au* (Site 04) was actually Kaiwaloa, and that this was an ancient name for Olowalu Valley. She mentioned that there are graves located in the cane fields

<sup>17</sup> Following by the migration of Chinese workers away from plantation work, either 13 new occupations or to return to China, a shortage of field laborers was created. Bartholomew and Bailey (1994) note that a colony of c. 80 Gilbert Islanders and a few Tongans were imported to Lahaina in the early 1880s and remained there until 1903 (p. 32).  
<sup>18</sup> This is probably Site #708, located during our inventory survey in the Olowalu Stream valley.

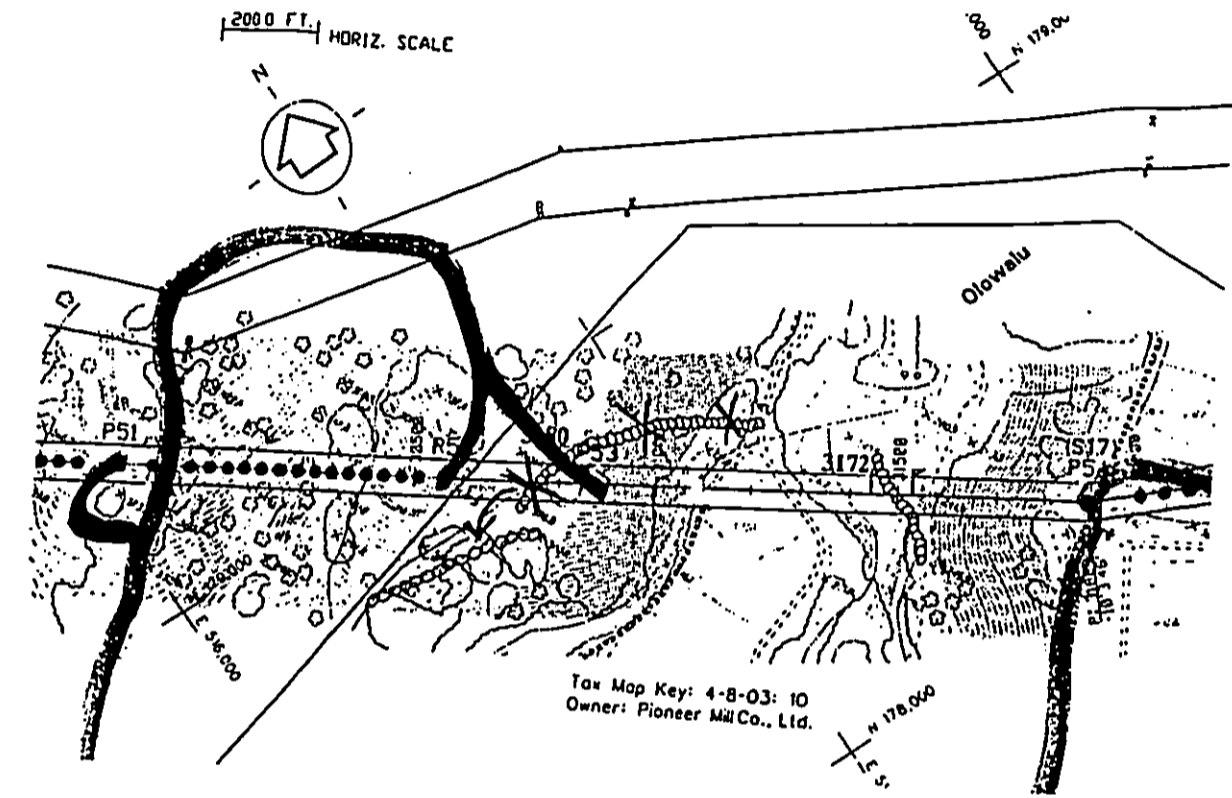












probable early post-contact subsurface habitation deposit, which may be connected with one of the *kūleana*. Site 4698 is a late precontact subsurface habitation deposit located in the vicinity of the Olowalu Sugar Mill ruins.

A total of 97 backhoe trenches were systematically used to test the subsurface deposits, after human remains were located in marine sands in an existing cane field. The precontact burial ground (Site 4693) is slated for preservation. The individual find spots identified during testing will be capped with cement, and a burial preservation area will be designated.

The other sites slated for preservation include the Olowalu Sugar Mill ruins (Site 1602), and Sites 4694, 4695 and 4696, which lie within the Beach Reserve, and will be avoided. Archaeological monitoring is recommended for Site 4697, and data recovery for the precontact habitation area (Site 4698). Archaeological monitoring of all earth altering activities was recommended for the near-shore area between Hekili Point and the manager's house (Fredericksen and Fredericksen, March 1999, Draft).

#### Archaeological work in nearby *ahupua'a* in Lahaina District

It is interesting to note the nature of the archaeological finds in the *ahupua'a* on either side of Olowalu. The information provides a framework of land utilization in those areas, which reflects the adaptation to the micro-environmental differences present in each area to some degree.

#### Launiupoko

In 1990, Paul H. Rosendahl, Inc. (PHRI) conducted an archaeological inventory survey of a 440-acre parcel for a proposed golf course in Launiupoko *ahupua'a* (Graves and Goodfellow, 1991) which lies to the north of Olowalu. During the fieldwork, 47 sites consisting of over 70

component features were identified. The sites were placed in the following formal types: terrace, clearing pile, agricultural plot, rock pile, canal, retaining wall, flume, flaked boulder, alignment, rock shelter, C-shape, wall upright, L-shape, petroglyph panel, coral, fence, esaim, and road. They fell into the following functional types: agriculture, animal husbandry, habitation, temporary habitation, and marker.

The findings were presented in terms of functional categories. The agricultural complexes predominated, consisting of 60% of the sites identified. These formal feature types included terraces, agricultural plots, rock clearing piles, cleared areas, canals and retaining walls. The terracing is extensive in Launiupoko. Much of it is interpreted as being historic, and connected with Pioneer Mill large-scale plantation agriculture. Other, smaller, agricultural plots found in the project area were probably used for horticultural activities, and consist of small dirt patches, enclosed by stacked-rock walls and windbreaks (ibid., p. 10).

The habitation sites comprise 19% of the sites, and consist of rock-filled terraces, uprights, overhangs, small C and L-shaped structures, and rock alignments. These sites often contain agricultural features within them. They tend to be larger, with a variety of features present (ibid., p. 12). The rock overhang shelters are found primarily on the north and south sides of Launiupoko Gulch.<sup>33</sup> The sites classified as having an animal husbandry function (13%) are historic, as are the roads.

The subsurface testing at habitation and agricultural sites yielded a series of

<sup>33</sup> Site 2672 is a modified rockshelter with a petroglyph panel and rock-filled terrace, quite similar to the Olowalu Complex (Sites 1200 and 1201). However, the petroglyphs are in the dripline of the overhang and have been significantly eroded over time (Graves and Goodfellow, p. 29).

radiocarbon dates that fell into a range from c. 1200 to 1650 AD. The authors conclude that many of the precontact sites were modified or destroyed by historic plantation and ranching activity. No doubt, the water system developed in precontact times was modified to suit the needs of sugarcane production, as was the extensive system of terraces.

In 1998, the site was revisited by PHRI after it was purchased by Launiupoko LLC, and 6 additional days of fieldwork were carried out from December 1997 to March 1998. The authors (Graves, Goodfellow, Haun, April 1998, p. ii) conclude that the pre-contact population of Launiupoko *ahupua'a* was probably limited. This is supported by the lack of *kūleana* land claims made during the Mahele (ibid., p. 9). They proposed that there probably had been permanent habitation settlements along the coast, while the alluvial plains and drainages were used for agriculture, and would have had temporary habitation sites associated (ibid.).

This model of settlement had to be revised. They state (ibid., p. 36):

*"The model predicted that permanent settlement would be focused at the coast. The upper portion of the project area appears to be the lower extent of prehistoric settlement on the inland, better-watered portion of Launiupoko Ahupua'a. This settlement probably occurred between the 1200s and 1400s. Temporary habitation sites associated with agriculture were predicted by the model. The project results date temporary habitation sites to the 1400s and later, with three age ranges overlapping the late 1600s. ..."*

*Although the age ranges for two habitation sites extended to the 1900s, the absence of associated historic materials indicates the sites were probably not occupied later than the early 1800s. Thus, as predicted by the model, traditional sites were probably abandoned as people moved*

*to new economic centers, in this case the coastal communities such as Lahaina."*  
Ukumehame

On the southern side of Olowalu is the *ahupua'a* of Ukumehame. This is another large, alluvial fan which spreads out below Ukumehame canyon. It was surveyed in 1997 by Cultural Surveys Hawaii (Deveraux, et al., 1997). There were 16 sites and site complexes identified within the 440-acre project area, most in higher elevations near the mouth of the canyon. They were grouped into class-types such as agricultural, habitation, *heiau*, petroglyphs, human graves, irrigation ditches, and a basalt quarry.

Two *heiau*, Hiki'i (Site 50-50-08-2), and Ukumehame<sup>34</sup> (Site 50-50-08-3) were previously noted by Walker in the 1930 survey. The latter was thought to contain human gravesites, and is in relatively poor condition. Hiki'i *heiau* has been recently reconstructed by volunteers connected to Ukumehame resident families.

#### Settlement Patterns and Expectation of Findings

The *mauka* portion of the study area represents the alluvial plains and Olowalu stream bed portions of the *ahupua'a* of Olowalu up to about the elevation of 400 feet AMSL, where the valley begins to narrow precipitously.<sup>35</sup> The *ahupua'a* was the traditional social and economic land unit division in precontact Hawaii, which stretched from the coastline inland to the mountains, encompassing a number of ecological and environmental zones.

<sup>34</sup> The name was given by DLNR archaeologists during the 1973 statewide survey (Deveraux, et al., 1997, p. 36).  
<sup>35</sup> The 73-acre *mauka* portion of the property was covered in an earlier archaeological inventory survey completed (Phase 1) in March 1999 by Xanaset Researches. This artificial division of the study area into two parts was requested by Olowalu Eha, LLC, in an effort to expedite the permit process.

Typically, this economic and social land unit was connected by trails running from sea to mountain which allowed for the transfer of economic goods from one zone to another. Additionally, *ahupua'a* were linked with one another by another trail system which ran along the shoreline. In Olowalu there was also a trail which crossed the mountain ridge and descended into Waiehu, Waiee and Waialuku Valleys on the north side of West Maui.

#### Precontact to 1850s

In late precontact to early 1800s times, permanent habitation was found along the coast and scattered along the stream in association with *taro lo'i*. Other agricultural dryland cultivation fields or plots were probably located on alluvial slopes adjacent to the Olowalu Stream *taro* patches. One very large ceremonial structure, Kawaitaloa Heiau was located at about 275 feet AMSL, and its presence dominated the *ahupua'a*. Petroglyphs marked trails extending up the valley into the mountains in at least 2 locations. Pu'u Kilea, one of the petroglyph areas also was a cemetery. Another burial area was located near the shoreline near the coastline. At least one fishpond was present near the coastline, which was probably controlled by High Chiefess Kalola, who was said to have lived just *manuka* of it.

Permanent settlements in the coastal zone were probably economically linked with marine resource exploitation, and/or wet *taro* production. *Manuka* of this zone were alluvial plains, used perhaps for dry-land cultigens, and drainages, used for *taro* production (*lo'i* and *anawai*). Temporary habitation sites were probably associated with such agricultural activities.

A trail system linking the various ecological zones within the *ahupua'a*, and other neighboring *ahupua'a*, would also be consistent with patterns in this part of Lahaina District. Another type of inland

could include stone house platforms, *taro lo'i* and *anawai*, associated with permanent and temporary habitation areas. Along communication trail systems such sites as petroglyph markers, and rock shelters used for temporary habitation, would be expected. In regions with less available water, one might expect small agricultural plots in which dry cultivation of crops such as sweet potatoes could have been undertaken. At least 1 known religious structure (*heiau*) is present on the southeast side of Olowalu Stream at an elevation of c. 260 to 275 AMSL. Another smaller one was noted in Walker as being below the larger *heiau*. *Heiau* have been found in both Launiupoko and Ukumehame.

As in other areas of Lahaina District, it appears that precontact settlement patterns continued into the early part of the 19<sup>th</sup> century. The distribution of the LCA *kuleana* in Olowalu followed the old route of Olowalu stream for the most part. There are also LCAs which were awarded as *pa'akale* on the coast. However, later cultivation appears to have obliterated nearly all of the remains of these *kuleana*.

Although filled in and now covered by the bed of Honoapi'iiani Highway, sediments from the old fishpond may still be present in subsurface deposits. The historic government road probably followed the route of the *Alaloa* trail along the coastline. Portions of Honoapi'iiani Highway cover it as well, although the Government Road route appears to be closer to the alignment of the cane road, which lies a few feet *manuka* and runs parallel to the highway.

It is also expected that some evidence of subsurface lagoonal/marsh sediments may be present behind the beach sand berm in the eastern portion of the study area. These sediments would possibly contain pollen samples which could provide

(Olowalu Stream as it was in the mid-1800s) and at the shoreline (Maps 4, 5 & 6).

information on ecological changes that have taken place in the *ahupua'a* over time.

#### Post 1850s

Following the Mahele, Land Commission Awards were granted which followed the precontact settlement to some degree. Houselot *kuleana* were granted along the coastal area, some of which were portions of *kula* and *taro lo'i* which were located along the course of Olowalu Stream. All maps showing LCAs illustrate this pattern. Sites which might be expected to be associated with these land claims typically would be rock walls outlining *lo'i*, terraces, water delivery systems, boundary markers, and house platforms and/or foundations.

#### Plantation Era

With the development of Olowalu Sugar Company and commercial agriculture in the 1860s, traditional settlement and land use patterns were drastically altered.

The general plantation system consisted of a processing mill located near the shore. A wharf or pier extended into the ocean. Smaller ships could moor and load bags of raw sugar. Larger vessels anchored off-shore, and the sugar was transported in our-driven boats (refer to photograph in Appendix C). Surrounding the mill were mule stables to the east, and the houses of the manager and important supervisory personnel to the west. *Manuka* of the mill were the homes of the plantation workers and the plantation store. Here also were recreational areas, schools and churches, to meet the needs of the plantation workers' families.

Surrounding the human community were the sugarcane fields, separated by dirt roads, irrigation ditches and rock clear-piles. Crucial to agricultural production was the water delivery system, which brought water from the upper valley to irrigate the lower

trail, followed the floor of Olowalu Valley, and extended up over the ridge of Mauna Kukui into Waiehu, Waiehu, and Waialuku valleys, which are located on the northeastern part of the island of Maui. This trail would have also allowed access to the resources found in the mountain regions, i.e. feathers from mountain birds as mentioned in the story about Mrs. Judd. Finally, the *Alaloa* (Long-Road) that encircled the island probably existed along the shore in Olowalu *ahupua'a*.<sup>21</sup>

Archaeological studies of sites located at higher elevations in both Ukumehame and Launiupoko *ahupua'a*, situated to the east and west of Olowalu, provide interesting comparisons. Evidence for the pattern of both irrigated and dry agricultural practice occurs in these 2 locations. The higher the elevation, the more water there was available for *taro* production in the stream beds. At lower elevations, dry land cultivation—probably sweet potatoes—was practiced. In both Ukumehame and Launiupoko, it is noted that plantation agriculture has probably used and modified ancient water systems within the *ahupua'a* to irrigate the sugar cane fields.<sup>22</sup> At Launiupoko the earliest permanent habitation was found at higher elevation, where people were closer to the supply of water, but no information was available for the coastal region, as it was outside the project area.

Given the general settlement patterns associated with the *ahupua'a* system found elsewhere in the Lahaina District, one would expect to find traces of precontact permanent and/or temporary occupation along the water sources (drainages).<sup>23</sup> The sites that might remain

<sup>21</sup> According to Martha Fleming (Handy and Handy, 1972, p. 490). "From Olowalu travelers were ferried by canoe to Ma'alea, thence to Makua where the *Alaloa* followed the long sandy beach."  
<sup>22</sup> Walker notes that in Olowalu this was the case in one area (see p. 20 of this report).

<sup>23</sup> The distribution of LCA parcels clearly represents this pattern. They cluster along the water source

fields, and also water to be used in the homes of the plantation community.

Also associated with the plantation system was a railroad system begun in the 1870s, which eventually consisted of 4 miles of track that ran *mauka-makai* from the mill, and to the east to link the fields of Ukumehame to the mill at Olowalu. The route of the railroad can be seen on the 1906 Alexander map (Figure 1a). Early in the history of the plantation, the rail cars were pulled by mules. In the latter part of the 19<sup>th</sup> and early 20<sup>th</sup> century, steam engines replaced mule power.

In Olowalu, commercial agricultural fields were cleared of rocks, and Olowalu stream was channelized sometime toward the end of the 19<sup>th</sup> century. This was probably done with men and mule power. The *haleaena* which had once stretched across the alluvial plain, were acquired by Olowalu Plantation, and physical evidence of their former presence was obliterated by decades of sugarcane cultivation. Any terraces or irrigation ditches that would have been present were leveled.<sup>31</sup> The 1906 plantation map refers to the area to the east of Pu'u Kilea as "very stony".

A well shaft was drilled at the foot of the mountains in 1933 to increase the water supply for the plantation. Mechanization replaced hand labor after the Second World War. Informants related that the large stone piles present in Olowalu were produced by field clearing activities at that time. This mechanized field clearing would have further destroyed any evidence of prior land usage. So, after more than a century of clearing and cultivation in these fields, the likelihood of anything from the traditional land use era remaining appears remote.

<sup>31</sup> Actually, only 3 of the 7 LCA, stretching east-west across the property were awarded for taro cultivation—LCA 10126.3 and LCA 5829-F.2 were listed as taro and *hala* land; LCA 5829-E.1, 2, 3, were listed as *hala* and housecove. The remaining 4 were listed as *kala*.

The historic sites that might be expected to be present, which were associated with the Olowalu Sugar Company and Pioneer Mill plantation activities, would be such features as sugarcane fields, walls, irrigation systems, roads, rock clear piles, and so forth. It had been suggested by informants, that burials associated with the old church (Site 1603) cemetery may extend onto the project area (See discussion in Appendix A, pp. 104-106).

## ARCHAEOLOGICAL FIELD METHODS

Fieldwork on the *mauka* (Phase 2) project area was carried out by Xamanek Researches in 2 phases. An initial reconnaissance survey was conducted on the 662-acre study area in October 1998. This preliminary work was undertaken in order to obtain a general understanding of the project area and to locate surface sites. Inventory level fieldwork was subsequently performed during December 1998 and in January, February and March of 1999. In addition, field checks, mapping and site evaluation were carried out in April and May 1999. Project members included Hugh Coffin, Mark Donham, Matthew Oterson and John Risendorf. Erik Fredericksen was the field director for the project, and Walter and Demaris Fredericksen were the overall project directors.

The inventory survey included backhoe test trenches, manual subsurface investigations, and site mapping and evaluations. A total of 97 backhoe trenches were placed in portions of the project area in order to explore subsurface conditions (Map 3).<sup>32</sup> Numbers of sites required various levels of clearing, in order to properly evaluate them. Limited subsurface manual excavations were conducted at selected sites in order to obtain radiocarbon samples and to gain additional information on site function.

Test Units were excavated by stratigraphic layers, and 10 cm. levels were utilized in strata greater than 10 cm. in thickness. All soil was screened through 1/8" inch hardware cloth. Cultural materials were collected in the field and retained for

<sup>32</sup> The reader is referred to the section on Backhoe Tests in Archaeological Findings, which discusses the rationale for placement of the trenches.

later laboratory analysis. Standard laboratory procedures were followed and no material culture remains, with the exception of 6 charcoal samples, were transported off island. The 6 radiocarbon samples were processed and placed in aluminum foil, and sent to Beta Analytic, Inc. in Florida for radiometric analysis.

Standard recordation methods were followed in the field. Mapping was done by Mark Donham in the field, and the maps and figures were further refined by him when fieldwork was completed. Photographs were taken with 35mm color film.

No additional recordation or subsurface testing was done at the two known sites—Site 04 (Kawaioloa *Helen*) and Site 1200 (Olowalu Petroglyph Complex). Several Olowalu residents requested that Site 04 not be disturbed, as it contains burials. In addition, members of the Hawaiian community, including the Chair and Vice-Chair of the Maui/Lana'i Islands Burial Council voiced similar concerns about the integrity of the large *halea*. It was mapped and photographed, however (Figure A4b; Photos 61-66).

## ARCHAEOLOGICAL FINDINGS

A total of 34 archaeological sites have been identified in the *manuka* project area. Of these, 28 are previously unrecorded. The newly identified sites have been assigned SHIP numbers.

Evidence of human burials was found during our inventory level survey. These finds included a mid- to late 1800s casket burial associated with the cemetery of the Olowalu Lanakila Hawaiian Protestant Church (Site 1603), a burial cave (Site 4699), pre- and post-contact burial ground of Pu'u Kilea (Site 4715), probable post-contact burials in Kawaihoa *heiau* (Site 04), a probable burial in an unnamed *heiau* (Site 4718), possible burial features (Sites 4710 and 4712), and scattered, previously disturbed human remains in the western part of the property (Site 4821)—between BTs 139 and 140, and near the old government /sugarcane haul road in the eastern part of the property (Site 4820—near BT 121). A Japanese cemetery (Site 4758) is also present in the study area. The disposition of these various finds are under the jurisdiction of the Maui/Lana'i Islands Burial Council (MLIBC) and the State Historic Preservation Division (SHIPD).

3180).<sup>31</sup> Another site located during the MECO transmission line monitoring is Site 3172, an historic irrigation ditch on the southeast side of Olowalu Stream at the 200 foot level. We did not further investigate this site. Its presence is noted, however, as being within the boundary of the subject property.

The newly identified cultural resources include an unnamed *heiau*, thought to have been destroyed after Walker's survey in 1930 (Site 4718); temporary habitation areas and rock overhang shelters; agricultural terraces; a possible *heiau*; a pre- and post-contact burial ground; a probable burial cave; boundary walls; retaining walls; 2 petroglyph panels; a severely impacted possible ceremonial site; plantation era retaining walls, ditch irrigation systems; and a plantation hydropower generation facility.

### Description of Sites

Site 50-50-08-4699 [31]<sup>32</sup>  
(Appendix A—pp. 1-6)  
(Figure A1; Photos 8-14)

This site is a complex of 8 rock overhang shelters, and 1 modified outcrop

<sup>31</sup> This site was identified during monitoring of the Maui/Lana'i MECO Transmission Line by Cultural Surveys Hawaii. However, it was not measured or recorded further. Therefore, we have included our findings on this site with this inventory survey.  
In Bracketed numbers represent Xeromach Resources field identification numbers.

The previously recorded sites include Kawaihoa *heiau* (Site 04); Olowalu Petroglyph Complex (Site 1200); Olowalu Petroglyph Complex Rock Shelter (Site 1201); Hawaiian Protestant Church (Site 1603); and an *ahupua'a* border wall (Site

with a rock wall (Features A through I). It is located along the southeast side of a finger ridge in the western part of the study property. Vegetation consists of buffelgrass, and *Kohe* trees. It extends c. 155 m. northeast-southwest, and is c. 30 m. in width. The series of rock overhang shelters were probably used as temporary shelters in precontact times. In one of the shelters, there is a probable burial (Feature D); Photo 8). There has also been usage during post-contact times, evidenced by the occurrence of historic artifacts in some of the features.

The first feature at the *makai* end is a rock overhang (Feature A), that has an opening 4.2 m. long, a depth of 1.75 m., and a maximum ceiling height of 2.4 m. It is a marginal shelter, the floor of which is covered with soft weathered rock which is exfoliated from the interior (Photo 9). There is a raised bench-like formation of bare rock, on which a piece of waterworn coral, a vesicular pebble and a fragment of olive green bottle glass were observed. This feature may have been used for temporary shelter in both precontact and post-contact times.

Feature B is another rock overhang shelter, located in the face of a weathered rock ridge, c. 17 meters to the east of Feature A. It is 3.8 m. long by 2.4 m. deep with a maximum ceiling height of 1.8 m (Photo 10). An historic glass bottle fragment was noted inside. There is a good aeolian soil deposit inside, and possibly outside as well, although it has been covered by a berm of earth from the excavation of a nearby irrigation canal. This was probably used as a temporary shelter in both pre- and post-contact times.

Lying c. 25 m. east, along the weathered finger ridge, is another rock shelter (Feature C). Dimensions are 2.3 m. in width by 3.0 m. in depth by 1.2 m. in height (Photo 11). This roomy shelter appears to have been altered during post-contact times. A number of post-contact

artifacts from the early to mid-1900s were noted on a small shelf along the eastern side of the interior of the shelter. These included several bottle glass fragments, a piece of metal and 1 white ceramic sherd. Here again, the shelter could have been used in precontact times for temporary habitation.

The next feature *manuka* (northeast) is the probable burial cave—Feature D. It has an opening that is 2.2 m. deep by 0.6 m. wide, with a maximum ceiling height of 0.6 m. Tightly woven *laukaha* matting was noted on the surface, and protruding from the soil deposit in the floor of the shelter (Photo 71). This narrow cave is interpreted as a burial cave. It is rather small to have been a temporary habitation. The soil deposit was not tested due to the probability that human remains are present.

The 4 remaining small rock overhang features (Features E through H) extend eastward along the base of the ridge. They are quite confined, but could possibly have served as temporary shelter.

Feature I (Figure A2; Photos 12-14) is an outcrop, modified by the construction of wall segments between basalt bedrock protrusions. The whole feature is c. 12.6 meters long with a maximum wall thickness of 0.8 m. and height of 0.75 m. There is some soil build-up on the upslope side of the walled areas that may have served as small, dry agriculture plots. Similar small agricultural features were found in both Lanuiipoko to the west, and Ukumehame to the east.

Site 50-50-08-4700 [4]  
(Appendix A—pp. 7-18)  
(Figure A3; Photos 15-18; Table 5)

This is a site-complex that lies in the northwestern portion of the study property. It consists of 10 features (Features A through J)—8 of which are rock overhang shelters, 1 is a rock wall or possible C-shape structure, and 1 is a crudely stacked wall. The site extends up a small ravine some 50



meters in a north-south direction. The maximum width of the corridor is c. 40 meters. There appear to be additional stone features outside the property border to the north. Two of the features, a rock overhang (Feature C) and a small C-shape associated with a small overhang (Feature B) lie c. 5 meters outside the project boundary.

The features appear to have been used as temporary shelters. Four manual test units were excavated in various features and are discussed below.

Feature A (Figure A4) lies directly on the property boundary. It consists of a small overhang shelter, 1.8 meters long by 0.8 meters in width, with a ceiling height of only 0.6 meters. Directly in front of the opening is a crude pile of boulders and cobbles, 3 courses high (c. 0.65 meter) that perhaps acted as a windbreak or barrier. A basalt flake and a waterworn pebble were noted near the entrance, along with waterworn coral and pebbles in the surrounding area. This feature is interpreted as a precontact, rock overhang temporary shelter, with minimum accommodation for a single person.

Feature B (Figure A5; Photos 15 & 16) lies just beyond the property boundary and consists of a semi-circular, low rock wall built on an outcrop that wraps around the *makai* side of a small, level area. A marginal rock overhang is found directly to the west. The wall measures 2.3 m. in length by 0.4 m. in width by c. 0.4 m. tall. The angular basalt cobbles are stacked 2 or 3 courses high. The function of this feature is not clear. Given the location, it possibly could have acted as a precontact observation point. No indigenous artifacts or manuports were observed, nor were there any post-contact objects present.

Although Feature C (Figure A6) lies just north of the boundary, this rock overhang shelter was tested anyway, because of the portable remains that were present on the surface of the floor of the

shelter. It measures 8.0 m. in length by 2.7 m. in depth with a ceiling maximum height of 3.0 m. A level area of c. 5 square meters inside has a good deposition of soil. There is also a good deposition of soil outside the dripline. There is some evidence to suggest that the shelter has been vandalized in recent times—cobbles have been piled in the corner, near a depression in the rear of the shelter.

This feature is interpreted as a rock overhang shelter, probably used in precontact times as a temporary habitation shelter.

#### Test Unit 1

This 0.5 by 0.5-meter unit was placed just inside the dripline in the central portion of the shelter. The surface is made up of loose, powdery, aeolian soil. Only one distinguishable layer was identified—a very loose light brown (7.5 YR 6/5) silt with about a 10% occurrence of semi-rounded pebbles and gravel. It extends to bedrock at a depth of c. 18 cm. in the northeast part of the unit, and 1 to 5 cm. in the southwest half. Marine shell consists of 7.4 g. *Nerita* pieces, 7.2 g. *Planaxis*, 1.7 g. *Conus* and a trace of other species. Six basalt flakes, 1 piece of coral, and 1 waterworn pebble were also recovered, along with 2.5 g. of *kukui* nut shell. One artifact (Artifact #9)—a volcanic glass core was recovered (Photo 72).

A carbon sample was recovered and submitted to Beta Analytic, Inc. for analysis. The measured carbon 14 age is 150 +/- 70 BP. The calibrated result at 2 sigma returned a date range of AD 1640 to 1955. Intercepts of the radiocarbon age with the calibration curve fell at AD 1680, AD 1740, AD 1805, AD 1930, and AD 1950. Because there were no historic artifacts found in the TU 1, we feel that a precontact date bracket is appropriate for this feature.

Feature D is also a rock overhang, and was probably used in precontact times

as a temporary shelter. It is about 5.5 meters to the southwest. It is 4 m. in length by 1.3 m. deep, and has a maximum ceiling height of 2 m. While there is a small level area in the shelter, there is only a very thin soil deposit. Most of the shelter floor is covered with weathering rock from the escarpment.

Feature E (Figures A7; Photo 17), another rock overhang, located c. 7 meters southwest of Feature D, has a 2 x 2 m. area in the central part of the shelter which is level and has a good soil deposit. This rock overhang shelter is c. 4.6 m. long by 3.9 m. deep, with a maximum ceiling height of 2.6 m. A series of 5 vesicular pebbles, cracked by exposure to heat were visible on the surface, along with a waterworn cobble. Because of the subsurface potential, a test unit was excavated. This feature is interpreted as a precontact temporary habitation feature.

#### Test Unit 2 (Figure A8)

Test Unit 2 dimensions were 0.5 by 1.0 m. and it was placed in the central portion of the shelter. The surface is made up of very loose and powdery soil. Layer I (0-10 cm.) is a light brown (7.5 YR 6/4), very loose silt, with little or no rock inclusions. There is an abundant amount of organic material that appears to be dead grass, layered into the soil. The layer was very thin in the eastern part of the unit, but grades into Layer II in the west part. Marine shell in Layer I consists of 13.6 g. of *Nerita* pieces, 8.5 g. of *Planaxis*, 6.4 g. of *Callana*, 3.4 g. of *Conus*, and 4.9 g. of *Cypraea*. Other portable remains include 3 basalt flakes, 6 volcanic glass flakes, 1 piece of coral, 2 waterworn pebbles, 3 "Maui diamonds", 9.7 g. of *kukui* nut shell, and 0.8 g. of fish bone. Three utilized volcanic glass flakes (Artifacts 10-12) and a relatively large worked basalt flake (Artifact 9) were recovered for this layer. It measures 63 x 50 x 25 mm., and weighs 90.1 g.

Layer II consisted of a slightly darker, medium brown silt (7.5 YR 5/2)

with no rock inclusions. It was excavated to bedrock at c. 10 to 18 cmbs. Portable remains recovered include 1.7 g. of *Callana*, 2.0 g. *Cypraea*, 6.2 g. *Nerita* pieces, 8.5 g. *Planaxis*, 2.3 g. *kukui* nut shell, 1 volcanic glass flake, and 3 waterworn pebbles. A basalt chisel fragment, measuring 24.3 x 17 x 11 mm., and weighing 7.8 g. was recovered (Artifact 14).

A charcoal sample was collected and submitted to Beta Analytic, Inc. for analysis. At 2 sigma, 95% probability, it returned a conventional radiocarbon age of 420 +/- 50 BP, and a calibrated date of AD 1420 to 1525 and AD 1560 to 1630, with an intercept or the radiocarbon age and calibration curve falling at AD 1450.

Feature F (Photo 18) is another rock overhang shelter, lying c. 4 meters to the southwest, which measures 6.3 m. long by 3.0 m. deep, and has a maximum ceiling height of 2.9 m. There is patchy, thin soil within the shelter, but a good soil deposit exists outside the dripline of this feature.

One subsurface test (TU 3) was excavated just inside the dripline. Unit dimensions were 50 by 50 by 19 cm. deep.

This is a fairly roomy shelter, with a good amount of level area within and outside. A large boulder with a niche beneath it contained a basalt abrader and a coral chunk. Feature F is interpreted as a precontact temporary shelter.

#### Test Unit 3 (Figure A9; Photo 19)

The surface soil is a light brownish gray silt ((10 YR 6/2) with some organic material. Three waterworn basalt rocks were present on the surface of the test unit. Layer I (0-17 cmbs.) consisted of 2 levels. Level I (0-10 cmbs.) yielded 13.4 g. of *Planaxis*, 3.0 g. of *Nerita* pieces, 10.6 g. of *Cypraea*, 5.5 g. of *Conus*, and 1.3 g. of *Callana*. Other portable remains included a trace of fishbone, one complete *kukui* nut (9.8 g.), 5 basalt

flakes, 4 pieces of volcanic glass, 4 small and 1 large waterworn pebbles. Level 2 (10-17 cmbs.) revealed what appeared to be a hearth feature in the southwest corner of the unit. Several fire-cracked rocks were noted. The layer contained 1.5 g. of *Planaxis*, 2 basalt flakes, 4 pieces of volcanic glass, 1 piece of coral, and 1 waterworn pebble. Two artifacts—worked volcanic glass flakes—were also recovered (Artifacts 15 & 16).

A radiocarbon sample was recovered from the hearth (Layer I, Level 2). The sample returned a conventional radiocarbon age of 200 +/- 60 BP, with the calibrated results being AD 1525 to 1560 and AD 1630 to 1950 (at 2 sigma, 95% probability). The intercept of the radiocarbon age with the calibration curve falls at AD 1665. The lack of historic artifacts would lead us to favor the earlier date range as the correct one.

Layer II (10-19 cmbs.) consisted of a light yellowish brown powdery silt (10 YR 6/4) that rests on the rock floor. It is shallower on the north side. The hearth was dug into this stratum from Layer I. Portable remains that were found include 8 pieces of volcanic glass, 1 basalt flake, 2 waterworn pebbles, along with small amounts of marine shell. Three artifacts were recovered, 2 utilized volcanic glass flakes (Artifacts 17 & 18), and an adze fragment, measuring 41.5 x 21.5 x 10.5 mm, and weighing 17.2 g. (Artifact 19).

Feature G—another rock overhang shelter c. 8.5 meters east of Feature F, is 5.2 m. long by 2.2 m. deep and has a maximum ceiling height of 1.5 m. While the interior of the shelter has a thin soil deposit, there is a fairly good soil deposit directly outside of the drip-line. The interior of the shelter is broken into 3 small shelf areas, with the level area just outside. A heavily weathered *opili* shell, along with a vesicular cobble, a fire-cracked rock, 2 waterworn pebbles, and a battered cobble were noted eroding out of

the edge of the level area outside the shelter. The function of this feature was probably temporary habitation, in precontact times.

A 0.5 m. by 0.5 m. test unit was placed just beneath the drip-line of the rock shelter.

#### Test Unit 4 (Photo 20)

This unit contained 2 soil layers. Layer I (0-6 cmbs.) consisted of a light brown silt (7.5 YR 6/2) with abundant organic debris mixed in it. It contained c. 40% rock spill from the roof of the shelter, and was sterile. Layer II (3-13 cmbs.) is a very pale brown silt (10 YR 7/2) that contained 1 waterworn pebble. Excavation was terminated at uneven bedrock that ranged from 6 to 13 cmbs.

Features H and I are both rock overhang features. The former one measures 4.5 m. long by 3.8 m. deep, and has a maximum ceiling height of 1.7 m. Most of the interior is bare rock. A large cleft in the ceiling has probably allowed water to wash away any soil periodically, which might be deposited on the floor. Further evidence of this erosion is the occurrence of waterworn coral deposited below the opening, about 3 m. down-slope from the drip-line. Feature H was probably used as a temporary shelter in precontact times.

Feature I is 2.6 m. long by 2.1 m. deep with a maximum ceiling height of 1.2 m. While there is some soil deposited on the shelter floor, much of the deposition appears to be rock exfoliation and slope wash. This feature could have been used as a temporary shelter in precontact times. A waterworn cobble was noted outside the opening.

The last feature in this site-complex (Feature J) consists of a crudely stacked wall that runs 2.3 m. in an east-west direction. It is c. 0.8 m. wide, and up to 0.7 m. in height. The rocks are unsorted and are piled on top of weathered bedrock that extends off the

base of a low escarpment. It ranges from 2 to 4 courses high, and is collapsing down-slope. Feature J may be a precontact boundary marker of some sort.

#### Site 50-50-08-4701 (Appendix A—pp. 18-19) [Figure A10]

This is a single component site that appears to be the remnant of a platform, measuring 33 by 27 m. It is a leveled area, located on a small, broad finger ridge in the western part of the project area, between Sites 4699 and 4700.

The primary feature is a roughly rectangular area paved with angular basalt cobbles, intermixed with numerous waterworn pebbles, cobbles and numerous pieces of coral. The eastern part of it has been severely impacted by a bulldozer. Scattered surface portable remains noted included lithic debitage, marine shell, and a single hammerstone. The feature appears as a leveled area on an undulating ridge. An intermittent streambed lies about 10 meters west of the site. The presence of quantities of branch and waterworn coral suggests that this site may represent a remnant of a possible precontact ceremonial structure.

#### Site 50-50-08-4702 (Appendix A—pp. 20-21) [Figure A11; Photos 21 & 22]

Site 4702 is another single component site. It consists of an L-shaped stacked, faced rock wall running c. 47 m. long in an east-west direction, with a 6 m. long north-south leg at the *manuka* side. The average width of this wall is c. 0.75 m. with a maximum height of 9 courses of rock measuring 1.2 m. It has been impacted by the construction of an irrigation ditch and cane field operations. It also appears that rocks have been pilfered from both ends of the wall. The east end terminates in collapsed rubble. This feature is possibly a historic boundary marker, which may have delineated a portion of the *manuka* and Lahaina side border of LCA 5829-D, a 5.5

acre parcel awarded to Kaaoahema on September 22, 1853. The nature of the land use is listed as "household and taro patches" in the LCA. The outline on the map does not coincide precisely with the site, although the orientation is very close. However, it is stated in the legend that the LCA locations are "approximate"—not plotted (See Map 5).

#### Site 50-50-08-4703 (Appendix A—pp. 21-23) [Figure A12]

This is a site complex with 3 features, located beneath the old power transmission line corridor, near the western border of the property. This corridor leads to a transformer and the water tunnel shaft opening in the northwestern portion of the project area. Site 4703 lies quite close to the border. The 3 features extend some 30 m. northwest-southeast, and cover c. 8 m. in width.

The western-most feature (Feature A) is a crude U-shaped rock enclosure. Although not well constructed, it appears to have some boulders placed in an upright position, leaning against one another. Its function is not clear, but it may be a boundary marker, given its location on the *alupua*'a boundary.

Feature B is a linear arrangement of rock, stacked 3 to 4 courses high. It has been heavily impacted by earthmoving activities associated with the placement of the power transmission line. Consequently, its function remains unclear.

Feature C is a modified outcrop, which may have functioned as a windbreak. Three to 4 courses of rock are stacked next to a protruding boulder, providing a sheltered space behind. It appears possible that Site 4703 dates from precontact times, and that the 3 features were part of a larger structure that has been destroyed by post-contact activities.

Site 50-50-08-3180 [8]  
(Appendix A—pp. 24-25)  
[Figure A13; Photos 23-26]

A single component site, Site 3180 is a rock wall that stretches 234 m. in a roughly east-west direction, from c. 240 to 400 ft. AMSL. Although it does not exactly align with the boundary line indicated on the map, it is close enough to the project border to suggest that it was made, probably in historic times, to mark that boundary. It is built as close to the boundary as the terrain would allow. It has an average width of 0.85 m., with a height of 1.2 m. on the downslope side, and 0.6 m. on the upslope side. The maximum height is 1.45 m. It is faced with 6 to 10 courses of angular boulders and cobbles, with core-filled sections. Walls of this type were constructed along boundaries in the 1880s-1890s, to manage cattle movement.

This is considered to be the site identified during the MECO transmission corridor inventory survey as Site 3180 (Robins, Folk and Hammat, 1994, p. 82). They interpret it as a cattle wall, "constructed to keep cattle outside of the cane fields and kuleana." They did not state its length, but described it as a "wall...stacked and vertically faced with basalt boulders. It measures an average width and height of 1.0 m. (3.3 ft.)."

Site 50-50-08-4704 [9]  
(Appendix A—pp. 24-31)  
[Figure A14; Photos 27-30; Table 6]

This is a petroglyph complex, located inside the mouth of the Olowalu Stream valley. It consists of 7 features—Features A through G.

Feature A is a vertical basalt face that has over 27 petroglyph images on it (Figures A15 & A16).<sup>33</sup> Feature B is a

<sup>33</sup> The petroglyphs were not individually analyzed at this level of study. Data recovery is recommended to undertake this task.

terrace that abuts this basalt face. It is formed by a stacked, faced retaining wall, 5 to 13 courses high, built parallel to the basalt face. A 0.5 by 0.5 m. test unit was placed in the level area between this wall and the petroglyph panel.

Test Unit 1 (Figure A17)

This unit was placed 1.7 m. out from the base of the petroglyph panel on the small terraced area. Unit dimensions were 50 by 50 by 60 cm deep. Layer I (0-40 cmbs.) consists of brown clay loam (7.5 YR 5/3), with a 15 to 20% mix of angular pebbles and gravel. Some historic bottle glass and a square nail were recovered from the surface level. Recovered marine midden included 9.4 g. of *Nerita plicata*, 5.8 g. of *Planaxis*, 2.7 g. of *Callinus*, trace amounts of sea urchin and crab, 0.3 g. of fish bone. Also recovered was a human deciduous tooth—an upper incisor. *Kukui* nut shell was found in the uppermost level. Other portable remains included 4 basalt flakes, 17 pieces of coral, and 1 large waterworn pebble (98.4 g.). Small amounts of charcoal were present, but not enough was available to obtain a radiocarbon sample.

Layer II was brown, very compact clay loam (7.5 YR 4/3), made up of 80% weathering bedrock and contained only a sparse amount of marine shell. Excavation was terminated at bedrock at 60 cmbs.

Feature C was composed of a natural terrace which was extended by a stacked rock retaining wall. A hammerstone was found directly below a petroglyph image at the base of a basalt face.

Feature D is a smaller terrace with a crude retaining wall that may have served as an agricultural plot. A utilized basalt flake and a battered cobble were noted on the surface. This feature is c. 8 m. southeast of Feature B. Feature E, F and G are probably other agricultural terraces, created by a

retaining walls of stacked boulders. Feature F was very nearly impacted by the pump station construction.

This site complex is interpreted as a precontact habitations/agriculture site (*to'i*), with a ceremonial or symbolic component in the form of pictographs or petroglyphs carved on the basalt cliff face.

Site 10<sup>a</sup>

This is a lumber scatter representing what remains of the previous marker for the northernmost boundary corner, probably built in the late 19<sup>th</sup> or early 20<sup>th</sup> centuries.

Site 50-50-08-4705 [11]  
(Appendix A—pp. 32-34)  
[Figures A18 and A19]

This is a site complex, made up of 2 rock overhang shelters (Features A and B) which are located on the west side of Olowalu Valley downslope from Site 4704. They are found about 1/3 of the way up from the base of the slope, and are c. 42 meters apart. They appear to have been used in precontact times for temporary shelter.

Site 50-50-08-4706 [12]  
(Appendix A—pp. 35-36)  
[Figures A20, A21; Table 7]

Site 4706 is another rock overhang, on the west side of the mouth of Olowalu Stream valley, in a weathered basalt cliff face. It measures 4.25 m. wide by 2.25 m. deep, with a maximum ceiling height of 1.25 m. A test unit was utilized in this rock shelter in order to investigate subsurface conditions.

Test Unit 1

This unit was placed within the shelter near the west corner. It

<sup>a</sup> This site was only given a field number and was not considered significant enough to assign a SIHP number.

measured 0.5 by 0.5 m. by 0.3 mbs. Layer I (0-5 cmbs.) was a light brown loose, very dry silty loam (7.5 YR 6/3), with 50% angular gravel or pebbles present. Small amounts of marine shell were recovered, along with 22.5 g. of *Kukui* nut shell, 38.1 g. of charcoal, and nine basalt flakes.

Layer II occurred at an abrupt color change. This gray silty loam (7.5 YR 6/1) contained 50% angular gravel. Bedrock encroached on the north, east and south sides. Layer II extends from 5 to 30 cmbs. and overlaid bedrock. There is a considerable amount of charcoal (over 100 g.) suggesting that this may have been the edge of a hearth. Material remains included 8.9 g. of marine shell, 1.6 g. of fish bone (including a parrot fish jaw), 23.4 g. of *Kukui* nut shell, and a piece of volcanic glass. A volcanic glass core, 22.5 x 14.5 x 10.5 (4.9 g.) was also recovered at about 28 cmbs. (Artifact 13).

A charcoal sample (Sample #3) from Layer II was submitted to Beta Analytic, Inc. for analysis. Its conventional radiocarbon age was 290 +/- 50 BP, with the date calibrated to be AD 1470 to 1670 and AD 1780 to 1795 at 2 sigma, 95% probability. The intercept of the radiocarbon age with the calibration curve falls at AD 1640.

The radiocarbon date establishes the site as late-precontact, and the portable remains suggest a temporary habitation function for the shelter.

Site 50-50-08-4707 [13]  
(Appendix A—pp. 37-38)  
[Figure A22]

This is a site complex made up of 2 features. Feature A is a rock wall that runs in a northeast-southwest direction for c. 26 meters inside the property boundary, and another 51 meters beyond. It lies on the floor of Olowalu Stream valley, c. 17 meters east of the stream. It is up to 5.5 meters wide. Feature A may be a boundary

marker. A fence line passes over the western edge.

Feature B is a mound of rocks c. 5 by 2.7 m. lying just inside the project boundary. This feature is interpreted as a possible burial.

Site 50-50-08-4708 [1-4]  
(Appendix A—pp. 39-42)  
[Figure A23; Photos 33 & 34]

This is a site complex with 2 features—a large platform with a nearly vertical, faced retaining wall on the stream side (Feature A); and a terrace system, which lies to the northeast (Feature B). It is situated within the mouth of Olowalu Stream valley, c. 25 meters east of the streambed. The site appears to border 2 LCA parcels—8817, Ap. 2 to Kanakaole to the east, and 5952; 2 to Minoemina, on the south.

Feature A (Photo 33) has been impacted on the southwest side by the construction of 2 water tanks and a perimeter fence associated with the tanks. A large boulder, which appears to have been fairly recently displaced bears 2 petroglyph images (Figure A24).

Feature B (Photo 34) is made up of a series of stacked, faced rock retaining walls that were agricultural features—probably taro *lo'i*. A 3 inch in diameter iron pipe was noted connecting the *lo'i*. Two test units were placed in Feature B to investigate the subsurface deposits.

#### Test Unit 1

This test unit measured 0.5 by 0.5 meters, and was up to 0.62 m. deep. There were 3 layers present. Layer 1 (0 to 6 cmbs.) was a dark brown loam (7.5 YR 3/5), with abundant organic material. A single waterworm pebble was recovered.

Layer 11 (6 to 22 cmbs.), a brown silt loam (7.5 YR 4/2) contained

no rock inclusions. Flocks of an orangish substance were noted, as well as a few bits of charcoal. No portable remains were found.

Layer III (22 to 42 cmbs.) consisted of a light brown silty loam (7.5 YR 6/3) with sparse weathering bedrock, increasing in occurrence toward the bottom of the excavation. A probe revealed another 10 cm. of rocky soil before reaching bedrock. Such stratigraphy would be consistent with agricultural activity.

#### Test Unit 2

Another 0.5 by 0.5 meter test unit produced similar results to those of Test Unit 1. There were 3 layers. Layer I (0 to 6 cmbs.) was composed of brown sterile loam (7.5 YR 4/3). Layer II (6 to 20 cmbs.) consisted of brown silty clay (7.5 YR 4/2), with a cut nail and 1 piece of historic glass in the upper 10 cm. In the lower 10 cm., a basalt flake was recovered. There were very few angular pebbles (5%) in the soil. Layer III was made up of brown compact clay (7.5 YR 5/4), with weathered rock becoming more common as depth increased. Excavation was halted at 40 cmbs.

Feature A is interpreted as a possible precontact religious structure, which has undergone modification in post-contact times. The size of the substantial platform and its proximity to Olowalu Stream and the Feature B taro *lo'i* suggest that this structure may be a *heiau* connected with agricultural activity. There were no soil deposits associated with this large rock platform. The amount of labor needed to construct the platform would have been considerable. While it might be a post-contact house platform, none of the nearby LCAs were awarded as houseless—only taro lands. No subsurface testing was conducted on this feature because of its possible religious significance. It would have been necessary to dismantle a portion

of the feature in order to investigate it further.

Feature B is interpreted as a series of *lo'i* that were probably utilized for wet-taro production in precontact times, and continued to be used into the 20<sup>th</sup> century. The subsurface silty loam soils within the terraced features were nearly devoid of rocks, which are abundant in the surrounding soils. There is an iron pipe between 2 of the *lo'i*, indicating later modification and usage. An informant, Ms. Katie Nahina, recalled that watercress was grown in these former taro *lo'i* in the time before she graduated from high school in 1957.

Site 50-50-08-4709 [1-5]  
(Appendix A—pp. 42-46)  
[Figures A25 & A26; Photos 35-37]

This is a complex made up of concrete foundations (Features A and B), a stacked rock wall/terrace area (Feature C), and irrigation ditches (Feature D). This post-contact feature probably dates from the early 20<sup>th</sup> century. Features A, B and D are related to plantation activities, while the wall feature and associated artifacts appear to have been part of a habitation area. Feature A (Photo 37) once supported hydroelectric generation equipment. Water was transported to the hydro-generator via a flume. This water subsequently flowed into various irrigation ditches.

Feature B (Photo 36) is a concrete vault or cistern lying to the south, the function of which is uncertain. Feature D consists of the irrigation ditches that intersect at Feature A, which carry water to the south and west, and are part of the current sugarcane irrigation system.

Feature C (Photo 35) is a terrace c. 60 square meters in area, which is formed by a stacked, faced retaining wall on the northwest side. A stacked, freestanding wall encloses another terrace on the upslope. A large boulder at the center of this wall has a

small niche at the bottom of it, in which a ceramic bowl has been placed, possibly as an offering. The presence of old kerosene stove, a cooking pan, pane glass and corrugated roofing suggest that Feature C may have been the foundation for a house.

Site 50-50-08-4710 [1-6]  
(Appendix A—pp. 46-51)  
[Figure A27; Photos 38-40; Tables 8 & 9]

This site is considered to be a habitation complex, and is located above the mouth of Olowalu Stream Valley on the eastern side at c. 330 feet AMSL. It is comprised of 7 features (Features A-G). The central element is a rectangular rock wall enclosure that is built on a terrace created by a boulder alignment (Feature A). Two other boulder alignments create a pair of terraces 3 meters to the east (Feature B). A pair of small enclosures (Features C and D) are adjacent at the north corner of the site (Photos 38 & 39). Feature E, a probable burial marker, is a small, roughly oval-shaped rock alignment directly adjacent to the northwest side of Feature A (Photo 40). It appears to be on the eastern edge of LCA 6728, Ap. 1—a 2.281 acre parcel granted as taro land to Mahulu in 1853.

The site has been impacted by a large pile of boulders and pieces of concrete that have been pushed from the adjacent canefield on the south side of the complex. It was not possible to tell how much of the site has been covered by the cane field push. Two test units were excavated at this site.

#### Test Unit 1 (Figure A28)

This unit was placed at the northwest corner of the uppermost terrace—Feature B. It measured 1.0 by 0.5 m., and was 0.5 m. deep. It contained 5 soil layers, and a hearth feature.

Layer I (0 to 10 cmbs) was a brown loam (7.5 YR 4/3) with c. 50% organic debris. This layer was shallower in the south end of the unit.

Portable remains recovered included 6 basalt flakes, a volcanic glass flake, a piece of coral and 1 waterworn pebble. No marine shell or other food midden was present in this uppermost stratum. A worked flake of quartz (Maui "diamond"—Artifact 21) weighed 0.8 g., and measured 18 x 8 x 4.5 mm. was recovered from Layer I.

Layer II (c. 3 to 18 cmbs.) was a yellowish-brown clay loam (10 YR 5/8) with angular gravel occurring at about 10% by volume. This layer contained considerably more cultural remains, including 38 basalt flakes, 2 volcanic glass flakes, 13 pieces of coral, as well as a ceramic shard, a piece of green bottle glass, and a small brown fragment. Marine shellfish remains included 7.2 grams of *Conus*, 4.8 grams of *Cypraea*, and 1.7 grams of *Turbo sandakensis*. Also recovered were 5.7 g. of mammal bone, and 26.2 g. of *Islandia* nut shell.

Layer III (c. 15 to 32) consisted of a grayish brown (10 YR 5/2), ashy silt loam, which appears to be on the edge of a hearth. At c. 20 cmbs. clear in the south part of the unit. It was a very ashy concentration in which many fire-cracked rocks were present. Portable remains recovered from Layer III include 5.2 g. *Conus*, 7.2 g. *Cypraea*, 0.7 g. *Nerita pikes*, 1.4 g. *Planaxis*, 11.1 g. of mammal bone, 0.5 g. fish bone, 20.8 g. *Islandia* nut shell, 83 basalt flakes, 22 pieces of coral, and 1 volcanic glass flake. Those remains recovered from the hearth feature include 2.6 g. *Conus*, 6.9 g. *Cypraea*, traces of *Nerita* and *Planaxis*, 2.3 g. of sea urchin, 11.4 g. of mammal bone, 2.3 g. of *Islandia* nut shell, 24 basalt flakes, 17 pieces of coral and 3 waterworn pebbles. Four formed artifacts were recovered, including a coral abrader fragment (Artifact 22); a piece of worked shell (Artifact 23); a hammerstone (Artifact 24); and a ground basalt abrader (Artifact 25).

Layer IV (c. 17-30 to 50) was composed of a medium, yellowish brown clay loam (10 YR 5/6), through

which the hearth feature had been dug. Small amounts of marine shell, fish bone and charcoal were recovered, along with 40 basalt flakes, 1 piece of volcanic glass, 16 coral pieces, and 2 waterworn pebbles. Four artifacts were found—2 basalt choppers (Artifacts 26 and 27); a basalt chopper core (Artifact 28); and a large polished basalt adze fragment (Artifact 29). At the bottom of this layer, the amount of cultural material dropped off markedly.

Layer V lay under the hearth and was composed of a sterile, reddish brown clay (5 YR 5/4) with weathered rock. Excavation of the unit was halted at c. 50 cmbs.

A radiocarbon sample was taken from the hearth and sent to Beta Analytic, Inc. for analysis. The results returned a conventional radiocarbon age of 200 +/- 50 BP, with calibrated date brackets at 2 sigma, 95% probability falling at AD 1635 to 1705 and AD 1715 to 1885, and AD 1910 to 1950. The intercept of the radiocarbon age with the calibration curve is at AD 1665.

#### Test Unit 2 (Figure A29)

This second unit was excavated in Feature C, a small rectangular enclosure. The unit was 1.0 by 0.5 meters, and was excavated to a depth of c. 0.40 mbd. Four layers were present.<sup>17</sup>

Layer I (0-8 cmbs.) was composed of mostly decomposing organic material. It contained 2 basalt flakes, and a piece of coral. Layer II (8-12 cmbs.) was a medium brown ashy silt (7.5 YR 4/4), which yielded 27 basalt flakes, 14 pieces of coral, and a single fragment of clear bottle glass. About 10 g. of marine shell, 5.9 g. of which was not identifiable, and some charcoal and *Islandia* nut shell were also found.

<sup>17</sup> A hearth feature was found in the central portion of the excavation unit, but did not show on the profiles. It showed up in Layer II, underneath the decayed vegetation of Layer I.

Layer III (12 to 40 cmbs.) is made up of gray ashy silt (10 YR 6/1) that contained many fire-cracked rocks, 263 basalt flakes, 56 pieces of coral, 4 waterworn pebbles and a large amount of charcoal. Marine shell remains were more abundant—2.9 g. of *Callina*, 30.6 g. of *Conus*, 28 g. of *Cypraea*, 7.8 g. of *Nerita pikes*, and 13.7 g. of *Planaxis*. A small piece of worked bone (Artifact 30), and a tiny coral abrader fragment (Artifact 31), were the only formed artifacts recovered. Layer IV was a sterile layer of compacted silt (7.5 YR 4/6).

A charcoal sample was submitted to Beta Analytic, Inc. for analysis. It returned a modern radiocarbon age of 60 +/- 50 BP, indicating that this feature was used in historic times, as a temporary camp. The hearth appears to have been dug into precontact deposits with cultural materials such as basalt flakes, marine shell, etc.

Although the radiometric date from a hearth feature in Feature C is modern, the general appearance and construction of Site 4710 strongly suggests that it was built in late-precontact times. It appears likely, however, that this habitation area was utilized in post-contact times as well, probably as part of a *kulcove*. As noted earlier, the southern portion of the site has been buried by a pile of boulders pushed off of the adjacent cane field. A 4-inch black PVC pipe crosses the site in an east west direction, separating Features C and D.

Site 50-50-08-4711 (Appendix A—pp. 51-53) [Figure A30]

This site, composed of 2 features, lies in the northeastern corner of the project area. Feature A lies a few meters within the property boundary, while Feature B is just outside. The latter feature is a small terrace that may have been an agricultural feature. Feature A consists of a linear pile of basalt rocks, the function of which remains

unclear. Both are presumed to be precontact. A piece of *Conus* shell and a piece of coral were noted in the immediate vicinity.

Site 50-50-08-4712 (Appendix A—pp. 53-56) [Figure A31]

Located on the southwest slope of Pu'u Kilea, this site consists of 2 features—Feature A, a narrow terrace constructed of cinder cobbles and gravel, that modifies a low outcrop; and Feature B, a small oval-shaped pile of cinder rocks. Lithic debris cobbles. A single waterworn cobble sits on top of Feature B, which may be a burial feature. The overall site appears to be precontact, but the function of Feature A was not determined.

Site 50-50-08-4713 (Appendix A—pp. 56-57) [Figure A32; Photo 41]

This is a single component site located on the northeast slope of Pu'u Kilea, c. 85 meters down from the summit. Site 4713 is interpreted as a rock overhang shelter, and 6.0 m. wide by 3.5 m. deep with a maximum ceiling height of 2.4 m. It appears to have been used for temporary habitation in both precontact and post-contact times. Historic items such as a bottle cap and old (non-synthetic) cordage were found inside, as well as a few waterworn pebbles. A possible hammerstone was noted c. 9 m. downslope of the shelter entrance. A small stacked wall with 4 to 6 courses of rock, blocks the lowest portion of the mouth. This wall is c. 0.6 meters high on the outside, and 0.85 meters above the interior floor. Charcoal is scattered on the shelter floor. Cordage similar to that found in this shelter was observed at Kawaialoa *keiua* (Site 04).

Site 50-50-08-4714  
(Appendix A—pp. 57-58)  
[Figure A33; Photo 42]

[20]

This small rock overhang is located on the northwestern flank of Pu'u Kilea, c. 30 meters downslope from the summit. It has a restricted entrance, and a relatively limited space inside. The maximum ceiling height is 0.7 meters, while the entrance is 2 meters wide and the depth is 2.4 meters. A single, cracked waterworn pebble lies just inside the entrance. Site 4714 is c. 5.5 meters southeast of and above the cliff face on which many petroglyphs, associated with Site 1200, are found.

Site 50-50-08-4715  
(Appendix A—pp. 57 and 59)  
[Figure A34; Photos 43-48]

[21]

This site is a burial ground located on the summit of Pu'u Kilea. It is a complex of rock mounds, platforms, terraces, *ʻiʻi* pavings, stone markers, and depressions. The exact number of burials is unknown, but judging from the number of features, it is felt that as many as 34 individuals may be buried here. Local residents report that they have relatives buried there.<sup>20</sup> The area was formerly enclosed with a wire fence that was attached to upright railroad rails. Many of these rails remain in place, but most of the wire fencing has collapsed. A gateway occurs at the northwest side. On one of our visits to the area, a dried *maile lei* was observed on the largest of the mounds on the north end of the cemetery.

Indigenous material culture remains noted on the surface included a basalt chopper, pieces of marine shellfish, and waterworn coral. None of these items were collected from this burial area. It is highly probable that both pre- and post-contact

<sup>20</sup> Members of the Nahoohouka family reported that a brother of Warren Nahoohouka, who died as a child, is buried there. Ms. Kaie Nahina reported that her great grandfather is buried there.

burials are present in this burial ground. No subsurface testing was undertaken in respect to those Olowalu residents whose ancestors are buried there.

[22]

Site 50-50-08-4716  
(Appendix A—pp. 60-62)  
[Figure A35]

Two features make up this site complex, located on the steep slope of Olowalu Stream drainage system. Site 4716 lies c. 30 meters northeast of the foot of Pu'u Kilea, and c. 25 meters south of the stream itself. Feature A is a terrace, and Feature B is a rock wall.

Feature A consists of a low stacked-boulder retaining wall, which forms a c. 10- to 15-square meter level area. Shell midden, basalt flakes, *kukui* nut shell and mammal bone fragments were observed on the surface and eroding from the base of the retaining wall. Historic debris was also noted around and inside a marginal sheltered space beneath a large boulder on the southeast side of the terrace. This feature is interpreted as a probable precontact temporary habitation area.

Feature B is a stacked, faced and core-filled wall that runs in a north-south direction for some 22 meters, down the steep slope of the drainage system. It could possibly have served as a boundary marker, although no *kūfana* in the immediate vicinity are shown on the map. It has been disturbed on the south end by the construction of a concrete irrigation ditch. The northern end appears to have been knocked down by water erosion. Its function and time of origin remain unclear.

Site 50-50-08-4717  
(Appendix A—pp. 62-65)  
[Figure A36; Photo 49]

[23]

This site consists of a number of features located along the Olowalu Stream bank, and was probably built for flood control during the plantation era. Feature A

is a retaining wall, 15 meters long, which creates a terrace area behind. A concrete ditch runs along the back side of the wall. Feature B is another wall feature built of dry-laid rock, which curves along the stream's cut bank for 25 meters. Feature C (Figure A36) consists of a stacked rock wall section across from the Pu'u Kilea petroglyph panel (Site 1200). It lies on the east side of the stream, along the cut edge. Feature D is a 51-meter section of wall, which is well-built, faced on the stream side, and with a slope of c. 15%. Rubble and earth form a somewhat leveled area behind the wall. This feature has been undercut to some degree, by water action. It was likely longer, but has collapsed into Olowalu Stream.

[24]

Site 50-50-08-4718  
(Appendix A—pp. 65-67)  
[Figure A37; Photos 50-53]

This site is a complex of 3 features, and is interpreted as the remnant of a *heiau*. It is located in the middle of a cane field in the central portion of the study area, at c. 80 feet AMSL. The original shape and extent of this site could not be determined accurately, because it has been covered with dirt and field stones from the surrounding cane fields. The probable dimensions of this site are essentially the same as the small *heiau* that Walker referred to, which measured 40 by 60 feet. Identified as Site 5, Walker goes on to note that "all interior structures have been destroyed", and that no name was learned for this *heiau* (Walker, 1931, p. 108). However, at the time of our survey, 3 interior features were identifiable.

Feature A consists of an enclosure that measures c. 12 meters in length by c. 6 meters in width, and is c. 0.7 meters high. Although damaged and partially covered, the intact portions are still visible, and are in fair condition. The interior is divided by linear rock alignments, retaining walls with paved and slightly raised areas, and separating pathways. One path leads in

from a possible entrance on the southwest side.

Features B and C appear to be burials. They are rectangular arrangements of semi-rounded cobbles and boulders, with an inner pavement of smaller cobbles and *ʻiʻi* pebbles, and are quite reminiscent of the known burials found on Pu'u Kilea. A concentration of surface cultural materials, including volcanic glass flakes (4), basalt debris (5), coral pieces (6) and a number of marine shells, occurs between these features. None of these cultural materials were collected and no subsurface testing was undertaken.

Informants reported that human remains, disturbed during field plowing operations elsewhere on the property, had been reinterred at the site. The precise location and time of reinterment was not determined. However, a portion of Feature C appeared to have been partially dismantled and reconstructed at sometime in the past.

Site 50-50-08-4719  
(Appendix A—pp. 67-68)  
[Figure A38; Photo 54]

[25]

Site 4719 is a boundary marker, which consists of a short section of dry-laid rock wall, which has been tied into the property corner monument, marking the eastern-most corner of the property. The latter is constructed of rounded rocks, and is mortared together. The wall segment may predate the monument. It was partially buried by a large pile of burned cane, so it was not possible to establish its total length. This pushed cane remains piled on the site at the writing of this report.

Site 50-50-08-4720  
(Appendix A—pp. 69-70)  
[Figure A39; Photo 55]

[26]

This is a single component post-contact site, associated with plantation activity. It consists of a retaining wall

across a small drainage gully, which is filled-in behind with earth, forming a level road crossing. The retaining wall is 5 to 6 courses high and dry laid, except for the top course, which is mortared together.

Site 50-50-08-04 [27]  
(Appendix A—pp. 70-72)  
[Figure A40; Photos 61-66]

This is Kawaioloa *Heiau*—Walker's Site 4, which was described as a large, walled *heiau*, in good condition in 1930. Remarkably, it remains in good condition today.<sup>27</sup> The structure was mapped by Mark Donham in January 1999. No subsurface testing was undertaken during this inventory survey, because of the cultural significance of this large *heiau*.

An informant, Ms. Katie Mahina, has told Erik Fredericksen, that her great uncle says the name of the *heiau* is Kawaioloa, which is in reference to an old name for Olowalu. However, this name is not used in any of the literature sources consulted by the present authors.

Site 50-50-08-4721 [28]  
(Appendix A—pp. 72-73)  
[Figure A41]

This site consists of a single component site, and is located c. 183 meters west of Olowalu Stream bed directly above the northern-most cane field. It is a small rectangular platform with a level area formed by a faced, retaining wall on the west side. It is built on a gradual slope, c. 7 meters up from the existing cane field. Post-contact artifacts such as an earthenware plate fragment, a piece of olive green glass and a piece of milled lumber were noted. This is interpreted as a possible, post-contact habitation site.

<sup>27</sup> Refer also to Photo 4. Site 04 is visible in the middle of the photograph.

Site 50-50-08-4758  
(Appendix A—p. 70)  
[Figure 7; Photos 56-60]

This is an historic cemetery, in which predominantly people of Japanese ancestry were buried. According to informant, Mrs. Adeline Rodrigues, only one person of Hawaiian ancestry is buried here. It is impossible to ascertain exactly how many graves are present. Some of the markers are made of concrete with engraved characters, while others are a simple basalt rock placed upright—some with inscriptions. A few are wooden upright posts, some are mounds of stone, and others are rectangular alignments that mark the burial plot.

Only one modern granite gravestone was noted, near the eastern edge. Fresh flowers at the gravesite on June 10, 1999, indicated that it had been visited recently. The inscription on the tombstone reads: Ralph H. Fujishiro, May 29, 1925 to January 31, 1938. This is a family name that is common in Olowalu, as well as in nearby Ukumehame. Two other Fujishiro graves are located in the Olowalu Stone Church cemetery (Site 1603).

The cemetery stretches for about 37 meters in a roughly east-west direction, and is c. 10 meters in width at the western end. It lies between 2 sugarcane fields, and along a cane road that runs *manuka-makai*.

As our inventory survey was nearing its completion, a cane fire swept across the cemetery and burned off the vegetation, and charred many of the wooden grave markers (Photos 56-60). It appears that 60 or more burials are contained in Site 4758.

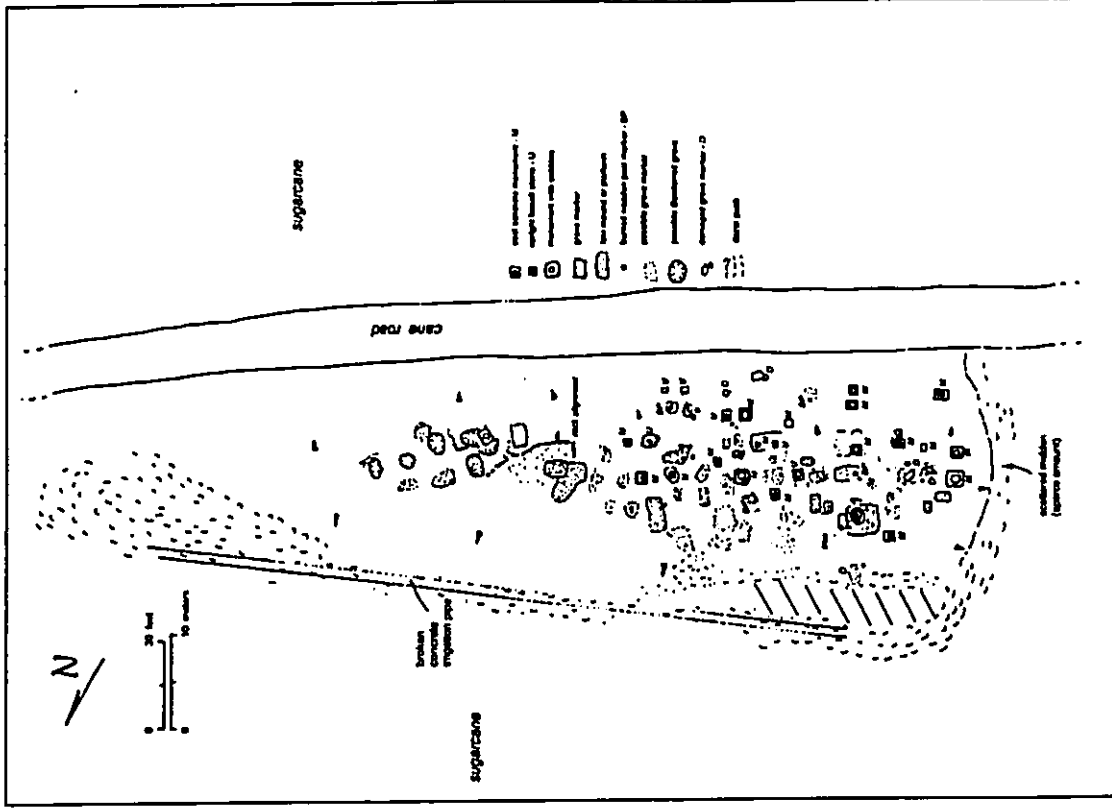


Figure 7 — Plan view of Site 4758—Japanese cemetery.

Site 50-50-08-1603  
(Appendix A—pp. 74-76)  
(Figure 5)

This is the Olowalu Lanakila Hawaiian Protestant Church site that was numbered during the statewide inventory of historic places in 1973. While excluded from the project area, one casket burial was located during backhoe testing in the area north of the stone church ruins. During ongoing discussions with informants about the project area, Ms. Adeline Rodrigues indicated to Erik Fredericksen that the church cemetery extended into the adjacent canefield. Ms. Rodrigues recalled that her maternal grandmother had told her not to forget that there were "old" graves behind the church. Our preliminary testing located one coffin burial below the existing sugarcane field.<sup>4</sup> Further testing was not attempted, since the property owners, Olowalu Elua Associates, LLC, have agreed to create a preservation area, which includes the former church property now covered by sugar cane.

Site 50-50-08-4820  
(Appendix A—p. 107)

This site consists of a surface scatter of weathered, fragmented human remains, made up of a few long bone shaft fragments primarily. The remains were located on the surface, near BT 121, and were scattered in an area roughly covering 100 square meters. Backhoe Trench 121 was excavated to determine whether subsurface evidence of a burial could be found. The subsurface layers consisted of a 40 cm.-thick plow zone on top of 5 layers of silty clay deposits extending to a depth of 2 meters. No subsurface cultural materials or deposits were found. The stratigraphy suggests that the surface layer with the remains in it may

<sup>4</sup> Another informant, who wishes to remain anonymous, indicated that in the early part of the 20<sup>th</sup> century, the plantation bulldozed the headstones and grave markers away before planting sugar cane.

have originated from somewhere else. Two informants reported that human skeletal remains have been recovered from this location for years, and that they were reburied at the small *heiau*, Site 4718.

Site 50-50-08-4821  
(Appendix A—p. 107)

This site represents another surface scatter of fragmented human remains (a skull fragment, a phalange, and a few long bone fragments) that were located on the surface of the plow zone between BTs 139 and 140 in the western-most portion of the study area. The remains were scattered in about a 50- to 60-square meter area. Additional remains were not found in subsurface deposits tested by the backhoe. Subsurface layers of both BT 139 and 140 indicate that this area has undergone at least 2 episodes of localized flooding, suggesting that the surface deposits may have resulted from an eroded burial originating elsewhere.

Site 50-50-08-4822  
(Appendix A—p. 107)

This is the site of a pond identified on early maps as a "Pond" (Refer to Figure 1 and 1a). This pond existed into the mid-20<sup>th</sup> century. A 1916 photograph of the school, situated on the edge of the pond is included in Appendix C. Informants have noted that the pond survived from precontact times. Mr. John Ka'aea gave the name of the pond as *Kaloko o Kapo'i'i*. It was also mentioned by another informant, Mrs. Adeline Rodrigues, and she said that High Chiefess Kalola lived just *maka* of this pond, and it was probably associated with her. The site's possible precontact origin is based solely on this oral testimony, since we have not found reference to the pond elsewhere.

Much of the area of the former pond lies outside the boundary of the study parcel. A narrow strip exists on the survey property, between the Highway and the existing cane-

haul road. A portion of the site lies within the Olowalu Subdivision boundary, on private property outside the project area. The pond was filled with boulders and debris during the construction of Honoapi'iani Highway, according to informants. Because of the nature of the fill on OEA property, no subsurface testing has been done at the site. In addition, the pond lies within the 80-foot wide State Department of Transportation highway setback. Finally, Site 4822 has been designated as part of the "greenway" system in the overall development plan for Olowalu, and therefore will be placed in passive preservation.

Site 50-50-08-4823  
(Appendix A—p. 108)

This site is located in the easternmost sector of the project area. It consists of subsurface gleyed soil deposits that are the result of marsh conditions created by water collected behind a beach sand berm. These soils are considered significant because they may contain pollen and charcoal deposits from the period of the first human settlement in Olowalu. These soils showed up in two backhoe trenches (BT 106 and 107), which are located about 75 meters apart. The trenches were dug about 30 to 80 meters *maka* of Honoapi'iani Highway. It appears that these soils may be fairly extensive in this part of the study area. On the 1906 map

Backhoe Trenches  
(Photos 67-70; Table 12)

We utilized a number of backhoe trenches in order to gain information on the stratigraphy at various portions of the survey area. Many areas of the study parcel were not readily accessible for backhoe testing. The rationale for selection of test locations is included with the discussion below. A total of 82 backhoe tests were excavated in

(Figure 1a) the area to the west of the trenches is referenced as "salty land".

This area of the leeward coast from Olowalu to Ukumehame is known for marshy conditions that occur after heavy rainfall. A salty residue is present on the surface when the water evaporates.

this process. Refer to Table 9 for details of stratigraphy of each trench, and significant findings, if any. The numbering system begins with BT 98, following the sequence begun on the *maka* portion of the study property (Fredericksen and Fredericksen, March 1999, Draft).



Trenches 98 to 102, 104 and 105 were located on the western part of the *makai* project area, along the north side of and parallel to Honoapiʻilani Highway. These subsurface tests were excavated in order to ascertain if there remained any evidence of precontact coastal habitation areas. The trenches were dug to ground water in all instances, which was reached at anywhere from 1.8 to 2.0 meters below surface. All of these trenches, except BT 101 and 105 yielded shoreline deposits of beach sand mixed with terrestrial based (i. e., basal) sand. BT 103 was excavated near Site 4699, in the cane field. Only the cultivated surface layer and subsurface clay loam alluvium were encountered. No significant material culture remains were found.

Backhoe trenches 106 and 107 were located at the easternmost end of the subject property. Here the water table was reached at 0.6 and 1.2 mbs., respectively. The presence of gley soils suggests that this area may have been a marsh area in the past. These soils are identified as Site 4823. It is east of the old mouth of Olowalu stream, and it is indicated as "salty land" on the 1906 map. Similar marshy areas exist all along the coastline to Ukumehame, where surface water collects behind the beach sand berm following rainy weather.

Trenches 108 to 123 were excavated fairly close to the old Government Road (cane haul road), in the cane fields just *makai* of the Honoapiʻilani Highway. The backhoe trenches extended from Camp Pecusa to about 500 meters west. The water table, when encountered, occurred at about 1.0 to 2.2 mbs. The water table was not reached in several trenches where the excavated depth exceeded 2 meters. These test trenches were dug to examine subsurface deposits that might contain precontact coastal permanent habitation areas. The area is *makai* of the burial preserve area on the *makai* portion of Olowalu (Site 4693).

Marine sand deposits similar to those found during the *makai* inventory survey were located in BT 108. Backhoe Trenches 109 through 112 are located in an area shown on the map as LCA 10128: 5 to E. Maui. This land was awarded for *kula* and houselot. The stratigraphy of these trenches beneath the plow zone consists mainly of silty clay above the marine beach sand deposit. One trench (BT 110) has a very thin layer of gley soil. In all 4 of these trenches, the water table was reached at 1.3 to 1.4 meters below surface. No clear evidence of wet-crop cultivation was apparent. In BT 112, stratigraphy showed the marine sand berm and terrestrial sand interface.

The marine sand deposits were found to extend to the east behind the existing Olowalu Subdivision, the Old Stone Church (Site 1603) and into the eastern cane field (Refer to Map 5).

A few scattered, human skeletal fragments were found on the surface near BT 121. However, no additional remains were encountered in the subsurface backhoe testing. This surface scatter of human remains fragments has been designated as Site 4820.

The next series of trenches was placed in the westernmost former cane fields of the property, west of Site 4700. Trenches 124 to 135 were located closest to Honoapiʻilani Highway, again in an effort to determine whether coastal habitation sites were present in the subsurface deposits. The highway runs along the shore in this area, and probably followed the precontact coastal trail. The subsurface findings in several of these trenches consisted of mostly waterworn cobbles and boulders, that might be expected near the shoreline. It is interesting to note that beach and terrestrial sand deposits were located in several of the trenches, indicating a former shoreline zone. The water table fluctuates between 1.2 and 2.0 mbs. in these tests.

Backhoe trenches 136 through 141 were located further inland. Between BT 139 and 140 human skeletal fragments were found on the surface—a skull fragment and a phalanx. The area was further investigated, but no additional surface finds were made. Some testing was done, but the source of the skeletal fragments could not be determined. This second surface scatter of fragmented human remains was designated as Site 4821.

Backhoe trenches 142 through 146 were excavated on the north side of Olowalu Stream, in the cane fields southwest of Pu'u Kilea. Subsurface conditions in these trenches were extremely rocky, indicating that this area may have been crossed by the stream in earlier times. The next series of trenches was located on the south side of the stream, southeast of Pu'u Kilea (BTs 147 to 150). Again subsurface conditions were very rocky. Backhoe Trench 147 was placed in LCA 10128, Apana 3 to E. Maui in an effort to determine if agricultural soils might remain that were undisturbed.<sup>41</sup> This was not the case. Backhoe Trench 150 was located just southwest of Site 4718—Walker's unnamed *heiau*. The lowest layer in BT 150 consisted of water deposited materials, indicating that the stream once flowed through this area.

Backhoe Trenches 151 to 158 were dug to further investigate the area *makai* of the first series of trenches—BT 98 to 102. The latter tests indicated that the shoreline had extended inland, and precontact coastal settlement remnants might be located farther from the present shoreline. A fragment of what appeared to be a grinding stone was located on the surface, and it was felt that a subsurface, coastal occupation area might be present. There was no subsurface evidence of a cultural deposit found during testing, however.

<sup>41</sup> LCA 10128, Apana 5 to E. Maui is located behind Olowalu Subdivision near the shore.

The next series of trenches concentrated in the cane fields around the old Hawaiian Lanakila Church ruins (Site 1603). Backhoe trenches 159 through 163 encountered the water table at between 1.15 to 1.5 mbs.

BT 164 was a 38-meter long excavation, which profiled a possible old lagoon area behind a marine sand barrier berm. A casket burial was located in the section of the trench nearest the old church (Site 1603). The grave was found at a depth of c. 0.6 mbs. It was subsequently determined that this burial was associated with the cemetery that extended *makai* from the Old Stone Church.

Following discussions between Erik Fredericksen and several informants, it was deemed best to create a burial preservation area based on the original church property configuration (refer to Figure A42). The old boundaries were surveyed and we conducted backhoe testing along the perimeter to help ensure that the preservation area was adequate. Backhoe trenches 165 through 174 were utilized to test the perimeter of the proposed preservation area to determine if additional burials might be present.

The remainder of the trenches (BT 175 to 180) were placed to the southwest of the existing churchyard, in a heavily overgrown area. No intact cultural deposits were found. The water table was reached at between 1.0 and 1.35 meters below surface. A probable lagoon area was located relatively near the existing cane haul road. A marine sand berm and clay soil deposits were found in BTs 175 and 177.

## Discussion

Marine sand deposits were found to extend onto the *makai* (Phase 2) portion of the project area from the *makai* (Phase 1) portion of the study area (See Map 5). Site 4693, the precontact burial ground, was located, in our earlier Phase 1 inventory

survey (Fredericksen and Fredericksen, 1999, Draft). The human remains within this site were buried in marine sand deposits on the *makai* study area. Further testing revealed that these sand deposits extended to Honopi'iani Highway, and across to the *manuka* project area north of the highway. Here they continued to the east behind the existing Olowalu residential area, the Old Stone Church (Site 1603), and onto the eastern portion of the project area near the Old Government Road (now the cane-haul road).

While no human remains were found directly associated with the marine sand deposits on the *manuka* study area, it is important to note that previously disturbed human remains were located on the surface within an immature sugarcane field to the east of Olowalu Village (Site 4820). In addition to this finding, an anonymous Pioneer Mill employee and Mrs. Adeline Rodrigues recalled that human remains had been disturbed in the past during field clearing activities in this area. Hence, it is possible that additional surface human skeletal materials are present in this part of the project area.

One trench, BT 147, was excavated in one of the LCA 10128—Apana 3 to E. Maui—in very rocky terrain. No evidence of traditional agricultural cultivation was found—in fact Layer I consisted of a thin, rocky (30% to 40% concentration of rocks by volume) soil, and Layer II was made up of weathered bedrock. This very rocky portion of the project area had previously been covered by a pedestrian survey. No significant material culture remains were noted on the surface at that time. We subsequently reinspected the area seeking possible locations for backhoe testing. This reinspection of the abandoned cane field revealed thin, rocky soil, and exposed, weathered bedrock. Given the negative findings in BT 147, and the fact that this extremely rocky area had been under cultivation for over a century, we did not

conduct further testing in this section of the study parcel.

#### Artifacts (Table 10; Photos 71-77)

The most notable artifact found during our inventory survey was tightly woven *kala* matting, located in Feature D, Site 4699. A small sample found on the surface was collected (Photo 71).

A total of 31 stone, bone, coral and shell artifacts were recovered during our limited subsurface testing during this inventory survey. Nine artifacts were formed from volcanic glass—two cobs and 7 utilized flakes. All of the worked flakes were recovered from rock shelter features in Site 4700. Other artifacts from Site 4700 included an adze fragment, a worked basalt flake and a small basalt chisel fragment.

The other site which yielded several artifacts from subsurface testing was Site 4710. These items ranged from a worked quartz (Maui "diamond") flake, 2 coral abrader fragments, and a piece of worked bone, to larger basalt implements such as choppers, an abrader, a polishing stone and a hammerstone. Finally, 4 large basalt artifacts (Artifacts 32-35) were located and collected from the surface. They may represent tools that were intentionally left in place, rather than transported from one work area to another.

A few historic bottles and crockery sherds were collected from the area near the well site.<sup>43</sup> These are catalogued on Table 11. Other historic items were noted on the surface in other areas and left in place. One ceramic jar was recovered from Backhoe Trench 164, in the vicinity of the casket burial (Burial 1). We were not able to determine if it was associated with that burial or not.

<sup>43</sup> This is near Site 4704.

#### Radiocarbon dates (Table 2) (Appendix B)

Six carbon samples were submitted to Beta Analytic, Inc. for radiometric analysis. Of these, 5 returned precontact dates, while 1 was modern.

A total of 3 samples (Samples #1, #2 and #6) were from subsurface testing in features that were part of Site 4700. This site is located in the western part of the study area. Sample #1, obtained from the Feature E rock shelter, yielded a radiocarbon age of 420 +/- 50 BP, and calibrated date brackets (at 2 sigma, 95% probability) of AD 1420 to 1525 and AD 1560 to 1610. The intercept date is AD 1450. This is the earliest date obtained during our inventory survey.

Sample #2 came from Feature F—another rock shelter, which appeared to have an intact hearth. The radiocarbon age of this hearth was 200 +/- 60 BP, yielding calibrated date brackets (2 sigma, 95% probability) of AD 1525 to 1560 and AD 1630 to 1950. The intercept date is AD 1665.

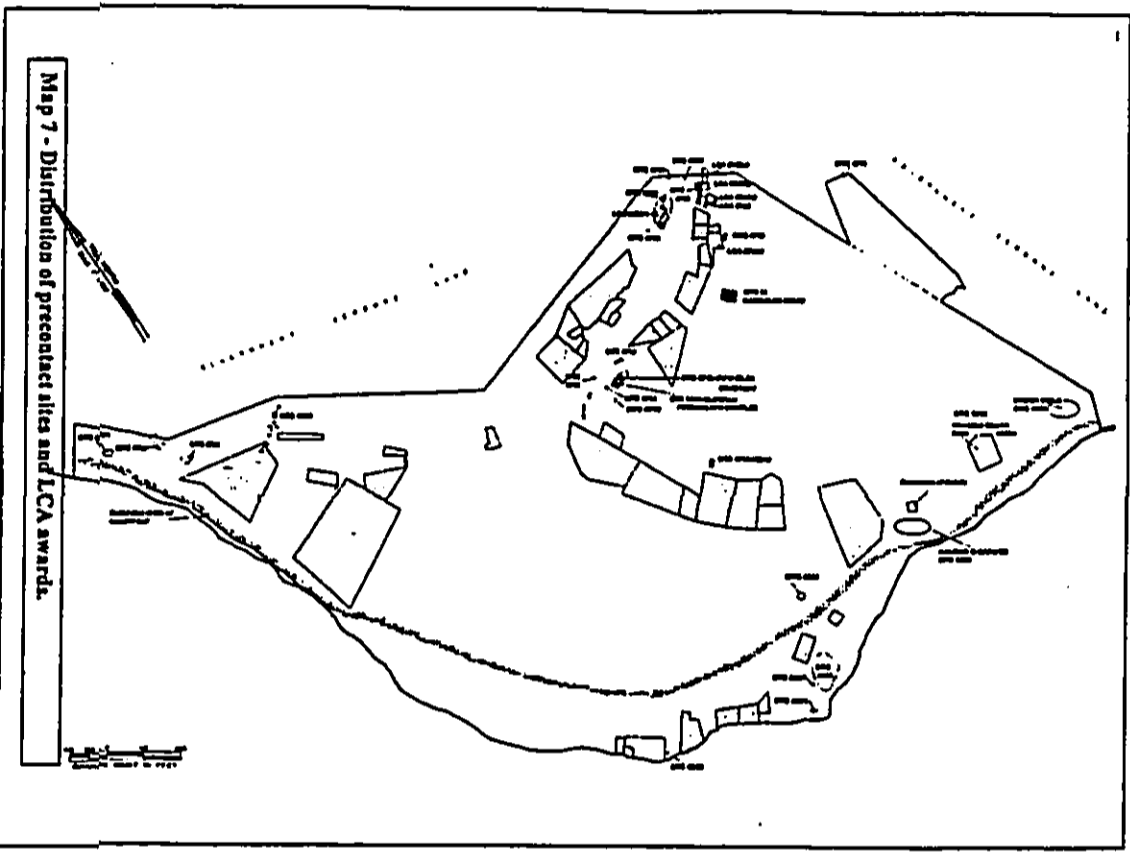
Sample #6 is a sample collected from Feature C, and returned a radiocarbon age of 150 +/- 70 BP. The calibrated date range is AD 1640 to 1955. There were 5 intercept dates—AD 1680, AD 1740, AD 1805, AD 1910 and AD 1950. Because there were no historic artifacts recovered in the subsurface excavations, we interpret the 2 precontact dates as the appropriate ones.

This series of dates suggests that these rock shelter features were used intermittently for a 300 year time span from the mid-15<sup>th</sup> century to the mid-18<sup>th</sup> century, and possibly later.

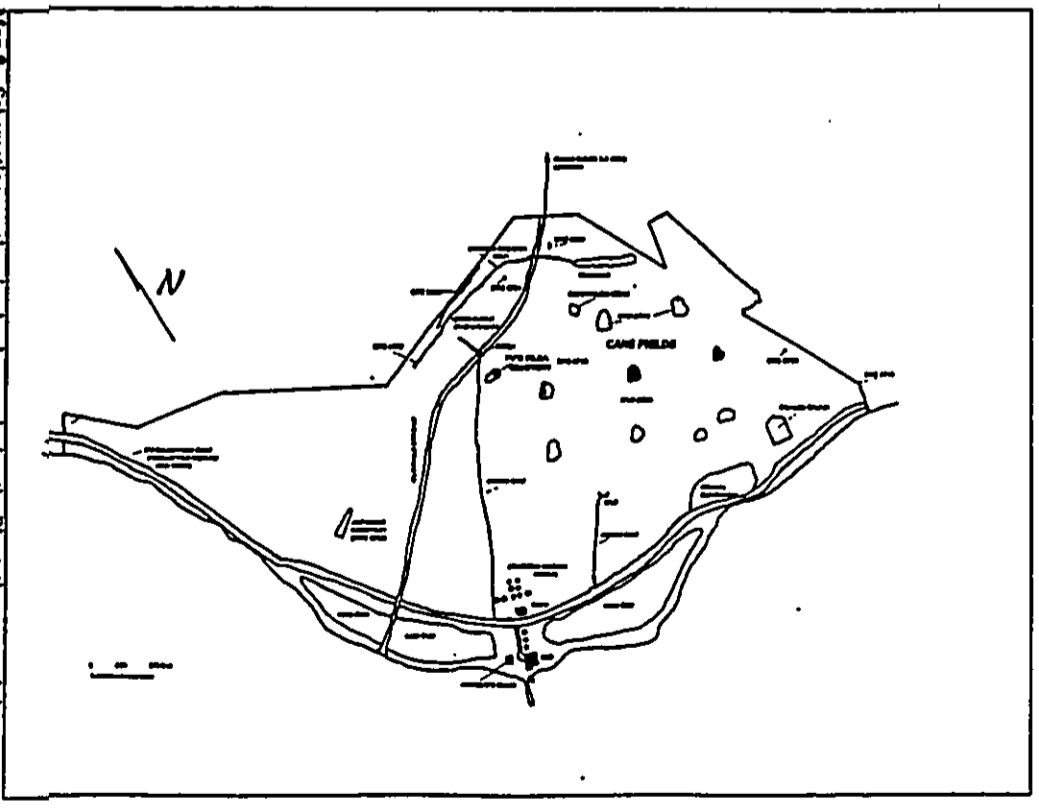
Another rock shelter (Site 4706) is located near the mouth of Olowalu Stream valley. Sample #3 returned a radiocarbon age of 290 +/- 50 BP, and calibrated date brackets (2 sigma, 95% probability) of AD 1470 to 1670 and AD 1780 to 1795. The use of this rock shelter may have been contemporaneous with activity associated with Site 4700.

The third site tested was Site 4710. This site is a permanent habitation area located on the east side of Olowalu Stream. Sample #4 was obtained from what appeared to be a hearth in Feature B—a terrace. It returned a radiocarbon age of 200 +/- 50 BP, with date brackets (2 sigma, 95 % probability) of AD 1635 to 1705, AD 1715 to 1885, and AD 1910 to 1950. The intercept date is AD 1665. A piece of bottle glass, a ceramic blue on white sherd, and a small amorphous piece of bronzes were recovered from Layer II. The site is located near the eastern boundary of LCA 6728, Ap.1 to Mahulu, the plotted approximate location of which is shown on Map 5. It seems probable that Site 4710 is a precontact habitation/agricultural site that continued to be used well into the 19<sup>th</sup> century.

The second date from Feature C at Site 4710 (Sample #5) yielded a modern age (60 +/- 50 BP), indicating that the site was used intermittently until quite recently.



Map 7 - Distribution of precontact sites and LCA awards.



Map 8 - Schematic map showing land usage during the Plantation era and the historic sites identified in the present inventory survey.

## SUMMARY AND CONCLUSIONS

The types of sites that were located and described in this report are consistent with those that we had expected to be present on this property. We had predicted that the precontact to 1850s settlement pattern would include:

- permanent habitation areas and associated agricultural *to'i*, in areas along Olowalu Stream which were afforded a consistent water source;
- temporary habitation shelters, and possibly trail markers (in the form of petroglyphs) associated with *maka-makai* trails;
- dryland agricultural features in alluvial plain areas with less rainfall;
- religious structures such as *heiau*;
- permanent habitation along the coastline;

Some of these sites were already identified—Kawaialoa *heiau* and the Olowalu Petroglyph Complex.

We had expected the distribution of land commission awards to roughly follow the precontact settlement pattern. We had also expected that habitation areas and boundary markers might be associated with LCA *kaikama*. Lands were awarded for taro

production on both sides of Olowalu Stream—some with houseless included.

The types of sites which we expected to be associated with the Plantation Era were features associated with agricultural activities—water delivery systems, road and railroad systems, cane fields. Also we expected to find remnants of the Olowalu Plantation community. The Olowalu Mill and associated manager's dwellings are situated in the *maka'i* portion of the study property.

A total of 34 sites are included in this report. Of these, 6 had previously been recorded and numbered (Sites 04, 1200, 1201, 1603, 3172, 3180). The only sites not additionally described here are Site 3172, a plantation-era concrete irrigation ditch; and Sites 1200 and 1201, which were recorded in the 1973 survey, and are discussed in the Previous Archaeology section of this report. Refer to Table 11 for additional details concerning interpretations of function and age.

### Precontact to 1850s Sites (Map 7)

Twenty-one of the sites are interpreted as precontact cultural resources. There are 52 recognizable features associated with these 21 sites. Six sites contain features that are considered to have been structures or areas for ceremonial usage—2 are *heiau*—Sites 04 and 4718,

while 3 contain petroglyphs (Sites 1200, 4704 and 4708). Site 4701, while heavily disturbed, is interpreted as a possible ceremonial structure.

Six features contain burials, or are suspected of containing burials. These features are found in Sites 04, 4699, 4710, 4712, 4718 (2 features). Two sites are surface scatters of human skeletal fragments (Sites 4820 and 4821).

Twenty-two features are interpreted as temporary habitation shelters, in the form of rock overhang shelters (Sites 1201, 4699 (8), 4700 (9), 4705, 4706, 4713, and 4714). Eight features are interpreted as agricultural and/or habitation features (Sites 4699, 4704 (4), 4708, 4710, 4711 and 4716). Three features have functions that could not be established (in Sites 4710 [Feature G], 4711 [Feature A], 4712 [Feature A]).

Two of the sites located during our survey are considered to be possible precontact sites (Sites 4703 and 4707). Two other sites (Sites 4700 and 4716) have features that are interpreted as possible precontact ones. Altogether these sites include 6 possible precontact features. One feature is a rock alignment/temporary shelter (Site 4703 [Feature C]); 1 is a possible burial (Site 4707 [Feature B]); 3 are possible boundary markers (Sites 4700 [Feature J], 4703 [Feature B], 4716 [Feature B]); 1 is a possible observation point (Site 4700 [Feature B]); and 2 have functions which could not be determined at the inventory survey level (Site 4703 [Features A and C]).

One site is a boundary marker, that appears to be associated with an LCA (Site 4702). Additionally, the precontact fishpond reported by informants and shown on late 19<sup>th</sup>-early 20<sup>th</sup> century maps, is given a site number (Site 4822).

Three radiocarbon dates were obtained from subsurface testing in features that were part of Site 4700. This site is located in the western part of the study area,

and is a series of rock overhang shelters. They ranged from 420 +/- 50 BP (AD 1420 to 1525 and AD 1560 to 1630) to 200 +/- 60 BP (AD 1525 to 1560 and AD 1630 to 1950), to 150 +/- 70 BP (AD 1640 to 1955). This series of dates suggests that these rock shelter features were used intermittently for a 300-year time span from the mid-15<sup>th</sup> century to the mid-18<sup>th</sup> century, and possibly later.

Another rock shelter (Site 4706) is located near the mouth of Olowalu Stream valley yielded a radiocarbon age of 290 +/- 50 BP (AD 1470 to 1670 and AD 1780 to 1795). The use of this rock shelter may have been contemporaneous with activity associated with Site 4700.

Site 4710 is a habitation area located on the east side of Olowalu Stream. One charcoal sample was obtained from what appeared to be a hearth in Feature B—a terrace. It returned a radiocarbon age of 200 +/- 50 BP (AD 1635 to 1705, AD 1715 to 1885, and AD 1910 to 1950). The second date from Feature C at Site 4710 yielded a modern age (60 +/- 50 BP), indicating that the site was used intermittently until quite recently. It appears that this site was occupied in precontact times and was used intermittently well into the 20<sup>th</sup> century.

It is possible Olowalu was settled earlier than any of these dates reflect. One would expect early settlement to have taken place near the coastline, and all of the dates obtained by this inventory survey came from sites located away from the coast—rock shelters on ridges and within Olowalu Valley, and a habitation site also in Olowalu Valley. All of these sites are situated well away from the shore. Theoretically, settlement could go back to AD 1000-1200, and the marsh/lagoonal soil deposit (Site 4823) may provide this information.

<sup>40</sup> According to Dr. Ross Corey, (SHRPD Doc. No. 9912RC11), December 14, 1999.

### Plantation Era Sites (Map 8)

Nine of the *maka* Olowalu sites covered in this report are interpreted as historic sites associated with the plantation era. One is a boundary marker associated with the plantation era (Site 4719); 1 is an historic house platform (Site 4721). Site 3180 is interpreted as a boundary/cattle wall, probably dating from the late 1800s.

Four sites are associated with sugarcane cultivation activities (i.e., irrigation, flood control, cane-haul roads, etc.) (Sites 3172, 4709, 4717, 4720); and 3 sites are burial areas or cemeteries (Site 1603, 4715, and 4758).

These are the kinds of finds that we had anticipated from the plantation era.

