

Stephen K. Yamashiro
Mayor



Kaawaloa Orchards 7-Lot
Agricultural Proj. Virginia Goldstein
Subdivision Director

Russell Kokubun
Deputy Director

County of Hawaii

PLANNING DEPARTMENT

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February 24, 1998

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OFFICE OF ENVIRONMENTAL
QUALITY CONTROL

Mr. Gary Gill, Director
Office of Environmental Quality Control
State Office Tower
235 S. Beretania Street, Suite 702
Honolulu, HI 96813

Dear Mr. Gill:

Final Environmental Assessment (EA) for the Development of a 7-lot Subdivision
and Related Improvements for Ka'awaloa Orchards Agricultural Project District
TMK: 3rd/8-1-09:19 & Portion of 20, Ka'awaloa, South Kona, Hawaii

The Planning Department has reviewed the comments received on the Draft EA for the subject project during the 30-day public review period which began on January 23, 1998, and has determined that this project will have no significant adverse effect upon the environment. Therefore, with this letter, we hereby issue a Finding of No Significant Impact (FONSI). We request that you publish notice of this determination in the March 8, 1998 issue of The Environmental Notice. ✓

Enclosed is a completed OEQC Bulletin publication form, four copies of the Final EA, and a diskette containing the project description in WordPerfect 6.0 format. Please contact Daryn Arai of this office at 961-8288 should there are any questions.

Sincerely,

VIRGINIA GOLDSTEIN
Planning Director

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Enclosures (4 copies of FEA, publication form, diskette)

c: Mr. Tim Lui-Kwan, Carlsmith Ball Wichman Case & Ichiki

1998-03-08-HI-**FEA**-Kaawaloa
Orchards 7-Lot Subdivision

MAR 8 1998
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**A PROPOSAL FOR THE DEVELOPMENT OF
SUBDIVISION AND RELATED IMPROVEMENTS FOR
KA'AWALOA ORCHARDS
AGRICULTURAL PROJECT DISTRICT**

Applicant: Seamount Enterprises, LLC dba Ka'awaloa Orchards
Approving Agencies: County of Hawaii Planning Department
**Purpose: Approval of Ka'awaloa Orchards Agricultural Project District Subdivision
and Construction of Related Roadway Improvements**
Location: Ka'awaloa, District of South Kona, Island, County and State of Hawaii
TMK: (3) 8-1-09:19 & 20(portion)

FINAL ENVIRONMENTAL ASSESSMENT

Prepared for:

County of Hawaii

February 1998

TIM LUI-KWAN
Carlsmith Ball Wichman Case & Ichiki
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LIST OF EXHIBITS

Exhibit 1	Master Conceptual Plan (project area, vicinity map and proposed improvements)
Exhibit 2	Legal Description of Project Area
Exhibit 3	County of Hawaii Ordinance No. 97-133, effective October 23, 1997
Exhibit 4	Archaeological Inventory Survey and Data Recovery, <u>Chinago Inc.</u> (Sept. 1990)
Exhibit 5	Addendum - 1994, by Archaeological Consultant, <u>James Head, B.A.</u>
Exhibit 6	DLNR Letter dated July 18, 1997

FINAL ENVIRONMENTAL ASSESSMENT

I. Identification of Applicant

The Applicant is Seamount Enterprises, LLC, dba Ka'awaloa Orchards, a Nevada limited liability company registered to do business in the State of Hawaii, whose mailing address is 845 Bellevue Place East, Suite 308, Seattle, Washington 98102 (hereinafter "Applicant"). Applicant is the owner and operator of an existing tropical fruit orchard at Ka'awaloa, District of South Kona, County, State and Island of Hawaii and is represented in the State of Hawaii by its attorneys, Carlsmith Ball Wichman Case & Ichiki (attention: Tim Lui-Kwan), whose mailing address is 1001 Bishop Street, Suite 2200, P. O. Box 656, Honolulu, Hawaii 96809-3402.

Applicant is the fee owner of contiguous tax map key parcels (3) 8-1-09: 19 ("Lot 1") and 20 ("Lot 2"), which are located along the south side of Napo'opo'o Road, approximately 800 feet *makai* (west) of the Ka'awaloa Road-Napo'opo'o Road intersection and approximately 1500 feet south of the Napo'opo'o Road- Hawaii Belt Highway (Highway 11) intersection near Captain Cook, South Kona, County and State of Hawaii. See, Exhibit 1, Map showing the subject lands and vicinity map.

II. Identification of Approving Agency

The approving agency is the Hawaii County Planning Department for the subject action, which is an application for the subdivision of all of Lot 1 and the pole portion of Lot 2 (the "Project Area") and the construction of related improvements. The legal description of the Project Area is attached as Exhibit 2. The Project Area lies within the boundaries of the Kealakekua Bay Historic District which is on the National Historic Register, and therefore, the proposed subdivision for the 7-lot planned agricultural community is subject to the requirements

of the Hawaii Environmental Policy Act pursuant to Hawaii Revised Statutes ("HRS") §343-5(a)(4).

III. Identification of Agencies Consulted

The Applicant, on May 29, 1997, submitted an application to the Planning Department and Planning Commission of the County of Hawaii for a change of zone by changing the district classification from Agricultural (A-5a) to Agricultural Project District (APD) for approximately 22.511 acres of land. This application ("APD application") was accompanied by a County Environmental Report ("CER") prepared pursuant to Rule 14 of the County of Hawaii Rules of Practice and Procedure and Hawaii County Code ("HCC") §25-2-42.

The APD application, together with the CER, was submitted to the following agencies and public utilities for review and comment:

Hawaii County Department of Public Works	State Land Use Commission
Hawaii County Department of Water Supply	Department of Land & Natural Resources
Hawaii County Police Department	State Department of Transportation-Hilo
Hawaii County Fire Department	State Department of Transportation-Hono.
Real Property Tax Division (County Finance)	State Department of Agriculture
West Hawaii County Office	State Department of Health
Hawaii Electric Light Company (HELCO)	US Department of Agriculture, Natural Resource Soil Conservation Service

Prior to the August 7, 1997 public hearing held at Keauhou, Kona by the Planning Commission of the County of Hawaii on the APD application, copies of the application and notices were also sent to surrounding land owners and lessees. Additionally, written testimony

in support of the APD application was received from Hula Brothers, Inc., Agro Resources, Inc., Pac Inv. Hawaii, Inc., Kim Greenwell and G. Rick Robinson.

The Hawaii County Council approved the APD application, effective October 23, 1997 pursuant to its adoption of Ordinance No. 97-133 following hearings held on September 17, October 1 and October 15, 1997. A copy of Ordinance No. 97-133 is attached as **Exhibit 3**.