### Site Significance Evaluations

The following significance evaluations are based on the Rules Governing Procedures for Historic Preservation Review (DLNR 1996; Chapter 275). According to these rules, a site must possess integrity of location, design, setting, materials, workmanship, feeling and association and shall meet one or more of the following criteria:

Criterion "A"—be associated with events that have made an important contribution to the broad patterns of our history;

Criterion "B"—be associated with the lives of persons important to our past;

Criterion "C"—embody the distinctive characteristics of a type, period, or method of construction; represent the work of a master; or possess high artistic value;

Criterion "D"—have yielded, or is likely to yield, important information for research on prehistory or history;

Criterion "E"—have an important traditional cultural value to the native Hawaiian people or to another ethnic group of the state due to associations with traditional cultural practices once carried out, or still carried out, at the property or due to associations with traditional beliefs, events or oral accounts—these associations being important to the group's history and cultural identity.

Sites can be considered no longer significant when they are significant only under criterion "D" and sufficient information has been collected from them during inventory survey level investigation. Refer to Table 4 for the significance evaluations and proposed mitigation of the 34 sites included in this inventory survey.

Eighteen sites (Sites 3172, 3180, 4700, 4702, 4703, 4705, 4706, 4709, 4711-4714, 4716, 4717, 4719-4721, and 1201) are considered significant only under Criterion "D" of the Federal and State historic preservation guidelines. Most of these sites are temporary habitation rock shelters. Several sites were tested and 4 of the 6 radiocarbon dates came from excavations in these rock shelters. The dates ranged from the mid-fifteenth century to c. mid-to latter eighteenth century. The other sites consist of historic features related to plantation activities. Site 1201 is a rockshelter associated within the Olowalu Petroglyph Complex that was excavated in the 1960s.

Of these sites, 8 are considered no longer significant, in that adequate information has been gathered (Sites 4702, 4703, 4711, 4717, 4719, 4720, 4721, and 3180). No further archaeological work is needed on these historic properties.

Two more sites are noted for their potential informational content (Criterion D). One is the old pond that is noted on historic maps, and said by informants to date from precontact times—Site 4822.

Remnants of pond sediments may be present on properties adjoining the present study parcel, which could reveal information on ecological or land use changes through time. The other site consists of subsurface lagoon/marsh deposits located in BIs 106 and 107 (Site 4823). These may contain pollen which can yield similar information about the climatic changes that have taken place in Olowalu over the centuries, that may be attributable to human activity.

Nine sites are considered to be significant under both Criteria "D" and "E" (Sites 4699, 4701, 4707, 4710, 4715, 4758, 4820, 4821, and 1603). Most are either sites in which known human burials or remains exist, or in which human burials are suspected. Site 4701 is significant under Criterion "E" because it may be a ceremonial structure.

Four sites are considered to be significant under Criteria "C", "D" and "E". These include Site 04—Kawaihoa *hela*; Site 4704—the petroglyph panel and associated terraces; Site 4718—*hela* remnant; and Site 1200—petroglyphs at Pu'u Kilea—the Olowalu Petroglyph complex.

### Site and Feature Mitigation Recommendations

The site significance and proposed mitigation recommendations for the 34 sites identified on the property are shown on Table 4. Eight are considered no longer significant, either having been severely impacted or largely destroyed, or they have provided adequate information.

Twenty-six sites are still considered to be significant. Eleven are recommended

for preservation, 1 is recommended for both data recovery and preservation, 9 are recommended to undergo data recovery, 2 are recommended to be monitored, and the remainder require no further archaeological work.

Preservation is the recommended mitigation treatment for Site 04—Kawaihoa *hela*; the Feature D burial cave at Site 4699; the petroglyph panel and associated terraces of Site 4704; Site 4708—possible religious structure and *laro lo'i*; Site 4710—habitation complex with possible burial; Site 4715—burial ground/cemetery on summit of Pu'u Kilea; Site 4718—*hela* remnant with burials; Site 4758—the Japanese cemetery, and Sites 1200 and 1201—the Olowalu Petroglyph Complex. In addition the burial associated with Site 1603 located on the subject property will be preserved in a large preservation area.

Data recovery is the recommended mitigation for several sites, and/or site features that need to have more information to make age and function determinations. These would include Features B and J of Site 4700, Site 4701, Site 4707, Site 4712—Feature B, and Site 4716—Feature B. Data recovery is recommended for Site 4704, if it is going to be impacted by future development.

Data recovery, in the form of a complete inventory of the petroglyph images at Site 1200, was recommended by archaeologists conducting the statewide inventory of historic places survey in 1973. The developers are committed to preservation of the site. If the site is to be for interpretative exhibit, data recovery on the images should be undertaken.

Two sites that are in the eastern part of the project area, represent the pond (Site 4822) and lagoon/marsh lands (Site 4823)

\* If data recovery reveals that burials are present in any of these features, they would then be considered significant under Criterion "E" as well as "D".

subsurface deposits. These may contain information on chronology relating to climatic and vegetation changes that have taken place in Olowalu, and should undergo data recovery in the form of subsurface testing. Site 4822 is located in an area of the property that has been designated as "open space".

Interpretative preservation is further recommended for Kawaihoa Heiau (Site 04), the Heiau remnant (Site 4718) and, possibly, the ceremonial platform and agricultural complex (Site 4708). Interpretative preservation is also considered appropriate for the Olowalu Petroglyphs—Site 1200, and possibly the other petroglyph panel and terrace complex of Site 4704. The Native Hawaiian community should be consulted about the appropriateness of interpretative preservation for any of these latter sites.

Site 3172 is an operating water delivery system and it is suggested that continued usage would be an appropriate mitigation for this site. No further archaeological work is needed, however.

There were two areas in which human remains were found on the surface during backhoe testing. One area was in the western portion of the study area, between Backhoe Trenches 139 and 140 (Site 4821). The other area was in the cane field east of Olowalu Village near Backhoe Trench 121 (Site 4820). Because of the presence of human remains, monitoring should accompany any earthmoving activities that are undertaken in these areas, in an effort to recover other skeletal materials that may be present.

Monitoring is also the recommended mitigation treatment for portions of land in the vicinity of significant sites. It is recommended that a master monitoring plan be formulated for the *manuka* project region, identifying the culturally sensitive areas that need to be afforded special attention during development. Again, input should be sought from native Hawaiian groups and concerned individuals in identifying these culturally sensitive areas. An ongoing oral history project is being undertaken by Olowalu Elua Associates, in which this kind of information will be forthcoming.

TABLE 2  
Radiometric Dating Results

	Sample ID	Material	C14 age	Calibrated date	Interpretation
1	130025	Site 4700, Feature E, TU 2, Layer II	420 +/- 50 BP	AD 1420 to 1525	Temporary habitation
2	130026	Site 4700, Feature F, TU 3, hearth	200 +/- 60 BP	AD 1560 to 1630	Temporary habitation
3	130027	Site 4706, rock shelter, TU 1, Layer II	290 +/- 30 BP	AD 1325 to 1360	Temporary habitation
4	130028	Site 4710, Feature B, TU 1, hearth	200 +/- 30 BP	AD 1630 to 1670	Temporary habitation
5	130029	Site 4710, Feature C, TU 2, Layer III	60 +/- 50 BP	AD 1780 to 1795	Habitation
6	130334	Site 4700, Feature C, TU 1, Layer I	150 +/- 70 BP	AD 1635 to 1705 AD 1715 to 1885 Modern	Habitation with later use
				AD 1640 to 1935	AD 1680 AD 1740 AD 1805 AD 1930 AD 1950

<sup>43</sup> Beta Analytic, Inc., Miami, Florida.  
<sup>44</sup> Calibrated at 2 sigmas, 95% probability

TABLE 3  
Site Function and Age

Site ID	Features	Description	Function	Age	Notes
1200	Area 1 Area 2	Kawaihoa Heiau Petroglyph panel Petroglyphs on large rocks Rock overhang	Ceremonial Ceremonial	Precontact Precontact	Structure in very good condition Kiles—dozens of petroglyphs Petroglyphs placed on large boulders west of Pu'u Kilea Associated with petroglyph panel in Area 1
1201	I	Old stone church	Religious / cemetery	Plantation era	Church not located on property, but casket burial located on project
3172	I	Concrete ditch	Irrigation	Plantation era	Located during MECO transmission line monitoring
3180	I	Rock wall	boundary marker	Plantation era	Located during MECO transmission line monitoring
4699	A-H	Rock shelters	Temporary habitation	Precontact	
4700	D	Rock shelter	Probable burial	Precontact	Loukalo making recovered
	I	Modified outcrop	Agricultural	Precontact	Possibly a dry-land plot
	A, C-1	Rock shelters	Temporary habitation	Precontact	Feature C—150 +/- 70 BP Feature E—450 +/- 50 BP Feature F—200 +/- 60 BP
4701	B	Rock wall, C-shape	Observation point (?)	Precontact(?)	
	J	Rock wall	Boundary marker (?)	Precontact(?)	
4702	I	Platform	Ceremonial/Habitation	Precontact	Impacted by bulldozer.
4703	A, B, C	Rock enclosure Wall remnant Rock alignment	Boundary marker	Early post-contact to 1850s	Possibly associated with and ICA heiaus
4704	A	Petroglyph panel	Unknown	Precontact (?)	Function and age are not certain
	B-C	Terraces	Unknown	Precontact (?)	Function and age are not certain
	D-G	Terraces	Temporary habitation (?)	Precontact (?)	
4705	A	Petroglyph panel	Ceremonial	Precontact	Over 27 separated images present
	B-C	Terraces	Ceremonial/Habitation	Precontact	Terraces directly below petroglyph panel
4706	A-B	Rock shelters	Agricultural/Habitation	Precontact	
	I	Rock shelter	Habitation	Precontact	
4707	A	Wall alignment	Temporary habitation	Precontact	Radiocarbon date—390 +/- 50 BP
	B	Rock mound	Boundary marker (?) Possible burial	Precontact (?)	Features A and B appear to be associated. Needs data recovery work.

Site ID	Features	Description	Function	Age	Notes
4708	A	Platform	Ceremonial	Precontact	Large boulder has petroglyphs on it
4709	B	Terrace complex	Agricultural	Precontact	With later historic usage
	A-D	Concrete structures	Irrigation system	Plantation era	
4710	A	Terrace w/enclosure	Habitation	Precontact	Portion of site impacted by field clearing.
	B	Terraces	Habitation	Precontact	Radiocarbon date—200 +/- 50 BP
	C	Enclosure	Habitation	Precontact	Radiocarbon date—60 +/- 50 BP
	D	Enclosure remnant	Part of complex	Precontact	
	E	Oval alignment	Possible burial	Precontact	
	F	Terrace	Part of complex	Precontact	
	G	Terrace	Undetermined	Precontact	
	A	Rock alignment	Undetermined	Precontact	
	B	Terrace	Possibly agriculture	Precontact	
	A	Terrace	Unknown	Precontact	
4712	B	Rock pile	Possible burial	Precontact	
	I	Rock shelter	Temporary habitation	Precontact	
4713	I	Rock shelter	Temporary habitation	Precontact	
	I	Rock shelter	Temporary habitation	Precontact	
4714	I	Rock shelter	Temporary habitation	Precontact	
	I	Complex of burial mounds, platforms and markers	Cemetery	Pre-to post-contact	Located on the summit of Pu'u Kilea, above the petroglyph panel
4716	A	Terrace	Habitation	Precontact	
	B	Rock wall	Boundary marker (?)	Precontact (?)	
4717	A-E	Retaining walls	Flood control	Plantation era	
	A	Heiau remnant	Ceremonial	Precontact	This is the unnamed heiau mentioned by Walker
4718	B	Rectangular stone outline w/pavement	Burial marker	Precontact	
	C	Rectangular stone outline w/pavement	Burial marker	Precontact	
4719	I	Rock wall	Boundary marker	Plantation era	
	I	Retaining wall	Road crossing	Plantation era	
4720	I	Platform	Habitation	Plantation era	
	I	Tomb stones, stone outlines, wooden grave markers	Japanese Cemetery	Plantation era	
4758	I	Surface scatter of human remains		Precontact	Secondary deposit of human skeletal material
	I	Surface scatter of human remains		Precontact	Secondary deposit of human skeletal material
4821	I	Pond	Fishpond	Precontact? Into historic times	Identified as Kaloko o Kapa like by informant
	I	Marsh/lagoonal soils	Glazed soils	Precontact	May contain pollen and charcoal dating from early human settlements

**TABLE 4**  
Significance Evaluations—Proposed Mitigation

SHIP ID	Significance Criteria	Component/ Feature	Status	Condition	AS <sup>1)</sup>	Proposed Mitigation
04	C, D, E	Perlane	U	Very good	I	Interpretive preservation <sup>4)</sup>
3180	D	1	A	G	H	NLS <sup>5)</sup>
4699	D and E	9	varies	G	I/H	Preservation
4700	D	9	U	G	I	Preservation—DR on Features B, J
4701	D	1	A	F	H	DR to determine function
4702	D	1	A	G	H	NLS
4703	D	3	A	varies	7	NLS
4704	C, D, E	7	U	G	I	Preservation—DR (if impacted)
4705	D	2	U	G	I	Passive preservation
4706	D	1	U	G	I	Passive preservation
4707	D, E	2	A	F-P	I	DR to ascertain age and function
4708	D	2	A	G	I/H	Interpretive preservation
4709	C, D	4	A	G	H	NLS
4710	D, E	7	A	G-F	I	Preservation
4711	D	2	U	G-P	I	NLS
4712	D	2	A	G	I	DR to ascertain if burial present
4713	D	1	U	G	I/H	Passive preservation
4714	D	1	U	G	I	Passive preservation
4715	D, E	cemetery	U	G	I/H	DR to determine function and age
4716	D	3	A	F	H	NLS
4717	D	3	U	G-P	H	Preservation
4718	C, D, E	3 (Perlane)	A	P	I	Preservation
4719	D	1	A	P	H	NLS
4720	D	1	A	G	H	NLS
4721	D	1	A	F	H	NLS
4758	D, E	cemetery	U	F	H	Preservation
1200	C, D, E	petroglyphs	A	F	I	Preservation
1201	D	1	A	F	I	Preservation as part of complex
1603	D, E	burials	A	F	H	Preservation <sup>6)</sup>
3172	D	Water delivery system	U	G	H	Preservation as an operating water system
4820	D, E	Surface scar of human remains	A	P	I	Monitoring to recover remains
4821	D, E	Surface scar of human remains	A	P	I	Monitoring to recover remains
4822	D	Food remains	A	P	I/H	DR-pollen samples, C14 dates
4823	D	March deposits	U	G	I/H	DR-pollen samples, C14 dates

4) A=unaltered; U=unaltered  
 5) G=good; F=fair; P=poor  
 6) I=indigenous; H=historic  
 7) Consultation with Native Hawaiian community recommended prior to implementation.  
 8) No longer significant—sufficient information has been collected.  
 9) Although the parcel on which this church is located is outside the property boundary, the portion in which at least one burial was found is within the project area. This will be preserved.

**REFERENCES**

Bartholomew, Gail and Bren Bailey  
1994  
Maui Remembers—A Local History. Mutual Publishing Company, Honolulu, Hawaii.

Conde, J.C. and Gerald M. Best  
1973  
Sugar Trains: Narrow Gauge Rails in Hawaii. Greenwood Publishers, Felton, California.

Connolly III, Robert A.  
1973  
Olowalu Site 1200, Hawaii Register of Historic Places (Short Form), SHPD.

Devereaux, Thomas, J. Masterson, M. Heidel, V. Creed, L. Pyle, and H.H. Hammett  
October 1997  
An Archaeological Inventory Survey and Subsurface Testing of a 40-acre Parcel, Ahupua'a of Uluhamehane, District of Lahaina, Island of Maui (TMK: 4-8-02: 09). Prepared for Sugar Way Ltd., Cultural Surveys Hawaii.

Devereaux, Thomas, Colin, Brian and Halbert H. Hammett  
April 1997  
An Archaeological Monitoring Report for the Aloaloa to Lahaina 3<sup>rd</sup> 69 KV Transmission Line, Island of Maui, Hawaii, prepared for Dames and Moore and Maui Electric Company Limited, by Cultural Surveys Hawaii.

Char, Winoa P.  
March 1999  
Botanical Survey, Olowalu Lands, Lahaina District, Maui, Prepared for Olowalu Elus Associates, LLC, by Char and Associates, Honolulu, Hawaii.

Dreflak, F. Kurt and Arlene H. Campbell  
August 1998  
Limited Phase One Environmental Assessment for Property Having the Legal Description: TMK (2)-4-8-03: 5, 10 and 11, Olowalu, Hawaii, prepared by Interisland Environmental Services, Inc., Honolulu for Launiupoko Associates, Kahului, Hawaii.

Foots, Donald E., E.L. Hill, S. Nakamura and F. Stephens  
1972  
Soil Survey of the Islands of Kauai, Oahu, Maui, Molokai and Hawaii, U.S. Dept. of Agriculture, U.S. Government Printing Office, Washington, D.C.



- Fomander, Abraham  
1996  
*Ancient History of the Hawaiian People to the Times of Kamehameha I*, Mutual Publishing Company, Honolulu.
- Fredericksen, Demaris L. and Erik M.  
March 1999 (Draft)  
*Archaeological Inventory Survey of Maialai portion of Olowalu Development Parcel, Olowalu, Ahupua'a, Lahaina District, Maui Island (TMK 4-9-03; por. 3)*, prepared for Olowalu Elua Associates, Kahului, Maui, by Xamanek Researches, Pukalani, Hawaii
- Graves, Donna K. and Susan Goodfellow  
January 1991  
*Archaeological Inventory Survey Lanaiupoko Golf Course, Land of Lanaiupoko, Lahaina District, Island of Maui (TMK: 4-7-01: 3)*, prepared for AMFAC/MB Development (Hawaii), Inc., Honolulu, HI, by PHRI, Hilo, Hawaii.
- Graves, Donna K., Susan Goodfellow and Alan Haun  
April 1998  
*Archaeological Inventory Survey Lanaiupoko Development Parcel, Land of Lanaiupoko, Lahaina District, Island of Maui (TMK 4-7-01: 2)*, prepared for Peter Martin, President, Lanaiupoko LLC, by PHRI, Hilo, Hawaii.
- Handy, E.S., Craig Hill, and Elizabeth G. Handy  
1972  
*Native Planters in Old Hawaii: Their Life, Lore, and Environment*, Bishop Museum Press, Honolulu.
- Kamakau, Samuel M.  
1992  
*Ruling Chiefs of Hawaii (Revised Edition)*, Kamehameha Schools Press, Honolulu.
- Schmitt, Robert C.  
1973  
*The Missionary Census of Hawaii*, Bishop Museum, Honolulu, Hawaii.
- Sterling, Elspeth  
1997  
*Sites of Maui*, Bishop Museum Press, Honolulu, Hawaii.
- The Maui News  
University of Hawaii  
1998  
Various articles cited in text.
- Walker, Winslow  
1931  
*Atlas of Hawaii*, 3<sup>rd</sup> Edition, University of Hawaii Press, Honolulu, Hawaii.
- Wilcox, Carol  
1999  
*Archaeology of Maui*, Manuscript at Maui Historical Society, Waihuku, Maui.
- Wright, J. C.  
1974  
*Sugar Water: Hawaii's Plantation Ditches*, University of Hawaii Press, Honolulu, Hawaii.
- Olowalu Sites 1602 and 1603. Hawaii Register of Historic Places (Short Form), SHPD.

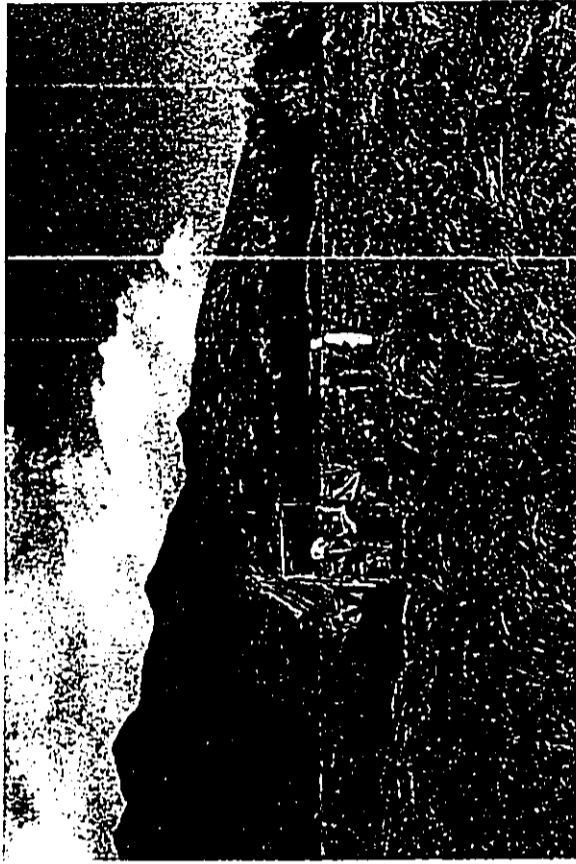


Photo 67 - View to east—Backhoe Trench 146.



Photo 68 - View to northwest—Backhoe Trench 99.



Photo 69 - View to east—Backhoe Trench 112.



Photo 70 - View to northeast—Backhoe Trench 121.

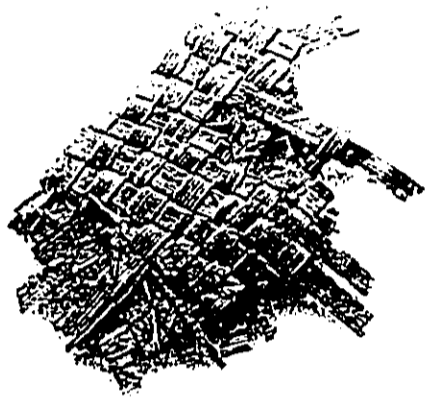


Photo 71 - Two views of sample of lauhala matting from Site 4699, Feature D.

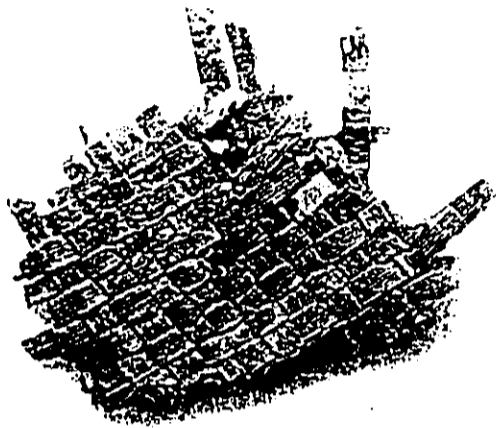




Photo 74 - Adze fragment (#19) and basalt chisel fragment (#14). [Site 4700]



Photo 75 - Worked basalt flake (#13) [Site 4700] and basalt chopper core (#28) [Site 4710].

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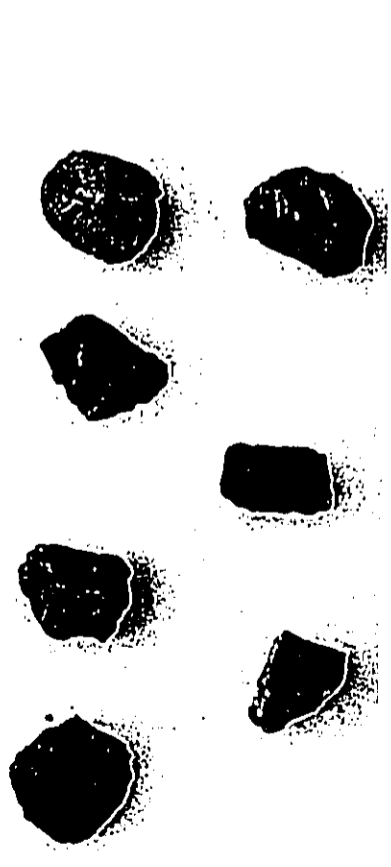


Photo 72 - Volcanic glass artifacts from Site 4700. Top row—left to right: # 10, #11, #12, #15; Bottom row—left to right: #16, #17, and #18.

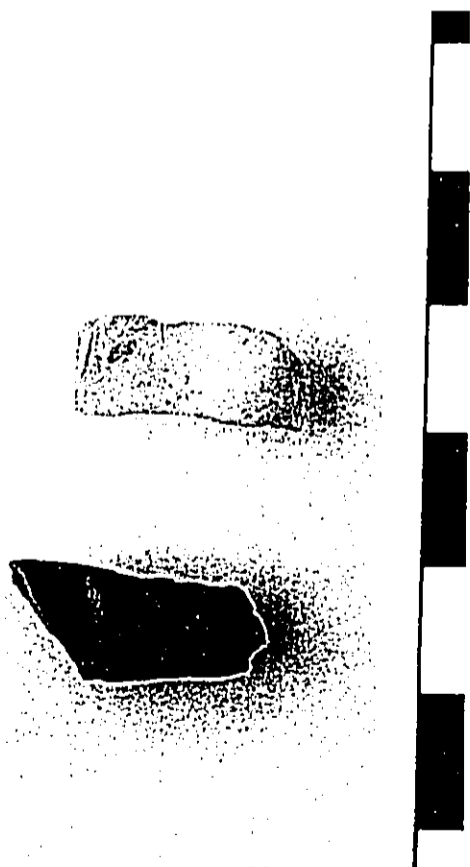


Photo 73 - Worked shell (#23) and Maui "diamond" utilized flake (#21). [Site 4710]

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TABLE 6

Summary of Subsurface Results at Site 4704 - Feature B

ARTIFACT/LEVEL	QUANTITY	WEIGHT (g)	COMMENTS
Calliana sp.	13	1.4	0.1
Cornus sp.			
Cypraea sp.			
Granula sandwicensis			
Libinia pinnata	4.8	3.8	0.8
Nerita sp.	3.2	2.2	0.4
Undetermined	0.1	0.1	0.1
Isopomus sp. unidentified			
Pencil urchin			
Sea urchin			0.1
Corb			0.2
Dog tooth			
Human tooth		0.1*	
Fish		0.1	0.1
undetermined			0.1
Kuhli nut shell	16.1	1.0	1.7
Charcoal	0.7	(?) 0.6	
UNWORKED BASALT FLAKES (pieces)	(?) 0.3		
UNWORKED CORAL (pieces)	(?) 49.3	(?) 0.8	(?) 2.0
WATERWORN PEBBLES (pieces)	(?) 98.4		
HISTORIC ARTIFACTS			
Bottle glass - clear	(?)		
Bottle glass - green	(?)		
Metal	Square nail-B.4		(?)

Weight in grams

\* This is a deciduous tooth—upper incisor.

TABLE 7

Summary of Subsurface Results at Site 4706 - Test Unit 1

ARTIFACT/LEVEL	QUANTITY	WEIGHT (g)	COMMENTS
Cornus sp.	0.4	0.4	0.8
Cypraea sp.			0.3
Nerita sp.			0.4
undetermined			
Planorbis sp.	0.2	2.9	1.1
Tellina palam	0.4		0.5
Undetermined			1.0
Isopomus sp. unidentified			
Pencil urchin			
Sea urchin	0.1	0.9	1.0
Corb			0.3
Dog tooth			
Fish			1.4
undetermined			0.4
Kuhli nut shell	22.5	23.3	2.1
Charcoal	38.1	92.3	20.1P
UNWORKED BASALT FLAKES (pieces)	(?) 23.6		
UNWORKED VOLCANIC GLASS FLAKES (pieces)			(?) 0.1
UNWORKED CORAL (pieces)			
WATERWORN PEBBLES (pieces)			

Weight in grams

\* Sample #3 - 290 +/- 50 BP



# CORRECTION

THE PRECEDING DOCUMENT(S) HAS  
BEEN REPHOTOGRAPHED TO ASSURE  
LEGIBILITY  
SEE FRAME(S)  
IMMEDIATELY FOLLOWING





TABLE 11  
Historic Artifacts Recovered

ARTIFACT	PROVENIENCE	DESCRIPTION	DIMENSIONS (cm)	REMARKS
H-1	Cemetery behind church	Ceramic jar	11.3 tall x 8.5 dia. Lip - 5.7 dia	Light tan color, with dark brown top. From BT 164 - near where Burial 1 was located.
H-2		Pale bluish glass bottle	17.7 tall x 6.45 dia.	Embossed: GEO. C. McLEAN (slug plate c. 1872); 2 piece applied rounded knob top.
H-3	Near well site	Ceramic jug base	c. 10.35 dia	Min. ges ware. Dot within circle on bottom.
H-4		Flat porcelain bowl	17.0 dia. x 6.0 high base is 1.4 thick	6 pieces of same bowl. Blue on white oriental design.
H-5		White ceramic plate with decorations on edge	7.5 mm. thick	Brown on white painted flowers along edges of plate. Black border along rim and bottom of design. 2 sherds.
H-6		Ceramic plate shard	c. 4 to 7 mm. thick	Yellow flowers with green leaves on white. Black stripe on lip edge.
H-7		Dark blue medicine bottle	12.75 tall x 3.2 dia.	Top missing. Seam visible down both sides.
H-8		Beer bottle top 1/3	13.0 tall x 7.3 dia.	Applied top; early 1880s; MacFarlane & Co., Hul. HI.
H-9		Care gin bottle base	5.2 x 4.9 base x 8.1 tall	Amethyst color; probably 1885-1915 date range.
H-10		Beer bottle top half	12.9 tall x 4.0 dia. at neck	Pale greenish color; 2 piece tooled; probably around 1910
H-11		Beer bottle top and neck		Same type as above.
H-12		Bottle neck and top	7.0 tall x 2.7 dia.	Probably part of a condiment bottle.
H-13		Complete bottle	28.7 tall	Olive green color, applied top, 3-piece mold marks, kick-up base.
H-14		Soda bottle top and side		Clear, LAHAINA ICE CO. LTD. 4-piece tooled crown top.
H-15		Complete bottle	29.0 tall x 7.3 dia.	Probable liquor bottle, 2-piece tooled, brown color.
H-16		Bottle bottom	7.9 dia.	Olive green color, champagne-style kick-up.
H-17		Bottle bottom	7.3 dia.	Dark red amber, champagne-style kick-up.
H-18		Bottle bottom	7.8 dia.	Medium amber, champagne-style kick-up.
H-19		Bottle bottom	7.7 dia.	Light green, champagne-style kick-up.
H-20		Bottle bottom	7.7 dia.	Brown color, shallow concave base.
H-21		Bottle bottom	6.7 dia.	Olive green, slightly concave base.
H-22		Neck portion of bottle	2.7 dia.	Pale aqua color, vinegar bottle w/ indentations to hold cap.

TABLE 10  
Indigenous Artifacts Recovered from Olowalu Mauka

ARTIFACT	PROVENIENCE	DESCRIPTION	DIMENSIONS (cm)	WEIGHT
4699	LII/L1	Volcanic glass core	18.0 x 11.0 x 10.2	3.4
4700	L1/L1, F-E	Utilized volcanic glass flake	15.0 x 16.1 x 5.0	1.0
	L1/L1, F-E	Utilized volcanic glass flake	15.0 x 12.0 x 5.0	1.1
	L1/L1, F-E	Utilized volcanic glass flake	16.0 x 11.0 x 3.0	0.5
	L1/L1, F-E	Worked basalt flake	63.0 x 50.0 x 25.0	90.1
	LII/L1, F-E	Basalt chisel fragment	24.5 x 17.0 x 11.0	7.8
	L1/L1, F-F	Utilized volcanic glass flake	14.0 x 12.0 x 4.5	1.0
	L1/L1, F-F	Utilized volcanic glass flake	13.0 x 10.5 x 3.2	0.4
	L1/L1, F-F	Utilized volcanic glass flake	14.0 x 8.5 x 3.0	0.4
	LII/L1, F-F	Utilized volcanic glass flake	16.0 x 13.0 x 6.0	0.8
	LII/L2, F-F	Adze fragment	41.5 x 21.5 x 10.5	17.2
4707	LII/L3	Volcanic glass core	22.5 x 14.5 x 14.0	4.9
4710	L1/L1, F-B	Maui "diamond" flake	18.0 x 8.0 x 4.5	0.8
	LII/L1, F-B	Coral abrader fragment	15.0 x 8.5 x 8.0	0.7
		Worked shell	10.0 x 8.5 x 4.0	0.6
	(in situ)	Hammerstone	132.0 x 106.0 x 71.0	1247.0
	(in situ)	Ground basalt abrader	87.0 x 81.5 x 25.0	295.2
	LIV/L1, F-B	Basalt chopper	110.5 x 93.0 x 45.5	467.0
	(in situ)			
	LIV/L2, F-B	Basalt chopper	120.0 x 78.0 x 31.0	340.2
	(in situ)			
	(in situ)	Basalt chopper core	55.0 x 45.0 x 31.5	110.3
	LIV/L2, F-B	Polished basalt	82.0 x 78.0 x 47.5	340.0
	LIII/L1, F-C	Worked bone	10.0 x 4.0 x 3.0	0.1
	Near BT 102	Coral abrader fragment	6.0 x 4.0 x 3.5	0.1
		Hammerstone	151.0 x 64.5 x 59.5	884.0
		Ground basalt	86.0 x 80.5 x 53.5	633.0
	At 200 foot level near petroglyphs	Possible adze preform	157.0 x 105.0 x 42.0	759.0
		Large basalt cobble, very smooth on one side	397.0 x 235.5 x 121.5	18.23 kg.

TABLE 12  
Summary of backhoe trenches

Station	Dimensions	Orientation	Stratigraphy	Remarks
98	4 m x 0.9 m 1.6 m deep	0-40	Layer I - sandy silty loam (10 YR 4/3) Layer II - beach sand (10 YR 8/4)	Water table reached at 1.6 m.
99	4 m x 0.9 m 1.8 m deep	0-70	Layer I - red, dk. brown silty sandy loam Layer II - beach sand (10 YR 8/4)	Water table reached at 1.8 m.
100	4 m x 0.9 m 1.8 m deep	0-43	Layer I - silty clay (10 YR 5/2) Layer II - sandy clay (10 YR 4/2) Layer III - beach sand (10 YR 8/4)	Water table reached at 1.8 m. Some amounts of coral in Layers I and II.
101	4 m x 0.9 m 2.0 m deep	0-60	Layer I - silty clay (10 YR 4/2) Layer II - clay loam (10 YR 4/4)	Water table reached at 2.0 m.
102	4 m x 0.9 m 1.8 m deep	0-60	Layer I - silty clay (10 YR 4/2) Layer II - clay loam (10 YR 4/4)	Water table reached at 1.8 m. Located near highway - some coral with numerous pebbles in Layer I.
103	4 m x 0.9 m 2.8 m deep	0-60	Layer I - silty clay (10 YR 4/2) Layer II - clay loam (10 YR 4/4)	Located east of Sec 1 checker complex. Layer I contains subangular and water-worn cobbles and pebbles. Layer II contains coral and numerous rock. Layer III contains coarse amounts of coral. Near highway.
104	4 m x 0.9 m 2.0 m deep	0-30	Layer I - silty clay (10 YR 4/2) Layer II - clay loam (10 YR 4/4)	Layer I contains water-worn cobbles and pebbles. Layer II contains water-worn cobbles and pebbles. Located near highway.
105	4 m x 0.9 m 1.5 m deep	0-30	Layer I - silty clay (10 YR 4/2) Layer II - clay loam (10 YR 4/4)	Water table reached at 0.9 m.
106	4 m x 0.9 m 0.6 m deep	0-33	Layer I - silty clay (10 YR 4/2) Layer II - clay loam (10 YR 4/4)	Water table reached at 0.6 m.
107	5 m x 0.9 m 1.2 m deep	0-30	Layer I - silty clay (10 YR 4/2) Layer II - clay loam (10 YR 4/4)	Water table reached at 1.2 m. A thin grey deposit is present separating Layers I and II.
108	4 m x 0.9 m 0.7 m deep	0-10	Layer I - silty clay (10 YR 4/2) Layer II - clay loam (10 YR 4/4)	Water table reached at 0.7 m.
109	4 m x 0.9 m 1.3 m deep	0-33	Layer I - silty clay (10 YR 4/2) Layer II - clay loam (10 YR 4/4)	Water table reached at 1.3 m. Layer I had water-worn pebbles and coral cobbles. Layer IV has stream deposited pebbles.
110	4 m x 0.9 m 1.4 m deep	0-30	Layer I - silty clay (10 YR 4/2) Layer II - clay loam (10 YR 4/4)	Water table reached at 1.4 m.

<sup>42</sup> Given as compass bearing in degrees—magnetic.  
<sup>43</sup> Centimeters below surface.



## APPENDIX A SITE DESCRIPTIONS

Site [3] 50-50-08-4699

### Features A-1

**Site type:** Complex of 8 rock shelters, with 1 rock wall with modified outcrops.  
**Environmental setting:** Located along the SSE side of a prominent finger ridge of heavily weathered basalt in the western portion of the project area. Primary vegetation is mature *Koala* with buffelgrass covering most of the ground surface along the base of the ridge. The site ranges from 20 - 80 feet AMSL.

**Dimensions:** 155 meters NE-SW by 30 meters NW-SE

**Function:** Temporary habitation, possible burial area, possible boundary marker.

**Subsurface potential:** good

**Tested:** No

**Site integrity:** varied

**Physical condition:** good

**Estimated age:** precontact and post-contact

**Portable remains:** Woven matting (Feature D), sparse coral and waterworn rocks, battered cobbles (Feature E). Historic artifacts include copper button, cut nail, bottle glass (Feature C).

**Comments:** The rock shelters (Features A-H) exist along a broken low escarpment on the SSE side of a prominent finger ridge. They range in size—the largest is Feature B, with 8 square meters of covered area and an average ceiling height of 0.9 meters, and the smallest is Feature D, having 1 square meter area with a 0.6 meter high ceiling.

In general, the portable remains count is low, ranging from historic to modern glass fragments and cut nails in Feature C to coral and waterworn cobbles in Feature E. Notably, Feature D has a woven mat protruding from the deposit within. Feature I is a stacked rock wall with modified outcrops 10 meters downslope from the Feature D shelter.

An irrigation ditch parallels the ridge and runs close to the escarpment base near the *maka* (SE) end of the site. Here the backdirt berm created during the excavation of the ditch partially fills the Feature B shelter. A series of historic fence posts run SW from the northwestern (*manuka*) shelter—Feature H, which is near the project boundary.

Feature	Dimensions	Stratigraphy	Depth	Notes
164	1.4 m. deep	Layer II - beach sand (10 YR 7/6) Layer III - silty clay (1.5 YR 4/1)	0-40	Found in shallow side. Layer III silty clay in another 2 meters of trench.
164	8 m. x 0.9 m. 1.4 m. deep	Layer I - silty clay (1.5 YR 4/1) Layer II - silty clay root zone (7.5 YR 4/4) Layer III - beach sand (10 YR 7/6) Layer IV - sandy clay (7.5 YR 5/2)	0-40 60-100 100-140 120-140	Water table at 7.3 m. Layer IV present to a depth of 120 cm. STs 163 and 164 appear to represent edge of a lagoon behind a beach berm.
164	8 m. x 1.1 m. 1.4 to 1.5 m. deep	Layer I - silty clay (1.5 YR 4/1) Layer II - silty clay root zone (7.5 YR 4/4) Layer III - silty clay (7.5 YR 5/4) Layer IV - sandy clay (7.5 YR 5/2)	0-40 60-90 90-120 120-130	Water table at 7.3 m. This portion of the beach is in the lagoon area. At 34 m. the outline of a cabinet was revealed and extended to 36.3 m. It was found at c. 0.4 m. (Partial I)
165	1.6 m. x 0.9 m. 1.6 m. deep	Layer I - silty clay (1.5 YR 4/1) Layer II - silty clay (1.5 YR 4/1)	0-30 30-90	Water table not reached.
166	4 m. x 0.9 m. 1.9 m. deep	Layer I - silty clay (1.5 YR 4/1) Layer II - silty clay (1.5 YR 4/1)	0-30 30-60	Water table at 1.9 m.
167	5 m. x 0.9 m. 2.0 m. deep	Layer I - silty clay (1.5 YR 4/1) Layer II - silty clay (1.5 YR 4/1)	0-30 30-60 60-90 90-110 110-300	Water table not reached.
168	5 m. x 0.9 m. 2.6 m. deep	Layer I - silty clay (1.5 YR 4/1) Layer II - silty clay (1.5 YR 4/1) Layer III - stream sand (10 YR 8/1) Layer IV - silty clay (1.5 YR 4/1) Layer V - moist clay (7.5 YR 4/3)	0-30 30-60 60-90 90-100 100-180 180-220 220-260	Water table at 2.6 m.
170	10 m. x 0.9 m. 2.2 m. deep	Layer I - silty clay (1.5 YR 4/1) Layer II - silty clay (1.5 YR 4/1) Layer III - stream deposit (10 YR 8/1) Layer IV - silty clay (1.5 YR 4/1) Layer V - moist clay (7.5 YR 4/3)	0-30 30-60 60-90 90-100 100-180 180-220	Water table at 2.2 m.
171	5 m. x 0.9 m. 2.0 m. deep	Layer I - silty clay (1.5 YR 4/1) Layer II - silty clay (1.5 YR 4/1) Layer III - compact silty clay (1.5 YR 4/4)	0-30 30-120 120-200	Water table at 2.0 m.
172	3.3 m. x 0.9 m. 2.0 m. deep	Layer I - silty clay (1.5 YR 4/1) Layer II - silty clay (1.5 YR 4/1) Layer III - compact silty clay (1.5 YR 4/4)	0-30 30-100 100-115 115-200	Water table not reached.
173	5 m. x 0.9 m. 2.0 m. deep	Layer I - silty clay (1.5 YR 4/1) Layer II - silty clay (1.5 YR 4/1) Layer III - silty clay (1.5 YR 4/1)	0-40 40-60 60-200	Water table at 1.8 m.
174	10 m. x 0.9 m. 1.8 m. deep	Layer I - silty clay (1.5 YR 4/1) Layer II - silty clay (1.5 YR 4/1) Layer III - silty clay (1.5 YR 4/1)	0-30 30-140 140-180	Water table at 1.8 m.
175	10 m. x 0.9 m. 1.4 m. deep	Layer I - silty clay (1.5 YR 4/1) Layer II - silty clay (1.5 YR 4/1) Layer III - silty clay (1.5 YR 4/1) Layer IV - beach sand (10 YR 8/1)	0-30 30-120 120-140	Water table at 1.35 m. Layer III beach sand rises to plow zone horizon to south end of trench.
176	5 m. x 0.9 m. 1.0 m. deep	Layer I - silty clay (1.5 YR 4/1) Layer II - beach sand (10 YR 8/1) Layer III - beach sand (10 YR 8/1)	0-30 30-50 50-100	Water table at 1.0 m.
177	5 m. x 0.9 m. 1.3 m. deep	Layer I - silty clay (1.5 YR 4/1) Layer II - beach sand (10 YR 8/1) Layer III - beach sand (10 YR 8/1)	0-30 30-75 75-115 115-130	Water table at 7.3 m. A 3 cm. grey deposit is present at the bottom of Layer II.
178	5 m. x 0.9 m. 1.2 m. deep	Layer I - silty clay (1.5 YR 4/1) Layer II - beach sand (10 YR 8/1) Layer III - beach sand (10 YR 8/1)	0-30 30-90 90-120	Water table at 1.15 m. Charcoal flecks present at 73 cm. level of Layer II.
179	5 m. x 0.9 m. 1.1 m. deep	Layer I - silty clay (1.5 YR 4/1) Layer II - beach sand (10 YR 8/1) Layer III - beach sand (10 YR 8/1)	0-30 30-110	Water table reached at 1.1 m.
180	5 m. x 0.9 m. 1.1 m. deep	Layer I - silty clay (1.5 YR 4/1) Layer II - beach sand (10 YR 8/1) Layer III - beach sand (10 YR 8/1)	0-30 30-50 50-110	Water table reached at 1.1 m.

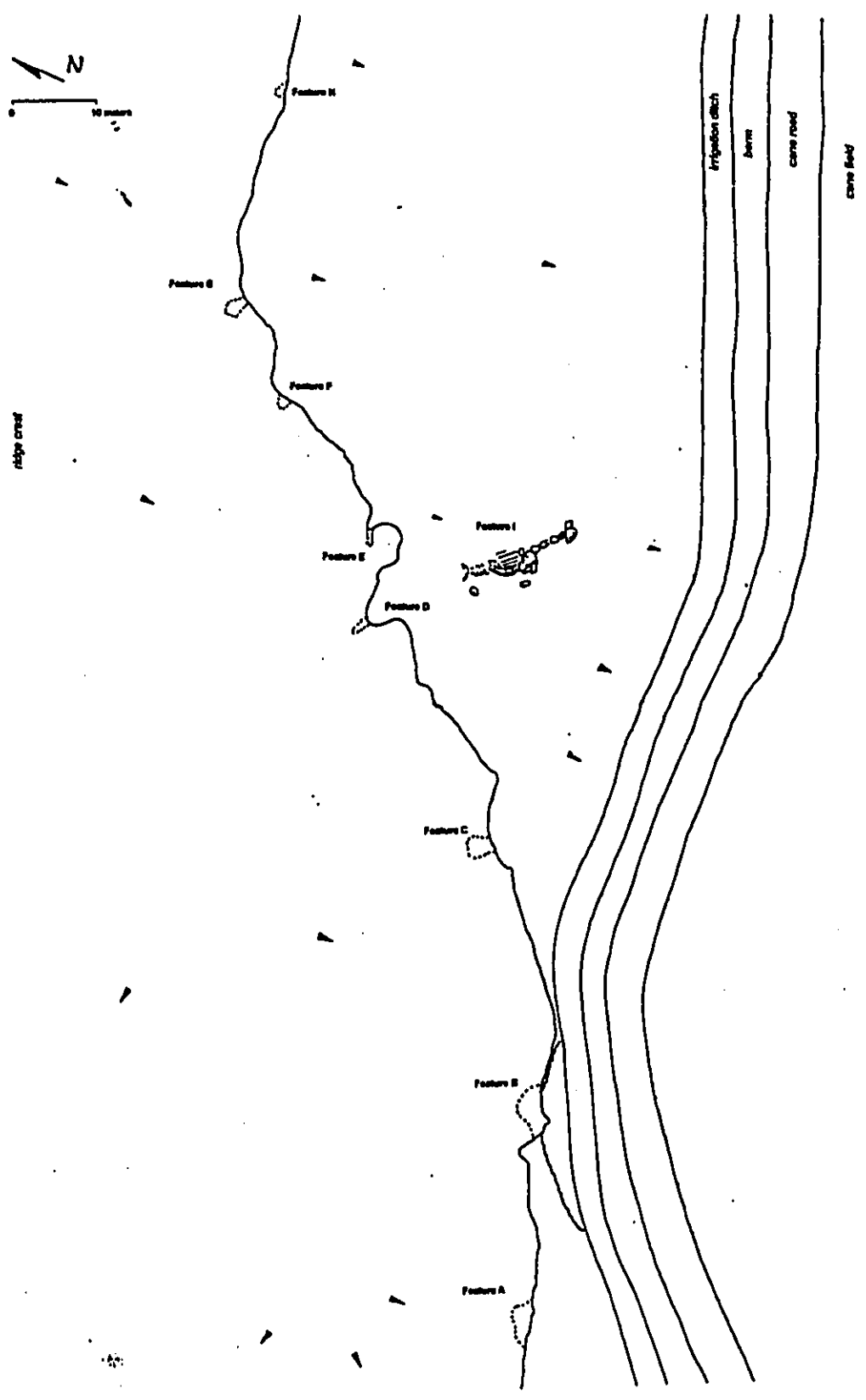


Figure A1 - Plan view of Site 4699.

**Feature A**  
Type: Rock Shelter—marginal  
Dimensions: 4.2 meters E-W by 1.75 meters in depth (N-S), by 2.4 meters max. height.  
Function: Possible temporary habitation  
Subsurface potential: moderate  
Integrity: unaltered  
Condition: good  
Tested: no  
Estimated age: precontact to post-contact  
Portable remains: 1 piece waterworn coral, 1 waterworn pebble, 1 olive green glass fragment.

Comments: Most of the deposit on the surface inside the dripline appears to have accumulated from exfoliation of the soft weathered rock of the cliff-line. There are 2 raised bench-like formations of bare rock within the shelter. The portable remains were observed on the 2 formations.

**Feature B**  
Type: Rock shelter  
Dimensions: 3.8 meters E-W by 2.4 meters deep (N-S) by 1.8 meters maximum height.  
Function: temporary habitation  
Subsurface potential: moderate  
Integrity: altered  
Condition: fair to good  
Tested: no  
Estimated age: possibly precontact with post-contact usage  
Portable remains: bottle glass fragments on surface

Comments: The cliff face consists of weathered, crumbling rock. The floor of this shelter has a thick powder-like silty deposit that may represent a buried cultural deposit. An earthen berm, created by the excavation of the adjacent irrigation channel, is below the dripline, and partially fills the shelter.

**Feature C**  
Type: Rock shelter  
Dimensions: 2.3 meters wide E-W by 3.0 meters deep (N-S) by 1.2 maximum height.  
Function: temporary habitation  
Subsurface potential: good  
Integrity: questionable  
Condition: fair  
Tested: no  
Estimated age: possibly precontact, with post-contact usage (late 1800s).  
Portable remains: vesicular cobble, 1 copper button, 1 rusted metal button, 1 small bucket, 2 cut nails, 1 battered cobble, olive green glass fragments.

Comments: There is good deposition on the nearly level floor of this relatively roomy shelter. The matrix appears to have been disturbed, possibly by bottle hunters. Most of the artifacts noted above were located on a small shelf of rock near the dripline.

**Feature D**  
Type: Rock shelter with probable burial  
Dimensions: 2.2 meters in depth (E-W) by 0.6 meters N-S by 0.6 meters ceiling height.  
Function: Temporary shelter, probable burial cave  
Subsurface potential: excellent  
Integrity: unaltered  
Condition: good  
Tested: no  
Estimated age: precontact  
Portable remains: fragments of woven matting visible on the surface—*halala*, tight weave.  
Comments: There is little habitable space within this shelter due to the low ceiling height. However there is good deposition. There is another small, restricted chamber directly above, which has no deposition. The presence of the *halala* matting which is covered by soil, strongly suggests that this is a burial cave.

**Feature E**  
Type: Small rock shelter (niche)  
Dimensions: 2.0 meters deep (NE-SW) by 0.5 meters NW-SE by 0.8 ceiling height  
Function: possibly temporary habitation  
Subsurface potential: excellent  
Integrity: unaltered  
Condition: good  
Tested: no  
Estimated age: probable precontact  
Portable remains: 3 chunks of waterworn coral (average 9 cm.), 1 waterworn basalt cobble (10 cm.)  
Comments: Good deposit within the confined space. Very little shelter—level area 0.5 by 1.5 meters just inside dripline. There is a small shelf in the rear. One waterworn piece of coral found 3 meters outside of the shelter.

**Feature F**  
Type: Rock shelter—marginal  
Dimensions: 1.0 meters N-S by 1.9 meters deep (E-W) by 1.3 meters ceiling height  
Function: possible temporary shelter  
Subsurface potential: minimal  
Integrity: unaltered  
Condition: good  
Tested: no  
Estimated age: possible precontact  
Portable remains: none  
Comments: No deposit within this marginal shelter.



Photo 9 - Site 4699—Feature A—rock shelter.

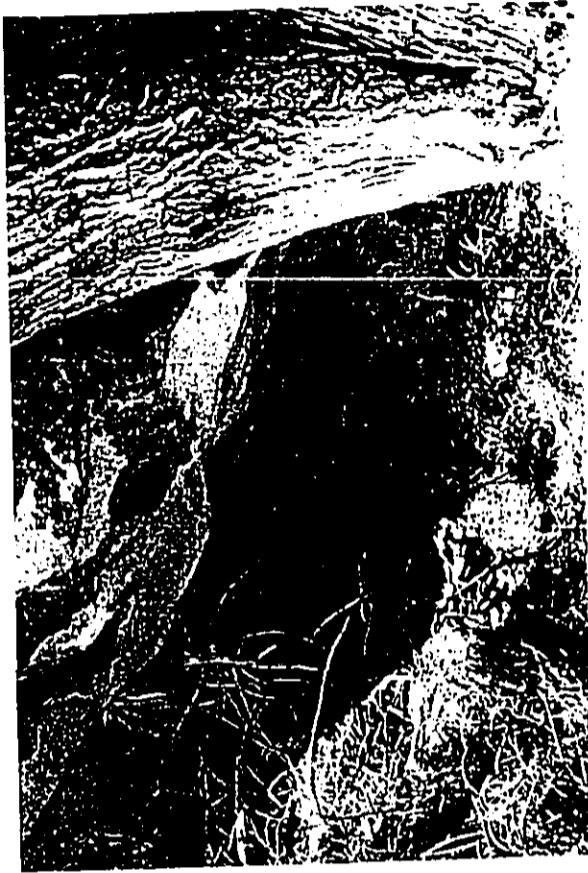


Photo 10 - Site 4699—Feature B—rock shelter.



97 Photo 7 - View into Olowalu Valley. Bright green vegetation on left is *taro* field.



Photo 8 - Site 4799—Feature D—burial cave.

**Feature G**  
Type: Rock shelter  
Dimensions: 1.9 meters E-W by 3.2 meters deep (NW-SE) by 1.5 meters ceiling height  
Function: possible temporary shelter  
Subsurface potential: low  
Integrity: unaltered  
Condition: good  
Estimated age: possible precontact  
Portable remains: none observed on surface  
Comments: Shallow deposit in lowest portion of the uneven floor.

**Feature H**  
Type: Rock shelter  
Dimensions: 2.0 meters E-W by 1.6 meter deep (N-S) by 1.2 meter ceiling height  
Function: possible temporary habitation  
Subsurface potential: moderate  
Integrity: unaltered  
Condition: good  
Tested: no  
Estimated age: probable precontact  
Portable remains: 2 basalt flakes (debitage)

Comments: There is an old wooden fence post jammed into the outcrop face adjacent to the shelter area. There is at least 10 cm. of deposit on floor of shelter.

**Feature I**  
Type: Rock wall with modified outcrops  
Dimensions: 12.6 meters NW-SE by 0.8 maximum wall thickness by 0.75 maximum wall height  
Function: undetermined, possibly agricultural  
Subsurface potential: good  
Integrity: unaltered  
Condition: good  
Tested: no  
Estimated age: probable precontact  
Portable remains: none observed

Comments: This feature consists of a short curved section of a faced, stacked wall incorporated in existing outcrops. It partially encloses an area c. 2.5 x 2.5 meters. The short wall section is 2.0 meters in length (NW-SE), curving around the west side of the feature and is 0.75 meters high, consisting of 4 to 5 courses of rock. An additional line of



Photo 11 - Site 4699 - Feature C - rock shelter.

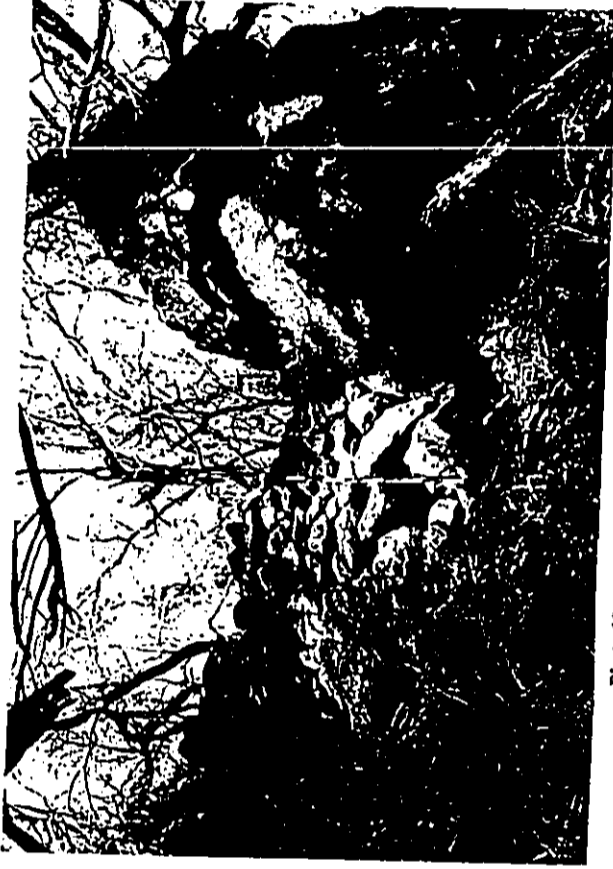


Photo 12 - Site 4699 - Feature I - looking north.





Photo 13 - Site 4699—Feature 1—looking south.



Photo 14 - Site 4699—Feature 1—east end of feature.

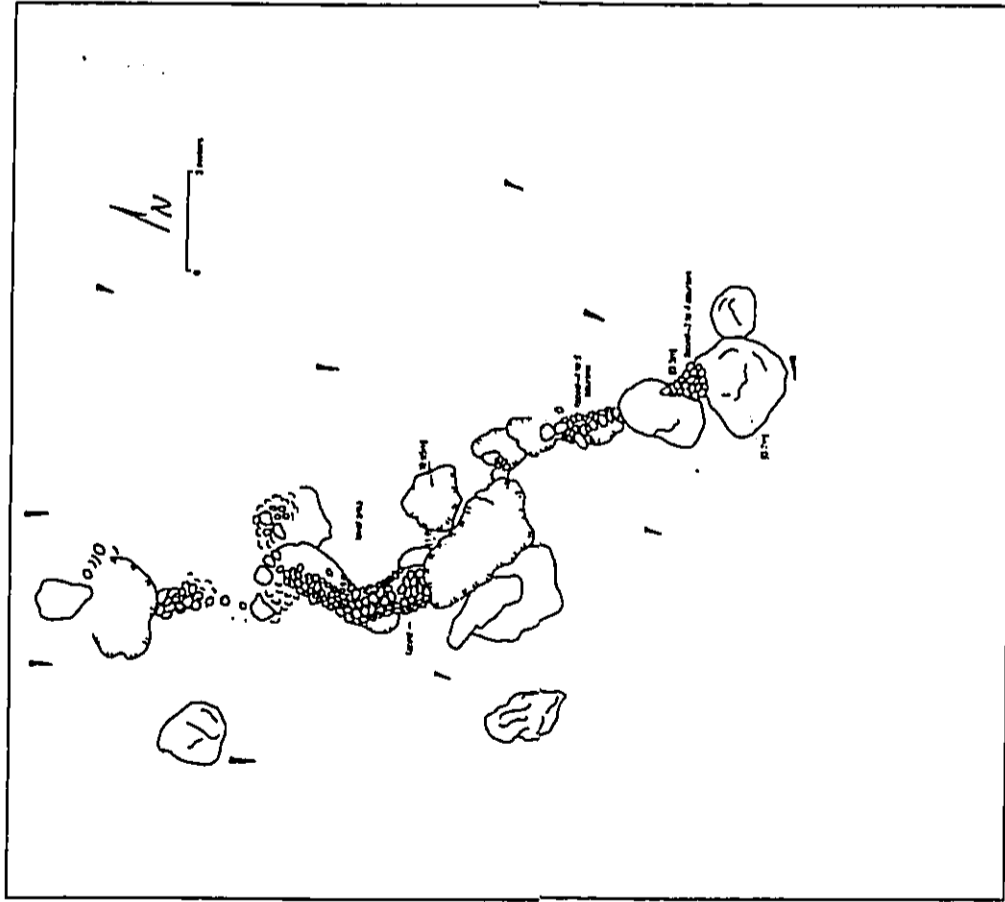


Figure A2 - Plan view of Feature 1—Site 4699.

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100

modified outcrops extend off to the SE for c. 4.5 meters, where angular cobbles or boulders are stacked atop and between outcrops creating a crude retaining wall. A collapsing section of stacked rock wall continues NW upslope for c. 2.8 meters, and is also tied into an existing outcrop.

A rocky soil matrix exists within the level partially enclosed area. Potential deposit may exist adjacent to the modified outcrop SE of the central element. This feature is located c. 13 meters SE downslope from the Feature D rock shelter.

**Site [4] 50-50-08-4700**

**Features A-I**

**Site type:** Complex with rock shelters and rock walls.

**Environmental setting:** This site is located along the crest and western face of a ridge near far western corner of project area. It is adjacent to one of the surveyed property corner markers. The landform consists of weathered basalt. Flora consists of sparse buffelgrass on ridge of the crest, with mature and shrub *kiawe* along the base of the ridge.

**Dimensions:** 55 meters NS by 40 meters E-W

**Function:** temporary habitation

**Subsurface potential:** good

**Tested:** yes—Test Unit 1, Feature D; TU 2, Feature E; TU 3, Feature F; TU 4, Feature G.

**Integrity:** unaltered

**Condition:** good

**Estimated age:** precontact

**Portable remains:** lithic debitage, hammerstone, marine shell, water-worn pebbles and cobbles.

**Comments:** The site consists of 7 rock shelters (Features C-I) that are along the exposed rock escarpment on the steep western face of a ridge near the far western project corner. One small modified outcrop with shelter potential is near the crest of the same ridge (Feature A). Numerous water-worn pebbles, cobbles and coral, along with several pieces of lithic debitage and 1 basalt hammerstone are scattered across the top of the ridge which extends to the north outside the project area. Other features exist along the ridge outside the project area as well.

Test units contained shallow deposits. Matrix was primarily very loose silt with a powdery consistency (aeolian deposit). Marine shell counts were high in Features C, E, and F. Lithic and volcanic glass debitage was common, as well as fire-cracked rocks. One potential hearth remnant (HF 1) was present in TU 3, Feature F.

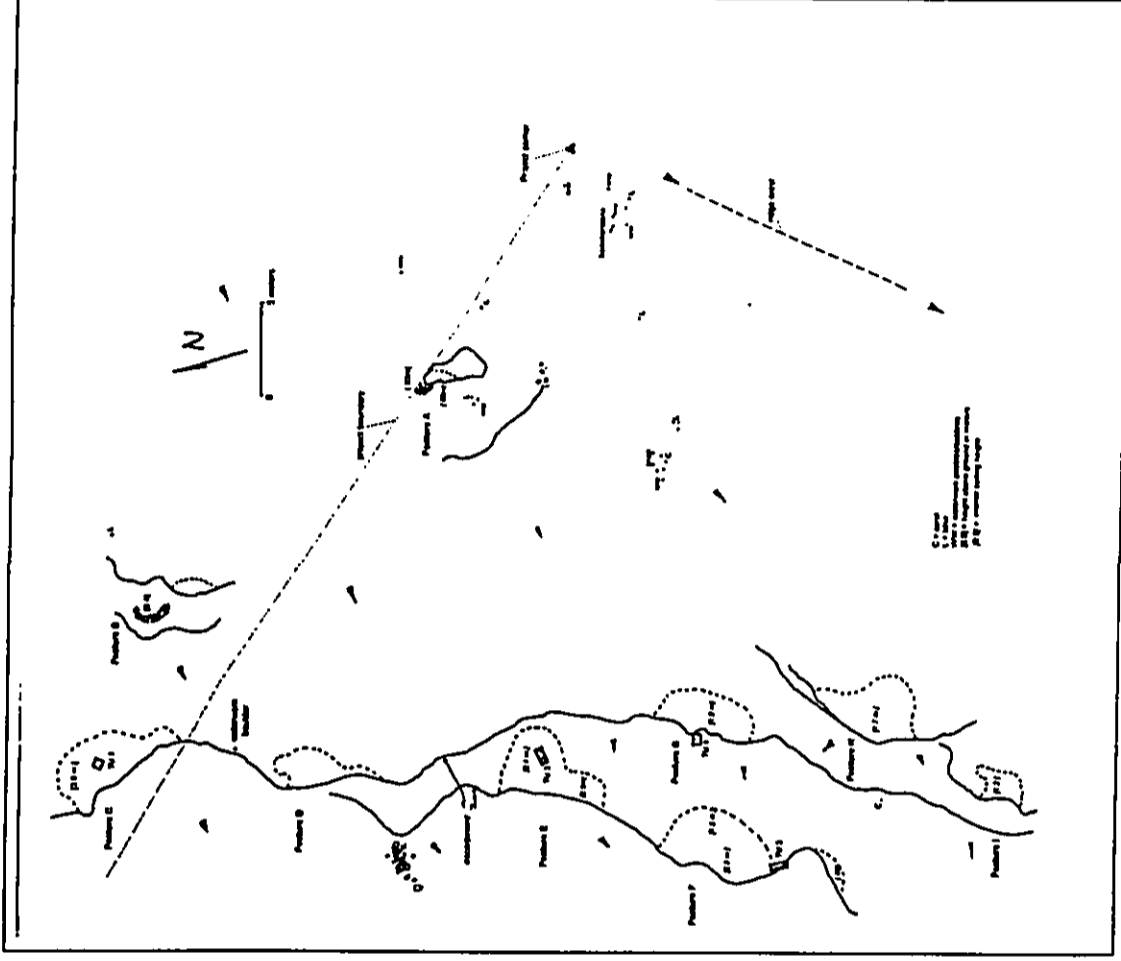


Figure A3 - Plan view of Site 4700.

- Feature A**  
 Type: rock shelter  
 Dimensions: 1.8 meters N-S by 0.8 meters deep (N-S) with 0.6 meter ceiling height  
 Function: temporary shelter  
 Subsurface potential: low  
 Integrity: unaltered  
 Condition: good  
 Tested: no  
 Estimated age: probable precontact  
 Portable remains: 1 basalt flake, 1 waterworm pebble within 1 meter area. Sparse waterworm coral and pebbles in surrounding area.  
 Comments: This is a small overhang in a low outcrop just large enough for an adult to lie in. A crude pile of angular boulders/cobbles is piled at the north end of the overhang. It measures 1.5 m. long x 0.8 m. wide x 0.6 m. high and has 1-3 courses.
- Feature B**  
 Type: rock wall, C-shape  
 Dimensions: 1.7 meters E-W by 2.0 meters N-S by 0.5 meters high  
 Function: undetermined—possibly an observation point  
 Subsurface potential: low  
 Integrity: unaltered  
 Condition: good  
 Tested: no  
 Estimated age: possible precontact  
 Portable remains: none observed  
 Comments: This feature consists of a semi-circular wall built on an outcrop which wraps around the *maka* side of a small level area c. 1 meter square. The wall measures a total of 2.3 meters in length by 0.4 meters wide by 0.4 meters high (2-5 courses). A shallow soil deposit exists in the center of the area. A marginal overhang is adjacent directly to the west.
- Feature C**  
 Type: rock shelter  
 Dimensions: 8.0 meters N-S by 2.7 meters deep (E-W) by 3.0 meters maximum ceiling height  
 Function: temporary habitation  
 Subsurface potential: good  
 Integrity: altered  
 Condition: good  
 Tested: yes—Test Unit 1, 0.5 x 0.5 meters—Radiocarbon date—150 +/- 70 BP.  
 Estimated age: probable precontact  
 Portable remains: 2 *opihii*, 2 *pipipi*, 1 cowrie fragment; lithic debitage, vesicular cobbles, 2 waterworm pebbles, 2 aluminum soda cans.  
 Comments: A level area 2.5 x 2.0 meters exists in the center of the shelter with good soil deposition. Another exists partially outside the dripline. The shelter appears to have been vandalized by bottle hunters, judging from the pile of cobbles in one corner.

13

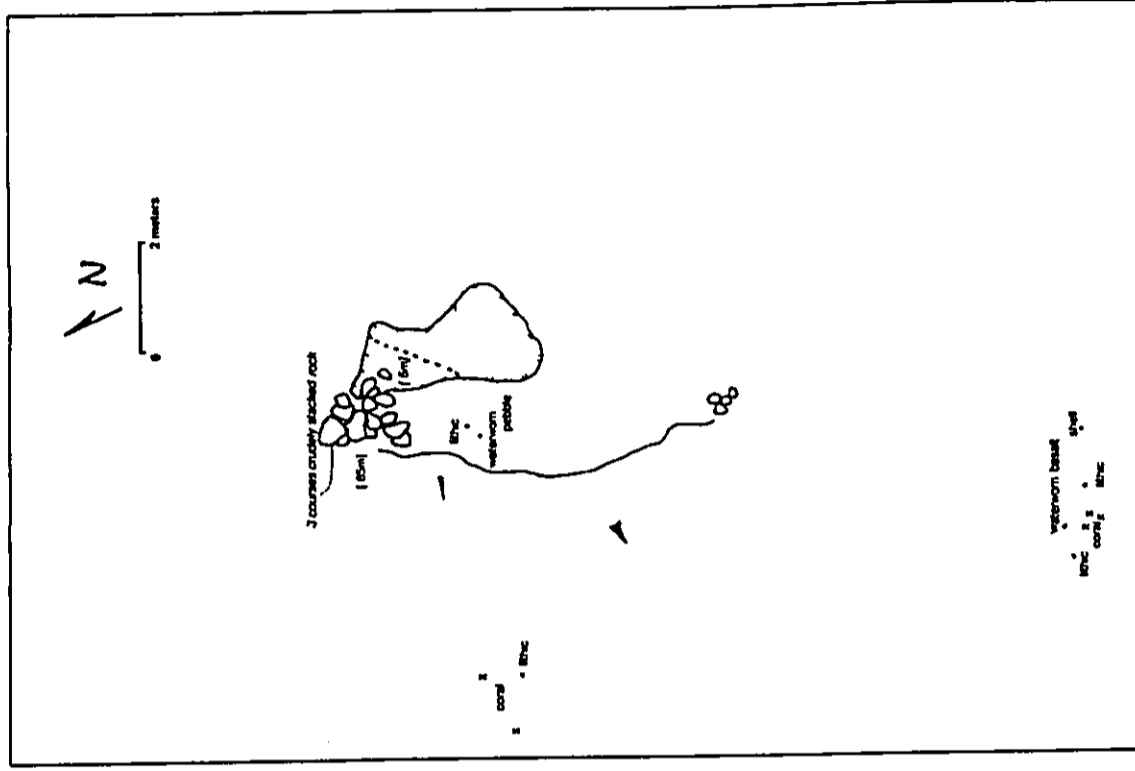


Figure A4 - Plan view of Feature A—rock shelter with possible windbreak.

14



Photo 15 - Site 4700 - Feature B - C-shape enclosure.



Photo 16 - Site 4700 - Feature B - view to north.

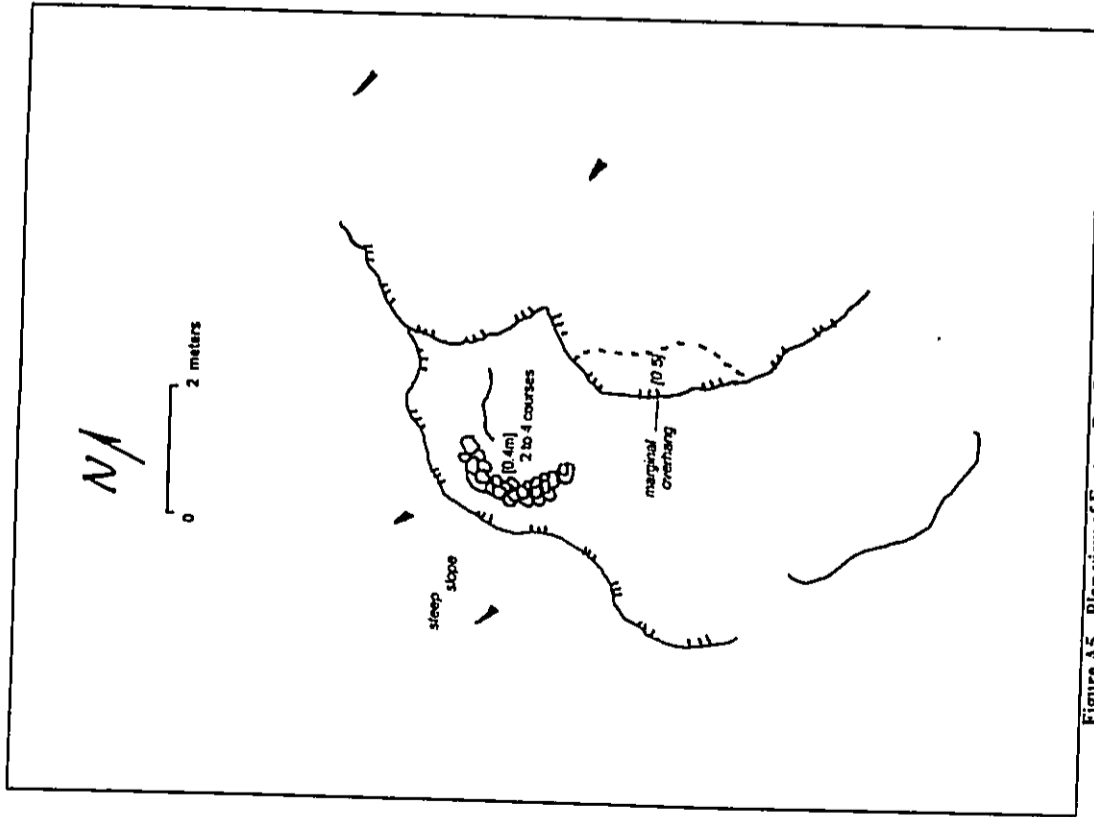


Figure A5 - Plan view of Feature B - C-shape rock wall - Site 4700.

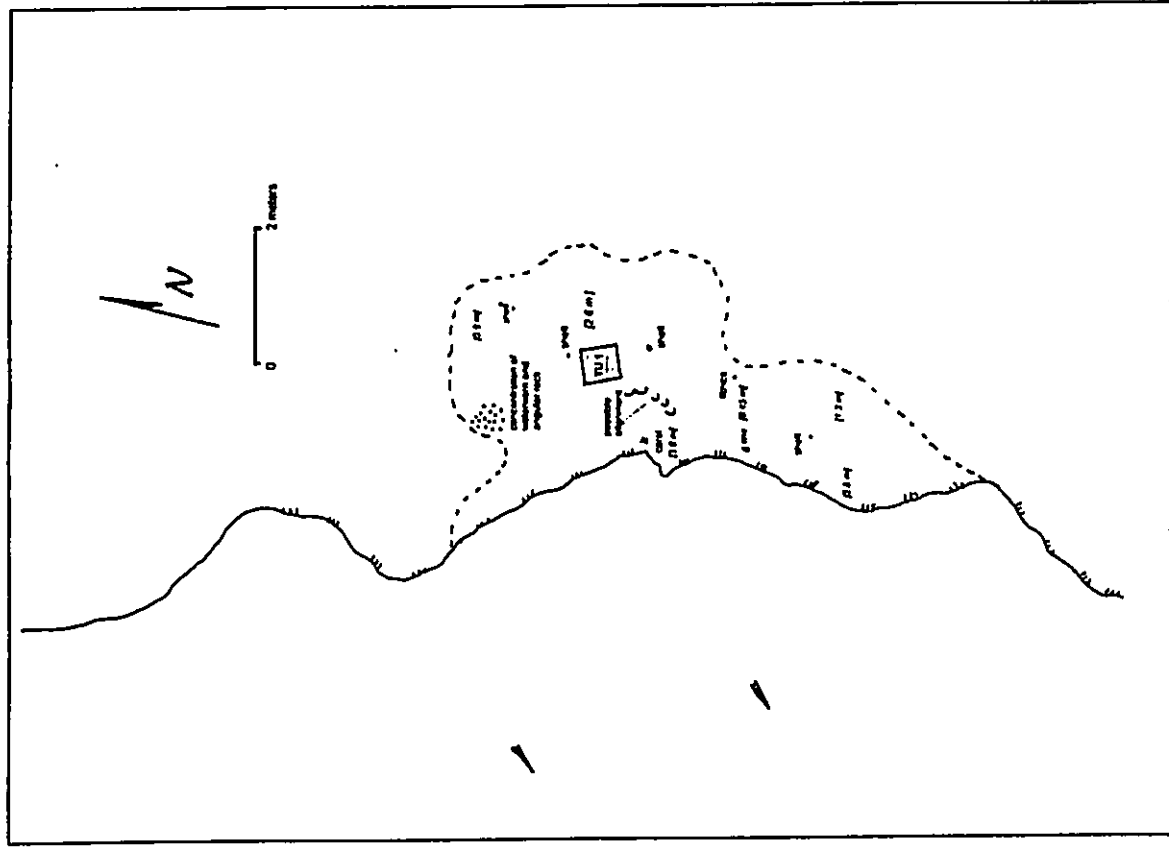


Figure A6—Plan view of Feature C—rock shelter—Site 4700.

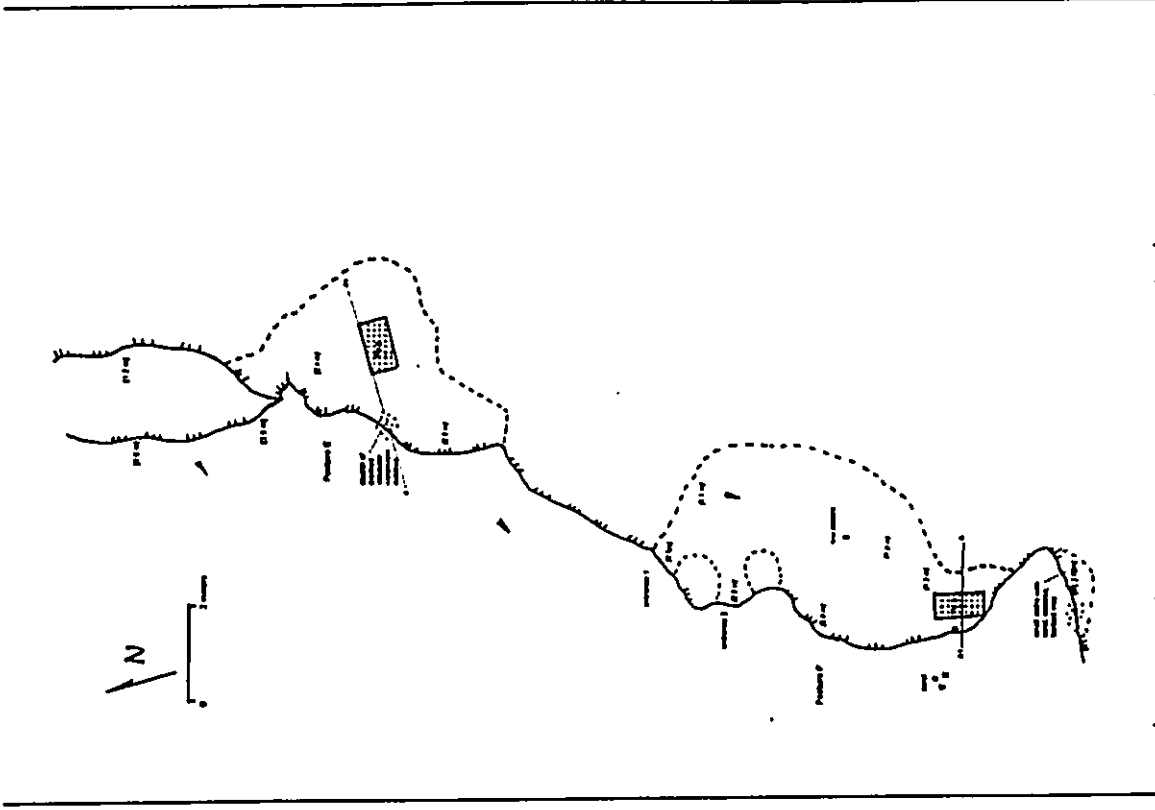


Figure A7—Plan view of Site 4700, Features E and F, showing Test Units 2 and 3.

**Feature D**

Type: rock shelter  
Dimensions: 4.0 meters N-S by 1.3 meters deep (E-W) by 2.0 maximum ceiling height  
Function: temporary habitation  
Subsurface potential: moderate  
Integrity: unaltered  
Condition: good  
Tested: no  
Estimated age: probable precontact  
Portable remains: none observed

Comments: A 2.0 by 1.0 meter level area exists in the central part of the shelter, with some soil deposition, most of which is from the weathering rock of the escarpment.

**Feature E**

Type: rock shelter  
Dimensions: 4.6 meters N-S by 3.9 meters deep (E-W) by 2.6 meters maximum ceiling height  
Function: temporary habitation  
Subsurface potential: good  
Integrity: unaltered  
Condition: good  
Tested: yes—Test Unit 2, 0.5 x 1.0 meter—Radiocarbon date—420 +/- 50 BP.  
Estimated age: precontact  
Portable remains: 5 cracked vesicular cobbles, 1 waterworm cobble.

Comments: a 2.0 by 2.0 meter level area exists in the central part of the shelter, with good soil deposition where a few potential fire-cracked rocks are eroding out.

**Feature F**

Type: rock shelter  
Dimensions: 6.3 meters N-S by 3.0 meters deep (E-W) by 2.8 maximum ceiling height  
Function: temporary habitation  
Subsurface potential: low to moderate—thin soil inside shelter; good soil deposit outside shelter  
Integrity: unaltered  
Condition: good  
Tested: yes—Test Unit 3, 0.5 x 0.5 meter—Radiocarbon date—200 +/- 60 BP.  
Estimated age: precontact  
Portable remains: 3 waterworm cobbles inside shelter, 1 probable coral abrader and a piece of coral in small niche outside, 3 coral chunks in root ball just outside shelter.

Comments: This is a roomy shelter with a fair amount of level space inside. A large boulder with a niche beneath it has an abrader and a coral chunk. A level area exists outside the shelter as well.



Photo 17—Site 4700—Feature E—rock shelter.



Photo 18—Site 4700—Feature F—rock shelter.

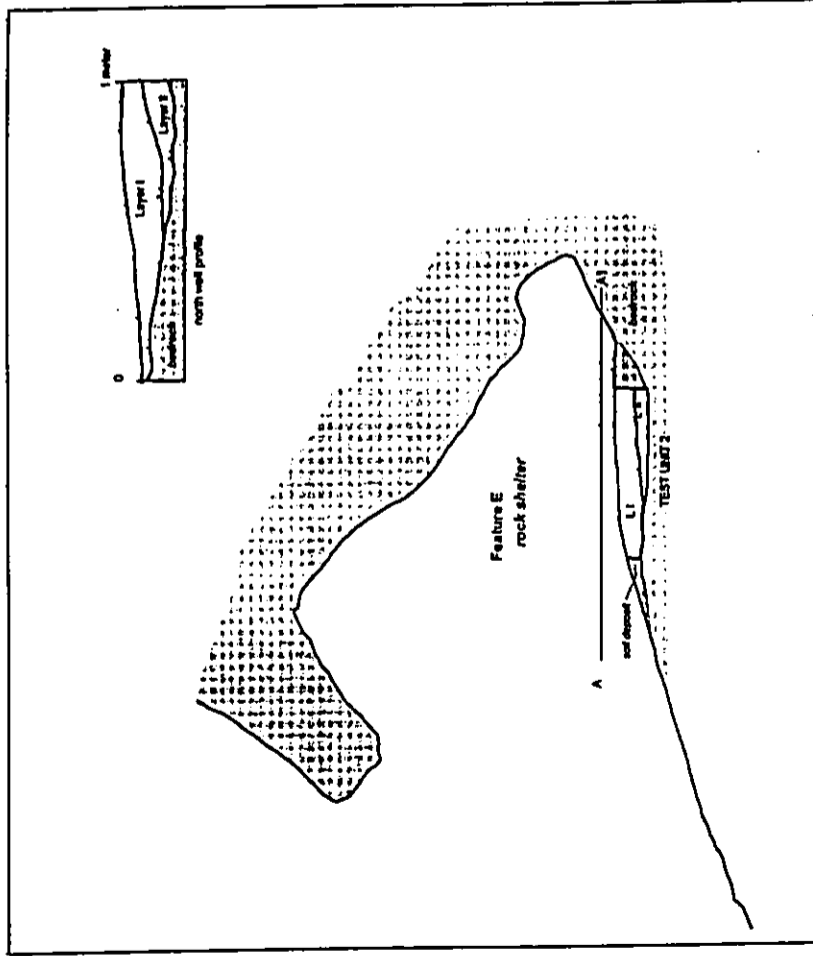


Figure A8 -- Profiles of Feature E and Test Unit 2--Site 4700.

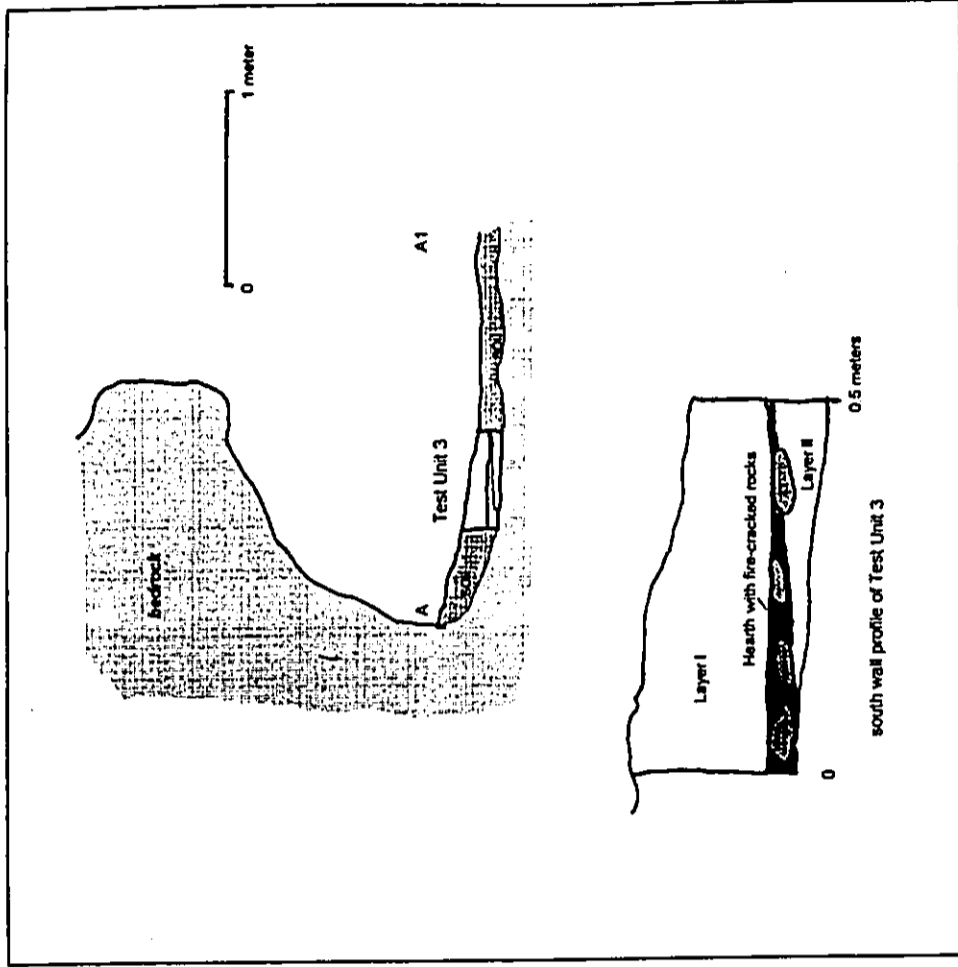


Figure A9 -- Profiles of Feature F and Test Unit 3--Site 4700.



Photo 19—Test Unit 3—hearth feature—Site 4700, Feature E.



Photo 20—Test Unit 4—Site 4700—Feature G.

**Feature G**

Type: rock shelter  
 Dimensions: 3.2 meters N-S by 2.2 meters deep by 1.5 meters maximum ceiling height  
 Function: temporary habitation  
 Subsurface potential: moderate inside shelter—patchy soil deposit; good directly outside of dripline  
 Integrity: unaltered  
 Condition: good  
 Tested: yes—Test Unit 4, 0.5 x 0.5 meters  
 Estimated age: precontact  
 Portable remains: 1 *opihī* (heavily eroded), 1 vesicular cobble, 1 fire-cracked rock, 2 waterworn pebbles, and 1 battered cobble outside  
 Comments: The interior of the shelter is broken into 3 small shelf areas, with a level area just outside the dripline. A few waterworn pebbles, a battered cobble and a FCR appear to be eroding out of the edge of the level area.

**Feature H**

Type: rock shelter  
 Dimensions: 4.5 meters N-S by 3.8 meters deep by 1.7 meters maximum ceiling height  
 Function: temporary habitation  
 Subsurface potential: low—thin patchy soil deposit, exposed rock over most of floor area  
 Integrity: unaltered  
 Condition: good  
 Tested: no  
 Estimated age: precontact  
 Portable remains: 1 waterworn coral cobble 3 meters downslope outside of dripline  
 Comments: This shelter is spacious. A large opening or cleft exists in the ceiling.

**Feature I**

Type: rock shelter  
 Dimensions: 2.6 meters N-S by 2.1 meters deep by 1.2 meters maximum ceiling height  
 Function: temporary habitation  
 Subsurface potential: moderate  
 Integrity: unaltered  
 Condition: good  
 Tested: no  
 Estimated age: probable precontact  
 Portable remains: waterworn cobble outside of shelter

Comments: There is some soil deposit on the shelter's floor, much of which is from rock exfoliation and slope wash from above.

**Feature J**

Type: rock wall



**Dimensions:** 2.3 meters E-W by 0.8 meters wide and 0.7 meters high

**Function:** boundary marker

**Subsurface potential:** low

**Integrity:** unaltered

**Condition:** fair

**Tested:** no

**Estimated age:** possible precontact

**Portable remains:** none observed

**Comments:** This is an extremely crude linear stacking of unsorted rock, 2 to 4 courses high. The rocks are piled on top of weathered bedrock which is extending off the base of a low escarpment. The rock shelter Feature D is 5.5 meters northeast. The wall is collapsing downslope.

#### **SITE [5] 50-50-08-4701**

**Site type:** single component, platform remnant

**Environmental setting:** This site is located on a small broad finger ridge in the western portion of the project area. Flora is primarily mature *koa* trees with patches of buffelgrass.

**Dimensions:** 33 meters N-S by 27 meters E-W

**Function:** ceremonial

**Subsurface potential:** good

**Tested:** no

**Integrity:** altered by bulldozer activity

**Condition:** poor

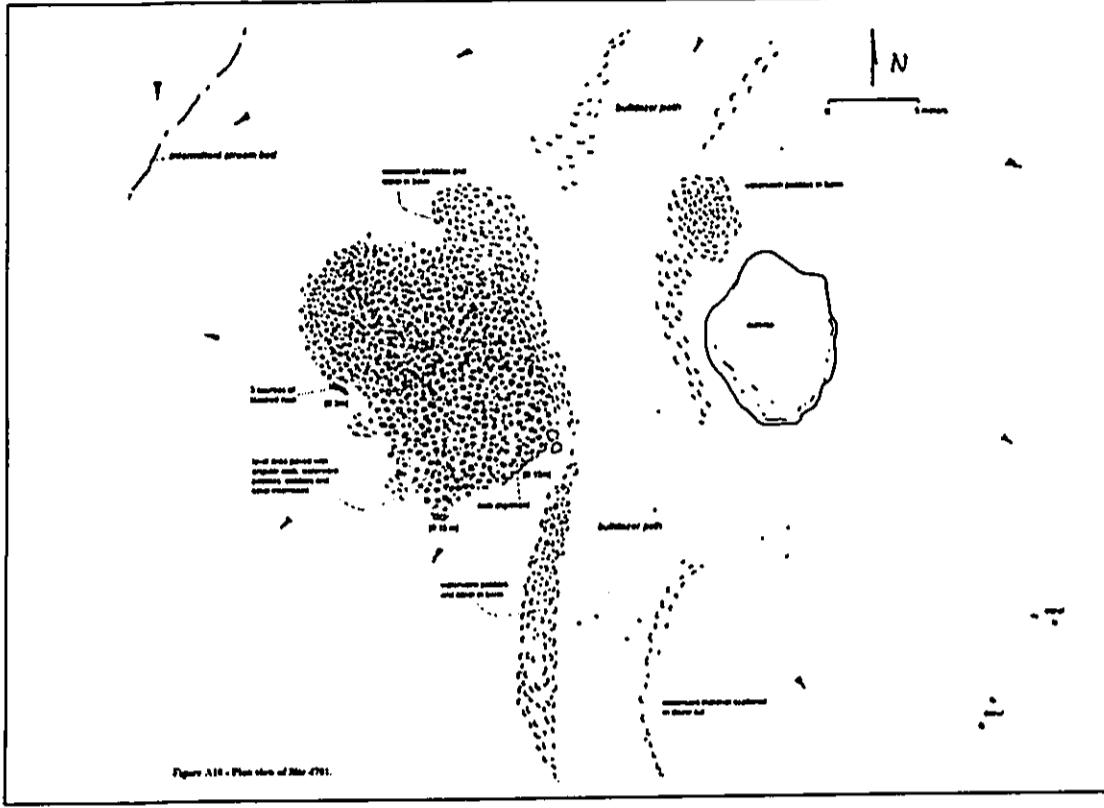
**Estimated age:** precontact

**Portable remains:** waterworn pebbles, cobbles and coral is abundant. Marine shell, lithic debitage are common. One hammerstone.

**Comments:** This site sits on a ridge crest 30 meters upslope from the canefield. The primary element here is roughly rectangular level area that is paved with angular cobbles. Mixed in among the angular rock are numerous waterworn pebbles, cobbles, and a considerable number of coral chunks. A short alignment of small boulders exists along the SE side of the feature with 2 small stacked rock sections 2 to 3 courses along the SW side. The feature has been severely impacted by a dozer cut that has cut away the eastern side, spreading waterworn material over a large area.

The platform remnant itself consists of a rectangular level area with a distinct concentration of angular cobbles mixed with a high concentration of waterworn pebbles and coral chunks. It measures 15 meters NW-SE by 11 meters NE-SW and 0.3 meters above ground surface. It is interpreted as a possible ceremonial structure.

A bulldozer path cuts through the east side of the feature. There are push piles in the area surrounding the feature that contain high concentrations of waterworn pebbles and coral. More waterworn material as well as marine shell fragments are to be found in the dozer path. One boulder alignment occurs at the SE end and some stacking is evident along the SW side. High concentrations of waterworn coral and pebbles are buried beneath the angular cobbles on the surface of the feature. The feature is located on top of the end of a finger ridge, and appears as a level area on the otherwise undulating ridge crest.



**SITE [6] 50-50-08-4702**

**Site type:** single component, rock wall  
**Environmental setting:** This wall is located near the base of a gradual sloping landscape that is c. 500 feet westnorthwest of the Olowalu stream bridge, directly adjacent to a cane field. Primary flora is *Eleocharis acicularis* and thick buffelgrass. The wall spans a shallow swale.  
**Dimensions:** 47 meters E-W by 6 meters N-S in length; 0.75 meters wide with maximum height of 9 courses or 1.2 meters.  
**Function:** boundary marker  
**Subsurface potential:** limited  
**Tested:** no  
**Integrity:** altered, both ends have had rocks removed  
**Condition:** good  
**Estimated age:** undetermined  
**Portable remains:** none

**Comments:** This well built, stacked, faced wall is at the base of a gradual slope and spans a shallow swale. The long axis is in an east-west orientation. A 90 degree corner exists at the west end where a 6 meter long section is cut off at a now inactive concrete irrigation ditch. The east end of the long axis terminates as collapsed rubble. This is possibly a portion of a larger enclosure destroyed by cane field operations. Possibly associated with an LCA *kuleana*.

**SITE [7] 50-50-08-4703**

**Features A through C**  
**Site type:** complex consisting of rock alignment, rock wall and rock enclosure  
**Environmental setting:** located on a moderate slope with subangular basalt boulders. This is just inside the northern project boundary north of *kuleana* properties not included in project area.  
**Dimensions:** 30 meters NW-SE by 8 meters NE-SW  
**Function:** indeterminate, possibly boundary markers  
**Subsurface potential:** limited  
**Tested:** no  
**Integrity:** altered (electric transmission line installation)  
**Condition:** varied  
**Estimated age:** unknown  
**Portable remains:** none observed

**Comments:** This site is located near the northern project boundary within the easement of the old transmission line with concrete poles. The site consists of 3 small rock features. All rock is of the type within the immediate vicinity.

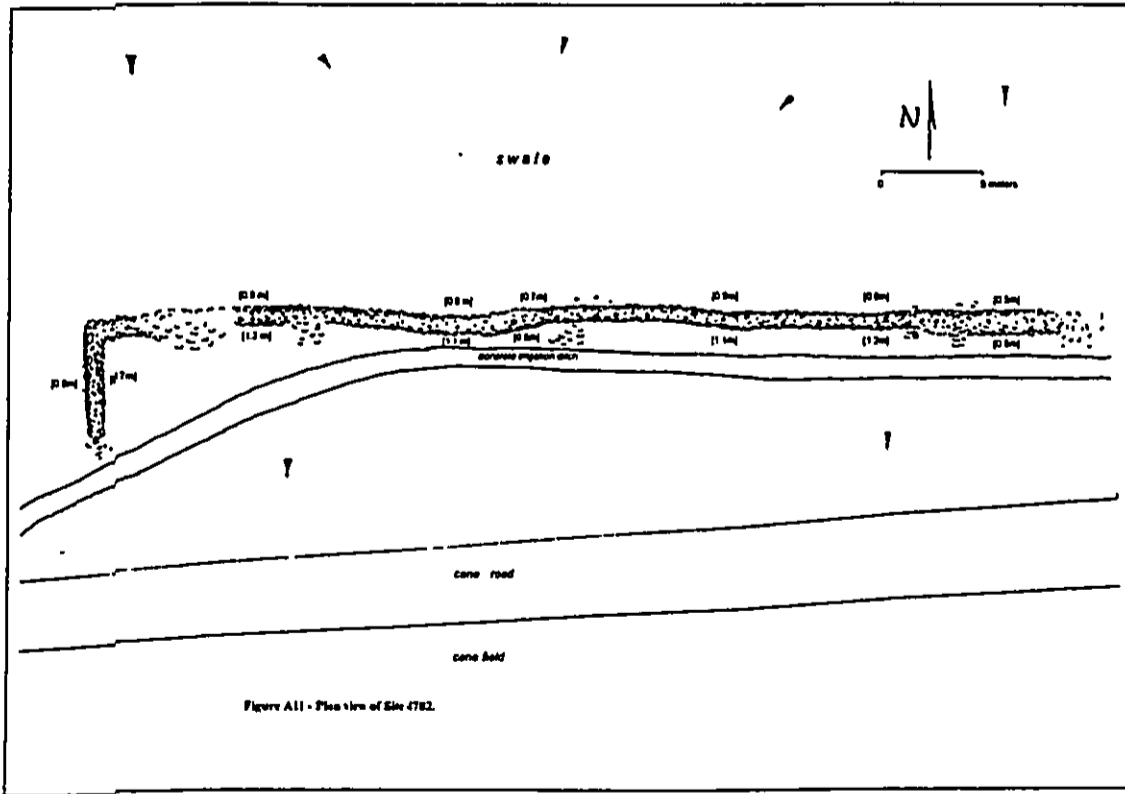


Figure A11 - Plan view of Site 4702.