IV. General Description of the Action's Technical, Economic, Social, and Environmental Characteristics

(A) **Technical Characteristics:** The Agricultural Project District ("APD") zoning for the Project Area was approved by the Hawaii County Council, effective October 23, 1997 by Ordinance 97-133 pursuant to authority and criteria set out in Hawaii County Code ("HCC") §25-6-51. The purpose of zoning action was intended to convert an existing tropical fruit orchard operation on 22.511 acres of land into a planned agricultural community, which maintains the orchards, provides for the establishment of farm dwellings accessory to the orchards, and establishes certain protective covenants for the maintenance of the needed infrastructural facilities and systems to support the agricultural operations (the "Project"). The layout of this Project is shown on the Master Conceptual Plan, attached as **Exhibit 1**.

The technical features of the Project include:

(1) **Subdivision.** The subdivision of Lot 1 into seven lots that range in size from 3 acres to approximately 3.5 acres. A protective covenant is proposed to be recorded against the land which would prohibit any further subdivision for a period of 40 years. Any further subdivision or increase in density would only be permitted with both the consent of a majority

of the land owners within the APD and upon the Hawaii County Council's amendment of Ordinance 97-133.

(2) **Extension of Existing Private Road.** It is proposed that the existing private roadway be extended approximately 1,000 feet to provide access to the Project Area from Napo'opo'o Road. The roadway is proposed to follow the natural contours of the land as much as possible. The grade of the roadway will not exceed 20% in any area. The roadway will be constructed to the same standards as the existing roadway with a paved roadway width of 16 feet within a 20-foot wide graded right-of-way, in order to maintain the agricultural character of the area, and subject to applicable grading, driveway, drainage, and roadway standards, including those standards for the design and construction of private roadways, of the Hawaii County Department of Public Works.

(3) **Limits on Density and Farm Dwelling Use.** Only one farm dwelling will be permitted on each lot created, and the area utilized for farm dwelling purposes will be limited to 15% of the total lot area. The remainder of the lot must continue to be utilized for permitted agricultural purposes. These restrictions will be contained in protective covenants recorded against the land. The single existing farm dwelling within the Project Area will be maintained as the farm dwelling for one of the newly created lots. The Agricultural Project District approved by the Hawaii County Council for the Project Area limits the number and the relative size of dwellings permitted within the Project Area.

(4) **Required Agricultural Use.** The existing tropical fruit orchards, which produce lychee, rambutan and avocado, are to be maintained on the newly created lots as long as they are viable. The permitted agricultural uses include the existing agricultural orchard uses and further permits other crop production, floriculture, nurseries and similar uses dealing with growing of plants. Accessory uses and facilities such as shade houses, agricultural storage sheds

and other uses necessary to facilitate or process the primary agricultural products are also permitted. Public retail sales of agricultural products are prohibited. These restrictions shall also be contained in protective covenants recorded against the land.

(5) **Existing Private Water System.** The existing private water system will be maintained as it is entirely suitable and adequate for the needs of the existing orchard. This system provides water to the existing residence and irrigates the entire orchard. It is connected to six existing County water meters installed along Napo'opo'o Road and serves the subject property via a waterline easement as shown on the master conceptual plan. A seventh meter has been paid for and will be installed in the near future and one meter assigned to each of the lots. Any future changes to this existing private water system, including changes which might be required for the construction of future farm dwellings would be the responsibility of lot owners.

(6) **No Street Lights.** In order to preserve the rural character of the area, no street lights be installed within the Project Area. The existing street light (outside of the Project area) at the intersection of the existing private road and Napo'opo'o Road would be maintained.

(B) **Economic Characteristics:** The Project Area is presently developed as a tropical fruit orchard. The main crops are lychee, rambutan and avocado. The objective of the Agricultural Project District is to allow the diversification of ownership within the Project Area, and to promote an agricultural stewardship of the land, which will result in the substantial preservation of the existing orchard. High outside labor and management costs make it uneconomical to continue to operate the orchard in its present form. Smaller orchard lots, that are manageable as family operations, can contain these costs, while preserving the agricultural character of the area. The Agricultural Project District within the Project Area will provide a planned agricultural community that maintains the existing agricultural uses and the integrity of

the rural South Kona area, while providing opportunities for residential use associated with the agricultural activities.

(C) **Social Characteristics:** The planned agricultural community, proposed by the Project, proposes many features to preserve the orchard operations while maintaining the integrity of the surrounding South Kona rural and agricultural area. These features necessitate exceptions to the traditional requirements of the Zoning and Subdivision Codes. As such, the Project lends itself to development as a planned Agricultural Project District, in lieu of a traditional agricultural development that would require additional variances from the requirements of the Zoning and Subdivision Codes.

The development of the Project as an Agricultural Project District is consistent with the purpose this district, as stated under Section 25-6-50 of the Hawaii County Code. Essentially, the Project provides a flexible and creative approach to provide small scale agricultural activities and associated residential uses. It provides a continuity in land use and design since land uses will be similar to those of the *mauka* two-acre lot subdivision. It satisfies the demand for a rural lifestyle, and it provides the needed infrastructural facilities and systems to support the development. A principal component of the rural lifestyle is the motivation for good stewardship which arises from the ownership by a family of an individual fee simple lot.

The Project was also found by the Hawaii County Council to be consistent with the criteria under Section 25-6-51 of the Hawaii County Code for establishment of this district. The general welfare is served by the preservation of the orchard, with a comprehensive planning approach. The orchard is a substantial aesthetic and environmental attribute to the area. It is also the largest commercial producing planting of the "Kaimana" lychee, developed by the University of Hawaii.

(D) **Environmental Characteristics:** The Project is consistent with the intent and purpose of the Zoning Code and the County General Plan. This planned development, which maintains the existing agricultural character of the 22.5-acre parcel, will not result in a substantial adverse impact upon the surrounding area or the South Kona region. The environmental characteristics of the Project can be described as follows:

(1) **Project Area:** The Project Area consists of approximately 22.511 acres in Ka'awaloa, South Kona, consisting of Lot 1 and the pole portion of Lot 2, which lots are shown in that final subdivision plat prepared by Wes Thomas Associates, approved by the County of Hawaii on May 6, 1997 as Subdivision No. 6835. The property is also a portion of R.P. 4356 and 7532, L.C. Aw. 8452, Apana 10 to Keohokalole. The Project Area is *makai* of the Hawaii Belt Road (Route 11) and Napo'opo'o Road (old Government Road) and borders Ka'awaloa Road on the Kailua side. It is more than 3,000 feet *mauka* of Kealakekua Pali (see vicinity map attached as part of Exhibit 1). The Project Area is designated by State of Hawaii Tax Map Key Nos. (3) 8-1-09: 19 and 20 (portion).¹

(2) **Proposed Lots:** Seven lots ranging in size from 3 acres to approximately 3.5 acres will be created by this Agricultural Project District. Covenants running with the land would prohibit further subdivision for a 40-year period. Thereafter, subdivision would only be permitted with the consent of the County of Hawaii and a majority of lot owners.

(3) **Time Frame and Cost:** The cost of the developing the proposed subdivision, including roadway construction and staking is estimated to be approximately \$96,000.00. It is the intention of the applicant to complete the subdivision approval process

¹ The tax map key numbers of these parcels were recently designated pursuant to the consolidation and resubdivision approved by the County of Hawaii on May 6, 1997, as Subdivision No. 6835.

and to construct the required improvements as soon as possible. The estimated time of completion is the second half of 1998.

(4) **Membership/Employees:** The Agricultural Project District would eventually consist of seven lot owners. A cooperative approach amongst the lot owners as to the maintenance of the orchard and its concomitant infrastructure will be encouraged.

Agro Resources Inc., a well established agricultural management company in South Kona, has agreed to make formal commitments to offer orchard management services to all new lot owners. This will allow for substantial savings in equipment purchase and efficiencies of scale in bulk purchases, and the use of common packing and marketing facilities maintained by Agro Resources nearby. Each owner would have the option of customizing their service relationship with Agro Resources from full management to individual services such as mowing.

The employees performing these orchard services would be the employees of Agro Resources unless an individual lot owner pursued an individual management option, in which case the lot owner might employ agricultural workers directly. The employment requirements of the orchard are seasonal. State requirements for workers compensation insurance, TDI and Federal and State withholding for all agricultural workers make it an attractive alternative to effectively share agricultural workers and their management through the services offered by Agro Resources.

(5) **Parking Arrangements:** Vehicles would be parked on the portion of each lot that is set aside for farm dwelling use, and protective covenants would restrict the storage of recreational or commercial vehicles.

(6) **Traffic Impacts:** Access to the Project Area will be provided by an extension of the existing private road extending off of Napo'opo'o Road, over an existing 50-foot wide easement shown on the Master Conceptual Plan as Access Easements A1 and A5. The existing road within these easements (shown as easement A2) presently provide access to four lots outside and mauka of the Project Area; Lots 4-B through 7-B. The larger 50-foot access easement was reserved by the prior owner when the mauka lots were created, and the rights under this easement were conveyed to the Applicant. The impact on existing residential units located on Lots 4-B through 7-B will be mitigated by maintaining this roadways present width of 16 feet of pavement in a 20-foot wide graded right-of-way. The remainder of the 50-foot easement will be reserved as a 15-foot ungraded roadway setback on either side of the roadway.

It is anticipated that most of the traffic from the Project Area will turn left or *mauka* onto Napo'opo'o Road, a County maintained roadway, with a paved roadway width of 40 to 50 feet. The Napo'opo'o Road intersects the Hawaii Belt Road or Route 11 approximately one-quarter mile north or *mauka* of the Project Area. Route 11 is the main roadway through South Kona, with portions of this highway at various locations being under the jurisdiction of either the State or the County. At the intersection of Napo'opo'o Road, Route 11 is a two-lane, County maintained highway that has a paved roadway width of approximately 60 feet within a 130-foot right-of-way. The intersection of Napo'opo'o Road and Route 11 is an unsignalized "T" intersection.

A Traffic Impact Analysis, prepared in 1987 for the Kealakekua Makai Subdivision² by Belt Collins & Associates, stated that as of 1987, the capacity of Napo'opo'o Road was approximately 1,800 vehicles per hour ("vph") and the capacity of Route 11 was approximately 1970 vph. The study also projected the 1990 p.m. peak hour (between 4:00 to 5:00 p.m.) traffic on Napo'opo'o Road as being 260 vph and on Route 11 as being 980 vph, which was

² The Kealakekua Makai Subdivision has never been developed.

well below the capacity of the two roadways. Since there has not been substantial development in this area since 1990, it can be assumed that the two roadways can still adequately accommodate the traffic generated by the six additional lots of the proposed Project.

The Traffic Impact Analysis also analyzed the impact of a proposed 36-lot subdivision upon the intersection of Route 11 and the Napo'opo'o Road. It found the level of service to be "A" for all turning movements within the intersection, except for the movement of the mauka bound Napo'opo'o traffic turning left onto northbound Route 11, which was found to be at service level "D". Level of service "A" indicates little or no traffic delays, level of service "D" indicates long traffic delays and level of service "E" indicates very long traffic delays. The Analysis also concluded that although the impact of 36 lots would be to change the level service for the p.m. peak hour from level "D" to "E", this change in service was only expected to occur in the p.m. peak hour. Therefore, no improvements to the intersection were recommended by the study for the proposed 36-lot subdivision.

From the 1987 Traffic Impact Analysis, it can be concluded that the roadways and the intersection are adequate to handle the traffic generated from the proposed six additional lots of the Project.

It should also be pointed out that under the prior 5-acre agricultural zoning (A-5a), four lots could be created within the Project Area. Thus, the Agricultural Project District would only add three lots to that already permitted by the existing zoning. In addition, to mitigate the impacts of the proposed development, the applicant is required under Ordinance No. 97-133 to create a restrictive covenant for the Agricultural Project District which prohibits the construction of more than one farm dwelling on each of the lots. Since more than one farm dwelling can be constructed on each of the four possible A-5a lots under the prior zoning, the density allowed by

the Agricultural Project District may result in less traffic than that permitted by the prior A-5a zoning.

(7) **Proposed Infrastructure:** It is proposed that the existing private roadway providing access to Napo'opo'o Road (of 16 feet of pavement in a 20-foot, graded, right-of-way) be extended by approximately 1,000 feet as shown on the Master Conceptual Plan. As in easement 5A, a further 15-foot ungraded roadway setback will be reserved on either side of the proposed roadway within the Project Area. The roadway is intended to follow the natural contours of the land as much as possible. The grade of the roadway will not exceed 20% in any area; however, the roadway will be engineered for a maximum speed of 15 mile per hour to accommodate the existing land contours. The entire roadway will be posted at a speed of 15 miles per hour.

Overhead utility lines already extend to the Project Area. These lines would be extended to each lot, as needed, by the respective lot owner.

Water is presently supplied to the Project Area from the County of Hawaii, Department of Water Supply system. Six County water meters are presently located along the Napo'opo'o Road, with a private water distribution system extending through the orchard within the Project Area. The existing private water system shall be used for the Project, with a seventh additional water meter being installed along the Napo'opo'o Road.

No off-site infrastructural improvements are required for the Project.