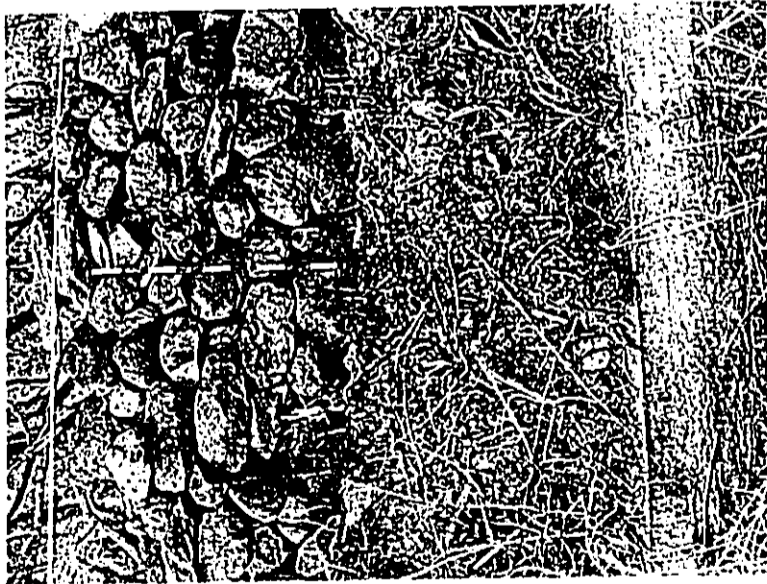
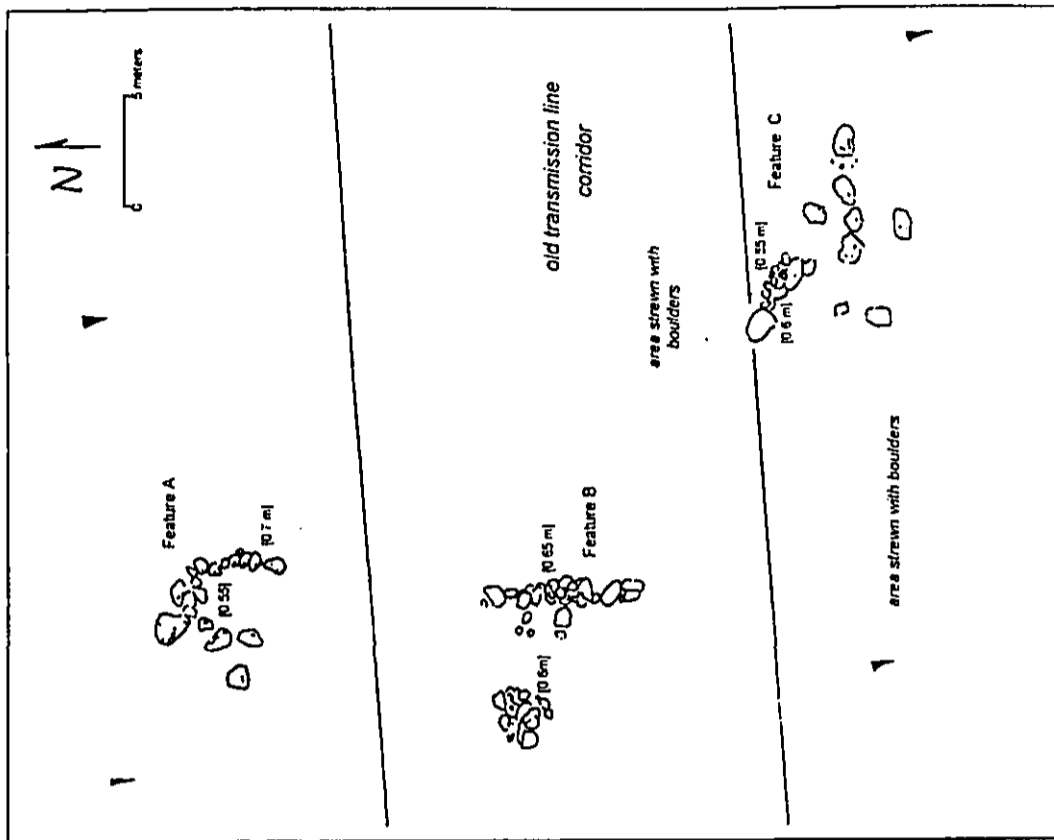


Photo 21 - South face of Site 4702, showing irrigation ditch in foreground.



Photo 22 - Looking westward along south face of Site 4702.



Feature A12 - Plan view of Site 4703.

**Feature A**

Type: rock enclosure  
Dimensions: 4 meters N-S by 3 meters E-W by 0.7 meters maximum height  
Function: indeterminate  
Subsurface potential: low  
Integrity: unaltered  
Condition: good  
Tested: no  
Estimated age: possibly precontact  
Portable remains: none

Comments: This is a rough alignment of boulders, some of which have been placed in an upright position and leaning on each other. The boulders occur along the east side of the feature. Additional boulders (average size of 0.6 meters in diameter) are placed in a single course alignment so as to create a small U-shaped partial enclosure. The immediate vicinity is strewn with naturally occurring boulders.

**Feature B**

Type: wall remnant  
Dimensions: 5.5 meters N-S by 0.65 meters wide by 0.65 meters maximum height  
Function: possible boundary marker  
Subsurface potential: low  
Integrity: altered during power pole installation  
Condition: poor  
Tested: no  
Estimated age: possibly precontact  
Portable remains: none

Comments: This is crudely stacked linear arrangement of boulders, 3 to 4 courses high, forming a short wall section. The feature appears to have been impacted by the installation of the old concrete-pole power line.

**Feature C**

Type: rock alignment  
Dimensions: 3 meters NW-SE by 1 meter NE-SW by 0.6 meters maximum height  
Function: possible temporary shelter  
Subsurface potential: low  
Integrity: unaltered  
Condition: good  
Estimated age: probably precontact  
Portable remains: none

Comments: This is a crudely stacked roughly linear arrangement of boulders, 3 to 4 courses high. Boulders averaging 0.4 meters in size are incorporated with an immovable boulder. This creates a potential shelter from the prevailing wind.

**Site [8] 50-50-08-3180**

Site type: single component rock wall  
Environmental setting: Located on a moderate slope with thick buffelgrass cover and sparse *Kiawe*.  
Dimensions: 234 meters long by average width of 0.85 meters, with an average height of 1.2 meters on downslope side and 0.6 meters on upslope side. Maximum height is 1.45 meters.  
Function: probable boundary marker/cattle wall  
Subsurface potential: limited  
Integrity: altered—western end of wall terminates at a cane field, and the east end at the transmission line easement.  
Condition: good  
Estimated age: post-contact—Plantation era.  
Portable remains: barbed wire, a single waterworn cobble observed.

Comments: This well-built wall zig-zags diagonally up the slope in a basically E-W direction paralleling the north project boundary. The wall terminates abruptly at either end. Overall condition of the wall is varied but much of it is in good condition. It is vertically faced with 6 to 10 courses of angular boulders and cobbles with core-filled sections occurring along its length. The eastern (*mauka*) portion of the wall is in generally better condition.

**Site [9] 50-50-08-4704**

**Features A through G**

Site type: complex of 7 features of petroglyph panels and rock terraces  
Environmental setting: Located inside the mouth of the Olowalu stream valley on the west side. The principle features are along the vertical basalt escarpment at the base of the steep valley walls. Primary flora consists of mature *Kiawe* trees and thick buffelgrass.  
Dimensions: 61 meters NE-SW by 23 meters NW-SE  
Function: ceremonial, habitation  
Subsurface potential: good  
Integrity: unaltered  
Condition: good  
Tested: yes—Test Unit 1, 0.5 by 0.5 meters  
Estimated age: precontact  
Portable remains: sparse marine shell, *kukui* nut fragments basalt abraders, hammerstone, utilized basalt flake, volcanic glass debitage, battered cobble. Historic ceramic shard, cut nail.

Comments: The principle features of this site, a large petroglyph panel and 2 large terraces are located at the base of the steep valley wall. A vertical basalt face has over 27 petroglyph images upon it (Feature A). Two terraces about this basalt face (Features B and C). Four smaller terraces are downslope to the south and southwest.

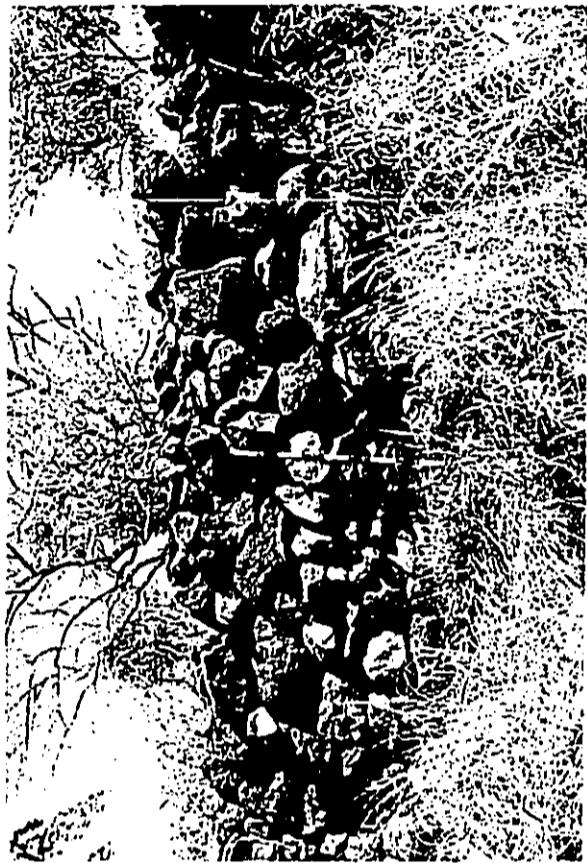


Photo 23 - South face of boundary wall—Site 3180.



Photo 24 - Looking westward along Site 3180—MECO power pole in upper right.

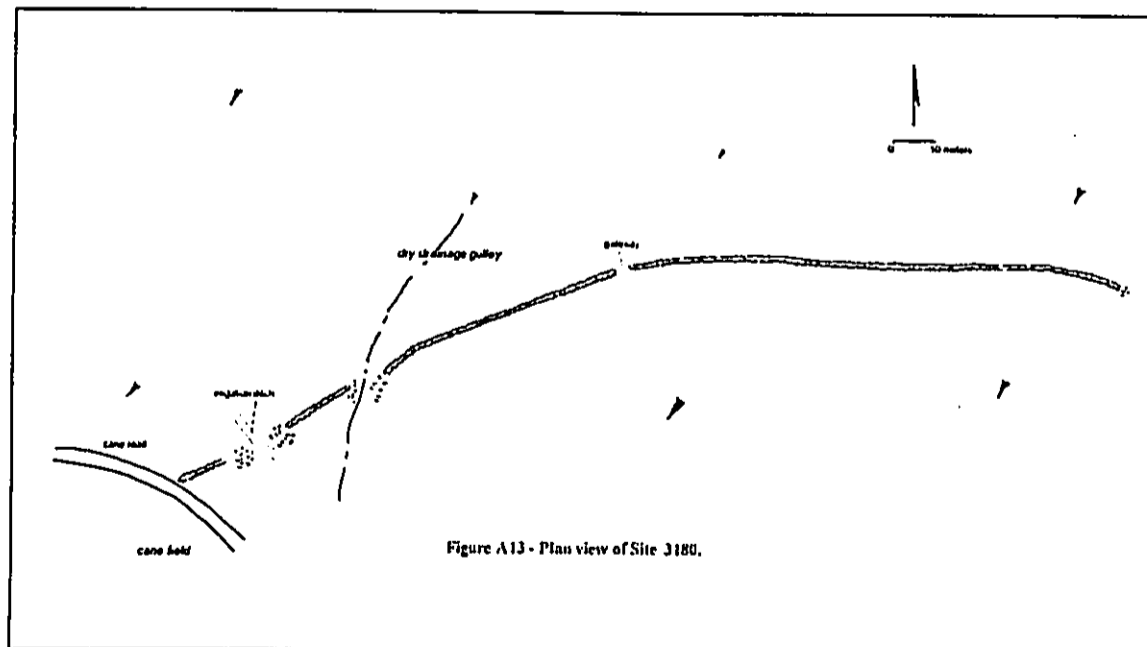


Figure A13 - Plan view of Site 3180.

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100



Photo 25 - Looking westward along north side of Site 3180.



Photo 26 - Break in wall—Site 3180.

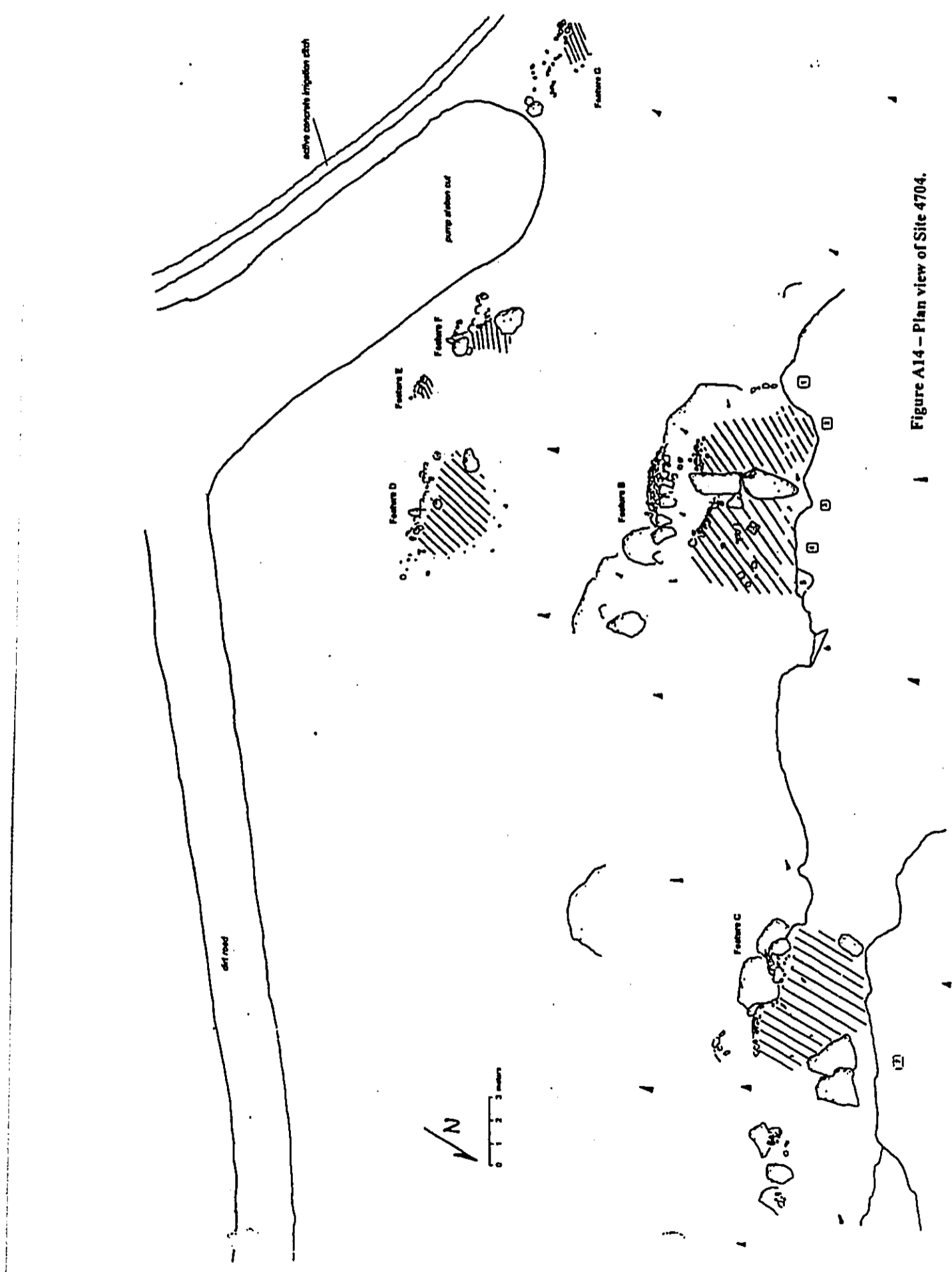


Figure A14 - Plan view of Site 4704.





Photo 27 - Site 4704—Feature B—portion of petroglyph panel in rear (Feature A).



Photo 28 - Site 4704—Feature D in foreground—Feature B in rear.

**Feature A**

Type: petroglyph panel  
 Dimensions: 14 meters NE-SW by 3.6 meters maximum height of highest image  
 Function: ceremonial  
 Subsurface potential: good at base of panel  
 Integrity: unaltered  
 Condition: good

Comments: At least 27 separate images occur on this panel.

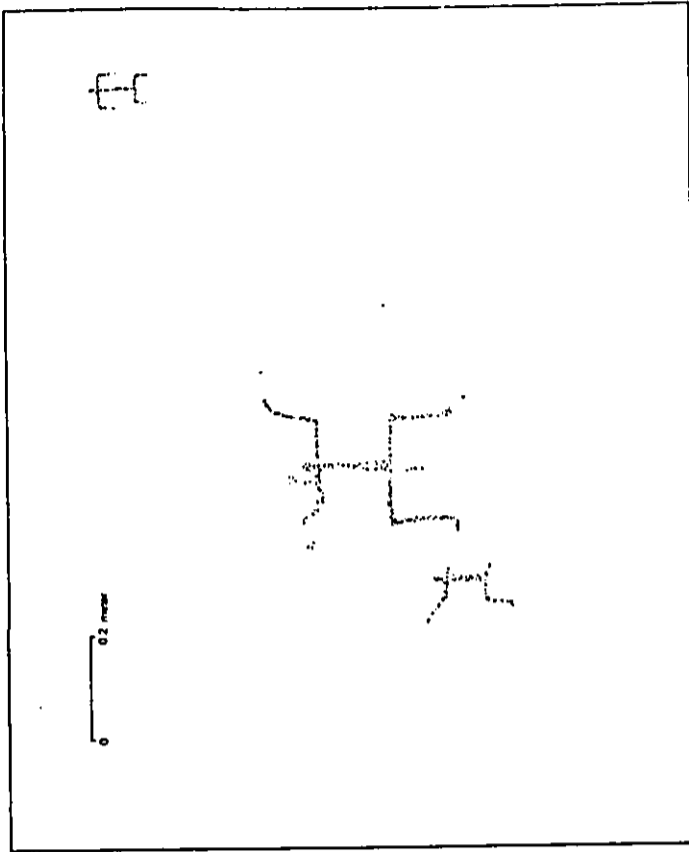


Figure A15 - Feature A—petroglyph panel number 2—Site 4704.



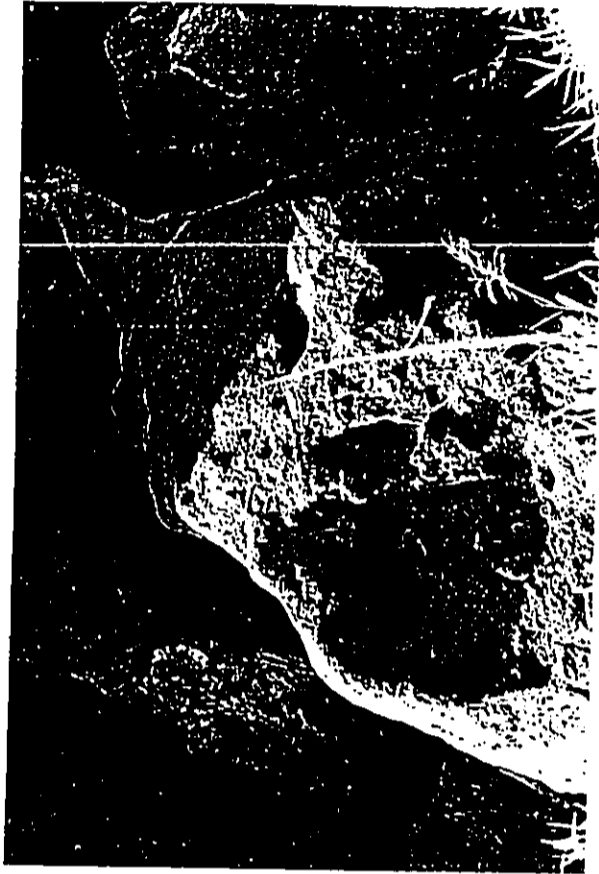


Photo 29 - Site 4704 - Feature A - pictographs in area 2.

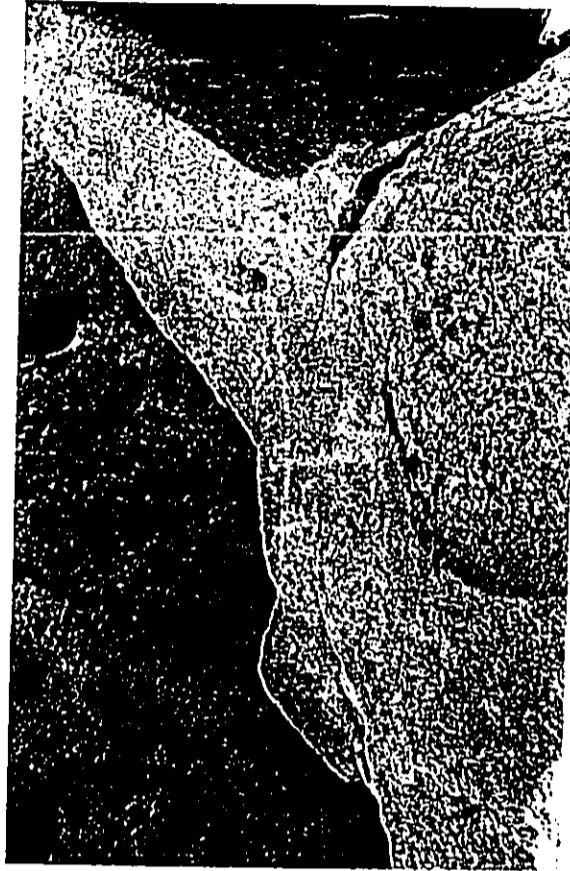


Photo 30 - Site 4704 - Feature A - pictograph - closer view.

40

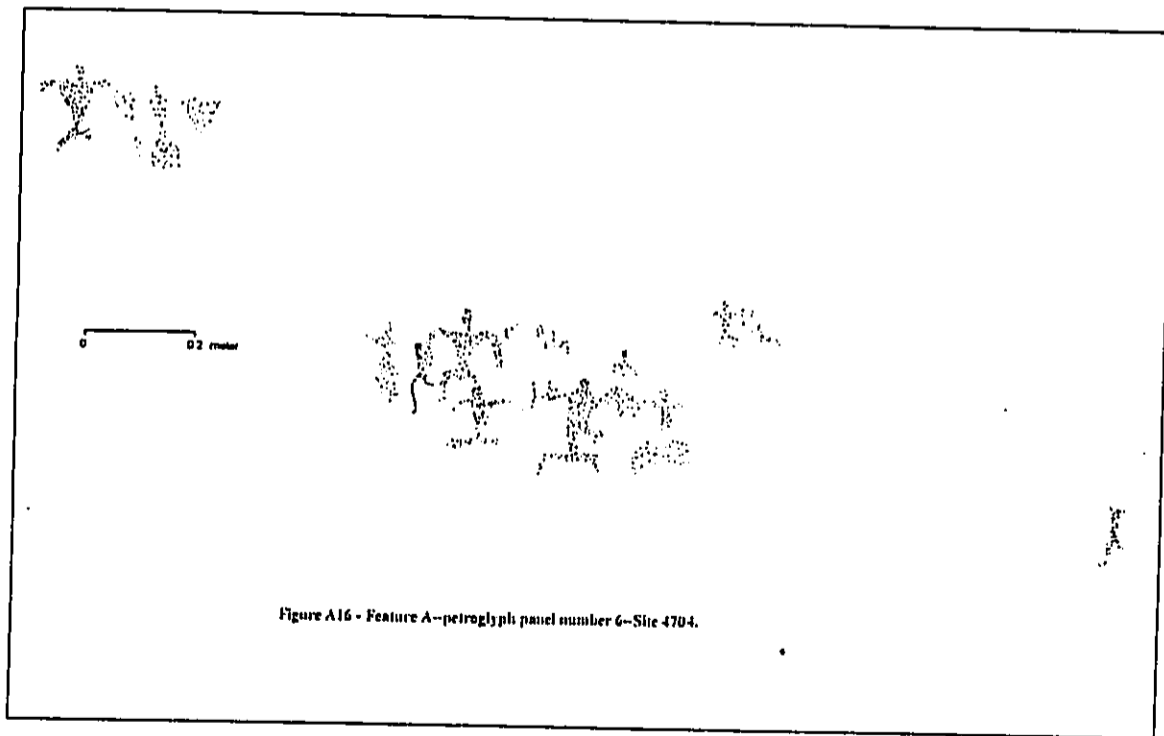


Figure A16 - Feature A - petroglyph panel number 6 - Site 4704.

65

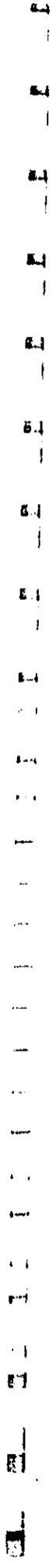




Photo 31 - Site 4702—Petroglyph images.



Photo 32 - Site 4704—Petroglyph image.

**Feature B**  
**Type:** terrace  
**Dimensions:** 8.0 meters NE-SW by 8.0 meters NW-SE by 2.7 meters maximum wall height

**Function:** ceremonial/habitation  
**Subsurface potential:** good  
**Integrity:** unaltered  
**Condition:** good  
**Tested:** yes—Test Unit 1  
**Estimated age:** precontact  
**Portable remains:** sparse marine shell, *kakari* nut fragments, basalt abrader

**Comments:** This terrace consists of a stacked, faced retaining wall of angular basalt boulders 5 to 13 courses high that is constructed parallel to the vertical basalt face with petrophylphs on it. Two small retaining walls of 1 to 3 courses create 2 level areas of 9 square meters and 25 square meters on top of the terrace. These level areas are separated by large boulders that have fallen from the basalt face.

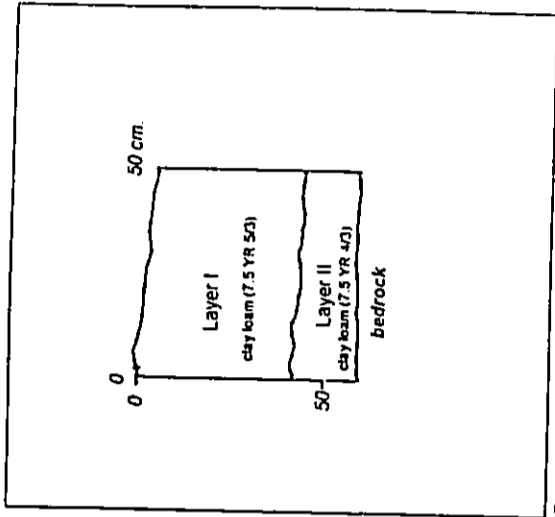


Figure A 17 - East wall profile of Test Unit 1—Feature B.

**Feature C**  
**Type:** terrace  
**Dimensions:** 6.0 meters NE-SW by 5.5 meters NW-SE by 0.9 meters maximum wall height

**Function:** ceremonial/habitation  
**Subsurface potential:** good  
**Integrity:** unaltered  
**Condition:** good  
**Tested:** no  
**Estimated age:** precontact  
**Portable remains:** hammerstone

**Comments:** A natural terrace created by a basalt outcrop has been broadened by extending a stacked rock retaining wall off to one side and by filling a cleft in the existing bedrock. This retaining wall is 5.0 meters SW of a vertical basalt face c. 6.0 meters high

on which at least 2 petroglyph images exist. The level area at the terrace is c. 30 square meters, extending back to the base of the basalt face. Two small modified outcrops are within 8.0 meters to the NE. A third is directly below the retaining wall. A hammerstone is directly below the petroglyph image at the base of the basalt face. This feature is located 12 meters NE of the NE edge of the Feature A petroglyph panel.

#### Feature D

Type: terrace  
Dimensions: 4.5 meters NE-SW by 4.5 meters NW-SE  
Function: habitation/agriculture  
Subsurface potential: good  
Integrity: unaltered  
Condition: fair  
Tested: no  
Estimated age: precontact  
Portable remains: 1 utilized basalt flake, 1 battered cobble

Comments: This feature consists of a crude retaining wall of angular basalt boulders and cobbles 2 to 3 courses high. The wall is collapsed along most of its length. A few water-worn cobbles and pebbles are included in the wall. The terraced, relatively level area is c. 18 square meters. This feature is located 8.0 meters SE of the larger retaining wall of Feature B.

#### Feature E

Type: terrace  
Dimensions: 2.3 meters E-W by 2.4 meters wide by 0.8 meters maximum wall height  
Function: agricultural/habitation  
Subsurface potential: moderate  
Integrity: unaltered  
Condition: good  
Tested: no  
Estimated age: precontact  
Portable remains: none observed

Comments: This feature consists of a retaining wall constructed of stacked cobbles and boulders of 5 courses, with 2 larger boulders (80 to 90 cm. in diameter) set on top. A small level section, c. 4 square meters in area, is created by the wall. The boulders rise up 0.4 meters on the inside of the wall at the leading edge of the terraced area.

#### Feature F

Type: terrace  
Dimensions: 5 meters E-W by 3.5 meters wide by 0.55 meters maximum wall height  
Function: agricultural  
Subsurface potential: moderate  
Integrity: unaltered  
Condition: good

Tested: no

Estimated age: precontact

Portable remains: none

Comments: This feature consists of 5 to 7 courses of boulders, averaging 40 cm. across, placed in an alignment so as to create a retaining wall. Crudely stacked or collapsed cobbles are at the west end of the terrace area. The terrace area is approximately 6.5 square meters in area. A large boulder c. 2.0 meters across sits at the NW corner of the terrace. Another boulder is at the east end of the alignment.

#### Feature G

Type: terrace  
Dimensions: 8.5 meters E-W by 4.0 meters wide by 0.75 meters maximum wall height  
Function: agriculture  
Subsurface potential: moderate  
Integrity: unaltered  
Condition: good  
Tested: no  
Estimated age: precontact  
Portable remains: 1 water-worn pebble

Comments: This feature consists of a short section of retaining wall of stacked, faced cobbles with an additional boulder alignment forming the leading edge along the length of the terrace. The level area created is c. 4 square meters.

#### Site 10<sup>1</sup>

Site type: single component—lumber scatter

Environmental setting: Located on the steep slope on the west side of the Olowalu Valley mouth, directly adjacent to the northern-most property corner.

Dimensions: 5 meters N-S by 3.0 meters E-W

Function: possible historic property corner marker

Subsurface potential: limited

Condition: poor

Tested: no

Estimated age: post-contact—late 19<sup>th</sup>/early 20<sup>th</sup> century

Portable remains: milled lumber, five 2x4 lengths, several cut nails, 1 broken bottle.

Comments: Due to the proximity of the current project corner boundary, the lumber concentration is likely associated with an earlier marker.

<sup>1</sup> This site was only given a field number, and is not considered significant enough to be assigned a SIFIP number.

Site [11] 50-50-08-4705

Features A and B

Site type: complex of 2 rock shelters  
Environmental setting: Located on the steep slope on the west side of the Olowalu Valley mouth. Primary flora is buffelgrass.

Dimensions: c. 45 meters NE-SW

Function: temporary habitation

Subsurface potential: good

Tested: no

Integrity: unaltered

Condition: good

Estimated age: precontact

Portable remains: 2 waterworn cobbles, 2 waterworn pebbles, 1 basalt flake

Comments: This site consists of two small rock shelters on the SE facing slope at the mouth of the Olowalu Stream valley, above Site 9. Numerous basalt outcrops occur along the slope. These 2 rock shelters are c. 1/3 of the way up from the base of the slope. A series of RR rail posts run up the slope in an alignment approximately 30 meters apart. These have been driven into the ground and extend 50 to 60 meters with steel cable attached to some. This post alignment runs upslope to the NE of Feature B.

Feature A

Type: rock shelter

Dimensions: 4.5 meters NNE-SSW wide by 1.75 meters deep by 2.0 meters maximum ceiling height

Function: temporary habitation

Subsurface potential: good soil deposit present

Integrity: unaltered

Condition: good

Tested: no

Estimated age: probable precontact

Portable remains: waterworn cobble, 1 waterworn pebble, 1 basalt flake

Comments: Average height of ceiling is 0.55 meters. There is narrow deep niche in the back of the shelter where a waterworn cobble has been placed on top of some partially burned stalk-like plant material. The south half of this shelter has a level soil deposit, while the north half is uneven bare rock. Feature B is 43 meters to the northeast.

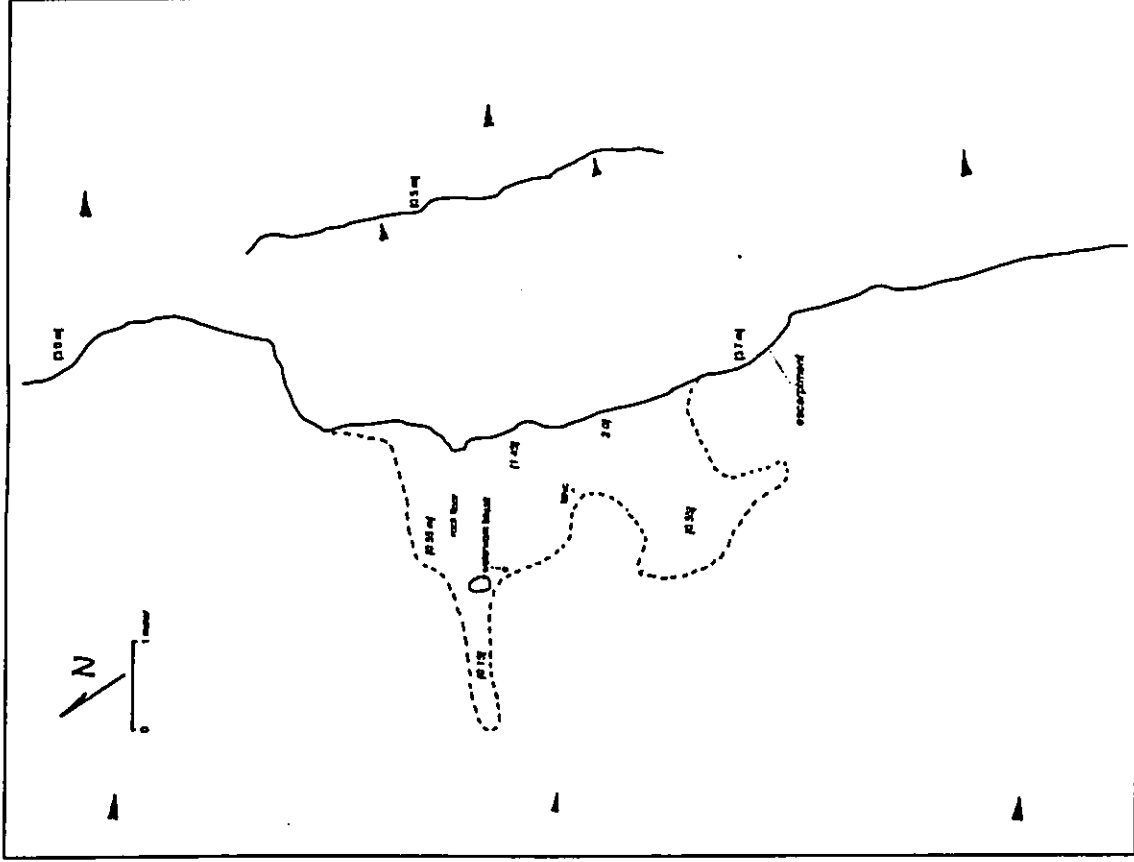


Figure A18 - Plan view of Feature A—Site 4705.

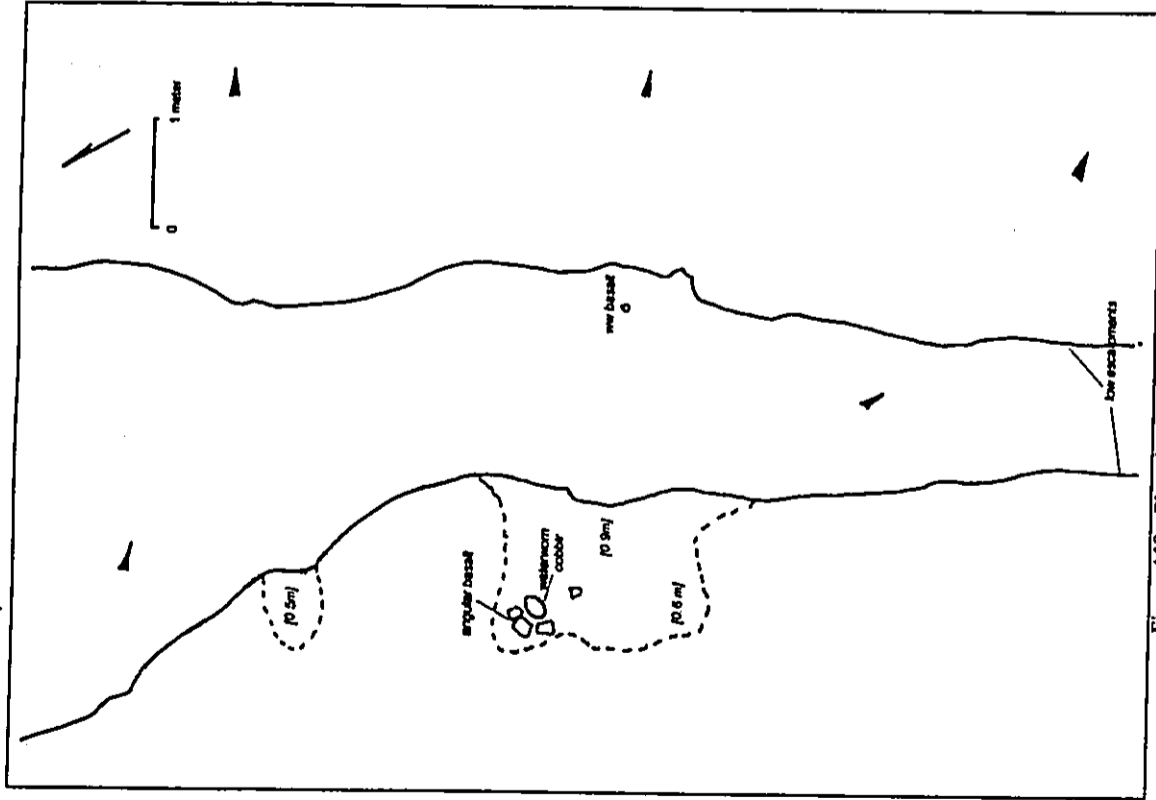


Figure A19 - Plan view of Feature B—Site 4705.

**Feature B**  
**Type:** rock shelter  
**Dimensions:** 2.5 meters NNE length by 1.35 meters deep by 0.9 meters maximum ceiling height  
**Function:** rock shelter  
**Subsurface potential:** good soil deposit present  
**Integrity:** unaltered  
**Condition:** good  
**Tested:** no  
**Estimated age:** precontact  
**Portable remains:** 1 water-worn cobble, 1 water-worn pebble

**Comments:** average ceiling height is 0.6 meters. A single water-worn cobble was noted near the back of the small shelter in a cluster of angular cobbles. One water-worn pebble is located directly outside the shelter.

**Site [12] 50-50-08-4706**

**Site type:** single component—rock shelter  
**Environmental setting:** Located on the west side of the mouth of the Olowalu Stream valley in a crumbling basalt cliff face. Primary vegetation is mature and scrub *Kiawe*, with some buffelgrass.  
**Dimensions:** 4.25 meters NE-SW by 2.25 meters deep by 1.25 maximum ceiling height  
**Function:** temporary habitation  
**Subsurface potential:** good  
**Tested:** yes—Test Unit 1, 0.5 by 0.5 meters. Radio-carbon date—270±50 BP.  
**Integrity:** unaltered  
**Condition:** good  
**Estimated age:** precontact  
**Portable remains:** 1 parrotfish jaw, 4 basalt flakes, 1 water-worn pebble, 3 *kukui* nut fragments

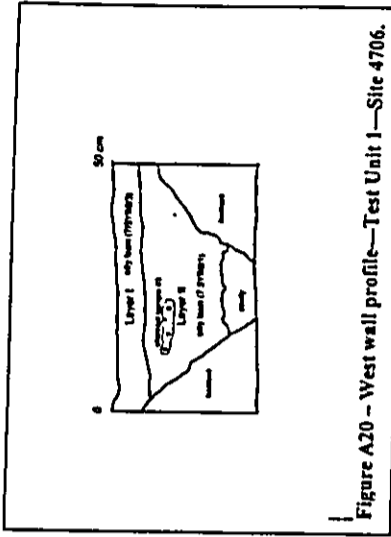


Figure A20 - West wall profile—Test Unit 1—Site 4706.

**Comments:** This shelter floor is c. 6.5 meters above the base of the escarpment and a near vertical ascent is required. There is c. 4 square meters of area within the shelter.

Site [13] 50-50-08-4707

Features A and B

Site type: complex with rock wall and rock mound  
 Environmental setting: Located on the floor of the Olowalu Stream valley, 17 meters east of the stream. Primary flora is *klawe* and *klia* trees, with buffelgrass ground cover.  
 Dimensions: 77 meters NE-SW by 5.5 meters E-W (includes portion outside project area). 26 meters NE-SW by 5.5 meters E-W (portion within project area)  
 Function: boundary marker; possible burial  
 Subsurface potential: moderate  
 Tested: no  
 Estimated age: possible precontact

Comments: This site consists of a stacked rock wall remnant and an oval-shaped rock mound. These are located at the northern project boundary on the floor of the stream valley. The wall, Feature A, appears as a linear berm of rubble within the project area and extends 51 meters beyond the property boundary. The rock mound, Feature B, is just inside the property boundary and abuts the rubble berm, which appears to curve around the west edge of the feature.

Feature A

Type: wall alignment  
 Dimensions: 77 meters in length by a maximum width of 3.5 meters by 0.8 meters high  
 Function: possible boundary wall  
 Subsurface potential: limited  
 Integrity: altered—impacted by bulldozer activity  
 Condition: poor  
 Estimated age: indeterminate—possibly precontact  
 Portable remains: none observed

Comments: Wall remnant extends outside project area where it is faced and fairly intact. The intact, faced section is 5 courses high. Within the project area it has collapsed and appears to be a line of rubble. Bulldozer action has further altered the feature.

Feature B

Type: rock mound  
 Dimensions: 5.0 meters N-S by 2.7 meters E-W by 0.85 meters maximum height  
 Function: possible burial mound  
 Subsurface potential: moderate to high  
 Integrity: altered (fence-line passes over western edge)  
 Condition: fair  
 Tested: no  
 Estimated age: possible precontact  
 Portable remains: 1 basalt core, 14 cm. in diameter; barbed wire lying across the surface

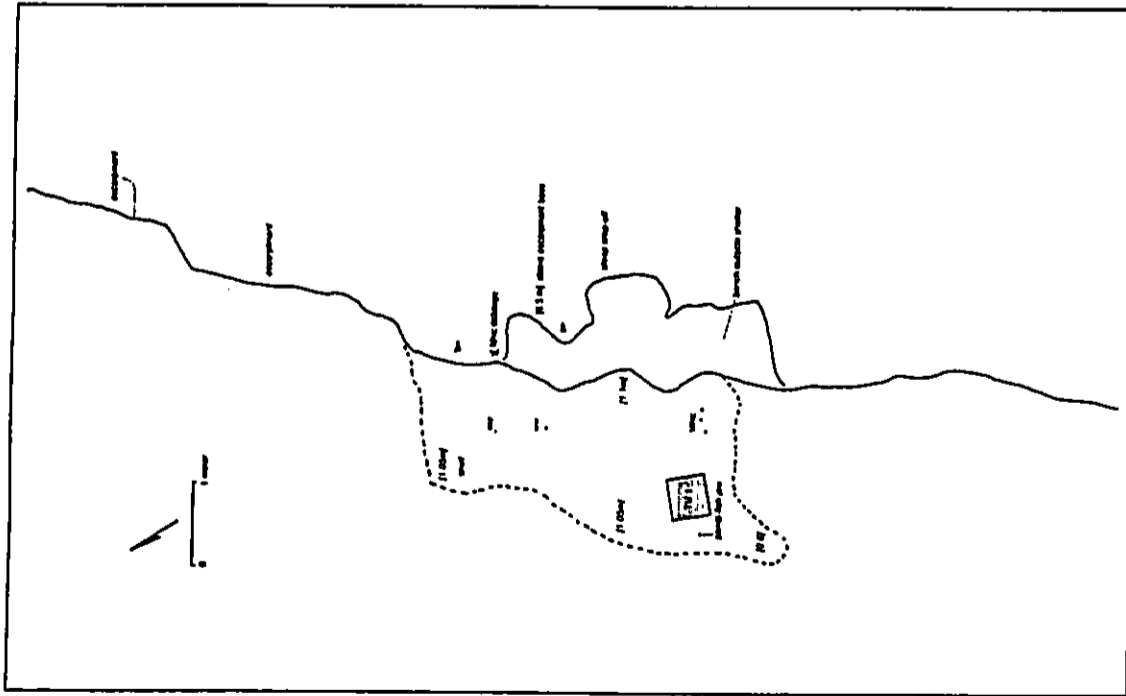


Figure A21 - Plan view of Site 4706.

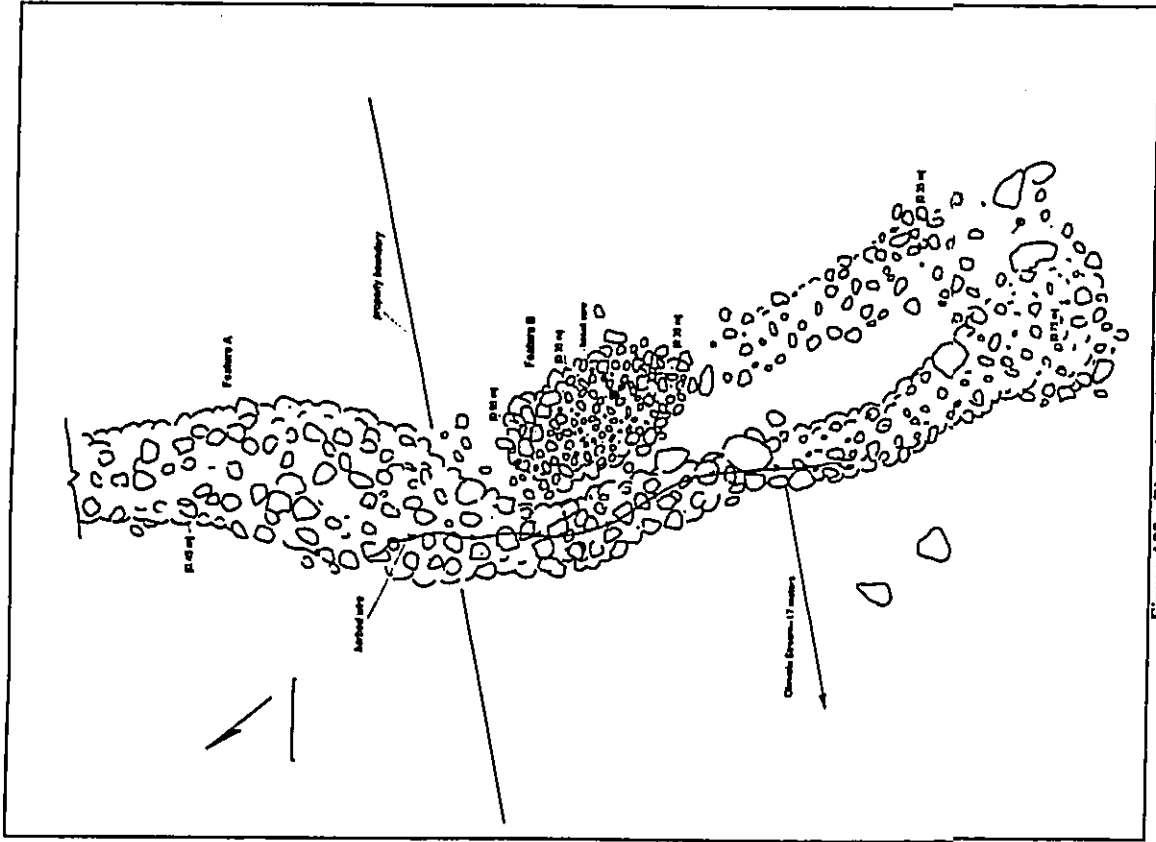


Figure A22 - Plan view of Site 4707.

**Comments:** This mound has a distinct oval shape with a somewhat flattened mound appearance. The wall remnant (Feature A) appears to wrap around the mound along its west side. This feature might also be an historic agricultural clear pile—only subsurface testing would resolve the question as to its function.

**Site [14] 50-50-08-4708**

**Features A and B**

**Site type:** complex—platform and terrace complex

**Environmental setting:** Located within the mouth of the Olowalu Stream valley c. 25 meters east of the stream. Flora consists of thick buffelgrass, *koa haole* and *kiu trees* and mature monkeypod trees.

**Dimensions:** 62 meters NE-SW by 23 meters NW-SE

**Function:** ceremonial, agricultural

**Subsurface potential:** poor to good

**Tested:** yes—Test Units 1 and 2

**Integrity:** altered during installation of water tanks

**Condition:** good

**Estimated age:** precontact - post-contact

**Portable remains:** Early 20<sup>th</sup> century metal hardware, milled lumber, cut nail, boulder with petroglyphs.

**Comments:** The dominant feature at this site is a large terrace platform (Feature A). The installation of two steel water tanks at the SW end of the feature have altered its integrity. Older metal bars with buckles are evidence that an older wood tank may have been installed here in the past. A complex of low, level terraces (Feature B) extends to the NW from Feature A.

**Feature A**

**Type:** terrace/platform

**Dimensions:** 19 meters NE-SW by 8 meters NW-SE by 2.6 meters high.

**Function:** ceremonial—probably *heiau*

**Subsurface potential:** poor to good

**Integrity:** altered

**Condition:** good to varied

**Tested:** no.

**Estimated age:** precontact

**Portable remains:** 7 steel straps with buckles (used to hold wooden stave tanks together), recent milled lumber, steel cable, 1 large boulder with petroglyphs on it.

**Comments:** This large terrace/platform is created by a near vertical faced retaining wall 8 to 12 courses high on the NW or stream side of the feature. Rubble slopes down to the original grade at the NW and SW ends. The back, SE side, appears to meet natural grade. The top of the feature has limited level areas and is largely strewn with boulders. There is one potential sub-feature in the form of a short rock alignment in the center of the top of the feature.

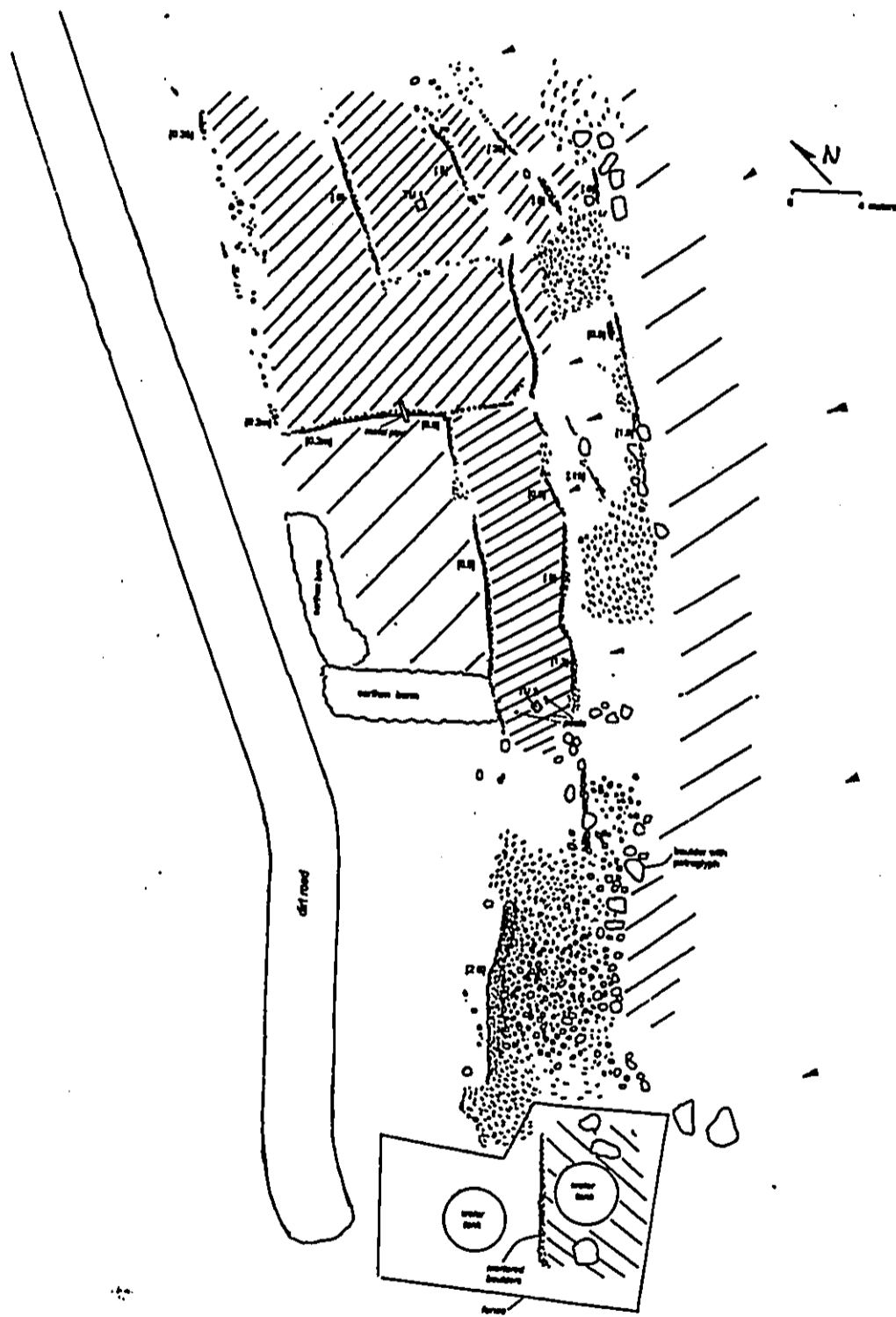


Figure A23 - Plan view of Site 4708.





Photo 33 - Site 4708 - Feature A - west face.



Photo 34 - Site 4708 - Feature B - looking east.

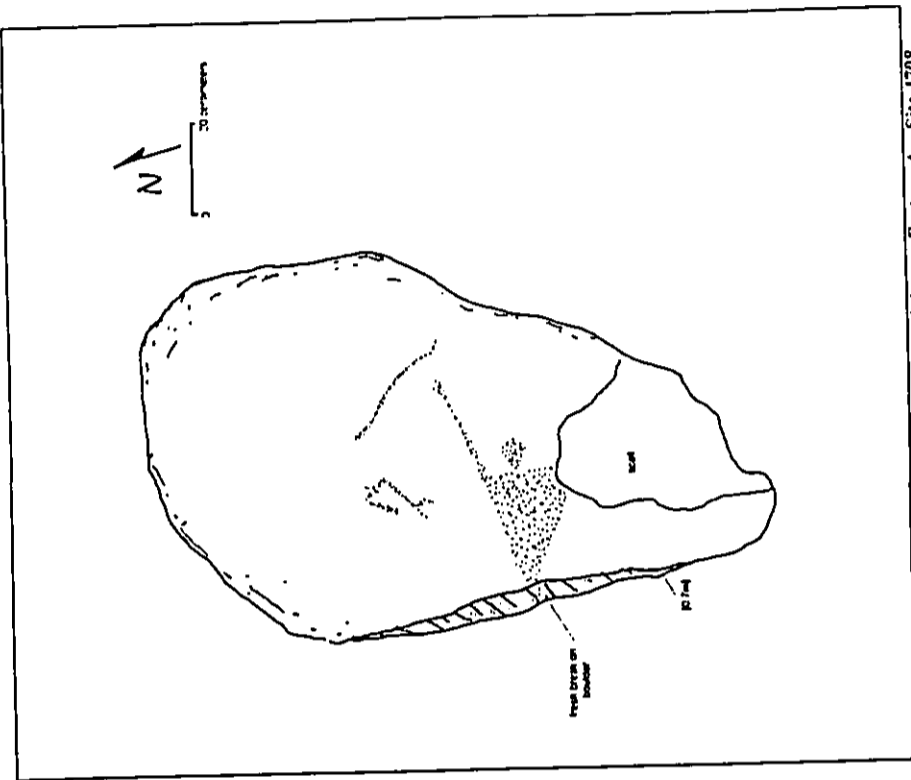


Figure A24 - Petroglyph images on boulder lying on Feature A - Site 4708.

Two large water tanks sit 2 to 3 meters off the SW end. A platform of rock supports one of the tanks. Some of this rock was likely taken from Feature A. A large boulder, 0.8 by 1.3 meters sits at the east corner of the platform. An apparent fresh break is on one edge, which appears to pass through the image. The boulder may have been pushed to its present location by a bulldozer.

**Feature B**

Type: terrace complex  
Dimensions: 40 meters NE-SE by 22 meters NE-SE  
Function: agricultural  
Subsurface potential: good  
Integrity: possibly unaltered  
Condition: good  
Tested: yes—Test Unit 1 (0.5 by 0.5 meter) near north end; Test Unit 2 (0.5 by 0.5 meter) near south end  
Estimated age: precontact - post contact  
Portable remains: 8" pipe section, 3 milled lumber posts with 1 cut nail, large metal angle iron

Comments: This is a complex of level terraces with stacked, faced rock retaining walls, most likely associated with Feature A, 5 meters to the south. The largest terraced area (c. 225 square meters) stretches the length of the feature in a zig-zag form and has a maximum width of 7.0 meters and is the lowest terrace of the complex. The associated retaining wall is varied in condition, but is stacked and faced 3 to 5 courses with basalt cobbles and boulders (0.4 to 0.7 meter in diameter) along most of its length. A second retaining wall runs along the back of this terraced area; stacked and faced and up to 1.3 meters high. Three smaller terraces occur at the northern end of the complex. These become smaller toward the top. The area of these ranges from c. 12 to 66 square meters.

Another intermittent retaining wall runs along the eastern upslope edge of the complex. It has an average height of 0.6 meters, and is 3 to 5 courses high. Two large rubble piles occur along its length. Three milled lumber posts protrude from the lowest terrace near the south end. A single cut nail is driven into one of the posts. These 4x4 posts have been cut off, and project and average of 15 cm. above the surface. They are set to create a rectangular arrangement that measures 1.8 meters by 1.2 meters. Test Unit 2 was placed between 2 of these posts.

The pipe section sits in the lowest terrace wall and likely aided irrigation of more recent agricultural activity.

**Site [15] 50-50-08-4709**

**Features A through D**

Site type: complex—concrete foundations, stacked rock wall, irrigation ditches  
Environmental setting: Located within the mouth of the Olowalu Stream valley, c. 30 meters east of the stream. Flora is buffelgrass with *Kiawe* and *Klu* trees interspersed  
Dimensions: 29 meters N-S by 23 meters E-W  
Function: historic hydro-electric plant  
Subsurface potential: good  
Tested: no  
Integrity: altered by salvage of equipment

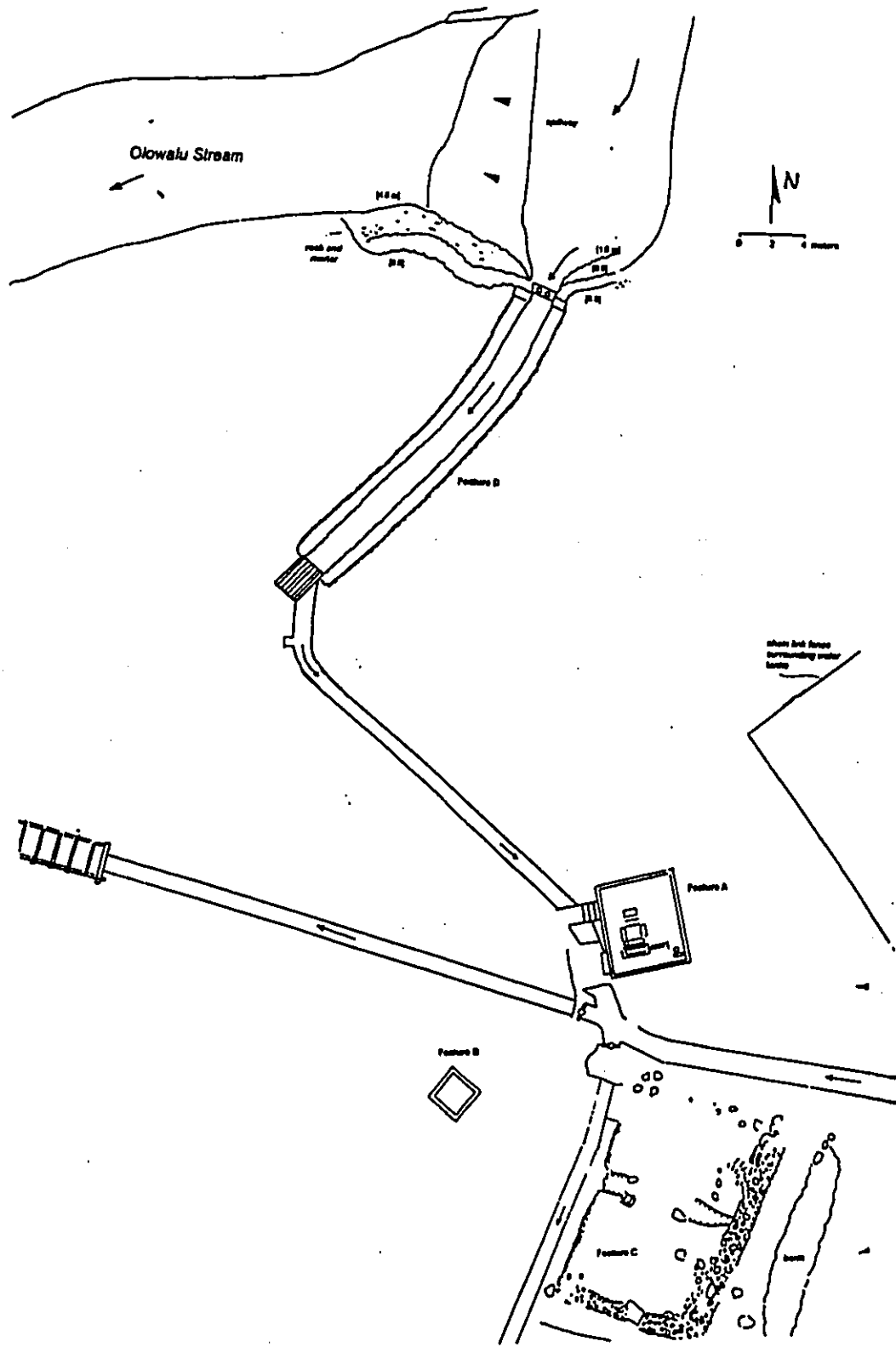


Figure A25 - Plan view of Site 4709.



Photo 35 - Site 4709—Feature C—view to west.



Photo 36 - Site 4709—Feature B.

Condition: good  
 Estimated age: probable 1930s  
 Portable remains: iron, steel hardware, kerosene stove, ceramic sherds, pane glass window pieces

Comments: This site consists of a concrete foundation that formerly supported a hydroelectric power plant, semi-subterranean concrete vault or cistern (Feature B), a stacked rock wall partial enclosure (Feature C), and a system of concrete water ditches (Feature D). A small dam on Olowalu Stream, c. 38 meters north of Feature A, diverts water toward the site complex.

**Feature A**

Type: concrete foundation  
 Dimensions: 5.5 meters SSE-NNW by 4.9 meters ENE-WSW  
 Function: foundation for hydro-electric plant  
 Integrity: altered  
 Estimated age: probably 1930s  
 Portable remains: electric plant hardware

Comments: The raised platform foundation is trapezoidal, sloping inward from the base. The lip at the topo edge of the foundation is 15 cm. wide and has 1/2" plate bolts protruding every 5" along its length. The power plant's cast iron turbine housing and water nozzle valve are on the SSE side of the foundation. The base or mount for the generator is directly adjacent.

Four concrete-lined water ducts converge at the foundation. One flows down slope from the east; one brings water from the stream to the NW. Another carries water to the south while the last carries water back over the stream via a large pipe. A semi-subterranean concrete vault or cistern is c. 10 meters to the SSW (Feature B).

**Feature B**

Type: semi-subterranean poured concrete vault or cistern  
 Dimensions: 2.26 by 2.26 meters outside diameter—1.83 by 1.83 meters inside diameter  
 Function: water retention  
 Integrity: unaltered  
 Condition: good  
 Estimated age: early 20<sup>th</sup> century

Comments: Poured concrete walls are 8" thick and rise 40 cm. above ground surface. A 6" entrance pipe is 1 meter below the NE inside wall. A 4" exit pipe is 1.7 meters below the SE wall.

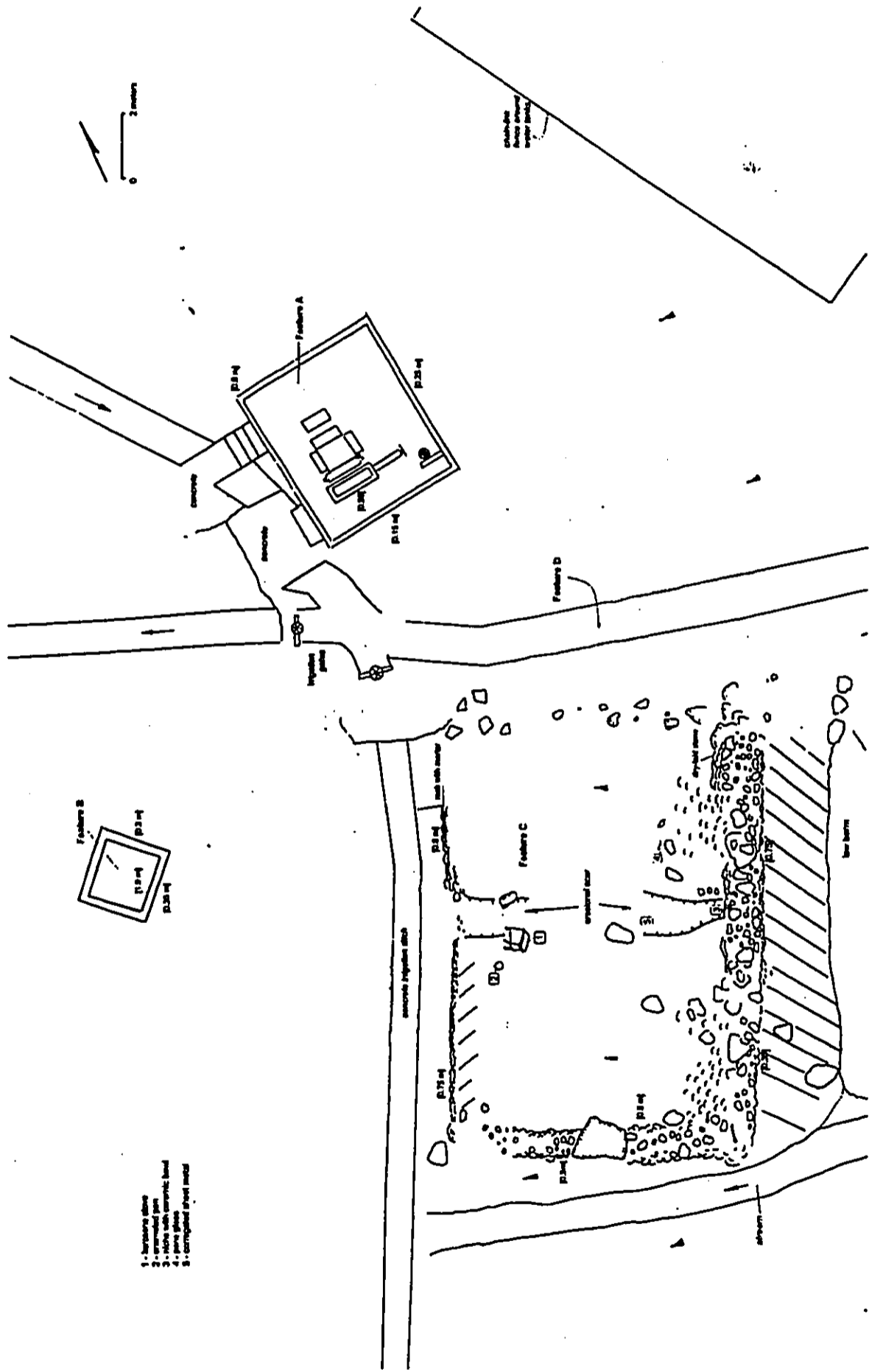


Figure A26 - Plan view of Features A, B, and C—Site 4709.

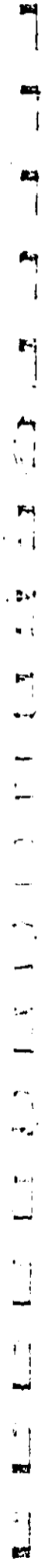




Photo 37 - Site 4709 - Feature A with water tank enclosure in background.



Photo 38 - Site 4710 - Feature C - looking northwest.

**Feature C**

Type: terrace with partial enclosure  
 Dimensions: 15 meters NNE-SSW by 10 meters ESE-WNW by 1.4 meters maximum wall height  
 Function: agricultural/habitation  
 Subsurface potential: good  
 Integrity: altered  
 Condition: fair  
 Tested: no  
 Estimated age: post-contact  
 Portable remains: kerosene stove, window pane glass, ceramic bowl sherds, corrugated metal

Comments: This feature consists of c. 60 square meter terrace created by a stacked, faced retaining wall, 0.6 meters thick, and 3 to 4 courses high. A stacked, free-standing wall encloses the terrace on the up ESE and SSW sides. The upslope section of wall is stacked and faced, utilizing some very large boulders, 1.0 to 1.5 meters in diameter. This wall is collapsing in places. At the center of this wall, at its base, is a large curved angular boulder with a niche beneath it, measuring 0.4 meters high by 1.0 meter deep. A broken ceramic bowl sits in the back of the niche, nearly covered with rubble from above. The wall on the SSW side is low and crude. The kerosene stove sits near the center of the terraced area. A concrete ditch runs parallel to the retaining wall along its base.

**Feature D**

Type: irrigation ditches  
 Dimensions: extensive  
 Function: agricultural irrigation  
 Integrity: unaltered  
 Condition: good  
 Estimated age: early 20<sup>th</sup> century  
 Portable remains: none observed

Comments: The irrigation ditches leave the intersection at the hydro-plant foundation and direct water to the south and west and are apparently an active part of the current sugarcane irrigation system.

Site [16] 50-50-08-4710

**Features A through G**

Site type: complex—terraces, enclosures, possible burial  
 Environmental setting: Located overlooking the mouth of Olowalu Stream valley on the eastern side at c. 230 feet elevation AMSL. Primary flora are mature *kurve* trees with buffalgrass ground cover. The site gradually slopes toward the west.  
 Dimensions: 27 meters WSW-ENE by 21 meters NNW-SSE  
 Function: habitation, possible ceremonial, possible burial  
 Subsurface potential: good

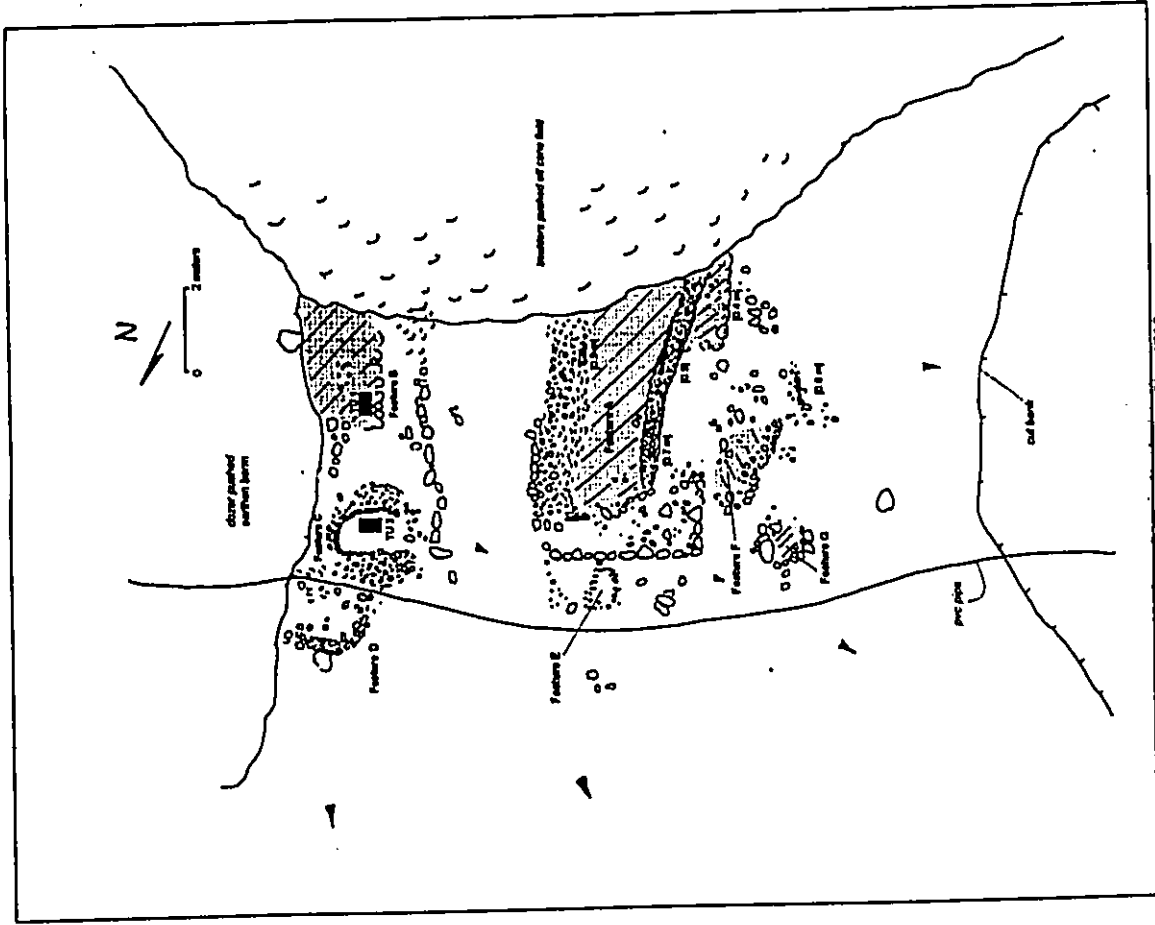


Figure A27 - Plan view of Site 4710.

Tested: yes—Test Unit 1 (Feature B); Test Unit 2 (Feature C)

Integrity: altered by bulldozer activity

Condition: fair to good

Estimated age: precontact

Portable remains: 1 battered cobble, coral chunk, waterworn pebbles

Comments: This site is on the eastern edge of the Olowalu Stream valley mouth at the top of a steep slope. Bulldozer push from adjacent cane field has covered an unknown percentage of the site.

The central element at this site is a rectangular rock wall enclosure which has been built on a terrace created by a boulder alignment (Feature A). Two other boulder alignments create a pair of terraces 3 meters to the east (Feature B). A pair of small oval shaped enclosures (Features C and D) are adjacent at the north corner of the site. Two other small terraces are west of Feature A. Feature E is a potential burial marker.

**Feature A**

Type: terrace with enclosure

Dimensions: 14.5 meter NNW by 9.0 meters ENE-WSW by 0.9 maximum wall height

Function: ceremonial

Subsurface potential: good

Integrity: altered and covered by cane field operations

Condition: varied

Estimated age: precontact

Portable remains: 1 battered cobble

Comments: This feature consists of a rectangular terrace created by an alignment of large boulders ranging from 0.6 to 0.8 meters in size. The alignment is L-shaped occurring on the NNW and WSW downslope sides, and forms a 90 degree corner. The terrace alignment wall averages 0.5 meters high on the outside. The alignment is broken or collapsed on the WSW sides and disappears under the dozer push at the SSE end.

A partial enclosure sits on the terrace, 11.5 meters in length NNW-SSE by 6.5 meters ENE-WSW by 0.9 meters wall height. The two parallel walls run the long axis and average 0.7 meters in height. The wall section along the WSW side is stacked and faced up to 3 to 5 courses. The other section is primarily collapsed rubble. The wall sections also disappear under dozer push at the SSE end.

**Feature B**

Type: terraces

Dimensions: 10.0 meters NNW by 7.0 meter ENE by 0.5 meter maximum height

Function: habitation, possible ceremonial

Subsurface potential: good

Integrity: altered

Condition: fair

Tested: yes—Test Unit 1

CI4 date—200 +/- 50 BP.

Estimated age: precontact

Portable remains: 1 coral chunk, 1 waterworm pebble

Comments: The upper

terraced area is created by a

straight alignment of large

boulders averaging 0.55

meters in size, forming a

retaining wall. The terrace

area is c. 24 square meters.

A crude arrangement of

boulders and cobbles,

roughly oval in shape,

occurs centrally in the

terrace where a single piece

of eroded coral sits, along

with a single waterworm pebble.

A bulldozer berm encroaches on the east side, and buries an unknown portion of the feature on the SSE side.

A second terrace (Feature C) is adjacent downslope. A less organized alignment of boulders 10 meters in length creates the retaining wall for a narrow 2.0 meter wide terrace. The alignment passes directly in front of the opening to the Feature C enclosure.

#### Feature C

Type: enclosure

Dimensions: 5.0 meters ENE by 4.0 meters NNW by 0.95 meters maximum wall height

Function: part of possible ceremonial complex

Subsurface potential: good

Integrity: altered during cane

field operations

Condition: fair

Tested: yes—Test Unit 2

CI4 date—60 +/- 50 BP.

Estimated age: precontact

Portable remains: none

observed

Comments: This is a small

roughly rectangular enclosure.

Overall construction is of crudely

stacked rocks, but faced in some

places and collapsed in others.

The opening is at the WSW end.

The wide NNW wall is shared by a

crude, more disturbed enclosure—(Feature D).

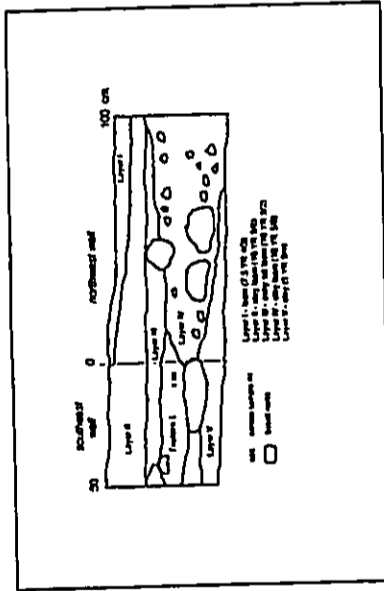


Figure A28 - Southeast/northwest profile of TU 1.

A bulldozer berm encroaches on the east side, and buries an unknown portion of the feature on the SSE side.

A second terrace (Feature C) is adjacent downslope. A less organized alignment

of boulders 10 meters in length creates the retaining wall for a narrow 2.0 meter wide

terrace. The alignment passes directly in front of the opening to the Feature C enclosure.

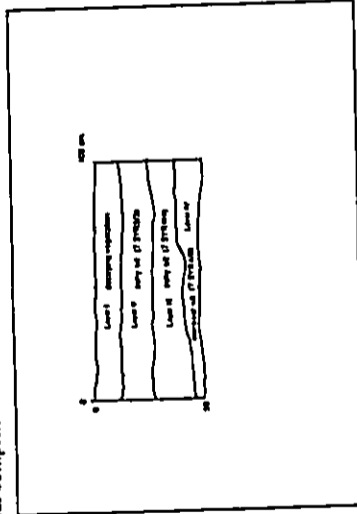


Figure A29 - West wall profile of TU 2.

The wide NNW wall is shared by a

crude, more disturbed enclosure—(Feature D).



Photo 39 - Site 4710 - Feature D to left - Feature C to right of PVC pipe.



Photo 40 - Site 4710 - Feature E - looking south.



**Feature D**

Type: enclosure remnant  
Dimensions: 4.6 meters in length  
Function: part of possible ceremonial complex  
Subsurface potential: moderate  
Integrity: altered by cane field activity  
Condition: fair  
Tested: no  
Estimated age: precontact  
Portable remains: none observed

Comments: This small oval-shaped enclosure has crudely stacked and collapsing walls made up of boulders averaging 0.4 meters in size. The SSE wall is apparently shared with Feature C. A 4" plastic water pipe passes directly over this central wall. The ENE end of the enclosure is filled with dirt from the dozer push.

**Feature E**

Type: rock alignment  
Dimensions: 2.1 meters in length by 1.5 meters wide by 0.3 meters maximum height  
Function: possible burial  
Subsurface potential: good  
Integrity: unaltered  
Condition: good  
Tested: no  
Estimated age: precontact  
Portable remains: none observed

Comments: This is a small, roughly oval-shaped rock ring alignment of cobbles and pebbles. This feature is located directly adjacent to the NNW side of Feature A.

**Feature F**

Type: terrace  
Dimensions: 4.0 meters N-S by 1.7 meters E-W by 0.6 meters maximum wall height  
Function: habitation, agriculture  
Subsurface potential: moderate  
Integrity: unaltered  
Condition: fair  
Tested: no  
Estimated age: precontact  
Portable remains: none observed

Comments: This is a crude terrace created by a stacked retaining wall, 2 to 4 courses high. The terraced level area is strewn with boulders and cobbles. This terrace appears to be connected to the boulder alignment on the WSW side of Feature A. A less defined small rock pile is 2.0 meters off the south end of the retaining wall.

**Feature G**

Type: terrace  
Dimensions: 2.0 meters N-S by 2.4 meters E-W by 0.35 meters maximum height  
Function: possible agriculture  
Subsurface potential: moderate  
Integrity: unaltered  
Condition: good  
Tested: no  
Estimated age: precontact  
Portable remains: none observed

Comments: This is a small, circular terrace created by a boulder alignment which curves round the front (west side) of the feature forming the retaining wall. The terraces are c. 2.5 square meters in area, and level. A crude rock pile and a large boulder form the east or upslope edge of the feature.

**Site [17] 50-50-08-4711**

**Features A and B**

Site type: complex with rock alignment and terrace  
Environmental setting: Located on a gradually sloping rock terrain in the northeastern-most corner of the property. Primary flora is *Kiawe* scrub with patchy buffelgrass.  
Dimensions: 16 meters N-S by 6 meters E-W  
Subsurface potential: good  
Integrity: unaltered  
Condition: good  
Tested: no  
Estimated age: possible precontact  
Portable remains: 1 piece coral, 1 cone shell

Comments: This site is located in the northwestern-most corner of the project area. It consists of a linear rock pile with a piece of coral on Feature A. This feature lies c. 5 meters inside the property boundary. Feature B, a small terrace, is c. 9 meters north of Feature A, just outside the project boundary. A possible section of modified outcrop is located between the features.

**Feature A**

Type: linear rock alignment  
Dimensions: 5.5 meters by 2.0 meters by 0.6 meters maximum height  
Function: undetermined  
Subsurface potential: low  
Integrity: unaltered  
Condition: poor  
Estimated age: probable precontact

Portable remains: 1 conus shell found 18 meters SW of feature; 1 coral chunk on middle of feature.

Comments: This rock alignment is made up of boulders and cobbles, and runs in a NW-SE direction. There are 2 possibly modified outcrops on the mauka side.

**Feature B**

Type: terrace

Dimensions: 3.2 meters by 3.5 meters by 0.5 meters high

Function: possibly agriculture

Subsurface potential: good

Integrity: unaltered

Condition: moderate to good

Estimated age: precontact

Portable remains: none observed

Comments: This is a poorly constructed, boulder faced and cobble filled feature. A flattened level area is about 6 square meters in area. A fair amount of soil is present, suggesting the possibility that this was a dry agriculture feature.

**Site [18] 50-50-08-4712**

Features A and B

Site type: terrace and rock pile

Environmental setting: Located on the SW slope of Pu'u Kilea, 35 meters SW of the summit benchmark. Flora is buffelgrass.

Dimensions: 30 meters NE-SW x 6 meters NW-SE

Function: unknown

Subsurface potential: moderate

Tested: no

Integrity: altered—dozer-cut road leading to summit of Pu'u Kilea may have destroyed related features.

Condition: fair

Estimated age: possible precontact

Portable remains: 2 basalt flakes, a few waterworn pebbles, 1 waterworn boulder and 1 cobble

Comments: The site consists of a terrace-like feature, with a crude retaining wall which runs downslope (Feature A). Feature B is a crude rock pile directly below. Above this site, at the edge of the dozer cut road that ascends Pu'u Kilea, is a concentration of cinder rubble with numerous waterworn pebbles, cobbles and coral pieces. It appears that another feature was extensively disturbed during road construction.

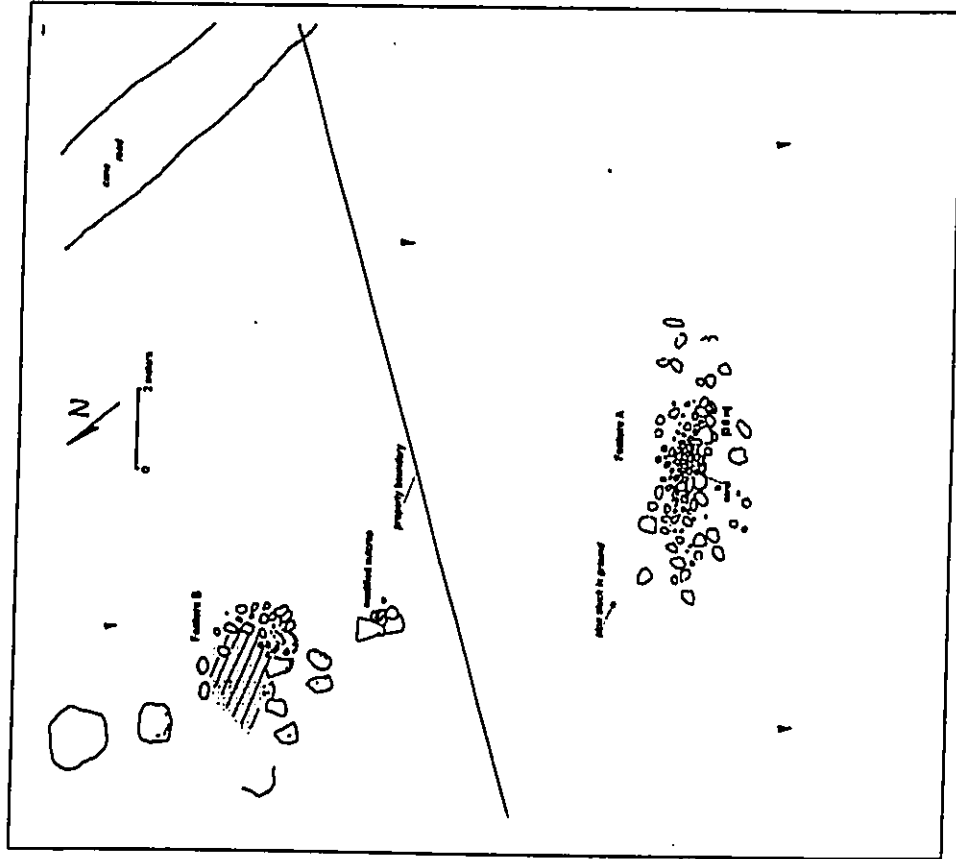
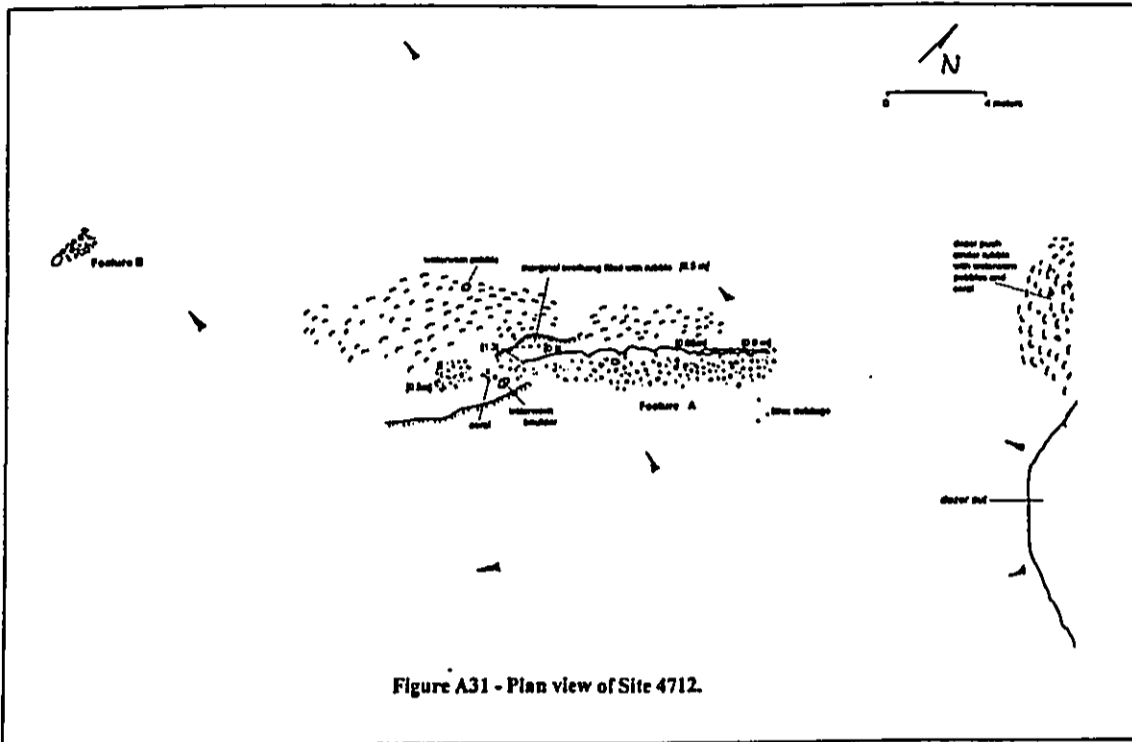
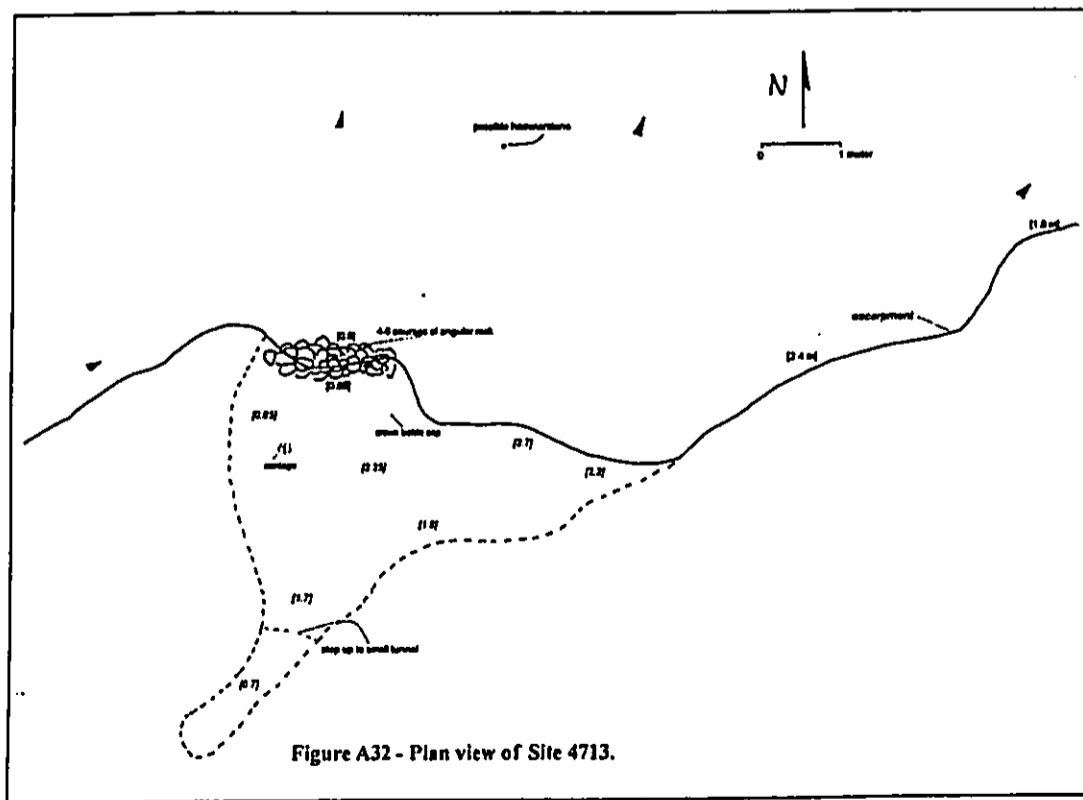


Figure A30 - Plan view of Site 4711.



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**Feature A**

Type: modified outcrop/terrace  
Dimensions: 14 meters NE-SW by 3.0 meters NW-SE by 1.3 meters high.  
Function: unknown  
Subsurface potential: good  
Integrity: unaltered  
Condition: good  
Estimated age: precontact  
Portable remains: lithic debitage, waterworn pebbles and cobbles

Comments: This feature consists of a low linear outcrop of weathered cinder that has apparently been modified by piling cinder cobbles and gravel along with several waterworn pebbles and cobbles on top of it. The outcrop runs diagonally down the west flank of Pu'u Kilea. A small paved cinder and gravel area c. 1 by 1 meter square, occurs at the SW end of the feature. A small overhang is adjacent at the base of the outcrop. The overhang is nearly completely filled with cinder cobbles. It was not possible to determine if it was intentionally filled.

**Feature B**

Type: rock pile  
Dimensions: 1.8 meters N-S by 0.8 meters E-W by 0.6 meters high  
Function: possible burial  
Subsurface potential: moderate to high  
Integrity: unaltered  
Condition: good  
Estimated age: possible precontact  
Portable remains: 1 waterworn cobble

Comments: This is a crude, low pile of cinder rock, roughly oval in shape. A single waterworn cobble sits on top.

**Site [19] 50-50-08-4713**

Site type: single component—rock shelter  
Environmental setting: Located on the NE slope of Pu'u Kilea, approximately 85 meters NE of the summit. Primary flora is buffelgrass.  
Dimensions: 6.0 meters in length by 3.5 meters deep with 2.4 maximum ceiling height  
Function: temporary habitation  
Subsurface potential: good to excellent  
Integrity: unaltered  
Condition: good  
Tested: no  
Estimated age: precontact, with later post-contact use  
Portable remains: 1 crown bottle cap (rusted), small amount of old cordage, 1 hammerstone and 1 waterworn pebble. Charcoal is common on the floor.



Photo 41 - Site 4713—rock shelter.



Photo 42 - Site 4714—rock shelter.

**Comments:** This roomy shelter has a small stacked rock wall blocking the lowest portion of the dripline opening. The wall measures 1.65 meters in length by 0.5 meters wide by 0.85 meters high (from floor to dripline), and has 4-6 courses of rock. The possible hammerstone sits 3.6 meters downslope from the shelter entrance. The shelter is located on the NE side of Pu'u Kilea, half-way up the slope. A narrow tunnel-like niche extends back an additional 2.2 meters from the back of the shelter.

**Site [20] 50-50-08-4714**

**Site type:** single component—rock shelter  
**Environmental setting:** Located on the NW slope of Pu'u Kilea, 30 meters downslope NW of the summit. Primary flora is buffelgrass.  
**Dimensions:** 2.0 meters NE-SW by 2.4 meters deep by 0.7 meters maximum ceiling height  
**Function:** possible temporary habitation  
**Subsurface potential:** limited  
**Tested:** no  
**Integrity:** unaltered  
**Condition:** good  
**Estimated age:** probable precontact  
**Portable remains:** 1 cracked waterworn pebble

**Comments:** The entrance to this shelter is very restricted as is the space within. The potential shelter is located the vertical escarpment on the NW side of Pu'u Kilea, c. 30 meters NW of the summit.

**Site [21] 50-50-08-4715**

**Site type:** Pu'u Kilea complex—burial mounds, platforms and markers  
**Environmental setting:** This complex lies at the summit of Pu'u Kilea, and gradually slopes off to the east. Primary flora is buffelgrass dotted with *Kiawe* scrub.  
**Dimensions:** 38 meters NE-SW by 20 meters NW-SE  
**Function:** cemetery—burial ground  
**Tested:** no  
**Integrity:** unaltered  
**Condition:** good  
**Estimated age:** precontact and post-contact  
**Portable remains:** broken glass, milled lumber, lithics, metal cans, *lei* offerings, waterworn pebbles, cobbles and boulders, coral.

**Comments:** This burial area lies to the east of the graded and leveled parking area, on the summit of Pu'u Kilea. Some of the features are simply oval-shaped depressions, indicating a probable coffin burial. Other are small terraces or oval-shaped rock arrangements. It appears that as many as 33 separate graves may be present, judging from the number of terraced plots, oval rock arrangements, and depressions. It is also possible that some of the burials may contain more than one individual. The western-most rock pile is roughly rectangular in shape and 1.2 meters in height, and has a waterworn boulder on top. The summit is enclosed by a smooth-wire fence attached to old railroad ties which are used as posts. This fence crosses the Kilea benchmark near the southwest corner.

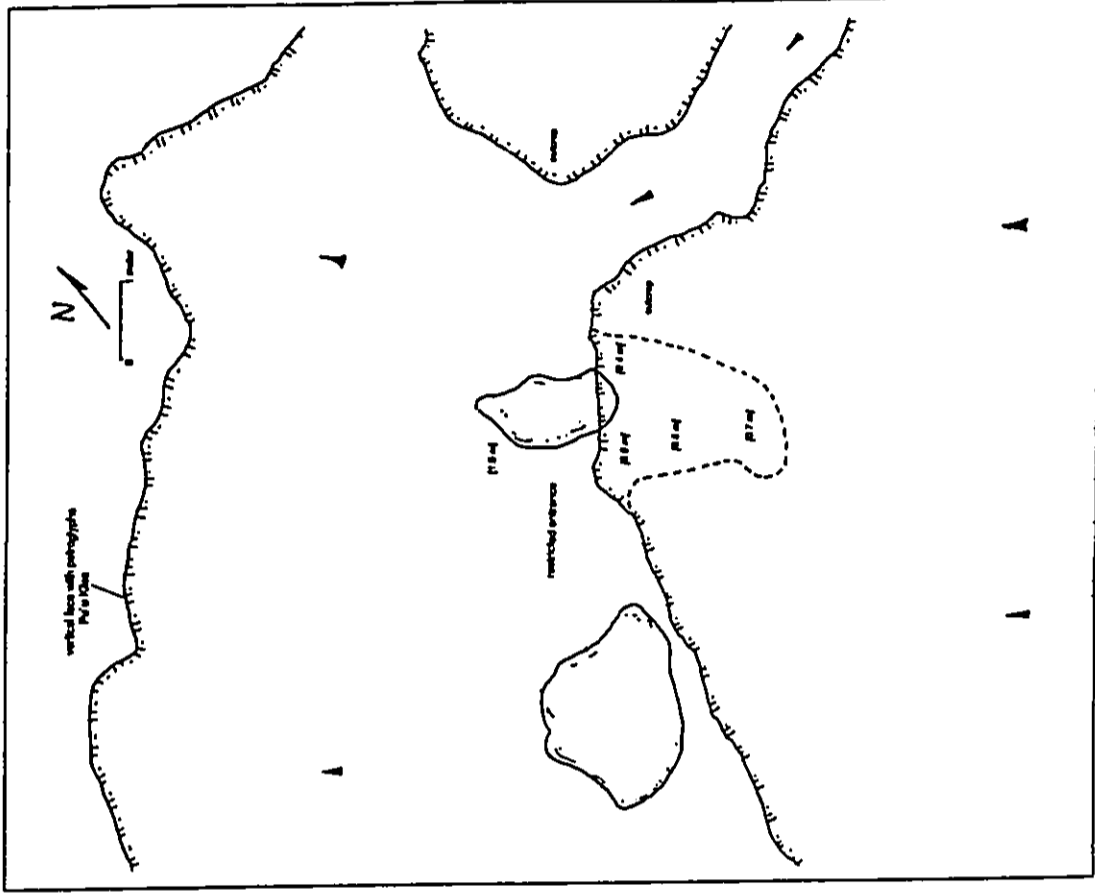


Figure A33 - Plan view of Site 4714.