V. **Summary Description of the Affected Environment and Identification Of Major Impacts**

(A) **Physical Characteristics/Environmental Setting**

(1) Description of Subject Property, Location, Climate,

Topography, Slope, Soils: The Project Area is *makai* of Route 11 and Napo'opo'o Road (old Government Road) and borders Ka'awaloa Road on the Kailua side. It is approximately 3,000 feet *mauka* of Pali Kapu-O-Keoua. The Project Area was completely cleared, bulldozed and rolled in 1987 and is now planted as a tropical fruit orchard. The age of the trees ranges from one to ten years. The land is gently sloping with a southwestern exposure. The elevation of the Project Area ranges between 1,000 feet above mean sea level at the *makai* boundary to 1,200 feet above mean sea level at the *mauka* boundary. Rainfall is between 40 and 50 inches per year.

The United States Department of Agriculture, Soil Conservation Services, Soil Survey Report classifies the soil on the Project Area as Kaimu, extremely stony peat over fragmented A'a. The slope ranges from 11 to 20 percent. There is one existing single-family, two-story dwelling of approximately 2,500 square feet under roof on the Project Area. Parking space for two cars is provided under the dwelling unit.

(2) Lava Hazard Zone: The United States Geological

Survey classifies the Project Area as being in Lava Flow Hazard Zone 3, on an ascending scale or risk, with 8 being the zone having the lowest risk and 1 being the zone with the highest risk. Zone 3 areas include the lower slopes of Mauna Loa, where lava flows have covered approximately 15 to 20 percent of the area during the past 750 years.

(3) Distance from Coastline: The Project Area is more

than 3,000 feet from the coastline.

(4) ALISH designation: The Agricultural Lands of

Importance in the State of Hawaii (ALISH) designation for the Project Area is: "Other Important Agricultural Lands."

(5) USDA Natural Resources Conservation Services Soil

Service Report Soil Type: The USDA Natural Resources Conservation Services Soil Services Soil Report designates the soil as rKED or Kaimu Extremely Stony Peat. This is a very shallow, well drained, organic soil over fragmented A'a, formed of organic matter and volcanic ash. The underlayment is fragmented A'a. Permeability is rapid, runoff slow and erosion hazard slight.

(6) Land Study Bureau Soil Rating: The Land Study

Bureau soil rating is C52 which is further described as: Volcanic Ash Rocky, well drained, and unsuited for machine tillability, with slope of 11 - 20 percent.

(7) FIRM designation: The U.S. Corps of Engineers, Flood

Insurance Rate Map designates the Project area as being within Zone X. Zone X is designated for those areas outside the 500 year flood plain.

(8) Existing Drainage Ways or Improvements: There are

no existing drainage ways or drainage improvements within the Project Area, or in the private road easement A1 and A5.

(9) Air, Noise, Water Quality: Air quality will not be

affected by the proposed Agricultural Project District as the present orchard and its attendant operations will remain substantially unchanged. Likewise the only noise associated with the orchard are tractor operations which will remain substantially unchanged. The noise associated with increased residential use will not have a significant impact on the surrounding areas as that use is consistent with the small agricultural lots adjacent to the project area. Covenants running

with the land will regulate unreasonable noise at given times of day. Water will be provided to each lot by separate County water meter through the existing private water system. Septic systems will be built for each individual residential unit in accordance with State Department of Health standards.

(B) Historic Resources:

The Project Area lies within the boundaries of the Kealahou Bay Historic District which is on the National Historic Register. However, there are no known archaeological resources in the Project Area. The entire Project Area was grubbed, lightly graded and then tracked smooth by heavy equipment to facilitate orchard operations. Hence, there are no visible or known archaeological features.

The clearing was done in two increments pursuant to a USDA soil and water conservation plan, approved in 1987, and County of Hawaii grubbing permit number 2431. The County permit was based on an archaeological inventory conducted by Chiniago Inc. (Exhibit 4), later amended by James Head, Archaeological Consultant (Exhibit 5). The State Department of Land and Natural Resources, Historic Preservation Division recommended preservation of Sites 14265 and 14267 for information purposes; however these two sites are located outside and *makai* of the Project Area. In reviewing APD application approved by the County of Hawaii in Ordinance No. 97-133, the Historic Preservation Division has determined that the Proposed Action will have "no effect" on significant historic sites. See, Exhibit 6, attached.

(C) Natural Resources

(1) Existing Floral/Faunal Resources: Flora within the Project Area consists primarily of fruit trees and wind break trees. There are also certain varieties of grasses, sedges

and broad-leaf weeds. There are no known threatened or endangered plant species on the Project Area.

Based on a botanical inventory of the Project Area, the following plant species have been identified:

Fruit Trees: Atemoya (*Annona hybrid*), avocado (*Persea Americana*), banana (*Musa accuminata*), breadfruit (*Artocarpus utilis*), cherimoya (*Annona cherimola*), grapefruit (*Citrus paradisi*), orange (*Citrus simensis*), tangerine (*Citrus reticulata*), tangelo (*Citrus hybrid*), white sapote (*Casimiroa edulis*), langsat (*Lansium domesticum*), longan (*Euphoria longan*), lychee (*Litchi chinensis*), rambutan (*Nephelium lappaceum*), coconut (*Cocos nucifera*), peach palm (*Bractris gasipaes*), vee apple (*Spondias cytherea*).

Wind-break Trees: *Eucalyptus dunii*, *Eucalyptus troyiana*, lobster claw flower (*Heleconia caribaea*), monkey pod (*Samanea saman*), kukui nut (*Aleurites moluccana*), silk oak (*Grevillea robusta*), china berry (*Melia azedarach*), jacaranda (*Jacaranda mimosifolia*).

Grasses: California grass (*Brachiaria mutica*), goose grass (*Eleusine indica*), molasses grass (*Melinis minutifolia*), guinea grass (*Panicum repens*), Hilo grass (*Paspalum conjugatum*).

Sedges: Kyllinga (*Cyperus brevifolius*), white kyllinga (*Cyperus kylinga*).

Broad-Leaf Weeds: Honohono (*Commelina diffusa*), spleen amaranth (*Amaranth dubius*), spiny amaranth (*Amaranth spinosa*), alena (*Boerhavia diffusa*), oklock (*Mirabilis jalapa*), pig weed (*Portulaca oleracea*), drymaria (*Drymaria cordata*), Japanese tea (*Cassia leschenauliana*), coffee senna (*Cassia occidentalis*), smooth rattle pod (*Crotalaria mucronata*).

Florida beggar weed (*Desmodium tortuosum*), indigo (*Indigofera suffruticosa*), haole koa (*Leucaena leucocephala*), sensitive plant (*Mimosa pudica*), yellow wood sorrel (*Oxalis corniculata*), wood sorrel (*Oxalis maritima*), Christmas berry (*Schinus terebinthifolia*), graceful spurge (*Euphorbia glomerifera*), garden spurge (*Euphorbia hirta*), petty spurge (*Euphorbia pepioides*), prostrate spurge (*Euphorbia prostrata*), Sacramento burr (*Triumfetta semitriloba*), hairy ilima (*Abutilon grandifolium*), falsemallow (*Malvastrum coromandelianum*), hairy morning glory (*Merremia aegyptia*), popolo (*Solanum nigrum*), peria (*Momordica charantia*), Spanish needle (*Bidens pilosa*), tree daisy (*Montanoa hibiscifolia*), yellow corn beard (*Siegesbeckia orientalis*), Asiatic hawkbeard (*Youngia japonica*), Jamaican vervain (*Stachytarpheta jamaicensis*).

Avifauna: With respect to the avifauna, the short winged owl or pueo (*Asio flammeus sandwichensis*) is the only endemic species which might occur at this site because it is relatively common in Hawaii, particularly at higher elevations. However, there is no evidence of nesting of this species within the Project Area. No other endemic birds would be expected at the site given the elevation and location of the site and nature of the habitats available. No waterbirds should be found within the Project Area as there are no wetlands.

Exotic birds which are most abundant in the area include the Japanese white eye (*Zosterops japonicus*), common myna (*Acridotheres tristis*), house finch (*Carpodacus mexicanus*), zebra dove (*Geopelia striata*), nutmeg manikin (*Lonchura punctulata*) and yellow fronted canary (*Serinus mozabicus*).

Fauna: Mammals in the vicinity of the Project Area include the small Indian mongoose (*Herpestes auropunctus*), which is found in the day along with feral cats. There is evidence of rats appearing at night. The area is also inhabited by feral pigs, but they have been excluded from the orchard by fencing because of the extensive damage which they can cause.

As with the flora, no endangered species of avifauna or mammals are to be found inhabiting the Project Area.

(2) **Scenic and Coastal Resources:** The Project Area is 800 feet *makai* of Napo'opo'o Road. Because of the distance, downhill slope and extensive orchard and windbreak plantings, no residential dwelling unit constructed within the Project Area is likely to be visible from Napo'opo'o Road or any other road except for Ka'awaloa Road. Ka'awaloa Road is an unimproved dirt road accessible primarily by foot and horseback and is used to visit the area around Cooks monument. A mature eucalyptus windbreak is planted down the entire Ka'awaloa Road boundary of the Project Area obscures the orchard and any future farm dwellings within the Project Area from sight.

The Project Area is not readily visible from the coast, because of its distance from the coast (3,000 feet) and the intervening feature of Pali Kapu-O-Keoua. The Project Area cannot be seen from Keawakea Point, Cook's Monument, the village of Napo'opo'o, or Kealakekua Bay Estates. The roof of the existing residential dwelling unit on the subject property is only barely discernible (through binoculars) from Palimano Point, from which many of the residential structures in the Captain Cook area can also be seen. Thus, the scenic coastal resources will not be impacted by reason of the Agricultural Project District.

(D) Social-Economic Characteristics

(1) **Social Settlement Pattern of the Area:** The Project Area lies just south of the boundary between North and South Kona and immediately *makai* of the community of Captain Cook. In 1990, the population of South Kona was calculated to be 7,658 persons with 33.8% of the districts population living in the community of Captain Cook.

The Project Area lies on the fringe of the center of density of the Captain Cook community, where small house lots give way to small farm lots. The area directly mauka has been developed into two-acre orchard lots, while the area between Napo'opo'o Road and Route 11 provides a transition from commercial uses to an agriculture zoning district, with a minimum lot size of one-acre, along with the smaller house lots, as shown on the vicinity map on **Exhibit __**.

The major agricultural uses in the area include the cultivation and production of coffee and macadamia nuts, with some vegetables, flowers and tropical fruit production. Most of these farming operations are part-time and provide families with a second source of income. This settlement pattern is entirely consistent with the aims of the proposed Agricultural Project District.

(2) Economic Resources of the Area: Besides farming and some fishing in Napo'opo'o, the economic resources of the area are limited to the retail and the state government activities still present in Captain Cook. Employment opportunities are limited and a substantial portion of the population commutes to Kailua-Kona. Construction of the infrastructural improvements and the six farm residential units contemplated in this Agricultural Project District will provide a limited amount of local employment opportunities.

(3) Land Values: Land values have fluctuated wildly in the past decade. There was a land boom in the early eighties, followed by a downtrend and another boom that ended in 1990. Since that time, land values have decreased, and in some cases land is presently valued at less than half of its peak value.

(E) Surrounding Lands

(1) **Land Use:** The surrounding area is a mix of agricultural and residential uses. The major agricultural uses in the area include the cultivation and production of coffee and macadamia nuts, with some vegetables, flowers and tropical fruit production.

(2) **Zoning:** The present zoning of the Project Area and the land *makai* and North of the Project Area is Agricultural, with a minimum lot size of five-acres (A-5a). Directly *mauka* of the Project Area, the zoning is Agricultural with a minimum lot size of two-acres (A-2a), and a large tract in the Ahupua'a of Kealakekua just south of the subject property is Residential-Agricultural with a minimum lot size of two-acres (RA-2a).

(F) Public Facilities and Services

(1) **Description of Access:** A 50-foot wide access easement from Napo'opo'o Road to the Project Area was a part of the conveyance to the applicant. This access easement is marked A1 and A5 on the Master Conceptual Plan attached as Exhibit 1. It is proposed that the present roadway, consisting of sixteen feet of pavement in a 20-foot wide graded right-of-way with a 15-foot wide ungraded setback reserved on each side would be extended to serve the Agricultural Project District as shown on the Site Plan. It is also proposed that in order to maintain the rural quality of the existing community, this roadway extension be engineered to follow the natural contours of the land as much as possible, minimizing the cuts and fills. It is anticipated that the design of the roadway will require a posted speed limit of 15 miles per hour.

This approach to the roadway improvement would accomplish the following: There would be a mitigation of the impact on Lots 4-B through 7-B over which easement A-5 passes. The volume of runoff would be reduced. The number of orchard trees which would need to be removed would be minimized. The ownership and maintenance of the road would remain

private, with its maintenance assumed by a private road maintenance association or limited liability company in which all the lot owners in the Project Area would participate.

(2) **Availability of Water:** The Project Area is presently served by six 5/8ths inch County water meters, located along Napo'opo'o Road. By letter dated January 29, 1996 (responding to a request from the previous owner dated January 12, 1996), the Hawaii County Department of Water Supply confirmed that there was a seventh water meter available to serve the Project Area. This will allow for each of the seven newly created lots in the Agricultural Project District to have its own 5/8ths inch County water meter.

(3) **Sewage Disposal:** There is no County sewer system in the vicinity of the Project Area. Sewage disposal will be handled by means of installation of individual septic systems, as approved by the State Department of Health.