Photo 47 - Site 4715—view of terrace which coral and pebble pavement.



Photo 48 - Site 4715—rock mound with dried malle lei offering.



Photo 45 - Site 4715—burial mound with coral offering.



Photo 46 - Site 4715—mauka terraces/platforms on southeastern side.

Site [22] 50-50-08-4716

Features A and B

**Site type:** complex—terrace and rock wall  
**Environmental setting:** Located on the steep slope of the Olowalu Stream drainage system, 30 meters NE of the base of Pu'u Kilea, and 25 meters south of Olowalu Stream. Flora is buffelgrass and *kiawe*.

**Dimensions:** 22 meters N-S by 22.5 meters E-W

**Function:** boundary marker, habitation

**Subsurface potential:** good

**Tested:** no

**Integrity:** altered, possibly by cane field operations

**Condition:** fair

**Estimated age:** precontact to post-contact

**Portable remains:** marine shell, *kukui*, lithic debris, unidentified, non-human skeletal fragments, glass fragments, milled lumber, hoe blade

**Comments:** This site is located on the steep slope of the Olowalu Stream drainage system with the wall (Feature B) descending N-S straight down the slope. Feature A is a potential habitation terrace that sits halfway down the slope, 14 meters west of the middle of the wall.

Feature A

**Type:** terrace/platform

**Dimensions:** 5 meters E-W by 3.5 meters N-S by 2.3 meters maximum wall height

**Function:** habitation

**Subsurface potential:** good

**Integrity:** unaltered

**Condition:** good

**Estimated age:** precontact

**Portable remains:** *kukui* nut fragment, 1 weathered mammal long bone, 2 small basalt flakes, 1 marine shell fragment—all associated with terrace/platform. Historic materials include a tin can, bottle glass fragment, timber, metal—which may be attributed to slope wash onto feature.

**Comments:** This is a small terrace with a stacked, faced retaining wall built of boulders averaging c. 0.75 meters in size. The level area created is c. 10 square meters, and is likely diminished in size due to erosion. Angular pebbles and cobbles are scattered across the surface. The artifacts noted are all eroding out of and at the base of the retaining wall. There is a large boulder with marginal overhang beneath it, adjacent to the SE. Olowalu Stream lies c. 32 meters to the north.

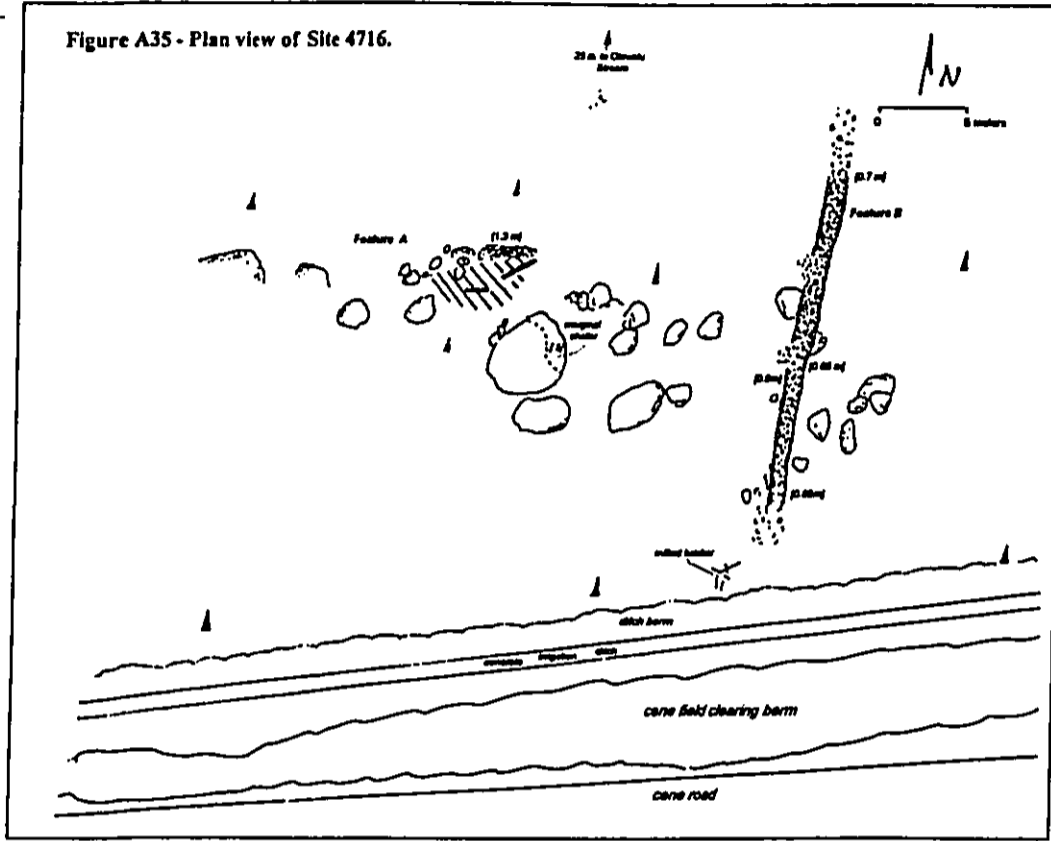
Feature B

**Type:** rock wall

**Dimensions:** 22.0 meters by 1.0 meter by 1.0 meter in height

**Function:** boundary marker/land divider

Figure A35 - Plan view of Site 4716.





Subsurface potential: low  
Integrity: altered  
Condition: fair to good—some collapse  
Estimated age: possible precontact  
Portable remains: metal can, hoc, fist-sized chunk of weathered coral  
  
Comments: The upper portion of this wall is disturbed by irrigation ditch construction along a steep incline of 30 degrees or so. The lower portion of the wall is core-filled. Feature A lies c. 14 meters to the west and may be contemporaneous.

#### Site [23] 50-50-08-4717

##### Features A through E

Site type: complex of retaining walls  
Environmental setting: These features are located along the Olowalu Stream bank. Vegetation includes klu and *kiawe* trees, *koa haole*, and buffelgrass.  
Function: flood protection, stream diversion  
Subsurface potential: limited  
Tested: no  
Integrity: unaltered  
Condition: good to poor  
Estimated age: early 20<sup>th</sup> century  
Portable remains: post-contact materials

##### Feature A

Type: retaining wall  
Dimensions: 15 meters NE-SW by 2.6 meters high, with 4.0 meter wide level area on top  
Function: flood control  
Subsurface potential: minimal  
Integrity: unaltered  
Condition: good  
Estimated age: post-contact—plantation era

Comments: At either end of this wall is evidence of dozer push and sloping rubble. The retaining wall is made up of 5 to 6 courses of rock, and creates a terrace area 3-4 meters wide. A concrete ditch runs along the back edge of the terrace area. The ditch emerges from the ground and water flows in it at this point.

##### Feature B

Type: retaining wall  
Dimensions: 25 meters E-W by 2.9 meters maximum height, by 2.5 meters terrace width  
Function: flood control  
Subsurface potential: minimal  
Integrity: altered  
Condition: fair

Estimated age: post-contact—plantation era  
Portable remains: milled lumber

Comments: This is a well-built dry laid rock retaining wall within the Olowalu Stream drainage system. The wall curves along the stream's cut bank and was undermined at the west end where it has collapsed. A level terrace area 2.5 meters wide is created by the retaining wall, which is made up of 10 to 12 courses of rock. The eastern end of the feature disappears beneath a huge dozer push pile that was evidently created sometime after this wall was made. The push pile parallels the stream bed, also along the length of the terrace areas-north edge.

##### Feature C

Type: retaining wall  
Dimensions: 20.5 meters NE-SW by 2.7 meters NW-SE by 0.9 meters maximum height  
Function: flood control  
Subsurface potential: limited  
Integrity: altered  
Condition: fair  
Estimated age: probable post-contact  
Portable remains: recent galvanized barbed wire (not incorporated into wall)

Comments: This is a stacked rock wall section near the edge of the Olowalu Stream cut bank, directly across (NW) from the Pu'u Kilea petroglyph panel. The wall is faced, 3 to 5 courses along most of its length on the stream side only. It is crudely piled or collapsed at either end and along the entire length on the other side. There are large *klu* trees, mixed with *koa haole*.

##### Feature D

Type: retaining wall  
Dimensions: 51.0 meters NE-SW by 3.3 meters wide by 1.3 meters maximum height  
Function: flood control  
Subsurface potential: low  
Integrity: unaltered  
Condition: good  
Estimated age: post-contact—plantation era

Comments: This is well-built section of wall, 3 to 5 courses high, running along the SE side of Olowalu Stream. It is faced on the stream side only. The face slopes back c. 15 degrees. The opposite side of the wall is sloping rubble. The top is somewhat level and has a higher concentration of cobbles. The retaining wall face utilizes boulders up to 1.2 meters across, with the average size being 0.4 meters in diameter. The wall has been undermined and disappears at the stream's cut bank at either end.

0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100



Photo 49 - Site 4717 - Feature A - plantation era retaining wall segment.



Photo 50 - Site 4718 - Walker's unnamed *halea* prior to clearing.

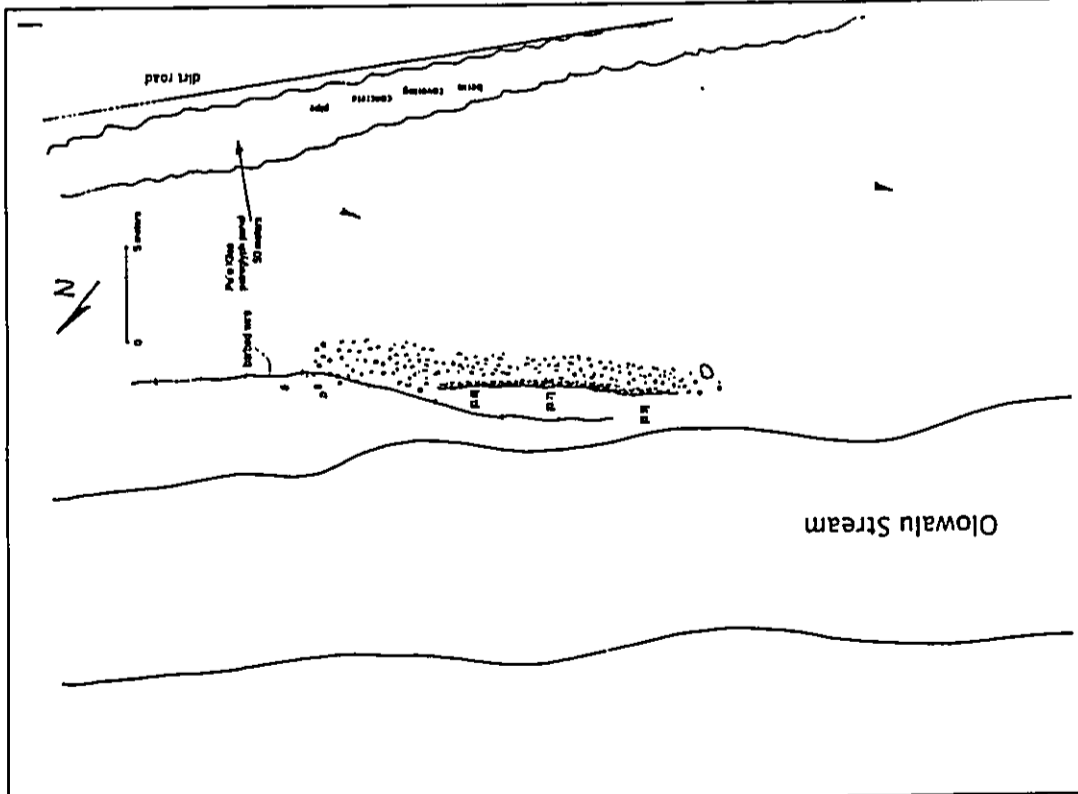


Figure A36 - Plan view of Feature C - Site 4717.

**Feature E**  
**Type:** retaining wall  
**Dimensions:** 12.0 meters E-W by 1.8 meters maximum height by 3.0 meters terraced area  
**Function:** flood control  
**Subsurface potential:** low  
**Integrity:** altered  
**Condition:** fair  
**Estimated age:** post-contact—plantation era

**Comments:** This is a short section of retaining wall which parallels Olowalu Stream on the SE side. The wall appears to have been impacted by water diversion on the east end and by stream undercutting on the west end. There is a probable bulldozer pushed berm of large boulders between the stream and the retaining wall. This feature may have been part of Features C and D, which would have formed a continuous retaining wall.

**Site [24] 50-50-08-4718**

**Features A through C**

**Site type:** complex—*heiau* remnant

**Environmental setting:** This site is located in a cane field, in the central portion of the project area. The feature sits at 80 feet elevation AMSL, directly adjacent to and upslope (NE), of a large field rock clear pile.

**Dimensions:** 21 meters NE-SW by 12 meters NW-SE by 0.7 meters maximum wall height.

**Function:** ceremonial/burial area/recent burial reinterment site

**Subsurface potential:** excellent

**Tested:** no

**Integrity:** altered—partly covered by cane field operations

**Condition:** fair to poor

**Estimated age:** precontact with post-contact activity

**Portable remains:** marine shell, volcanic glass flakes, basalt debitage, coral chunks  
**Comments:** The original shape and size of this feature could not be ascertained due to the extensive damage from cane field operations. Most of the outside edges of the feature are either covered with bulldozed push-piles of earth and boulders, or have been partially displaced. Intact portions include 1 stacked, faced inner wall section, 0.7 meters high. The interior is divided by linear rock alignment retaining walls with paved, slightly raised areas leaving pathways devoid of rock. One such pathway leads in from a possibly intact entrance on the SW side. A room, of sorts, exists in the NE end of the feature with 2 small, roughly rectangular rock alignments with inner pavement, 2 to 3 meters in length. These subfeatures are similar to those observed on the summit of Pu'u Kilea, that are known burial features. An artifact concentration exists in this northeastern enclosure, a 5 square meter area that has most of the portable remains mentioned above.

This site is interpreted to be the unnamed *heiau* mentioned by Walker in his discussion of the larger *heiau*, Kawaihoa (Site 4), which was said to have been located in the cane fields below. The unnamed *heiau* was not relocated during the 1973 survey, possibly because it is partially covered by a large pile of boulders and cobbles, and was likely heavily vegetated.

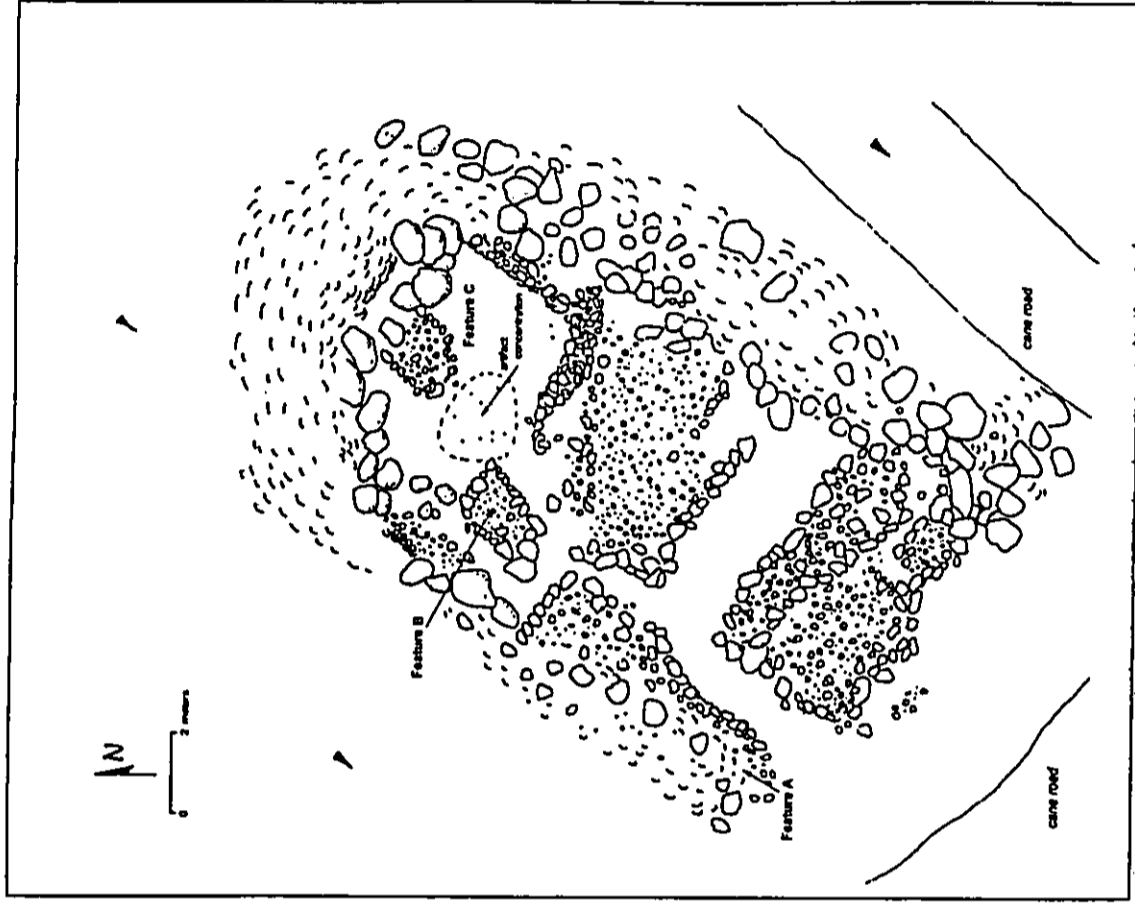


Figure A37—Plan view of Site 4718—*heiau* remnant.



Photo 51 - Site 4718—*Heaia* remnant after vegetation was cleared away.



Photo 52 - Site 4718—view of *Heaia*—looking east.

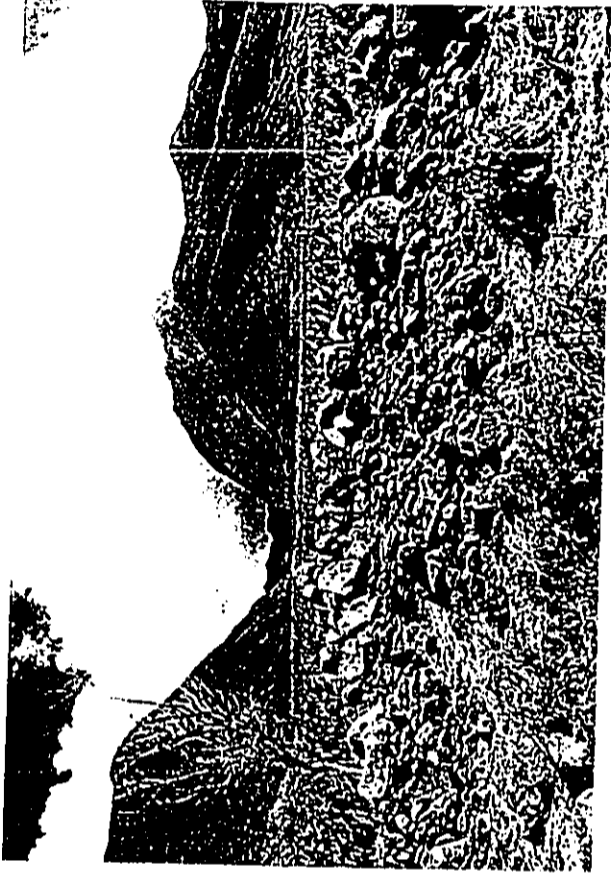


Photo 53 - Site 4718 in foreground—Olowalu Valley in background.



Photo 54 - Site 4719—historic boundary marker.

**Feature A**  
 Type: *heiau* remnant—wall alignment  
 Dimensions: 21.0 meters NE-SW by 12.0 meters NW-SE by 0.7 meters maximum wall height

Function: ceremonial/burial area  
 Subsurface potential: excellent  
 Integrity: altered  
 Condition: poor  
 Portable remains: marine shell, volcanic glass, basalt debris and coral

**Feature B**  
 Type: probable burial  
 Dimensions: 3.0 meters NE-SW by 1.6 meters NW-SE by 0.35 meters maximum height  
 Function: burial marker  
 Subsurface potential: excellent  
 Integrity: unaltered  
 Condition: good  
 Estimated age: precontact

Comments: This small subfeature sits in the northeastern-section of Feature A. The feature consists of a rectangular arrangement of semi-rounded cobbles and boulders, with an inner pavement of smaller cobbles and pebbles. The long axis is in the same orientation as Feature C.

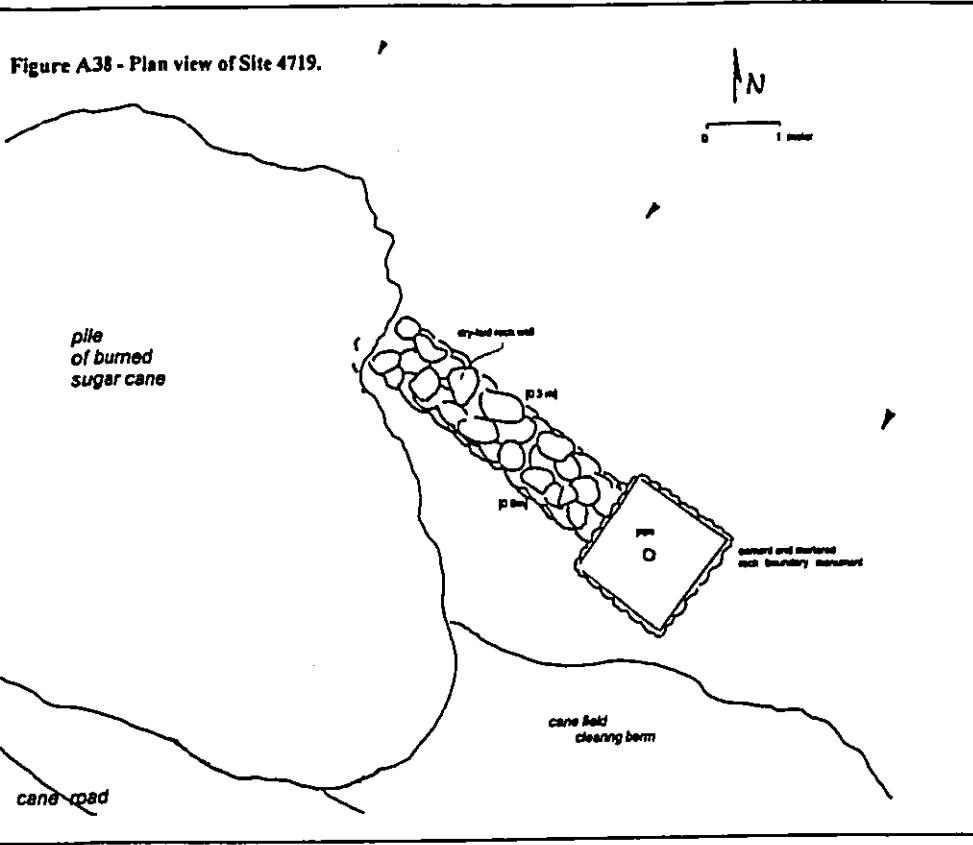
**Feature C**  
 Type: probable burial  
 Dimensions: 2.0 meters NE-SW by 1.75 meters NW-SE by 0.3 meters maximum height  
 Function: probable burial marker  
 Subsurface potential: excellent  
 Integrity: altered—cane field rocks cover the NE end of feature  
 Condition: good  
 Estimated age: precontact, with post-contact modification

Comments: This small feature sits at the northeastern end of the interior of the *heiau* remnant—Feature A. The feature consists of a roughly rectangular alignment of semi-rounded cobbles and boulders with inner pavement of cobbles and pebbles.

Site [25] 50-50-08-4719

Site type: single component—rock wall  
 Environmental setting: Located at the far eastern corner of the project area at the northern extent of the cane field. Flora consists of mature *Kiawe* trees and buffelgrass.  
 Dimensions: 8.0 meters NW-SE by 0.8 meters wide by 0.9 meters maximum height  
 Function: boundary marker  
 Subsurface potential: minimal  
 Tested: no  
 Integrity: altered by cane field operations

91





Condition: poor  
Estimated age: post-contact—plantation era  
Portable remains: none observed

Comments: This short section of wall has been tied into the property corner monument which is made of boulders and mortar. The wall is dry-laid, stacked and faced, and has 2 to 3 courses of boulders averaging 0.4 m. in diameter. The wall runs c. 315 degrees off the monument. The wall section may predate the monument. This site is partially covered by a burned cane pile.

Site [26] 50-50-08-4720

Site type: single component—retaining wall

Environmental setting: Located in the eastern portion of the project area in a small drainage system at the NE boundary of the property, on the northern edge of a cane field. The flora consists of mature *kiawe* trees and buffelgrass.

Dimensions: 9.0 meters long by 9.5 meters wide by 1.6 meters maximum height

Function: road grade across drainage area

Subsurface potential: minimal

Tested: no

Integrity: altered by cane operations

Condition: good

Estimated age: post-contact—plantation era

Portable remains: none

Comments: This is a well-built retaining wall, made of waterworn boulders that are dry-laid, 5 to 6 courses high. The upper course is mortared with waterworn pebbles and coral for aggregate. The retaining wall crosses an intermittent stream and creates a relatively level area that extends 9 meters back to a large clearing berm that post-dates the feature.

Site 50-50-08-4758

Site Type: Historic cemetery

Environmental setting: Located on the edge of a cane field. Overstory of *kiawe* trees, with buffelgrass ground cover mixed with *haole koa*.

Dimensions: c. 80 meters east-west by 30 meters north-south

Condition: Fair—recent burn-over charred wooden markers. Some head stones have been displaced in the past—others remain upright. One grave appears to be visited regularly, as fresh flowers were present.

Estimated age: Early 1900s to c. 1938

Portable remains: scattered bottles, metal cans, vases—which probably held flowers or offerings at one time.

Comments: With the exception of the attention being given to the grave of Ralph H. Fujishiro (May 29, 1925 - January 31, 1938), the other graves did not appear to be visited. The cemetery was overgrown with buffelgrass and *kiawe* trees. Fire from the adjacent sugarcane field burn swept over the cemetery sometime in early May 1999, exposing the tombstones, and damaging some of the wooden markers.



Photo 57 - Site 4758—gravestones prior to burning.



Photo 58 - Site 4758—cemetery following burning of underbrush.



Photo 59 - Site 4758—engraved headstone.



Photo 60 - Site 4758—charred wooden grave marker.

Site [27] 50-50-10-04

Site type: known *heiau*—Kawaiaola  
 Environmental setting: On rising ground south of Pu'u Kilela at c. 250 feet elevation AMSL. Flora consists of buffelgrass, young *kiawe* trees, and common *koa haole*  
 Dimensions: 51 meters long by 32 meters in width  
 Function: ceremonial  
 Subsurface potential: excellent  
 Tested: no  
 Integrity: unaltered for the most part  
 Condition: good to very good  
 Estimated age: precontact

Comments: This is a large walled *heiau* in remarkably good condition, considering it is surrounded on 3 sides by cane roads, and an active cane field on the *makai* side. The walls range in thickness from 2.6 meters on the west side to 3.8 meters on the south and east, where it is composed of 2 terraces. The north wall is lower and ranges from 1.5 to 2.5 meters thick. Several low terraces and enclosures are identifiable inside. The low platforms in the western part are probably graves. The *heiau* is constructed of rough red vesicular rock.

This site was recorded by Winslow Walker during his 1929-1930 inventory of ceremonial structures on Maui. It is considered to be the most culturally significant indigenous site on the survey property.

Site [28] 50-50-08-4721

Site type: single component—platform  
 Environmental setting: Located 600 feet west of Olowalu Stream, directly above the northern extend of the cane field. Flora consists of *kiawe* and *kiu* trees, buffelgrass, and various alien vines.  
 Dimensions: 7.25 meters N-S by 4.75 meters E-W  
 Function: probable habitation  
 Subsurface potential: good  
 Tested: no  
 Integrity: altered  
 Condition: fair  
 Estimated age: post-contact  
 Portable remains: 1 white earthenware plate fragment; 1 olive green glass fragment; 1 piece of milled lumber  
 Comments: This is a small rectangular platform with a level area of c. 31 square meters. A faced retaining wall runs along the west side. The south and east sides are made of earth. The north edge meets the base of an earth berm created during the excavation of a currently active concrete lined water ditch up the slope. The platform is built on a gradual sloping area 7 meters up from the edge of a cane field. Large boulders and an earthen berm are at the south edge of the feature. A small rubble pile occurs at the SE corner of the platform.



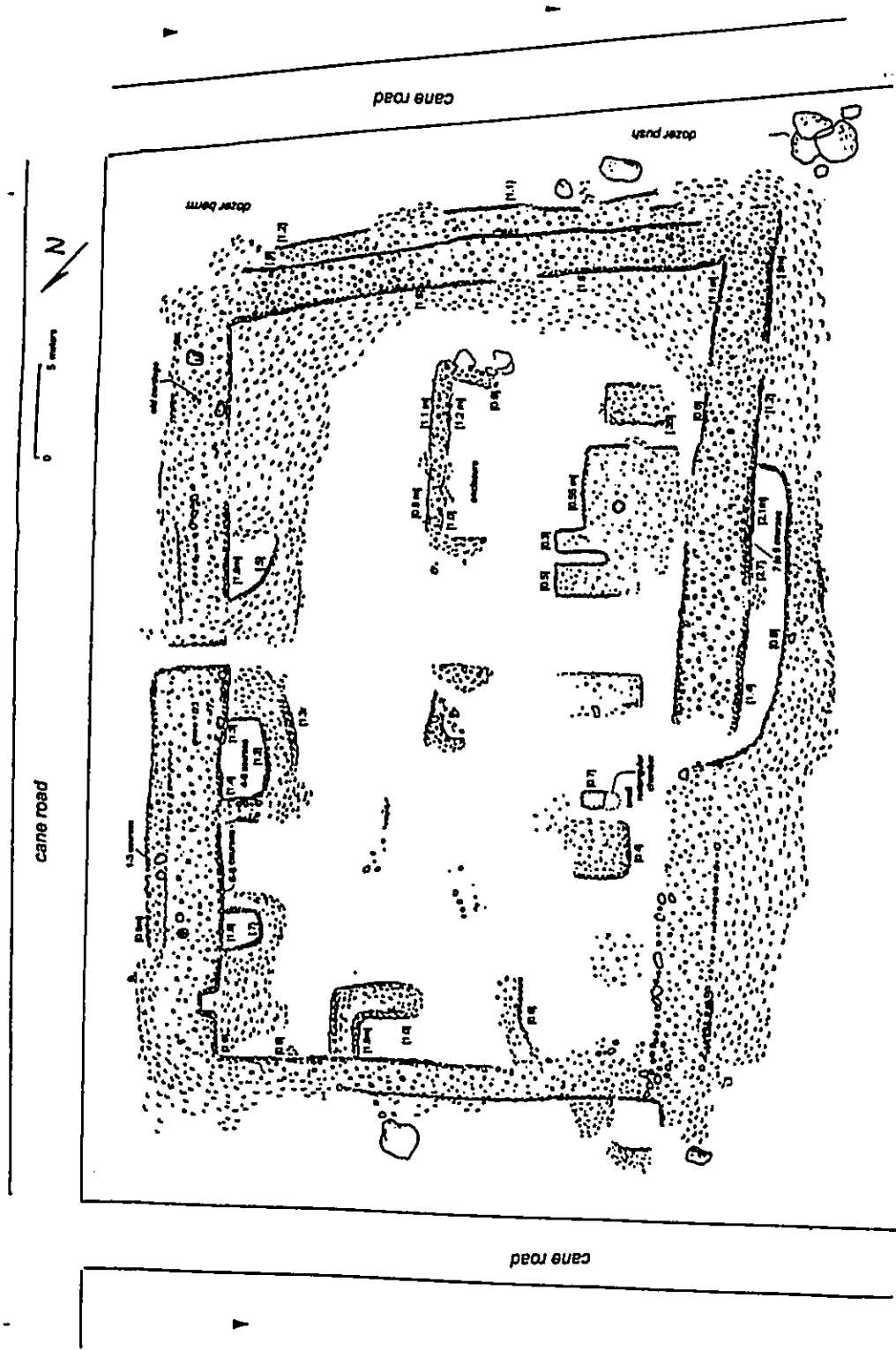


Figure A40 - Plan view of Site 04 - Kawalioa Heiau.

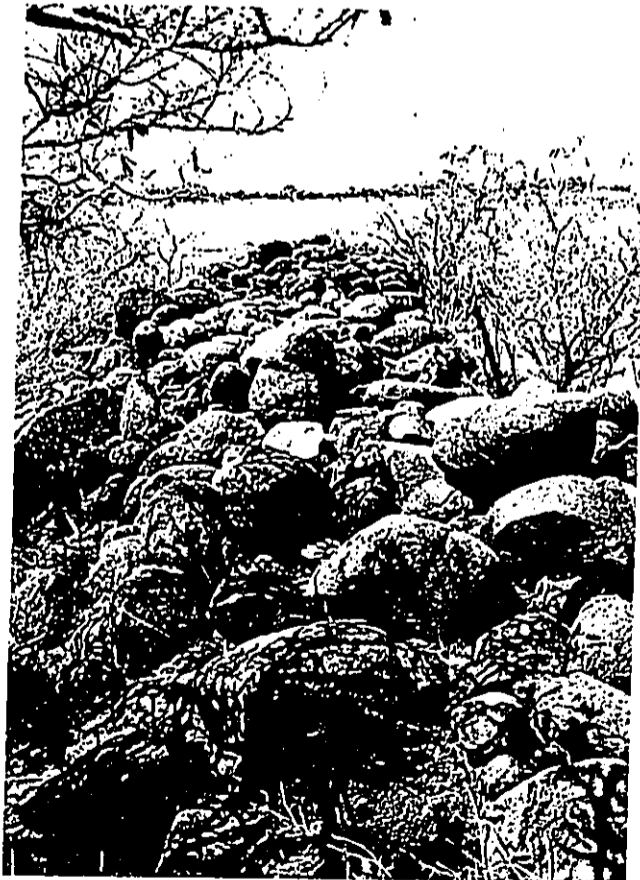


Photo 61 - Site 04—Kawaiulou heiau—east wall.

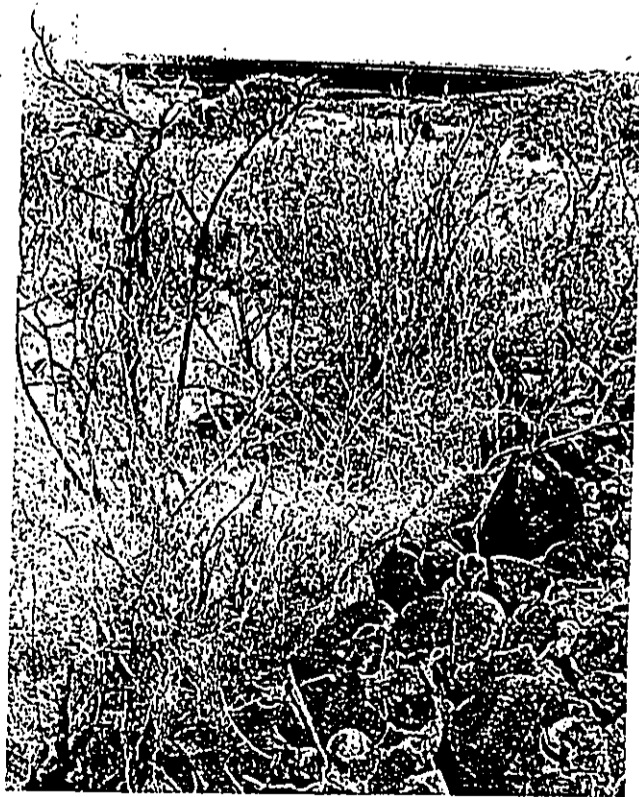


Photo 62 - Site 04—Kawaiulou heiau—west wall.



Photo 63 - Site 04—south side of east wall.



Photo 64 - Site 04—north wall.



Site 50-50-08-1603

While this site is technically excluded from study parcel, informants indicated that the church property had been more extensive in the past. There was concern that graves of church members might be present in the adjacent cane fields. For this reason, we undertook a series of backhoe trench tests in this area. Backhoe Trench 164 located an unmarked casket burial quite near the old church ruins (Figure 5), which vindicated their concern.

The following excerpts are from letters archived in the Mission Houses Museum Library, Honolulu, copies of which were present in the Olowalu Church files, which provide information on the church property. They were provided to Xamanek Researches by Ms. Adeline Rodrigues.

1) From E. E. Pleasant to H. P. Judd, February 4, 1929:

"I am inclosing [sic.] a map of the Olowalu district showing the church lot. We suspect that this lot is still owned by the government in the same way as was the Kaupo Church lot. I spoke to Garcia, our local land man here about it and he suggested that I take it up with you and proceed as in the case of the Kaupo Church. Will you look up the title and see if they have any sort of description from which a deed could be drawn? We are looking up the historical data, to show that this property has been used all along for church purposes. They continue to use the old church building although it is almost entirely minus a roof now. We want to get the deed to the land, and then the people there will consider the repair of the old building or removal to some other site and the making of an exchange.

2) From E. E. Pleasant to H. P. Judd, April 19, 1929.

"I saw Mr. Garcia of the Land office here yesterday. He was over at Olowalu two days ago and secured from Mr. Wm. Hoopili the data about the use of the old church and its past history. He also talked with Hanneberg, Manager of the Plantation and learned that he seems to have it in for Mr. Hoopili. He says that the plantation has always, at least for quite a number of years, used probably half or more of this church lot for cane. It is in cane now. Mr. Hanneberg said that their deed calls for all this land except two acres of the church land and he wants the church to take their two acres from the church out to the road in front. This would not include any of the land where they have cane.

Now it seems to me that the church is entitled to a deed to the two acres as laid out in the map for this was the exact boundary of the lot as originally set aside long ago under the Hawaiian government for Church and school land. We have used the house of worship continuously, as the history will show. Let the deed issue to the church (or to the Board as trustee) according to the map and

then we can negotiate an exchange with the plantation or make an agreement for rental.

I told the church that we ought to get our title to the land first in the shape of a deed and then we could take up the matter of deciding whether to repair the old church or build a new one nearer to the center..."

3) From E. E. Pleasant to H. P. Judd, January 11, 1933.

"What we wish to avoid is the repairing of that old church. It would cost at least \$2000.00 to do it with new material and more if we add the cost of tearing down an old building to provide the lumber.

The school lot is a better location although we would not need all of it. It seems to me that the better way would be for us to buy the building at whatever price we would have to pay when the auction takes place and the government give the Board a trust deed for the amount of land needed there.

It may be objected that the government has already give that church a plot of land in the form of a trust deed. This is true but I think it was a mistake. That deed should have been an out and out deed with no conditions. For 70 years or more the church has been in possession of that plot of land where the old church stands and many are buried there. But no deed or writing was ever given. It belonged to the classification 'Church and School land' under the monarchy i.e. land set apart for that purpose. It has been the policy for the government to give title where it can be established that the church has been in possession for so long and has used the land for that purpose un-interruptedly. A plain deed or patent was secured by Mr. Lake for the church lot at Hana which the church had used for nearly a hundred years but never had a deed. I think the Kaupo church lot was recently deeded in the same way. But at Olowalu the deed recently made was put in the form of a trust deed and the land reverts to the government if not used by the church....."

Site 50-50-08-4820

**Site type:** Surface scatter of human remains  
**Environmental setting:** Located in a cane field, c. 30-35 meters northeast of Honoapi'iiani Highway, and c. 250 meters west of Olowalu Subdivision.  
**Dimensions:** Covers c. 100 square meters—located between BT 120 and 121.  
**Subsurface potential:** Subsurface evidence of an *in situ* burial was not found in the 2 backhoe trenches.  
**Integrity:** Altered. Secondary deposition of human remains—additional surface skeletal material is expected from this displaced burial.  
**Condition:** human remains are fragmented and weathered.  
**Estimated age:** precontact

**Comments:** Find consisted of a few fragmented long bone shafts. Informants reported that human skeletal remains have been recovered from this location for years, and that they were reinterred in Site 4718—*heiau*. Site 4820 lies about 180-200 meters *mauka* of the Site 4693 burial preserve.

Site 50-50-08-4821

**Site type:** Surface scatter of human remains  
**Environmental setting:** Located in a cane field, in the westernmost section of the study parcel, about 100 to 120 meters *mauka* of Honoapi'iiani Highway.  
**Dimensions:** Covers c. 50 to 60 square meters—located between BT 139 and BT 140.  
**Subsurface potential:** Subsurface evidence of an *in situ* burial was not found in the 2 backhoe trenches.  
**Integrity:** Altered. Secondary deposition of human remains—additional surface scattered skeletal material may be present.  
**Condition:** skeletal remains fragmented and weathered.  
**Estimated age:** precontact

**Comments:** Find consisted of a skull fragment, a phalange, and a few long bone fragments.

Site 50-50-08-4822

**Site type:** Location of historic pond.  
**Environmental setting:** Located between the shoreline and Olowalu Subdivision, in the eastern sector of the subject property. Only a narrow strip between Honoapi'iiani Highway and the cane road is on the study parcel, and is designated as a greenway area in development plans.  
**Dimensions:** unknown  
**Subsurface potential:** good—pond sediments are probably still present.  
**Integrity:** Altered—pond was filled in the 1950s when Honoapi'iiani Highway was constructed.

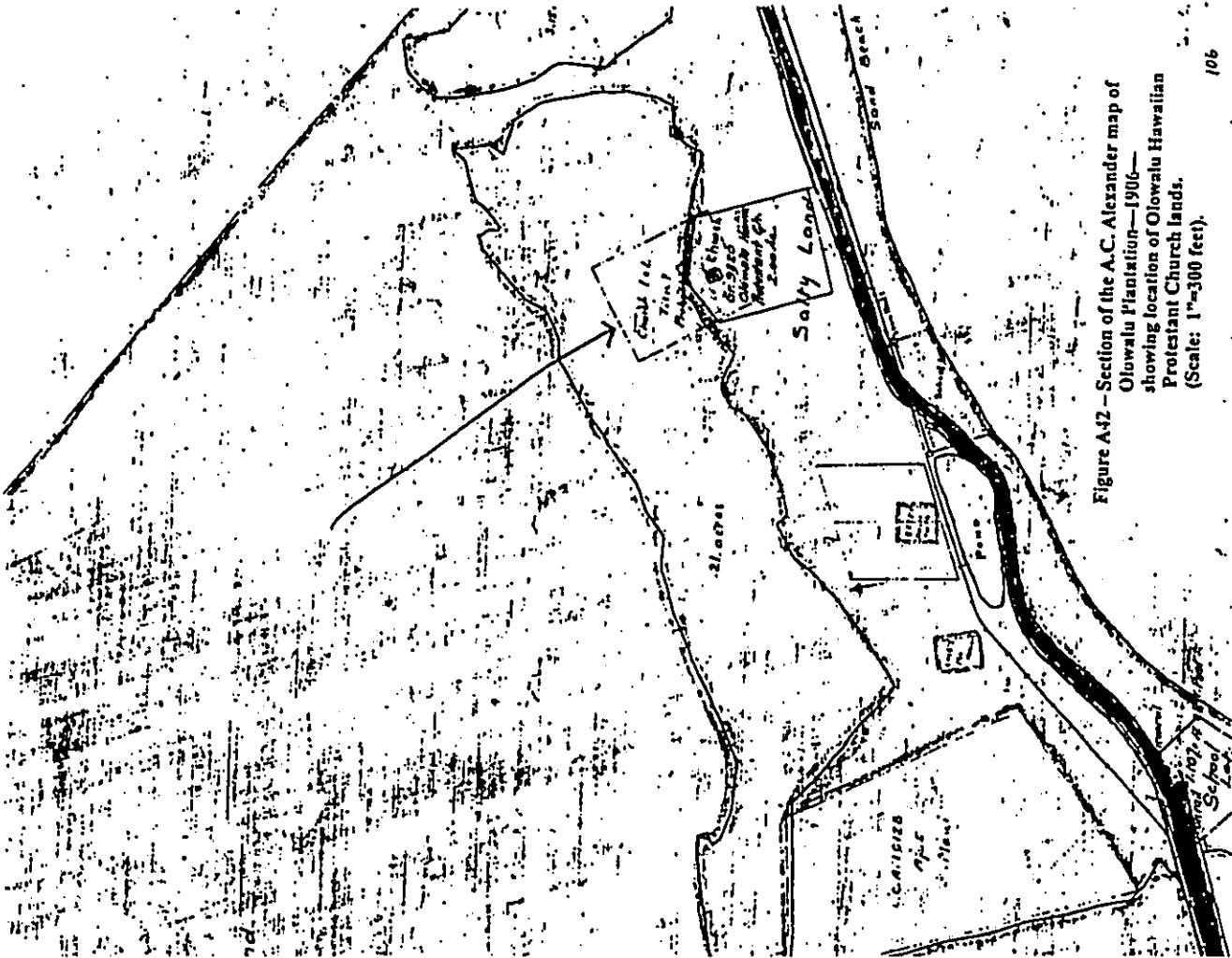


Figure A-12 - Section of the A.C. Alexander map of Olowalu Plantation—1906—showing location of Olowalu Hawaiian Protestant Church lands. (Scale: 1"=300 feet).

**Estimated age:** Reported by informants to date from precontact times. Existed into 20<sup>th</sup> century.

**Comments:** This pond was reported to have been called *Kaloko o Kapa'ih* by informant John Ka'aea. Mrs. Adeline Rodrigues said that High Chiefess Kalola lived just *mauka* of it, and that it was probably associated with her. It is shown on maps from the 19<sup>th</sup> and early 20<sup>th</sup> centuries (Figures 1 and 1a).

**Site 50-50-08-4823**

**Site type:** Subsurface gleyed marsh/lagoonal soils.

**Environmental setting:** Located in the eastern portion of the study property, 30 to 80 meters *mauka* of Honapi'iiani Highway in BTs 106 and 107. Soils are found inland of a sand beach berm which traps rain water behind it, creating marsh conditions.

**Dimensions:** unknown

**Subsurface potential:** good—these soils may contain pollen and charcoal deposits from the period of the first human settlement in Olowalu.

**Estimated age:** dates from precontact times.

**Comments:** These subsurface marsh/lagoonal soils may be fairly extensive. On the 1906 map (Figure 1a) the area to the west of the backhoe trenches is referenced as "salty land". The leeward coast of Maui between Olowalu and Ukumehame is known for marshy conditions that occur after heavy rainfall.

**APPENDIX B**

**Radiometric Data Sheets  
Beta Analytic, Inc.**



**CALIBRATION OF RADIOCARBON AGE TO CALENDAR YEARS**

(Variables: C13/C12=-23.7;lab. mult=1)

Laboratory Number: Beta-130025

Conventional radiocarbon age: 420 ± 50 BP

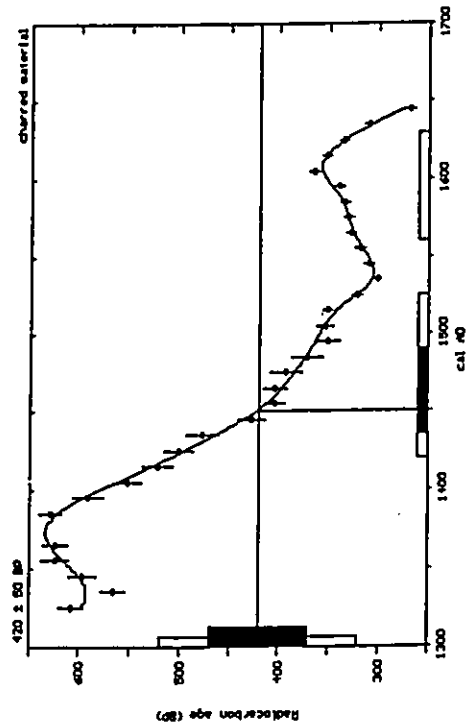
Calibrated results: cal AD 1420 to 1525 (Cal BP 530 to 425) and  
cal AD 1560 to 1630 (Cal BP 390 to 320)

(2 sigma, 95% probability)

Intercept data:

Intercept of radiocarbon age with calibration curve: cal AD 1450 (Cal BP 500)

1 sigma calibrated results: cal AD 1435 to 1490 (Cal BP 515 to 460)  
(68% probability)



References:  
Calibration Database  
Elderfield  
Stuiver, M., van der Pligk, H., 1998, Radiocarbon 40(7), pp.438  
INTCAL98 Radiocarbon Age Calibration  
Stuiver, M., et al., 1998, Radiocarbon 40(7), p.1041-1043  
Mathematics  
A Simplified Approach to Calibrating C14 Dates  
Tolman, J. S., Fryxell, J. C., 1991, Radiocarbon 33(2), p.173-177

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**CALIBRATION OF RADIOCARBON AGE TO CALENDAR YEARS**

(Variables: C13/C12=-24.8;lab. mult=1)

Laboratory Number: Beta-130026

Conventional radiocarbon age: 200 ± 60 BP

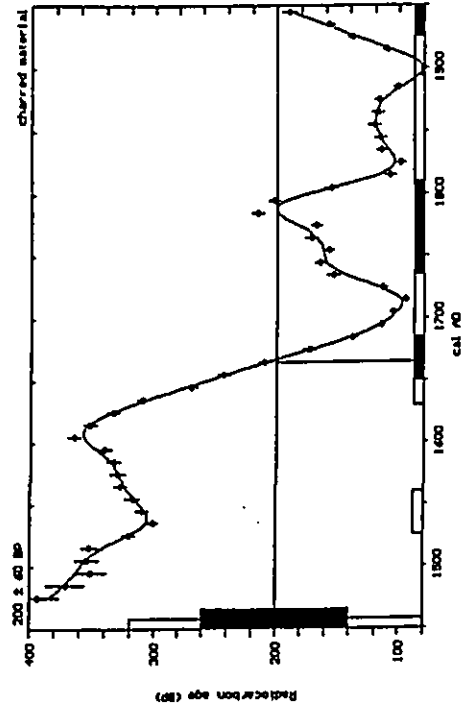
Calibrated results: cal AD 1525 to 1560 (Cal BP 425 to 390) and  
cal AD 1630 to 1950 (Cal BP 320 to 0)

(2 sigma, 95% probability)

Intercept data:

Intercept of radiocarbon age with calibration curve: cal AD 1665 (Cal BP 285)

1 sigma calibrated results: cal AD 1650 to 1685 (Cal BP 300 to 265) and  
cal AD 1735 to 1810 (Cal BP 215 to 140) and  
cal AD 1925 to 1950 (Cal BP 25 to 0)



References:  
Calibration Database  
Elderfield  
Stuiver, M., van der Pligk, H., 1998, Radiocarbon 40(7), pp.438  
INTCAL98 Radiocarbon Age Calibration  
Stuiver, M., et al., 1998, Radiocarbon 40(7), p.1041-1043  
Mathematics  
A Simplified Approach to Calibrating C14 Dates  
Tolman, J. S., Fryxell, J. C., 1991, Radiocarbon 33(2), p.173-177

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**CALIBRATION OF RADIOCARBON AGE TO CALENDAR YEARS**

(Variables: C13/C12=25.3;lab\_mult=1)

Laboratory Number: Beta-130027

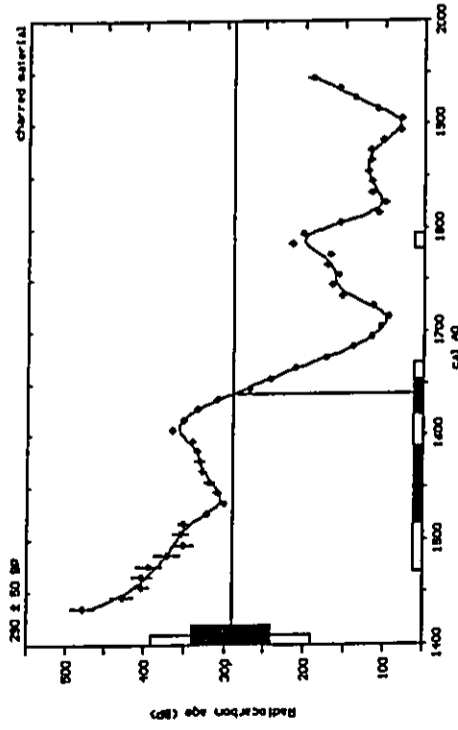
Conventional radiocarbon age: 290 ± 50 BP

Calibrated results: cal AD 1470 to 1670 (Cal BP 480 to 280) and  
cal AD 1780 to 1795 (Cal BP 170 to 155)  
(2-sigma, 95% probability)

**Intercept data:**

Intercept of radiocarbon age with calibration curve: cal AD 1640 (Cal BP 310)

1 sigma calibrated results: cal AD 1515 to 1590 (Cal BP 435 to 360) and  
cal AD 1620 to 1655 (Cal BP 330 to 295)  
(68% probability)



References:  
Calibration Database  
Editorial Comment  
Stuiver, M. van der Plicht, H., 1998, Radiocarbon 40(2), p18-21  
INTCAL98 Radiocarbon Age Calibration  
Stuiver, M. et al., 1998, Radiocarbon 40(1), p1041-1083  
Mathematics  
A Simplified Approach to Calibrating C14 Dates  
Taylor, R. S., Taylor, J. C., 1993, Radiocarbon 35(2), p317-322

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**CALIBRATION OF RADIOCARBON AGE TO CALENDAR YEARS**

(Variables: C13/C12=23.8;lab\_mult=1)

Laboratory Number: Beta-130028

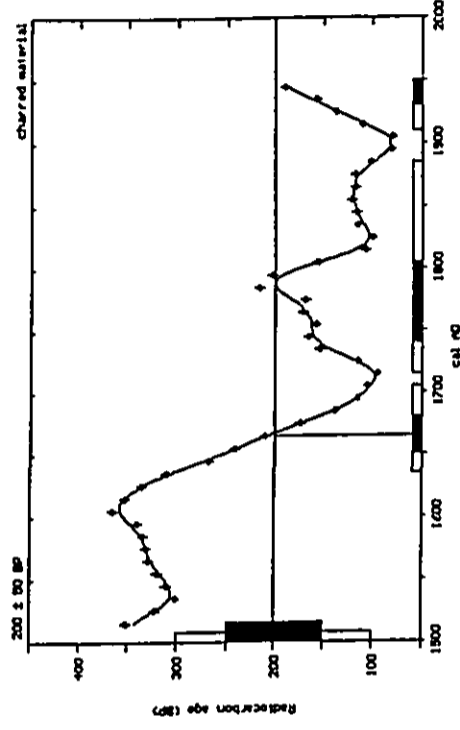
Conventional radiocarbon age: 200 ± 50 BP

Calibrated results: cal AD 1635 to 1705 (Cal BP 315 to 245) and  
cal AD 1715 to 1885 (Cal BP 235 to 65) and  
cal AD 1910 to 1950 (Cal BP 40 to 0)  
(2-sigma, 95% probability)

**Intercept data:**

Intercept of radiocarbon age with calibration curve: cal AD 1665 (Cal BP 285)

1 sigma calibrated results: cal AD 1650 to 1680 (Cal BP 300 to 270) and  
cal AD 1740 to 1805 (Cal BP 210 to 145) and  
cal AD 1930 to 1950 (Cal BP 20 to 0)



References:  
Calibration Database  
Editorial Comment  
Stuiver, M. van der Plicht, H., 1998, Radiocarbon 40(1), p18-21  
INTCAL98 Radiocarbon Age Calibration  
Stuiver, M. et al., 1998, Radiocarbon 40(1), p1041-1083  
Mathematics  
A Simplified Approach to Calibrating C14 Dates  
Taylor, R. S., Taylor, J. C., 1993, Radiocarbon 35(2), p317-322

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## CALIBRATION OF RADIOCARBON AGE TO CALENDAR YEARS

(Variables: est. C13/C12 = 25; lab. mult = 1)

Laboratory number: Beta-130334

Conventional radiocarbon age: 150 ± 70 BP

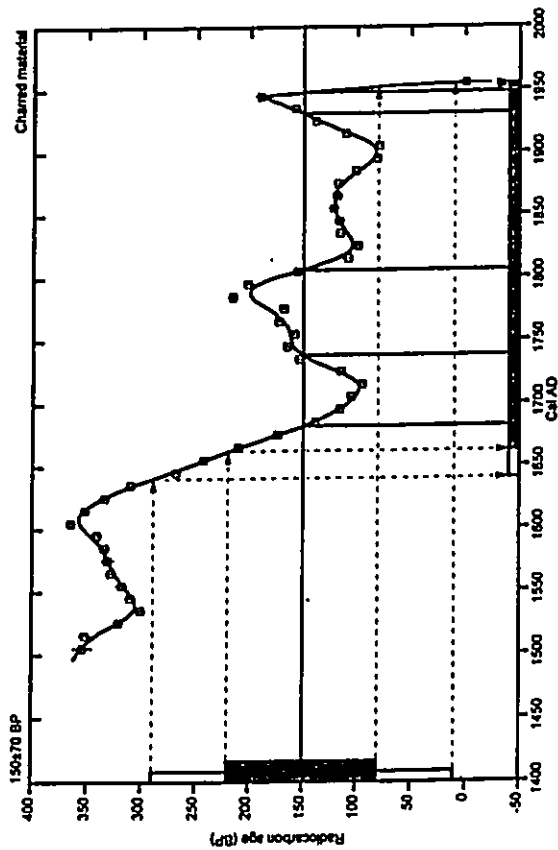
2 Sigma calibrated result:  
(95% probability)  
<sup>14</sup>C/13C ratio estimated

### Intercept data

Intercepts of radiocarbon age  
with calibration curve:

Cal AD 1680 (Cal BP 270) and  
Cal AD 1740 (Cal BP 210) and  
Cal AD 1805 (Cal BP 145) and  
Cal AD 1930 (Cal BP 20) and  
Cal AD 1950 (Cal BP 0)

1 Sigma calibrated result:  
(68% probability)



### References:

- Calibration Database
- Editorial Comment
- Saunders, M., van der Plicht, H., 1998, Radiocarbon 40(2), p.10-11
- INTCAL98 Radiocarbon Age Calibration
- Saunders, M., et al., 1998, Radiocarbon 40(1), p.1041-1083
- Mathematics
- A Simplified Approach to Calibrating C14 Dates
- Tollman, A. S., Vogel, J. C., 1993, Radiocarbon 35(2), p.317-322

Beta Analytic Radiocarbon Dating Laboratory

4953 S.W. 74th Court, Miami, Florida 33155 • Tel: (305)447-3187 • Fax: (305)447-0944 • E-mail: beta@radiocarbon.com

## APPENDIX C

### Historic documents relating to the Plantation Era

Mr. Robert Horrajo has been collecting historic information on Olowalu since the property was acquired by Olowalu Elua Associates in 1998. Olowalu Elua Associates has also contracted Ms. Gail Ainsworth to conduct archival research on the Olowalu Sugar Company. The documents included in this appendix were supplied by Mr. Horrajo, and are arranged in chronological order. These include census information from 1878; chronology of the Olowalu Sugar Company and school; the Honolulu Trades and Labor Council Committee report of 1904; an enlargement of the Alexander map of 1906, showing the former and new courses of Olowalu Stream; a 1916 photograph of the pond and school; two additional photos of the mill (date unknown); an aerial view of Olowalu Valley and *mauka* lands, showing the extent of cane cultivation into the valley; and maps of the plantation community in 1936, along with the floor plans of selected plantation houses. Also included is an aerial photograph which shows the water systems, cane field and road patterns, and the agricultural clear piles that were begun in the 1940s and 1950s.

DOCUMENT CAPTURED AS RECEIVED

Olowalu Sugar Company  
Chronology  
Draft November 6, 1999

Date	Name	Owner(s)	Manager	Agent	Sqr/ Acres	Misc.
1876	Olowalu Plantation	Goodale Armstrong Hilton Philip				
1877	West Maui Plantation (probably misnomer)	Goodale Armstrong Hilton Philip		M.G. Irwin		
1878	Olowalu Plantation	Goodale Armstrong Another half owner G. Armstrong & Co.	G. Armstrong	H. Hackfeld & Co.		Half interest sold for \$105,000
1879	Olowalu Plantation	G. Armstrong & Co.	G. Armstrong	H. Hackfeld & Co.		
1880	Olowalu Plantation	G. Armstrong & Co.	G. Armstrong	H. Hackfeld & Co.	700/	J. Markle-overseer W. W. Weed-engr C.O. Johnson-bkpr D. Lyons-blacksmith Independent grower Akeo cultivates 120 leased acres.

GENUINE TABLE, 1878 Olowalu

(5) PAPA HILU I NA KAWA, 1878

TABLE of the Olowalu plantation, showing the names of the owners, managers, agents, and the number of acres, from 1876 to 1880. The table is divided into columns for each year and rows for each plantation. The data is as follows:

Year	Plantation Name	Owner(s)	Manager	Agent	Sqr/Acres	Misc.
1876	Olowalu Plantation	Goodale Armstrong Hilton Philip				
1877	West Maui Plantation (probably misnomer)	Goodale Armstrong Hilton Philip		M.G. Irwin		
1878	Olowalu Plantation	Goodale Armstrong Another half owner G. Armstrong & Co.	G. Armstrong	H. Hackfeld & Co.		Half interest sold for \$105,000
1879	Olowalu Plantation	G. Armstrong & Co.	G. Armstrong	H. Hackfeld & Co.		
1880	Olowalu Plantation	G. Armstrong & Co.	G. Armstrong	H. Hackfeld & Co.	700/	J. Markle-overseer W. W. Weed-engr C.O. Johnson-bkpr D. Lyons-blacksmith Independent grower Akeo cultivates 120 leased acres.

1881 Olowalu Plantation/ Olowalu Company	Franklin S. Pratt/ Inc. by F. Pratt, Hermann A. Widemann, Wm. F. Sharratt		G. W. McFarlane	Inc. May 5 \$150,00 1,500 shares Pratt sells 30.9 acres to O.C. May 12 for \$1,500 2-foot gauge rr authorized.
1882 Olowalu Plantation	Corporation		Hermann A. Widemann	rr track completed to Uku. - 3 miles (prob. mule driven)
1883 Olowalu Plantation	30.6% Brit. 37.5% Germ. 10/83 31.9% Hawn Heine 1/4, Conradt 1/4 late 83 Haneberg 1/4, Widemann 1/4		G. W. McFarlane	600 est/ Value: \$160,000 Port. immigrants 40 adults, 26 ch
1884 Olowalu Sugar Company	Corporation		W. G. Irwin	6 Port. immigrants 5 m, 1 w
1885 Olowalu Sugar Company	Corporation	(AK on Kauai)	W. G. Irwin	4 Port. immigr. men
1886 Olowalu Sugar Company	Corporation C.O. Berger, Eq. Secy.		W. G. Irwin	
1887 Olowalu Sugar Company	Corporation	August W. Haneberg	W. G. Irwin	149 laborers Hawn 10% Portuguese 13% Chinese 67% South Sea Islanders 7% Other 3% (not Jpn) Preferred labor: Jpnse & Chinese Value: \$150,000 155 laborers W. Fecola-Overseer F. E. Hartman-Bkpr W. Heine-Eng/Boiler
1888 Olowalu Sugar Company	48.3% American 16% British 28% German 3.3% Chinese 4.3% Chilean	A. Haneberg	W. G. Irwin	155 laborers Same staff 1 <sup>st</sup> steam locomotive Olowalu ordered
1889 Olowalu Sugar Company	48.3% American 16% British 28% German 3.3% Chinese 4.3% Chilean	A. Haneberg	W. G. Irwin	
1890 Olowalu Sugar Company	48.3% American 16% British 28% German 3.3% Chinese 4.3% Chilean	A. Haneberg	W. G. Irwin	950/ Value: \$150,000

1891 Olowalu Sugar Company	Corporation C. Bosse Secy	A. Haneberg	W. G. Irwin	760/	138 laborers F. Kohler-Bkpr M. McCann-Eng J. Schwartzing-Blr Chas. Davidson-Phys J. Dow-Overser
1892 Olowalu Sugar Company	Corporation	A. Haneberg	W. G. Irwin	859/	107 hands - 16 men plus few women operate mill Clear \$30,000
1893 Olowalu Sugar Company	34.3% American* 27.2% British* 32.3% German* 4% Other C. Bosse Secy	A. Haneberg	W. G. Irwin	702/	Ownership is ?? *Not Hawaiian born
1894 Olowalu Sugar Company	Corporation	A. Haneberg	W. G. Irwin	937/	
1895 Olowalu Sugar Company	Corporation	A. Haneberg	W. G. Irwin	905/227	
1896 Olowalu Sugar Company	Corporation	A. Haneberg	W. G. Irwin	1,163/229	147 laborers 5% Hawaiian 74% Jpns (61% m, 12% w) 21% Chinese

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1897 Olowalu Sugar Company	Corporation	A. Haneberg	Irwin & Co.	1,112/217	148 laborers 4% Hawaiian 77% Jpns (71% m, 6% w) 1% Other
1898 Olowalu Sugar Company	Corporation	A. Haneberg	Irwin & Co.	1,425/220	1 of 9 Maui pltns
1899 Olowalu Sugar Company	Corporation	A. Haneberg	Irwin & Co.	1,502/270	
1900 Olowalu Company	Corporation	A. Haneberg	Irwin & Co.	1,480/282	
1901 Olowalu Company	Corporation	Emil Kruse	Irwin & Co.	1,240/260	ground cane for the Maunalei Sugar Co. of Lana'i
1902 Olowalu Company	Corporation	George Gibb	Irwin & Co.	1,055/276	
1903 Olowalu Company	Corporation	George Gibb	Irwin & Co.	843/240	Crop short due to inefficiency of labor

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1904 Olowalu Company	Corporation	George Gibb	Irwin & Co.	1,125/270 Acres owned-98 Acres leased-7702 Acres in cane-400 4-mile track, 1 locomotive, 50 cars, 27 bldgs. Laborers: 120 Americans-2 Portuguese-1 Other Euro.-1 Havns.-6 Puerto Ricans-22 Jpns-82 Chinese-6 Labor needed: 45
1905 Olowalu Company	Corporation	George Gibb	Irwin & Co.	1652/285 2 <sup>nd</sup> replacent loco- motive ordered.
1906 Olowalu Company	Corporation	George Gibb	Irwin & Co.	1,635/320
1907 Olowalu Company	Corporation	George Gibb	Irwin & Co.	1,448/335
1908 Olowalu Company	Corporation	George Gibb	Irwin & Co.	1,765/365
1909 Olowalu Company	W. G. Irwin	George Gibb	Irwin & Co.	1,829/380

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1910 Olowalu Company	C. Brewer	George Gibb	C. Brewer	1796/372 W. G. Irwin merges with C. Brewer. Controls 900 acres of land. 2 locomotives, 50 cars, 6 miles of track, 9-roller mill.
1911 Olowalu Company	C. Brewer, pres. W. G. Irwin	George Gibb	C. Brewer	1,693/395 Paid 2 <sup>nd</sup> dividend
1912 Olowalu Company	C. Brewer, pres. W. G. Irwin	George Gibb	C. Brewer	1,707/355
1913 Olowalu Company	C. Brewer, pres. W. G. Irwin	James Campsie	C. Brewer	1,738/353
1914 Olowalu Company	C. Brewer, pres. Richard Ivers	James Campsie	C. Brewer	2,026/345
1915 Olowalu Company	C. Brewer, pres. Richard Ivers	Alexander Valentine	C. Brewer	2,173/329 Drought
1916 Olowalu Company	Pres. R. Ivers	A. Valentine	C. Brewer	1,850/365
1917 Olowalu Company	Pres. R. Ivers	A. Valentine	C. Brewer	1,974/356 Drought

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1918 Olowalu Company	Pres. Ivers/ Edward Irwin Spalding	A. Valentine	C. Brewer	1,999/354	W. Giffard sells 153 acrs to Brewer. Completes 12-roller mill. Acqs 13 acres. Blds new warehouse. Extends rr to 4mils.
1919 Olowalu Company	Pres. E. Spalding	A. Valentine	C. Brewer	1705/364	New mill grinds.
1920 Olowalu Company	Pres. E. Spalding	A. Valentine	C. Brewer	2,090/365	Main camp laid out in street lines. Drought
1921 Olowalu Company	Pres. E. Spalding	A. Valentine	C. Brewer	1,884/370	Affected by drought. C. Brewer sells to O. C. 615 acres in cultivation. 13,000 acres under lease. E. Haneberg bkpr/chem Fred Walker-engr David Kinney bkr Joe Botelho/Joe Rickard -lunas
1922 Olowalu Company	Pres. E. Spalding	A. Valentine	C. Brewer	1,739/363	
1923 Olowalu Company	Pres. E. Spalding	A. Valentine	C. Brewer	1,883/364	
1924 Olowalu Company	Pres. E. Spalding	A. Valentine	C. Brewer	2,289/367	

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1925 Olowalu Company	Pres. E. Spalding	A. Valentine	C. Brewer	2,065/371	
1926 Olowalu Company	Pres. E. Spalding	A. Valentine/ Eugene Haneberg	C. Brewer	2,262/370	
1927 Olowalu Company	Pres. E. Spalding	E. Haneberg	C. Brewer	2,437/369	
1928 Olowalu Company	Pres. E. Spalding	E. Haneberg	C. Brewer	2,588/375	
1929 Olowalu Company	Pres. E. Spalding	E. Haneberg	C. Brewer	2,728/408	1 of 6 haul pltns.
1930 Olowalu Company	Pres. E. Spalding	E. Haneberg	C. Brewer	2,967/373	replaced steam locomotive with gasoline
1931 Olowalu Company	Pres. Allen W. T. Bottomley	E. Haneberg	C. Brewer		sold to Pioneer Mill

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**OLOWALU SCHOOL CHRONOLOGY**  
**1881-1932**  
 Draft 8/13/99

YEAR	TEACHERS/SALARY/ NATIONALITY	STUDENTS M/F TOTAL	GRADES	FACILITIES	MISCELLANEOUS
1881-1882	S. Kamakahiki	17/8 25			Common school-Hawaiian speaking
1882-1883	S. Kamakahiki	less than 25			Hawaiian speaking
1883-1884	S. Kamakahiki	less than 25			Hawaiian speaking
1884-1885	S. Kamakahiki				Hawaiian speaking
1885-1886	S. Kamakahiki	9/7 16		\$200 expended on bldg	Hawaiian speaking
1886-1887	S. Kamakahiki				Hawaiian speaking
1887-1888	S. Kamakahiki	14/10 24			Hawaiian speaking
1888-1889					Hawaiian speaking
1889-1890	Mrs. Robt Newton	17/18 35		Building enlarged	Converted into English language school, causes increase in enrollment
1890-1891					Budget: \$416.50 (for 1890-1892)
1891-1892	H. Halliworth/ \$500/British	13/13 26	"chiefly very young"		Budget: \$416.50 (for 1890-1892)
1892-1893	H. Halliworth/ \$500/British				Budget: \$626.66 (for 1892-1894)

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School Chronology - page 2

1893-1894	H. Halliworth/ \$500/British	14/12 26		Building in good condition. Lot is neat & tidy.	Budget: \$626.66 (for 1892-1894)
1894-1895					
1895-1896	D. Kanevanui	14/17 31			
1896-1897	W. K. Maipo/ \$480/Hawn				
1897-1898	W. K. Maipo/ \$480/Hawn	15/14 29			99% Attendance, \$16.55 cost of tuition per capita
1899-1900	Miss Laura R. Fell/\$300/Hawn	13/18 31			\$9.68 cost of tuition per capita
1900-1901	William Hoopii/ \$300/Hawn	9/14 23			
1901-1902	William Hoopii/ Hawn/\$360				
1902-1903	William Hoopii/ Hawn/\$360	24/20 44			81% Attendance
1903-1904	William Hoopii/ Hawn/\$360			Combined school house & cottage to come out of Loan Fund for 2 years ending 6/30/07	
1904-1905	William Hoopii/ Hawn/\$360	21/23 44			73% Attendance

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School Chronology - page 3

1905-1906	William Koopii/ Hawn/8360				
1906-1907	Ms. K. Koopii/ Hawn/8360	29/19 42		New bldg needed	Daily average attendance - 39
1907-1908	Ms. K. Koopii			Secured title for new site	
1908-1909	Ms. K. Koopii/ Hawn/8480	26/21 47	Fourth grade at most	New building	Average daily attendance-40
1909-1910	Ms. K. Koopii/ Hawn/8480			1 framed room	
1910-1911	Ms. K. Koopii Hawn/8480 One additional teacher proposed	35/27 62	Rec'g 1,2,3,4	1 framed room, 1 additional framed room & cottage needed (\$800 each)	Average daily attendance - 54
1911-1912	Ms. K. Koopii/ Hawn/8600				
1912-1913	Ms. K. Koopii/ Hawn/8600 Frank K. Koopii/ Hawn/8600	45/46 91			Average daily attendance - 77
1913-1914					

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School Chronology - page 4

1914-1915	Miss Annie P. Chung/Part Hawn/ \$1,000 Mrs. Lillian P. Hiram	42/48 90			Average daily attendance - 80
1915-1916					
1916-1917	Miss Olive T. Siple/Am/8720 Miss Beattie McCracken/Am/8720	29/36 65			Average daily attendance - 59
1917-1918					
1918-1919	Miss Teulan V. Choy/\$1,056 Miss Kinu (Kinu?) Yoshimi/8480	25/30 55			Average daily attendance - 55
1919-1920					
1920-1921	Miss Shiquyo Karamoto (acting) Mrs. Margaret Valentine	37/29 66			Average daily attendance - 64
1921-1922					
1922-1923	Mellie R. Walker Louie Camara	37/36 73 37 (Pr, Recg, 1,2) 36 (3,4,6)			

School Chronology - page 5

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1923-1924	Samuel K. Mookini, principal Second teacher		
1924-1925	Samuel K. Mookini Second teacher	67	1-6
1925-1926			
1926-1927			1.98 acres worth \$200 Bldg worth \$4,140
1927-1928			
1928-1929		55	Land worth \$200 Bldg worth \$4,400 Equipmt & Furn worth \$1,213. 1 main bldg, 2 class-rooms 23"x23", 1 tchrs cottage
1929-1930			
1930-1931		32/27	59
			Play space, drinking fountains, etc. rated very good per capita. Value of real estate, etc. same.
1931-1932	Mrs. Rosina C. Crone	37	

Closed on January 4, 1932.  
Students attend Kamehameha III School in Leleina

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*Plantation continued.*

100  
101  
Labor worked steadily previous to Association.

No. Labor has been rather unpetited; very few would give a fair day's work.

As the Territory of Hawaii is now being developed by the introduction of the Chinese laborer to the Territory of Hawaii, it is necessary that the Government should take steps to protect the interests of the Chinese laborer and to prevent the Territory of Hawaii from being swamped by the Chinese laborer.

A solution of the labor problem would, in my opinion, be effected by introducing or legislating so as to allow Chinese laborers in the Territory.

We get rain on the cane lands once or twice per year, and have to depend on guich water with what the wells give us to tide the crop over the summer months. About two months per year, we get sufficient water from the guiches to supply the growing crops, but from August to November inclusive, the wells get dry if pumped continuously for 24 hours, and we have to stop the pumps at night to allow the wells to fill up to a certain extent.

Most of our wells being gravelly, require water every seven days.

Done this 21st day of November 1931 at Honolulu.

(Signed) George Gibb.

We the undersigned, members of the Honolulu Trades and Labor Council and the Builders and Traders Exchange, on the report of the Honorable George Gibb, Chairman of the Committee on Labor and Industrial Relations, hereby certify that on the 10th day of October A. D. 1931, we read the above statement, and that we believe that the same contains the facts as they were properly ascertained, although the Committee, by this certification, does not bind itself as endorsing the views expressed in these individual reports.

HONOLULU TRADES AND LABOR COUNCIL COMMITTEE

*Thomas Mahan* Chairman  
*William H. Hagan* Secretary

THE BUILDERS AND TRADERS EXCHANGE COMMITTEE

*Richard L. ...* Chairman  
*Arthur ...* Secretary

133

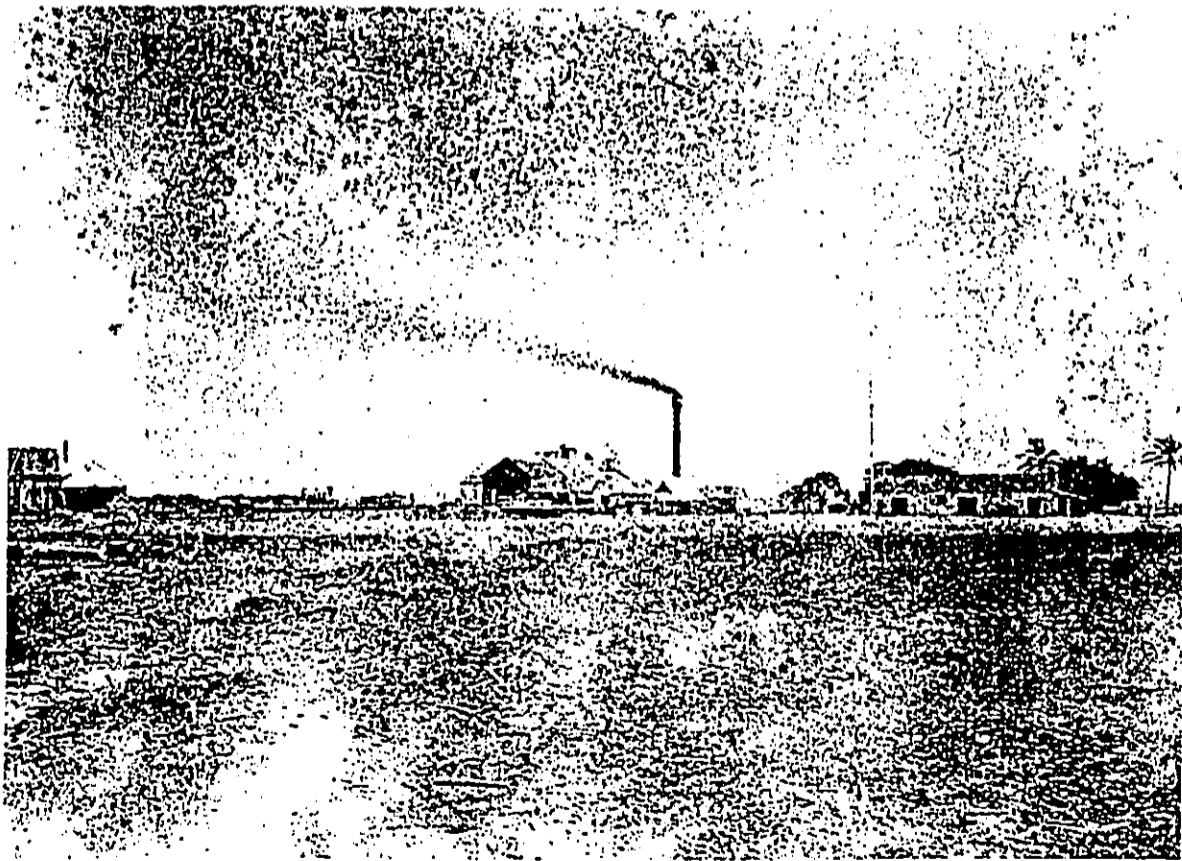






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1916 - Old Mill



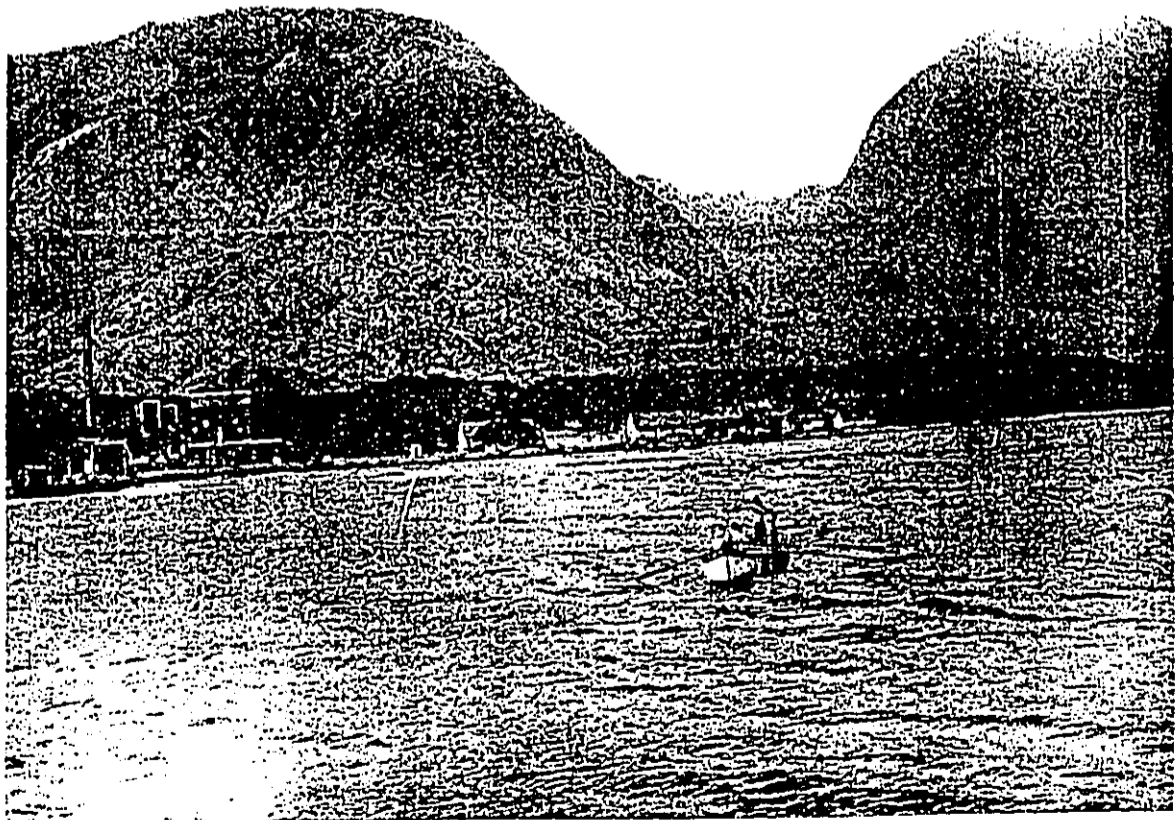
139

DOWELL MILL FROM HIGHWAY



141

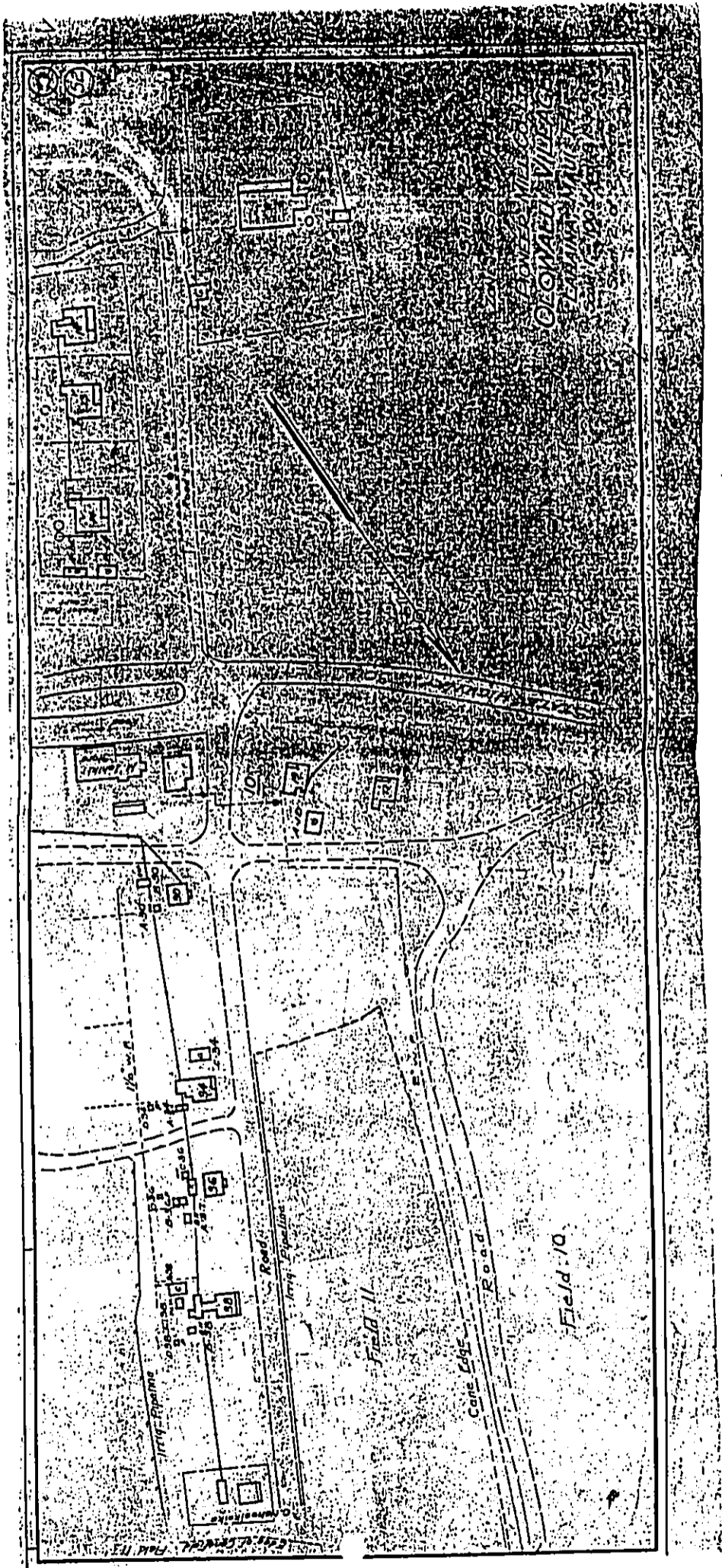
VALLEY + MARINA BRIDGE



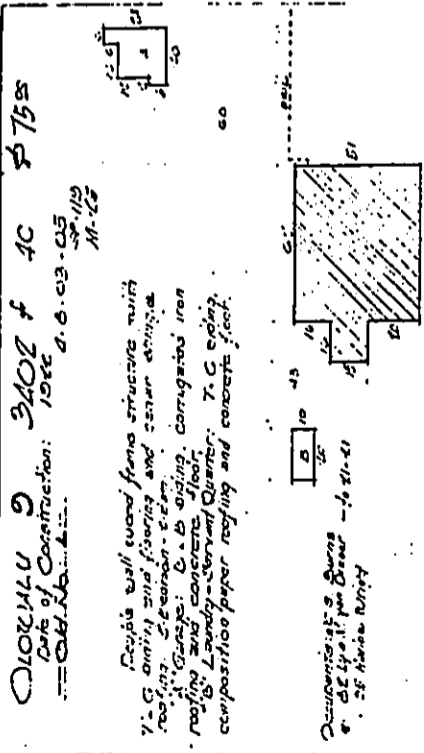
142

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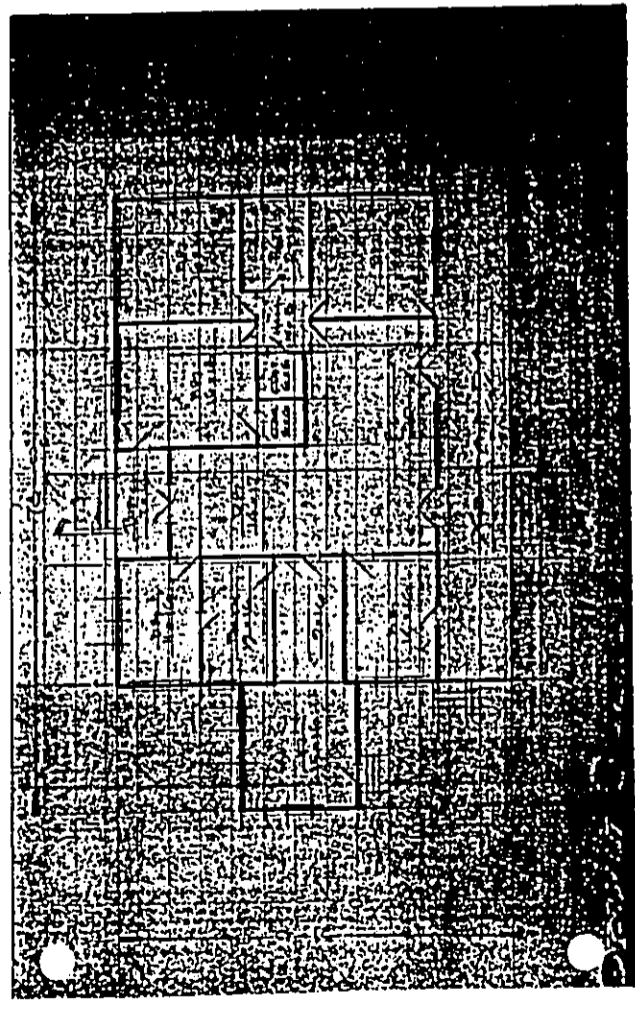




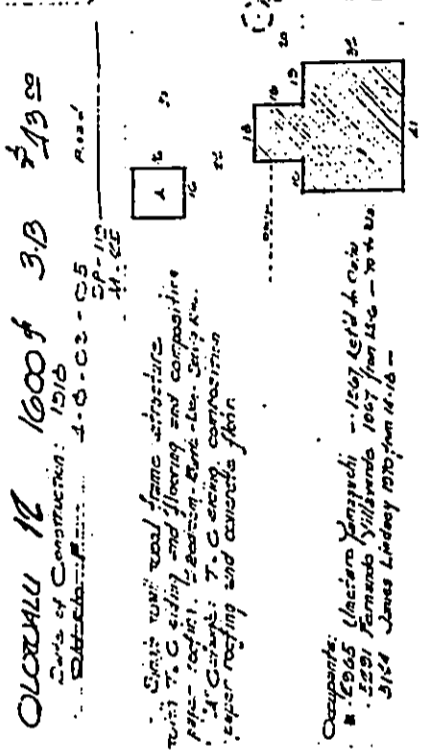




Scale: 1" = 50' 0"

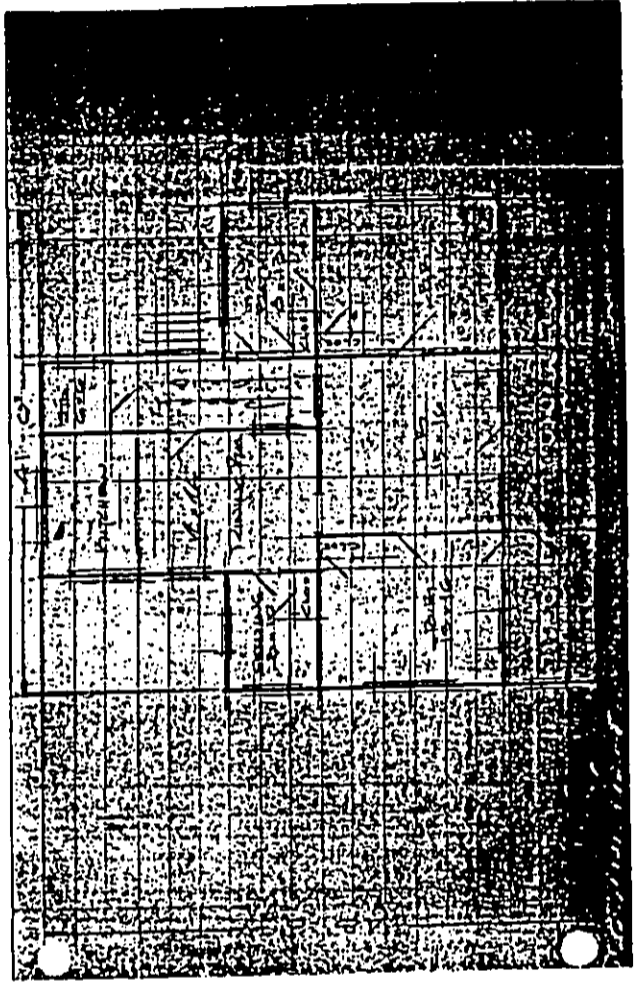


144



Occupants:  
 M. 1905 (Macrina Yampyochi - 1907 left & died)  
 1909 Fernando Villaverde 1907 from 1906 - 1914  
 1914 James Lindsey 1910 from 1910 -

Scale: 1" = 40' 0"

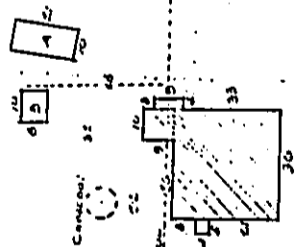


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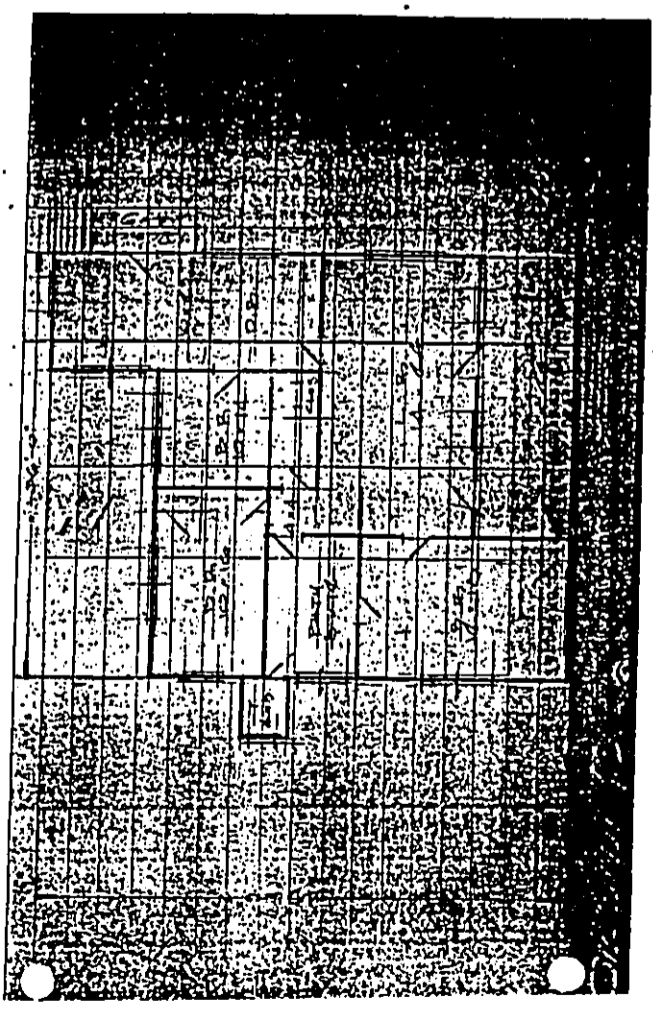
**OLYMPIA 13** 1442 f 3-C 747 3E

Date of Construction: 1915  
 Date of Drawing: 11-19-15  
 Scale: 1" = 10'-0"

Single wall wood frame structure with T. C. siding and flooring and composition paper roofing. S. L. Simpson, Architect, Olympia, Wash. 1915. Construction by: E. J. Smith, Olympia, Wash. 1915.



Scale: 1" = 10'-0"

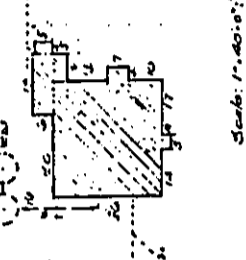


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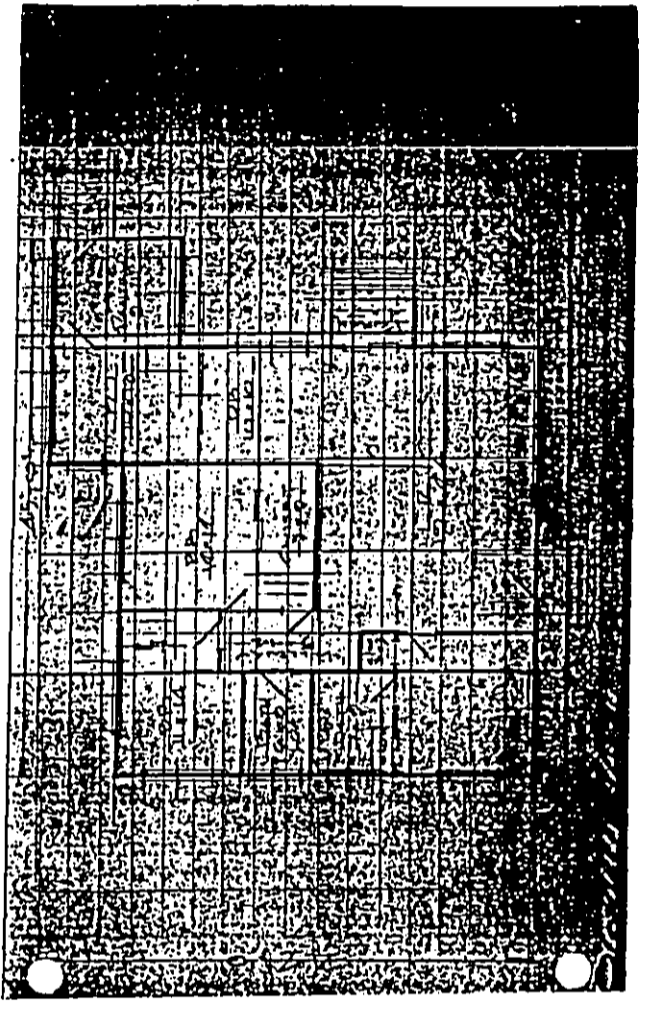
**OLYMPIA 14** 1522 f 3-C 746 3B

Date of Construction: 1916  
 Date of Drawing: 11-19-15  
 Scale: 1" = 10'-0"

Single wall wood frame structure with T. C. siding and flooring and composition paper roofing. S. L. Simpson, Architect, Olympia, Wash. 1916. Construction by: E. J. Smith, Olympia, Wash. 1916.