(4) **Solid Waste:** Solid waste will be disposed of by individual lot owners and the agricultural management company in the nearest County transfer station. A transfer station is situated at Keei and the landfill for the West Hawaii area is located at Puuanahulu. To mitigate potential impacts, all lot owners will be encouraged to practice recycling measures to the greatest extent possible. Organic debris generated by the orchard will continue to be mulched on site.

(5) **Police and Fire protection:** The Project Area is less than a mile from the fire station and the police substation in Captain Cook. There is an existing fire hydrant located on Napo'opo'o Road at the juncture of Lots 3 -B and 4-B.

(6) **Schools:** Hookena School in Captain Cook serves the area families with children in grades K to 8. Konawaena High School serves students in grades 9 to 12.

(7) **Parks:** There is only one neighborhood recreation center in South Kona, the County's Arthur L. Greenwell Park in Captain Cook. There are also four developed beach parks and two beach park reserves in this district. Recreational facilities are crowded, and the State and County have plans to provide additional facilities.

(8) **Other Utilities and Services:** Electricity, telephone and cable TV are already connected to the existing residential dwelling unit within the Project Area. These utilities will be extended to each of the proposed lots.

(G) Conformance with State/County Plans

(1) **State Land Use Designation:** The Project Area is designated Agricultural under the State land use classification system. The Agricultural Project District is permitted under this land use designation.

(2) **Hawaii County General Plan Land Use Pattern Allocation Guide Map Designation:** The Project Area is designated for orchard use on the Land Use Pattern Allocation Guide (LUPAG) Map of the Hawaii County General Plan. This use is consistent with the uses permitted by the Agricultural Project District.

(3) **Hawaii County General Plan Goals, Policies, Standards and Courses of Action:** The Hawaii County General Plan consists of goals, policies and standards to guide the future long-range development of the County. The Agricultural Project District and the development of the subdivision and related improvements is consistent with the following goals, policies and objectives discussed below:

Economic Element

Goals: Economic development and improvement shall be in balance with the physical and social environments of the island of Hawaii.

The County shall provide an economic environment which allows new, expanded or improved economic opportunities that are compatible with the County's natural and social environment.

Policies: The County of Hawaii shall assist the expansion of the agricultural industry, especially diversified agriculture, through the protection of important agricultural lands, ...

The County of Hawaii shall strive for diversification of its economy by strengthening existing industries and attracting new endeavors.

Standard: The island of Hawaii should be developed into a unique scientific and cultural model. The island should become a model of living where economic gains are in balance with social and physical amenities. Development should be reviewed on the basis of total impact on the residents of the County, not only in terms of immediate short run economic benefits.

Analysis: The South Kona district is primarily agricultural, and the Agricultural Project District is consistent with the existing social environment in South Kona. The maintenance of the orchard is also a substantial contribution to the physical environment of the area. In addition, the Project protects and strengthens the existing tropical fruit industry in the County. The creation of small orchard parcels will provide an economic opportunity for a family managed

tropical orchard business, which is in balance with the social and physical environment of the area.

Historic Sites Element

Goal: Protect and enhance the sites, buildings and objects of significant historical and cultural importance to Hawaii.

Policy: The County of Hawaii shall require both public and private developers of land to provide a historical survey prior to the clearing or development of land when there are indications that the land under consideration has historical significance.

Analysis: Although the Project Area lies within the boundaries of the Kealahou Bay Historic District, which is on the National Historic Register, it was cleared in 1987 pursuant to a USDA soil and water conservation plan and County of Hawaii Grubbing Permit No. 2451. Prior to the land clearing, an archaeological inventory was conducted by Chiniago, Inc., (Exhibit 4) and amended by James Head (Exhibit 5). No preservation was recommended under the inventory, or by the Department of Land and Natural Resources Historic Preservation Division. In reviewing APD application approved by the County of Hawaii in Ordinance No. 97-133, the Historic Preservation Division has determined that the Proposed Action will have "no effect" on significant historic sites. See, Exhibit 6.

Public Utilities Element

Goal: Ensure that adequate, efficient and dependable public utility services will be available to users.

Analysis: Water, electricity and telephone service are presently available to service the lots of the proposed Agricultural Project District.

Land Use Element

Goal: Designate and allocate land uses in appropriate proportions and mix and in keeping with the social, cultural, and physical environments of the County.

Policy: The county shall encourage the development and maintenance of communities meeting the needs of its residents in balance with the physical and social environments.

Analysis: The Agricultural Project District with 3-acre orchard lots is in keeping with the social, cultural and physical environment of the South Kona area. This Project also meets the needs of residents by providing small farming enterprises that can be family managed.

Land Use - Agriculture Element

Goal: Identify, protect and maintain important agriculture lands on the island of Hawaii.

Policies: Zoning shall protect and maintain important agricultural lands from urban encroachment. New approaches to preserve important agricultural land shall be implemented by the County. Rural style residential-agricultural developments, such as new small-scale rural communities or extensions of existing rural communities, shall be encouraged in appropriate locations.

Analysis: The ALISH map designates the Project Area as "other important agricultural lands." The creation of 3-acre agricultural orchard lots will maintain the orchard use of the land, which is a better utilization of these agricultural lands than the possible cattle grazing that would result from the abandonment of the orchard. Further, the small-scale agricultural lots are in keeping with the type of small agricultural lots throughout South Kona.

South Kona - Economic Element

Course of Action: The County shall assist the further development of agriculture by protecting important agricultural lands from urbanization, by providing necessary resources, such as water, and through other assistance.

Analysis: The proposed Agricultural Project District will further assist in the development of the tropical fruit industry in South Kona. It will also maintain the agricultural use of the land; thus, protecting this agricultural land from urban development.

(4) **Zoning:** The Project Area is presently zoned as an Agricultural Project District and the proposed subdivision and related improvements are consistent with this zoning classification.

The Project is consistent with the purpose of the Agricultural Project District as provided under HCC Section 25-6-50 in the following manner:

(a) The Project is a "flexible and creative planning approach" to assure the survival of the existing orchard operation by creating "smaller scale agricultural activities and associated residential uses" in lieu of the present larger orchard configuration that is no longer financially viable. The flexibility provided by this special zoning district also

permits the variability of development standards regarding roadways and utilities in order to maintain the financial viability of family orchard operations on these smaller lots, and preserve the rural qualities of the area.

(b) The Project provides "continuity in land use and design" in that it will be substantially similar to the land use and design in the two-acre subdivision situated directly *mauka* of the Project Area. It also maintains the concept of small agricultural lots that are prevalent throughout South Kona.

(c) The Project "satisfies the demand for a rural lifestyle" in South Kona.

(d) The "needed infrastructural facilities and systems" to support the orchard operations are being provided. The water system already exists and the extension of the existing roadway is appropriate for the agricultural requirements of the Agricultural Project District.

The Project was approved by the Hawaii County Council in meeting the criteria under Section 25-6-51 for establishing an Agricultural Project District. The general welfare requires that a comprehensive planning approach for this area should be adopted in order to preserve the existing tropical fruit orchard operations. The required infrastructural facilities are available to service the small scale orchard lots. The Project is consistent with the intent and purpose of the Zoning Code and the County General Plan. Moreover, the development will not result in a substantial adverse impact upon the surrounding area or the South Kona region.

(5) **Regional Plan:** The Kona Regional Plan, completed in 1983, recommends that the Project Area remain in agricultural use, which is consistent with the use proposed.

(6) Special Management Area

The Project Area is within the special management area ("SMA") designated by the County Planning Commission, pursuant to Chapter 205A, Hawaii Revised Statutes and Rule 9 of the Planning Commission Rules of Practice and Procedure. Thus, an SMA assessment must be prepared for the proposed development, and an SMA use permit obtained prior to any development, unless the development is exempt from a permit under Rule 9.

VI. Summary of Major Impacts and Alternatives Considered

(A) Relationship Between Local Short Term Use of Environment and Maintenance and Enhancement of Long Term Productivity: The proposed subdivision and related improvements with the Agricultural Project District does not contemplate a substantial change of use, but rather a change in operations and ownership structure. The economic viability of Ka'awaloa Orchards as presently operated does not merit continuation. By introducing a residential component to the land, the financial viability of the orchard is increased, because in smaller units the owners and their families are more likely to undertake portions of the farm work themselves.

Small family farm operations do not require expensive labor and management as required under the present management structure. The motivation for the long-term stewardship of the land is increased because the preservation of the orchard is not only motivated by its economic return but by the aesthetic benefits and rural lifestyle concomitant with residential use and ownership of an individual fee simple lot ownership.

The preservation of a substantial portion of the existing orchard is a clear environmental preference to its discontinuation and reversion of the land to an impassable

pasturage of exotic grasses. It serves to maintain the long-term productivity of the land and enhance the environment. Its preservation is dependent on its economic sustainability.

Moreover, the entire Project Area has been previously disturbed by longstanding agricultural uses of the property, including the present orchard operations as described above.

(B) Alternatives to proposed development: The alternatives to the proposed development would be to (1) discontinue orchard operations, turn the water off and return the land to grazing; or (2) plant alternative crops. None of these alternatives is reasonable to the applicant, as discussed below.

(1) Alternative of Discontinuing the Orchard Operations: It would be extremely regrettable to let the orchard which produces Hawaii's finest lychees die. If the water were turned off and mowing operations terminated, the land would return to a combination of weeds and exotic grasses, impassible to persons on foot and providing minuscule returns as a cattle pasture. This would be an aesthetic and environmental loss to the community.

(2) Alternative of Planting Other Crops: This alternative would require the outlay of substantial capital which is not available.

Alternative Analysis: The only reasonable alternative is the development of the proposed subdivision and related improvements within the Agricultural Project District.

VII. Proposed Mitigation Measures

Mitigation Measures to Avoid, Minimize, Rectify or Reduce Impacts: The impacts of this proposed development within the Agricultural Project District are minimal. Under

the prior zoning, four 5-acre lots could be created on the 22.5 acres comprising the Project Area with the possibility of constructing additional farm dwellings on each lot. Under the ordinance approving Agricultural Project District within the Project Area, the number of dwellings would be limited to one per lot or a total of seven dwelling units, which could well be less than that allowed under present zoning.

As discussed above, the extension of the existing private road as opposed to the development of a full width County standard road, will mitigate the impact on the environment and on the community.

The proposed limitations on land use under which 85% of each lot may only be used for orchards, crop production, floriculture, nurseries and similar uses dealing with the growing of plants, is a substantial mitigative measure on surrounding landowners. Under prior A-5a zoning, all the uses in a State agricultural land use district are permitted including intensive livestock, slaughterhouses, and processing facilities.

Short term impacts during construction of the roadway will be mitigated by Applicant's compliance with all applicable governmental regulations for noise abatement and dust, drainage and sedimentation control. Moreover, the development of the proposed subdivision shall be subject to other conditions contained in the ordinance approving the Agricultural Project District including the suspension of all construction activities in the event unidentified archaeological remains are encountered.

VIII. Determination and Findings of No Significant Impact

(A) Irreversible and Irretrievable Commitments of Natural Resources that would be Involved if Proposed Action was Implemented: There are no known irreversible and

irretrievable commitments of natural resources that would be involved if the proposed action was implemented, particularly since there will not be any substantial change of the present orchard use of the land.

(B) Determination: This Final Environmental Assessment was prepared in accordance with Chapter 343, Hawaii Revised Statutes. Upon review of all available information and based on the significance criteria set forth in Section 11-200-12 of Title 11, Chapter 200 of the Administrative Rules of the Hawaii State Department of Health, the County of Hawaii has determined that the proposed Project, which consists of a subdivision of the property into seven (7) parcels with a minimum lot size of 3 acres and construction of roadway improvements, will not have a significant effect on the environment and that a Finding of No Significant Impact (FONSI) is appropriate and will be issued as the construction and use of the proposed action will not:

(1) *Involve the loss or destruction of any natural or cultural resource.*

The proposed action will not involve any construction or use activity which might lead to a loss or destruction of any natural or cultural resource. The project area does not contain any significant natural resources or any known archeological features. While situated in the Kealakekua Bay Historic District, the State Historic Preservation Division has determined that the proposed action will have "no effect" on significant historic sites.

(2) *Curtail the range of beneficial use of the environment.*

The proposed project would not interfere with any of the surrounding areas which is a mix of agricultural and residential uses. The project area is currently used as a working orchard which will be maintained under the action requested. The proposed action will complement the agricultural setting and enhance the rural lifestyle of the surrounding area.

(3) *Conflict with the State's long-term environmental policies.*

The proposed project does not conflict with long-term environmental policies, goals and guidelines of the State of Hawaii. Temporary impacts, including the construction of improvements to the existing roadway, can be mitigated by compliance with all governmental requirements, including the conditions of County of Hawaii Ordinance No. 97-133 approving the Agricultural Project District for the Project Area.

(4) *Substantially affect the economic or social welfare of the community.*

The proposed project will provide long-term benefits to the agricultural community by maintaining the agricultural use of the land, ensuring the viability of continuing commercial operations by its individual owners of the smaller orchard units, assist in the development of the tropical fruit industry in the South Kona area, and protect these agricultural lands from further encroachment by urban development.

(5) *Sustantially affect public health.*

The proposed action will not affect public health.