Scale: 1" = 10'-0"



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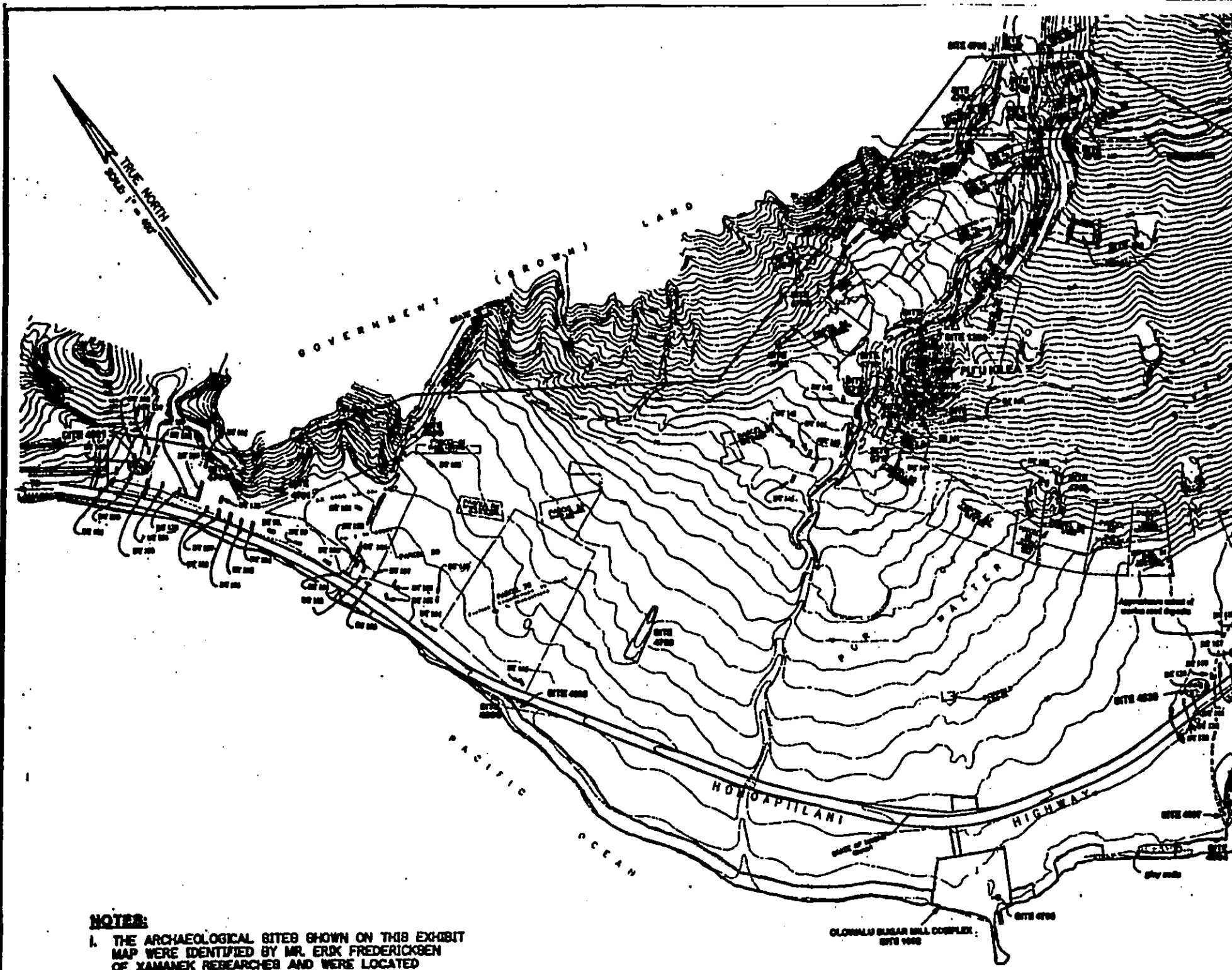




# Olowalu, Lahaina, Maui

Existing Potable Water System  
Existing Ditch System  
Appx. Boundary for Conservation District

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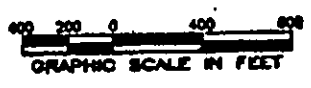


- NOTES:**
1. THE ARCHAEOLOGICAL SITES SHOWN ON THIS EXHIBIT MAP WERE IDENTIFIED BY MR. ERK FREDERICKSEN OF XAMANEK RESEARCHES AND WERE LOCATED ON THE GROUND DURING THE MONTH OF APRIL, 1999.
  2. KULEANAS AS SHOWN ARE APPROXIMATE.

Prepared for: **OLOWALU ELUA ASSOCIATES, L.L.C.**  
173 Hoonana Street, Suite 201  
Kahului, Hawaii 96732

**ARCHAEOLOGICAL SITES LOCATION**  
**OLOWALU MAUKA AND MAKAI PROPERTIES**  
**AT OLOWALU, LAHAINA, MAUI, HAWAII**

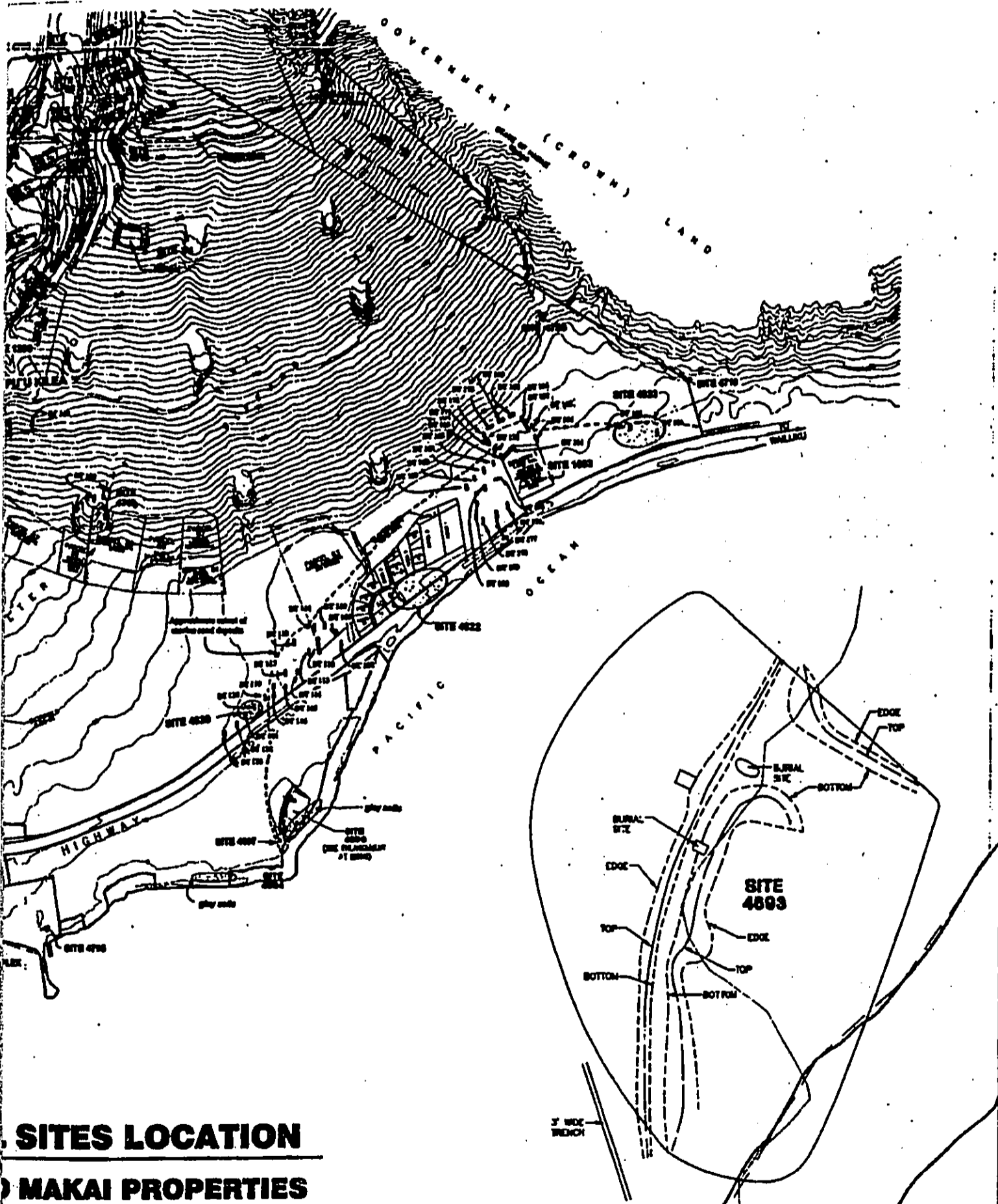
SCALE: 1 in. = 400 ft.



See Map Key (B) 4-8-03  
871 KOLU STREET, SUITE 201  
WAILUOLI, MAUI, HAWAII 96793

**R. T. TANAKA ENGINEERS, INC.**  
LAND SURVEYORS - CIVIL & STRUCTURAL ENGINEERS

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**SITES LOCATION**

**MAKAI PROPERTIES  
MAUI, HAWAII**

1" = 400 ft.

**ENLARGEMENT - SITE 4893**

SCALE 1" = 40'

REVISED: JULY 08, 1988  
REVISED: JULY 01, 1988  
APPROX. 30, 1988  
JOB NO. 88-0

**ENGINEERS, INC.**  
STRUCTURAL ENGINEERS

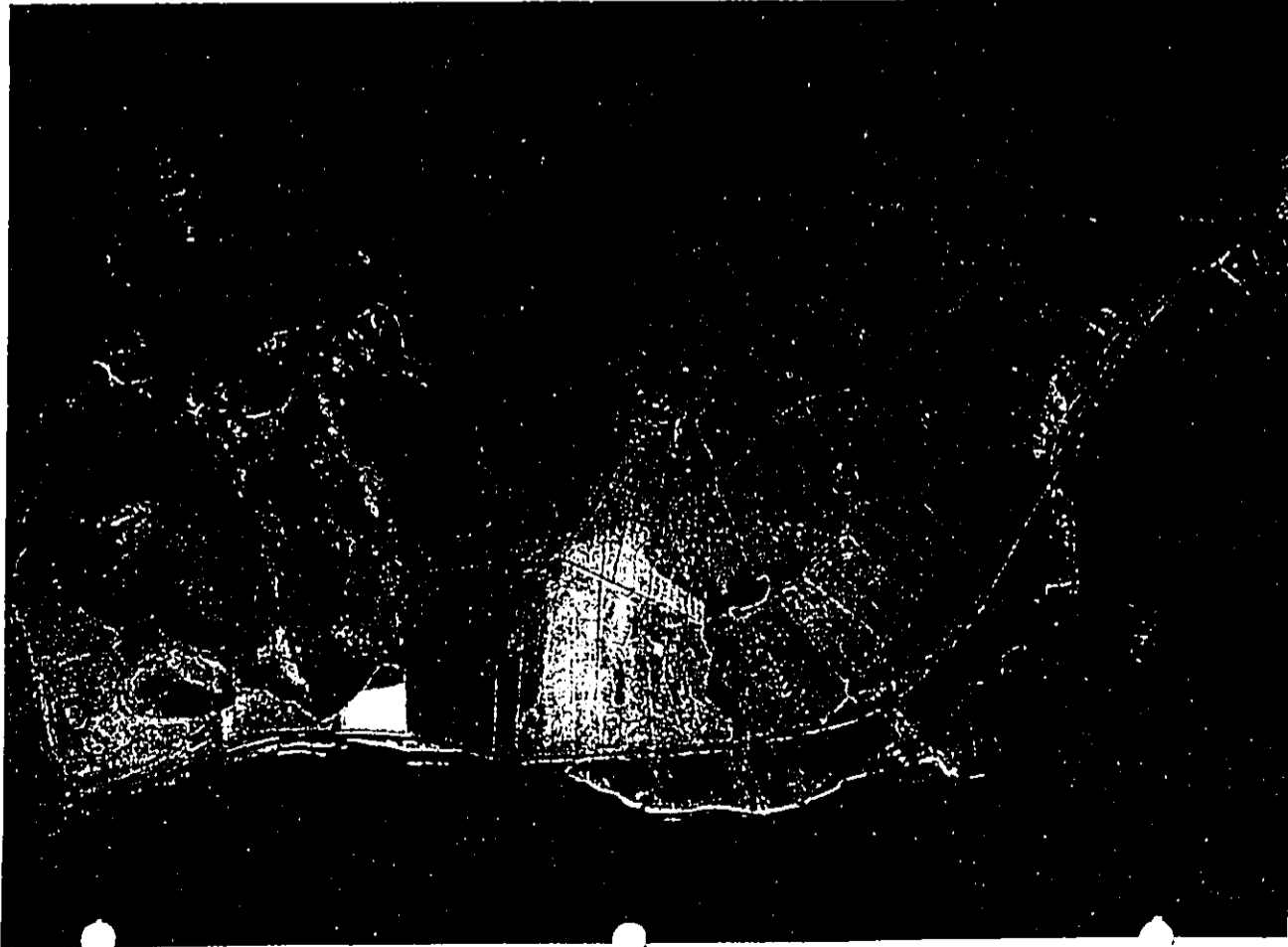
# ***Appendix B-1***

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***Archaeological Inventory  
Survey for Makai Area***







## ABSTRACT

Xamanek Researches carried out an archaeological inventory survey on the c. 73 acre *mukut* portion of Olowalu *aihi* in Lahaina District, Maui Island in late 1998 and early 1999. A total of 6 previously unrecorded sites were found during the survey. These were assigned SHIP Numbers 30-50-08-4693 through 4698. In addition, the ruins of the Olowalu Sugar Mill (Site 1602) also lie within the study area. Site 4693, a precontact burial ground, is considered to be the most significant cultural resource on the subject parcel. Other sites include a probable precontact wall remnant partially enclosing a habitation area (Site 4694); a probable post-contact sea wall (Site 4695); a remnant of the Old Government Road, which followed the route of the traditional Piliam coastal trail (Site 4696); a probable early post-contact subsurface habitation deposit (Site 4697); and a late precontact subsurface habitation deposit (Site 4698). All of the above sites qualify for significance under Criterion D of the Federal and State historic preservation guidelines.

The Olowalu Sugar Mill (Site 1602) also is deemed significant under Criterion A. Finally, the Site 4693 burial ground qualifies for significance under Criterion E—for its traditional cultural value.

Preservation is the recommended mitigation for the Site 4693 burial ground, the Site 4694 structure, and the Olowalu Sugar Mill. Additional research is being conducted by an independent historic researcher contracted by Olowalu Elua Associates for an interpretative exhibit about the Sugar Mill. Sites 4695 and 4696 both lie in the Beach Reserve and are considered to be no longer significant. However, because of their location, they will not be affected by development plans. Proximity to the burial preservation area makes preservation for Site 4697 an appropriate mitigation. As well, the location of precontact habitation area (Site 4698) between the Manager's house and the Olowalu Mill ruins places it in an area with will not be developed, and thereby preservation will be accomplished. Archaeological monitoring of earth altering activities in the near-shore area between Hekili Point and the former manager's house is also recommended, because of the presence of sand deposits next to the Beach Reserve.

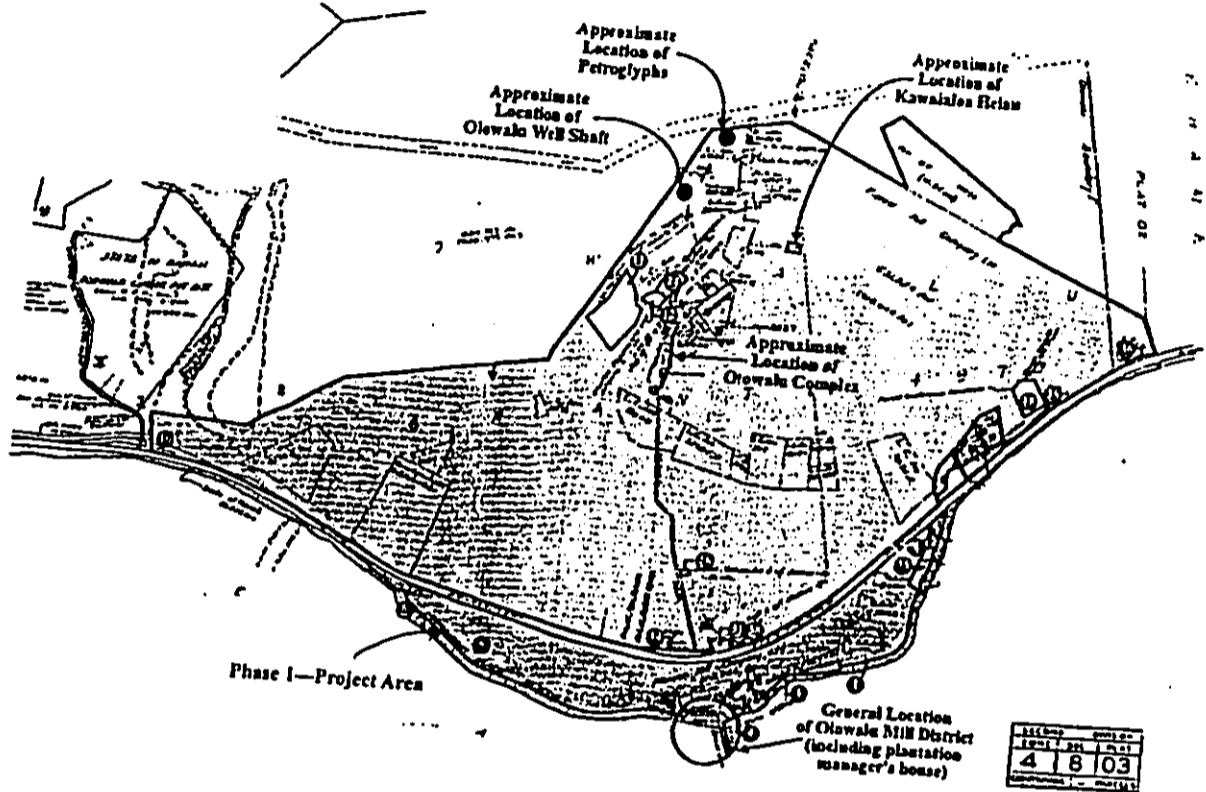
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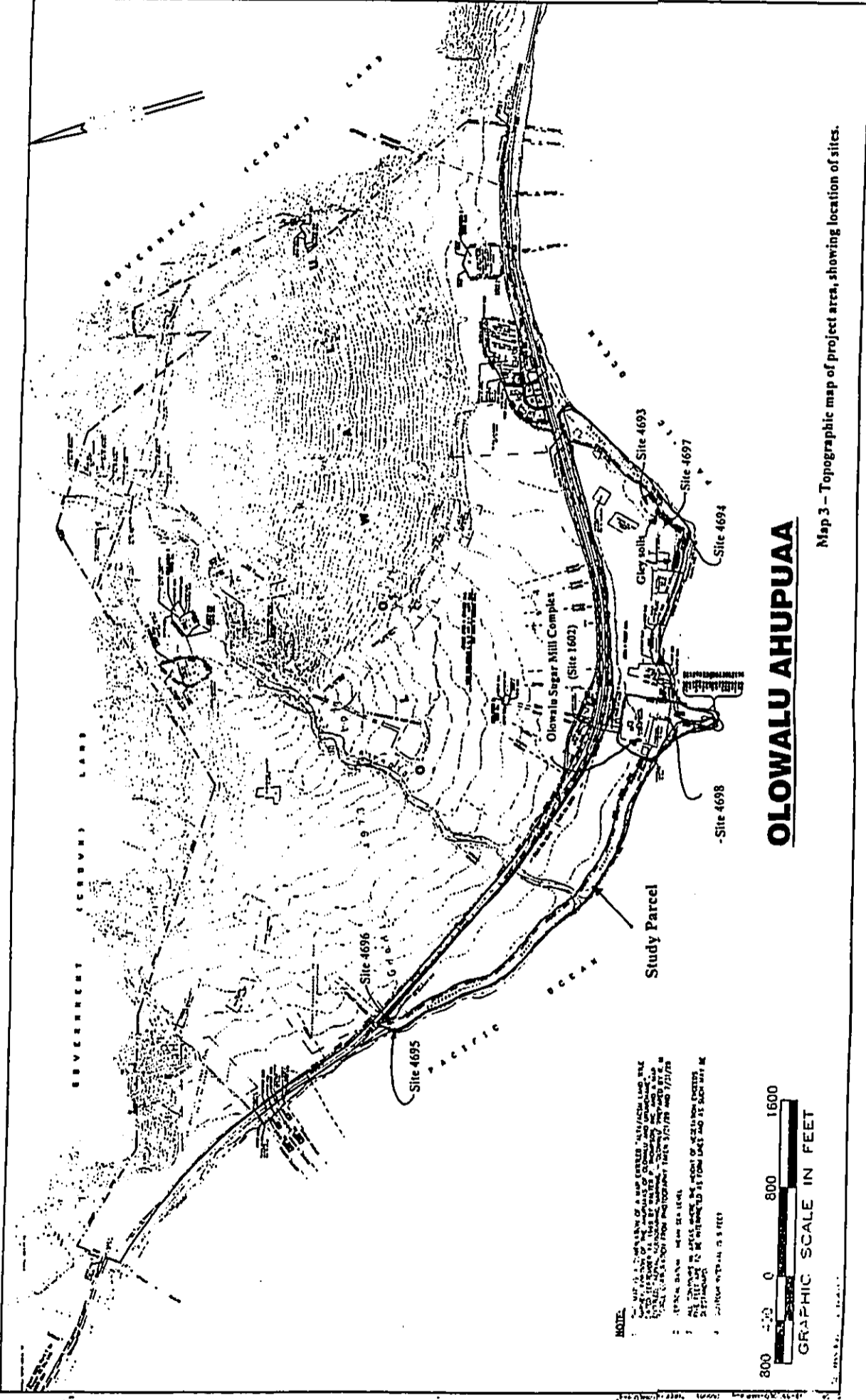


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Map 2 - Tax Map, Zone 4, Section, Plat 3. State of Hawaii.

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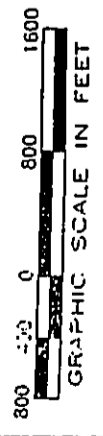


# OLOWALU AHUPUAA

Map 3 - Topographic map of project area, showing location of sites.

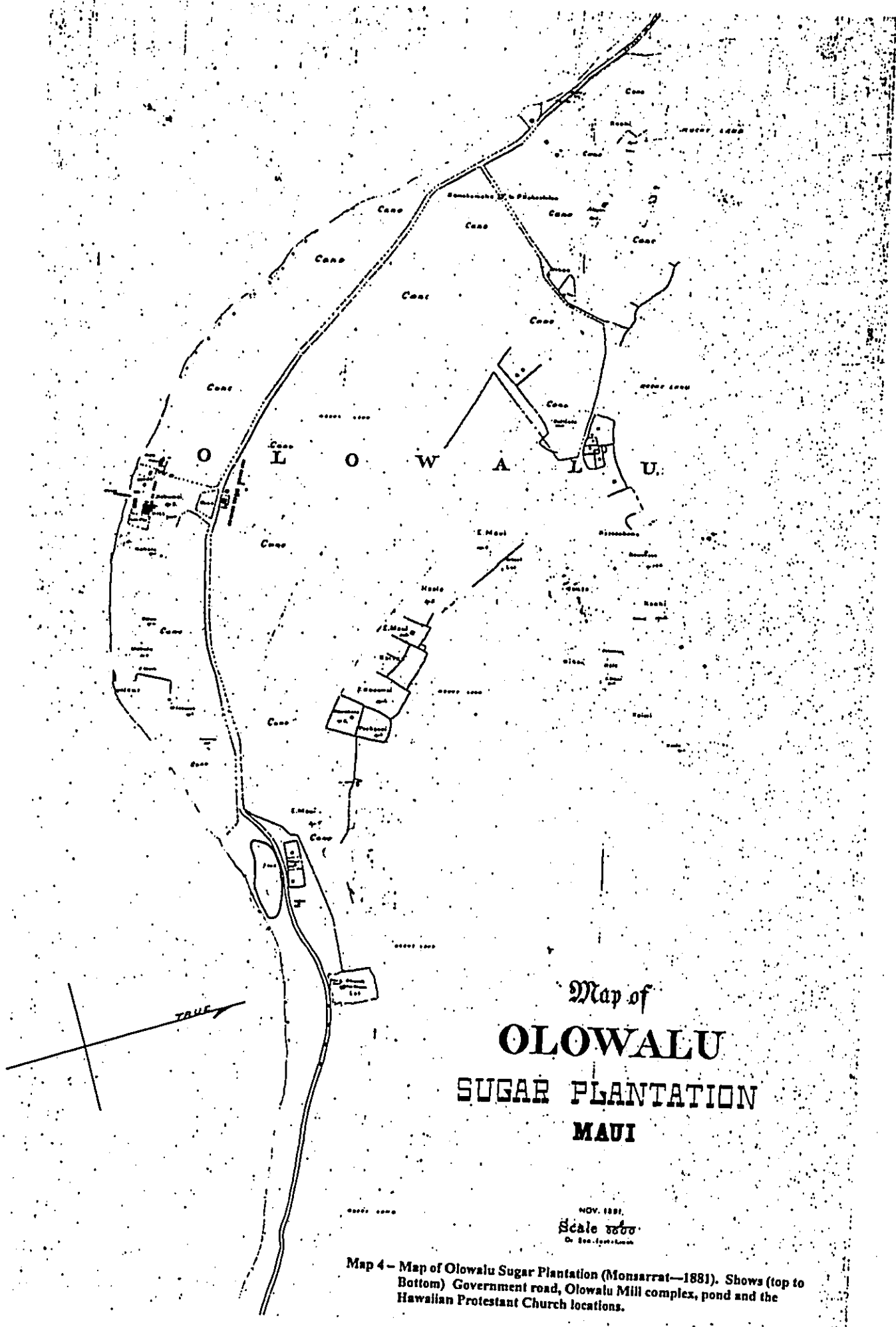
NOTE:

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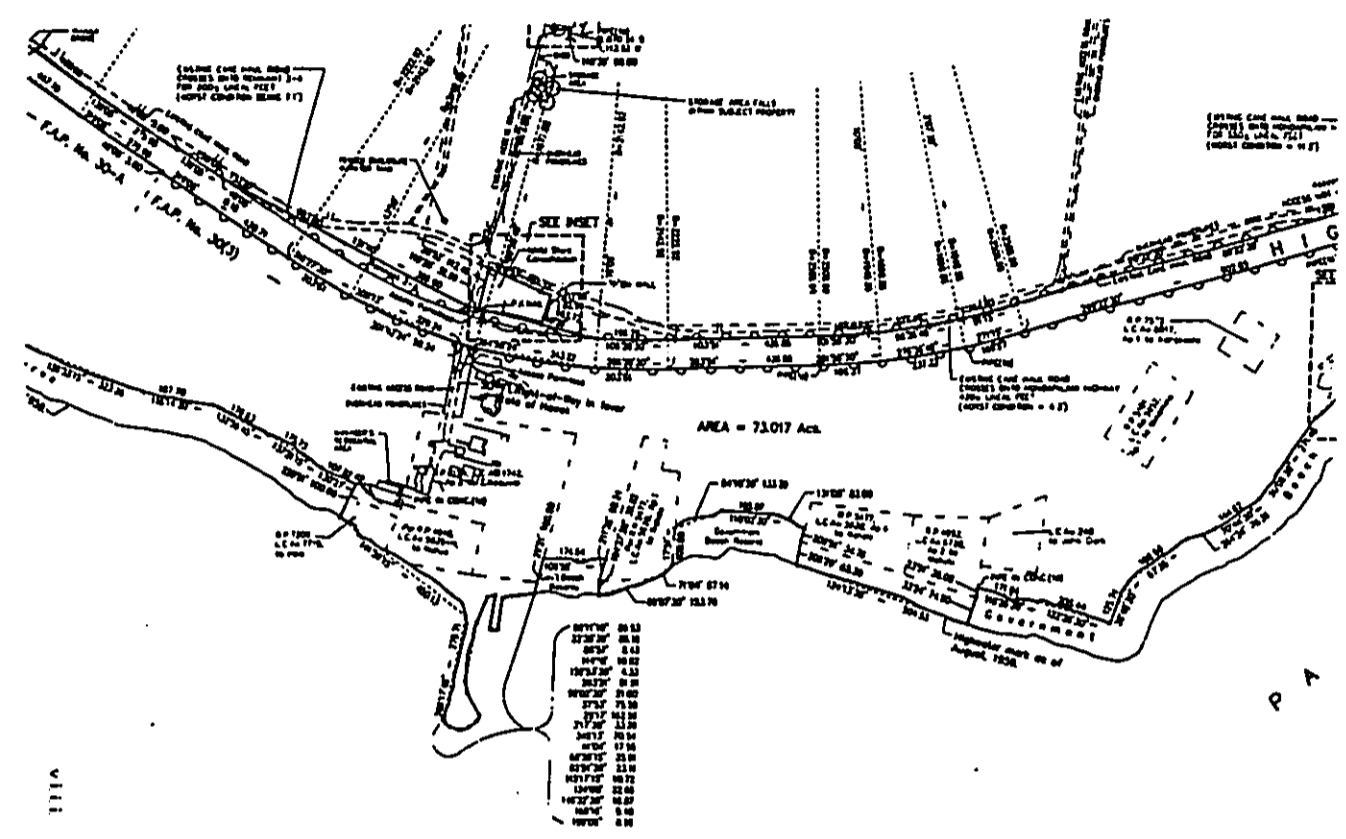
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100

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Map 4 - Map of Olowalu Sugar Plantation (Monsarrat-1881). Shows (top to Bottom) Government road, Olowalu Mill complex, pond and the Hawaiian Protestant Church locations.

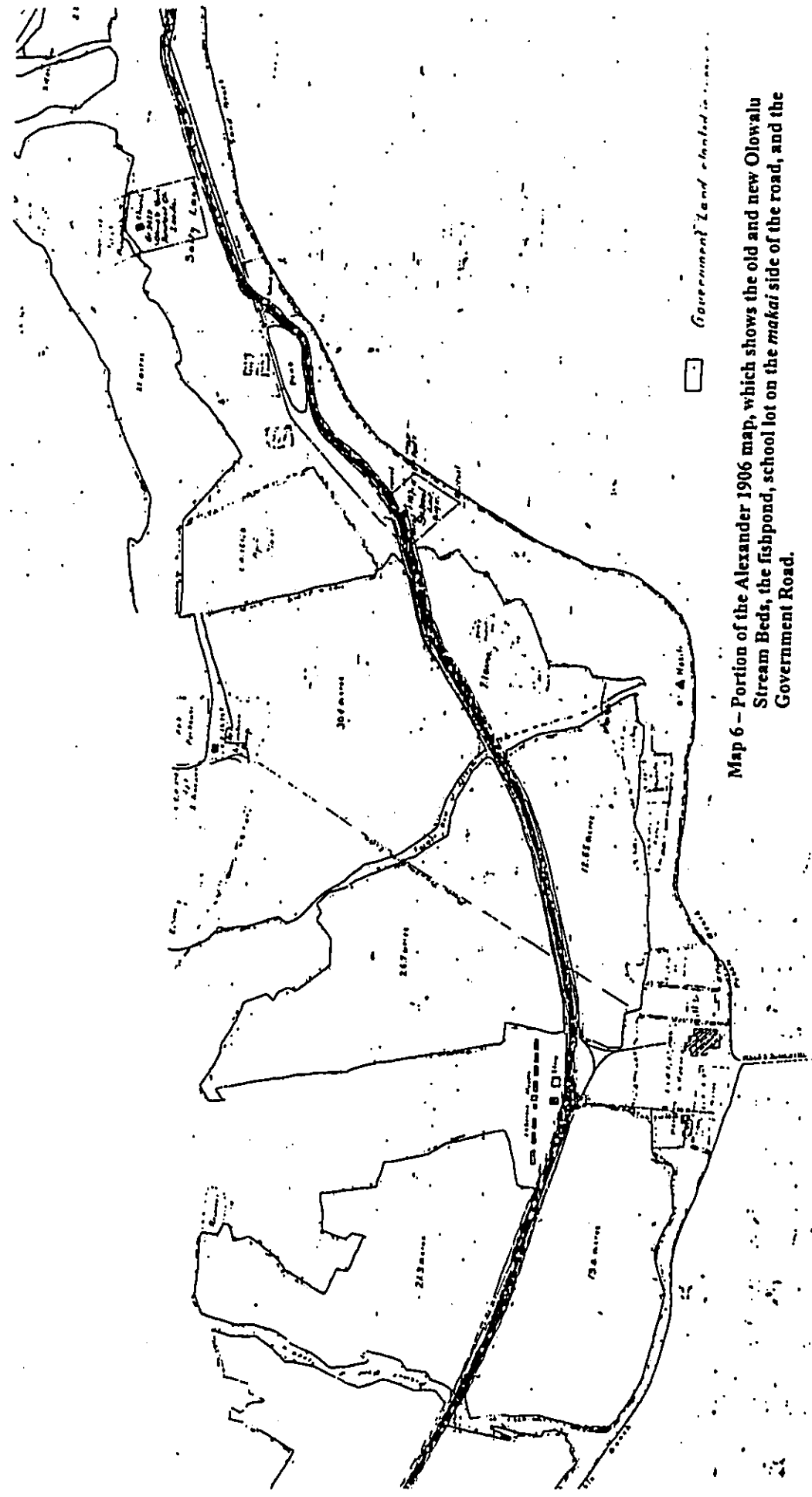
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Map 5 - Location of Land Commission Awards present in study area.

3 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100

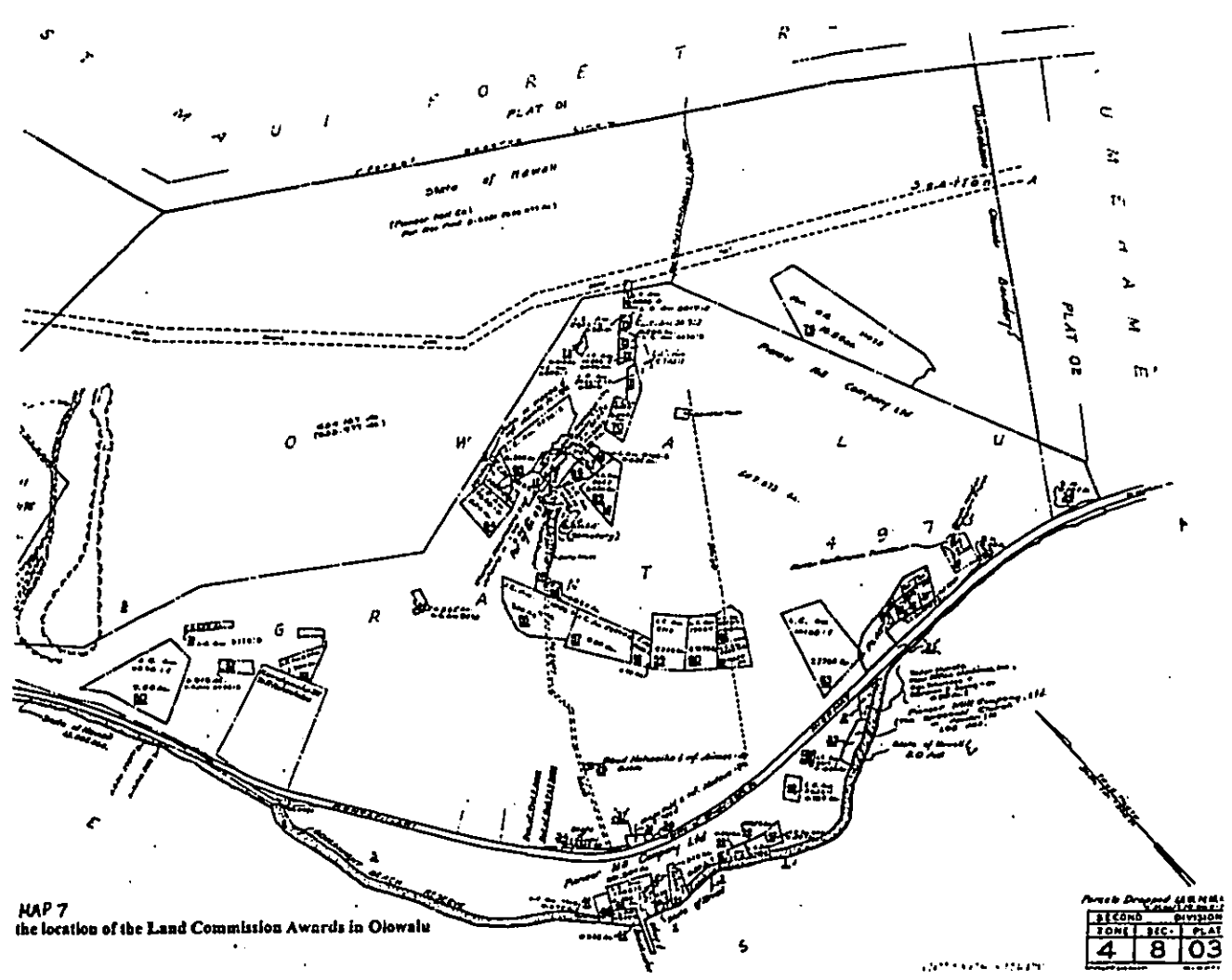
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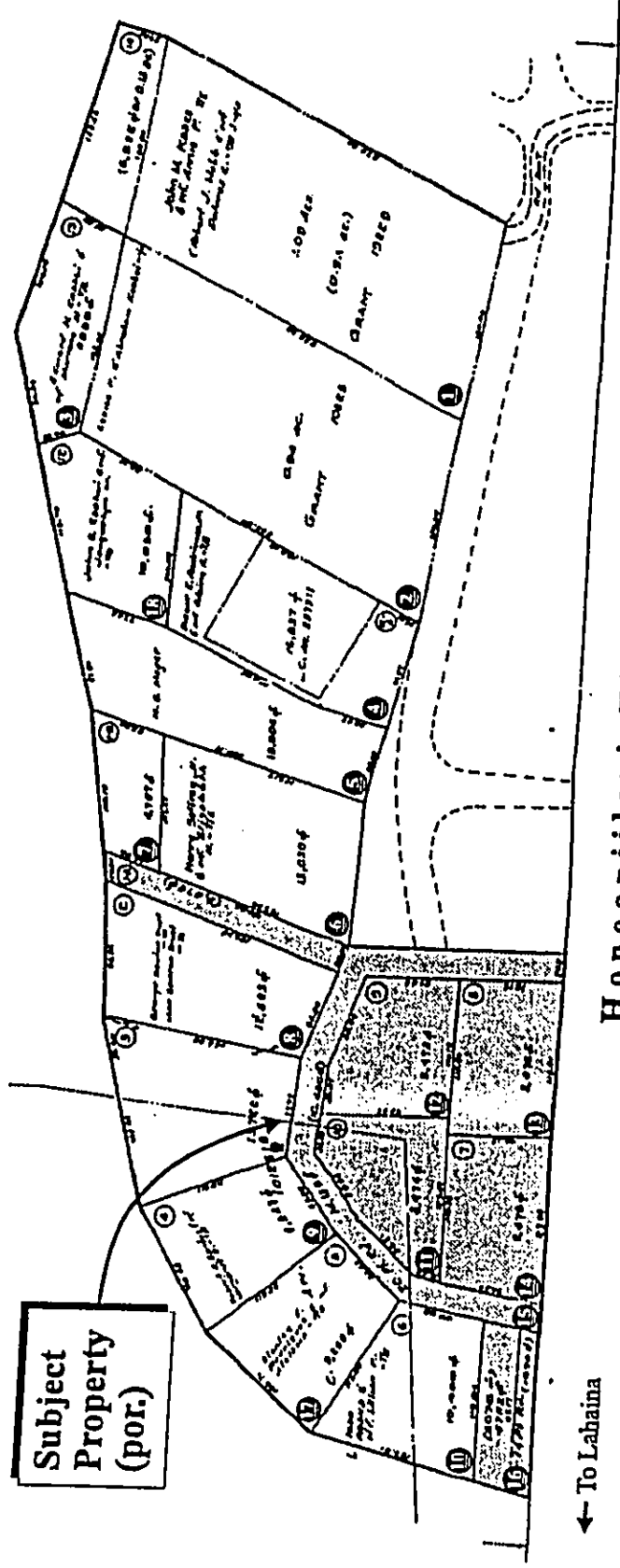
Map 6 - Portion of the Alexander 1906 map, which shows the old and new Olowalu Stream Beds, the fishpond, school lot on the makai side of the road, and the Government Road.



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PLAT 03



← To Lahaina

Honopilani Highway

To Waituku →

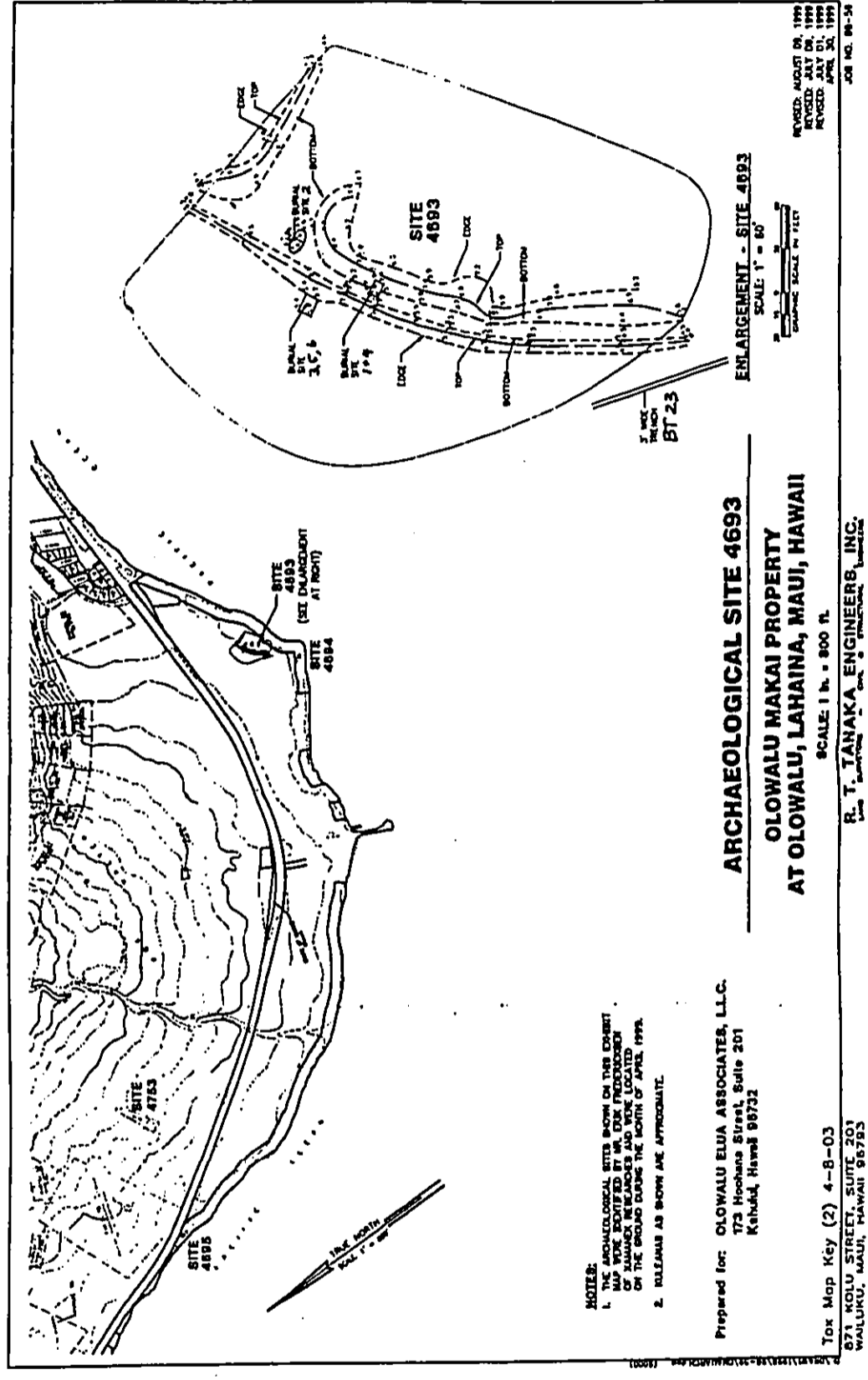
PLAT 03

DEPARTMENT OF THE TAX COMMISSIONERS			
TAXATION MAPS BUREAU			
TERRITORY OF HAWAII			
TAX MAP			
1948	1949	1950	1951
4	8	0	4
CONTAINS 1951-53			

Note: All lots owned by Adeline Rodriguez

Map 8 - Tax Map showing the location of informant, Ms. Adeline Rodriguez' property (Lot 4) in Olowalu Subdivision. It includes LCA 8573, Apana 1 to Kailiula. Apana 2 is noted as "faro land" and is located west of Olowalu Stream between 75 and 85 feet AMSL.

OLOWALU SUBDIVISION, OLOWALU, LANAI, MAUI.



NOTES:  
 1. THE ARCHAEOLOGICAL SITES SHOWN ON THIS EXHIBIT ARE THE RESULT OF RESEARCH CONDUCTED BY SAHARU RESEARCHERS AND WERE LOCATED ON THE GROUND DURING THE MONTH OF APRIL, 1999.  
 2. RELEASES AS SHOWN ARE APPROXIMATE.

Prepared for: OLOWALU ELUA ASSOCIATES, L.L.C.  
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 Kahului, Hawaii 96732

**ARCHAEOLOGICAL SITE 4693**  
**OLOWALU MAKAI PROPERTY**  
**AT OLOWALU, LAHAINA, MAUI, HAWAII**

Top Map Key (2) 4-8-03  
 871 KOLU STREET, SUITE 201  
 WAILUKU, MAUI, HAWAII 96793

R. T. TANAKA ENGINEERS, INC.  
 1000 S. W. 10TH AVENUE, SUITE 200  
 MIAMI, FLORIDA 33135

Map 9 -- Topographic map showing the location of Site 4693 Burial Preservation Area.

REVISED: AUGUST 04, 1999  
 REVISED: JULY 01, 1999  
 REVISED: APRIL 01, 1999  
 JOB NO. 99-54

0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100

## INTRODUCTION

We were contacted in September 1998 by Mr. Robert Horrajo, Project Manager, Olowalu Elua Associates, Kahului, Maui about conducting an archaeological inventory survey on a c. 730-acre portion of land in Olowalu, Maui. This large area consists of lands formerly owned by Pioneer Mill Company, Ltd., a subsidiary of AmFac/JMB Hawaii, Inc.

The bulk of the overall project area is comprised of lands in the Olowalu *ahupua'a*, while a c. 5-acre portion at the southeastern end of the study area lies in the overall project in October 1998. Subsequently, we were asked to conduct the inventory survey for the 730-acre project area in 2 phases. Phase 1 was to consist of an inventory survey of the land *makai* (south) of Honoapi'iiani Highway, and Phase 2 was to include the land *mauka* (north) of the highway. The subject property is located approximately 14.5 miles from Waituku and 5.5 miles from Lahaina.

This report presents the inventory survey level results for Phase 1—the *makai* (c. 73 acres) portion of the overall project area (TMK 4-8-3; por. 5). Some of the details of historic background research on settlement patterns and land usage patterns for the entire project could not be included in this report, as the research was on-going by Ms. Gail Ainsworth. Ms. Ainsworth was hired by Olowalu Elua Associates to gather information on the Olowalu Mill and plantation era, which is to be used in an interpretative exhibit. Background information which is pertinent to both the *makai* and *mauka* archaeological inventory surveys is included in the Olowalu *mauka* (Phase 2) report (Fredericksen and Fredericksen, February 2000). The reader is referred to that report for additional data concerning these topics.

## STUDY AREA

The Olowalu project lies along the flank of the West Maui Mountains. The *makai* portion of the overall study area, which is the focus of our Phase 1 survey, lies to the south of Honoapi'iiani Highway and is bounded by the ocean. It essentially consists of alluvial deposits, marine sand deposits, and an active beach shoreline. Please refer to the aerial photograph at the beginning of this report.

Most of the *makai* section has been under sugar cane cultivation for many years. However, a relatively narrow strip (10 to 40 meters wide) of Government Beach Reserve land has been left vacant. This Reserve extends parallel to the shoreline and is not part of the subject property. However, it was also surveyed at the request of Olowalu Elua Associates. Although the exact width of the beach reserve varies with shoreline accretion and erosion, these lands are considered to be public lands. The strip of the *makai* project property nearest to the ocean is moderately to densely vegetated. The current, channelled Olowalu Stream flows through the property and drains into the ocean (Photo 1). Three cottages and the former sugar plantation manager's house are located on the central portion of the property relatively near the ocean. In addition, Camp Pecusa, an Episcopalian religious retreat center, is located in the southeastern part of the parcel.

### Natural History

The study area is located along the Olowalu shoreline and extends up to 250 meters *mauka* or north of the coast. The level to gently sloping project area ranges from a maximum elevation of c. 16 feet AMSL near the highway, to a low of about 2 feet AMSL along portions of the coast. The 73-acre property lies in the rain shadow of West Maui and receives c. 15 inches of precipitation per year.

Soils present on the project area are classified as mollisols and tend to be relatively well drained and fertile. They fall into the Pulehu-Ewa-Jaucas association—deep, nearly level to moderately sloping, well-drained and excessively drained soils that have a moderately fine textured to coarse-textured subsoil or underlying material; on alluvial fans and in basins (Foote, et al., 1972).

The southeastern section of the *makai* parcel, closest to shore, is identified as Jaucus sand (JaC). Typically such sands occur on 0 to 12 percent slopes. They are characteristically pale-brown in color, and more than 60 inches deep. Permeability is rapid, and runoff is very slow to slow. The major hazard is wind erosion in places where the surface vegetation has been removed (Ibid., p. 48). In the northwestern portion of the study area, in the vicinity around the present mouth of Olowalu stream, soils are classified as Pulehu clay loam (PsA). This series consists of well-drained soils on alluvial fans and stream terraces. They developed in alluvium washed from basic igneous rock. The soils are nearly level (0 to 3 percent slopes), permeability is moderate, runoff is slow. The surface is characteristically dark brown clay loam up to 20 inches thick, underlain by 40 inches or more of banded sandy loam, silt loam, etc. Beneath this is coarse, gravelly or sandy alluvium (Ibid., pp. 115-116).

Lying *mauka* of the Jaucus sands is a region of Pulehu silt loam (PpA) which is similar to Pulehu clay loam (0 to 3 percent slopes), but with a somewhat coarser texture. This soil is ideal for sugarcane. Stretching along the shore, *makai* of the Jaucus sands, is a strip of beach sand (BS). Beaches occur as sandy, gravelly, or cobbly areas. They are constantly washed and re-washed by ocean waves, and consist mainly of light colored sands derived from coral and seashells (Ibid., p. 28).

Observed vegetation on the project area is dominated by various alien species. *Kiawe* (*Prosopis pallida*) trees form the primary overstory vegetation in the coastal strip, along with scattered *Opuntia* trees (*Echinocylindrus dulcifer*). At least 2 varieties of palm trees were observed in the landscaped area near the former plantation manager's house. Finally, a few *hau* trees (*Hibiscus tiliaceus*) and *milo* trees (*Thespisia populnea*) were noted north of the manager's residence. *Milo* is a native species, while *hau* is thought to be a probable Polynesian introduction. Various landscaping plants were also found in the plantation area. Finally, several salt tolerant species including Indian flatbanc (*Pluchea indica*) were observed near the coast.

Much of the parcel was previously under sugar cane cultivation. While sugar cane is no longer cultivated on the *makai* project area, ratoon (wild, or volunteer) cane was growing on much of the parcel at the time of the survey.

The property is generally level to slightly sloping, and contains streambed deposits in many areas. In addition, marine sand deposits underlie much of the southeastern project area. Olowalu Stream empties into the ocean to the west of the manager's home. The *makai* project area contains approximately 2 miles of shoreline.

The entire study area occupies a large alluvial fan spreading from the mouth of Olowalu Valley to the ocean. It is bisected by Olowalu Stream, which took a more northwest-southeast path in the past. Olowalu Stream is one of 4 major waterways in the Lahaina District—the others being Ukumehame, Launiupoko, and Kaua'ula—which provided water for agricultural activity that supported a considerable precontact population.

E.S. Craighill and Elizabeth Handy (1972, p. 492) note:

"Lahaina District was a favorable place for the high chiefs of Maui and their entourage for a number of reasons: the abundance of food from both land and sea; its equable climate and its attractiveness as a place of residence; it had probably the largest concentration of population, with its adjoining areas of habitation; easy communication with the other heavily populated areas of eastern and northern West Maui. The Four Streams, and with the people living on the western, southwestern and southern slopes of Haleakala; and its proximity to Lanai and Molokai."

Concerning Olowalu, they continue (Handy and Handy, 1972, p. 492):

"Olowalu, the largest and deepest valley on southwest Maui, had even more extensive *lo'i* lands both in the valley and below. Just at the mouth of the valley we found in 1934 a little settlement of five *kaukale* (family homes) surrounded by their flourishing *lo'i*. There are said to be abandoned *lo'i* far up in the valley. In and below the next valley, Launiupiko [sic], there were no evidences of *lo'i*, and the people of Olowalu said there had never been any. But we think there must have been a few, although the land is, in general, dry and rough."

While these observations were made in the earlier part of the 20<sup>th</sup> century, there is no doubt that Olowalu was an important agricultural area in precontact times. As long as water was available, the hot climate was ideal for producing taro. It was the ability to produce quantities of taro that contributed to a substantial population, and placed West Maui in a position of prominence throughout the island.

## BACKGROUND HISTORICAL RESEARCH

### Precontact to 1850s

Because Lahaina District had ample resources that supported a large population, it became a focal point in the struggle for power between important chiefs. One of the fiercest battles was between Maui chief Ka-uhi, and the chief of Hawaii, Alapa'i in the mid-18<sup>th</sup> century. Concerning this war, Samuel Kamakau relates the following:

*A whole year Alapa'i spent in preparation for the war with Maui. It was in 1738 that he set out for the war in which he swept the country. What was this war like? It employed the usual method in warfare of drying up the streams of Kawa'ula, Kanaha, and Mahama (which is the stream near Lahainaluna). The wet taro patches and the broots were dried up so that there was no food for the forces of Ka-uhi or for the country people. Alapa'i's men kept close watch over the brooks of Olowalu, Uluhamehame, Waituk, and Honokawai. When Pele-io-holani<sup>1</sup> heard that Alapa'i was at Lahaina he gathered all his forces at Honokahua and at Honolua. At Honokawai an engagement took place between the two armies, and the forces of Alapa'i were slaughtered and fled to Keawawa. There Alapa'i heard that Pele-io-holani had landed at Honokahua and had an army stationed at Keawawa, and he disposed his forces, some on sea and some on land. Although Pele-io-holani had but 640 men against Alapa'i's 8,440 from the six districts of Hawaii, there were among them some famous warriors... Pele-io-holani intended to unite his forces with those of Ka-uhi, but Alapa'i's men held Lahaina from Uluhamehame to Mala on the north, and in attempting to aid Ka-uhi. Pele-io-holani became involved with the difficulty. The hardest fighting, even compared with that at Napili and at Honokahua in Ka'anapali, took place on the day of the attack at Pu'unene. Pele-io-holani was surrounded on all sides, mauka and makai, by the forces of Alapa'i, led by Ka-lani-'opu'u and Keoua. The two ruling chiefs met there again, face to face, to end the war and became friends again, so great had been the slaughter on both sides... (Kamakau, 1992, p. 74).*

At the end of this period of warring, Kamehameha-nui became the ruling chief of Maui. Alapa'i returned to Hawaii. There, following the death of Keoua, in 1752,

<sup>1</sup> Pele-io-holani was the ruling chief of Oahu. Maui chief Ka-uhi sent a present to him and requested his help in defending Maui (Kamakau, p. 74).

relations between Alapa'i and Ka-lani-'opu'u began to sour, because the latter felt that Alapa'i had some part in causing Keoua's death. Battles were fought between the two rivals, and eventually Ka-lani-'opu'u succeeded in establishing his rule over the entire island of Hawaii in 1754, after he "seized and cruelly put to death and baked" (Ibid., p. 78) the son of Alapa'i, Keawe-opala.

In the years from 1775 to 1779 there was constant warfare between Ka-lani-'opu'u and Kahekili, the younger brother of Kamehameha-nui. Ka-lani-'opu'u engaged in battles all around the island of Maui. At Waikapu, he was defeated and routed by the forces of Kahekili in 1776. Still nursing a fierce hatred for Kahekili for his defeat, Ka-lani-'opu'u launched another series of attacks—sailing to Kaupo, Lahaina, and on to Lanai, where his forces ravaged and slaughtered the citizens. When food ran out on Lanai, he moved on to Maui where food was abundant, and fed his soldiers on taro from Honokahua. After this he headed around West Maui for Ko'olau. Upon landing at Hamakualoa, he engaged in battle with Kahekili's forces, who put up such a fierce fight that Ka-lani-'opu'u fled in his canoes. When Ka-lani-'opu'u made landfall at Ko'olau "he slew the common people and maltreated the captives by urinating into their eyes" (Kamakau, p. 91).

### Arrival of Europeans

It was toward the last part of this 4-year period of warfare, in January of 1778, that Captain James Cook sailed into the islands—and set in motion a wave of changes that would engulf the Hawaiian people in years to come.

Ka-lani-'opu'u returned to Hawaii from Maui in January of 1779, during Cook's visit in Kealakua. When he saw how many women were prostituting themselves on board Cook's ship, he forbade the women from continuing to visit the vessel. He treated Cook hospitably, however, "giving him hogs, taro, potatoes, bananas, and other provisions, as well as feather capes, helmets, kahili, feather leis, wooden bowls beautifully shaped, tapa cloths of every variety, finely-woven mats of Puna, and some especially fine mats made of pandanus blossoms" (Kamakau, p. 101). The most desired trade items, as far as the Hawaiians were concerned, were guns, ammunition, and iron.

In the month of February, Cook sailed away, only to discover that a mast on one of his ships was defective and needed immediate repair. He put back to Kealakua, where developing tensions between the Hawaiians and the *haoles* (foreigners) resulted in the theft of a longboat. When Cook went ashore to retrieve it, he and 4 of his crewmen were killed. The body of the slain Captain was delivered to Ka-lani-'opu'u, who offered it in sacrifice. Afterwards "they stripped the flesh from the bones of Lono. The palms of the hands and the intestines were kept; the remains (*pe'ea*) were consumed with fire. Ka-lani-'opu'u was kind enough to give the bones to the strangers on board the ship, but some were saved by the kahunas and worshiped" (Kamakau, p. 103).

It was not until 1786, that foreign vessels again visited the Hawaiian Islands. The first ships were the King George, under Captain Portlock, and the Queen Charlotte, under

Captain Dixon. They landed at Kealahou on May 26<sup>a</sup>, but found the "natives troublesome and no chief of apparently sufficient authority to keep them in order," so they left on the 27<sup>th</sup> (Formander, 1996, p. 230). On May 28<sup>a</sup>, the notable French explorer, La Perouse, anchored near Lahaina on Maui, after having visited the southern part of the island that bears his name—La Perouse Bay. Other vessels followed, which were chiefly occupied in the fur trade on the Northwest Coast of America. Hawaii also became a stopover on the trade route to and from China. The most desirable trade items continued to be arms and ammunition, which were in high demand by the different chiefs. For the most part, trading was friendly. However, cultural misunderstandings sometimes led to tragic consequences. Such was the case that culminated in the infamous incident that occurred off Olowalu in 1790.

#### *Olowalu Massacre*

The ship *Eleanora*, under the command of Captain Metcalf, and a smaller schooner, *Fair American*, under the command of Metcalf's son, Thomas, arrived off Hawaii Island in the winter of 1789, to engage in trade. In February 1790, the *Eleanora* proceeded to Honua'ula on Maui to trade there. The following is Formander's recounting of what followed (pp. 232-234):

*"The native accounts state that the captain was an irritable and harsh man, and liberal in his use of the rope's-end on trifling provocations; yet trade was continued and his ill-usage submitted to for the gain the common people thought they obtained in the barter of the commodities for those that the foreigner brought them.*

*Kalala, the widow of Kaloniopuu, with her new husband, Kaopuiki, and her family, were at this time living in the village of Olowalu, some fifteen miles from where Metcalf's vessel was anchored. Hearing of the arrival of the trading ship at Honua'ula, Kaopuiki got ready a number of hogs and other produce, and started for Honua'ula to trade for muskets, ammunition, and such other articles. It is not known that Kaopuiki received any bad usage from Captain Metcalf, although others did; but noticing that the ship's boat was left towing astern during the night, Kaopuiki formed the design of getting the boat into his possession. The following night the plan was carried into effect, the boat was set adrift from the vessel, the watchman, who had fallen asleep in her, was killed, the boat towed ashore and broken up for the sake of the iron fastenings, and Kaopuiki and his men returned to Olowalu.*

*When the loss of the boat and the death of the seaman were ascertained in the morning, Captain Metcalf fired on the people ashore, and took two prisoners, from one of whom belonging to Olowalu it is thought that he received information as to who the party was that had stolen his boat. In a day or two the vessel left her anchorage at Honua'ula and came to off Olowalu."*

The account is continued by Kamakau (pp. 145-147):

<sup>a</sup> An informant, Ms. Adelina Rodrigues was told by her grandfather that their property was the location of Kalala's residence. See Maps 6 and 8.

*"...in the morning Ka-lala declared a tabu restricting canoes from going out to the ship on pain of being burned to death if they disobeyed. 'Withered grass' (Mau'umae) was the name of this law. It belonged to Ka-lala alone and to her children and grandchildren: no other chief could declare such a tabu. It lasted three days. On the fourth the tabu was ended, and canoes in great numbers went out to trade with the foreigners. Many came from Lahaina as well as from Ka'anapali, Lanai, and neighboring places. The canoes gathered under the ship's sides, the men eager to procure iron, beads, looking-glasses, scissors, muskets for the constant warring going on at the time, red cloth and other foreign material. Little did they suspect the terrible carnage that was to follow, a carnage without any effort to apprehend and punish the offenders or any pity for the innocent. So these Christians murdered the Hawaiian people without any more mercy than cannibal Nukihivans show, or people of pagan lands. Canoes that drifted toward bow or stern were compelled by a shower of stones to keep admidships, and when all were clustered together, the captain was pretending to trade, and the people were busily eyeing the objects they desired, just as Aka-kane and another man had climbed upon the deck, the ship opened fire and shot the people down without mercy, just as if they were creatures without souls. Even those who swam away were shot down. John Young was an eyewitness on board the ship and has testified to the great number who were killed at this time. At noon that day the *Eleanora* (sic.) sailed, and the people went out and brought the dead ashore, some diving down into the sea with ropes and others using hooks; and the dead were heaped on the sands at Olowalu. Because the brains of many were oozing out where they had been shot in the head, this battle with the ship *Eleanora* and her captain was called 'The spilled brains' (Kalolopahu). It was a sickening sight, as Mahulu and others have reported it; the slaughtered dead were heaped upon the sand; wives, children, parents, and friends came to view and mourn over their dead; and the sound of loud wailing arose."*

Formander relates the incident (pp. 233-234):

*"But Captain Metcalf meditated a terrible revenge for the loss of his boat and the death of his seaman. As the canoes collected around the ship, he ordered the guns and small arms to be loaded, and the unsuspecting natives were ordered to keep their canoes off the waists of the ship, and when any strayed either under the bows or the stern, they were pelted with stones or other missiles until they rejoined the fleet of canoes lying off either broadside of the ship waiting for trade to commence. When all was ready, Captain Metcalf mounted on the rail and gave orders to open the ports of the ship, loaded with small shot and grapnel, and the musketry of the sailors, were fired in the crowd of canoes lying within easy range on both sides. The carnage was immense. Over a hundred natives were killed outright, and several hundred more or less seriously wounded. The confusion, the wailing, the rush to escape was indescribable.*

*After this cruel and wanton vengeance on an innocent multitude—for the main trespasser, Kaopuiki (sic.) was not among the slain, and does not appear to have been afloat that day—Captain Metcalf lifted his anchor and proceeded to Hawaii to join his tender, the *Fair American*."*

On the morning of March 17<sup>th</sup> the *Fair American* was captured off Kaupulehu in North Kona by Kamehamehame, a great chief and supporter of Kamehameha. He had

suffered a beating at the hands of the elder Metcalf, and vowed vengeance on the next foreign vessel he could get aboard. The 18-year old captain, Thomas Metcalf, was thrown overboard and drowned, and the other members of the crew were killed. For some reason, the mate, Isaac Davis, was wounded, but his life spared. The vessel was taken ashore and the guns, ammunition and general cargo, along with the wounded Davis, were taken to Kamehameha at Kealahou.

The *Eleanora* was anchored there at Kealahou. The boatswain, John Young, and several other men had gone ashore. Young became separated from his fellow crewmembers, and was detained by Kamehameha, since the latter needed a foreigner to show him how to use the newly acquired guns and ammunition (ibid., p. 235). The *Eleanora* waited for 2 days for Young to return. On the third day when he did not appear, Captain Metcalf sailed away, not knowing the fate of his son.

Davis and Young spent the remainder of their lives in the service of Kamehameha. Their knowledge of foreign technology proved extremely valuable to Kamehameha. One of the cannons which was taken from the *Fair American*, *Lopaka*, was used in the Battle of Kepaniwai, where Kamehameha defeated the warriors of Kahakili, in 1790. The Maui warriors were driven into Iao Valley, attacked with the cannon and other firearms, and slaughtered in great numbers. Those that escaped did so by climbing over the steep ridge and down into Olowalu Valley.<sup>4</sup>

Although his warriors were defeated on Maui, Kahakili still commanded a sizable army on the island of Oahu. He was considered to be a very old chief when he was visited at Lahaina by Vancouver in March of 1793. Kamakau reports (1992, p. 165) that during this meeting Vancouver urged Kahakili to stop fighting and establish friendly relations with the chiefs of Hawaii. Kahakili said that it was not right for the chiefs of Hawaii to raid Maui "and rob and pillage without cause. Ka-hekili requested Vancouver, if he desired peace, to stay there all the time and guard him against further wars." Vancouver recognized that Kamehameha had superior numbers of chiefs and warriors, and they possessed firearms and the knowledge of their use. Sometime after Vancouver's departure for Oahu, Kahakili died.

With the great chief's passing, Kamehameha moved to bring Maui and Oahu under his rule. In 1796, following the battle of Nu'uuanu, the southern islands were united under one chief for the first time.

#### Early 19<sup>th</sup> century

Foreign influence became more and more pervasive following the unification of the Hawaiian Islands under Kamehameha. These forces brought commercial, social and religious changes to Lahaina District, as well as to the other islands. Lahaina was the

<sup>4</sup> According to Handy and Handy (1972, p. 490), the overland trail provided a link between the Lahaina District and the north coast of West Maui, as well as allowing the exploitation of forest resources found at higher elevations. More specifically, this trail extended *mauila* into Olowalu Valley and over the summit of Mauna Kea.

center for West Maui because of the favorable conditions for sailing craft that is found in the Lahaina Roads. The first whaling ships anchored off Lahaina in 1819, and the provisioning of these ships became a lucrative new venture. Following a few years later, missionaries from New England were added to the mix, and the wheels of acculturation turned ever more quickly. By 1832, the missionaries conducted a census which gave the population of Lahaina as 4,028; Olowalu as 832; and Ukumehame as 573 (Schmitt, 1973).

At this time, Lahaina was considered the capitol of the Hawaiian Kingdom, primarily because Kamehameha III preferred to reside there rather than in Honolulu. However, by 1845, he agreed to move the capitol permanently to Oahu, although Lahaina was still the residence of many important people associated with the Kamehameha line.

Following the Mahele in 1848, there were 42 individual Land Commission Awards granted in the *ahupua'a* of Olowalu, between the years 1852 and 1855. The majority are in the upper reaches of the property, along Olowalu stream. The distribution of land awards, and the present route of the stream suggest that the stream was channeled in a general, straighter north-east direction sometime after the Mahele. This was probably done to controlled flooding of agricultural fields. The award plots run across the alluvial fan in a northwesterly-southeasterly direction. A 1906 map of the Olowalu Plantation, made by A. C. Alexander, shows the new, straighter route of the stream (Map 6).<sup>5</sup>

The land awards range in size from one *lo'i* or 0.047 acres, to a houselot and *kula* amounting to 8,638 acres. Most are *kuleana* associated with taro production, residences and surrounding lands. There are 9 LCAs on the *mafi* portion of the study area. The earliest was a houselot granted to John Clark on August 22, 1849. The other 8 were granted between 1852 and 1855, and are scattered along the coastline. All are referred to as houselots. Map 5 shows the locations and Table 1 details these awards.

The remainder of the *ahupua'a* was crown land, that was originally granted to Kamehameha III. Kamehameha IV granted one 17.5-acre parcel of that crown land to Nahaolelua in 1858. Crown lands became government lands after the annexation of the Hawaiian Islands in 1893.<sup>6</sup>

<sup>5</sup> Refer to Appendix B for the complete list of LCA awards for the *ahupua'a* of Olowalu.  
<sup>6</sup> A deed provided by Mr. Horatio, of Olowalu Elua Associates, states that in conformity with the Land Act of 1893, all of the land "situate at Olowalu and Ukumehame in the District of Lahaina, Island of Maui" was "granted and confirmed unto Walter M. Griford for the consideration of Thirty-seven Thousand Seven Hundred and Fifty Dollars" (\$37,750.00). This was identified as Land Patent No. 4973, and was a cash purchase at public auction, which took place on July 9, 1906. Title was granted on July 23, 1906. The land area in Olowalu was 684.7 acres, exclusive of 1, C.A.S. school lots and land sold by Kamehameha IV to Kahalaleho, all of which amounted to 96.4 acres.



TABLE 1

TMK	Size in acres	Royal Patent	LCA Number	Year conveyed	Awardee	Ill	Nature of use
4-8-03:41	.375	7209	7719	9/22/1853	Hala	Maunao	House lot
4-8-03:42	.825	4840	3839-H	11/1/1852	Nahue	Kaluaha	House lot
4-8-03:43	3.386	2134	1742-2	9/26/1853	Z. Kanawai	Kaluaha	House lot
4-8-03:44	1.313	5477	3620:1	3/6/1855	Kabele	Kaluaha	House lot
4-8-03:45	.881	5477	3620:4	3/6/1855	Kabele	Kaluaha	House lot
4-8-03:46	.913	4952	6728-2	9/22/1853	Mahulu	Kaumukohi	House lot
4-8-03:47	.597		240	8/22/1849	John Clerk	Kaluakanaka	House lot
4-8-03:48	.792	3181	5952:1	9/24/1853	Minamina	Kaumukohi	House lot
4-8-03:49	.4	7572	8817:1	9/24/1853	Kanakaole	Kamani	House lot

Plantation Era

Olowalu Sugar Company

The Olowalu Sugar Company is said to have been an enterprise of King Kamehameha V, who reigned from 1863 to 1872. He began the operation sometime during his reign, under the name of the West Maui Sugar Company. It was incorporated as the Olowalu Sugar Company on May 6, 1881, and the agents were H. Hackfeld & Company. It was sold in 1877, and a reference states that in 1884, the agents were Macfarlane & Co (Wilcox, 1996, p. 5). From 1898 to 1910, W.G. Irwin & Company were the agents. This company was consolidated into C. Brewer & Co., and they assumed the agency until December 1931, when it was purchased by Pioneer Mill Company, Ltd. (HRHP, Wright, 1974).<sup>7</sup> Maps 4 and 6 show the Olowalu Sugar Company lands in Olowalu in 1881 and 1906 respectively. Figure 1 shows the water system for the plantation in 1916.

Additional information is sketchy. There are references to repairs made to the Olowalu wharf in 1884, with the costs being shared by the Hawaiian government and the sugar company. This wharf is shown on the 1881 map of Olowalu Sugar Plantation (Map 4). In 1915, new boilers were installed in the mill along with other improvements. The boilers replaced some that had been in operation for 35 years (Ibid.).

There is some information on the plantation railroad found in the Letter Books of the Hawaiian Kingdom dated October 31, 1881 (Conde and Best, 1974, p. 263):

<sup>7</sup> This information was provided by Mr. Robert Horacio, coordinator for the Olowalu project, and came from the Royal Patent/Award Books, Bureau of Conveyance's archives through Title Guarantee of Hawaii.  
<sup>8</sup> The ruins of the Olowalu Sugar Company mill have been identified as Site 50-90-08-1602.

Messrs. H. Hackfeld & Co.  
 Agents Olowalu Comp y

Gentlemen:

I am directed by the Minister of the Interior to acknowledge receipt of your favor of the 20<sup>th</sup> Inst. Asking permission for the company to lay a narrow gauge railroad at Olowalu, and to inform you in reply that the company is hereby authorized to build a narrow gauge railroad for use of their plantation along the side of the Government road, upon express condition that the said railway shall in no wise interfere with the traffic on the Government road; and in such places where it may be found necessary to cross the Government road, proper guards or bridges shall be built for the safety of the public.

I have the honor to be  
 Your obedient. Servt.  
 J.S. Hassinger  
 Chief Clerk

With this, a 2-foot gauge railroad was built, and apparently the cars were pulled by mules until the latter part of 1889, when the Baldwin Locomotive Works engine—Olowalu—was ordered for plantation use (Ibid.).<sup>8</sup> In 1882 the railroad was extended an additional 2 miles south to Ukumehame, making a total of 3 miles of track. In 1905, a second locomotive from Baldwin Works replaced the original machine. By 1918 another mile had been added, making it a 4-mile line.

The Olowalu Mill was probably constructed in the 1870s. A photograph is reproduced in Maui Remembers (Bartholomew and Bailey, 1994, p. 45), and is one of the few in existence. It shows the iron pole, which still remains (Photo 21) that was probably used to guide cables or ropes, to boats tied to the pier. It may be part of a type of loading system that was used in the sugar industry at other mills.

The manager's house, which lies 100 meters to the northwest of the Mill, was built somewhere from 1910 to 1915. It is a one-story wooden structure with a sloping hip roof and ventilated gable ends. A front porch is seven bays long and is marked by a simple balustrade. Rafter ends are left exposed and the house is raised approximately 3 feet about grade (HRHP, Wright, 1974). There are also 3 other plantation houses located between the Mill and the highway, that may have built around the same time.

In 1931, when the Olowalu Sugar Plantation was bought out by Pioneer Mill Company, all of the railroad equipment transferred to that company. By 1933, the mill was being dismantled and the machinery sold to a company in the Philippines (The Maui News, June 15, 1933). Pioneer Mill Company grew cane on much of the study parcel until fairly recently.

<sup>8</sup> The 1881 map (Map 4) of the Olowalu Sugar Plantation shows the mule pen directly to the east of the Olowalu Sugar Mill (Site 50-90-08-1602).  
<sup>9</sup> It is included in this report on page 46a.



## PREVIOUS ARCHAEOLOGICAL STUDIES

There have been 4 other archaeological inventory surveys conducted near Olowalu in recent years. Prior to those studies, the only archaeological work had been the survey of *heiau* on the island of Maui that was conducted by Winslow Walker in 1929 to 1930, and the Statewide Inventory conducted in 1973-74. Both the Walker and State surveys documented significant sites in Olowalu *ahupua'a*.

Walker noted that there were two *heiau* structures on the *mauka* portion of the present study parcel. The larger structure is named Kawaialoa (Site 50-50-08-4). He described it as follows (1931, p. 108):

"Location: On the rising ground south of Kileea Hill above the ditch.

Description: A large walled *heiau* in good condition. It measures 156 x 110 feet. The walls range in thickness from 8 1/2 feet on the west to 12 feet on the south and east where it is composed of two terraces. The highest part is 10 feet high. The north wall is lower and ranges from 5 to 8 feet thick. Several low terraces and enclosures are found inside. The low platforms in the western part are probably graves of recent date. The entrance evidently was at the north. At a point on the west wall and at two points on the south wall are piles of stones cone-shaped whose use or purpose could not be determined. Rough red vesicular basalt is the material used in the *heiau* construction and no coral is found. No artifacts were found there."

He goes on to mention a smaller *heiau* which is located in the cane fields below the ditch. It is described as measuring 40 x 60 feet. He reported that all of the interior structures had been destroyed, and he had not been able to find out what it had been named (*Ibid.*).

The Statewide survey relocated Kawaialoa *Heiau*, but was unable to locate the smaller, unnamed one. Another indigenous site that the survey documented was the Olowalu Complex (site 50-50-08-1200). The site lies about 0.5 mile *mauka* of Highway 30 (Hanaoipi'i lani Highway) on the north side of Pu'u Kileea. The complex is made up of

2 features—the Olowalu Petroglyphs and a natural rock overhang at the base of the cliff, which was probably used as a shelter (HRHP, Connolly, 1973)<sup>15</sup>.

The rock overhang was excavated by Elspeth Sterling in 1962. It was given a Bishop Museum site number—M-4. It is documented as follows (Sterling, 1998, pp. 26-27):

"Description: The main part of the sheltered bluff runs about 60 feet *mauka-kaui* and forms about 12-15 feet from the wall to the irregular sloping edge. It is about 20 feet up on the side of the hill from the road. It appears the water has run through with enough force to leave the rock base floor and forming more and more shelter under the overhang. Although Olowalu receives very little rain, water has in some way run off the cliff and through the shelter.

Makai of the main area the bluff slopes down to a little open terraced area about 3' x 5' against the wall of the bluff. Makai and below this is another level somewhat protected area. Both of these produced no material except an occasional shell which had washed in.

On Tuesday December 11, Lyman Harada and Larry Windley accompanied me. We set up the grid which was rather extensive. This was with high hopes, not so much for the interior floor as for the outer edge.

We first sifted through the dirt dug out by a previous excavator. This produced some shell, kukui, if or sugar cane leaf, obsidian, Hawaiian diamonds, etc. We then dug the disturbed area which is G-18, G-19, G-10. This produced more of same material with addition of a coral file and *konane* pebble. The bone point was picked up in G-18, lying on the surface of excavated depression.

The F line marks more or less the interior floor of the shelter. This floor consisted of rock or gravel and occasional water worn stone. The material was not found generally throughout the floor but only in pits of ash which went down through the gravel to 12 inches.

We tried E-18 which is toward the outer edge. We had to dig through about 6 inches of soil until we reached ash where we found the same type of material although this appeared older. At the end of the third day we decided there was no reason to continue with the digging.

Our conclusion is that the area was not lived in but merely used as a camp site or resting place.

The bluff (at this time of year) affords shade from the sun until mid-afternoon. However, a light rain fell Wednesday night and the whole shelter was damp except for a small spot under the lowest overhand....

We believe the early campers camped on the outer edge and as the floor eroded away they were able to move further in. The material was not scattered throughout the floor which was rock and gravel... but found only in ash fire pits which extended down 12 inches through the gravel.

The material continued to produce little variety and practically no artifacts, tools or variety in food remains.

<sup>15</sup> Subsequently the Olowalu rock shelter was given site number 50-50-08-1201.

There was no evidence of post-European occupation, which caused us to wonder if the shelter created to be used when the trail through Olowalu to Iao fell into disuse. Without the present trees there is probably a good view out over the plains. Perhaps army look-outs camped at the spot.

According to the HRHP short form (Connolly, 1973), the northern, sheer cliff face of Pu'u Kilea, is covered with over 70 petroglyphs in two areas. At the time of the Statewide survey the site had been turned into a small park next to the access road. A viewing platform had been erected in Area 1. Here the petroglyphs extended about 8 meters across, and were situated from 1 to 4.7 meters up the rock face. Area 2 lies about 15 meters south of Area 1, and is adjacent to the road. Here the petroglyphs extend along the cliff, and are placed on the large rocks in front of the cliff for about 60 meters. They extend up the cliff face from 0.5 to 3.3 meters. In Area 1 there are at least 41 figures, including human forms with stick and triangular bodies; animals (probably dogs and horses); circles; a sail, and other indistinct forms. They range in size from 2 x 2 cm. to 35 x 55 cm. In Area 2, there are at least 31 petroglyphs. The figures here include human forms with stick and triangular bodies, historic writing, animals including dogs and horses, a figure resembling a coffee pot, a large fish or whale, a figure with five lines radiating from the head, an outrigger canoe with sail, and many indistinct forms. These range in size from 4 x 6 cm. to 40 x 40 cm. One of the historic forms, early Hawaiian writing, measures 80 cm. by 10 cm.

It is noted in the 1973-74 survey that the petroglyphs had been vandalized. Some had been covered with paint, chalk, crayon and charcoal. Also modern graffiti and profanity, along with "poor attempts to imitate the early Hawaiian petroglyph forms" (Ibid.) had been added. This desecration was not mentioned in 1962, when the Bishop Museum undertook excavations in the adjacent rock overhang shelter.

The petroglyph site was given valuable status, for the State Registry, and a hand written note also indicated that it was a "National Register quality site", but it would have to undergo a cleaning program to remove the paint and other substances that have been recently added. It also recommended that complete and accurate data should be recorded on all petroglyphs at this site (Ibid.).

Two historic sites were also identified during the statewide survey—the Historic District associated with Olowalu Sugar Company mill (Site 50-50-08-1602) and the Olowalu Stone Church ruins at Mopua (Site 50-50-08-1603).

The Olowalu Historic District (Olowalu Sugar Company Mill site and associated residences) was discussed in the previous section. The Church ruins site (Site 1603<sup>11</sup>) is described as follows (HRHP, Wright, 1974):

<sup>11</sup> This church lies in the mauka study area of Olowalu (Phase 2). Additional information can be found in that report. Its location is shown on the historic map from 1881 (Map 4) of this report. It appears that the north arrow is point directly toward it.

"The general shore district of Olowalu was a small Hawaiian village of farmers and fishermen, located about half way between Lahaina and Maalaea, toward Waiuku. A mission station from Lahaina was established at Mopua in 1833, and in 1837 a small adobe and thatch roof church was built. Early in 1858, work began on the construction of a stone church and by May, 1859, the walls were completed. The exact date of the finishing of the church is not known. Originally it may have had a thatch roof, but a previously unidentified photograph, most likely taken about 1890, shows the church with a shingled gable roof and short square steeple.

Members of the church voted in 1868 to become an independent church, keeping that status until 1897 when again the church affiliated with the mother church in Lahaina. (The usual founding date of May 10, 1868, relates to this) At some time prior to 1930 the church was abandoned. Clearing and reconditioning work was done in 1960 by an ecumenical work group. ...

The church ruins stand on a slightly sloping plain with the mountains to the northeast forming a spectacular background. On the W side of the ruins are remains of a cemetery, heavily overgrown. The walls of the church are 30 by 60 feet, parts being collapsed, and the loose rock has been piled outside the S entrance. Three window openings are indicated for each side, with one at the N end, the altar end. Constructed of fieldstones set in mortar, with quoins of coral blocks cut from the reef off Hekili Point, the church once was a fine example of a Protestant mission church. -13

#### Lauulupoko

In 1990, Paul H. Rosendahl, Inc. (PHRI) conducted an archaeological inventory survey of a 440-acre parcel for a proposed golf course in Lauulupoko ahupua'a (Graves and Goodfellow, 1991) which lies to the north of Olowalu. During the fieldwork, 47 sites consisting of over 70 component features were identified. The sites were placed in the following formal types: terrace, clearing pile, agricultural plot, rock pile, canal, retaining wall, flume, flaked boulder, alignment, rock shelter, C-shape, wall upright, L-shape, petroglyph panel, coral, fence, cairn, and road. They fell into the following functional types: agriculture, animal husbandry, habitation, temporary habitation, and marker.

The findings were presented in terms of functional categories. The agricultural complexes predominated, consisting of 60% of the sites identified. These formal feature types included terraces, agricultural plots, rock clearing piles, cleared areas, canals and retaining walls. The terracing is extensive in Lauulupoko. Much of it is interpreted as being historic, and connected with Pioneer Mill large-scale plantation agriculture. Other, smaller, agricultural plots found in the project area were probably used for horticultural activities, and consist of small dirt patches, enclosed by stacked-rock walls and windbreaks (Ibid., p. 10).

<sup>11</sup> It should be noted that in 1930, the shingled roof caught fire from a cane fire spark, and burned. The Olowalu Sugar Company apparently agreed to provide the labor to replace the roof, if church members would supply the material. However, the changes that occurred when Pioneer Mill bought out Olowalu Sugar did not include the reconstruction of the church roof (THE MAUI NEWS, November 24, 1996).

The habitation sites comprise 19% of the sites, and consist of rock-filled terraces, uprights, overhangs, small C and L-shaped structures, and rock alignments. These sites often contain agricultural features within them. They tend to be larger, with a variety of north and south sides of Launiupoko Gulch.<sup>16</sup> The sites classified as having an animal husbandry function, are historic, as are the roads.

The subsurface testing at habitation and agricultural sites yielded a series of radiocarbon dates that fell into a range from c. 1200 to 1650 AD. The authors conclude that many of the precontact sites were modified or destroyed by historic plantation and ranching activity. No doubt, the water system developed in precontact times was modified to suit the needs of sugarcane production, as was the extensive system of terraces.

In 1998, the site was revisited by PHRI after it was purchased by Launiupoko LLC. The report prepared earlier had never been submitted to SHPD for review. There were several unanswered questions that needed addressing, and 6 additional days of field work were carried out from December 1997 to March 1998 (Graves, Goodfellow, Haun, April 1998).

The authors conclude that the pre-contact population of Launiupoko *ahupua'a* was probably limited. This is supported by the lack of *kulcama* land claims made during the Mahele (Ibid., p. 9). They proposed that there probably had been permanent habitation settlements along the coast, while the alluvial plains and drainages were used for agriculture, and would have had temporary habitation sites associated (Ibid.).

This model of settlement had to be revised. They state (Ibid., p. 36):

*"The model predicted that permanent settlements would be focused at the coast. The upper portion of the project area appears to be the lower extent of prehistoric settlement on the inland, better-watered portion of Launiupoko Ahupua'a. This settlement probably occurred between the 1200s and 1400s. Temporary habitation sites associated with agriculture were predicted by the model. The project results date temporary habitation sites to the 1400s and later, with three age ranges overlapping the late 1600s. ..."*

*Although the age ranges for two habitation sites extend to the 1900s, the absence of associated historic materials indicates the sites were probably not occupied later than the early 1800s. Thus, as predicted by the model, traditional sites were probably abandoned as people moved to new economic centers. In this case the coastal communities such as Lahaina."*

Ukumehame

<sup>16</sup> Site 2673 is a modified rockshelter with a petroglyph panel and rock-filled terraces, quite similar to the Olowalu Complex (Sites 1200 and 1201). However, the petroglyphs are in the dripline of the overhang and have been significantly eroded over time (Graves and Goodfellow, p. 29).

On the southern side of Olowalu is the *ahupua'a* of Ukumehame. This is another large, alluvial fan which spreads out below Ukumehame canyon. It was surveyed in 1997 by Cultural Surveys Hawaii (Deveraux, et al., 1997). There were 16 sites and site complexes identified within the 440-acre project area, most in higher elevations near the mouth of the canyon. They were grouped into class-types such as agricultural, habitation, *heiau*, petroglyphs, human graves, irrigation ditches, and a basalt quarry.

Two *heiau*, Hiki'i (Site 50-50-08-2), and Ukumehame<sup>17</sup> (Site 50-50-08-3) were previously noted by Walker in the 1930 survey. The latter was thought to contain human gravesites, and is in relatively poor condition. Hiki'i *heiau* has been recently reconstructed by volunteers connected to Ukumehame resident families.

Maui Electric Company's Lahaina to Maalaea Transmission Line

The transmission line is located between 0.9 and 2.0 miles mauka from the coastline. It extends through the *ahupua'a* of Waikapu, Ukumehame, Olowalu, Launiupoko, Polanui, Pohaiki, Waieae, and Kula. An archaeological inventory survey was conducted on the 14.7-mile long corridor in 1994, by Cultural Surveys Hawaii (Robins, Folk and Hammatt, 1994). A total of 34 archaeological sites were identified in the project area—all of which were evaluated as significant archaeological resources (Ibid., p. 109). Subsequently, and additional survey of access roads, and monitoring of the pole replacement process was conducted in 1996 and 1997—also by CSH (Deveraux, Colin and Hammatt, 1997).

At Olowalu the transmission line crosses the mauka portion of the study area at ca. 350 to 400 feet AMSL (poles 40-56). Specific reference to Olowalu is made in the discussion of restoration efforts to the areas that were impacted by access road construction and power pole excavations. The 2 poles mentioned in Olowalu are poles 31 and 34 (Ibid., p. 77), but these do not appear to be associated with Olowalu. The maps included at the end of the report show that there are 2 sites (Sites 3180 and 3172) which are present in the Olowalu stream area, beneath the power lines between poles 52 and 54 (Figure 2).

Site 3180 is identified as a cattle wall that has been attributed to ranching. Its condition is rated fair to good, and it occurs at 240-400 ft. AMSL. It is described as follows (Robins, Folk and Hammatt, 1994, p. 82):

*"Site -3180 is a wall which is crossed by the preferred alignment just beyond the west side of Olowalu Stream. The wall extends along the mauka perimeter of the cane fields, and like Sites -3167 and -3170, was probably constructed to keep cattle outside of the cane fields and kulcama. The terrain is rocky and slopes moderately to the southwest. The wall is stacked and vertically faced with basalt boulders. It measures an average width and height of 1.0 m. (3.3 ft)."*

<sup>17</sup> The name was given by DLNR archaeologists during the 1973 statewide survey (Deveraux, et al., 1997, p. 36).

The report does not state its length.

Site 3172 is identified as a canal, associated with cane irrigation. Its condition is listed as excellent, and the linear extent was not determined. It was noted at the 200 foot elevation level. It is described as follows (Ibid., p. 78):

*"Site -3172 is a historic ditch located on the southeast side of Olowalu Stream. The terrain southeast of the ditch descends steeply to the Olowalu stream bed. The stream bed was dry during the survey. Vegetation consists of an assortment of introduced fruit trees and grasses."*

*The ditch is constructed of cemented stone on its southeast side and concrete on its northwest side. It measures approximately 0.8 m. (2.6 ft.) by 0.5 m. (1.6 m.)[sic.] deep and is currently used for cane irrigation."*

#### Settlement Patterns and Expectation of Findings Precontact to 1850s

The *makai* and *mauka* portions of the study area represent the valley, alluvial fan and mouth of Olowalu Stream, and typically include several environmental zones. Archaeological studies in the stream gulches and colluvial slopes in both Ukumehame and Launiupoko *ahupua'a*, situated to the east and west of Olowalu, provide interesting comparisons. Evidence for the pattern of irrigated agricultural practice occurs in the stream narrow upper valleys and stream gulches in both cases. At lower elevations, on colluvial slopes, dry land cultivation—probably sweet potatoes—was practiced in Launiupoko. However, neither area was studied along the coast line.

No archaeological studies have been done in the coastal area that stretches from Ukumehame and Launiupoko. However, given the general settlement patterns associated with the *ahupua'a* system found elsewhere in the Lahaina District, one would expect to find traces of precontact permanent occupation near the shoreline (Graves, Goodfellow and Haun, 1998). These would typically be found at stream mouths, and would be habitation sites associated with activities concerned with marine resource exploitation, and possibly agriculture and aquaculture (i.e. taro pondfields and fishponds) as found in Lahaina. The features that might remain would take the form of stone house platforms, canoe *kale*, fishing shrines, rock alignments, and so forth. Subsurface features would likely be occupation floors and fire hearths, and burials. A probable fishpond is present in Olowalu, in the *mauka* portion of the study parcel, as shown on Maps 4 and 6. It is probable that this dates from precontact times. If such features were present in the *makai* study area, the subsurface manifestations would be in the form of gley soil deposits, behind sand berms near shore.

The distribution of Land Commission Awards in the *ahupua'a* show taro lands following the stream bed from the narrow upper valley floor, across the colluvial slopes

to the mouth of the stream (Map 6). The LCAs shown on the *makai* portion are all identified as houselots, some of which are connected, with taro lands in the upper valley. What might remain of these habitation sites would be stone walls, house foundations, etc. Subsurface indications could be midden deposits, house floors or occupation surfaces.

Since most of the *makai* study area was cultivated for growing sugarcane, the likelihood of surface remnants seems unlikely. However, it is possible that remnants of such features could be present on the fringes of cultivated fields.

**Plantation Era**

The known sites on the *makai* study parcel are associated with the Olowalu Sugar Company complex. The mill itself was dismantled in the early 1930s, and only some of the stone foundations remain. The site was documented during the Statewide Inventory survey in 1973, and additional archival research is being conducted by Ms. Gail Bartholomew Ainsworth at the present time. A small settlement consisting of houses of plantation *luna* also exists on the parcel, along with cane fields, roads and a water delivery system.<sup>18</sup>

<sup>18</sup> The archival research on the Plantation era had not progressed very far at the time of the writing on this report. More detailed information on the Plantation era settlement pattern can be found in the Olowalu *Makua* report (Phase 2) (Fredericksen and Fredericksen, February, 2000) of this archaeological inventory survey. Appendix C of that report contains more maps and photos, along with census information and a chronology of Olowalu School and plantation management.

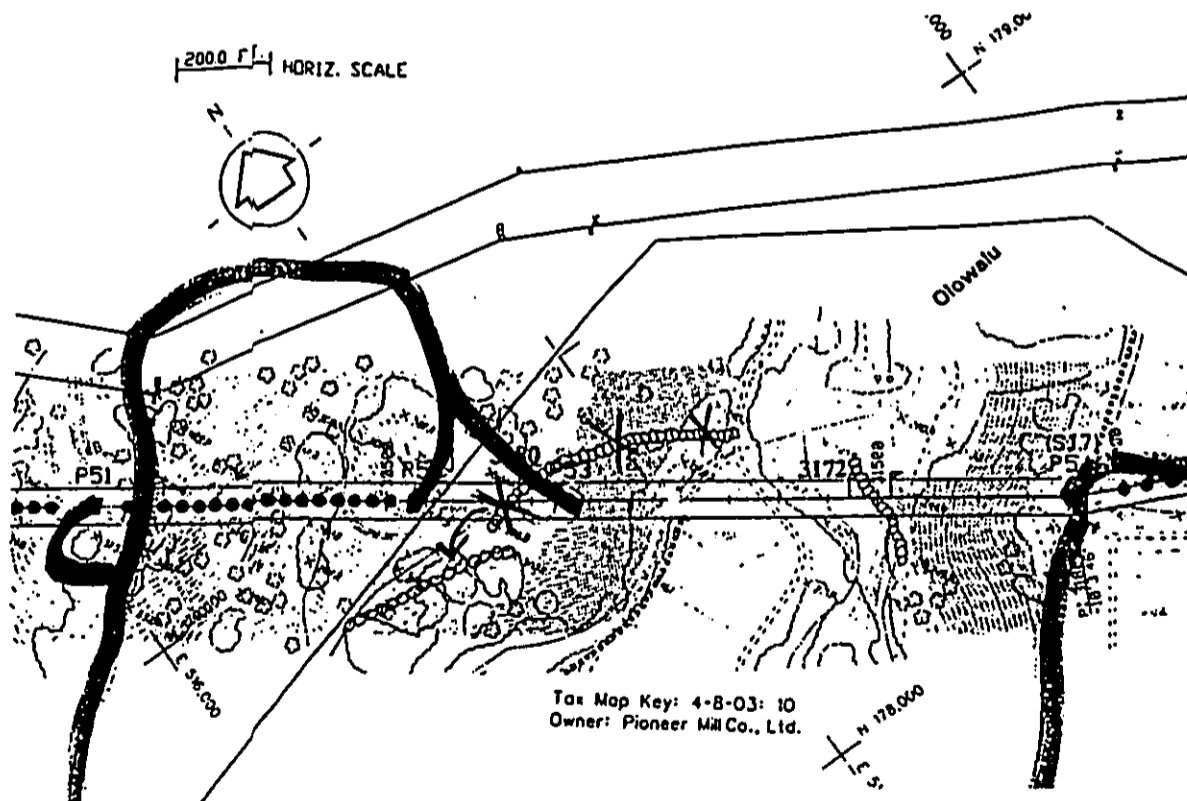


Figure 2 - Reproduction of map from Maui Electric report (Robins, Folk, and Hammatt, 1994) showing Olowalu sites.

## ARCHAEOLOGICAL FIELD METHODS

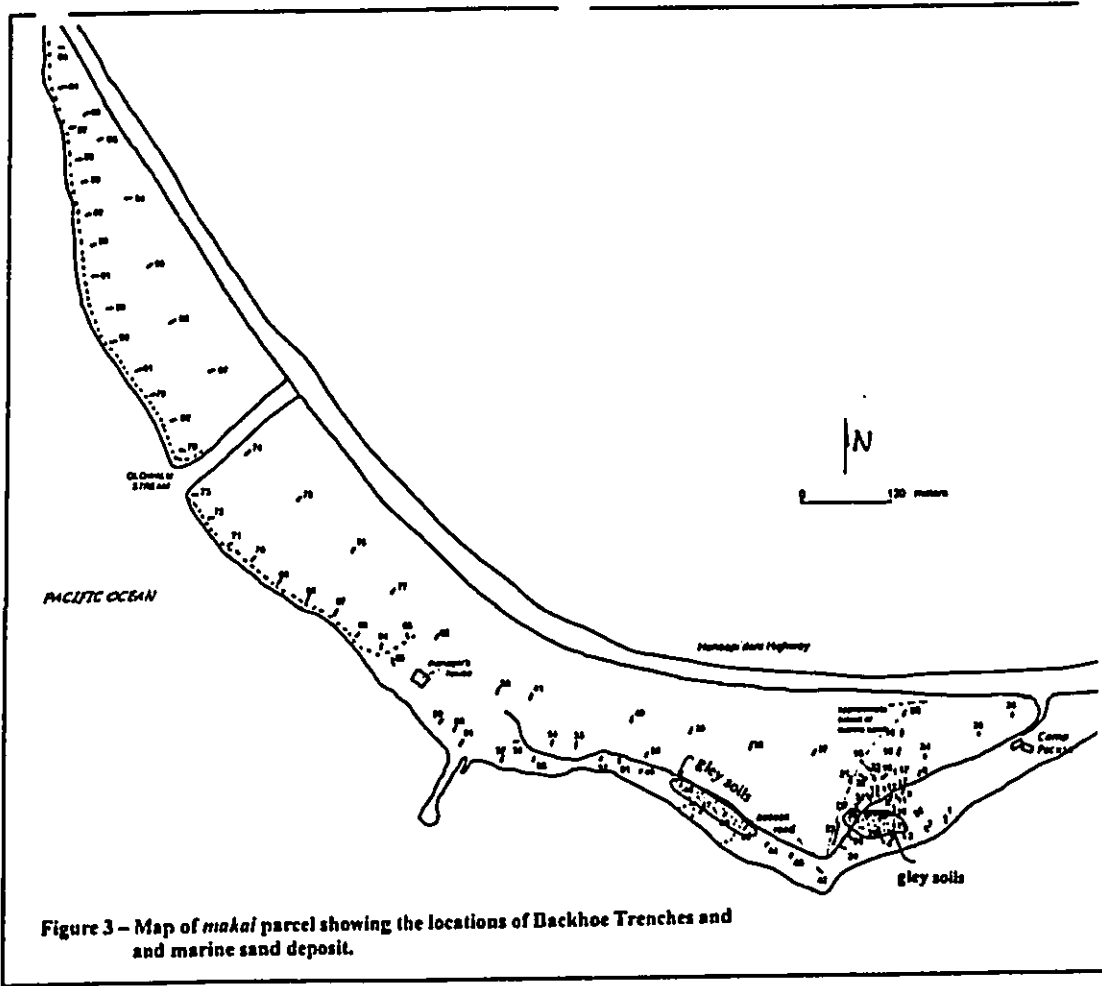
Fieldwork was conducted by Xamanek Researches personnel during October, November and December of 1998. Research team members included Marciel Balli, Hugh Coffin, Mark Donham and Erik Fredericksen. Erik Fredericksen was the field director, and the overall project coordinators were Walter and Demaris Fredericksen.

The archaeological inventory survey was carried out in 2 phases. A pedestrian walkover of the c. 73-acre parcel was first conducted. Surface sweeps were oriented roughly N-S, using a 5 meter spacing between survey members. Ground visibility ranged from poor to good, depending upon vegetative cover. In general, about half of the beach strand area along the 2-mile coast was densely vegetated. In addition, portions of the abandoned sugar cane fields contained up to 2-meter tall ratoon (not cultivated) cane plants. Three surface sites were found during this phase of the inventory survey. In addition to the ruins of the Olowalu Sugar Mill (Site 1602). Descriptive notes were taken in the field and photographs were taken with color film.

Subsurface investigation, mapping and site evaluation formed the second phase of our inventory survey. Site maps were prepared with metric measuring tapes and hand help compasses. Representative backhoe trench profiles and all test unit profiles were recorded. It was not possible to closely inspect some trenches because of safety concerns. A total of 97 backhoe trenches (Figure 3), 3 backhoe scrapes, and 6 manual test units were utilized to investigate subsurface conditions on the project area.

The 6 1-meter square test units were excavated by stratigraphic layers, using 10 cm. levels in thicker strata. All soil was screened through 1/8-inch hardware cloth. Several bulk samples were collected and screened in the laboratory. All material culture remains were collected in the field for subsequent analysis. Laboratory work was conducted on Maui, and none of the cultural materials, except for 2 charcoal<sup>19</sup> samples, were transported off island. Common laboratory methods were used in the analysis of collected material.

<sup>19</sup> Charcoal radiocarbon samples were collected in the field in bulk, and separated for surrounding material by flotation. The charcoal was then dried and placed in aluminum foil and sent to Beta Analytic, Inc. for radiometric analysis.





## ARCHAEOLOGICAL FINDINGS

A total of 6 previously unrecorded sites were located on the *makai* project area during the inventory level survey. These include 3 surface, 2 subsurface sites, and a burial area. Site 50-50-08-4693 is interpreted as a burial ground, probably dating from the precontact period. Site 4694 consists of a coastal rock structure with an associated subsurface cultural deposit. Site 4695 is a stone platform/terrace structure at the shoreline near the western end of the project area. Site 4696 consists of a segment of the old Government Road. Site 4697 appears to be an early post-contact habitation area that lies in the vicinity of the Site 4693 burial ground. The last site (Site 4698) located on the *makai* project area is interpreted as a late-precontact habitation area. In addition to the sites mentioned above, the project area also contains the ruins of the Olowalu Sugar Mill (Site 1602). Refer to Tables 2 through 7 for manual excavation results, Table 8 for backhoe trench results, and Table 9 for site significance assessments.

### Site 50-50-08-4693

This site lies near Hekili Point, within c. 50 meters of the existing coastline (see Photos 2 through 6). It is interpreted as a probable precontact burial ground. An existing, unpaved access road separates the abandoned sugar cane field to the north and the wooded coastal strand to the south (Figure 4). The general area *makai* of the access road is vegetated with salt-tolerant species such as Indian fleabane (*Pluchea indica*), salt bush, *Kiawe* trees, opiuma trees, and various alien grasses. An unpaved access road cuts through the dense vegetation to the coast.

On 13 November 1998, human remains were located by Mark Donham and Erik Fredericksen. An informant, who wished to remain anonymous, had indicated on the previous day that there was an area where he recalled seeing "bones" in the past. Careful inspection along the *makai* berm of the cane access road yielded 3 cranium fragments and 1 femur shaft fragment. Subsequent inspection of the area yielded a surface scatter of previously disturbed human skeletal materials. Following consultation with Maui/Lana'i Islands Burial Council members, it was decided to conduct subsurface testing to determine the presence of burials.

A series of backhoe trenches were then placed in the vicinity of the surface scatter in order to assess subsurface conditions (Figure 5). Two backhoe trenches (BT 8 and 13)

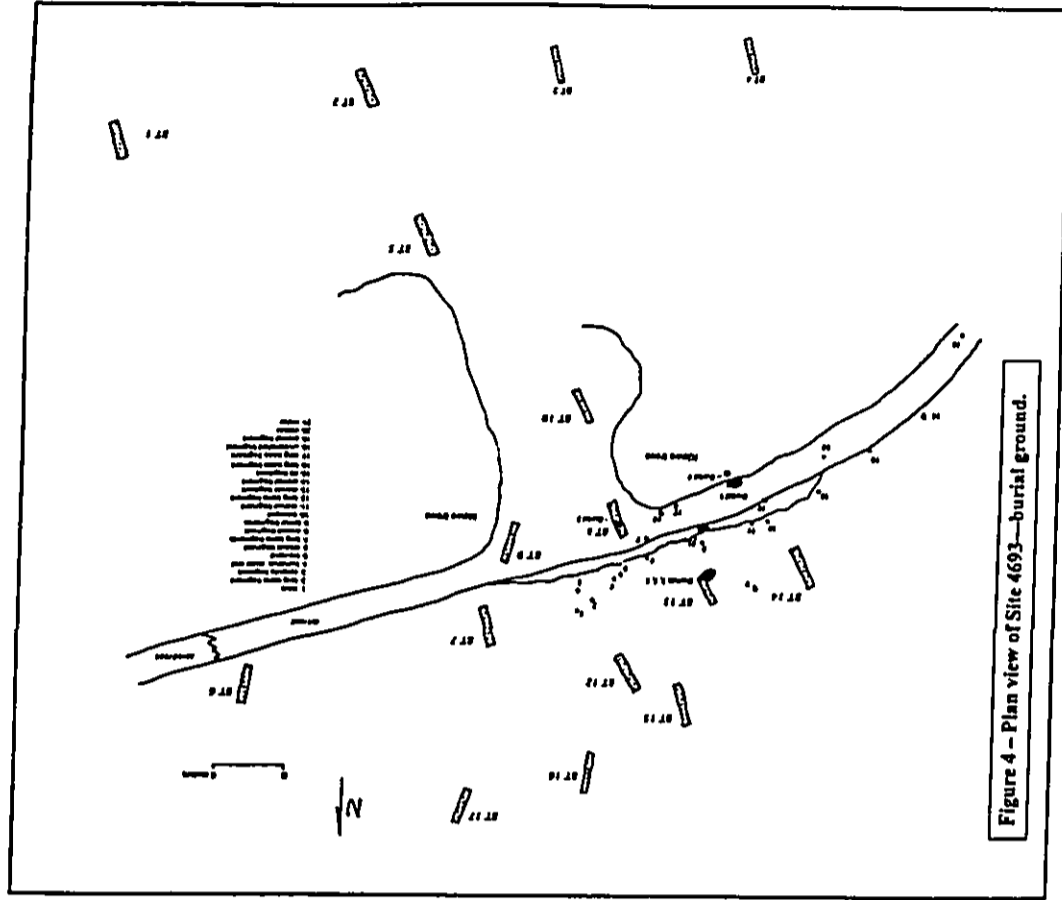


Figure 4 - Plan view of Site 4693—burial ground.

exposed *in situ* human remains. In addition, a single back-blade pass along the road located a heavily impacted *in situ* burial. Given the presence of these burials, we halted mechanical testing in the immediate area. Manual investigation was then undertaken on the burial in the road (Burial #1), and on the remains that were located in BT 8 and BT 13. Subsequent investigation yielded 3 additional finds of human skeletal remains.

#### Find #1 (Burial #1)

This first burial was found on 19 November 1998 by Hugh Coffin and Mark Donham during a single back-blade pass on the sugar cane access road. Burial #1 was located within 5 cm. of the existing surface of the graded road. This set of human remains has been heavily impacted over the years by activities associated with the maintenance of the road and by vehicular traffic. The remains were partially exposed and mapped (Figure 5; Photo 3).

While this burial has obviously been impacted by past activities, it is nevertheless, interpreted as remnant of an *in situ* burial. The presence of a partially articulated hand supports this interpretation. Further work on these remains was halted due to the deteriorated condition of the skeletal materials. Burial #1 was covered with screened sand and the road was blocked off with large tree branches.

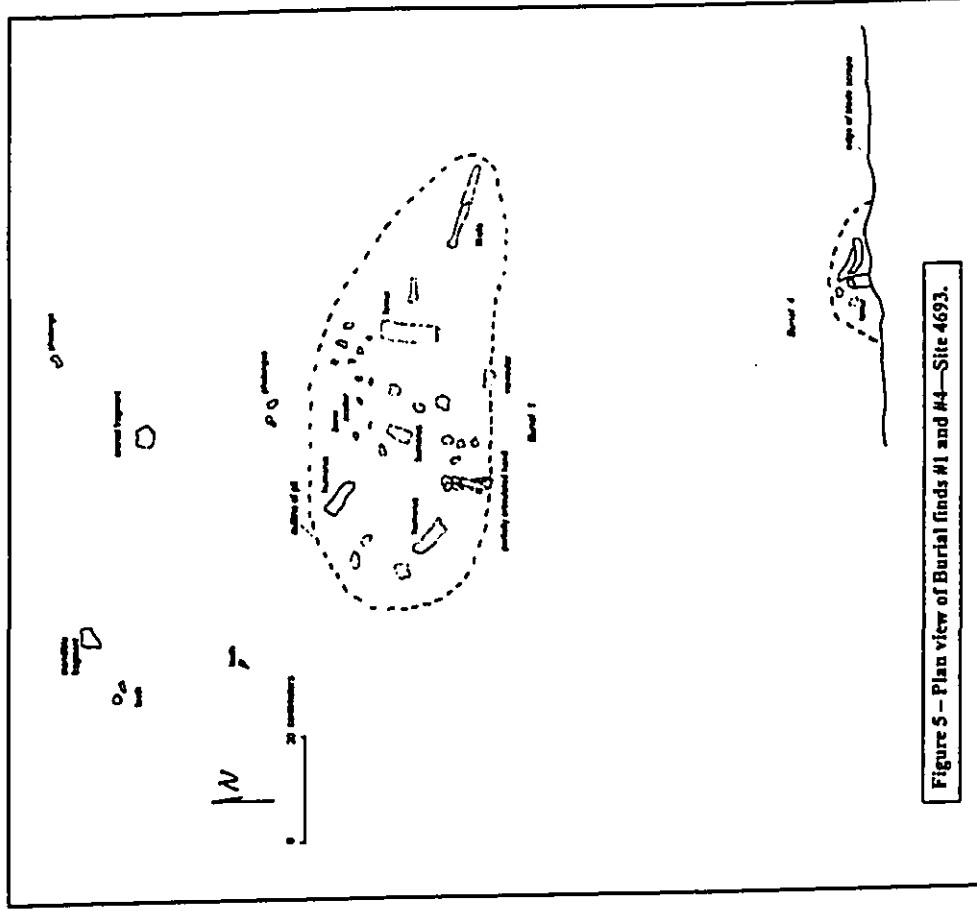
#### Find #2 (Burial #2)

The second find was also made on 19 November 1998. Burial #2 was located by Hugh Coffin and Erik Frederickson during the excavation of a stratigraphy trench (BT 8) (Figures 6 and 7; Photo 12). The remains of an adult were found c. 80 to 85 cmbs. at ground water level. The backhoe bucket dislodged a portion of the burial when it broke through a large *kiawe* root. The inadvertently disturbed remains were subsequently recovered from the back dirt pile and from the trench floor.

This burial is located in a pit that was truncated by the backhoe when it broke through the root. Examination of the screened pit fill did not yield any post-contact material culture remains. Burial #2 appears to represent a precontact interment. The burial pit extended from a coarse, very pale brown (10 YR 8/2) marine sand deposit into the underlying very pale brown (10 YR 8/4) cemented marine sand deposit.

#### Find #3 (Burial #3)

This find was made in the abandoned cane field by Marcel Ball and Hugh Coffin on 20 November 1998. Backhoe Trench 13 was less than 30 cm. deep when human skeletal material was noted (Figure 8). Closer examination revealed pit-outline in the trench containing a cluster of metacarpals and phalanges, which appeared to be from the same individual. Manual excavation into the southeastern face of BT 13 located a right ulna and radius, along with a right femur and fibula. The ulna and radius lay below the plow-zone and apparently had not been disturbed.



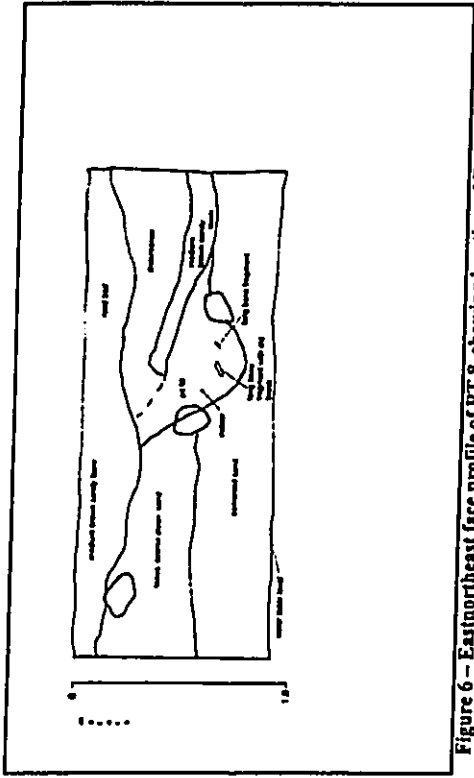


Figure 6 - East-northeast face profile of BT 8, showing location of Burial #2.

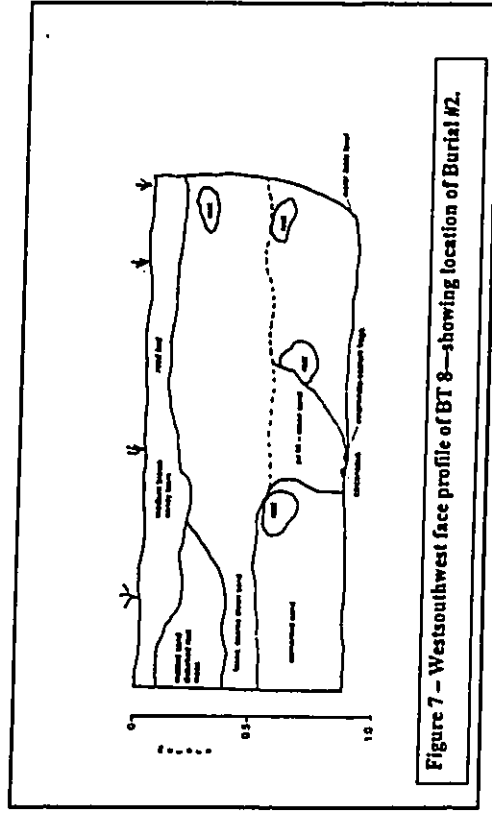


Figure 7 - West-southwest face profile of BT 8—showing location of Burial #2.

#### Find #4 (Burial #4)

This find was made by Mark Donham on 21 November 1998 as he was completing mitigation work on the Find #1 burial. Find #4 lies c. 1 meter south of Find #1 and is c. 40 cm. below the berm surface on the *makoi* side of the access road (Figure 5). A clear pit outline was noted and only a small portion of the burial was exposed. No effort was made to further expose it because of a clear commitment from Olowalu Elua Associates to create a burial preservation area on this part of the project area.

A small portion of a femur appears to have been shattered by past road maintenance activities. However, the overall condition of the remains appears to be good.

#### Find #5 (Burial #5)

Find #5 and #6 were made by Mark Donham on 24 November 1998 while he was investigating Find #3 in BT 13. These finds also lie in the abandoned sugar cane field and have been disturbed by earlier plowing and cultivation.

Find #5 lies c. 2.5 m. to the west of Find #3. Much of this individual skeleton has been impacted by the plow zone, as it lies between 25 and 35 cm. below the existing surface. The lower vertebral column and much of the pelvis are articulated (Figure 8). The left radius, and the right ulna and radius were also found, along with several scattered hand bones and 2 articulated phalanges. A line-mark imprint was clearly visible in the sand, indicating that the upper portion of the find was likely displaced by mechanical plowing. It is possible that the scatter to the north of Find #5 is part of the *in situ* individual.

A total of 4 lithic flakes were found resting directly on top of the lower arm bones on the *in situ* portion of Find #5 (Figure 8). These flakes ranged from 9 to 18 cm. in length and appear to represent single-use artifacts. The labor expended to produce these artifacts appears to have been minimal. It is interesting to note that none of the other long bones of this individual were located. It may be that the lithic flakes were used to separate the major long bones from the individual, and then discarded on what remained of the burial.<sup>28</sup> The absence of the long bones could be explained as well by the extensive disturbance the burial has sustained.

#### Find #6 (Scattered remains)

Find #6 was located c. 1.5 to 2 meters northwest of Find #5. This scatter contained a c. 18 cm.-long portion of a radius in addition to other unarticulated skeletal

<sup>28</sup> Human long bones were used as raw material for fishhook manufacture. Peter Buck (Te Rangi Hiroa) states: "Human long bones, particularly the thigh bone, were cut in lengths probably with sharp-edged pieces of stone flakes. The lengths were cut into rectangular pieces to correspond with the length and width of the proposed hook." (1957, Volume VII, p. 324) Again he states that when burying an individual "secrecy was observed, because it was feared that the bones might be stolen by an enemy to make fishhooks or to ornament stop bowls and so degrade the deceased and his family." (1957, V. XIII, p. 569).

fragments (Figure 8). This find was initially thought to represent a disturbed portion of an *in situ* burial. However, Find #6 is now interpreted as a scatter of human remains. The previously disturbed remains are located in the plow zone within 20 cm. of the existing surface.

#### Discussion

This portion of the project area contains relatively thick marine sand deposits which were probably exposed during precontact times. Subsurface investigation yielded articulated portions of at least 5 individuals. Find #6 is interpreted as scattered remains. Find #2 was the deepest of all subsurface finds and did not appear to have been impacted by post-contact agricultural activities. Find #4 was much nearer to ground surface, but appeared to be intact. All other subsurface finds had been heavily disturbed.

The 6 subsurface finds appear to represent indigenous burials. Unfortunately, post-contact agricultural activities have severely impacted Finds #1, #3, #5 and #6. The other burials are more intact, and Finds #2, #3 and #4 were contained within pit features. Indigenous lithic tools were found in association with what remained of Find #5. No post-contact cultural materials were associated with any of the finds. Sex and age determination for the burials was not possible from the fragmented remains recovered, and the M/LIBC requested that no further excavation of *in situ* portions be undertaken. The borders of the burial preserve are based on the burial council's recommendations.

The proximity of the disturbed finds to the existing surface, and the distribution of human remains on the surface of the sugar cane field, suggests that additional burials are likely to be present. Mr. Sonny Waiohu, a long-time employee of Pioneer Mill, remembers seeing "bones" in this part of the *makai* fields on several occasions. In addition, we located 3 of the finds with the partial excavation of 2 backhoe trenches and a single surface scrape. It seems quite probable that additional burials are located in the immediate area and in the vegetative undergrowth *makai* of the access road.

#### Site 50-50-08-4694

This site is located on Hekili Point (Photos 10 and 11). It rests c. 3-4 feet AMSL and lies within 20 m. of the existing high water mark in the Beach Reserve. Alien vegetation observed in the vicinity of Site 4694 included *kiawe* and opiuma trees, salt tolerant Indian fleabane, and various grasses and succulent weeds. The site consists of an L-shaped wall of water-worn basalt cobbles and a few small boulders (Figure 9; Photo 10). In addition, several coral cobbles were noted in the structure wall.

This structure ranges from 30 to 60 cm. in height and is up to 1.2 meters wide. It is c. 10 meters E-W by c. 9.5 meters N-S on the west leg. The northern portion of this leg appears to have been impacted by past bulldozing activities likely associated with the nearby abandoned sugarcane field. The eastern end of the site did not appear to have been mechanically damaged. The overall labor expenditure for the construction of this structure was moderate to high, and its overall condition is fair. However, a portion of

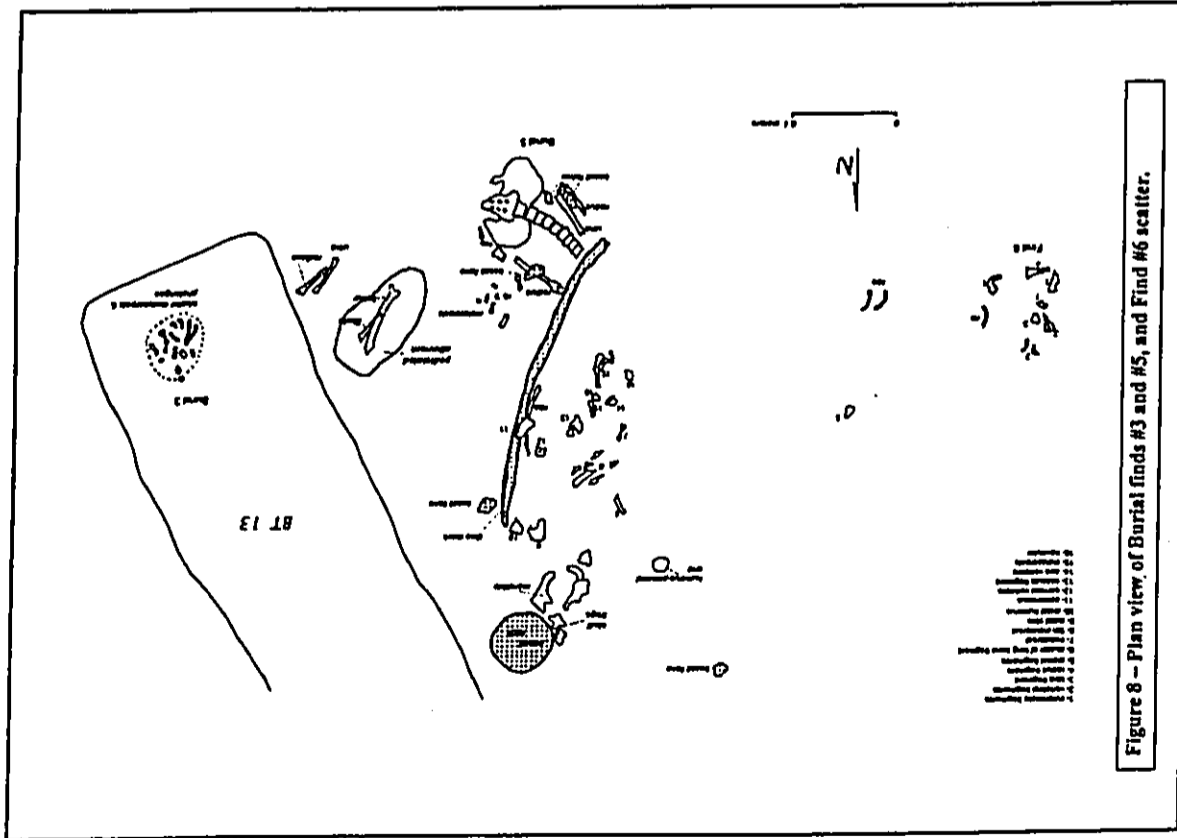


Figure 8 - Plan view of Burial finds #3 and #5, and Find #6 scatter.

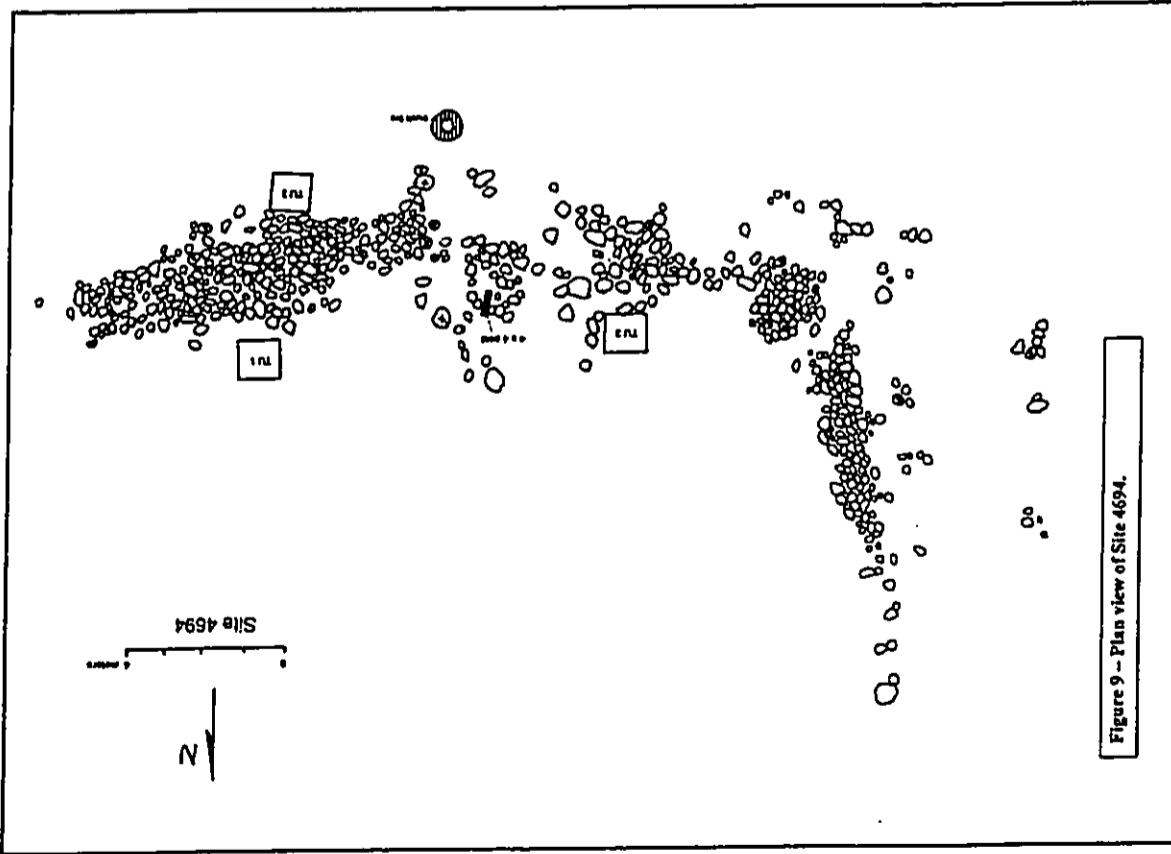


Figure 9 - Plan view of Site 4694.

this structure appears to have been impacted in the past 50 years. No post-contact material culture remains were noted in the structure of the site. However, a 4 x 4-inch timber was apparently placed in the rock structure in modern times. The dimensions (3 1/2 x 3 1/2 inches) of the post and its generally good condition suggest it was put there in recent times.

A total of 3 test units were utilized to investigate subsurface conditions. No subsurface features were encountered in any of the 1-meter square test units.

**Test Unit 1**

This first test unit was excavated on the north side of the structure. A relatively low amount of material culture remains were present in this c. 1 meter deep unit. Four layers were encountered before excavation of TU 1 was halted (Figure 10).

Layer 1 was 17 to 19 cm. thick and consisted of dark brown sandy loam (10 YR 3/3). This humus rich soil contained c. 30 waterworn pebbles, a few pieces of waterworn coral, scattered charcoal (7.9 g.), and a single *pipi* (*Nerita picea*) shell. No other material culture remains were present in this loose dry stratum. The soil boundary with the underlying stratum was abrupt and clear.

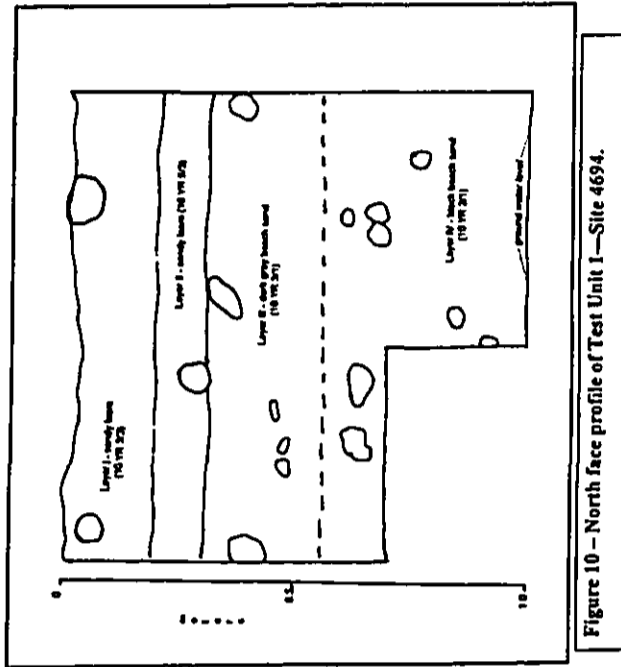


Figure 10 - North face profile of Test Unit 1—Site 4694.

Layer II was up to 10 cm. thick and extended to 29 cmbs. This brown sandy loam (10 YR 5/3) contained relatively large amounts of water-worn basalt cobbles and pebbles (c. 15 % by volume). In addition, over 80 pieces of water-worn coral were noted. Small amounts of shell midden were recovered, along with 3 flakes of volcanic glass (3.6 g.), 2 unworked basalt flakes (4.3 g.), a Maui "diamond" (0.1 g.) and a *puka* shell (0.1 g.). This last item is interpreted as an ornament and has an enlarged hole. Floral remains were composed of 2.0 g. of scattered charcoal. The boundary separating this loose, dry stratum from the one beneath was clear.

Layer III is interpreted as a beach sand deposit. This very dark gray (10 YR 3/1) layer was up to 25 cm. thick. A low amount of material culture remains were recovered from this stratum, which included marine shell, unidentified mammal bone, and a *kukui* nut shell. In addition to the above materials beach basalt cobbles, pebbles and coral were found. The lower part of this stratum graded into a slightly darker beach sand deposit.

Layer IV was encountered at c. 52 to 55 cmbs. This black sand layer (10 YR 2/1) was essentially sterile. The southwestern quadrant of TU 1 was excavated to 1 meter below surface. The ground water table was encountered about 1 meter below surface, and excavation in the unit was terminated.

#### Test Unit 2

This second subsurface test was excavated on the *makai*, or south side of the structure. It was intended to gain information about the subsurface extent of the wall. Low amounts of material culture remains were found in this test unit, which contained 4 strata (Figures 11 and 12).

Layer I was up to 20 cm. thick and was composed of dark brown sandy loam (10 YR 3/3). This very friable soil contained large amounts of organic material. Numbers of water-worn pebbles and coral pieces were present throughout this layer. The stacked portion of the structure wall extended through Layer I. Small amounts of marine shell, a lead pellet, and 15.2 g. of charred *Mawe* wood were recovered. The soil boundary with the lower layer was clear and abrupt.

Layer II was a maximum of 10 cm. thick and reached a depth of 25 cmbs. This brown sandy loam (10 YR 5/3) yielded c. 30 water-worn pebbles and cobbles, a few water-worn pieces of coral, an unworked piece of coral, a small amount of marine shellfish remains, and 2.7 g. of scattered charcoal. Inspection of the northern profile of TU 2 revealed that Layer II did not extend into the structure wall (Figure 12).

Layer III beach sand deposit was encountered between 20 to 25 cmbs, and was up to 30 cm. thick. This very dark gray sand (10 YR 3/1) yielded low amounts of material culture remains consisting of marine shellfish, and 3.7 g. of charred *kukui* nut shell. In addition, fairly large amounts (c. 30% by volume) of water-worn beach cobbles and pebbles were present in this deposit. It was determined that the Site 4694 wall extended to c. 35 cmbs. Layer III graded into Layer IV between 50 to 54 cmbs.

Layer IV was composed of the common black sand (10 YR 2/1). This beach deposit did not contain any material culture remains, and excavation was halted at 60 cmbs.

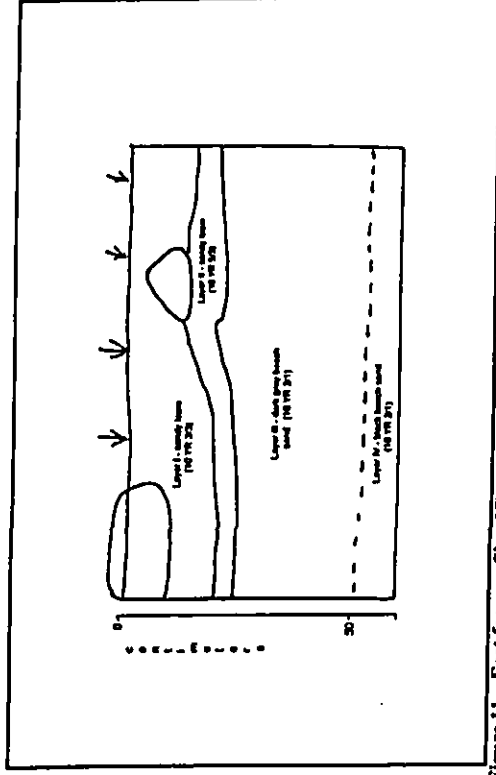


Figure 11 - East face profile of Test Unit 2—Site 4694.

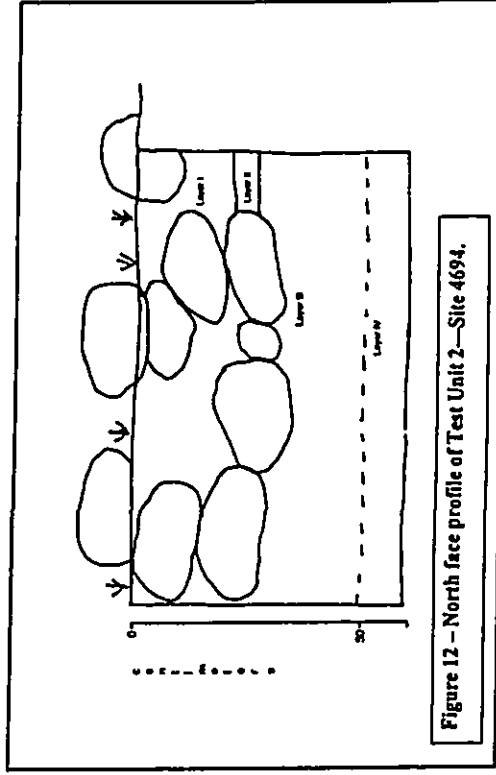


Figure 12 - North face profile of Test Unit 2—Site 4694.

This last unit was placed on the *manuka* or north side of the structure. Test Unit 3 was excavated in an attempt to recover a charcoal sample. A moderate amount of material culture remains were recovered. The same soil layers were present as were encountered in the other test units (Figure 13).

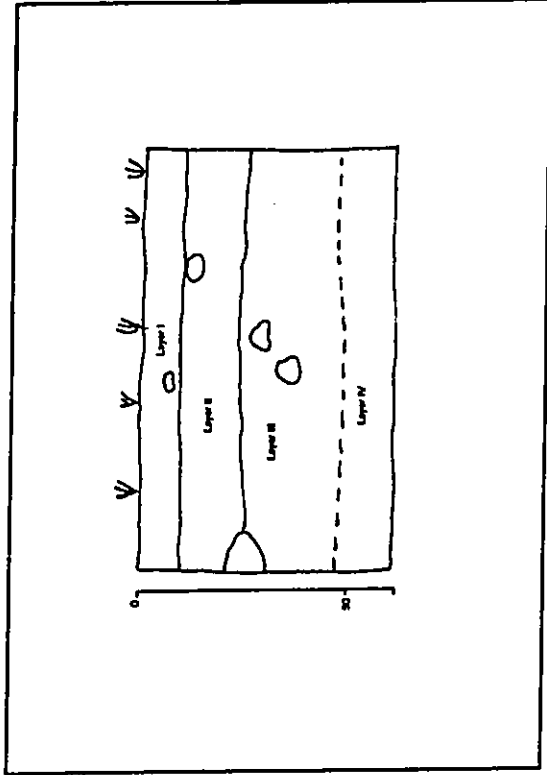


Figure 13 - East face profile of Test Unit 3—Site 4694.

Layer I was 8 to 10 cm. thick and was made up of the same dark brown (10 YR 3/3) sandy loam that was found elsewhere. A low amount (c. 5% by volume) of waterworm basalt cobbles and pebbles were present in this stratum, along with a few waterworm coral pieces. One cowrie shell (*Cypraea sp.*) was found in the layer, along with 0.7 g. of scattered charcoal, and 2 unworked basalt flakes.

Layer II deposit was somewhat thicker in this unit and extended up to 25 cmbs. The brown sandy loam (10 YR 5/3) contained low amounts of waterworm basalt cobbles and pebbles. Portable remains included 12.9 g. of marine shell, 1.6 g. of scattered charcoal, 7.9 g. of waterworm *Aikui* nut shell, 1 unworked basalt flake, and 1 piece of unutilized coral.

Layer III was encountered between 22 and 25 cmbs. This very dark gray sand (10 YR 3/1) yielded low amounts of material culture remains and was up to 29 cm. thick.

Recovered portable remains included 30.4 g. marine shellfish, unidentified mammal bone, 2 unworked basalt flakes, and 2 pieces of unutilized coral. Finally, a rusted iron spike (42 mm. long) was recovered from the upper portion of Level 1 (22-32 cmbs.) This post-contact artifact was partially encircled by a *kiawe* root, and it appears possible that this spike could have been vertically displaced by the root. Water rounded cobbles, pebbles, and coral became increasingly common in the lower portion of the stratum. A probe was utilized to determine the depth of the Site 4694 wall below surface beyond the south face of TU 3. Structure rocks were detected to a maximum depth of c. 40 cmbs.

The black beach sand (10 YR 2/1) of Layer IV was encountered between 45 and 48 cmbs. This beach deposit yielded only waterworm marine shellfish remains and is interpreted as a culturally sterile layer. Excavation was halted at 60 cmbs.

#### Discussion

Investigation at Site 4694 yielded information on the subsurface extent of the rock structure itself and the 4 soil layers present. It appears probable that the structure was built on the upper portion of the Layer III deposit. Both Layers I and II appear to have formed after the construction of the feature. There was no clearly defined cultural layer located. No suitable charcoal samples were recovered to allow for radiometric dating. However, the material culture remains finds (volcanic glass, basalt flakes, *Aikui*, food remains), though sparse, seem typical of precontact habitation sites. With little or no clearly associated post-contact remains present, it appears as if this is a habitation site with subsurface deposits, and what remains of a rock wall around it. The inland extent of this site has been obliterated by sugarcane cultivation activity.

#### Site 50-50-08-4695

This site lies near the northwestern extreme of the *makai* project area. Site 4695 is located at the high water mark. It is constructed of waterworm and angular basalt boulders and cobbles. Remnants of weathered concrete are present as well. It is c. 10 meters long on the N-S axis, by up to 4.5 meters wide. It is about 1.1 meter above the beach level (Figure 14). Much of this site is covered by dense *hau* growth. The overall condition of the site is generally poor. The construction style of this feature, i.e. the mixture of waterworm, angular rocks, and concrete indicate that it was built in post-contact times. It is important to point out that this site has been impacted by storm waves in the past, and the broken pieces of coral that were noted in between the feature boulders and cobbles were probably cast ashore by high surf.

Recently broken and unbleached coral pieces on the structure tend to reinforce the above interpretation. A few sherds of a blue on white porcelain tea pot were present on the surface of the feature. Site 4695 may represent some sort of retaining wall, possibly for a pull-off associated with a nearby section of the Old Government road. This site lies in the Beach Reserve and will not be impacted by development of the property. It has generally low research potential.

**Site 50-50-08-4696**

This site consists of Remnant 3 of the Old Government Road that is located on the topographic maps of the project area. It is c. 15 m. wide by 100 m. long and is oriented at c. 135 degrees. The old black-top road segment on the study parcel is covered by extensive *Naupia* growth and is in poor overall condition. It is truncated by the nearby Honoapi'iiani Highway. It lies within the Beach Reserve and is c. 15 to 18 meters northeast of coastal Site 4695. An old road that is shown on the 1881 Olowalu Sugar Plantation map is presumed to mark the course of the road, of which this site is a remnant (Map 4). The Old Government road followed a traditional trail that encircled the island in precontact times. Much of the Old Government Road was abandoned in the early 1950s when Honoapi'iiani Highway was constructed. However, the existing Pioneer Mill cane haul road continues to follow along much of the former road bed.

**Site 50-50-08-4697**

This is a subsurface site, which lies in the abandoned sugar cane field to the west of the Site 4693 burial ground. Site 4697 was encountered during the excavation of the 30-meter long BT 23. Portions of a dog skeleton were located near the 15.5 meter point of the long trench (Figure 20; Photos 8 and 9). Subsequently, charcoal flecking and a few pieces of marine shell were noted in the profile of BT 23. Two 1-meter square test units were utilized, in order to evaluate subsurface conditions near the 17-meter mark in BT

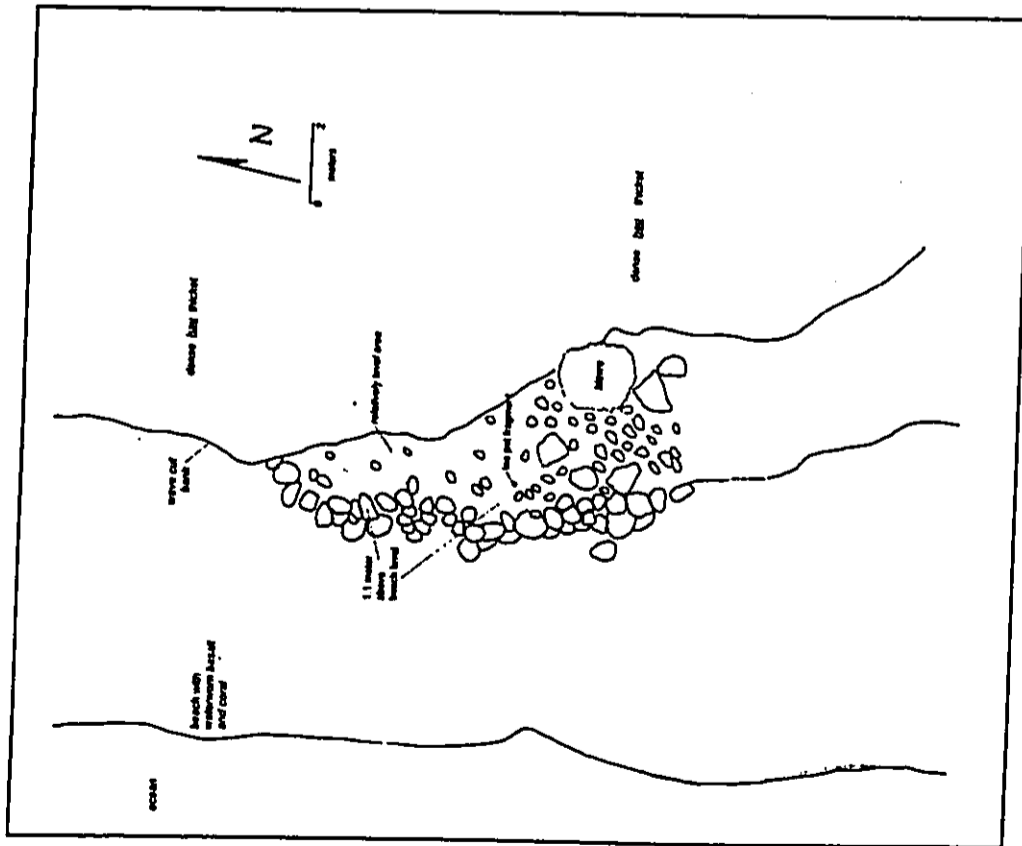


Figure 14 - Plan view of Site 4695.

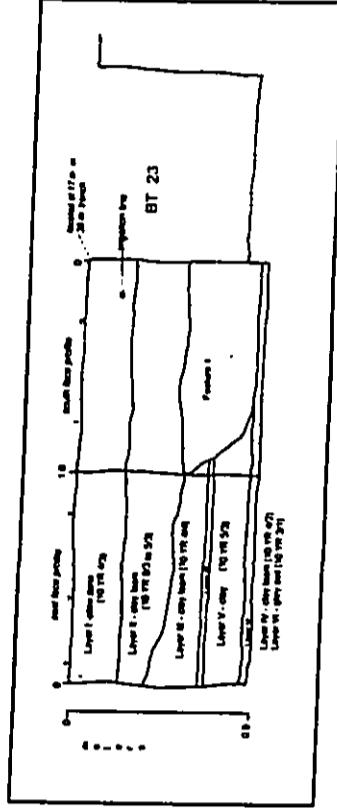


Figure 15 - East and south face profiles of Test Unit 1--Site 4697.



#### Test Unit 1

This unit was excavated on the eastern side of BT 23. It was placed c. 1.5 meters *maka* or north of the area where the dog skeletal remains were previously encountered. This first test unit contained 6 soil layers (Figure 15).

Layer I was up to 25 cm. thick and was composed of the common brown (10 YR 4/3) sandy loam found elsewhere in much of the *maka* portion of the abandoned sugar cane field. This agriculturally disturbed layer contained 3.0 g. of scattered marine shell fish remains, 5.3 g. of echinoderm body parts, 2 pieces of white ceramic, and several sections of black plastic irrigation tubing. The soil boundary with the underlying stratum was somewhat indistinct.

Layer II was pale brown (10 YR 6/3) to brown (10 YR 5/3) and appeared to have been partially impacted by the overlying plow zone. This clay loam stratum was up to 16 cm. thick and contained 14.7 g. of scattered marine shell fish remains, 36.0 g. of urchin body parts, a dog tooth, scattered fish bone (0.4 g.) and a broken mammal tooth (non-human). In addition, 2 white ceramic pieces, an unidentified piece of plastic, a Maui "diamond" quartz, and a concentration of charcoal (10.7 g.) were encountered.<sup>31</sup> A plow scar extended through the bulk of Layer II to a maximum depth of 39 cmbs.

Layer III was encountered between 39 and 41 cmbs. This dark yellowish brown (10 YR 4/4) clay loam was about 10 cm. thick. It contained low amounts of material culture remains, including 5.8 g. of marine shell fish remains and 14.6 g. of urchin body parts. In addition, this damp clay loam contained a subsurface feature—Feature 1.1.

#### Feature 1.1

This feature made itself apparent at c. 48 cmbs. near the southern face of TU 1. It runs up to 80 cm. wide in TU 1, and extended into the unexcavated southern profile of the unit. This irregularly shaped pit was a maximum of 33 cm. deep (from c. 48 to 81 cmbs.). Test Unit 2 was excavated adjacent to TU 1, in order to investigate the feature more fully. Material culture remains in this feature were recovered from both test units. These consisted of 70.6 g. of marine shell fish, 48.1 g. of echinoderm parts, 0.5 g. of fish bone, 3 unworked coral pieces, and a small Maui "diamond" (0.3 g.).<sup>32</sup> An Asian-motif ceramic shard was located in the top few centimeters of Feature 1.1. Floral remains consisted of 11.9 g. of scattered charcoal. A radiocarbon sample was submitted to Beta Analytic, Inc. This sample returned a date of 120 +/- 70 RCYBP. The calibrated results put the date at between AD 1650 and 1950. The intercepts of the radiocarbon age with the calibrated curve fell at AD 1695, AD 1725, AD 1815, and AD 1920 (refer to Appendix A).

While a ceramic shard was found near the top of the feature, there were no other historic materials recovered. The radiocarbon date does not clearly indicate a time frame for Feature 1.1. This irregularly shaped pit truncated the Layer IV deposit.

<sup>31</sup> This charcoal concentration contained one of the ceramic pieces.

<sup>32</sup> Crystals of white quartz—some of gem quality (Macdonald, Abbott and Peterson, 1983, p.488).

Layer IV was present in the northern portion of TU 1. This thin dark grayish brown (10 YR 4/2) clay loam extended from c. 63 to 67 cmbs. No material culture remains were found in this slightly compact stratum. Layer V extended from 67 to 82 cmbs. This layer was a moist, compact brown clay (10 YR 5/3). No material remains were found in this stratum.

Layer VI was composed of saturated very dark gray clay (10 YR 3/1). This gley soil appeared to be sterile. Excavation was halted at a maximum depth of 90 cmbs.

#### Test Unit 2

This unit was excavated adjacent to and *maka* (south) of TU 1, in order to more fully investigate Feature 1.1. Six similar strata were encountered in this 1-meter square unit (Figure 16). Layer I was a maximum of 37 cm. thick. The plow zone (10 YR 4/3) yielded 8.0 g. of scattered marine shell fish, 19.6 g. of urchin body parts, 2.6 g. of pig bone, and unworked basalt flake, 3 pieces of unworked coral, a piece of white ceramic, a green bottle glass fragment, and a piece of iron. In addition, plastic drip-line irrigation tubing was located just to the east of the test unit.

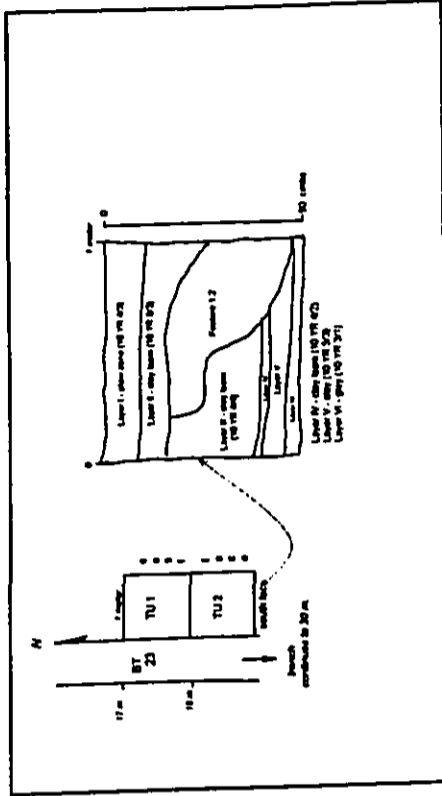


Figure 16 - South face profile of Test Unit 2—Site 4697. Figure on the left shows relationship of Test Units to Backhoe Trench 23.

Layer II was located c. 25 to 27 cmbs. and consisted of the common pale brown (10 YR 6/3) to brown (10 YR 5/3) clay loam. This somewhat compact layer yielded 58.4 g. of marine shell fish remains, 62.1 g. of echinoderm body parts, a dog tooth, 15.4 g. of

scattered charcoal, and a rusted iron spike (92 mm. long). This stratum appeared to be largely intact.

Layer III was encountered at 38 to 40 cmbs. Only a small portion of stratum was present in the eastern half of TU 2. Feature 1.1 extended into much of the dark yellowish brown (10 YR 4/4) clay loam. All material culture remains located in the Feature 1.1 pit were combined with those found in the TU 1 portion of the same feature.

Layer IV was encountered at c. 60 to 69 cmbs. and was a maximum of 6 cm. thick. This thin stratum was located only in the eastern portion of TU 2. No material culture remains were recovered from this dark grayish brown (10 YR 4/2) clay loam.

Layer V was encountered at c. 66 cmbs. and was a maximum of 12 cm. thick. This brown (10 YR 5/3) clay was somewhat compact and moist. This stratum was also sterile. The Layer VI deposit extended from 78 cmbs. to the bottom of TU 2 at 90 cmbs. This saturated gley soil was very dark gray (10 YR 3/1) in color and did not yield any cultural materials.

#### Discussion

A series of auger probes were made to determine the extent of this subsurface site. Beginning at the test units, the subsurface cultural deposit appeared to extend c. 6 meters northwest, and about 3 to 4 meters west, giving an area extent of c. 30 to 40 square meters to the west of the burial preserve. It may also extend to the east, but that area is within the burial preservation reserve itself, and was not further tested. No plan view drawing of the estimated area of the site was made.

Excavation at Site 4697 yielded a radiocarbon date that could fall into the late precontact or early post-contact period, although it was far from being definitive. The post-contact material items included bottle glass and ceramic sherds. There were 2 house/lot *kuleana* awards in the general vicinity (LCA 8817:1 and LCA 5952:1). Site 4697 could be a remnant of activity associated with one of these. The radiocarbon calibrated date bracket was AD 1695 to 1950— with 4 intercepts, falling at AD 1695, AD 1725, AD 1815 and AD 1920.

#### Site 50-50-08-4698

This last site was located during backhoe testing near the ruins of the former Olowalu Mill (Site 1602). Backhoe Trench 59 was excavated just to the east of the landscaped area of the former manager's home. This backhoe trench lies within c. 25 m. of the existing shoreline. Charcoal flecking and scattered marine shellfish remains were noted in the profile and subsequently, a 1-meter square test unit was excavated to further investigate subsurface conditions.

#### Test Unit 1

This subsurface test was located in the western fact of BT 59. A total of 6 layers, including a cultural deposit (Layer III) were located (Figure 17). The uppermost layer consisted of dark brown (10 YR 3/3) clay loam that was humus rich. Angular and waterworn basalt cobbles were common in this loose, somewhat dry stratum. Material culture remains included modern refuse that was not collected. In addition, 12.8 g. of scattered marine shell fish remains, 5.9 g. of pencil urchin spine, a trace of crab shell, 14.9 g. of pig bone, 142.8 g. of cut beef bone, 6.5 g. of *kukui* nut shell, 3 pieces of unworked coral and a trace of charcoal. Layer I was about 30 cm. thick.

Layer II was up to 19 cm. thick and was composed of brown (10 YR 5/3) silty loam. This loose stratum contained low amounts (less than 5% by volume) of basalt cobbles and pebbles. A low amount of material culture remains were recovered from this

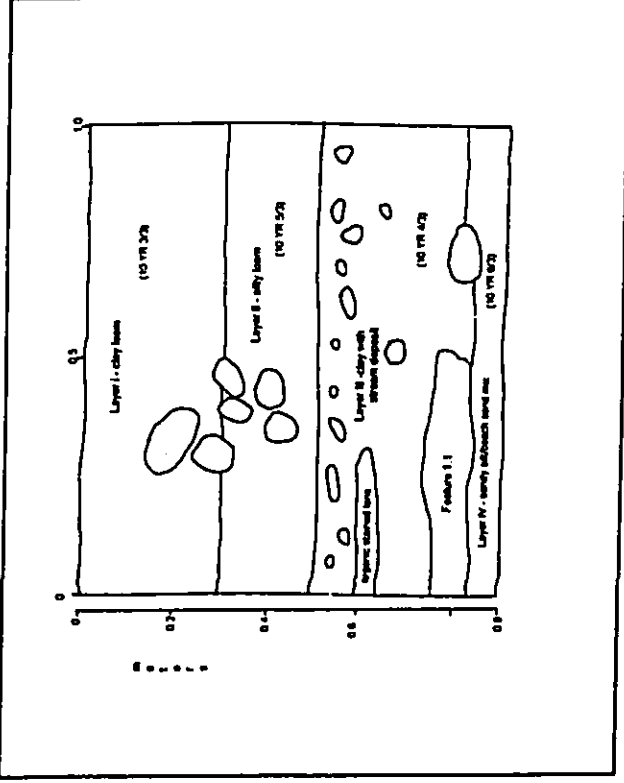


Figure 17 — West face profile of Test Unit 1—Site 4698.

layer. Portable remains included 2.2 g. of scattered marine shell fish, 4.4 g. of pencil urchin spine, a mammal tooth, and a trace of charcoal.

Layer III had a higher clay content than the overlying stratum. This lower layer was brown (10 YR 4/5) in color and contained an *in situ* cultural deposit. This moist, compact stratum contained stream gravel and sand deposits, material culture remains, and a subsurface feature. Portable remains in the c. 32 cm. thick layer included 61.2 g. of marine shell fish remains, 36.3 g. of echinoderm body parts, 17.1 g. of charcoal, 2 unworked basalt flakes, 2 flakes of volcanic glass (2.9 g.), and 5 pieces of unworked coral. The 2 volcanic glass flakes are of good quality. A feature was located in Level 2 (59 to 69 cmbs.) and extended to the bottom of Layer III.

Feature 1.1 is interpreted as a hearth remnant, and yielded 26.1 g. of charcoal. This feature was a maximum of 61 cm. wide and its lower section extended into the unexcavated western profile of the unit. The eastern part of the feature was truncated by the BT 59 excavation. A suitable charcoal sample was collected and sent to Beta Analytic, Inc. This sample returned a radiocarbon age of 230 +/- 70 RCYBP. This sample yielded a date range (at 2 sigma, 95% probability) of AD 1495 to 1950. The intercept data indicated that the intercept of the radiocarbon age and the calibration curve fell at AD 1665. This date is comfortably in precontact times. The latter date of 1950 is attributed to atmospheric testing. Given the lack of post-contact material culture remains, this site is interpreted as precontact.

The lower portions of Layer III contained less cultural material and Level 4 (79 to 83 cmbs.) was sterile. The soil boundary with the bottom-most stratum in TU 1 was abrupt and clean.

Layer IV consisted of dark, yellowish brown (10 YR 4/4) sandy silt mixed with pale brown (10 YR 6/3) sand banding. This moist stratum extended to the bottom of TU 1 at 90 cmbs. Excavation was halted just above the ground water table.

#### Discussion

Excavation next to BT 59 yielded a precontact cultural deposit. It appears that the site might extend under the landscaped portion of the nearby Manager's house, but that area was not available for subsurface testing. Backhoe Trench 60 which lies 20 meters to the east did not contain any precontact cultural materials, indicating that the site did not extend beyond that point to the east. A series of auger probes, revealed that the site extended about 8 meters north of the test unit location, c. 3 meters to the south. The area to the east has been recently filled in. With this information, we estimate that the extent of Site 4698 to c. 35 to 50 square meters. No plan drawing was made of this site. Given its proximity to the ocean, it was probably a permanent habitation site, if one follows the traditional settlement pattern coastal zone model.

This subsurface site lies between the ruins of the old Mill and the Manager's house, both of which are not going to be disturbed. This area will be part of a planned Olowalu Mill Complex interpretative center.

#### Site 50-50-08-1602

The ruins of the old Olowalu Sugar Mill lie on the *makai* side of Honoapi'iiani Highway, approximately 20 meters from the shore (see Photos 14 through 21). The historic and archaeological material on this site was presented earlier in this report—in the section deals with background information. The reader is referred to that section. In addition, historic background research is being pursued by Ms. Gail Ainsworth, who has been contracted by Olowalu Elua, LLC to collect information which can be used in an interpretative exhibit. Additional research on our part was viewed as a duplication of effort. Pertinent historical information on the Mill and surrounding plantation

community will be included in the companion report dealing with the Olowalu *Mauka* (Phase 2) portion of this inventory survey. The reader is referred to that report for additional information on the Olowalu Mill complex.

A rough sketch map was included in the short data form completed during the 1974 statewide inventory of historic places. A map of the ruins, as they are today, was prepared by Mark Donham for the present inventory survey (Figure 18). The buildings associated with the Mill include the manager's house, which was probably built around 1910. There are 3 other dwellings that were the residences of other managerial personnel connected with the plantation. These lie *mauka* between the remnants of the mill foundation and the highway. On the ocean side of the mill is the remnant of a boat-landing ramp and pier, which was used to load sugar onto cargo ships that would transfer it to market (Photo 21). A longer, more substantial breakwater or jetty, located on the Lahaina side of the ramp, extends c. 50 meters into the ocean, perpendicular to the shoreline. This creates a relatively calm basin leading up to the boat ramp.

The foundations of the mill are overgrown with alien vegetation. A large opiuma tree is growing out of an area between two brick walls at the *makai* end of a large cement slab (Photos 19 and 20). This may have been a boiler area, where sorghum was reduced to sugar in the refinement process. Other areas are completely covered with *Uroea* and opiuma trees and debris (Photo 18). The stable area is located on the east side of the site. Mules were kept for working in the fields, and hauling cars along the railroad tracks around the turn of the century.

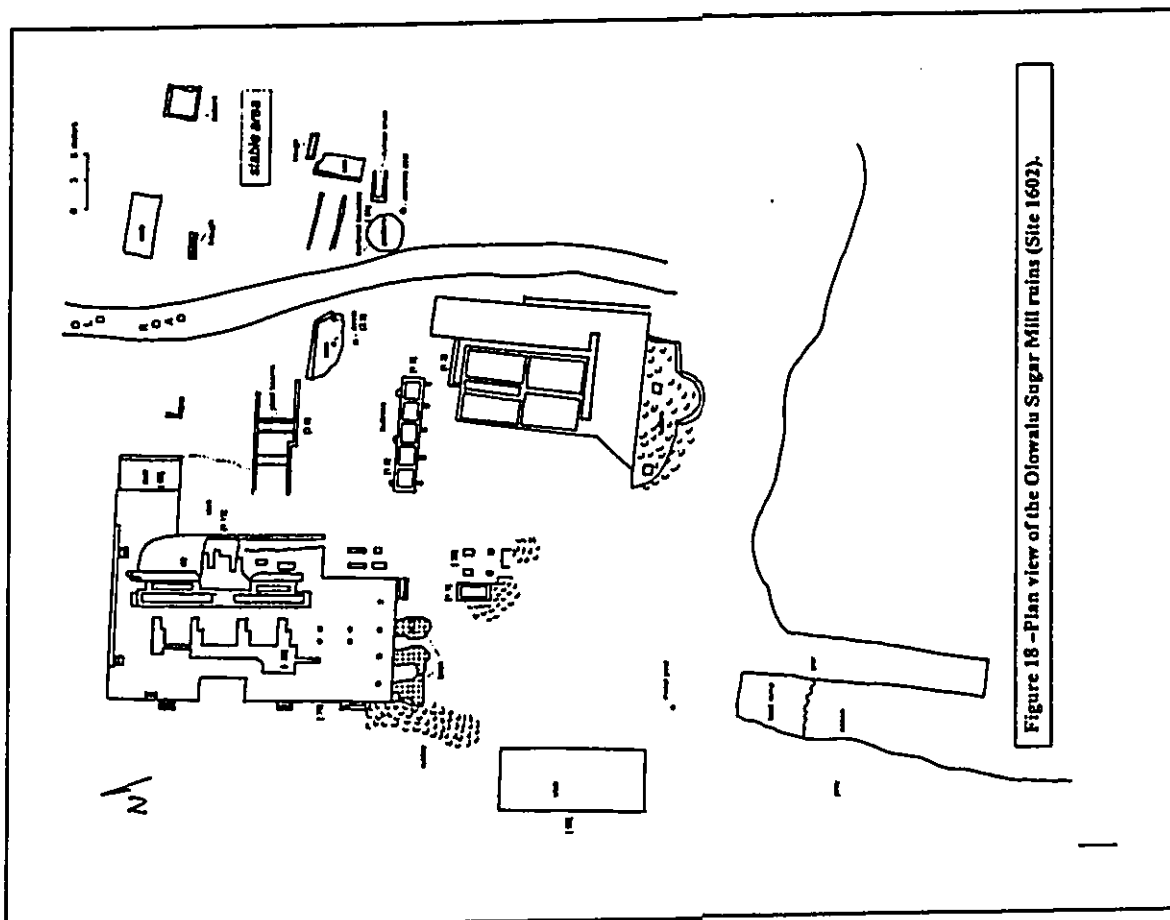
The historic photo on page 50 (Figure 18a) shows the Mill in the latter part of the 19<sup>th</sup> century. A boardwalk appears to be extending onto the jetty. Directly behind is the smokstack that would have extended from the brick structures that made up the boiling room at the *makai* end of the large concrete slab. We were not able to find anyone who had knowledge about the specific designation of the various parts of the remaining ruins. It is hoped that this information will be forthcoming with Ms. Bartholomew's continuing research.



*The Olowalu Sugar Company mill between 1870 and 1890.*

( Bartholomew and Bailey, 1994, p. 45)

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### Backhoe Trenches

A total of 97 backhoe trenches were excavated on the *mauka* portion of the Olowalu project area (Figure 3). Trenches were excavated past the ground water table, except in locations where subsurface conditions proved to be too unstable or where human skeletal remains were encountered (BT 8 and BT 13). The majority of the backhoe trenches were c. 5 meters in length by c. 0.9 meters (the width of the backhoe bucket) in width. In general, depths ranged from 1 to 3.5 meters. The bulk of the trenches were closely inspected. It was not possible, however, to inspect several of the trench profiles due to unstable subsurface stream deposits. Refer to Table 8 for subsurface results for each of the backhoe trenches.

The scope of our sampling methodology was broadened after the Site 4693 burial ground was located to the northeast of Hekili Point. The area near the burial ground was more extensively sampled, in order to obtain a clearer understanding of the extent of the burials, and the subsurface marine sand deposit and apparent marsh deposit.

After the initial discovery of human remains in the sandy area, it was deemed prudent to systematically test areas where sand was either observed on the surface, or suspected to occur in subsurface deposits. It remains possible that additional burials might be present in these sandy areas along the coast of the study property. No additional human burials were located elsewhere in our inventory survey. The backhoe trenches did, however, provide valuable information on subsurface cultural deposits (Sites 4697 and 4698), and on the geology of the project area.

Subsurface results indicate that the former bed of the Olowalu Stream entered the ocean near Hekili Point on the eastern portion of the project area.<sup>23</sup> An extensive and course sand deposit was located to the east of the former stream bed. This sand was determined to be a marine deposit and was found to extend across much of the eastern project area and onto the portions of the *mauka* study area.<sup>24</sup> The marine sand deposit was exposed at the surface in the vicinity of the Site 4693 burial ground and was capped by up to 1 meter of alluvium elsewhere on the eastern portion of the study area (refer to Figure 3).

Further testing to the west of Site 4693 yielded thinner marine sand deposits and thicker gley soil deposits. In addition, stream deposits were noted in several trenches (BT 16, 17, 20) in this area as well. The presence of stream deposits in several test trenches indicates that the old Olowalu stream bed crossed this part of the project area before it was channelized to its present location, sometime around the turn of the century.

Saturated gley soil deposits were located in numbers of backhoe trenches. These gley soil deposits were high in organic content and are interpreted as former marsh

<sup>23</sup> These findings are corroborated by a 1906 survey map of Olowalu Sugar Plantation, drawn by A. C. Alexander. This map shows the former stream bed and the new channelized stream.

<sup>24</sup> Human remains were found associated with this marine deposit (Site 4693). This marine sand was probably deposited within the last 2000 years.

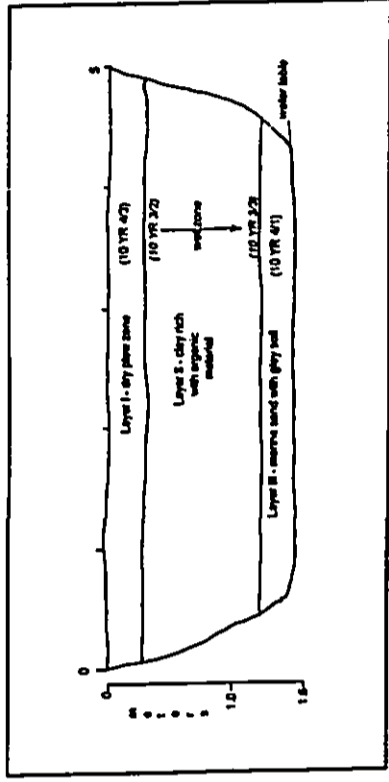


Figure 19 - West face profile of Backhoe Trench 21.

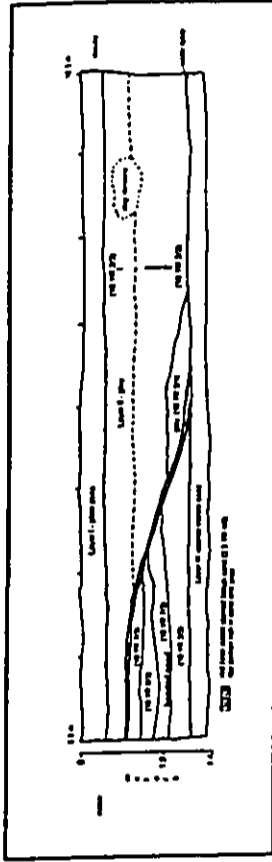


Figure 20 - West face profile of Backhoe Trench 23.

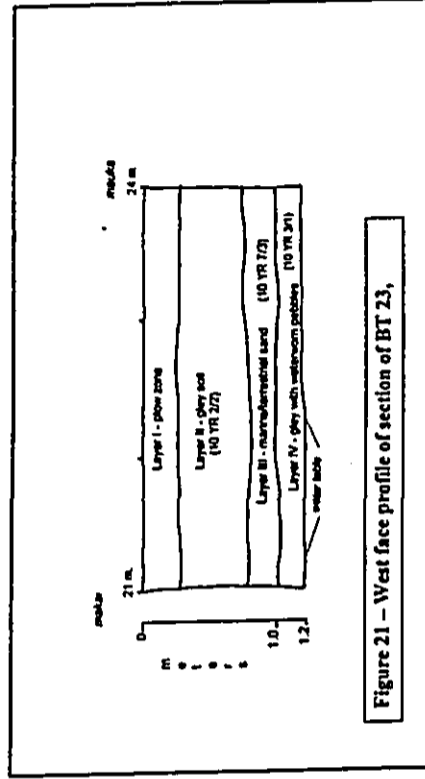


Figure 21 - West face profile of section of BT 23.

deposits. It appears plausible that a coastal berm of the previously noted marine sand partially dammed the Olowalu stream flow sometime in the past 2000 to 5000 years, when the sea level was higher than at the present time. Direct evidence of such a berm and the resultant marsh deposits that would have formed behind it, was exposed in BT 23. We did not attempt to date the marsh deposits, as this was beyond the scope of our inventory survey.

Backhoe Trench 23 was 30 meters long and was excavated in an effort to locate the extent of the Site 4693 burial ground, and determine the edge of a possible marsh and a marine sand berm, if possible. Trench orientation was essentially N-S. Trench stratigraphy included the common brown (10 YR 4/3) plow zone which was underlain by alluvial deposits and what is interpreted as marsh deposits. Examination of the trench profile revealed a marine sand deposit that appears to have built up in the area where the former mouth of Olowalu Stream was likely located. This deposit of very pale brown (10 YR 8/3) marine sand was impacted by the plow zone in the southern most portion of BT 23. A sand berm which slopes down into alluvium and the underlying very dark gray (10 YR 3/1) gley soil deposit, was visible in the 7 to 10 meter section of the 30 meter long trench. The rest of BT 23 running mauka or north of this sand berm area did not contain any marine sand deposits. Rather, this subsurface test yielded gley soil and stream deposits which indicate a coastal lagoon marsh environmental setting.

Stream deposits became more common in the stratigraphy west of Hekili Point, and continued to the western end of the project area. In the coastal area particularly, mixing of beach sand with terrestrial sand was noted in several trenches excavated between Hekili Point and the old Olowalu Mill. Trenches within this zone of mixing included BTs 41, 43, 54 and 58). Stream deposits were present in nearly all of the trenches west of the former manager's house (BTs 62 through 97). However, 3 trenches in the vicinity of the existing shoreline in that area yielded more recent beach deposits (BTs 63, 66 and 67). Backhoe Trench 83 contained what appeared to be a storm wave beach sand deposit (Figure 23). All other trenches in this area yielded stream deposits of various grades from fine terrestrial sands through waterworn gravels, pebbles, cobbles and small boulders. Backhoe Trench 71 provides a representative profile for the bulk of the trenches with stream deposits.

Briefly touching on the results from other backhoe testing, we note that BT 21 (Figure 19) shows shallow, low turbidity deposit relationship going from stream deposit to marine and terrestrial sand mixing with clay and gley soil. In BT 32 and 33, large chunks of coral were found mixed with soil, which may indicate storm surge deposits as

23 These types of marsh deposits can be seen along Honoapi'iiani Highway between Ukumehame and Olowalu today. The combination of being at sea level and behind a beach sand berm which blocks drainage, causes water to pool in low areas after heavy rains. As the stagnant water evaporates, salt crystals form on the surface. Such conditions would not have been conducive to the cultivation of taro. However, according to Dr. Ross Corey (SHPD Doc. No: 0001RC11, January 11, 2000), "...stream fed 'coastal lagoon marsh' lands could be used for fishponds and could have paleoenvironmental information on Hawaiian history (e.g., pollen record showing clearing of trees as signs of human settlement and charcoal dating that period). It is clear that these marsh soils must be studied further in the mitigation phase of this project—with trenching/coring, pollen studies, and dating."

appeared to be the case in BT 83. Backhoe Trench 59 (Figure 22) revealed a thin cultural layer, while BT 60 uncovered 19<sup>th</sup> century historic debris. Backhoe Trench 75 indicated a heavy water-flow area, by the presence of a high density of waterworn pebbles and cobbles. Backhoe Trench 97 had a 50%-50% marine and terrestrial sand deposit at the very bottom of the trench, which may indicate another possible tributary section, where during high tide, the marine-terrestrial sand mixing occurred.

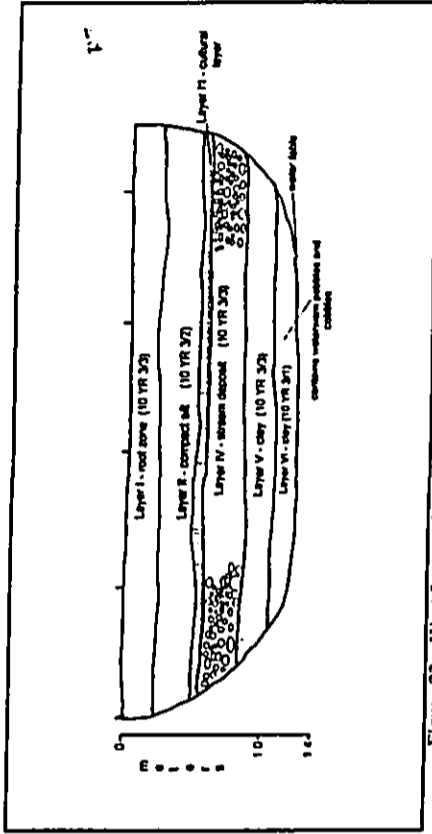


Figure 22 - West face profile of Backhoe Trench 59.

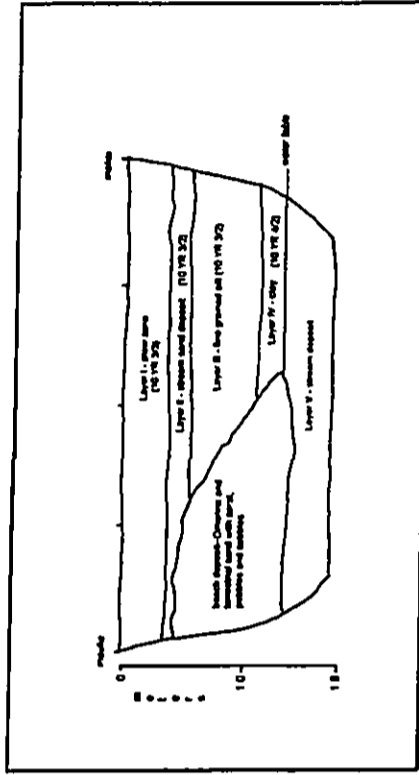


Figure 23 - East face profile of Backhoe Trench 83.

## SUMMARY AND CONCLUSIONS

A total of 6 previously unrecorded archaeological sites were identified during this inventory level survey of the *makai* c. 73 acre study area. In addition, the Olowalu Mill ruins (Site 50-50-08-1602) were mapped. The previously unidentified sites were assigned SIHP numbers 50-50-08-4693 through 4698.

Site 4694 appears to be the remnants of a habitation site with what remains of a rock wall around it. Sites 4695 and 4696 lie near the western boundary of the *makai* project area. Site 4695 seems to represent a coastal retaining wall of post-contact construction. Site 4696 consists of a segment of the Old Government Road that was constructed in 19<sup>th</sup> century and probably followed a traditional coastal trail. Both Sites 4697 and 4698 consist of fairly localized subsurface occupation deposits. Site 4697 probably represents post-contact habitation activity, possibly associated with one of the houselots present in the area. The last site (Site 4698) is interpreted as a temporary habitation area.

### Precontact to 1850s

The 2 precontact sites (Sites 4694 and 4698) are consistent with the expected settlement patterns previously discussed in this report—that is, permanent coastal habitation. Expected features such as walled enclosures, subsurface cultural deposits, and associated burials might be expected. While it was not possible to directly date the Site 4693 burial ground, it is considered to be a precontact burial area probably associated with house sites that go back to c. AD 1500. There was no evidence of habitation sites in the western portion of the property. Those we found are on the eastern side of the property, near the mouth of Olowalu Stream in earlier times. Activities associated with the sugar plantation have directly impacted all of the precontact cultural resources located in the inventory survey, and very well may have eliminated others.

Marine sand deposits around the former mouth of the stream on the eastern portion of the study parcel are older than the stream deposited materials that dominate the western portion of the property. The most significant cultural finds were located within these marine sand deposits. While gley soils were present in a few of the backhoe trenches, we were not able to ascertain if they were associated with taro pondfields or fishponds. However, because none of the LCAs stipulated taro lands or fish ponds in the *makai* study area—only houselots—it seems more likely that the soils are associated with seasonal lagoonal features. However, these soils may contain important paleoenvironmental information on Hawaiian history in the area, and are considered to be significant finds.

In general all of the backhoe tests were dug to the water table, which occurred as shallow as 70 cmbs. in some areas. The average depth at which the water table occurred was between 1 and 2 meters, however. Marine sand was distinguished from terrestrial sand from the nature of its color and content. Marine sand was typically lighter in color, and mixed with bits of waterworm shell, coral and pebbles. Terrestrial sand was generally darker and made up of basalt and olivine crystals. The action of tidal fluctuations, bringing sea water laden with marine sand into an area of sand deposited by stream erosion, would cause the kind of mixing that was observed in many of the backhoe tests.

Only 4 backhoe trenches located cultural materials. Backhoe Trenches 8 and 13 uncovered human remains, while BTs 23 (Figures 20 and 21) and 59 (Figure 22) indicated cultural layers. The only radiocarbon dates from the inventory level subsurface survey, were obtained in test units which examined the cultural layers found in BTs 23 and 59.

### Radiometric Dates

There were 2 radiometric dates obtained during our inventory survey on the *makai* portion of the Olowalu project area. One was from subsurface Feature 1.1 in Site 4697. It yielded a conventional radiocarbon age of 120 +/- 70 RCYBP. The calibrated result at 2 sigma (95% probability) is AD 1650 to 1950. A series of intercepts of the radiocarbon age with the calibration curve fell at AD 1695, AD 1725, AD 1815, and AD 1920. Cultural material in this feature was not definitive—there were no indigenous artifacts found. However, there was marine shell fish midden present. A few sherds of ceramic ware were found on the surface of the feature. These factors appear to suggest an early post-contact date. There were several LCA parcels located to the west, which indicate that there were *haleana* homesteads in this coastal area well into post-contact times.

The second radiometric date was obtained from a sample recovered from a subsurface feature at Site 4698, located in the vicinity of the old sugar mill. A subsurface cultural deposit was exposed in BT 59 in this area. When this deposit was explored further in a 1 x 1 meter square test unit, a concentration of carbon was collected and sent to Beta Analytic, Inc. for analysis. This sample returned a conventional radiocarbon age of 230 +/- 70 RCYBP. The calibrated results (2 sigma, 95% probability) provided a date range from AD 1495 to 1950. The intercept of the radiocarbon age and calibration curve fell at AD 1665. There were no historic materials found in the cultural layer, which tends to corroborate a late precontact time frame.

No direct archaeological evidence was found associated with the Mahele period. The Site 4697 post-contact subsurface cultural deposit could possibly be associated with activity during time period, given the range of radiocarbon dates, however.

#### Plantation Era

The Olowalu Mill Complex remains are remnants from the Plantation era, as are the series of cane fields and associated roads, and the water delivery system. As stated before, the activity of the Plantation era has heavily impacted and/or obliterated remains of precontact and Mahele times.

#### Site Significance Evaluations

All of the above sites, including the Olowalu Mill (Site 1602) are deemed significant under Criterion D of the Federal and State historic preservation guidelines. These sites are considered to be important for the information content they have yielded or are likely to yield. Further, Site 1602 is considered significant under Criterion A as well—associated with events that have made important contributions to the broad patterns of Hawaiian history.

Site 4693 also qualifies for significance under Criterion E for its cultural value. It appears to be a precontact burial ground that has been extensively impacted by sugar cane cultivation. The remains of at least 5 individuals were found, and it is very probable that additional burials are present in this area of marine sand deposits.

Site 4694 consists of a remnant of a relatively large rock structure. A portion of the site has been impacted by sugar cane cultivation. The overall integrity of the site is altered, although the remaining portion of it is in generally fair condition. It lies in the Beach Reserve area.

Both Sites 4695 and 4696 lie in the Beach Reserve of the western portion of the project area. Site 4695 appears to have been built in post-contact times, and is tentatively identified as a shoreline erosion wall that may have been associated with Site 4696. The site is in generally fair condition. Site 4696 is in poor condition and is part of the Old Government Road that is shown on an 1881 map (Map 4). This Government road was probably built in the mid-1800s, and followed the route of the traditional trail that encircled the island of Maui.

Site 4697 is interpreted as a post-contact habitation area. Site 4698 represents a late-precontact habitation area.

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It is also noted that the gleyed soils located near the former mouth of the Olowalu Stream are considered to be important under Criterion "D"—for their information content.

#### Mitigation Recommendations

We are recommending that 5 sites be preserved—Site 4693 (Burial ground), 4694 (coastal habitation site), and 1602 (Olowalu Mill), habitation sites 4697 and 4698. The gleyed soils are recommended to undergo archaeological data recovery. Two sites—Sites 4695 and 4696—are considered to be "no longer significant" and do not require further work.

Site 4693 is the most significant site in the study area for its traditional cultural value. Permanent preservation is the recommended mitigation for this site.

Site 4694 lies on Hekili Point to the southwest of Site 4693. This structure is within the Beach Reserve. Preservation is the recommended mitigation for this cultural resource.

Site 4697 seems to represent an early post-contact habitation area. Since its location near the Burial Preserve will not allow future development, preservation will take place.

Site 4698 is interpreted as a precontact temporary habitation area. This site also lies in an area that is not planned for development. The owners have agreed to place it into passive preservation.

The area of gleyed soils should undergo data recovery at some point in the future, in order to gather information relating to climate and ecology, and a chronology of human settlement in Olowalu.

The Olowalu Mill complex (Site 1602) is recommended for interpretive preservation.

The discovery of the Site 4693 burial ground has heightened the cultural sensitivity of the *makai* portion of the development project. In an effort of alleviate concerns within the Hawaiian community, archaeological monitoring appears to be appropriate mitigation during any ground altering activities between Hekili Point and the former manager's home. Sand deposits are present, and while no burials were found in

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this area during our inventory level testing, the possibility exists that human remains may be located in the area near the Beach Reserve boundary.

No commercial or residential development of any kind is recommended for the area that contains the Site 4693 burial ground and the marine sand deposits on the eastern portion of the *makai* project area. Passive preservation, such as a park is deemed the most appropriate mitigation for this portion of the project area.

## REFERENCES

- Bartholomew, Gail and Bren Bailey  
1994  
*Maui Remembers—A Local History*, Mutual Publishing Company, Honolulu, Hawaii.
- Buck, Peter H. (Te Rangī Hiroa)  
1957  
*Arts and Crafts of Hawaii: Fishing*, Volume VII, Bishop Museum Press, Honolulu.
- Conde, J.C. and Gerald M. Best  
1973  
*Arts and Crafts of Hawaii: Death and Burial*, Volume XIII, Bishop Museum Press, Honolulu.
- Connolly III, Robert A.  
1973  
*Sugar Trains: Narrow Gauge Rails in Hawaii*, Glenwood Publishers, Felton, California.
- Devereaux, Thomas I.  
October 1997  
Olowalu Site 1200, Hawaii Register of Historic Places (Short Form), SHPD.
- Devereaux, Thomas I., Heidi, V. Creed, L. Pyle, and H.H. Hammatt  
October 1997  
*An Archaeological Inventory Survey and Surface Testing of a 440-acre Parcel, Ahupua'a of Uluwauhome District of Lahaina, Island of Maui (TMK: 4-8-02: 09)*, Prepared for Sugar Way Ltd., Cultural Surveys Hawaii.
- Devereaux, Thomas, Colin, Brian and Hallett H. Hammatt  
April 1997  
*An Archaeological Monitoring Report for the Ma'aloa to Lahaina 3rd 69 KV Transmission Line, Island of Maui, Hawaii*, prepared for Demes and Moore and Maui Electric Company Limited, by Cultural Surveys Hawaii.
- Foot, Donald E., E.L. Hill, S. Nakamura and F. Stephens  
1972  
*Soil Survey of the Islands of Kona I, Oahu, Maui, Molokai and Lanai, State of Hawaii*, U.S. Dept. of Agriculture, U.S. Government Printing Office, Washington, D.C.
- Fornander, Abraham  
1996  
*Ancient History of the Hawaiian People to the Times of Kamehameha I*, Mutual Publishing Company, Honolulu.
- Fredericksen, Demaris L. and Erik M. Fredericksen  
February 2000  
*Archaeological Inventory Survey of the Mauia Portion of Olowalu Development Parcel, Phase 2, Olowalu Ahupua'a Lahaina District, Maui Island (TMK: 4-8-3: 10)*, Prepared for Olowalu Elua Associates, by Xamanek Researches, Pukalani, HI.

Graves, Donna K. and Susan Goodfellow  
January 1991  
Draft  
*Archaeological Inventory Survey Lanaiipoko Golf Course,  
Land of Lanaiipoko, Lohaina District, Island of Maui  
(TMK: 4-7-01: 2), prepared for AMFAC/JMB  
Development (Hawaii), Inc., Honolulu, HI, by PHRI, Hilo,  
Hawaii.*

Graves, Donna K. Susan Goodfellow and Alan Haun  
April 1998  
*Archaeological Inventory Survey Lanaiipoko Development  
Parcel, Land of Lanaiipoko, Lohaina District, Island of  
Maui (TMK 4-7-01: 2), prepared for Peter Martin, President,  
Lanaiipoko LLC, by PHRI, Hilo, Hawaii.*

Handy, E.S. Craighill, and Elizabeth G. Handy  
1972  
*Native Pioneers in Old Hawaii: Their Life, Legs, and  
Environments*, Bishop Museum Press, Honolulu.

Kamakau, Samuel M.  
1992

*Ruling Chiefs of Hawaii (Revised Edition)*, Kamehameha  
Schools Press, Honolulu.

Schmitt, Robert C.  
1973

*The Missionary Centres of Hawaii*, Bishop Museum,  
Honolulu, Hawaii.

Sterling, Elspeth  
1997

*Sites of Maui*, Bishop Museum Press, Honolulu, Hawaii.

Walker, Winslow  
1931

*Archaeology of Maui*, Manuscript at Maui Historical Society, Wailuku,  
Maui.

Wilcox, Carol  
1998

*Sugar Water: Hawaii's Plantation Ditches*, University of  
Hawaii Press, Honolulu, Hawaii.

Wright, J. C.  
1974

*Olowalu Sites 1602 and 1603*. Hawaii Register of Historic  
Places (Short Form), SHPD.

Table 2  
Inventory Level Significance Evaluations

SIIP Site #	Significance Criterion	Components / Features	Status	Condition	Age	Proposed Mitigation
50-50-08						
4693	D and E	Burials (5 minimum)	A	G-P	I	Preservation
4694	D	Structure and deposit	A	F	I	Preservation (in Beach Reserve)
4695	D	Wall / terrace	A	F-P	H	No longer significant (in Beach Reserve) No further work
4696	D	Old Gov't Road	A	P	H	No longer significant (in Beach Reserve) No further work
4697	D	Cultural deposit	A	F-P	H	Preservation
4698	D	Cultural deposit	A	F	I	Preservation
1602	A, D	Olowalu Mill complex	A	F	H	Interpretive preservation
Glazed soils	D	Subsurface			I	Data recovery

A=valued; UA=unaltered  
G=good; F=fair; P=poor  
I=indigenous; H=historic  
\* No longer significant because adequate information has been collected.

TABLE 3

Summary of Subsurface Results at Site 4694 -- Test Unit 1

LAYER/LEVEL	I/1	I/2	II	III/1	III/2	III/3	IV/1
<b>GASTROPODA</b>							
Cellana sp.			0.5				
Cypraea sp.				2.2			
Nerita picea	0.1		1.6	2.4	0.5		
Planaxis			0.7	0.2	0.2		
Operculum			0.5				
Strombus sp.			5.5	2.3			
Vermetidae			0.5				
Unidentified			2.8	1.7	0.5		
<b>TOTALS</b>							
<b>BIVALVIA</b>							
Argopecten sp.							
Brachidontes sp.				0.1			0.1
Unidentified			0.4		0.5	0.6	0.2
<b>TOTALS</b>							
<b>ECHINOIDEA</b>							
Pencil urchin							
Sea urchin			0.3	0.5	1.0		
<b>TOTALS</b>							
<b>CRUSTACEA</b>							
Crab			0.7	1.3	0.1		0.1
<b>BONE</b>							
Dog tooth							
Fish							
Unidentified				2.4			
<b>TOTALS</b>							
<b>FLORAL</b>							
Charcoal	7.9	5.2	2.0				
Kukul nut					3.7		
Volcanic Glass debris		(1) 0.1	(3) 3.6				
<b>UNWORKED BASALT FLAKES (pieces)</b>			(2) 4.3				
<b>UNWORKED CORAL (pieces)</b>	(1) 0.1		(3) 4.9				
<b>WATERWORN PEBBLES (pieces)</b>	(1) 122.0		(1) 71.3				
Mauit "Diamond"			(1) 0.1				

Weight in grams

TABLE 4

Summary of Subsurface Results at Site 4694 -- Test Unit 2

LAYER/LEVEL	I/1	I/2	II/1	II/2	III/1	III/2
<b>GASTROPODA</b>						
Cellana sp.					0.6	1.1
Cypraea sp.						0.7
Granula		0.1				2.3
Nerita picea	0.5		0.5	0.7		1.7
Nerita sandwicensis						
Operculum						
Unidentified	0.1		0.1			
<b>TOTALS</b>						
<b>BIVALVIA</b>						
Argopecten sp.						
Brachidontes						0.1
Unidentified	2.7		2.7	0.2	0.2	0.2
<b>TOTALS</b>						
<b>ECHINOIDEA</b>						
Pencil urchin						
Sea urchin					0.4	0.2
<b>TOTALS</b>						
<b>CRUSTACEA</b>						
Crab						0.4
<b>BONE</b>						
Dog tooth						
Fish						
Unidentified						
<b>TOTALS</b>						
<b>FLORAL</b>						
Charcoal	3.2	12.0	2.7			
Kukul nut shell					2.8	0.9
<b>UNWORKED BASALT FLAKES (pieces)</b>	(1) 0.2		(1) 0.2			
<b>UNWORKED CORAL (pieces)</b>						
<b>WATERWORN PEBBLES (pieces)</b>						
<b>Historic artifacts</b>						
Lead pellet		(1) 1.0				

Weight in grams

TABLE 5

Summary of Subsurface Results at Site 4694 - Test Unit 3

LAYER/LEVEL	I/1	II/1	D/2	W/1	III/2	III/3
GASTROPODA						
Cellana sp.				0.1		
Comus sp.				22.0		
Cypraea sp.	3.9					1.7
Granula sandwicensis		10.8				
Nerita picea		0.1	0.5	1.6	3.2	0.7
Nerita sandwicensis						
Operculum		0.4		1.8		1.1
Planaxis				0.2		
Strombus sp.						
Turbo sandwicensis				1.5	1.5	0.5
Unidentified		0.8			0.8	0.2
TOTALS						
BIVALVIA						
Isognomon sp.						0.5
Brechidontes				0.1		
Periglypta reticulata			0.2			
Unidentified			0.1			0.2
TOTALS						
ECHINOIDEA						
Perell urchin						
Sea urchin				0.1		
TOTALS						
CRUSTACEA						
Crab						
BONE						
Dog tooth			0.3	0.5		0.1
Fish						
Unidentified					0.5	
TOTALS						
FLORAL						
Charcoal	0.7	1.4	0.2	0.4		0.2
Kukui nut shell				8.7	10.8	3.2
UNWORKED BASALT FLAKES	(2) 6.7		(1) 0.1	(2) 0.9		
UNWORKED CORAL						
(pieces)	(24) 4.3		(1) 0.1	(19) 6.1	(2) 0.9	
WATERWORN PEBBLES (pieces)						
Historic artifacts						
Rusted iron spike						
TOTALS				(1) 8.3		

Weight in grams

TABLE 6  
Summary of Subsurface Results - Site 4697

	TU1 Layer #	TU1 Layer Liters	TU1+2 Pieces	TU3 1/1"	TU2 U/1	TU2 U/2
GASTROPODA						
Cellana				0.2		
Comus sp.	1.6	8.8	10.2	0.7	2.9	
Cypraea sp.	0.8	2.7	44.6	2.0	18.5	2.5
Nerita picea	0.6	2.9	2.1	1.7	3.5	0.1
Planaxis		0.3	0.1	0.2	0.9	
Strombus sp.		3.7			0.8	
Turbo sandwicensis						11.5
Unidentified					2.8	
TOTALS		0.8		3.2	2.3	
BIVALVIA						
Brechidontes			0.3			
Isognomon sp.						
Tedonidae						3.3
Unidentified		0.4	0.2		0.1	
TOTALS						
ECHINOIDEA						
Ferrel urchin	5.0	3.8	34.5	14.6	50.7	3.5
Sea urchin	0.3	2.2	0.3	1.8	2.3	3.3
Unidentified						
TOTALS				3.7	0.1	
CRUSTACEA						
Crab		0.8	0.2			
BONE						
Dog tooth		1.2			0.5	
Dog						
Fish		0.4	0.5			0.4
Unidentified						
TOTALS		1.1	0.2		1.4	
FLORAL						
Charcoal		10.7			13.4	
UNWORKED BASALT FLAKES (pieces)			(1) 12.3	(1) 2.7		
UNWORKED CORAL (pieces)			(4) 20.7	(2) 1.8		
WATERWORN PEBBLES (pieces)		(1) 2.2				
Historic artifacts		(1) 0.4	0.3		1.9	
Ceramics		(2) white 2.4	(1) yellow 0.2	(1) white 1.9		
		(2) 2.0		(1) green 1.9		
Clays						
Flint		(1) 3.0				
Alloy				(1) 8.2	Spear 6.2	

\* 0 to 25 cmbs.  
 \*\* 25-40 cmbs.  
 \*\*\* 40 to 50 cmbs.  
 \*\*\*\* 0-25 cmbs.

TABLE 7

Summary of Subsurface Results - Site 4698

Test Unit / Layer / Level	1/1	1/2	1/3	II	III/1	III/2	III/3
<b>GASTROPODA</b>							
Cellana sp.		3.8	0.2	0.3			
Conus sp.					1.5		
Cypraea sp.	5.1			0.5	7.1	0.4	7.0
Granula sandwicensis	0.2						
Littorina pinnado		1.8	0.3	0.3	2.8	0.6	0.4
Nerita picea							
Nerita sandwicensis					2.1	0.1	
Planaxis	0.2						
Operculum							
Strombus sp.					0.6		
Trochus lineatus							
Turbo sandwicensis					27.4		
Unidentified	0.5			1.1	0.6	0.2	1.3
<b>TOTALS</b>							
<b>BIVALVIA</b>							
Argopecten sp.							
Periglypta reticulata						9.1	
Unidentified							
<b>TOTALS</b>							
<b>ECHINOIDEA</b>							
Pencil urchin		2.7	3.2	4.4	4.3	16.4	1.5
Sea urchin					5.1	7.3	1.7
<b>TOTALS</b>							
<b>CRUSTACEA</b>							
Crab							
<b>BONE</b>			0.2				
Mammal tooth						0.4	
Fish							
Bovine			1.1				
Unidentified mammal bone	14.9	66.4	76.4				
<b>TOTALS</b>							
<b>FLORAL</b>							
Charcoal		0.1	0.1	0.1	1.2	15.9	
Kula nut	6.5						
<b>UNWORKED BASALT FLAKES (pieces)</b>					(1) 10.5		(1) 8.4
<b>VOULCANIC GLASS DEBRITAGE (pieces)</b>						(2) 2.9	

TABLE 8

Summary of portable remains from inventory survey  
Subsurface testing (Makai portion)

	BT 15 Site 4698	BT 20	BT 31	BT 33	BT 61	BT 63
<b>GASTROPODA</b>						
Cellana sp.						3.6
Conus sp.		8.1				54.2
Cypraea sp.	21.9		2.0			10.0
Granula sandwicensis						
Littorina pinnado						
Nerita polita						3.3
Periglypta reticulata	31.6					
Strombus sp.		126.2 <sup>24</sup>				
Unidentified	0.7					12.7
<b>TOTALS</b>						
<b>BIVALVIA</b>						
Argopecten sp.						
Unidentified						2.8
<b>TOTALS</b>						
<b>ECHINOIDEA</b>						
Pencil urchin		12.0				
Sea urchin						
<b>TOTALS</b>						
<b>CRUSTACEA</b>						
Crab						
<b>BONE</b>						
Dog						
Fish						
Unidentified mammal				62.4	11.5	2.6
<b>TOTALS</b>						
<b>FLORAL</b>						
Charcoal						(1) 23.6
<b>UNWORKED BASALT FLAKES (pieces)</b>						
<b>UNWORKED CORAL (pieces)</b>						
<b>WATERWORN PEBBLES (pieces)</b>						

<sup>24</sup> This could possibly be a portion of a conch-shell trumpet, although no signs of a lamination were visible on this large fragment.

TABLE 9

Indigenous Artifacts Recovered

TEST UNIT	LAYER/LEVEL FEATURE	ARTIFACT NUMBER	ARTIFACTS	L x W x H (mm)	WEIGHT (g)
Site 4696	TU 1-Layer II	1	Fish bone pick	29.5 x 30.0 x 2.0	0.1
		2	Shark tooth	16.5 x 16.5 x 4.0	0.5
	TU 2-HF 2 Level 1	3	Basalt fishing sinker	38.0 x 24.5 x 13.5	18.3
		4	Worked basalt flake	70.5 x 35.0 x 8.5	30.1
Site 4694	TU 2-HF 2 Level 3	5	Coral abrader	37.0 x 14.5 x 12.0	3.0
		6	Coral abrader	53.0 x 41.0 x 14.5	28.5
	TU 1-Layer II	7	Puka shell ornament	17.0 x 14.5 x 7.0	1.0
Site 4697	TU 1-Layer III, Level 3	8	Fish bone awl	28.5 x 4.0 x 4.0	0.2

TABLE 10

Summary of Backhoe Trenches

BT #	Dimensions	Orientation	Stratigraphy	cm <sup>3</sup>	Remarks
1	3 m x 0.9 m 1.0 m deep	343	Layer I: reddish sandy loam Layer II: medium brown sandy loam Layer III: black sand Same as for BT #	0-20 20-90 90-100	Water table at 1.0 m. Layer I is recently deposited fill to be cleared area.
2	3.6 m x 0.9 m 1.0 m deep	343	Layer I: reddish sandy loam Layer II: black sand Same as for BT #	0-40 40-120	Water table at 1.2 m. Surface 10 to 15 cm recently disturbed. Numerous unworked basaltic pebbles with depth in Layer II.
3	3.3 m x 0.9 m 1.2 m deep	340	Layer I: reddish sandy loam Layer II: black sand	0-40 40-100	Water table at 1.0 m. Surface to 20 cm recently disturbed.
4	4.1 m x 0.9 m 1.1 m deep	344	Layer I: reddish sandy loam Layer II: sand, brown clay loam Layer III: medium brown sandy loam Layer IV: black sand	0-40 40-100 100-120	Water table at 1.1 m.
5	3.8 m x 0.9 m 1.2 m deep	333	Layer I: reddish sandy loam Layer II: black sand	0-40 40-120	Water table at 1.1 m.
6	4.5 m x 0.9 m 1.1 m deep	326	Layer I: reddish sandy loam Layer II: compact sand, dark brown loam Layer III: compact sand, brown loam Layer IV: compact sand, brown loam Refer to figures 4 and 5.	0-30 30-110 110-120	Water table at 1.1 m.
7	3.0 m x 0.9 m 1.0 m deep	343	Layer I: reddish sandy loam Layer II: black sand	0-40 40-100	Water table at 1.0 m.
8	3.0 m x 0.9 m 0.9 m deep	346	Layer I: reddish sandy loam Layer II: black sand	0-40 40-100	Water table at 1.0 m.
9	4.8 m x 0.9 m 1.0 m deep	326	Layer I: reddish sandy loam Layer II: black sand	0-40 40-100	Water table at 1.0 m.
10	4.8 m x 0.9 m 0.9 m deep	330	Layer I: reddish sandy loam Layer II: black sand Sandy alluvial soil, brown loam grading to 5 YR 2.5/1 to near 5 YR 2.5/2	0-40 40-100	Water table at 1.0 m.
11	3.4 m x 0.9 m 1.0 m deep	328	Layer I: reddish sandy loam Layer II: black sand Layer III: wackestone, shales and pebbles (5 YR 5/1)	0-30 30-100 100-120	Soil becomes wetter with depth to water table at 0.95 m. Partially to main road.
12	4.8 m x 0.9 m 1.2 m deep	310	Layer I: sandy clay (5 YR 3/2) Layer II: sandstone Layer III: reddish sandy loam Layer IV: sandstone Layer V: black sand deposit (10 YR 0/1) Layer VI: black sand deposit (10 YR 0/1 to 4/1)	0-30 30-100 100-120	Water table at 1.0 m.
13	4.0 m x 0.9 m 0.5 m deep	312	Aggregational pebbles mixed with wackestone sand (10 YR 4/0)	0-35	Water table at 1.1 m.
14	4.1 m x 0.9 m 1.0 m deep	313	Layer I: black sand (10 YR 0/1) Layer II: black sand Layer III: black sand (10 YR 0/1) Layer IV: black sand (10 YR 0/1) Layer V: black sand (10 YR 0/1) Layer VI: black sand (10 YR 0/1) Layer VII: black sand (10 YR 0/1) Layer VIII: black sand (10 YR 0/1) Layer IX: black sand (10 YR 0/1) Layer X: black sand (10 YR 0/1) Layer XI: black sand (10 YR 0/1) Layer XII: black sand (10 YR 0/1) Layer XIII: black sand (10 YR 0/1) Layer XIV: black sand (10 YR 0/1) Layer XV: black sand (10 YR 0/1) Layer XVI: black sand (10 YR 0/1) Layer XVII: black sand (10 YR 0/1) Layer XVIII: black sand (10 YR 0/1) Layer XIX: black sand (10 YR 0/1) Layer XX: black sand (10 YR 0/1) Layer XXI: black sand (10 YR 0/1) Layer XXII: black sand (10 YR 0/1) Layer XXIII: black sand (10 YR 0/1) Layer XXIV: black sand (10 YR 0/1) Layer XXV: black sand (10 YR 0/1) Layer XXVI: black sand (10 YR 0/1) Layer XXVII: black sand (10 YR 0/1) Layer XXVIII: black sand (10 YR 0/1) Layer XXIX: black sand (10 YR 0/1) Layer XXX: black sand (10 YR 0/1)	0-30 30-100 100-120	Water table at 1.0 m. 25 cm black sand at 25 cm.
15	3.4 m x 0.9 m 1.2 m deep	350	Layer I: black sand (10 YR 0/1) Layer II: black sand (10 YR 0/1) Layer III: black sand (10 YR 0/1) Layer IV: black sand (10 YR 0/1) Layer V: black sand (10 YR 0/1) Layer VI: black sand (10 YR 0/1) Layer VII: black sand (10 YR 0/1) Layer VIII: black sand (10 YR 0/1) Layer IX: black sand (10 YR 0/1) Layer X: black sand (10 YR 0/1) Layer XI: black sand (10 YR 0/1) Layer XII: black sand (10 YR 0/1) Layer XIII: black sand (10 YR 0/1) Layer XIV: black sand (10 YR 0/1) Layer XV: black sand (10 YR 0/1) Layer XVI: black sand (10 YR 0/1) Layer XVII: black sand (10 YR 0/1) Layer XVIII: black sand (10 YR 0/1) Layer XIX: black sand (10 YR 0/1) Layer XX: black sand (10 YR 0/1) Layer XXI: black sand (10 YR 0/1) Layer XXII: black sand (10 YR 0/1) Layer XXIII: black sand (10 YR 0/1) Layer XXIV: black sand (10 YR 0/1) Layer XXV: black sand (10 YR 0/1) Layer XXVI: black sand (10 YR 0/1) Layer XXVII: black sand (10 YR 0/1) Layer XXVIII: black sand (10 YR 0/1) Layer XXIX: black sand (10 YR 0/1) Layer XXX: black sand (10 YR 0/1)	0-30 30-100 100-120	Water table at 1.0 m. 25 cm black sand at 25 cm.
16	3.0 m x 0.9 m 1.25 m deep	34	Layer I: black sand (10 YR 0/1) Layer II: black sand (10 YR 0/1) Layer III: black sand (10 YR 0/1) Layer IV: black sand (10 YR 0/1) Layer V: black sand (10 YR 0/1) Layer VI: black sand (10 YR 0/1) Layer VII: black sand (10 YR 0/1) Layer VIII: black sand (10 YR 0/1) Layer IX: black sand (10 YR 0/1) Layer X: black sand (10 YR 0/1) Layer XI: black sand (10 YR 0/1) Layer XII: black sand (10 YR 0/1) Layer XIII: black sand (10 YR 0/1) Layer XIV: black sand (10 YR 0/1) Layer XV: black sand (10 YR 0/1) Layer XVI: black sand (10 YR 0/1) Layer XVII: black sand (10 YR 0/1) Layer XVIII: black sand (10 YR 0/1) Layer XIX: black sand (10 YR 0/1) Layer XX: black sand (10 YR 0/1) Layer XXI: black sand (10 YR 0/1) Layer XXII: black sand (10 YR 0/1) Layer XXIII: black sand (10 YR 0/1) Layer XXIV: black sand (10 YR 0/1) Layer XXV: black sand (10 YR 0/1) Layer XXVI: black sand (10 YR 0/1) Layer XXVII: black sand (10 YR 0/1) Layer XXVIII: black sand (10 YR 0/1) Layer XXIX: black sand (10 YR 0/1) Layer XXX: black sand (10 YR 0/1)	0-30 30-100 100-120	Water table at 1.15 m. Sediment layers are fine grained. Layer I is dry and pumicey.

<sup>1)</sup> Given as compass bearing in degrees—magnetic.  
<sup>2)</sup> Centimeters below surface.







### APPENDIX A

Radiometric data from  
Beta Analytic, Inc.

93	4.0 m. x 0.9 m. 3.0 m. deep	53	Layer I-pile zone (10 YR 4/7 to 3/1) Layer II-stream deposit (rocks) Layer III-stream sand	0-40 40-130 130-200	Water table at 3.0 m. Layer I is commonly rocky.
94	4.0 m. x 0.9 m. 2.5 m. deep	60	Layer I-pile zone (10 YR 4/7 to 3/1) Layer II-stream sand Layer III-silty loam	0-40 40-70 70-150	Water table was not reached.
95	4.0 m. x 0.9 m. 2.7 m. deep	50	Layer I-pile zone 4/7 to 3/1 Layer II-stream deposit Layer III-silty clay loam (10 YR 4/7)	0-40 40-150 150-270	Water table at 2.5 m.
96	4.0 m. x 0.9 m. 2.3 m. deep	50	Layer I-pile zone in clay (10 YR 4/4) Layer II-stream deposit Layer III-silty clay loam (10 YR 3/2)	0-40 40-200 200-230	Water table at 2.2 m.
97	4.0 m. x 0.9 m. 2.9 m. deep	50	Layer I-pile zone (10 YR 4/4) Layer II-stream deposit	0-40 40-290	Water table at 2.8 m.

**BETA ANALYTIC INC.**

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DR. M.A. TAMERS and MR. D.G. HOOD

**REPORT OF RADIOCARBON DATING ANALYSES**

Dr. Walter Fredericksen

February 22, 1999

Xamanek Researches

March 2, 1999

Sample Data	Measured C14 Age	C13/C12 Ratio	Conventional C14 Age (*)
Beta-128107	270 +/- 70 BP	-27.6 o/oo	230 +/- 70 BP

SAMPLE #: OLOWALU SAMPLE #2  
ANALYSIS: radiometric-PRIORITY  
MATERIAL/PRETREATMENT: (charred material); acid/alkali/acid  
COMMENT: the small sample was given extended counting time

NOTE: It is important to read the calendar calibration information and to use the calendar calibrated results (reported separately) when interpreting these results in AD/BC terms.

NOTE: Sample "OLOWALU SAMPLE #1" was submitted but not analyzed.

Dates are reported as RCYBP (radiocarbon years before present, "present" = 1950 A.D.). By international convention, the modern reference standard was 95% of the C14 content of the National Bureau of Standards' Oxalic Acid & calculated using the Libby C14 half life (5568 years). Quoted errors represent 1 standard deviation statistics (68% probability) & are based on combined measurements of the sample, background, and modern reference standards. Measured C13/C12 ratios were calculated relative to the PDB-1 International Standard and the RCYBP age is adjusted to -25 permil. If the ratio and age are accompanied by an (C), then the C13/C12 value was estimated, based on values typical of the material type. The quoted results are NOT calibrated to calendar years. Calibration to calendar years should be calculated using the Conventional C14 age.

**CALIBRATION OF RADIOCARBON AGE TO CALENDAR YEARS**

(Variables: C13/C12 = -27.6; lab mult. = 1)

Laboratory Number: Beta-128107

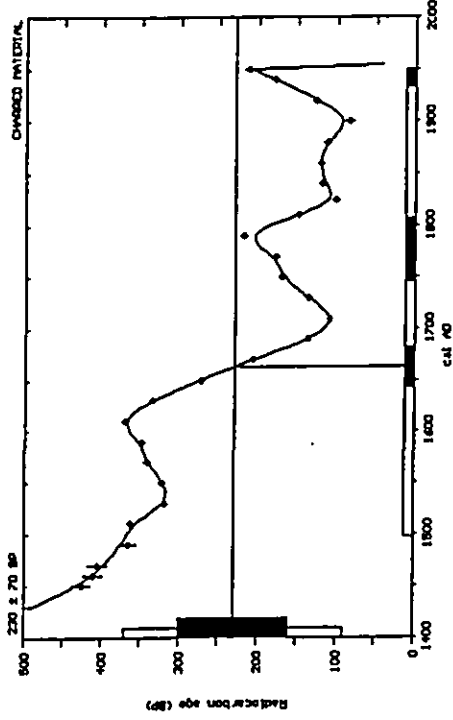
Conventional radiocarbon age: 230 ± 70 BP

Calibrated results:  
(2 sigmas, 95% probability)  
cal AD 1495 to 1950

Intercept data:

Intercept of radiocarbon age  
with calibration curve: cal AD 1665

1 sigma calibrated results:  
(68% probability)  
cal AD 1640 to 1680 and  
cal AD 1742 to 1805 and  
cal AD 1935 to 1950

**References:**

Previews Calibration Curve for Short Lived Samples  
Fogel, J. C., Fels, A., Pater, E. and Bockheim, B., 1993, Radiocarbon 35(1), p.7-16  
A Simplified Approach to Calibrating C14 Dates  
Tishin, A. S. and Fogel, J. C., 1993, Radiocarbon 35(2), p.17-22  
Calibration - 1993  
Stuiver, M., Lin, A., Kra, R. S. and Devine, J. M., 1991, Radiocarbon 33(1)  
Calibration of Radiocarbon Dates for the Late Pleistocene Using 1700 Dates on Stalagmites  
Fogel, J. C., Krupnik, J., 1991, Radiocarbon 33(1), p.17-22

**Beta Analytic Radiocarbon Dating Laboratory**

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# BETA ANALYTIC INC.

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## REPORT OF RADIOCARBON DATING ANALYSES

Dr. Walter Fredericksen

March 1, 1999

Xamanek Researches

March 9, 1999

Sample Data	Measured C14 Age	C13/C12 Ratio	Conventional C14 Age (y)
Beta-128396	160 +/- 70 BP	-27.3 ‰/‰	120 +/- 70 BP

SAMPLE #: OLOWALU SAMPLE #3  
ANALYSIS: radiocarbon-PRIORITY  
MATERIAL/PRETREATMENT: (charred material): acid/alkali/acid

NOTE: It is important to read the calendar calibration information 1 to use the calendar calibrated results (reported separately) when interpreting these results in AD/BC terms.

Dates are reported as RCYBP (radiocarbon years before present, "present" = 1950 A.D.). By international convention, the modern reference standard was 95% of the C14 content of the National Bureau of Standards' Oxalic Acid & calculated using the Libby C14 half life (5568 years). Quoted errors represent 1 standard deviation statistics (68% probability) & are based on combined measurements of the sample, background, and modern reference standards. Calibration to calendar years should be calculated using the Conventional C14 age.

## CALIBRATION OF RADIOCARBON AGE TO CALENDAR YEARS

(Variables: C13/C12 = -27.3; lab mult. = 1)

Laboratory Number: Beta-128396

Conventional radiocarbon age: 120 ± 70 BP

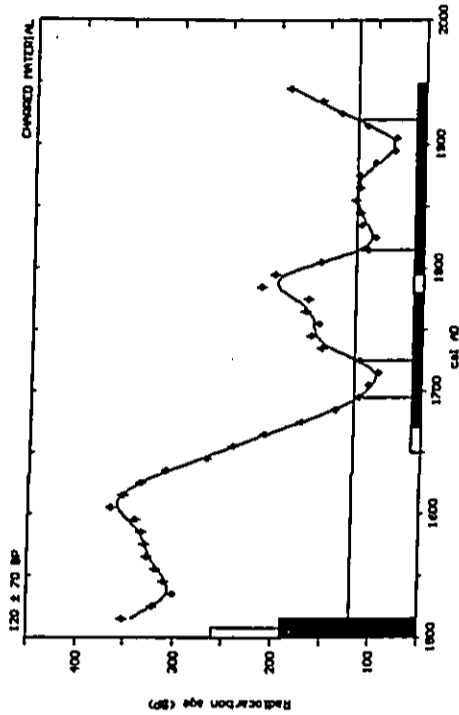
Calibrated results: cal AD 1650 to 1950 (Cal BP 300 to 0)  
(2 sigma, 95% probability)

### Intercept data:

Intercepts of radiocarbon age with calibration curve:

cal AD 1695 (Cal BP 255) and  
cal AD 1725 (Cal BP 225) and  
cal AD 1815 (Cal BP 135) and  
cal AD 1920 (Cal BP 30)

1 sigma calibrated results: cal AD 1670 to 1780 (Cal BP 280 to 170) and  
(68% probability) cal AD 1795 to 1950 (Cal BP 155 to 0)



### References:

- Calibration Database
- Editorial Comment
- Stahle, M., von der Plick, H., 1998, Radiocarbon 49(2), pp. 21-24
- INCAL98 Radiocarbon Age Calibration
- Stahle, M., et al., 1998, Radiocarbon 49(1), p. 1041-1083
- Mathematics
- A Simplified Approach to Calibrating C14 Dates
- Talbot, A. S., Popen, J. C., 1993, Radiocarbon 35(2), p. 17-22

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APPENDIX B

LAND COMMISSION AWARDS IN OLOWALU

Following the Mahele in 1848, there were 42 individual Land Commission awards granted in the *ahupua'a* of Olowalu, between the years 1852 and 1855. The majority are in the upper reaches of the property, along Olowalu stream. The distribution of land awards,<sup>1</sup> and the present route of the stream suggest that the stream was channelled in a general, straighter north-south direction sometime after the Mahele. This was probably done to control flooding of agricultural fields. The award plots run across the alluvial fan in a northwesterly-southeasterly direction. A 1906 map of the Olowalu Plantation, made by A. C. Alexander, shows the new, straighter route of the stream (Map 6).

There are 36 land grant awards listed in the *manuka* portion of the property. Refer to Table 1 for detailed information on the awards. Thirty-three of the grants are *kuleana* other purposes—the 17.592-acre award granted to Nahaoleleua by Kamehameha IV in 1858, the 924-acre parcel granted to the Board of Education for a school at Olowalu 2, and the 16.5-acre Land Patent Grant (Grant 11073) to Pioneer Mill in 1942.

There are 9 awards on the makai portion of the property, and it should be noted that several *taro/kula kuleana* awards in the *manuka* area correspond to house/lot awards on the makai property. These include LCA 6728 to Mahulu; LCA 5952 to Minamina; LCA 8817 to Kanakaole; and LCA 1742 to Z. Kaauwai (See Table 1).

<sup>1</sup> Please refer to Maps 4 and 5 for the approximate locations and distribution of LCAs within Olowalu *ahupua'a*, and to historic maps in Figures 1 and 1a.

TABLE 1

Land Commission Awards - <i>manuka</i> parcels <sup>2</sup>									
TMK	Size in acres	Royal Patent	LCA Number	Year conveyed	Awardee	III	Nature of use		
4-8-03: 11	1.787	7989	5829-E:1,2	9/22/1853	Kawehena	Hawaiikete & Kamani	House/lot and taro land		
4-8-03: 50	7.5	6267	4376:1	3/6/1855	Keahi	Puukolohele	Kula at Puukolohele		
4-8-03: 51	.638	6285	3772:3	9/24/1853	Alapai		Kula land		
4-8-03: 52	.919	6285	3772:2	9/24/1853	Alapai		Kula land		
4-8-03: 53	2.704	6946	9906	9/24/1853	Pikao	Puamaumau	House/lot and taro patches		
4-8-03: 54	.525	3810	8573:2		Kailaha		Taro land		
4-8-03: 55	7.0	4041	10128:3	3/6/1855	E. Maui		Kula and taro		
4-8-03: 56	.924	N/A	R.P.G.R.15:2	9/30/1882	Board of Ed.		School lot at Olowalu 2		
4-8-03: 57	4.5	5183	5829:2	9/22/1853	Haele	Wailoa	Taro and kula land		
4-8-03: 58	1.75	4041	10128:4		E. Maui	Wailoa	Kula		
4-8-03: 59	4.938	3776	5113	11/1/1852	Kailaa		Kula		
4-8-03: 60	2.975	2154	1742:1	9/26/1853	Z. Kaauwai	Kamani 1	Land for cultivation		
4-8-03: 61	1.655	7989	5829-E:1,2,3	9/22/1853	Kewehena	Hawaiikete & Kamani	House/lot and taro land (apua 3-kula land)		
4-8-03: 62	1.813	5468	6038:3	9/22/1853	Peekauai	Kamani	Kula land		
4-8-03: 63	8.638	4041	10128:5	3/6/1855	E. Maui	Kamani	House/lot and kula		
4-8-03: 64	5.5	7102	5829-D:1,2,3	9/22/1953	Kaaohelema		House/lot and taro patches		
4-8-03: 65	6.5	6267	4376:2	3/6/1855	Keahi	Puukolohele	Taro and kula		
4-8-03: 66	.863	6611	10714	11/1/1852	Pohakanui	Kamani 2	Taro and kula		
4-8-03: 67	.588	N/A	6547	11/1/1852	Hale	Kamani 2	Taro and kula		
4-8-03: 68	.623	4041	10128:2	3/6/1855	E. Maui	Kamani	Taro land		
4-8-03: 69	3.456	6881	8657	9/24/1853	Kikau	Kamani 2	Kula, taro land and house/lot		
4-8-03: 70	2.063	3344/3811	8668	3/6/1855	Kaiwi		Taro and kula		
4-8-03: 71	.581	5183	5829-E:1	9/22/1853	Haele	Kamani	Taro land		
4-8-03: 72	.456	5187	10592:2	11/1/1852	Paia	Kamani 3	Taro land		

<sup>2</sup> This information was provided by Mr. Robert Horcajo, Project Manager for Olowalu Elua, Associates, LLC, and came from the Bureau of Conveyances archives through Title Guarantees of Hawaii. It was determined in July 1999 that 2 *ahupua'a*—LCA 3188, and LCA 3772, Apama 1—located on the *manuka* project area were not part of Olowalu Elua Associates, LLC property (Letter from Title Guarantees of Hawaii to Mr. Robert L. Horcajo, July 14, 1999).

4-8-03: 73	313	5468	6058: 1	9/22/1853	Peekauai	Ohi'a	Taro land
4-8-03: 74	506	6267	4376: 3	3/6/1855	Keahi	Kaumakukahi	Taro land
4-8-03: 75	381	5181	5952: 2	9/24/1853	Minaimina		Taro land
4-8-03: 76	16.5	N/A	L.P.Gr. 11073	8/21/1942	Pioneer Mill		Portion of crown land of Olowalu
4-8-03: 77	1,232	4041	10128: 1	3/6/1855	E. Maui	Wailoa	Kula
4-8-03: 78	17,592	N/A	Award from Kam. IV	8/2/1858	Nahaloieua		
4-8-03: 79	146	5468	6058: 4	9/22/1853	Peekauai	Kaumakukahi	Taro land
4-8-03: 80	2,381	4952	6728: 1	9/22/1853	Mahulu	Kamani	Taro land
4-8-03: 81	47	7572	8817: 2	9/24/1853	Kanakaole	Kaumakukahi	Taro land
4-8-03: 82	169	7572	8817: 3	9/24/1853	Kanakaole	Kaumakukahi	Taro land
		6,285	3772: 1	9/24/1853	Alapai	Puukoihihilo	House lot
		6630	3888	2/28/1854	Panioni		house lot

Land Commission Awards - makai parcel							
TMK	Size in acres	Royal Patent	LCA Number	Year conveyed	Awardee	///	Nature of use
4-8-03: 41	375	7209	7719	9/22/1853	Hala	Momoso	House lot
4-8-03: 42	325	4840	5829: H	11/1/1852	Nahue	Kaliuaha	House lot
4-8-03: 43	3,386	2154	1742: 2	9/26/1853	Z. Kahuwai	Kaliuaha	House lot
4-8-03: 44	1,313	5477	5620: 1	3/6/1855	Kahole	Kaliuaha	House lot
4-8-03: 45	381	4952	5620: 4	3/6/1855	Kahole	Kaumakukahi	House lot
4-8-03: 46	913	4952	6728: 2	9/22/1853	Mahulu	Kaumakukahi	House lot
4-8-03: 47	397	5181	240	8/22/1849	John Clark	Kaliuaha	House lot
4-8-03: 48	792	5181	5952: 1	9/24/1853	Minaimina	Kaumakukahi	House lot
4-8-03: 49	4	7572	8817: 1	9/24/1853	Kanakaole	Kamani	House lot

The remainder of the *ahupua'a* was crown land, that was originally granted to Kamehameha III. Crown lands became government lands after the annexation of the Hawaiian Islands in 1893.

A deed provided by Mr. Horcajo, of Olowalu Elua Associates, LLC, states that in conformity with the Land Act of 1895, all of the land "situate at Olowalu and Ukumehame in the District of Lahaina, Island of Maui" was "granted and confirmed unto Walter M. Gifford for the consideration of Thirty-seven Thousand Seven Hundred and Fifty Dollars" (\$37,750.00). This was identified as Land Patent No. 4973, and was a cash purchase at public auction, which took place on July 9, 1906. Title was granted on July 23, 1906. The land area in Olowalu was 684.7 acres, exclusive of L.C.A.s, school lots and land sold by Kamehameha IV to Kahaulio, all of which amounted to 96.4 acres.



Photo 1 - Mouth of Olowalu Stream.

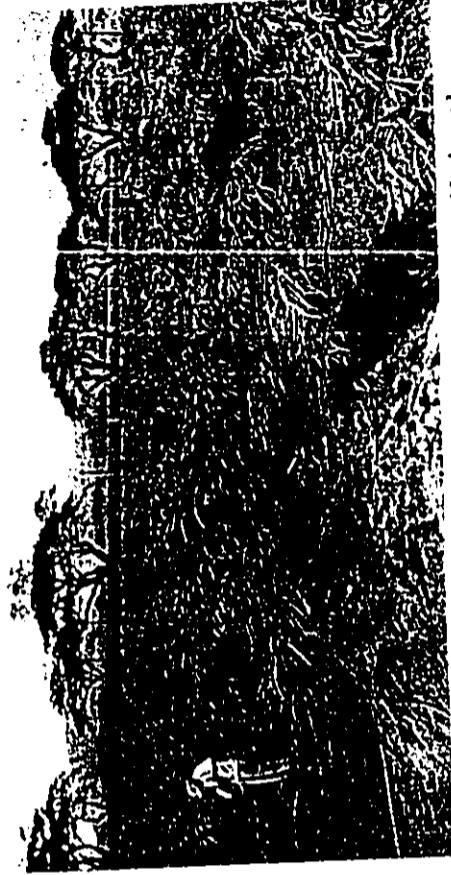


Photo 2 - General mauka view of eastern portion of study area. Monkeypod Trees line Honoapi'iiani Highway (Highway 30).



Photo 3 - Mitigation of Burial find #1 in access road.



Photo 4 - Excavation of Backhoe Trench 14—BT 13 in foreground—Burial find #1 to the left.



Photo 5 - Backhoe Trench 8, containing Burial #2. View to the northwest.



Photo 6 - Burial mitigation in process—view to the northwest.



Photo 9 - West face profile of BT 23, showing the banded sand deposits in the *maka* end of the trench.



Photo 10 - Site 4694 rock structure. Test Unit 2 in process.



Photo 7 - West wall of Backhoe Trench 14 showing marine sand deposits.



Photo 8 - Southern portion of Backhoe Trench 23.



Photo 12 - Backhoe Trench 8 with burial find covered with blue tarp, showing the proximity of the burials to the ocean.



Photo 13 - Backhoe Trench 78, located on the west side of Olowalu Stream. Note the shallow water table.



Photo 11 - Test Unit 1 in Site 4694 rock structure.

of

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Photo 14 - Boat launching ramp at Site 1602—Olowalu Sugar Mill.

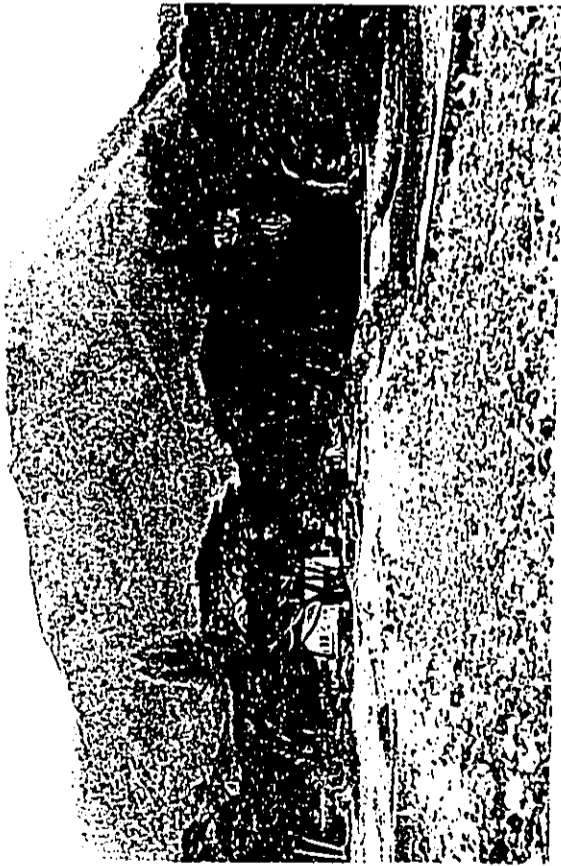


Photo 15 - View of the Mill area from the end of the jetty.



Photo 16 - Manager's House and cottage to the right.



Photo 17 - View of ruins of largest structure—view to the east.



Photo 20 - Large tree growing within the brick structure.



Photo 21 - Iron post with rigging and eye on top. Ruins of the mill are behind thick vegetation.



Photo 18 - View of eastern portion of ruins, in the vicinity of the mule pen.



Photo 19 - Ruins of brick feature on makai end of large building foundation.

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# ***Appendix B-2***

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***State Historic Preservation  
Division Correspondence  
on Mauka and Makai  
Inventory Surveys***

DOCUMENT CAPTURED AS RECEIVED



STATE OF HAWAII

DEPARTMENT OF LAND AND NATURAL RESOURCES

HISTORIC PRESERVATION DIVISION  
Kekuhihewa Building, Room 555  
601 Kamehaha Boulevard  
Honolulu, Hawaii 96807

DEPUTY  
JANET E. KAWALO

AQUATIC RESOURCES  
BOATING AND OCEAN RECREATION  
CONSERVATION AND RESOURCES  
ENFORCEMENT  
CONVEYANCES  
FORESTRY AND WILDLIFE  
HISTORIC PRESERVATION  
LAND  
STATE PARKS  
WATER RESOURCE MANAGEMENT

April 12, 2000

Mr. Robert Horcajo  
Olowalu Elua Associates, LLC  
173 Ho Ohana Street, Suite 201  
Kahului, Hawaii 96732

LOG NO: 25237 ✓  
DOC NO: 0004RC10

Dear Mr. Horcajo:

**SUBJECT: Review of Archaeological Inventory Survey – Mauka Olowalu Lands  
Olowalu, Lahaina, Maui  
TMK: 4-8-3: 10**

This letter reviews this revision of this report which our staff received March 20, 2000 (Dee Fredericksen & Erik Fredericksen 2000. Archaeological Inventory Survey of Mauka Portion of Olowalu Development Parcel ... Xamanek ms.). The report is now acceptable.

We can now conclude that all historic sites have been found, totaling 34 sites. It now seems clear that the irrigated kalo fields along the lower stretches of Olowalu Stream were destroyed by intensive land clearing activities of the sugarcane industry. The background section is acceptable, as are site descriptions and interpretations.

Only remnants of the precontact to early 1800s Hawaiian settlement pattern survive – notably one large heiau (site 4, Kawaialoa heiau), a medium-size heiau (4718), the burial area on Pu'u Kilea (4715), and inland of Pu'u Kilea, sites along Olowalu Stream associated with habitation and irrigated kalo farming (including two small, possible agricultural heiau in sites 4701 and 4708). Petroglyphs are also present in sites 1200, 4704, 4708. Remnants of the sugarcane era (late 1800s-1900s) include walls, canals, and a workers' cemetery. Burials are present in 9 sites – including cemeteries at Pu'u Kilea (Hawaiian), some unmarked graves extending from the Old Hawaiian Protestant Church, and a plantation era Japanese cemetery.

We agree with the significance evaluations that are proposed in Table 4 (p. 73). Eight of the 34 sites were significant solely for their information content, but they contained minimal information (being late 1800s-1900s walls, or having been severely damaged) and this information was adequately and reasonably recorded, making these sites "no longer significant". The remaining 26 sites are significant – 9 solely for their information content and 17 for multiple criteria.

We also agree with the proposed mitigation commitments for the 26 significant sites, with some clarifications. Nineteen of the sites are proposed for preservation, while 5 sites are proposed for archaeological data recovery, and 2 are proposed partly to be preserved/partly data recovered.

Mr. Robert Horcajo  
Page 2

We are pleased to see that a number of the sites are proposed for interpretive preservation, which we believe will enhance the public's understanding of past settlement in this area of Maui. These sites include the large heiau and moderate-sized heiau on the slopes not far from the former houses and lo'i once located along Olowalu Stream, two sites with sizable numbers of petroglyphs, and an irrigated kalo field complex. This part of Maui (indeed the entire island) has very few interpreted historic sites which are accessible to the public. Some sites are to be interpreted in the Launiupoko area (habitations and some dry land agricultural features near the mouth of the upper valley and some temporary habitations - rock shelters - along the lower reaches of Launiupoko Stream), and with the addition of sites being interpreted in Olowalu, the public will be able to go to a series of historic preserves and see how Hawaiians used the landscape in the Lahaina area in the past. We hope eventually to expand this picture with sites being preserved in the upper valleys (such as upper valley lo'i and houses) and along the shore (coastal habitations in the form of subsurface deposits, ponds, and irrigated kalo fields) including important places in Lahaina which was a royal center in precontact times up to the time of Kamehameha III. Having such sites preserved improves the public's understanding of the past, enabling people to see and touch places where people once lived, farmed and worshipped in addition to seeing objects in Museums and reading about the past in books.

We are also pleased to see that one of the sites to be archaeologically data recovered is the buried marsh/lagoonal soils (site 4823). These soils may have the potential (through pollen cores) to identify when permanent settlement began along this shoreline. Often pollen shows vegetation changes reflecting human clearing of vegetation for farming. Current scientific models suggest that the Lahaina area may have been one of the earliest leeward areas settlement on Maui with its small flowing streams, perhaps as early as the A.D. 1000s. Thus, data recovery work may be able to shed light on this important subject.

Our few clarifications are:

1. The Maui Island Burial Council must vote on the burial treatment proposals, before those proposals can be considered final. Most burials are recommended for preservation in place, which is the general policy of our office and the councils. But, we note that two sites (4820 & 4821, each a scatter of human bone, evidently single burials disturbed by cane activities) are proposed for disinterment (and data recovery) and reinterment. The text on page 69 states as if this will occur. However, the Burial Council must first vote on this proposal, and it is possible that they would recommend preservation in place. (If removal were approved, then archaeological data recovery and monitoring would be a component of removal. If preservation in place were approved, then archaeological monitoring in the vicinity, to ensure all bones are recovered and placed in the preservation area, would be a component of the preservation plan.)
2. It must be understood that no preservation activities should occur without an approved preservation plan. We understand that your firm may be planning to deed over preserve areas to a local group for them to care for the sites, or possibly have a group act as curator. While this seems fine, it needs to be clear that no preservation tasks should begin without a plan approved by our office and the County. This ensures that the preservation actions will be appropriate. In cases like this when native Hawaiian sites are involved, our policy is that the local Hawaiian community be either involved in the preparation of the preservation plan or be able to comment on the plan, prior to the plan's submittal to our office for review.

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Mr. Robert Horcajo  
Page 3

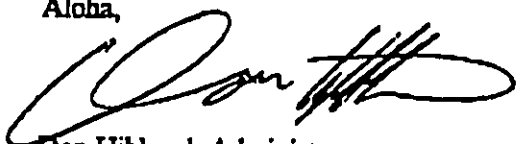
Again, we find the survey report acceptable. Please send a copy of the final report to our Maui office also.

Clearly, the proposed development of this area will impact the significant historic sites that are present. The proposed mitigation commitments (preservation and data recovery) will help reduce the impacts of the development and should have educational benefits to the public at large. To ensure that the mitigation commitments are acceptably carried out, we recommend to the County by copy of this letter that any approved permit application contain the following standard conditions:

1. The Maui/Lana'i Islands Burial Council must vote on the mitigation proposals for all burials.
2. The survey report identifies sites which shall be preserved. The applicant shall submit a detailed preservation plan (scope of work) for these sites to the State Historic Preservation Division (SHPD) for approval. This plan will include buffer zones, interim protection measures (as needed), and long-range preservation plans. No land alteration may occur in the vicinity of these sites until minimally the buffer zones and interim protection measures are approved and the SHPD verifies the interim protection measures are in place. No preservation activities may occur in these sites until the preservation plan is approved. The SHPD shall verify in writing to the County when the plan has been successfully executed.
3. Archaeological data recovery shall occur at the sites so identified in the survey report. The applicant shall submit an archaeological data recovery (scope of work) for these sites to the State Historic Preservation Division (SHPD) for approval. The SHPD shall verify in writing to the County when the plan has been successfully executed.

If you have any questions, please feel free to contact our office. Assuming that all permits will be obtained from the County and/or State, we will await receiving the preservation and data recovery plans. Ross Cordy, our Branch Chief for Archaeology (692-8025), can be contacted on those matters. Please contact Ka'iana Markell of our Burials Program (587-0044) for placement on the Burial Council's agenda and for information that the Council will need to see.

Aloha,



Don Hibbard, Administrator  
State Historic Preservation Division

RC:jen

- c: Public Works Department, County of Maui  
Planning Department, County of Maui  
Maui Cultural Resource Commission  
Ed Henry, DLNR Land Division  
Chair, Maui/Lanai Island Burial Council  
Dee Fredericksen, Xamanck Researches

BENJAMIN J. CAYETANO  
GOVERNOR OF HAWAII

R. J. D.



TIMOTHY E. JOHNS, CHAIRPERSON  
BOARD OF LAND AND NATURAL RESOURCES  
COMMISSION ON WATER RESOURCE MANAGEMENT

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STATE OF HAWAII

DEPARTMENT OF LAND AND NATURAL RESOURCES

HISTORIC PRESERVATION DIVISION  
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AQUATIC RESOURCES  
BOATING AND OCEAN RECREATION  
CONSERVATION AND RESOURCES  
ENFORCEMENT  
CONVEYANCES  
FORESTRY AND WILDLIFE  
HISTORIC PRESERVATION  
LAND  
STATE PARKS  
WATER RESOURCE MANAGEMENT

December 14, 1999

Mr. Robert Horcajo  
Olowalu Elua Associates, LLC  
173 Ho Ohana Street, Suite 201  
Kahului, Hawaii 96732

LOG NO: 24591 ✓  
DOC NO: 9912RC11

Dear Mr. Horcajo:

**SUBJECT: Review of Archaeological Inventory Survey Report of Mauka Olowalu Lands  
Olowalu, Lahaina District, Maui  
TMK: 4-8-3: 10**

This letter reviews this report which you submitted on July 30, 1999 (Demaris Fredericksen and Erik Fredericksen 1999. Archaeological Inventory Survey of Mauka Portion of Olowalu Development Parcel. Phase 2. ... Xamanek Researches ms.). We apologize for our late review.

This report has excellent material in it.

However, we are not sure if the project area's sites have all been found, without some additional clarification as to whether it is likely the Land Commission Award's taro soils along the stream may survive. This clarification can use archaeological back-hoe trench information or historical evidence of land alteration. 30 sites are noted to have been found, but at least two back-hoe areas found human skeletal remains (BT 121 & BT 139-140), and these areas should be given site numbers, which would increase the number of sites. Also, BT 106-107 found gleyed soils that are considered to be marsh or taro soils. If taro soils, then this area must be given a site number. If marsh soils, then it is still possible that a number may be merited for paleo-environmental/human settlement information purposes. Also, a fishpond was mentioned by informants. The report needs to clarify if it was in the project area and if testing was done to determine if its deposits survive. The report needs to be revised to address these points.

The background section of the report contains extremely interesting and detailed information on precontact to early 1800s settlement and on late-1800s to 1900s cane era settlement. However, the summary of the settlement is much too general, given the details that are presented elsewhere in the background section. The information needs to be better summarized into a clear and detailed picture of the ahupua'a settlement pattern minimally for these two times. For example, a very specific model of early settlement can be described and shown on a map -- locating the major coastal trail, exact areas under lo'i cultivation, specific house locations (including that said to be the high chiefess Kalola's), the fishpond, the heiau, and nearby burials and petroglyphs. Similarly, for the late 1800s to early 1900s, the report's information enables the location of cane fields, its irrigation and rail system, the mill, the plantation manager's house and the camp's houses, churches, stores, and cemeteries. Maps for each period would be very useful. Also, project area site expectations based on plantation land alteration needs clarification, as this will indicate which types of sites might survive and where -- and alternately which might be destroyed and where. The background section, thus, needs additional work on the summary of ahupua'a and project area settlement patterns. Some other minor points need work. Please see the attachment for details.

Mr. Robert Horcajo  
Page 2

Site descriptions are generally fine -- with good maps and excellent photographs. The tables and the appendices are fine, as are the summaries in the text. Some interpretations, however, have no supportive justifications -- particularly for several minor religious site interpretations and the "possible" ahupua'a boundary wall. Thus, some upgrading of interpretations is needed. Please see the attachment for details. Chronology is supplied with radiocarbon dating, and dates so far extend back to the A.D. 1400s-1600s.

The summary of the findings needs some improvements to clearly state what parts of the former settlement survive and to analyze how the findings match or modify our picture of old Olowalu. Again, please see the attachment for details.

Until the above revisions are made, we cannot evaluate the significance evaluations -- particularly those for sites claimed as minor religious structures and an ahupua'a boundary wall but as yet with no supportive information. But, we do have some questions about a few evaluations, and we request the inclusion of a standard significance evaluation table. Please see the attachment for details. We do note that a number of sites clearly are significant for multiple criteria -- the two large heiau, the petroglyphs at Pu'u Kilea and upstream, and the burials (and possibly the gleyed taro/marsh soils and any fishpond soils that might survive).

Again, until revisions occur, we cannot fully evaluate the mitigation recommendations. The needed significance table should also include mitigation commitments for each site. We also see some items that need clarification, and these are detailed in the attachment. The majority of the recommendations seem fine -- e.g., preservation of the two larger heiau, the petroglyphs (at Pu'u Kilea and upstream), the burials, and the platform/terrace site (4708) and data recovery of other sites.

Given the above, the report needs to be revised before it can be considered acceptable and before we can finalize our comments on which sites are significant and what appropriate mitigation might be. In general, the revisions are relatively minor (clarifications), with the summary of the ahupua'a settlement being perhaps the larger task. But in the latter case, all the information is in the report, it simply needs to be pulled together into detailed views of the precontact to early 1800s and late-1800s to early 1900s times. This detailed picture is extremely important for Olowalu, and it is a rarity and a great advantage. It will help the survey and mitigation work yield top quality information on old Olowalu.

As always if you or your archaeological consultant disagree with any of our comments or have questions, please contact our review staff as soon as possible, so these matters can be resolved. Dr. Ross Cordy, our Branch Chief for Archaeology, is our contact at this time for this project (692-8025).

Aloha



Don Hibbard, Administrator  
State Historic Preservation Division

RC:jen

Attachment

c: E. Fredericksen, Xamanek  
Planning Department, County of Maui  
Public Works Department, County of Maui  
Maui Island Burial Council Chairperson



ATTACHMENT  
NEEDED REVISIONS  
INVENTORY SURVEY FOR OLOWALU MAUKA  
XAMANЕК

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**Background Section**

Minimally, two main time periods seem useful to emphasize -- precontact to 1850 times and late-1800s to early 1900s cane times. This section (as noted in the cover letter) has some excellent details on Olowalu. However, these details are scattered about. They need to be brought together in the summary at the end of this section to form a detailed picture of settlement with accompanying maps for each time period. When this much detailed information is available, it is very important to have the summary also be detailed. It does not have to be pages of detail, simply an itemization of where things were on the land. For example, for precontact to 1850 times, where was the major coastal trail, where were specific house sites (including the high chiefess Kalola's), where were known lo'i fields, where was the fishpond, where were the known heiau (from oral information or prior archaeology), where were the petroglyphs (clearly among the houses and lo'i -- which is very unusual), etc.

Minor points follow:

1. Map 2. This needs the project border to be shown.
2. p. 1, para 5 and pp. 29-30. Site 1603 (the old Church) is not located on the site location maps. Please include this site's label.
3. The fishpond location needs to be shown clearly on some of these maps within the text.
4. p. 13, left column, para 3. Was not Kahekili on O'ahu during the Battle of Kepaniwai? Was not his son, Kalanikupule the leader of the Maui forces at the battle? Please check and revise if needed.
5. pp. 14-16, Mahele information. Clearly, you have details here. You need to show on a map (with color coding or hatching or some other way) exactly which parcels (apana) were lo'i, which were kula, which were permanent habitation (pa hale). This will enable the reader to see if there were clusters of houses, if houses were dispersed, if houses were all on one side of the stream, etc. The text should then briefly say what the patterns were.
6. p. 17, Figure 1. Can a better copy of this figure be made? The Old Government Road needs a label. The text does not describe this road and needs to. More than likely this was the old major coastal trail route of precontact times (or close to it), an important finding.
7. p. 18, Figure 1a. The print is very hard to read. It would be good to make labels for the old and present stream bed and other key information, and to include the project borders.
8. p. 19. The sugar mill is mentioned in the text and the wharf. Later (p. 20), the manager's house and water system. You need all these on one location map for the time period. Also, what about sugarcane field locations? It is critical to show field locations on this same map.

Attachments Page 2

9. p. 21. Mrs. Rodriques' parcel is not readily visible on Map 3, so please make a label. This is very important because she identifies it as the former residence of Kalola. The fishpond needs to be labeled too. Both need to go on the overall map of the site patterns for the precontact-1850 time period.

10. p. 22. The sketch maps of the camps and related features are good. But be sure to include the camp, baseball field, stores, etc. on the overall map of the cane era -- along with the mill, wharf, etc.

11. p. 26. Site 1200 (the petroglyphs) do not appear on a map accompanying the text, do they? Please be sure it is clearly on maps.

12. pp. 31-34. Much of the Launiupoko and Ukumehame information can be deleted, except perhaps for dates or general settlement conclusions. Delete all references to significance evaluations and mitigation as this is irrelevant to the settlement pattern analysis of Olowalu.

13. p. 34. Include the Olowalu makai archaeology with the prior archaeology on Olowalu in general, again with references to significance evaluations or mitigation.

14. pp. 36-37. Again, this summary section is too general, given the bits of very detailed information in the prior pages. Replace it with maps of each period showing the settlement in detail and with more detailed text. Also, be sure to include an analysis of the extent of cane land alteration and which types of earlier sites are likely to survive/be destroyed.

#### Methods

1. p. 38, left column, 2nd para. Map 5 (not Map 3) shows the backhoe locations. Please revise.

2. The report here needs to include some rationale for why the back-hoe trenches were placed where they were. For example, very few (if any) trenches seem to have been placed in former lo'i fields (old LCAs) to check to see if taro soils survive as archaeological deposits. If these deposits are considered to be long destroyed by cane land alterations, then this conclusion needs to come here again. Or if one or two key backhoe trenches show the deposits are gone, then that needs to be noted as a reason why more such trenches were not dug.

#### Site Inventory -- Descriptions, Interpretations, & Summary

1. Site 4701, p. 44. There is no reasoning given for the conclusion of "possible ... ceremonial ... perhaps a ko'a". Justification for this interpretation is needed.

2. Site 3180, p. 45. Ahupua'a boundary walls were usually constructed on Hawai'i Island by ranches in the 1880s-1890s. Why do you claim this wall to be a pre-contact ahupua'a boundary wall, given its historic architectural traits (1.2 meters high) and the apparent association of such boundary walls with the very late 1800s? It seems likely that this is a late 1800s wall -- and probably not significant for other than its information and probably not meriting preservation. Please upgrade your interpretation.

3. Site 4705, p. 47. Map 4 seems to show this site downslope of 4704, not upslope as noted in the text. Please check and revise if needed.

4. Site 4708, p. 48. Why does size and location lead to a claim that the platform is religious, particularly when it has late 1800s artifacts on it? The interpretation needs justification. Also, why is the terrace system concluded to be irrigated fields; no justification is given -- please provide justification.

5. Site 1200. We could find no description of this site. If it is not described, it would be good to add it to your appendix.
6. Site 4716. Feature A is described as 10 x 10 meters on p. 52 and as 5 x 3.5 meters on page 81. Which is correct? What type of habitation is this -- permanent or temporary? An analysis of type is required.
7. Site 4758, Japanese cemetery. The maps seem to show this as 4753; is this a typo on the maps?
8. p. 57, BT 106-107. These trenches found gleyed soils considered to be taro soils or marsh soils. Either conclusion would seem to merit assignment of a site number and a discussion under the site section.
9. p. 57, BT 121 and p. 58, BT 139-140. These trenches found skeletal fragments and thus site numbers must be assigned, and a discussion needs to be made under the site section. Text here says more work and re-visiting is needed to determine if more burials. Was this done? The size of these sites needs to be established in the survey with some feeling of confidence.
10. p. 58. There needs to be a summary map showing the soil patterning found from the backhoe trenches.
11. Summary, pp. 61-63.
  - a. Be sure to include all sites -- the Backhoe trench sites too. Also, be sure to include analysis of whether LCA lo'i deposits survive and the fishpond deposits.
  - b. The functional types of sites for each time period (precontact to 1850 and late-1800s to early 1900s) could be put into a table and the text on the sites found could be reduced. The percentage of each type is not very relevant and could be deleted.
  - c. Mention the chronology of the sites separately and whether it is believed that these are representative, or whether earlier dates are expected with a larger sample of sites being dated. We believe that dates should go as early as A.D. 1000s-1200s, and that the marsh/lo'i soil deposit may provide this information.
  - d. Please make it clear what parts of the former settlement patterns survive -- given your findings - and where. Also be sure to analyze how the findings modify the picture of old Olowalu's settlement.
  - e. If comparison to Ukumehame and Launiupoko is desired, percentages of sites found in the different areas means nothing because different land forms survive in different areas. Launiupoko has rock shelters along streams and Olowalu has some on ridges. The most striking thing is that in the lower valley (flood plains) Launiupoko had no lo'i, while Olowalu did. These comparisons are not vital, but they can be made.

#### Significance Evaluations

We cannot evaluate all the significance evaluations until the justifications for some sites' interpretations are upgraded. For example, 3180 may not be a precontact ahupua'a boundary wall, and if so, it would not be significant under criterion C.

1. Please include the standard significance table. This vastly helps the reader when this many sites are found. The columns should be site number, site function, significance criteria, and mitigation commitment.
2. Site 4701. This may not be criterion E, unless religious interpretation can be supported.
3. Site 4703. Why is this site not "no longer significant", since it is largely destroyed?

4. Site 4711. Why is this site not "no longer significant", since it consists of a few very minor, possibly agricultural features?

5. Be sure to include all your "no longer significant" conclusions under the Significance section. And be sure to conclude this section with a statement of how many significant sites are present (minus the "no longer significant").

#### Mitigation Commitments

We cannot evaluate these commitments until the justifications for some of the sites' interpretations are upgraded. A few comments follow.

1. Site 3180. If this site is not a precontact ahupua'a boundary wall, and we doubt it is, then preservation would not seem merited.
2. We agree with the other preservation recommendations and the sites recommended for interpretation. We also agree that local native Hawaiian groups and individuals should have input on the detailed preservation plan's development, and that other interested parties should have the opportunity to comment on the preservation plans.
3. The marsh/lo'i site must be included in this section. Coring for paleo-environmental information would seem desirable to determine possibly when permanent settlement began in the area and the plant changes before and after settlement.
4. For the two backhoe areas where skeletal remains were found. Here on page 65 it seems to be saying more survey testing is needed to determine the source and size of these sites. If that is the case, maybe this testing should be done and reported on in the revision.
5. p. 65, right column, para 2. Monitoring of earth moving activities to recover skeletal fragments in the backhoe trench areas would not be data recovery work. It is monitoring solely to recover the skeletal material. Similarly, in the next paragraph, we will not approve data recovery in the form of monitoring for any of the sites found. Excavations and mapping will be the approach used. If after data recovery, some areas may possibly contain scattered burials, then monitoring would occur (as monitoring -- not data recovery) solely to recover such finds. If such monitoring is proposed here, please be very specific as to what areas should be monitored and why. Also, would on-call monitoring be possible in some of these cases?

BENJAMIN J. CAYETANO  
GOVERNOR OF HAWAII

**RECEIVED**

DATE 3/10/00



STATE OF HAWAII

DEPARTMENT OF LAND AND NATURAL RESOURCES

HISTORIC PRESERVATION DIVISION  
Kakuhikawa Building, Room 555  
501 Kamehale Boulevard  
Honolulu, Hawaii 96813

February 25, 2000

Mr. Robert Horcajo, Project Manager  
Olowalu Elua Associates, LLC  
173 Ho Ohana Street, Suite 201  
Kahului, Hawaii 96732

TIMOTHY E. JOHNS, CHAIRPERSON  
BOARD OF LAND AND NATURAL RESOURCES

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WATER RESOURCE MANAGEMENT

LOG NO: 24957 ✓  
DOC NO: 0002RC39

Dear Mr. Horcajo:

**SUBJECT: Review of Revised Archaeological Inventory Survey Report – Olowalu Makai  
Development Parcel  
Olowalu, Lahaina, Maui** TMK: 4-8-3: portion 5

This letter reviews the revised report which was submitted February 7, 2000 and received in our office on February 9th (D. Fredericksen & E. Fredericksen 2000. Archaeological Inventory Survey of Makai Portion (Phase 1) of Olowalu Development Parcel ... Xamanek ms.). This revision addresses our review letter of January 14, 2000 (Log: 24,721; Doc: 0001RC11).

The summary of the ahupua'a settlement pattern in the background section of the report is better, but it still does not summarize the details of all the important information that was presented in that section of the report. However, rather than ask for another revision, our staff will prepare a detailed summary which will be placed in our library along with the report.

The revision has addressed all our other concerns, particularly regarding site size, descriptions, and interpretation matters. The report is now acceptable.

Although many precontact and early 1800s habitation sites may have been along the shoreline in this project area, sugarcane cultivation has apparently destroyed most of these sites. A fishpond to the east seems to be under the highway today, and it appears not to be in the project area. Seven archaeological sites, plus gleyed marsh soils with possible historical importance, survive in the project area. These include 4 precontact to early 1800s sites (3 habitation sites – 4694, 4697, and 4698; 1 burial site – 4693) plus the gleyed marsh soils, and 3 late 1800s-1900s sites (the Olowalu Mill Complex – 1602; a road remnant – 4696; a sea wall apparently associated with a road turnout – 4695).

We agree with the report's significance evaluations. The road remnant (4696) and associated sea wall (4695) are "no longer significant" because the limited important information in these sites was recorded during the survey. The 3 precontact to early 1800s habitation sites are significant for their information content, as are the gleyed marsh soils (which may contain important pollen and charcoal material for dating initial settlement along this coast). The burial site (4693) and the Olowalu Mill Complex (1602) are significant under multiple criteria. As an aside, our review letter of January 14th contained an error in final editing. Table 2 should have "no longer significant", not D, in the significance column for 4695 and 4696 and simply "no further work" or no entry at all in the mitigation column (as only significant sites need mitigation). We apologize for this, but could you please have Table 2 revised accordingly and send a replacement page? This change will clearly show to all readers of the report that these 2 sites are not significant.

Mr. Robert Horcajo  
Page 2


Last, we agree with the revised mitigation proposals for the 5 significant sites and the gleyed marsh soils. The 5 sites will be preserved, and the gleyed marsh soils will undergo archaeological data recovery. These actions will alleviate (mitigate) the adverse effects of the proposed project to these sites.

Thus, by a copy of this letter, we recommend to the County and State permitting agencies that the following standard conditions be attached to any approved permits, to ensure that the mitigation commitments to treat the significant sites are acceptably carried out:

1. Five sites shall be preserved (3 precontact to early 1800s habitations sites - 4694, 4697, 4698; 1 burial site - 4693; and the Olowalu Mill Complex - 1602). A preservation plan for all sites but the burial site must be submitted to and be approved by the State Historic Preservation Division (SHPD) (including buffer zones, as appropriate around the sites, interim protection measures, and long-term preservation measures). The preservation proposal and plan for the burial site shall be submitted to the Maui/Lana'i Islands Burial Council for vote. Minimally, the buffer zones and interim protection measures shall be in place (and verified in writing by the SHPD) prior to land alteration in the area of the sites. The SHPD shall verify in writing to the permitting agencies when the plan has been successfully completed.
2. The gleyed marsh soils shall undergo archaeological data recovery. An archaeological data recovery plan (scope of work) shall be submitted to and be approved by the State Historic Preservation Division (SHPD) prior to the beginning of the data recovery work. This scope should be completed, before a data recovery contract is negotiated. Minimally, data recovery fieldwork must be successfully concluded (and verified in writing by the SHPD) prior to land alteration in this part of the project area. The SHPD shall verify in writing to the permitting agencies when the plan has been successfully completed.
3. Archaeological monitoring of land altering construction in the sand areas along the shore shall occur, as a contingency to identify, document and treat any burials that might be found. A monitoring plan (scope of work) shall be submitted to and be approved by the State Historic Preservation Division (SHPD) prior to the beginning of the monitoring. This plan (which need only be a few pages long) must specify how any burials that are found will be documented archaeologically, notification procedures, and treatment measures that will be taken. This scope should be completed, before a monitoring contract is negotiated.

If you have any questions, please feel free to contact Dr. Cordy at 692-8025.

Aloha,



Don Hibbard, Administrator  
State Historic Preservation Division

RC:jen

c: Land Division, DLNR (CDUA application)  
Planning Department, County of Maui  
Public Works Department, County of Maui  
Burials Program, DLNR  
Maui/Lana'i Islands Burial Council Chair

BENJAMIN J. CATYANO  
GOVERNOR OF HAWAII



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COMMISSION ON WATER RESOURCE MANAGEMENT

DEPUTIES  
JANET E. KAWILO  
L. ANN HISHIOKA

STATE OF HAWAII

DEPARTMENT OF LAND AND NATURAL RESOURCES

HISTORIC PRESERVATION DIVISION  
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AQUATIC RESOURCES  
BOATING AND OCEAN RECREATION  
CONSERVATION AND RESOURCES  
ENFORCEMENT  
CONVEYANCES  
FORESTRY AND WILDLIFE  
- HISTORIC PRESERVATION  
LAND  
STATE PARKS  
WATER RESOURCE MANAGEMENT

January 14, 2000

Ms. Demaris Fredericksen  
Xamanek Researches  
P.O. Box 880131  
Pukalani, Maui, Hawaii 96788

LOG NO: 24721  
DOC NO: 0001RC11

Dear Ms. Fredericksen:

**SUBJECT: Review of Revised Archaeological Inventory Survey Report --  
Olowalu Makai  
Olowalu, Lahaina, Maui  
TMK: 4-8-3: portion 5**

This letter reviews the revised report, replacement pages submitted August 26, 1999 (D. Fredericksen & E. Fredericksen 1999, Archaeological Inventory Survey of Makai Portion (Phase 1) of Olowalu Development Parcel ... Xamanek ms.). The revisions address our review letter of July 6, 1999 (Hibbard to E. Fredericksen; Log: 23565; Doc: 9907RC07). Our apologies for our delayed review.

We can now conclude that the survey has likely found all sites, totaling 7 archaeological sites, plus gleyed marsh soils with possible historical value. We understand this report is a companion to the Olowalu Mauka Phase II inventory survey report.

Site descriptions need some minor work. The size of two subsurface habitation sites (4697 and 4698) has not been established. Please provide additional information or justification for not undertaking such work.

Site interpretations need a few minor revisions. It appears that you have found 4 sites of precontact-early 1800s age, 3 being remnants of coastal housing and 1 being an associated burial area. Also, the gleyed soils found behind the beach berm seem to be marsh soils associated with these times. Three sites seem to belong to the Plantation Era -- the Olowalu Mill complex, a paved road remnant, and a sea wall possibly associated with a road turnout.

We agree with your significance evaluations, assuming the sizes of sites 4697 and 4698 are not very large. As we read your evaluations, 2 sites are "no longer significant" (the road remnant and sea wall), 3 are significant for their information content (the 3 habitation sites -- 4694, 4697, 4698) as well as the gleyed marsh soils, and 2 are significant for multiple criterion (the burial site 4693 and the Olowalu Mill complex). Thus, 5 significant historic sites are present, plus the marsh soils.

[Signature]

Ms. Demaris Fredericksen  
Page 2

We agree with your proposed mitigation commitments for these 5 significant sites -- preservation of the Olowalu Mill complex and the burial site (4693) and one habitation site which is in the Beach Reserve (4694) and archaeological data recovery of the two remaining habitation sites (4697 and 4698). We note that the gleyed marsh soils also need to undergo archaeological data recovery work.

Also, you propose archaeological monitoring of land alteration work in the sand deposits at the eastern end of the project area, as burials are present at site 4693 and might be found elsewhere. We agree.

Last, you recommend no commercial or residential development on the sands in the eastern end of the project area. The burial site is to be preserved in this area.

In summary, the report still needs revision before it can be considered acceptable. As always, if you disagree with our comments or have questions, please contact our review staff as soon as possible. Ross Cordy, our Branch Chief for Archaeology, is our contact for this review at this time (692-8025).

Aloha,



Don Hibbard, Administrator  
State Historic Preservation Division

RC:jen

Attachment

c: Robert Horcajo, Olowalu Elua Associates [fax 877-9409]  
Planning Department, County of Maui  
Public Works Department, County of Maui



ATTACHMENT  
NEEDED REVISIONS  
LOWALU MAKAI SURVEY

KAMANAK

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[Comments which follow use the same numbering as in our July 6, 1999, review letter, so you can easily refer to those earlier comments.]

**Site Inventory -- Descriptions & Interpretations**

1. Site 4693 -- the Burial Site. All our concerns have been met regarding this site, except for some questions related to the site map. Map 9 needs to have each burial labeled on the insert. Also, text should indicate the justification for the site borders.
2. Site 4694
  - a. p. 32, para 4, last 3 lines. An alignment is not the same as a wall. This correction has not been made. Is the L-shaped structure a wall, or an alignment?
3. Site 4695 -- Sea wall?
  - a. p. 38, last para. The construction techniques of this wall that are considered post-contact are now included -- mixture of waterworn and angular rocks. Our question now is on what evidence do you conclude that a wall that is a mixture of waterworn and angular rocks is post-contact? It seems like pre-contact walls also could include such construction techniques.
5. Site 4697 -- Subsurface Habitation Deposit
  - b. The size of the site is not delimited. Inventory survey requirements are that site size needs to be delimited. It is a crucial factor in significance and mitigation planning. Thus, it seems that additional testing is needed at this site -- as part of this survey -- to determine its borders. Findings should be included in the next revision of this report.
  - d. Which LCA house lot (give LCA number) do you think that this site might be associated with.
6. Site 4698 -- Subsurface Habitation Deposit of Pre-contact Age
  - a. Site size. Your hand-written notes again indicate that determining site size will be done in data recovery. Again, this is not acceptable for an inventory survey. Site size must be determined now. If you feel that you can adequately propose site size based on a nearby backhoe trench with no finds, and the limits of the landscaped yard of the manager's house, then please so clarify the text on page 45. Otherwise, more testing will be needed before this survey can be accepted.
  - b. Site function. Please clarify if you have sufficient information to determine whether this is a temporary or permanent habitation site.

7. Site 1602 -- Olowalu Sugar Mill site

b. It still is unclear why the description of this site is so brief. Again, if it is described before in the Statewide Inventory in detail that is acceptable, just say that. If it has not been described, then why are not the features measured and described like the features of other archaeological sites? The photo is excellent. Can you link that to your description a bit more?

8. Possible Other Sites -- Irrigated Taro Field Soils, Fishpond Soils, Marsh Paleo-environmental Soils?

a. *Original p. 47, last para. (now pp. 48-49), Gleyed soils behind the beach berm.* Your footnote now makes it clear that these are not likely to have been taro soils. However, stream fed "coastal lagoonal marsh" lands could be used for fishponds and could have paleoenvironmental information on Hawaiian history (e.g., pollen record showing clearing of trees as signs of human settlement and charcoal dating that period). It is clear that these marsh soils must be studied further in the mitigation phase of this project -- with trenching/coring, pollen studies, and dating. You need to note the location of these soils in the Conclusion and include the mitigation need in the Mitigation Proposal section.

9. Summary.

b. The third paragraph evaluates the pre-contact sites. The last paragraph notes the gleyed soils. Please include a sentence here saying that these soils may include important paleoenvironmental information on Hawaiian history in the area. What about Mahele Period and what you found that remains? What about the Plantation Era? You need at least two more paragraphs in this section.

**Significance Evaluations**

2. Site 1602, the Olowalu Mill. On page 53 it is evaluated as significant only under Criterion D. On page 54, para 5, it is evaluated as significant under Criterion A and D. Please amend page 53.

3. We note, in the Significance Table on page 69 in the last column that you consider sites 4695 and 4696 "no longer significant", evidently because reasonable and adequate amounts of their information have been recorded in the survey. We agree. Please note in the last column "no further work".

4. Be sure to indicate that the gleyed soils are significant for their information content, criterion D.

**Mitigation Proposals**

Essentially, you are recommending no protection for sites 4695 (sea wall) and 4696 (paved road remnant), because you feel they are "no longer significant". This seems reasonable.

1. We recommend that you have an introductory paragraph and simply say that you are recommending that two sites (habitation sites -- 4697, 4698) and the gleyed soils undergo archaeological data recovery and that three sites be preserved (the burial site, 4693; 1602 Olowalu Mill; one habitation site 4694). Then elaborate as needed. Again, delete the references to significance. The data recovery cannot focus on site size (an inventory issue), but it can focus on the research question of chronology of the settlement of Olowalu.

BENJAMIN J. CAYETANO  
GOVERNOR OF HAWAII



RECEIVED  
7/13/99

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ENFORCEMENT  
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FORESTRY AND WILDLIFE  
HISTORIC PRESERVATION  
LAND  
STATE PARKS  
WATER RESOURCE MANAGEMENT

July 6, 1999

Erik Fredericksen  
Xamanek Researches  
P.O. Box 131  
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LOG NO: 23565 ✓  
DOC NO: 9907RC07

Dear Mr. Fredericksen:

**SUBJECT: Review of Archaeological Inventory Survey of Makai Portion of Olowalu  
Development Parcel  
Olowalu, Lahaina, Maui TMK: 4-8-3: portion 5**

This letter reviews this report which was received on May 25, 1999 (D. Fredericksen & E. Fredericksen 1999. Archaeological Inventory Survey of Makai Portion of Olowalu Development Parcel ... Xamanek Researches ms.). Our apologies for our delay in reviewing this report. When the report was received, our then newly hired Maui Archaeologist (Brian Ramos) was undergoing the lengthy training necessary for reviewing such reports. He reviewed this report in late May-early June, and Dr. Ross Cordy (our Branch Chief for Archaeology) has just checked the review as a basic need during the training period.

Unfortunately, we must conclude that, while 7 historic sites have been found on the parcel, we cannot yet confirm that the survey has found all sites. There is a possibility that archaeological deposits of taro lo'i fields and a fishpond are present, or at least paleo-environmentally important marsh soils. The background section needs to clarify whether lo'i fields were likely present and needs to clarify exactly where the former fishpond was located. Lo'i and fishponds were frequently present behind beach berms in the Lahaina area as you note near the end of the report. The report mentions gleyed soils in a number of trenches which are usually indicators of lo'i, fishpond, or marsh soils. You conclude these were marsh soils, but we believe their extent needs to be clarified and it needs to be evaluated whether these might be lo'i or even fishpond soils - particularly since lo'i and fishpond soils can contain very significant information on the past. Even if these prove solely to be marsh soils, the archaeological pollen record in marsh soils also contains important paleo-environmental information on the past, and that possibility needs evaluation.

Also, the background section needs revisions to clarify the ahupua'a and project area settlement patterns for pre-contact to early 1800s, 1830s-1850s (Mahele era) and 1860s-1940s (Plantation era) times. This is vital to clearly show the historical context for interpreting the sites found and for evaluating their significance. It is also important for specifically locating sites that existed in the past and may be present today. (See the attachment for details.)

" - 2 - 1999

Erik Fredericksen  
Page 2

Further, site borders, descriptions and interpretations need upgrading in many cases. (See attachment). For example, the boundaries of 4693 (the burial site) and of 4697 and 4698 (subsurface habitation deposits) are not established. Borders must be established for significance evaluations and for evaluating impacts and mitigation proposals.

Until the above items are addressed and revised, we cannot determine how many significant historic sites are present or evaluate mitigation proposals.

As always, if you disagree with any of our comments, please contact our office immediately, so these disagreements can be resolved. Ross Cordy (692-8025) is our contact point on this project's review.

Aloha,



Don Hibbard, Administrator  
State Historic Preservation Division

RC:jen

Attachment

c: Robert Horcajo, Olowalu Elua Associates  
Department of Public Works, County of Maui

**ATTACHMENT**  
**NEEDED REVISIONS**  
**OLOWALU MAKAI SURVEY**  
**XAMANEK RESEARCHES**

---

**Background Section – Establishing Ahupua'a Settlement Patterns & Likely Patterns within the Project Area**

The aim of these sections of reports are to minimally establish the ahupua'a settlement patterns and likely project area settlement patterns at different points in time (as relevant). You can present this information in several ways. One is to discuss archival and oral historical data and summarize the settlement patterns from this information source by time period, then review archaeological findings on settlement patterns and summarize them by time period, and then create a large synthesis. Another is to combine the archival, oral historical and archaeological information together and briefly discuss the materials used (archaeological studies existing, historical sources reviewed, oral interviews, etc.) and then summarize what is known by time period. You can use either approach. We would suggest that you take the latter approach for this report.

1. Map 4. The map needs better labeling. The project area's boundaries should be superimposed, and the shoreline should be clear. The location of Olowalu Stream should be clear.

2. Pre-Contact to Early 1800s – Archival

a. Pages 4-9 are largely a discussion of general Hawaiian history, but there is no focus on Olowalu's settlement patterns. Do you have information on settlement patterns from this period? There certainly are descriptions for Lahaina in oral histories and early journals which could be extrapolated for Olowalu, if the environmental zonation is similar. (The information compiled in archaeological reports on Launiupoko and Olowalu could be used here too.)

3. 1830s-1850s – Mahele Era

a. Our minimal standards require you to analyze ahupua'a and project area Mahele patterns – to locate where the houselots, lo'i, dryland fields, etc. were – to also help predict pre-contact patterns. However, there is no ahupua'a analysis of Mahele patterns. Minimally, it must be shown in text and a map where the irrigated fields, houselots, dryland fields, etc. were located (as best as possible with the information found in the records).

b. pg. 10, para 2. For the coastal awards, what sources did you use (e.g., Native Register, Native Testimonies, Award Books)? This must be cited. It could be placed as a note under the table. Also, some of these awards were one piece (apana) of multiple-piece awards. What were the other pieces used for (dry fields, irrigated fields?) and where were they located? This establishes the land use pattern of these coastal residents. Here, from the information available, you also need to extrapolate the likelihood of irrigated agriculture on the floodplain in your project area.

c. Also, what of the major coastal trail?

Attachment Page 2

4. Plantation Period, pp. 11-13.

a. The places of the plantation (mill, houses, fields, irrigation ditches, internal roads, shipping pier, railroads) need to be better itemized, located, and their age clear. Some of this information is present, and some is not. Refer to Figure 1 in the text or blow-up the Olowalu portion of Figure 1 to help the reader follow the discussion.

b. Also, what of the awarded kuleana lots; did the owners' descendants still reside on them?

c. Also, what of the coastal major trail and its change to a road?

5. Interviews

a. These interviews include some information on Plantation era sites and some on earlier periods. This is one reason we suggest that all sources of information be combined into one discussion of each of the time periods.

b. pg. 13, para 6. Locate the Olowalu school in your discussion of Plantation era patterns.

c. pg. 13, last para. How were these rocks and boulders cleared (bulldozers with massive earth-moving)? This is critical to evaluate if sites were likely to have been destroyed. Which areas were cleared – any in the coastal project area?

d. pg. 14, para 2. Locate the fishpond more exactly. How old was this pond? If pre-contact, then it should be noted in your section on precontact settlement patterns. If this fishpond area was in your project area, make sure under your fieldwork section on backhoe trenching that you note whether you tested this area.

e. You need to include some background on this informant. Also, the residence of Kalola should be specified and placed under your pre-contact section's discussion. It importantly indicates where (at least at one point in time) the overlord high chief who held Olowalu may have lived.

f. pg. 14, para 4 & 5. These are places that need to be incorporated into the late Plantation era's patterns. Where these plantation company areas or general public areas or private enterprises?

6. Prior Archaeology. Again, it might be easier to blend this information (as relevant) into one discussion of each time period's settlement patterns.

a. pg. 15. Clearly locate Kilea Hill (Pu'u Kilea) on one of your maps and clearly show the borders and numbers of the sites. This seems to be Map 2. Clearly, this information adds religious sites to the settlement pattern information (such information being lacking in the Mahele documents, usually).

b. pg. 17, Mopua church. This discussion could be spilt and placed into the Mahele period and the Plantation period sections.

c. pg. 17, Olowalu Sugar Co. Mill Site. You include no information on this site. It must be included. This can also be blended into the Plantation Period discussion.

d. Pg. 18-22. Currently, the way the sections on Launiupoko, Ukumehame and Transmission line studies are presented, they are irrelevant to your Olowalu discussion. You could include the Olowalu sites in the transmission line – into the discussions under the relevant time periods. The Launiupoko and Ukumehame settlement patterns are probably relevant for comparative periods (if you include information from their background section and itemize expectations and finds by topographic zones). You could briefly summarize this information by time period and place it under the relevant time period discussion. Information on significance of sites, delays in survey, etc. are not really relevant to a background review.

7. Summary of Ahupua'a & Project Area Settlement Patterns. This needs to be done to incorporate some of the details from your prior pages.

a. Pre-contact to early 1800s. You can use Launiupoko and Ukumehame to predict patterns, but be specific what you mean by "higher elevations" vs. "lower elevations". Actually, it would be best to present the settlement zones – e.g., coast (sand and floodplains), stream gulches, colluvial slopes, narrow upper valleys within the mountains, forested ridges in the mountains. Note what was found in these zones in adjacent lands (from archival, oral historical and archaeological sources). Here too you could note the Lahaina pattern of beach berms with ponds forming behind the berms along streams (if relevant – and it seems to be with your gleyed soil findings in your trenches). Also, you can use your Mahele era specifics to predict for Olowalu. And you have some archaeological information on heiau.

1) Take care in claiming plantation irrigation used ancient water systems. To our knowledge, there was no evidence of such use in the Launiupoko project. Indeed in many cane areas that our staff are aware of, plantations made new ditches.

b. Present the patterns for the Mahele era and then for the Plantation era.

c. Project area

1) Present references for the Lahaina lands having shoreline permanent and temporary habitations from archaeological and historical sources to support your claim. What about the possibility of irrigated fields and fishponds?

2) Present your Mahele and oral history information for pre-contact to 1850s expectations. There is plenty of specific information that needs to be summarized.

3) Similarly specify the Plantation era settlement patterns in your project area and likely archaeological remnants.

4) Remember to discuss known disturbances. Sugarcane fields and the moving of rocks/boulders. Discuss likely impacts on sites once in these areas.

#### Site Inventory – Descriptions & Interpretations

1. Site 4693 – the Burial Site.

a. Please label each likely burial as Burial 1, 2, 3 ... in the headings and on page 25 (last para) and page 26 (1st para), as it is difficult to follow the discussion.

b. Be sure that for each burial there is an evaluation of ethnicity and age, with evidence for the conclusions specified. This is done in only some cases.

c. Burial 1 and 4. On Figure 5, these are only 60-80 cm apart, yet they are interpreted as two individuals rather than one. Your description of the context should be more precise, and provide justification for this interpretation.

d. Burials 3, 5, and 6. The same is true. These finds, which all appear disturbed, are within a 2-3 meter area, yet the report concludes that they represent three individuals. The basis of this conclusion should be clarified by addressing the depositional context in greater detail.

e. The boundary of the site must be determined and be made clear in the report. The plan map shows no borders (Figure 4) and it shows trenches which had no burial remains. At this point, it appears to us that this site's borders are not established. If that is the case, then more fieldwork is needed for this survey to establish the site's borders.

## 2. Site 4694 – L-shaped Wall

a. pg. 32, para 4, line 5. Here this site is called an L-shaped alignment. Later it is called a wall. Which is it? An alignment is one-stone high; a wall is multiple tiers.

b. pg. 38, para 3. Contrary to your claim, you definitely have cultural deposits from your test units (in association and below the wall). These finds seem typical of pre-contact habitation sites (volcanic glass, basalt flakes, kukui, food remains). Little or no clearly associated post-contact remains are present. This makes it appear as if this is a habitation site with a wall and associated subsurface deposits. Please re-evaluate your interpretation.

c. Your claim that this is a kuleana wall remnant needs extreme caution. A kuleana often refers to an awarded LCA claim. Your maps seem to clearly show no such claims near this site. Also, pre-contact house sites could have low enclosure walls around them. A safer conclusion might be a habitation wall or a houselot wall. Please reconsider and alter accordingly.

d. The inland extent of subsurface deposits was not established. Do you feel confident that the inland extent corresponds with the wall? If not, more testing would seem merited.

## 3. 4695 – Sea wall?

a. pg. 38, para 5, sentence 6 concludes that the construction techniques of this wall are post-contact. Please state the evidence for this claim.

b. The interpretation of this site as a sea wall seems pretty speculative. Why do you think it is a sea wall; just because it lines the shore?

## 4. Site 4696 – Paved Govt. Road Segment.

a. The site has no acceptable description – measurements. What is the condition of the site?



Attachment Page 5

b. What is the age of this remnant – 1950s? If it is paved, clearly you can make some assessment on its age.

5. Site 4697 – Subsurface Habitation Deposit of Post-Contact Age

a. pg. 40, para 3, line 1. Map 3 shows an arrow pointing to this site “west” of 4693. The text here says “east”. Which is correct?

b. The extent of the site does not seem to be delimited. The site seems to have been discovered with one trench, and two small test units were dug off this trench. Do you know the borders? If so, indicate them on the map and note the dimensions in the text. If you do not know the borders, then more fieldwork seems to be needed.

c. What time in the post-contact era do you place this site?

d. In your conclusion, it is suggested that this may be associated with a kuleana. Take care again, because none of the awarded LCAs (kuleana) seem to be at this location. Many commoners did not receive awards, so this could certainly be a houselot of that era. But take care with how you use kuleana.

e. What is a “Maui diamond”? This should be defined the first time it is used.

6. Site 4698 – Subsurface Habitation Deposit of Pre-contact Age

a. Again, the size of this site does not seem to be established. You indicate that it appears likely to go under the landscaped yard of the plantation manager’s house, but have you delimited the borders in all directions? It needs to be done.

b. What is the evidence that makes you conclude that this is a temporary habitation? Permanent houses were also near the shore. This is not clear. Also if the deposit is extensive (under the landscaped yard) would this not argue against a temporary habitation in many cases?

7. Site 1602 – Olowalu Sugar Mill site.

a. pg. 46, Fig. 18. Label what these structures are, or note in the caption.

b. The description is far too brief. Have all these structures been described before in the Statewide inventory? If not, why are they not better described here? Also, which buildings are intact and which are remnants? Are the remnants simply foundations?

8. Possible Other Sites – Irrigated Taro Field Soils, Fishpond Soils, Marsh Paleo-environmental Soils?

a. pg. 47, last para. Here it says that some trenches showed gleyed soils, which are interpreted as marsh soils. The limits of these gleyed soils should be shown on a map. The interpretation of these soils needs to consider whether they might be irrigated taro field soils or fishpond soils which are often gleyed. This is particularly relevant when on page 49 you note that Backhoe Trench 23 showed that a

sand berm was present with gleyed soils behind it. As you indicate, this pattern is also present in Lahaina, where waters from streams overflow into low lands behind the beach berm and were sometimes taro fields, sometimes fishponds, and sometimes simply ponds. Please amplify this discussion. Also, even if these prove to be marsh soils, marsh soils often contain pollen and charcoal which contain important information on Hawaiian history (pre-settlement vegetation, when that vegetation began to be cleared with initial settlement, etc.). Please evaluate the possible presence of such important soils.

9. Summary. The summary should present your findings and evaluate the predicted settlement patterns. This way our information on settlement patterns is refined or altered.

a. pg. 52, para 2. Typo? You mean 1881 map vs. "1991", correct? Also, the wall does not seem to be close in our analysis.

b. pg. 52, para 1. It states that the sites are consistent with the expected settlement patterns. How? What were the expected patterns? It would be good to re-state them briefly. What did you find relevant to each time period? What new information do you have – minimally indications that burials are indeed near the shore in the sand probably one associated with house sites (meeting expectations) and that you have a date for a habitation site going back to ca. A.D. 1500. Clearly your expected pattern was lots of houses and probably associated burials, at least east of the pier. Your work showed very few habitation remnants (an important finding) and then only in the sands to the east. What happened to the other habitations – land alterations? (be specific)?

#### Significance Evaluations

We are not going to evaluate your proposals at this time, but what follows are some points that you need to consider and clarify.

1. Why are 4695 (sea wall) and 4696 (paved road) significant, given their condition? 4695 is a fragment of a wall of uncertain age and function, and 4696 is a fragment of a paved (1950s) road. Clarify.
2. Why is 1602 (the Mill) significant under criterion C, which is a good example of a type? The site has undergone considerable modification and has no remaining buildings present. This would seem to not qualify this site under C.

#### Mitigation Proposals

Again, we are not evaluating at this time, but here are some points you need to consider and clarify.

1. If 4695 (sea wall) and 4696 (paved road) are not considered significant, then they should not be discussed here. If you still consider them significant, what significant information do they have in them, and why do they need protection?
2. Site 4697 (post-contact habitation deposit). The size and the age of this deposit are not clear in the text. When they are defined and if the site is early to mid 1800s, then controlled data recovery excavations would be the appropriate mitigation approach, not monitoring.

Attachment Page 7

3. Abstract, para 3. There are only two forms of mitigation in the 1987-current state guidelines: preservation or data recovery. There is no such official category as "avoidance"; this is preservation. Also, there is no official category of "monitoring" of a site; this is data recovery. Delete the wording avoidance and monitoring here, and indicate how many sites will be preserved and how many will be data recovered.

4. You also recommend monitoring of earth moving activities in the "near-shore area between Hekili Point and the former manager's house". No reason is given in the abstract, but page 54 indicates that this is due to the proximity of site 4693 (the burial site). Again, the burial site needs to have its limits clarified (as best as possible). If that area proves small, the justification for monitoring the remaining area must be very clear. Is this a sand area likely to have held burials and is this a precautionary action? Again, justification needs to be very clear, as monitoring can be extremely expensive and needs to be merited.

# Appendix C

**Traffic Impact  
Analysis Report**

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**LOWALU MAKAI AND  
MAUKA SUBDIVISIONS  
TRAFFIC IMPACT ANALYSIS REPORT**  
Olowalu, Maui, Hawaii

August 1999

Olowalu Elua Associates, LLC



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**LOWALU MAKAI AND MAUKA SUBDIVISIONS  
TRAFFIC IMPACT ANALYSIS REPORT**  
Olowalu, Maui, Hawaii

PREPARED FOR:  
**LOWALU ELUA ASSOCIATES, LLC**

PREPARED BY:  
**Austin, Tsutsumi & Associates, Inc.**  
Civil Engineers • Surveyors  
Honolulu • Waikaha, Hawaii

August 1999

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## OLOWALU MAKAI AND MAUKA SUBDIVISIONS TRAFFIC IMPACT ANALYSIS REPORT

### I. INTRODUCTION

This report documents the findings of the traffic impact analysis study conducted by Austin, Tsutsumi & Associates, Inc. to evaluate the potential traffic impact on Honopiāni Highway by the proposed subdivision of lands at Olowalu, Maui, Hawaii.

#### A. Project Description

Olowalu Elua Associates, LLC proposes to subdivide lands at Olowalu, Maui, Hawaii into agricultural lots. Pursuant to Section 19.30A of the Maui County Code relating to the Agricultural District, a total of nine (9) lots will be created on lands situated makai of Honopiāni Highway. In addition to the subdivision of lands makai of the highway, Olowalu Elua Associates, LLC proposes to subdivide the lands mauka of the highway to create 34 lots.

A Special Management Area (SMA) Use permit application will be filed for the proposed creation of seven subdivided lots on the makai side of Honopiāni Highway. The seven lots, along with two existing makai lots not affected by the SMA permit application, yield a total of nine lots makai of the highway. Although the mauka lands do not fall within the County's SMA boundaries, and accordingly, are not subject to the County's SMA requirements, this study considers the cumulative traffic impact of the proposed subdivisions by evaluating the potential traffic generated from both makai and mauka lands. Hence, for the overall identification of potential traffic impacts, a total of 43 agricultural lots are assessed in this study.

Construction of the lots is expected to be completed in the Year 2000; however, the construction of the homes will be undertaken by the buyers. Occupancy of the homes will be dependent upon the individual schedules of the buyers, but it is estimated that

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most of the buyers would construct and occupy their dwelling units within a five-year period. Hence, Year 2005 is utilized for future conditions when the project is expected to be fully occupied. The buyers are expected to be a mixture of local residents and recreational users (part-time vacation or second homes).

The proposed project is located at Olowalu, Maui as shown in Figure 1 and in the vicinity map provided in Figure 2. The project consists of two agricultural subdivisions, which are referred to as the Makai and Mauka Subdivisions and shown in Figure 3. There will be 9 lots in the Makai Subdivision and 34 lots in the Mauka Subdivision.

The Makai Subdivision (consisting of 7 SMA lots in TMK 4-8-03.05, 41-43 and 2 existing non-SMA lots in TMK 4-8-03.44 and 84) is located on the makai side of Honopiāni Highway in the vicinity of the Olowalu General Store and Chez Paul restaurant. The agricultural lots in the Makai Subdivision will be served by two driveways, one on each side of the Olowalu Stream. A single lot on the north side of the Olowalu Stream will have a separate access, which is referred to as Driveway B. Access to the other lots in the Makai Subdivision will be at an existing driveway situated opposite of the north driveway of the Olowalu General Store/Chez Paul restaurant parking lot, labeled as Driveway C. The Makai Subdivision also contains an existing camping facility, known as Camp Pecusa, which is accessed by a separate, unofficial driveway. The camping facilities are mainly utilized by local groups during the weekends. Presently, there are no plans to change the Camp Pecusa facilities or alter its driveway.

The Mauka Subdivision (TMK 4-8-03.10, 50-70, 73-92, and 4-8-4:11-16) is proposed to access Honopiāni Highway via two new driveways, labeled as Driveway A and Driveway D. It is anticipated that access on Honopiāni Highway for Driveway A will be requested when the mauka area is subdivided for development. An existing private road, which serves as access for Pioneer Mill properties, is located on the mauka side of Honopiāni Highway and runs parallel to the highway. The 34 lots in the Mauka Subdivision will be able to utilize this private road to conduct trips internally within the mauka area without traveling onto Honopiāni Highway. The proposed project driveways are shown in Figure 3, the project site map.

#### B. Study Methodology

The purpose of the study is to identify, quantify and mitigate the potential impacts on Honopiāni Highway by the vehicular trips generated by the proposed subdivisions. The roadway improvements which would be required to accommodate the future regional traffic growth as well as the project-generated traffic are identified, as needed.





Traffic counts were taken on Honoapiʻiani Highway in the vicinity of the project to quantify existing traffic operations during the morning and afternoon peak periods of traffic. Field observations were also conducted during the course of the day while the traffic counts were being taken. In order to assess the traffic impacts of the Olowalu subdivisions in context with the regional traffic growth in the area, future traffic volumes were forecasted without and with the project-generated traffic. The traffic impacts of the proposed project were determined through the analytical comparison of these two future traffic assignments.

II. EXISTING CONDITIONS

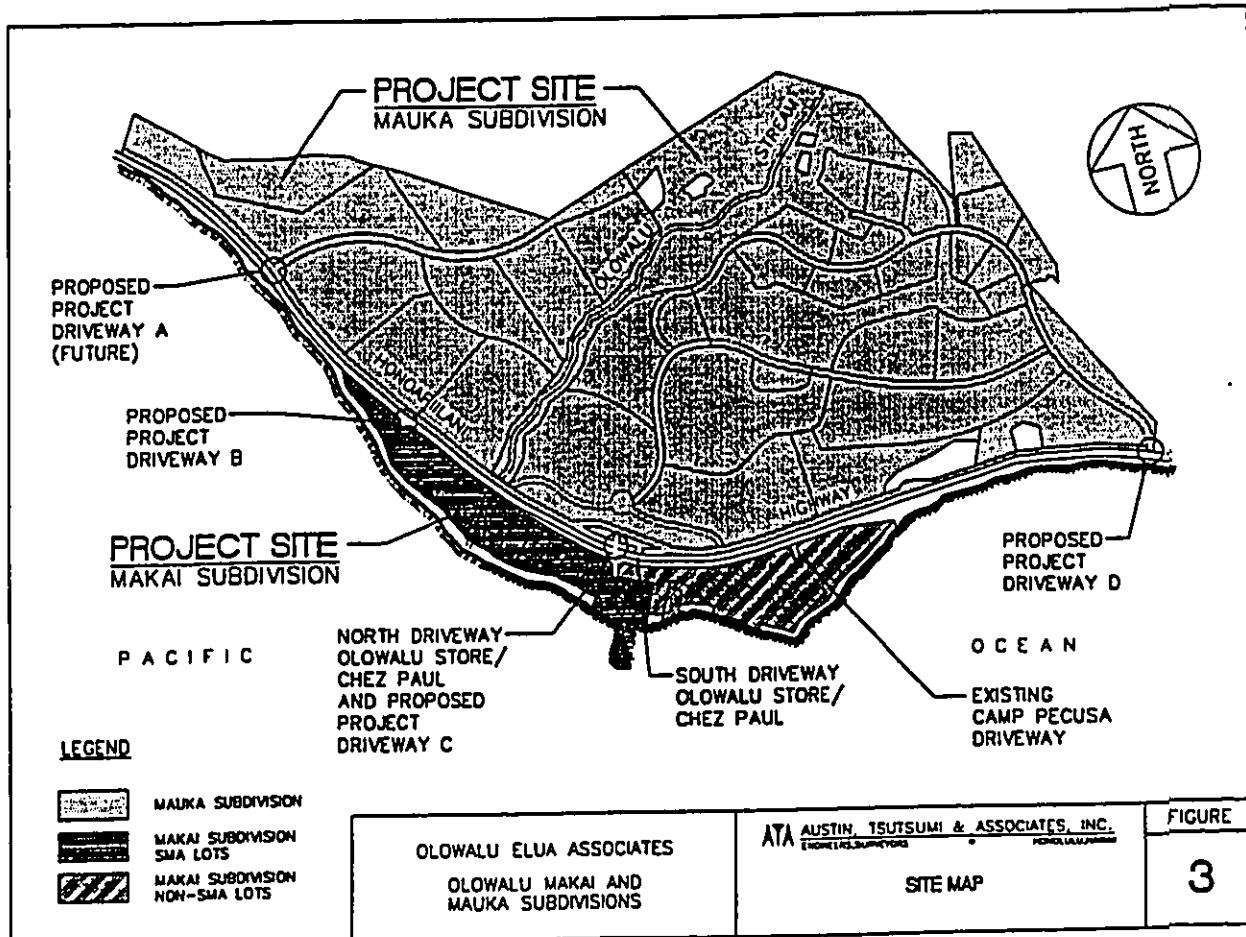
A field investigation was undertaken to develop a description of existing traffic conditions and roadway infrastructure at the study intersections. Information relevant to the study includes the number of travel lanes, traffic control devices, traffic volumes and the current traffic conditions on the existing roadway system.

Twenty-four hour traffic counts were taken on Honoapiʻiani Highway during Tuesday-Wednesday, February 2-3, 1999. In addition, turning movements into and out of the north and south driveways of the Olowalu General Store and the Chez Paul restaurant parking lot were observed during portions of the morning and afternoon peak periods on February 3, 1999. Weather conditions were generally sunny and windy with intermittent rain.

A. Existing Roadway System

Honoapiʻiani Highway is a two-lane major State highway linking Waiuku with West Maui. In the vicinity of the project, Honoapiʻiani Highway has two 12-foot travel lanes with paved shoulders of varying widths. Channelization, including left turn bays and acceleration and deceleration lanes, exist at selected intersections. The project is located in a rural area with a speed limit of 45 miles per hour, which is reduced to 35 miles per hour in the vicinity of the Olowalu General Store.

The parking lot shared by the Olowalu General Store and Chez Paul restaurant is paved and accessed by two driveways on Honoapiʻiani Highway. The north driveway forms a four-legged (cross) intersection with Honoapiʻiani Highway and a driveway for Pioneer Mill residences on the makai side of the highway. Separate left turn lanes are provided for the northbound and southbound directions of Honoapiʻiani Highway at this intersection. Guardrails front large trees on both sides of the highway at this



intersection. Several of the large trees were noted to restrict sight distance for motorists exiting the parking lot on the mauka side of the highway. In order to obtain a better or longer sight distance before entering the highway, it appears that many motorists were using an open, gravelly area to enter Honoapiʻiani Highway; the gravelly area is contiguous to the Olowalu paved parking lot and is situated to the north of the parking lot's north driveway.

The south driveway at the Olowalu General Store/Chez Paul restaurant parking lot is an unpermitted access utilized by many large, northbound trucks. The south driveway forms an unsignalized T-intersection with Honoapiʻiani Highway. The Honoapiʻiani Highway northbound left turn storage lane/taper for the intersection with the Pioneer Mill residences/north parking lot driveways extends past the south parking lot driveway. None of the southbound highway traffic entered at the south driveway during the period when manual traffic counts were being taken.

The Olowalu General Store serves as a convenience stop, where motorists stop for morning coffee break and/or to pick-up a bento for lunch. During the weekdays, the Olowalu General Store is open from 6:00 AM to 6:30 PM. The Chez Paul restaurant serves only dinner and is officially opened at 6:30 PM. A structure is situated on the south side of the restaurant; however, the structure appears to be vacant and none of the motorists utilizing the parking lot were observed to enter or exit the structure.

A private road is situated on the mauka side of the highway; this private road parallels the highway and serves as an access road for Pioneer Mill property/cane land. Private homes are located mauka of the store and these residents also utilize the Olowalu General Store/Chez Paul restaurant driveways to access Honoapiʻiani Highway.

#### B. Existing Traffic Operations

The speed limit on the highway is 45 miles per hour on either side of the Olowalu General Store and is reduced to 35 miles per hour in the vicinity of the store. The afternoon peak period of traffic conditions are noticeably busier than the morning peak period of traffic. Motorists entering the highway experienced varying lengths of delays; some motorists waited for a few seconds while others waited for over a minute for suitable gaps in the highway traffic.

#### 1. Existing Traffic Volumes

Twenty-four hour machine counts were taken during February 2-3, 1999 on Honoapiʻiani Highway between the two driveways to the Olowalu General Store/Chez Paul restaurant parking lot. Manual counts of driveway volumes were also taken during portions of the morning and afternoon peak periods of traffic. The existing traffic volumes for the morning and afternoon peak hours of traffic are shown in Figure 4.

#### 2. Technical Analysis

The existing traffic volumes were analyzed by the methodology described in the 1984 Highway Capacity Manual for two-lane highways and for unsignalized intersections. Level of service (LOS) is a qualitative measure used to describe the condition of traffic flow, ranging from free flow conditions at LOS A to congested conditions at LOS F. The volume-to-capacity (v/c) ratio serves as an indicator of the utilization of the available capacity of a roadway facility. Detailed descriptions of Levels of Service for two-lane highways and unsignalized intersections are contained in Appendix B.

The results of the two-lane highway analyses show that the existing v/c ratio for Honoapiʻiani Highway is presently at 0.63 during the morning peak hour of traffic and at 0.78 during the afternoon peak hour of traffic, indicating the highway operates at LOS E for both peak hours of traffic.

The overall operations at the intersection of Honoapiʻiani Highway and the north driveway of the Olowalu General Store/Chez Paul restaurant parking lot are currently at LOS A. The left turn movements from Honoapiʻiani Highway into the north parking lot driveway operate at LOS B during the morning and afternoon peak hours of traffic. The left turn movements into the maʻka driveway (Pioneer Mill residences) operate at LOS A and LOS B during the morning and afternoon peak hours of traffic, respectively. The traffic exiting at the north parking lot driveway and the maʻka driveway (from the Pioneer Mill residences) both experience LOS C conditions during the morning peak period of traffic. The operating conditions for maʻka driveway drops to LOS E during the afternoon peak hour of traffic, but the north parking lot driveway remains at LOS C.

Field observations noted a wide range in the variation of the delays experienced by traffic entering or exiting the Olowalu General Store parking lot or the driveway to private homes on the makai side of the highway. A few motorists could enter or exit the parking lot with little or no delay (LOS A), while other motorists waited over a minute (LOS F) for a suitable gap in highway traffic to execute their turning movements.

### III. FUTURE BASE YEAR 2005 CONDITIONS WITHOUT THE PROJECT

The Year 2005 was selected for future baseline traffic conditions. While completion of construction and occupancy of the homes would be undertaken by the individual buyers, estimates are that most of the buyers are expected to occupy their homes by the Year 2005.

#### A. Background Traffic Growth

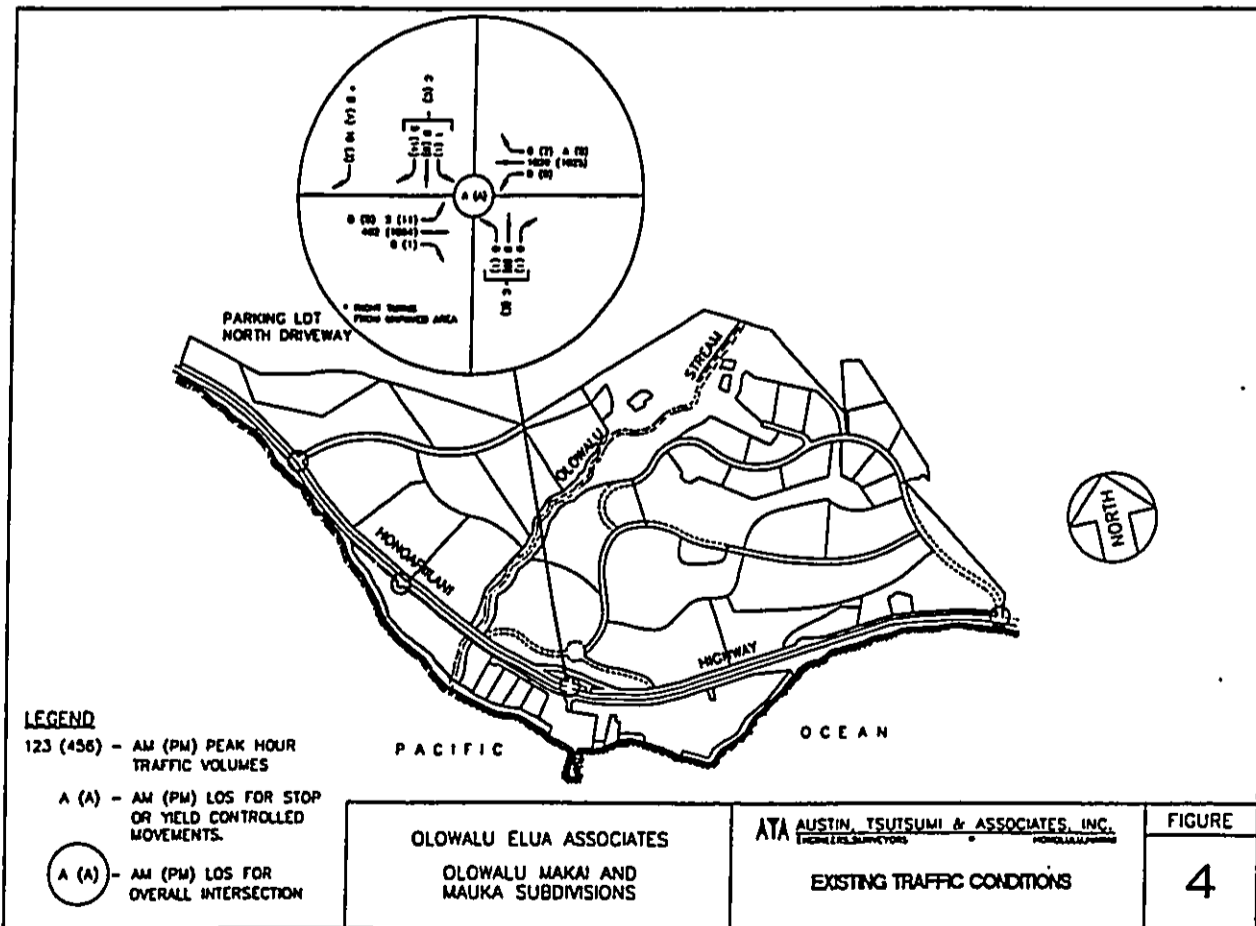
Future traffic volumes in the vicinity of the project are expected to increase due to changes in delicto growth on Maui. A growth factor of 2.1 percent per year was derived through review of historical State DOT traffic counts on Honoapiʻiani Highway in the Olowalu area, and forecasts of traffic volumes in the 1997 Maui Long-Range Land Transportation Plan (MLRTP) report. The growth factor was applied to the existing traffic volumes to estimate future base traffic volumes in Year 2005.

#### B. Future Base Volumes and Level of Service Analysis

The future base traffic volumes without the project are shown in Figure 5. The level of service analyses for unsignalized intersections and two-lane highways were applied to the projected volumes and are summarized below.

With the projected increases in traffic volumes, the two-lane highway analysis shows Honoapiʻiani Highway would have a v/c ratio of 0.71 in the morning peak hour of traffic, or LOS E. During the afternoon peak hour of traffic, the v/c ratio would be at 0.88, or operating conditions at LOS E.

For the Honoapiʻiani Highway intersection with the Olowalu General Store north parking lot driveway, the overall intersection operating conditions are expected to be at LOS A. The Honoapiʻiani Highway left turn movements into the north parking lot driveway would be at LOS B during the morning and afternoon peak hours of



traffic. The left turn movements into the Pioneer Mill residences makai driveway would operate at LOS A during the morning peak hour of traffic and at LOS B during the afternoon peak hour of traffic. The traffic exiting from the makai driveway (Pioneer Mill residences) would be expected to experience longer delays at LOS D during the morning peak hour of traffic and at LOS F during the afternoon peak hour of traffic. Traffic exiting from the north driveway of the parking lot would operate at LOS C conditions during the morning and afternoon peak hours of traffic. The traffic volumes at the north driveway of the Olowalu General Store parking lot do not meet the warrants for traffic signals.

IV. PROJECT-GENERATED TRAFFIC VOLUMES

The development of the project traffic is undertaken in three sequential steps: trip generation, trip distribution and traffic assignment. Trip generation identifies the project-generated traffic volumes and trip distribution determines the direction of travel (or origin and destination) for the project traffic. Traffic assignment designates the roadways which would be utilized by the project traffic. Each of these steps is explained in further detail in the following sections.

A. Trip Generation

Trip generation quantifies the number of trips that would enter and exit the project site. The vehicular trips are directly related to project land uses. The Institute of Transportation Engineers has compiled trip generation data collected across the nation and established direct correlation between vehicle trip rates and various types of land uses. The trip generation rates for the project were based on trip rates compiled by the Institute of Transportation Engineers in a report entitled, *Trip Generation*, 6th Edition, and are shown in Table 1. The project traffic volumes are quantified in Table 2.

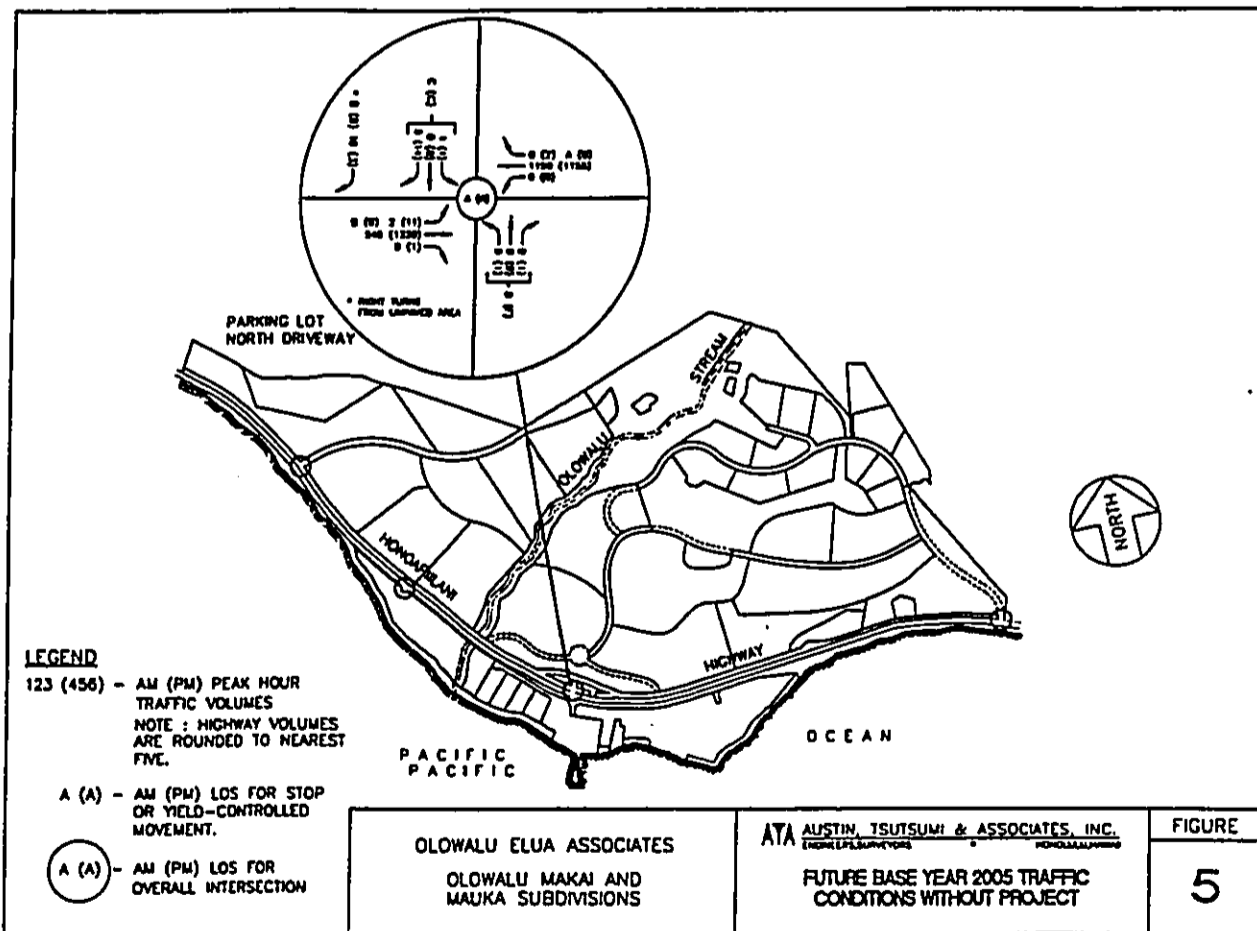


Table 1  
 TRIP GENERATION RATES

Land Use Parameter	Single Family Dwelling Unit		Recreational Homes Dwelling Unit	
	Daily	Dwelling Unit	Daily	Dwelling Unit
Daily	9.55		3.16	
AM Peak Hour				
Enter	0.19		0.11	
Exit	0.55		0.05	
PM Peak Hour				
Enter	0.65		0.11	
Exit	0.36		0.15	

B. Trip Distribution

Trip distribution determines the direction of travel (or origins and destinations) of the project-generated trips. The trip distribution was derived from review of existing and projected population and employment data in the MLRLTP, historical traffic counts collected by the State DOT, and consideration of the travel time or proximity to nearby land uses. Although the MLRLTP indicates that 75-80 percent of the population and employment would be expected to be located south of the Okowalu area, most residents would probably prefer to travel to the Lahaina area for employment or shopping since it is closer than Waiuku/Kahului or Kihei.

The traffic entering or exiting the project subdivisions would travel in two primary directions: north or south. For the project trip distribution, the project traffic was distributed equally between the two directions, or 50% northbound and 50% southbound.

C. Traffic Assignment

The traffic assignment determines the routes travelled and the driveways utilized by the project traffic. The project traffic is assigned onto Honouliuli Highway since it is the only route which connects Okowalu to the rest of the island. The Makai Subdivision traffic will utilize Driveways B and C. Although the traffic generated by the Mauka Subdivision could utilize the Okowalu Store/Chez Paul parking lot driveways, the Mauka Subdivision traffic was assigned to Driveways A and Driveways D as these driveways provide more direct connections to the highway. Also, since there are no changes planned for Camp Pecusa, none of the project traffic was assigned to its driveway. The project traffic assignment is provided in Figure 6.

V. FUTURE YEAR 2005 CONDITIONS WITH THE PROJECT

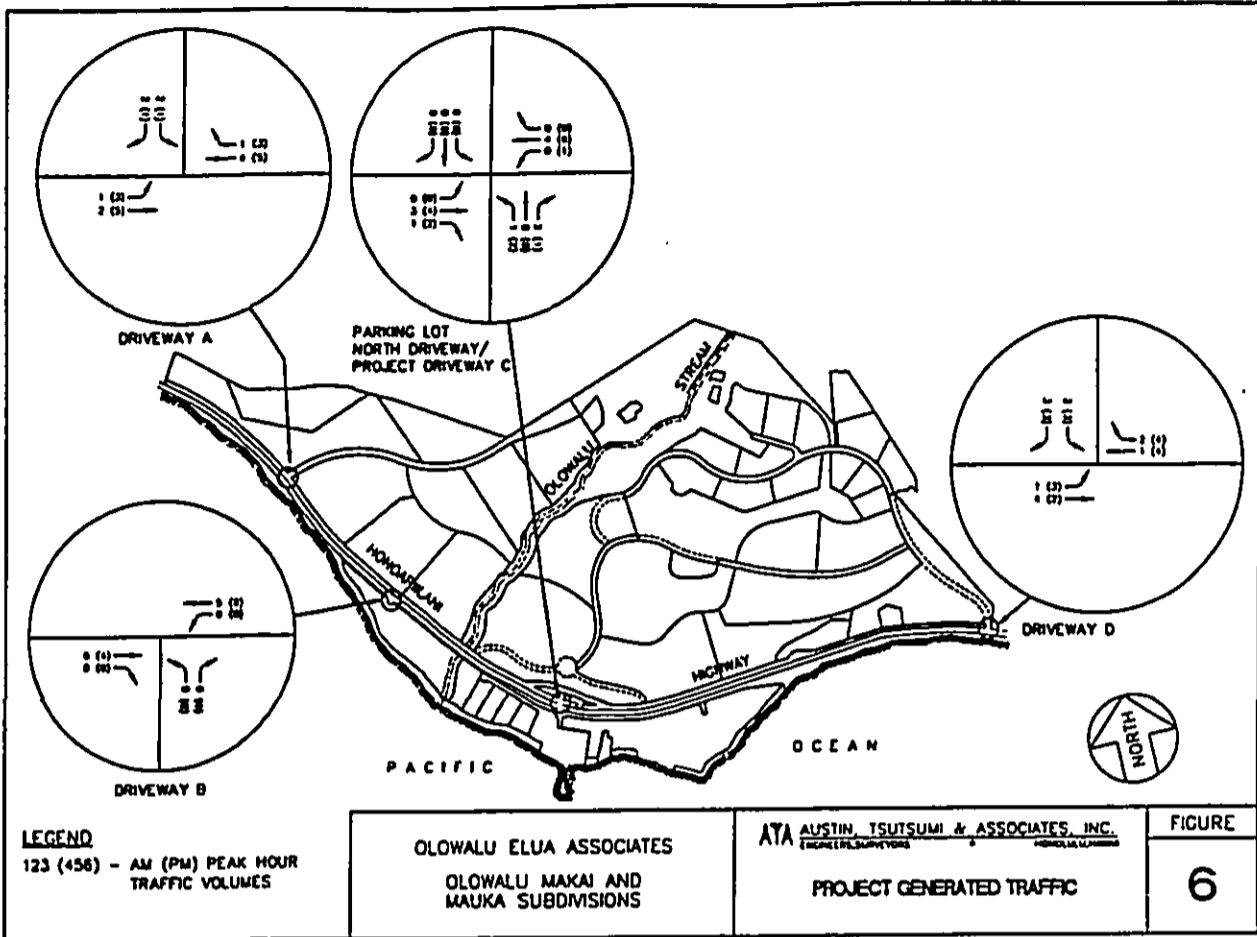
The future traffic conditions with project-generated traffic are derived by adding the project-generated traffic volumes to the Year 2005 baseline traffic volumes.

A. Future Traffic Volumes with Project-Generated Traffic

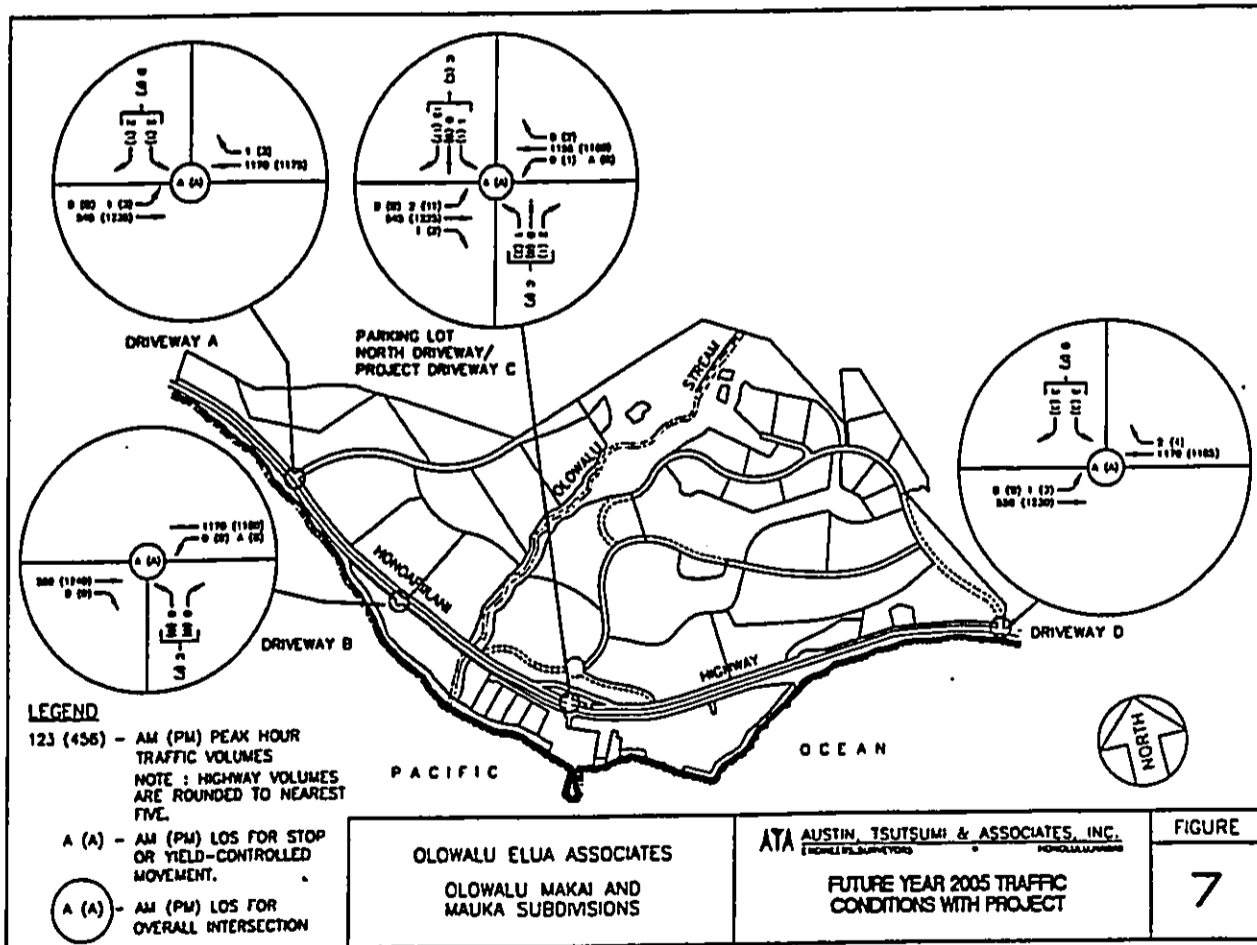
The future traffic assignment with the project-generated traffic is shown in Figure 7. The analysis results are described in the following pages.

Table 2  
 PROJECT-GENERATED TRIPS

Makai Subdivision	Daily	AM Peak Hour		PM Peak Hour	
		Enter	Exit	Enter	Exit
5 Single Family Dwelling Units	28	1	3	3	2
4 Recreational Dwelling Units	12	0	0	0	1
Subtotal	60	1	3	3	3
Mauka Subdivision					
17 Single Family Dwelling Units	162	3	9	11	6
17 Recreational Dwelling Units	54	2	1	2	2
Subtotal	216	5	10	13	8
Total	276	8	13	16	11



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**B. Analysis Results**

The future traffic volumes with the project traffic were analyzed by the 1994 HCM two-lane highway methodology and also by the unsignalized intersection methodology for the four Honoapiʻiani Highway intersections in this study.

During the morning peak hour of traffic, Honoapiʻiani Highway in the vicinity of the project would operate at a v/c ratio of 0.72 and LOS E. During the afternoon peak hour of traffic, Honoapiʻiani Highway, in the vicinity of the project, would operate at a v/c ratio of 0.89 and LOS E.

The intersection analyses show that the four intersections in this study would be expected to operate with overall traffic conditions at LOS A. The left turns into parking lot and project driveways would be at LOS B during the morning and afternoon peak hours of traffic, except for the left turn movements into Project Driveway B and Project Driveway C (former Pioneer Mill residences) which would be at LOS A during the morning peak hour of traffic.

The motorists exiting from the north parking lot driveway would operate at LOS C during the morning and afternoon peak hours of traffic. The motorists exiting at Project Driveway C would be expected to experience LOS C during the morning peak hour of traffic and LOS F during the afternoon peak hour of traffic.

Traffic exiting from Project Driveway A and Project Driveway D would operate at LOS D and LOS F during the morning and afternoon peak hours of traffic, respectively. Traffic exiting at Project Driveway B would experience LOS C during the morning peak hour of traffic and at LOS F during the afternoon peak hour of traffic.

The traffic volumes at the project driveways do not meet the warrants for traffic signals. The net change in the Honoapiʻiani Highway v/c ratios due to the project traffic results in an increase of only 0.01 for the morning and afternoon peak hours of traffic.

**C. Warrants for Left-Turn Storage Bay**

Traffic volume warrants were developed by M.D. Hamelink to assess the need for separate left-turn lanes at unsignalized intersections. The future traffic volumes at each of the project driveways meet these volume warrants. Left-turn bays should be provided at each of the project driveways so left-turning movements do not hinder through traffic on Honoapiʻiani Highway. The left-turn bays at Driveways A, C and D should have a storage length for at least two vehicles; the left-turn bay at Driveway B should have sufficient storage length for at least one vehicle.

**D. MLRLTP Considerations**

The MLRLTP, which evaluated long-term regional traffic growth on the island of Maui, recommends the widening of Honoapiʻiani Highway from two to four lanes from Lahaina to the Olowalu area between the Years 2006-2020. Since the proposed Olowalu Subdivisions will be developed on both sides of Honoapiʻiani Highway, the planning of these subdivisions should incorporate the provision for the future widening of Honoapiʻiani Highway.

**VI. SUMMARY OF FINDINGS AND RECOMMENDATIONS**

This section summarizes the findings and recommendations of this traffic impact analysis report for the Olowalu Makai and Mauka subdivisions. The analysis results are presented in Tables 3 and 4 for two-lane highway and unsignalized intersections, respectively.

Table 3  
TWO-LANE HIGHWAY  
ANALYSIS RESULTS

	AM Peak Hour		PM Peak Hour	
	v/c Ratio	Level of Service	v/c Ratio	Level of Service
Existing Conditions	0.63	E	0.78	E
Future Base Conditions without Project	0.71	E	0.88	E
Future Traffic Conditions with Project	0.72	E	0.89	E

A. Findings

1. Existing Conditions

Traffic on Honoapiʻiani Highway operates at LOS E with v/c ratios of 0.63 and 0.78 during the morning and afternoon peak hours of traffic, respectively.

Overall, the intersection of the Okowalu General Store north driveway and Honoapiʻiani Highway is at LOS A. The northbound left turn movements are at LOS A during the morning peak hour of traffic and at LOS B during the afternoon peak hour of traffic. The southbound left turn movements are at LOS B during the morning and afternoon peak hours of traffic. The traffic exiting from the north parking lot driveway is at LOS C during the morning and afternoon peak hours of traffic. The traffic exiting from the makai driveway (Pioneer Mill residences) is at LOS C during the morning peak hour of traffic and at LOS E during the afternoon peak hour of traffic.

2. Future Base Year 2005 Traffic Conditions Without Project Traffic

Traffic on Honoapiʻiani Highway would operate at LOS E at a v/c ratio of 0.71 during the morning peak hour of traffic, and at LOS E at a v/c ratio of 0.88 during the afternoon peak hour of traffic.

The overall traffic conditions at the Okowalu General Store north driveway would be at LOS A. The southbound left turn movement into this driveway would operate at LOS B during both peak hours of traffic. The northbound left turn movement into the makai driveway (Pioneer Mill residences) would operate at LOS A during the morning peak hour of traffic and at LOS B during the afternoon peak hour of traffic. The traffic exiting from the north parking lot driveway would be at LOS C during the morning and afternoon peak hours of traffic. Traffic exiting at the makai driveway for the Pioneer Mill residences would be expected to experience longer delays at LOS D during the morning peak hour of traffic and at LOS F during the afternoon peak hour of traffic. The traffic volumes exiting the north parking lot driveway do not meet the warrants for traffic signals.

Table 4  
UNIGNALIZED INTERSECTION  
ANALYSIS RESULTS

	EXISTING CONDITIONS				FUTURE BASE CONDITIONS WITHOUT PROJECT				FUTURE CONDITIONS WITH PROJECT			
	AM Peak Hour Delay (Seconds)	Level of Service	PM Peak Hour Delay (Seconds)	Level of Service	AM Peak Hour Delay (Seconds)	Level of Service	PM Peak Hour Delay (Seconds)	Level of Service	AM Peak Hour Delay (Seconds)	Level of Service	PM Peak Hour Delay (Seconds)	Level of Service
<b>Honoapiʻiani Highway Intersection</b>												
Okowalu Store - North Driveway (and Project Driveway C)												
Northbound Left Turn	3.8	A	6.9	B	3.8	A	6.9	B	3.8	A	6.1	B
Southbound Left Turn	8.8	B	8.8	B	7.4	B	7.7	B	7.9	B	7.7	B
Pioneer Mill Residences / Driveway C	17.8	C	38.7	E	22.3	D	34.2	F	18.1	C	34.3	F
North Parking Lot Driveway	10.8	C	14.8	C	12.8	C	18.0	C	12.8	C	18.2	C
Overall Intersection	6.2	A	6.2	A	6.2	A	6.2	A	6.2	A	6.3	A
<b>Project Driveway A</b>												
Southbound Left Turn	-	-	-	-	-	-	-	-	7.8	B	7.7	B
Makai Driveway A	-	-	-	-	-	-	-	-	22.8	D	48.8	F
Overall Intersection	-	-	-	-	-	-	-	-	0.1	A	0.1	A
<b>Project Driveway B</b>												
Northbound Left Turn	-	-	-	-	-	-	-	-	3.8	A	8.2	B
Makai Driveway B	-	-	-	-	-	-	-	-	18.4	C	48.8	F
Overall Intersection	-	-	-	-	-	-	-	-	0.0	A	0.0	A
<b>Project Driveway D</b>												
Southbound Left Turn	-	-	-	-	-	-	-	-	7.8	B	7.8	B
Makai Driveway D	-	-	-	-	-	-	-	-	22.8	D	51.3	F
Overall Intersection	-	-	-	-	-	-	-	-	0.1	A	0.2	A



### 3. Future Year 2005 Traffic Conditions with Project-Generated Traffic

The Makai Subdivision would generate 4 vehicular trips during the morning peak hour of traffic and 6 vehicular trips during the afternoon peak hour of traffic. The Mauka Subdivision would generate 15 vehicular trips and 21 vehicular trips during the morning and afternoon peak hours of traffic, respectively.

For the two-lane highway analysis, the results would be similar to future base traffic conditions without the project. The Honoapiʻilani Highway traffic would operate with a v/c ratio of 0.72 at LOS E during the morning peak hour of traffic and a v/c ratio of 0.89 at LOS E during the afternoon peak hour of traffic.

The results for the four intersections in this study would be similar to the future base conditions without the project at the Olowalu General Store north driveway intersection. The overall intersection operations at the four intersections are expected to remain at LOS A. The Honoapiʻilani Highway left turn movements into the north parking lot driveway and the project driveways would be at LOS B, except for the left turn movements into Project Driveway B and Project Driveway C (former Pioneer Mill residences) which would be at LOS A during the morning peak hour of traffic. Traffic exiting the north parking lot driveway would operate at LOS C during the morning peak hour and afternoon peak hours of traffic. Traffic exiting from the Driveway C and from Driveway B would be at LOS C during the morning peak hour of traffic and LOS F during the afternoon peak hour of traffic. The traffic exiting at Driveway A and at Driveway D would experience longer delays at LOS D and LOS F during the morning and afternoon peak hours of traffic, respectively. The traffic volumes at the Honoapiʻilani Highway intersections with parking lot and project driveways do not meet the warrants for traffic signals. In the MLRLTP, the widening of Honoapiʻilani Highway is recommended for the time period between Year 2006 and Year 2020.

#### B. Recommendations

The following roadway improvements are recommended to accommodate the traffic generated by the proposed Olowalu Makai and Mauka Subdivisions:

- For Driveways A, C and D, left turn bays and deceleration and acceleration lanes for right turn movements into and out the project driveways should be provided at these project driveways so project traffic turning into and out of the project driveways does not delay motorists in the through lanes. The storage length of

the left turn bays should be adequate to accommodate at least two vehicles, exclusive of taper. For the Honoapiʻilani Highway T-intersections with Driveways A and D, a refuge lane in the median should be provided. Left turn movements from the project driveways onto Honoapiʻilani Highway would use the refuge lane as a shelter or to accelerate to merge with through traffic; the refuge lane would allow the left-turning movement to be executed in two steps and reduce delays for the project traffic.

- For Driveway B, a left turn bay with storage length for a single vehicle should be provided. Deceleration and acceleration lanes are not recommended for this single lot driveway.

The recommendations, described below, would allow Honoapiʻilani Highway to be improved to serve the future growth in regional highway traffic volumes expected beyond Year 2005:

- Adequate right-of-way should be reserved along the Honoapiʻilani Highway corridor to allow for the future widening of Honoapiʻilani Highway from Lahaina to Olowalu, as identified in the MLRLTP. The widening of Honoapiʻilani Highway would be needed for the future conditions with or without the proposed Olowalu Makai and Mauka Subdivisions. The MLRLTP indicates that the widening would be required between Year 2006 and Year 2020.



**APPENDIX A**  
**EXISTING TRAFFIC COUNT DATA**

AUSTIN, TSUTSUMI & ASSOCIATES, INC.  
 Oahu Traffic Count Data

JANUS FILE: HONORARY4  
 Site Code: D4  
 Start Date: 2/02/99  
 Start Time: 12:35 PM  
 Senior Layout: 11  
 LOCATION: HONOAPILANI HIGHWAY  
 AREA: OLOWALLU

Date	Start Time	NB	SB	Total Volume	
				15 Min	Hour
2/2/99	12:00 PM	*	*	*	*
2/2/99	12:15 PM	*	*	*	*
2/2/99	12:30 PM	*	*	*	*
2/2/99	12:45 PM	*	*	*	*
2/2/99	1:00 PM	*	*	*	*
2/2/99	1:15 PM	197	186	383	
2/2/99	1:30 PM	252	199	451	
2/2/99	1:45 PM	251	191	442	
2/2/99	2:00 PM	250	212	462	1814
2/2/99	2:15 PM	222	222	444	
2/2/99	2:30 PM	246	260	506	
2/2/99	2:45 PM	281	219	500	
2/2/99	3:00 PM	226	236	464	2033
2/2/99	3:15 PM	288	242	530	
2/2/99	3:30 PM	270	255	525	
2/2/99	3:45 PM	262	252	514	
2/2/99	4:00 PM	259	252	511	2113
2/2/99	4:15 PM	268	288	556	
2/2/99	4:30 PM	256	274	530	
2/2/99	4:45 PM	244	272	516	
2/2/99	5:00 PM	220	238	458	1784
2/2/99	5:15 PM	218	260	478	
2/2/99	5:30 PM	210	259	469	
2/2/99	5:45 PM	166	193	361	
2/2/99	6:00 PM	209	190	398	
2/2/99	6:15 PM	188	168	356	
2/2/99	6:30 PM	156	160	316	
2/2/99	6:45 PM	134	142	276	
2/2/99	7:00 PM	105	112	217	815
2/2/99	7:15 PM	100	92	192	
2/2/99	7:30 PM	104	100	204	
2/2/99	7:45 PM	106	96	202	
2/2/99	8:00 PM	122	100	222	829
2/2/99	8:15 PM	91	104	195	
2/2/99	8:30 PM	99	110	209	
2/2/99	8:45 PM	77	126	203	
2/2/99	9:00 PM	73	106	179	649
2/2/99	9:15 PM	66	92	158	
2/2/99	9:30 PM	66	104	170	
2/2/99	9:45 PM	56	84	142	
2/2/99	10:00 PM	36	106	144	552
2/2/99	10:15 PM	61	87	148	
2/2/99	10:30 PM	51	64	115	
2/2/99	10:45 PM	39	76	115	
2/2/99	11:00 PM	30	52	82	329
2/2/99	11:15 PM	28	82	110	
2/2/99	11:30 AM	22	47	69	
2/2/99	11:45 AM	19	48	68	



**LEVEL OF SERVICE DEFINITIONS**

1. **LEVELS OF SERVICE CRITERIA FOR TWO-LANE HIGHWAYS**  
 The highest quality of traffic service occurs when motorists are able to drive at their desired speed, representative of Level of Service A. Almost no platoons of three or more vehicles are observed. Drivers would be delayed no more than 30 percent of the time by slow-moving vehicles. A maximum flow rate of 420 pcph, total in both directions, may be achieved under ideal conditions.  
 Level of Service B characterizes the region of traffic flow where drivers are delayed up to 45 percent of the time on the average. Service flow rates of 750 pcph, total in both directions, can be achieved under ideal conditions. Above this flow rate, the number of platoons forming in the traffic stream begins to increase dramatically.  
 Further increases in flow characterize Level of Service C, resulting in noticeable increases in platoon formation, platoon size, and frequency of passing impediment. At high volume levels, chaining of platoons and significant reductions in passing capacity begin to occur. While traffic flow is stable, it is becoming susceptible to congestion due to turning traffic and slow-moving vehicles. Percent time delays are up to 60 percent. A service flow rate of up to 1,200 pcph, total in both directions, can be accommodated under ideal conditions.  
 Unstable traffic flow is approached as traffic flows enter Level of Service D. The two opposing traffic streams essentially begin to operate separately at higher volume levels. Mean platoon sizes of 5 to 10 vehicles are common, although speeds of 50 mph can still be maintained under ideal conditions. The fraction of no passing zones along the roadway section usually has little influence on passing. Turning vehicles and/or roadside distractions cause major shockwaves in the traffic stream. The percentage of time motorists are delayed approaches 75 percent. Maximum service flow rates of 1,800 pcph, total in both directions, can be maintained under ideal conditions. This is the highest flow rate that can be maintained for any length of time over an extended section of level terrain without a high probability of breakdown.  
 Level of Service E is defined as traffic flow conditions on two-lane highways having a percent time delay of greater than 75 percent. Passing is virtually impossible under Level of Service E conditions, and platooning becomes intense when slower vehicles or other interruptions are encountered.  
 The highest volume attainable under Level of Service E defines the capacity of the highway. Under ideal conditions, capacity is 2,800 pcph, total in both directions. Operating conditions at capacity are unstable and difficult to predict. Traffic operations are seldom observed near capacity on rural highways, primarily because of a lack of demand.  
 As with other highway types, Level of Service F represents heavily congested flow with traffic demand exceeding capacity. Volumes are lower than capacity. Level of Service E is seldom attained over extended sections on level terrain as more than a transient condition; most often, perturbations in traffic flow as Level E is approached cause a rapid transition to Level of Service F.

2. **LEVEL OF SERVICE CRITERIA FOR UNSIGNALIZED INTERSECTIONS (HCM 1994)**  
 The level of service criteria for unsignalized intersections is defined as the average total delay, in seconds per vehicle. As used here, total delay is defined as the total elapsed time from when a vehicle stops at the end of the queue until the vehicle departs from the stop line, this time includes the time required for the vehicle to travel from the last-in-queue position to the first-in-queue position.

While the criteria for level of service for two-way stop-controlled (TWSC) and all-way stop-controlled (AWSC) intersections are the same, procedures to calculate the average total delay may differ.

Level of Service	Average Total Delay (sec/veh)
A	< 5
B	>5 and < 10
C	>10 and < 20
D	>20 and < 30
E	>30 and < 45
F	> 45

Level of Service Criteria  
for TWSC Intersections

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**APPENDIX C**  
LEVEL OF SERVICE CALCULATIONS  
• Existing Conditions

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**APPENDIX C**  
LEVEL OF SERVICE CALCULATIONS

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0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100

1985 HCM:TWO-LANE HIGHWAYS

FACILITY LOCATION..... Honospillani Hwy North of Olowalu Store  
 ANALYST..... JAI  
 TIME OF ANALYSIS..... AM Existing  
 DATE OF ANALYSIS..... 03-31-1999  
 OTHER INFORMATION.....

A) ADJUSTMENT FACTORS

PERCENTAGE OF TRUCKS..... 5.3  
 PERCENTAGE OF BUSES..... 0  
 PERCENTAGE OF RECREATIONAL VEHICLES..... 0  
 DESIGN SPEED (MPH)..... 50  
 PEAK HOUR FACTOR..... 1  
 DIRECTIONAL DISTRIBUTION (UP/DOWN)..... 68 / 32  
 LANE WIDTH (FT)..... 12  
 USABLE SHOULDER WIDTH (AVG. WIDTH IN FT.)..... 6  
 PERCENT NO PASSING ZONES..... 60

B) CORRECTION FACTORS

LEVEL TERRAIN

LOS	E	E	E	E	E	f	f	f	HV
	T	B	R	w	d	w	d	w	
A	2	1.8	2.2	1	.9	1	.9	1	.95
B	2.2	2	2.5	1	.9	1	.9	1	.94
C	2.2	2	2.5	1	.9	1	.9	1	.94
D	2	1.6	1.6	1	.9	1	.9	1	.95
E	2	1.6	1.6	1	.9	1	.9	1	.95

C) LEVEL OF SERVICE RESULTS

INPUT VOLUME (vph): 1519  
 ACTUAL FLOW RATE: 1519

LOS	FLOW RATE	V/C
A	168	.07
B	450	.19
C	806	.34
D	1412	.59
E	2393	1

LOS FOR GIVEN CONDITIONS: E

1985 HCM:TWO-LANE HIGHWAYS

FACILITY LOCATION..... Honospillani Hwy North of Olowalu Store  
 ANALYST..... JAI  
 TIME OF ANALYSIS..... PM EXISTING  
 DATE OF ANALYSIS..... 03-31-1999  
 OTHER INFORMATION.....

A) ADJUSTMENT FACTORS

PERCENTAGE OF TRUCKS..... 2.1  
 PERCENTAGE OF BUSES..... 0  
 PERCENTAGE OF RECREATIONAL VEHICLES..... 0  
 DESIGN SPEED (MPH)..... 50  
 PEAK HOUR FACTOR..... 1  
 DIRECTIONAL DISTRIBUTION (UP/DOWN)..... 49 / 51  
 LANE WIDTH (FT)..... 12  
 USABLE SHOULDER WIDTH (AVG. WIDTH IN FT.)..... 6  
 PERCENT NO PASSING ZONES..... 60

B) CORRECTION FACTORS

LEVEL TERRAIN

LOS	E	E	E	E	E	f	f	f	HV
	T	B	R	w	d	w	d	w	
A	2	1.8	2.2	1	.99	1	.99	1	.98
B	2.2	2	2.5	1	.99	1	.99	1	.98
C	2.2	2	2.5	1	.99	1	.99	1	.98
D	2	1.6	1.6	1	.99	1	.99	1	.98
E	2	1.6	1.6	1	.99	1	.99	1	.98

C) LEVEL OF SERVICE RESULTS

INPUT VOLUME (vph): 2139  
 ACTUAL FLOW RATE: 2139

LOS	FLOW RATE	V/C
A	191	.07
B	516	.19
C	923	.34
D	1608	.59
E	2726	1

LOS FOR GIVEN CONDITIONS: E



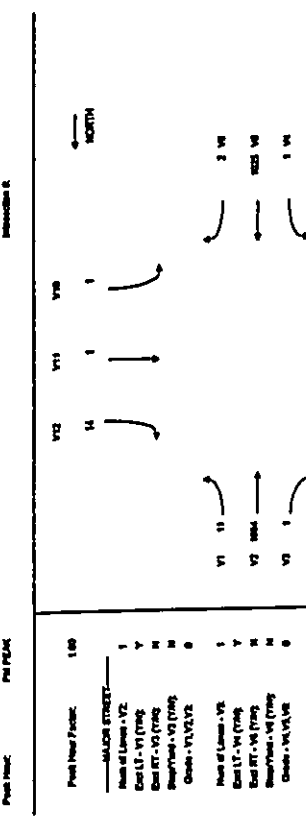


Major Street: KOKONUKULANI HWY  
 Minor Street: NORTH DRIVEWAY  
 Analysis: 31-Aug-88  
 Date: 31-Aug-88  
 Project No.: 0  
 Designer: [Signature]

Major Street: KOKONUKULANI HWY  
 Minor Street: NORTH DRIVEWAY  
 Analysis: 31-Aug-88  
 Date: 31-Aug-88  
 Project No.: 0  
 Designer: [Signature]

**STEP 1 - VOLUME AND PEAK PERCENT**

Direction	Volume	Peak %
Major Street - NB	100	100
Major Street - SB	100	100
Major Street - WB	100	100
Major Street - EB	100	100



**STEP 2 - LANE VOLUMES**

Direction	Through	Left	Right	Total
Major Street - NB	100	0	0	100
Major Street - SB	100	0	0	100
Major Street - WB	100	0	0	100
Major Street - EB	100	0	0	100

**STEP 3 - LANE VOLUMES**

Direction	Through	Left	Right	Total
Major Street - NB	100	0	0	100
Major Street - SB	100	0	0	100
Major Street - WB	100	0	0	100
Major Street - EB	100	0	0	100

**STEP 4 - SERVICE LEVEL**

Direction	Level of Service
Major Street - NB	A
Major Street - SB	A
Major Street - WB	A
Major Street - EB	A

**STEP 5 - SERVICE LEVEL**

Direction	Level of Service
Major Street - NB	A
Major Street - SB	A
Major Street - WB	A
Major Street - EB	A

**APPENDIX C**

**LEVEL OF SERVICE CALCULATIONS**

- Future Base Year 2005 Without Project Conditions

1985 HCM: TWO-LANE HIGHWAYS  
 \*\*\*\*\*  
 FACILITY LOCATION..... Honospillani Hwy North of Olowalu Store  
 ANALYST..... JAI  
 TIME OF ANALYSIS..... AM FUTURE W/O PROJ  
 DATE OF ANALYSIS..... 03-31-1999  
 OTHER INFORMATION.....

A) ADJUSTMENT FACTORS

PERCENTAGE OF TRUCKS..... 5.3  
 PERCENTAGE OF BUSES..... 0  
 PERCENTAGE OF RECREATIONAL VEHICLES..... 0  
 DESIGN SPEED (MPH)..... 50  
 PEAK HOUR FACTOR..... 1  
 DIRECTIONAL DISTRIBUTION (UP/DOWN)..... 68 / 32  
 LANE WIDTH (FT)..... 12  
 USABLE SHOULDER WIDTH (AVG. WIDTH IN FT.)..... 6  
 PERCENT NO PASSING ZONES..... 60

B) CORRECTION FACTORS

LEVEL TERRAIN

LOS	T	E	B	R	E	W	F	HV
A	2	1.8	2.2	1	.9	.95		
B	2.2	2	2.5	1	.9	.94		
C	2.2	2	2.5	1	.9	.94		
D	2	1.6	1.6	1	.9	.95		
E	2	1.6	1.6	1	.9	.95		

C) LEVEL OF SERVICE RESULTS

INPUT VOLUME (vph): 1709  
 ACTUAL FLOW RATE: 1709

LOS	FLOW RATE	V/C
A	168	.07
B	450	.19
C	806	.34
D	1412	.59
E	2393	1

LOS FOR GIVEN CONDITIONS: E

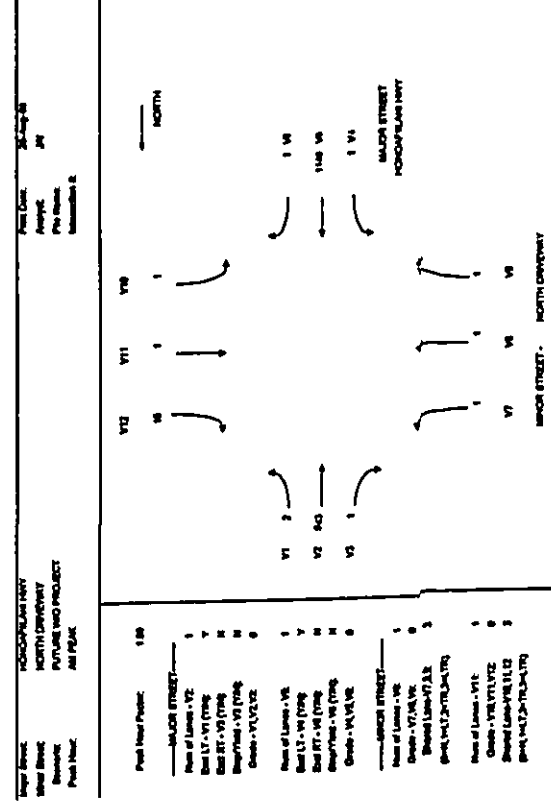
1985 HCM: TWO-LANE HIGHWAYS  
 \*\*\*\*\*  
 FACILITY LOCATION: Honoapiilani Hwy North of Olowalu Score  
 ANALYST: JAI  
 TIME OF ANALYSIS: PM FUTURE W/O PROJ  
 DATE OF ANALYSIS: 03-31-1999  
 OTHER INFORMATION: \*\*\*\*\*

A) ADJUSTMENT FACTORS  
 -----  
 PERCENTAGE OF TRUCKS..... 2.1  
 PERCENTAGE OF BUSES..... 0  
 PERCENTAGE OF RECREATIONAL VEHICLES..... 0  
 DESIGN SPEED (MPH)..... 50  
 PEAK HOUR FACTOR..... 1  
 DIRECTIONAL DISTRIBUTION (UP/DOWN)..... 49 / 51  
 LANE WIDTH (FT)..... 12  
 USABLE SHOULDER WIDTH (AVG. WIDTH IN FT.)..... 6  
 PERCENT NO PASSING ZONES..... 60

B) CORRECTION FACTORS  
 -----  
 LEVEL TERRAIN

LOS	E	T	E	B	R	E	w	d	f	HV
A	2	1.8	2.2	1	.99	.98				
B	2.2	2	2.5	1	.99	.98				
C	2.2	2	2.5	1	.99	.98				
D	2	1.6	1.6	1	.99	.98				
E	2	1.6	1.6	1	.99	.98				

C) LEVEL OF SERVICE RESULTS  
 -----  
 INPUT VOLUME (VPD): 2405  
 ACTUAL FLOW RATE: 2405  
 LOS SERVICE V/C  
 LOS FLOW RATE V/C  
 A 191 .07  
 B 516 .19  
 C 923 .34  
 D 1608 .59  
 E 2726 1  
 LOS FOR GIVEN CONDITIONS: E



APPROACH	PHASE	VEHICLE COUNT	PHASE	VEHICLE COUNT
MAJOR STREET NORTH	V1	544	V4	544
	V2	734	V5	734
	V3	734	V6	734
MAJOR STREET SOUTH	V4	544	V7	544
	V5	734	V8	734
	V6	734	V9	734
MINOR STREET EAST	V7	544	V10	544
	V8	734	V11	734
	V9	734		
MINOR STREET WEST	V10	544		
	V11	734		
	V12	734		

ATA No. TWO-WAY STOP CONTROLLED INTERSECTION LEVEL OF SERVICE ANALYSIS

Major Street: HONOLULU HWY  
 Minor Street: NORTH DREWEY  
 Scenario: FUTURE W/O PROJECT  
 Peak Hour: AM PEAK

DATE: 31-Aug-88  
 Preparer: JH  
 Revision #: 0

MOVEMENT	lanes	width	approach	signal	LOS	AVG DELAY
MAJOR LEFT TURN (L)	1	10	THRU	THRU	B	9.90
MAJOR THROUGH (T)	1	10	THRU	THRU	D	23.3
MAJOR RIGHT TURN (R)	1	7.5	THRU	THRU	D	9.90
MAJOR LEFT TURN (L)	1	10	THRU	THRU	C	9.90
MAJOR THROUGH (T)	1	10	THRU	THRU	C	13.3
MAJOR RIGHT TURN (R)	1	20	THRU	THRU	D	9.90
MAJOR LEFT (L)	2	40	THRU	THRU	A	7.1
MAJOR LEFT (L)	1	30	THRU	THRU	A	3.5
MAJOR APPROACH (T)	-	-	-	-	D	23.3
MAJOR APPROACH (T)	-	-	-	-	C	13.3
MAJOR APPROACH (R)	-	-	-	-	A	9.9
MAJOR APPROACH (L)	-	-	-	-	A	9.9
TOTAL INTERSECTION (L+T+R)	-	-	-	-	A	9.2

LEVEL OF SERVICE CRITERIA

LEVEL OF SERVICE	AVG DELAY (SECONDS)
A	< 10
B	10-15
C	15-20
D	20-25
E	25-30
F	> 30

ATA No. TWO-WAY STOP CONTROLLED INTERSECTION LEVEL OF SERVICE ANALYSIS

Major Street: HONOLULU HWY  
 Minor Street: NORTH DREWEY  
 Scenario: FUTURE W/O PROJECT  
 Peak Hour: AM PEAK

DATE: 31-Aug-88  
 Preparer: JH  
 Revision #: 0

MOVEMENT	lanes	width	approach	signal	LOS	AVG DELAY
MAJOR LEFT TURN (L)	1	10	THRU	THRU	B	9.90
MAJOR THROUGH (T)	1	10	THRU	THRU	D	23.3
MAJOR RIGHT TURN (R)	1	7.5	THRU	THRU	D	9.90
MAJOR LEFT TURN (L)	1	10	THRU	THRU	C	9.90
MAJOR THROUGH (T)	1	10	THRU	THRU	C	13.3
MAJOR RIGHT TURN (R)	1	20	THRU	THRU	D	9.90
MAJOR LEFT (L)	2	40	THRU	THRU	A	7.1
MAJOR LEFT (L)	1	30	THRU	THRU	A	3.5
MAJOR APPROACH (T)	-	-	-	-	D	23.3
MAJOR APPROACH (T)	-	-	-	-	C	13.3
MAJOR APPROACH (R)	-	-	-	-	A	9.9
MAJOR APPROACH (L)	-	-	-	-	A	9.9
TOTAL INTERSECTION (L+T+R)	-	-	-	-	A	9.2

LEVEL OF SERVICE CRITERIA

LEVEL OF SERVICE	AVG DELAY (SECONDS)
A	< 10
B	10-15
C	15-20
D	20-25
E	25-30
F	> 30

10-92 12 11 10 9 8 7 6 5 4 3 2 1



1985 HCM:TWO-LANE HIGHWAYS  
 \*\*\*\*\*  
 FACILITY LOCATION..... Honoapiilani Hwy North of Olowalu Store  
 ANALYST..... JAI  
 TIME OF ANALYSIS..... AM FUTURE WITH PROJ  
 DATE OF ANALYSIS..... 06-25-1999  
 OTHER INFORMATION.....

A) ADJUSTMENT FACTORS  
 -----  
 PERCENTAGE OF TRUCKS..... 5.3  
 PERCENTAGE OF BUSES..... 0  
 PERCENTAGE OF RECREATIONAL VEHICLES..... 0  
 DESIGN SPEED (MPH)..... 50  
 PEAK HOUR FACTOR..... 1  
 DIRECTIONAL DISTRIBUTION (UP/DOWN)..... 68 / 32  
 LANE WIDTH (FT)..... 12  
 USABLE SHOULDER WIDTH (AVG. WIDTH IN FT.)..... 6  
 PERCENT NO PASSING ZONES..... 60

B) CORRECTION FACTORS  
 -----  
 LEVEL TERRAIN

LOS	E	T	B	R	E	f	w	d	f	HV
A	2	1.8	2.2	1	1	.9				.95
B	2.2	2	2.5	1	1	.9				.94
C	2.2	2	2.5	1	1	.9				.94
D	2	1.6	1.6	1	1	.9				.95
E	2	1.6	1.6	1	1	.9				.95

C) LEVEL OF SERVICE RESULTS  
 -----  
 INPUT VOLUME (vph): 1718  
 ACTUAL FLOW RATE: 1718  
 LOS SERVICE V/C  
 A 168 .07  
 B 450 .19  
 C 806 .34  
 D 1412 .59  
 E 2393 1

LOS FOR GIVEN CONDITIONS: E

1985 HCM:TWO-LANE HIGHWAYS  
 \*\*\*\*\*  
 FACILITY LOCATION..... Honoapiilani Hwy North of Olowalu Store  
 ANALYST..... JAI  
 TIME OF ANALYSIS..... PM FUTURE WITH PROJ  
 DATE OF ANALYSIS..... 06-25-1999  
 OTHER INFORMATION.....

A) ADJUSTMENT FACTORS  
 -----  
 PERCENTAGE OF TRUCKS..... 2.1  
 PERCENTAGE OF BUSES..... 0  
 PERCENTAGE OF RECREATIONAL VEHICLES..... 0  
 DESIGN SPEED (MPH)..... 50  
 PEAK HOUR FACTOR..... 1  
 DIRECTIONAL DISTRIBUTION (UP/DOWN)..... 49 / 51  
 LANE WIDTH (FT)..... 12  
 USABLE SHOULDER WIDTH (AVG. WIDTH IN FT.)..... 6  
 PERCENT NO PASSING ZONES..... 60

B) CORRECTION FACTORS  
 -----  
 LEVEL TERRAIN

LOS	E	T	B	R	E	f	w	d	f	HV
A	2	1.8	2.2	1	1	.99				.98
B	2.2	2	2.5	1	1	.99				.98
C	2.2	2	2.5	1	1	.99				.98
D	2	1.6	1.6	1	1	.99				.98
E	2	1.6	1.6	1	1	.99				.98

C) LEVEL OF SERVICE RESULTS  
 -----  
 INPUT VOLUME (vph): 2417  
 ACTUAL FLOW RATE: 2417  
 LOS SERVICE V/C  
 A 191 .07  
 B 516 .19  
 C 923 .34  
 D 1608 .59  
 E 2726 1

LOS FOR GIVEN CONDITIONS: E







THROUWAY STOP CONTROLLED INTERSECTION LEVEL OF SERVICE ANALYSIS

ATA No. HOCOMPLAN HWY NORTH DRIVEWAY/PROJECT DRIVEWAY C DATE 31-Jan-88  
 Major Street HOCOMPLAN HWY ANALYST  
 Minor Street NORTH DRIVEWAY/PROJECT DRIVEWAY C PROBLEM  
 Scenario FUTURE W/ PROJECT (Peak Land Use) PHASE  
 Peak Hour AM PM

MOVEMENT	CHANGING PHASE	PEAK HOUR VOLUME (V)	PEAK HOUR CAPACITY (C)	PEAK HOUR DELAY (D)	LEVEL OF SERVICE
MINOR LEFT TURN (L)	1	174	174	0.00	A
MINOR THROUGH (T)	2	174	174	0.00	A
MINOR RIGHT TURN (R)	3	174	174	0.00	A
MINOR LEFT TURN (L)	4	174	174	0.00	A
MINOR THROUGH (T)	5	174	174	0.00	A
MINOR RIGHT TURN (R)	6	174	174	0.00	A
MAJOR LEFT (L)	7	174	174	0.00	A
MAJOR LEFT (L)	8	174	174	0.00	A
MAJOR APPROACH (P)	9	174	174	0.00	A
MAJOR APPROACH (P)	10	174	174	0.00	A
TOTAL INTERSECTION (1-10)		174	174	0.00	A

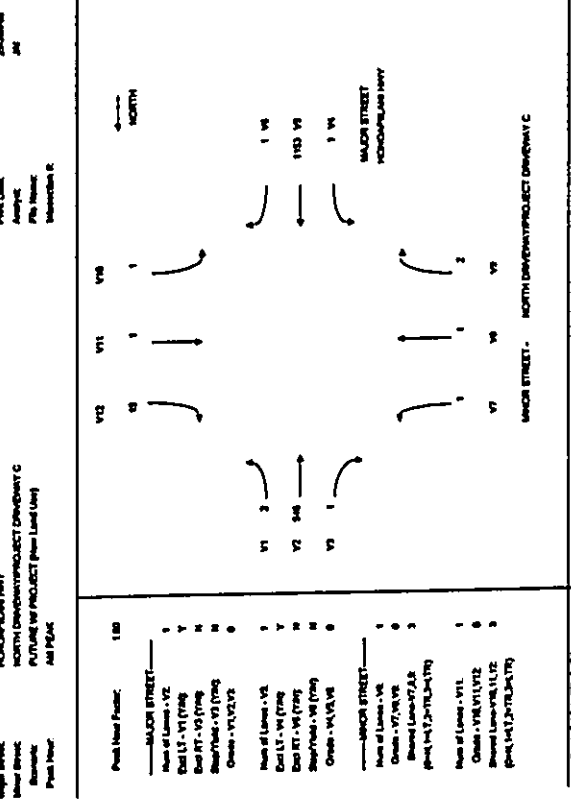
DELAY AND LEVEL OF SERVICE SUMMARY

MOVEMENT	CHANGING PHASE	PEAK HOUR VOLUME (V)	PEAK HOUR CAPACITY (C)	PEAK HOUR DELAY (D)	LEVEL OF SERVICE
MINOR LEFT TURN (L)	1	174	174	0.00	A
MINOR THROUGH (T)	2	174	174	0.00	A
MINOR RIGHT TURN (R)	3	174	174	0.00	A
MINOR LEFT TURN (L)	4	174	174	0.00	A
MINOR THROUGH (T)	5	174	174	0.00	A
MINOR RIGHT TURN (R)	6	174	174	0.00	A
MAJOR LEFT (L)	7	174	174	0.00	A
MAJOR LEFT (L)	8	174	174	0.00	A
MAJOR APPROACH (P)	9	174	174	0.00	A
MAJOR APPROACH (P)	10	174	174	0.00	A
TOTAL INTERSECTION (1-10)		174	174	0.00	A

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THROUWAY STOP CONTROLLED INTERSECTION LEVEL OF SERVICE ANALYSIS

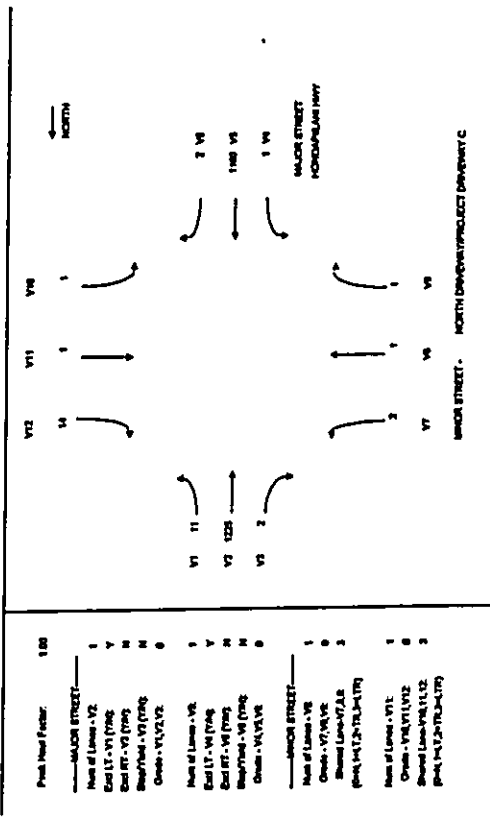
ATA No. HOCOMPLAN HWY NORTH DRIVEWAY/PROJECT DRIVEWAY C DATE 31-Jan-88  
 Major Street HOCOMPLAN HWY ANALYST  
 Minor Street NORTH DRIVEWAY/PROJECT DRIVEWAY C PROBLEM  
 Scenario FUTURE W/ PROJECT (Peak Land Use) PHASE  
 Peak Hour AM PM



MOVEMENT	CHANGING PHASE	PEAK HOUR VOLUME (V)	PEAK HOUR CAPACITY (C)	PEAK HOUR DELAY (D)	LEVEL OF SERVICE
MINOR LEFT TURN (L)	1	174	174	0.00	A
MINOR THROUGH (T)	2	174	174	0.00	A
MINOR RIGHT TURN (R)	3	174	174	0.00	A
MINOR LEFT TURN (L)	4	174	174	0.00	A
MINOR THROUGH (T)	5	174	174	0.00	A
MINOR RIGHT TURN (R)	6	174	174	0.00	A
MAJOR LEFT (L)	7	174	174	0.00	A
MAJOR LEFT (L)	8	174	174	0.00	A
MAJOR APPROACH (P)	9	174	174	0.00	A
MAJOR APPROACH (P)	10	174	174	0.00	A
TOTAL INTERSECTION (1-10)		174	174	0.00	A

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Major Street	MINOR STREET	DATE	31-Aug-88
Minor Street	NORTH DRIVE/PROJECT DRIVEWAY C	Analyst	JM
Scenario	FUTURE (W/ PROJECT Lane Load)	Pre-Header	0
Peak Hour	PM PEAK	Intersection #	0



STEP 1: FROM MINOR STREET

Controlled Phase	V4, V5	1000 vph	1000 vph
Potential Capacity	1000 vph	1000 vph	1000 vph
Capacity Adj Factor	0.95	0.95	0.95
Adjusted Capacity	950 vph	950 vph	950 vph
Peak of Queue-Size Ratio	0.15	0.15	0.15

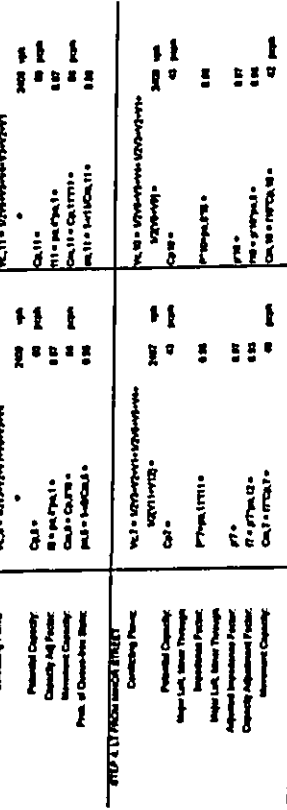
STEP 2: FROM MAJOR STREET

Controlled Phase	V1, V2, V3, V4	2000 vph	2000 vph
Potential Capacity	2000 vph	2000 vph	2000 vph
Capacity Adj Factor	0.95	0.95	0.95
Adjusted Capacity	1900 vph	1900 vph	1900 vph
Peak of Queue-Size Ratio	0.15	0.15	0.15

LEVEL OF SERVICE SUMMARY

Movement	Queue (veh)	Delay (sec)	LOS
MINOR LEFT TURN (T)	1	48	D
MINOR THROUGH (T)	1	28	D
MINOR RIGHT TURN (T)	1	21	D
MINOR LEFT TURN (L)	1	42	D
MINOR THROUGH (L)	1	24	D
MINOR RIGHT TURN (L)	1	27	D
MAJOR LEFT (T)	12	478	F
MAJOR LEFT (L)	1	448	F
MAJOR APPROACH (T)	-	-	-
MAJOR APPROACH (L)	-	-	-
MAJOR APPROACH (T)	-	-	-
MAJOR APPROACH (L)	-	-	-
TOTAL INTERSECTION (L+T)	-	-	A

Major Street	MINOR STREET	DATE	31-Aug-88
Minor Street	NORTH DRIVE/PROJECT DRIVEWAY C	Analyst	JM
Scenario	FUTURE (W/ PROJECT Lane Load)	Pre-Header	0
Peak Hour	PM PEAK	Intersection #	0



STEP 1: FROM MINOR STREET

Controlled Phase	V4, V5	1000 vph	1000 vph
Potential Capacity	1000 vph	1000 vph	1000 vph
Capacity Adj Factor	0.95	0.95	0.95
Adjusted Capacity	950 vph	950 vph	950 vph
Peak of Queue-Size Ratio	0.15	0.15	0.15

STEP 2: FROM MAJOR STREET

Controlled Phase	V1, V2, V3, V4	2000 vph	2000 vph
Potential Capacity	2000 vph	2000 vph	2000 vph
Capacity Adj Factor	0.95	0.95	0.95
Adjusted Capacity	1900 vph	1900 vph	1900 vph
Peak of Queue-Size Ratio	0.15	0.15	0.15

LEVEL OF SERVICE SUMMARY

Movement	Queue (veh)	Delay (sec)	LOS
MINOR LEFT TURN (T)	1	48	D
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MINOR RIGHT TURN (L)	1	27	D
MAJOR LEFT (T)	12	478	F
MAJOR LEFT (L)	1	448	F
MAJOR APPROACH (T)	-	-	-
MAJOR APPROACH (L)	-	-	-
MAJOR APPROACH (T)	-	-	-
MAJOR APPROACH (L)	-	-	-
TOTAL INTERSECTION (L+T)	-	-	A



# ***Appendix D***

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## ***Preliminary Drainage and Erosion Control Report***

**PRELIMINARY ENGINEERING REPORT FOR  
SUBDIVISION OF OLOWALU LANDS**  
Portions of TMK: (2) 4-8-03 and (2) 4-8-04  
Olowalu, Maui, Hawaii

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Date: October 20, 1999

I. PURPOSE

The purpose of this report is to evaluate the infrastructure requirements of the proposed project. This report will review the water system, drainage system, sewer system, and electrical, telephone & cable television systems.

II. PROJECT DESCRIPTION & LOCATION

The Olowalu Land Subdivision, mauka and makai, is located in Olowalu, on the island of Maui. The mauka section of the project encompasses TMKs: (2) 4-8-03: parcels 10, 50 through 70, inclusive, 73 through 82, inclusive, and TMKs: (2) 4-8-04: parcels 11 through 16, inclusive. The makai section of the project encompasses TMKs: (2) 4-8-03: parcels 05, and 41 through 43, inclusive. The development site is bound by State of Hawaii lands on the north (or mauka), the Pacific Ocean and Government Beach Reserves on the south, the Olowalu Under Pit and Sanitary Convenience Station on the west, and Ukumehame on the east. Olowalu Stream runs through the project site, and the project site surrounds the Olowalu Store. The project site is located about 5-miles southeast of Lahaina town and encompasses a total area of about 710 acres. (See Figure 1 - Location Map)

The Olowalu Land Subdivision can be separated into two distinct sections, mauka and makai. The Olowalu Mauka Subdivision consists of a total of 34 agricultural lots ranging from 3-acres to 87-acres. The Olowalu Makai Subdivision consists of a total of 7 agricultural lots ranging from 2-acres to 18-acres. Cultural reserve easements are incorporated in both the mauka and makai subdivisions. (See Figure 2 - Concept Subdivision Map)

III. WATER SYSTEM

The Olowalu area is serviced by a privately owned and operated system consisting of a surface water intake, a multi-stage filtration system, and a series of water tanks and distribution waterlines. This system presently services the existing residents in Olowalu Village, the Olowalu Store, Teen Challenge, Camp Pecusa, the Pioneer Mill Managers' residences, and several private residences.

The Olowalu Water Company, LLC is in the final stages of approval of a well source to replace the surface water intake for potable water. This system will incorporate a 50,000-gallon water storage tank and a chlorination system. The existing storage and distribution network will be used to maintain service to the existing users.

As part of the subdivision proposal, a new 100,000-gallon water storage tank will be constructed to serve the new agricultural lots. This reservoir will be located at the mauka limits of the project site and will gravity feed the project through a

network of 12-inch and 8-inch transmission and distribution waterlines. This 100,000-gallon tank together with the previously mentioned 50,000-gallon tank will provide the computed 150,000-gallon water demand for the proposed agricultural use and fire protection.

See Figure 3 - Concept Utilities Plan

IV. DRAINAGE SYSTEM

Existing Conditions: The existing ground within the site slopes from an elevation of about 400 feet above mean sea level along the mauka boundary to an elevation of about 5 feet along the makai boundary. A government beach reserve exists between the property and the shoreline. The average ground slope is about 7 percent, with the makai lands averaging about 1.5 percent, and the mauka lands averaging about 11 percent. The project site contains no engineered drainage systems except culvert and bridge crossings along Honoapiʻiani Highway.

According to the Soil Survey of Islands of Kauai, Oahu, Maui, Molokai and Lanai, State of Hawaii, the on-site soil consists of Pulehu clay loam, 0 to 3 percent slopes (PsA), Pulehu cobby clay loam, 0 to 3 percent slopes (PIA), Pulehu Cobby Clay Loam, 3 to 7 percent slopes (PIB), Pulehu Silt Loam, 0 to 3 percent slopes (PpA), Waieae extremely stony silty clay, 7 to 15 percent slopes (WYC), and Jaucas Sand, 0 to 15 percent slopes (JaC). Within Olowalu Stream the soils consist of Stony alluvial lands (rSM) and Rough broken and stony lands (rFS). The soil survey describes these soils as having moderate permeability, slow runoff, and no more than a slight erosion hazard. The Pulehu and Waieae series are described as well-drained soils on alluvial fans and stream terraces developed from washed igneous rock.

The Federal Emergency Management Agency's (FEMA) Flood Insurance Rate Map (panel nos. 15003-0227 B and 15003-0229) designate portions of the proposed development area in zones A0, B, and C. Zone A0 (depth 1') is defined as an area of 100-year shallow flooding (1-foot), but no determined flood hazard. Zone B is defined as the area between the 100-year and 500-year flood inundations with average depths of less than 1-foot. These zones exist primarily in the Olowalu Stream area. Zone C is an area subject to minimal flooding. FEMA's Flood Boundary and Floodway Map (panel nos. 15003-0227 B and 15003-0229) also designate floodway boundaries resulting from a 100-year and 500-year flood storm event within the project site in the area of Olowalu Stream.

The existing drainage occurs in three distinct drainage basins (See Figure 4 - Drainage Basins). The central basin, or Olowalu Stream extends well mauka of the project site and into the West Mau Mountains. The drainage area crosses Honoapiʻiani Highway via 2 - 28' x 11' box culverts creating Olowalu Bridge and

several secondary culverts. The west system also extends mauka of the project site and crosses Honoapiʻiani Highway via a 10' x 3' box culvert and several secondary culverts. The east basin contains the bulk of the project site and crosses Honoapiʻiani Highway via 2 - 36" diameter culverts and several secondary culverts.

Developed Conditions: The Olowalu Lands Subdivision development will not alter the natural drainage patterns of the area. The existing drainage facilities crossing Honoapiʻiani Highway will be evaluated and incorporated into the project drainage plan.

The mauka subdivision incorporates a generous amount of greenways and cultural reserve areas. These areas will provide natural overland flow corridors to maintain the natural drainage patterns. Drainage retention/recharge basins will be developed immediately mauka of Honoapiʻiani Highway to provide capacity and environmental controls.

Grading and roadway improvements within the makai subdivision will be limited to the area immediately makai of Honoapiʻiani Highway. This plan, along with the required shoreline setbacks provide for spacious planting areas between the developments and the shoreline. Furthermore, a berm exists within the government shoreline reserve which discourages and filters runoff before entering the near shore waters. Grading within the flood inundation limits and floodways will not have an adverse impact on the flood patterns or flood heights.

Since the existing cane fields are presently barren, calculations contained in Appendix A - Drainage Computations indicate a decrease of surface runoff generated from the site after development (900 cfs predevelopment to 600 cfs post development). Comparing the formerly planted cane fields as the predevelopment benchmark, however, results in an increase of about 100-cfs (510-cfs predevelopment to 600-cfs post development).

The surface runoff generated as a result of the subdivision improvements will be addressed by drainage improvements incorporated with the development and will have no adverse effect on the adjoining properties or near shore waters.

Conclusion: Development of the project will not result in any significant increase in peak flow rates or runoff volumes. The addition of impervious areas such as subdivision roads, and future building roofs is minimal. The "flat" graded planting areas consistent with this type of development, together with the abundance of greenways and cultural reserves will reduce the flow velocity encouraging infiltration and reducing surface runoff to offset the developed hard surfaces. Detention/recharge basins incorporated into the development will provide further drainage controls and keep surface runoff to predevelopment levels. These basins will also serve an environmental function to reduce sediment discharge into the ocean. Therefore, the development of these agricultural lots will improve the

drainage system in the area and will have no adverse effects on the adjacent and downstream properties.

#### V. SEWER SYSTEM

The existing uses in the Olowalu area are serviced by cesspools or other individual wastewater systems. Future developments within the project will be required to incorporate a septic tank and leach field type of individual wastewater system, or individual treatment facilities.

#### VI. ELECTRICAL SYSTEM

Mau Electric Company, Ltd. maintains an overhead electrical distribution system along Honoapiʻiani Highway, and a primary transmission system mauka of the project site. MECO can provide the additional electrical power requirements for this project.

#### VII. TELEPHONE SYSTEM

GTE Hawaiian Telephone Company maintains overhead telephone lines along Honoapiʻiani Highway which serves the Olowalu area. HTEL can provide the additional telephone services for the project.

#### VIII. CABLE TELEVISION SYSTEM

Hawaiian Cablevision's system does not currently service the Olowalu area, however, a service area expansion is being planned. Hawaiian Cablevision's expanded system will provide service to the project area.

#### IX. REFERENCES

1. City and County of Honolulu, Department of Public Works, Division of Engineering, *Storm Drainage Standards*, Honolulu, Hawaii, May 1988.
2. County of Maui, Department of Water Supply, *Rules and Regulations*, Wailuku, Hawaii, January 1977.
3. Federal Emergency Management Agency, National Flood Insurance Program, *FIRM, Flood Insurance Rate map, Maui County, Hawaii*, Community-Panel Numbers 150003 0227 B and 150003 0229, June 1, 1981.

4. Federal Emergency Management Agency, National Flood Insurance Program, *FLOODWAY, Flood Boundary and Floodway map, Maui County, Hawaii*, Community-Panel Numbers 150003 0227 B and 150003 0229, June 1, 1981.
5. R. M. Towill Corporation, *Drainage Master Plan for the County of Maui*, Honolulu, Hawaii, October 1971.
6. R. M. Towill Corporation, *Water Master Plan for the County of Maui*, Honolulu, Hawaii, December 1971.
7. U. S. Department of Agriculture, Soil Conservation Service, *Erosion and Sediment Control Guide for Hawaii*, Honolulu, Hawaii, March 1981.
8. U. S. Department of Agriculture, Soil Conservation Service, *Rainfall-Frequency Atlas of the Hawaiian Islands*, Honolulu, Hawaii, 1962.
9. U. S. Department of Agriculture, Soil Conservation Service, *Soil Survey of Islands of Kauai, Oahu, Maui, Molokai, and Lanai, State of Hawaii*, Washington, D.C., August 1972.

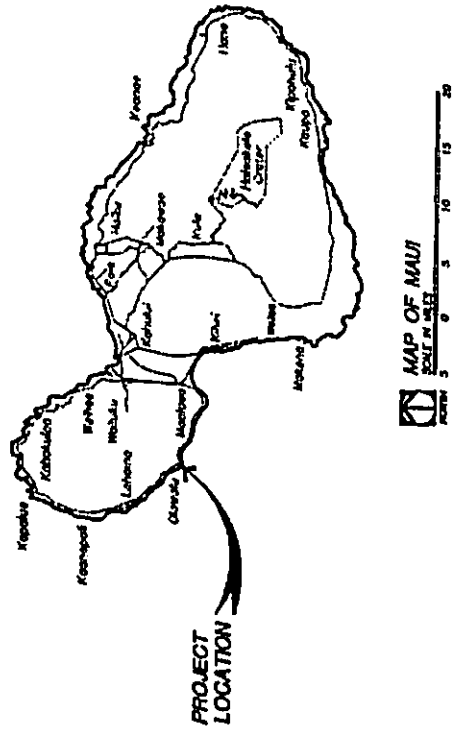


Figure 1  
Location Map

PRELIMINARY ENGINEERING REPORT  
ON SUBDIVISION OF OAHU LANDS

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100



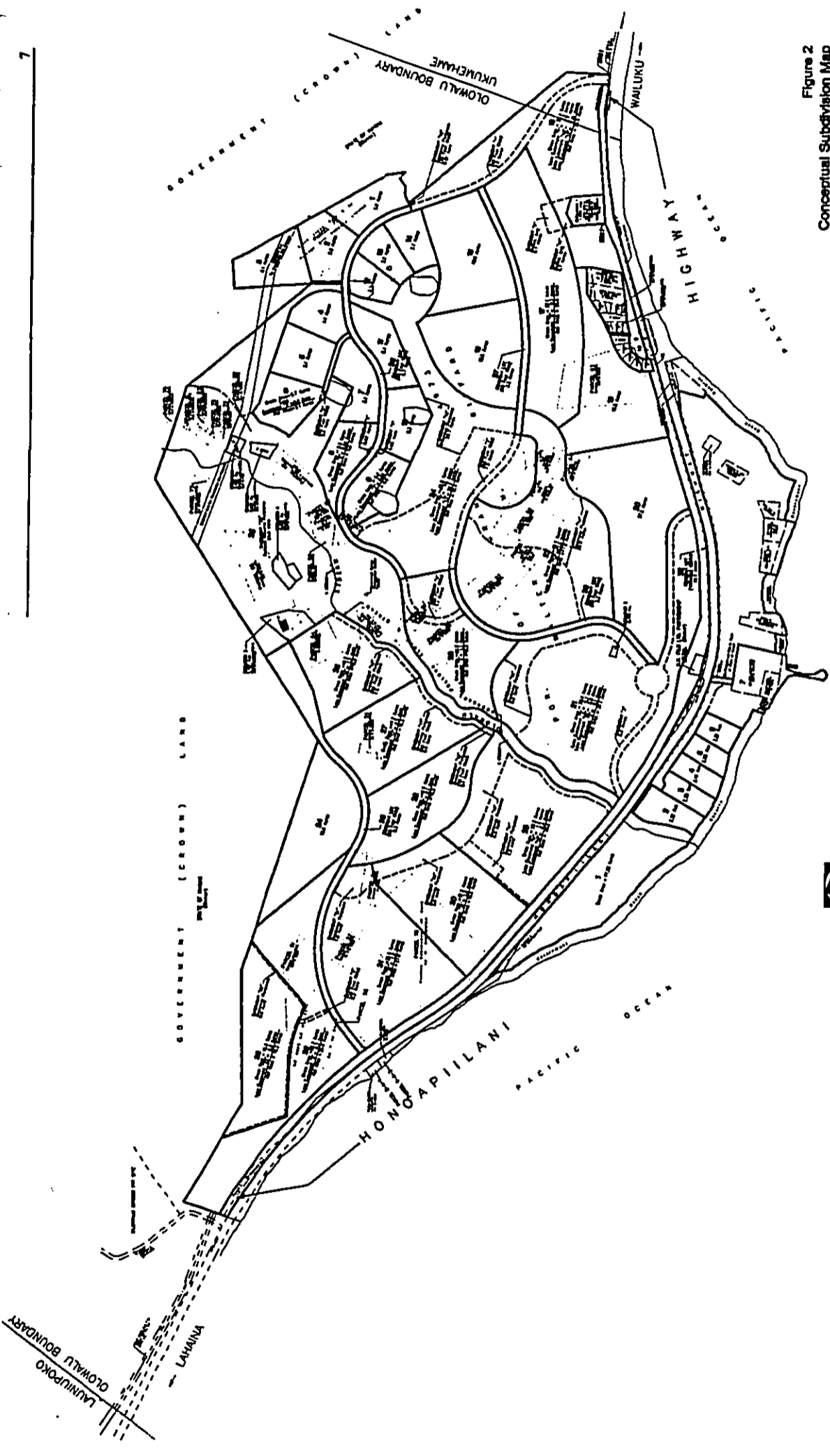
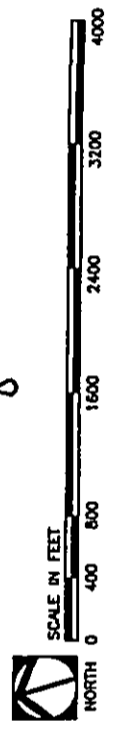
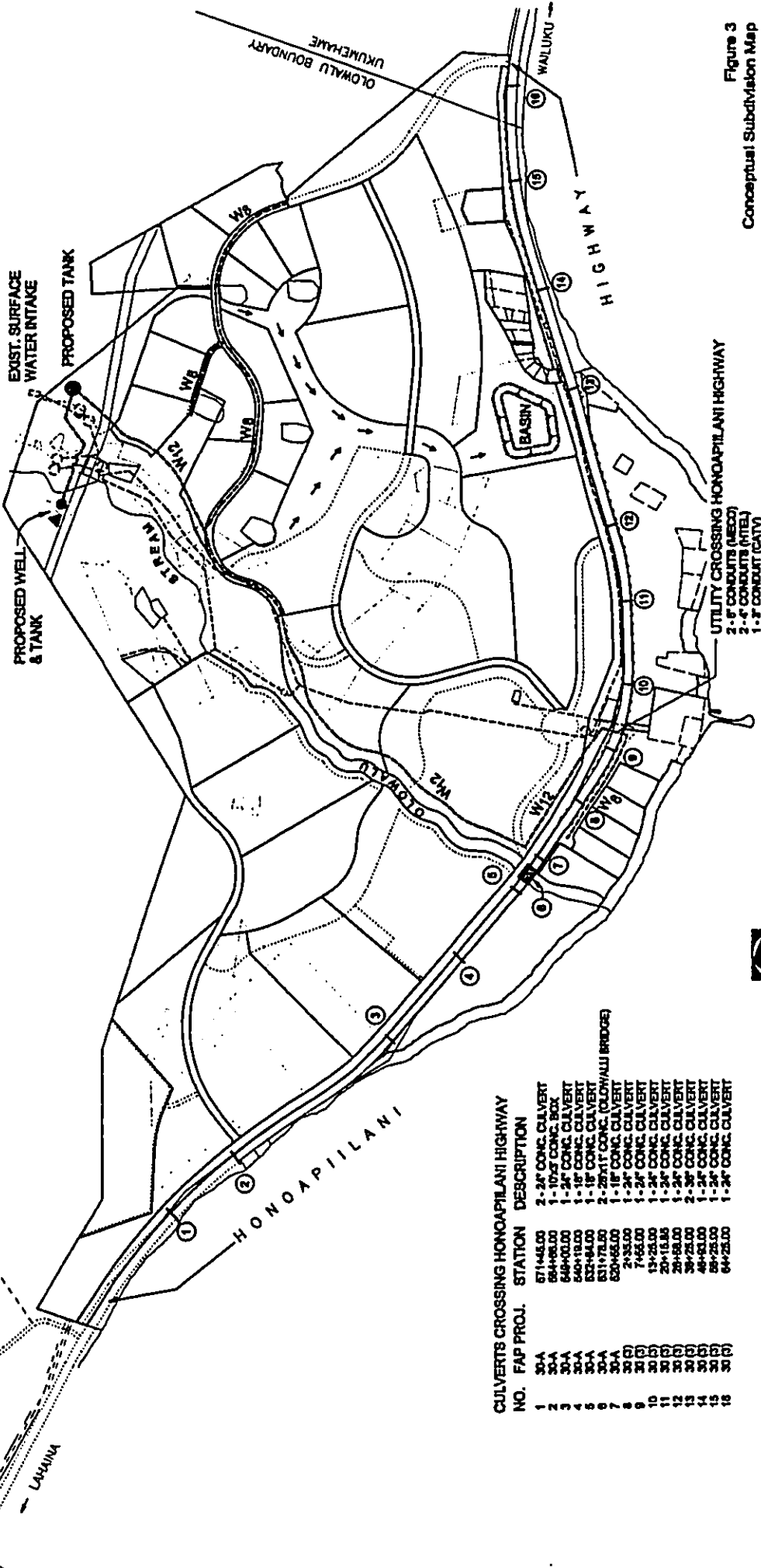


Figure 2  
Conceptual Subdivision Map



PRELIMINARY ENGINEERING REPORT  
for SUBDIVISION OF OLOWALU LANDS

LAUNIPOKO  
OLOHALU BOUNDARY



CULVERTS CROSSING HONOAPIILANI HIGHWAY		
NO.	FAP PROJ.	STATION DESCRIPTION
1	30-A	2-24" CONC. CULVERT
2	30-A	1-10'x12" CONC. BOX
3	30-A	1-24" CONC. CULVERT
4	30-A	1-18" CONC. CULVERT
5	30-A	1-18" CONC. CULVERT
6	30-A	2-28'x11' CONC. (LOW WALL BRIDGE)
7	30-A	1-18" CONC. CULVERT
8	30(B)	1-24" CONC. CULVERT
9	30(B)	1-24" CONC. CULVERT
10	30(B)	1-24" CONC. CULVERT
11	30(B)	1-24" CONC. CULVERT
12	30(B)	1-24" CONC. CULVERT
13	30(B)	2-36" CONC. CULVERT
14	30(B)	1-24" CONC. CULVERT
15	30(B)	1-24" CONC. CULVERT
16	30(B)	1-24" CONC. CULVERT

Figure 3  
Conceptual Subdivision Map



PRELIMINARY ENGINEERING REPORT  
FOR SUBDIVISION OF OLOHALU LANDS

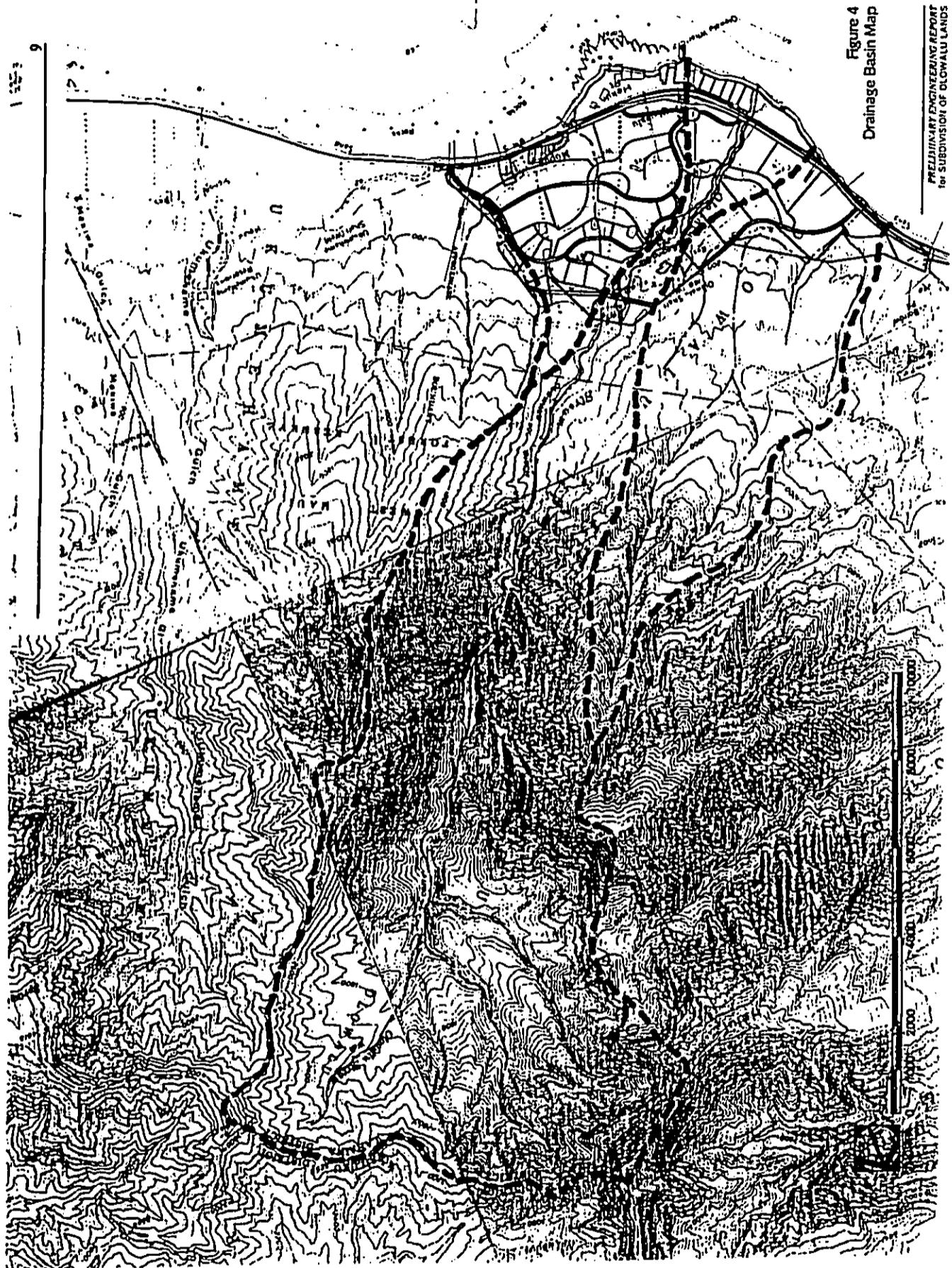


Figure 4  
Drainage Basin Map

PRELIMINARY ENGINEERING REPORT  
for SUBDIVISION OF OLOWALI LANDS

6  
1

APPENDIX A

DRAINAGE COMPUTATIONS

PURPOSE: To calculate the surface runoff generated by the proposed Olowalu Makiel Subdivision site before and after the proposed development.

1. EXISTING CONDITIONS

Drainage Area (A) = 740 acres (1.15 sq. miles)  
 Rainfall (P) 100yr-6hr = 5 inches  
 Soil Type and Curve Number:

Map Class	Soil Class	Soil Group	Area	Pre-Development CN	Post-Development CN
P&A	Pulehu Clay Loam, 0-3	B	88	75	68
PA	Pulehu Cobbley Clay Loam, 0-3	B	195	75	68
PTB	Pulehu Cobbley Clay Loam, 3-7	B	68	75	68
P&A	Pulehu Silt Loam, 0-3	B	42	75	68
W/C	Wahee Ex-Stony Silt Clay, 7-15	B	233	75	68
J&C	Jacuas Sand, 0-15	A-1	24	65	65
RSM	Stony Alluvial Lands	C	70	74	74
rFS	Rough Broken Stony Lands	C	20	74	74
			740	75	69

Runoff Amount (Q) =  $f(P, CN)$   
 Hydrograph Family =  $f(P, CN)$   
 Duration of Excess Rainfall ( $T_e$ ) =  $f(P, CN)$   
 Time of Concentration ( $T_c$ ) =  $f(P, CN)$   
 $T_c = 1.67L$   
 $L = \frac{P^{0.7}}{(S+1)^{0.7}} / 1900 Y^{0.5}$   
 $L$  = Lag in Hours  
 $I$  = Hydraulic length of Watershed = 4,800 ft  
 $S = 1000/CN - 10$   
 $Y$  = ave. land slope

Initial Value  $T_p = 0.7T_c =$   
 $T_o / T_p$  Ratio =  
 Revised  $T_o / T_p$  Ratio =  
 Revised  $T_p =$   
 Unit Hydrograph Peak Discharge:  
 $q = 484A / T_p$  revised =  
 Hydrograph Peak Discharge (cfs):  
 $Q_p = (Q_e / C_p) \cdot Q \cdot q =$

# ***Appendix E***

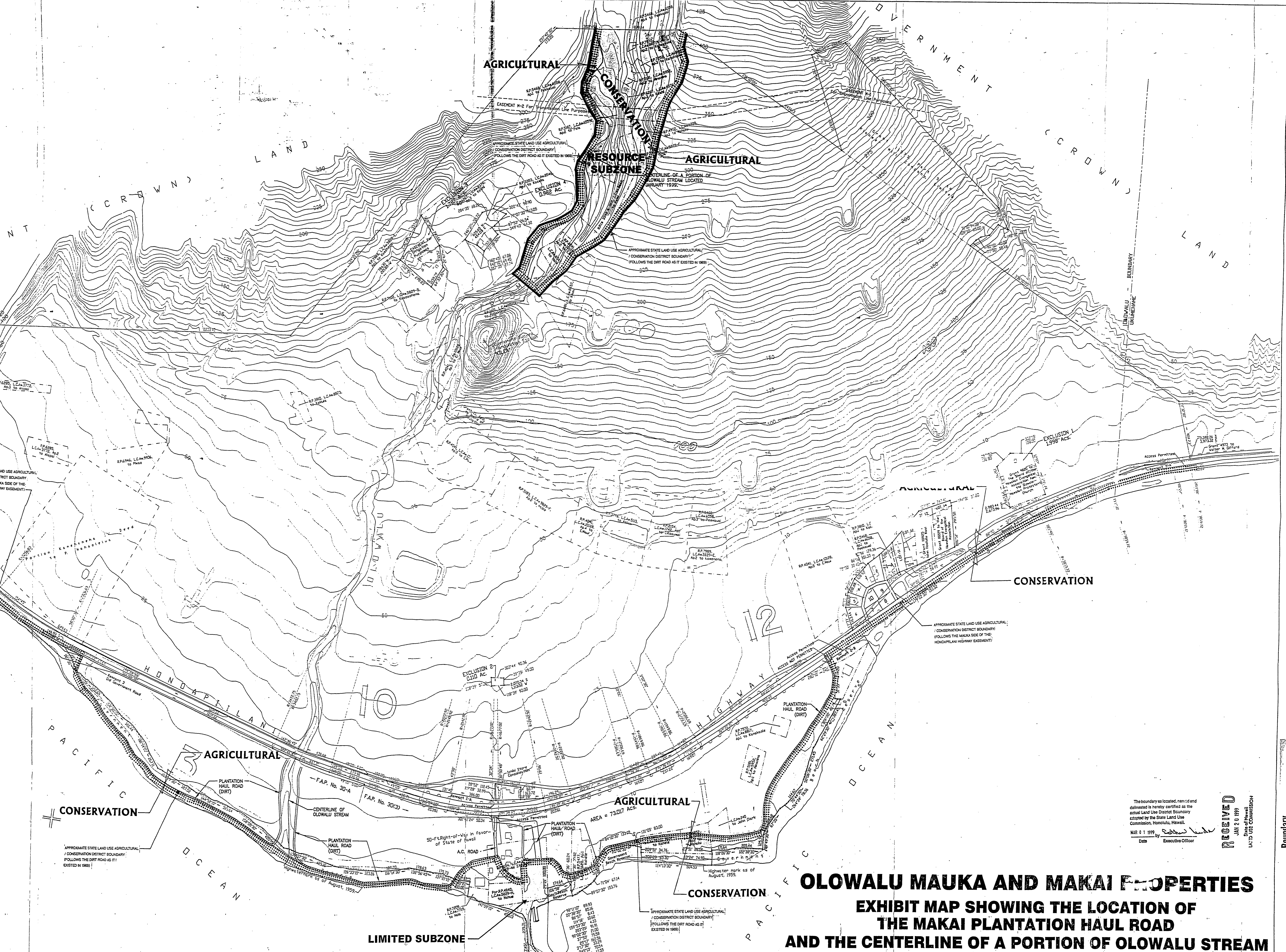
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***Boundary Interpretation  
No. 98-48***

97

0





AGRICULTURAL

RESOURCE  
SUBZONE

AGRICULTURAL

AGRICULTURAL

AGRICULTURAL

CONSERVATION

CONSERVATION

CONSERVATION

LIMITED SUBZONE

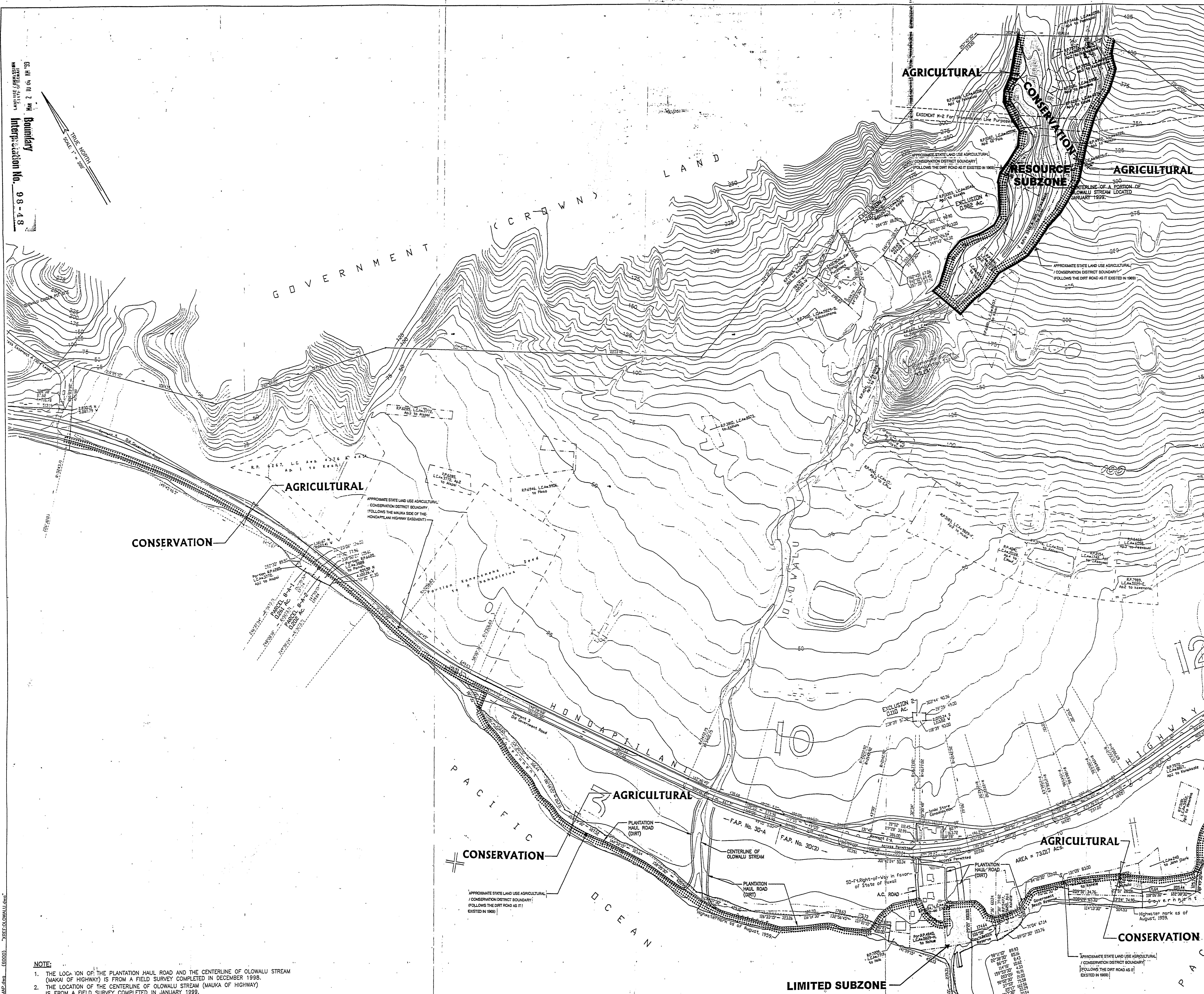
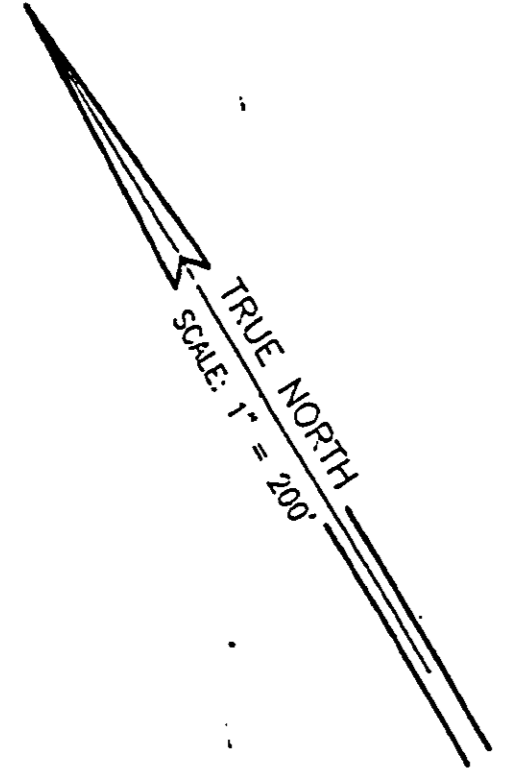
**OLOWALU MAUKA AND MAKAI PROPERTIES  
EXHIBIT MAP SHOWING THE LOCATION OF  
THE MAKAI PLANTATION HAUL ROAD  
AND THE CENTERLINE OF A PORTION OF OLOWALU STREAM**

The boundary as located, named and delineated is hereby certified as the actual Land Use District Boundary adopted by the State Land Use Commission, Honolulu, Hawaii.  
Date: MAR 01 1999  
Executive Officer

RECEIVED  
JAN 20 1999  
State of Hawaii  
LAND USE COMMISSION



65 1/4 IN TO 1/4 IN 2 1/4" Boundary Interpretation No. 9-8-48



**NOTE:**  
 1. THE LOCATION OF THE PLANTATION HAUL ROAD AND THE CENTERLINE OF OLOWALU STREAM (MAUKA OF HIGHWAY) IS FROM A FIELD SURVEY COMPLETED IN DECEMBER 1998.  
 2. THE LOCATION OF THE CENTERLINE OF OLOWALU STREAM (MAUKA OF HIGHWAY) IS FROM A FIELD SURVEY COMPLETED IN JANUARY 1999.

MAP.DWG (GOOD) "XREF:OLOWALU.DWG"