(6) *Involve substantial secondary effects, such as population changes or infrastructural demands.*

No substantial secondary effects are anticipated as the number of the maximum number (7) of residential units (farm dwellings) are consistent with existing zoning for the project area and surrounding lands, and existing infrastructure is adequate and available to service the proposed project. The proposed action will contain restrictions which limit the density and farm dwelling use within the project.

(7) *Involve a substantial degradation of environmental quality.*

Neither the construction of improvements to the existing roadway nor the proposed continued use of the orchards or its related farm dwellings are anticipated to significantly impact the surrounding environment.

(8) *Cumulatively have considerable impact upon the environment.*

The proposed project is not anticipated to have a considerable cumulative impact upon the environment.

(9) *Substantially affect a rare, threatened or endangered species or habitat.*

There are no known rare, threatened or endangered flora or fauna on the property that could be affected by the proposed project.

(10) *Detrimentially affect air or water quality or ambient noise levels.*

Air quality and ambient noise levels will not be affected by the proposed project as the present orchard and its attendant operations will remain substantially unchanged. No significant impacts to water quality are anticipated as individual septic systems for each farm dwelling and orchard operation will be built in accordance with State Department of Health standards. There may be temporary noise or air quality impacts during the construction of improvements to the existing private roadway, however, such impacts will be mitigated by the contractor's compliance with all government regulations relating to noise, fugitive dust and erosion control.

(11) *Affect or likely to cause damage to an environmentally-sensitive area.*

The proposed project is not located in an environmentally-sensitive area.

(12) *Substantially affect scenic vistas and viewplanes.*

The proposed project will not substantially affect any scenic vistas or viewplanes identified in county or state plans or studies.

(13) Require substantial energy consumption.

The proposed project will not require substantial energy consumption. Domestic electrical utility services are currently provided to the existing residence within the project area and can be extended to other farm dwellings by the owners of the individual orchard units in the future, though no more than six additional farm dwellings would be allowed within the Agricultural Project District.

VIII. List of Required Permits and Approvals

The Project will require final subdivision approval by the Planning Department of the County of Hawaii pursuant to Chapter 23, Hawaii County Code. The roadway improvements for the access extending to and within the Project Area shall be constructed in compliance with applicable standards of the Hawaii County Department of Public Works and may require the issuance of grading permit.

Additionally, the Project Area is within the special management area ("SMA") designated by the County Planning Commission, pursuant to Chapter 205A, Hawaii Revised Statutes and Rule 9 of the Planning Commission Rules of Practice and Procedure. Thus, an SMA assessment must be prepared for the proposed development, and an SMA use permit obtained prior to any development, unless the development is found exempt from a permit under Rule 9.

APPENDIX A

COPIES OF COMMENT AND RESPONSE LETTERS

The following parties submitted written comments on the Draft Environmental Assessment for the Ka'awaloa Orchard Agricultural Project District:

- (1) Office of Hawaiian Affairs ("OHA"), State of Hawaii
- (2) Office of Environmental Quality Control ("OEQC"), State of Hawaii

Copies of the comment letters and applicant's responses are reproduced below.

FEB 1 0 1998



STATE OF HAWAII
OFFICE OF HAWAIIAN AFFAIRS
711 KAHULANI BOULEVARD, SUITE 600
HONOLULU, HAWAII 96813-5218
PHONE: (808) 584-1888
FAX: (808) 584-1885
February 11, 1998

Doc. No. EIS-139

Mr. Tim Lui-Kwan
Carlsmith Ball, Wichman, Case & Ichiki
1001 Bishop Street
Post Office Box 656
Honolulu, HI 96809-0656

Subject: Draft Environmental Assessment (DEA) for Subdivision and Related
Improvements, Kalawala Orchards Agricultural Project District, South
Kona, Island of Hawaii.

Dear Mr. Lui-Kwan:

Thank you for the opportunity to review the Draft Environmental Assessment (DEA) for Subdivision and Related Improvements, Kalawala Orchards Agricultural Project District, South Kona, Island of Hawaii. The applicant proposes to divide 22.5 acres of tropical fruit orchard land into seven lots of approximately 3 to 3.5 acres with provisions to (i) prohibit any further subdivision for 40 years, (ii) maintain current land use, (iii) extend existing private road to provide additional access, (iii) limit farm dwelling to one per lot, (iv) maintain existing private water system, and (v) prohibit street lights.

The Office of Hawaiian Affairs (OHA) has no objections at this time to the proposed development. The tropical fruit orchard is a private land and the proposed subdivision and related improvements apparently bear no adverse impacts on adjacent lands nor upon existing flora and fauna and no known archaeological remains exist in the area. A traffic impact analysis of the area indicates that the existing roadway system is adequate to handle traffic generated by the additional lots.

Letter to Mr. Tim Lui-Kwan
February 11, 1998
Page 2

Please contact Colin Kippen (594-1938), LNR Officer, or Luis Manrique (594-1758), should you have any questions on this matter.

Sincerely yours,


Randall Ogata
Administrator


Colin Kippen
Officer,
Land and Natural
Resources Division

cc: Board of Trustees
CAC, Island of Hawaii

CARLSMITH BALL, WICHMAN CASE & ICHIKI

ATTORNEYS AT LAW

A REGISTERED PROFESSIONAL CORPORATION
PACIFIC TOWER, SUITE 2200
1001 BISHOP STREET
POST OFFICE BOX 688
HONOLULU, HAWAII 96809-0688

DIRECT DIAL NO
1001 533-3111

TELEPHONE (808) 533-2600
FAX (808) 533-0642
E-MAIL: TK@CARLSMITH.COM

OUR REFERENCE NO.
924348-8

February 18, 1998

Mr. Randall Ogata, Administrator
Office of Hawaiian Affairs
State of Hawaii
711 Kapi'olani Boulevard, Suite 500
Honolulu, Hawaii 96813-5249

Re: Draft Environmental Assessment for Subdivision and Related
Improvements, Kāi'awala Orchards Agricultural Project District,
South Kona, Hawaii, TMK 3/8-1-9; parcel 19 and portion of parcel 20.

Dear Mr. Ogata:

Thank you for your letter of February 11, 1998 (Doc. No. EIS-137) indicating that the Office of Hawaiian Affairs (OHA) has no objections to the proposed development at the present time. Your letter, along with this response will be reproduced in the forthcoming Final Environmental Assessment.

We appreciate your interest and participation in the consultation phase of the environmental review process.

Sincerely yours,


Tim Lui-Kwan

cc: Hawaii County Planning Department
Seamount Enterprises, LLC

BENJAMIN J. CAETANO
COMMISSIONER



DARYL GILL
DIRECTOR

STATE OF HAWAII
OFFICE OF ENVIRONMENTAL QUALITY CONTROL

235 SOUTH BERTANAMA STREET
SUITE 202
HONOLULU, HAWAII 96813
TELEPHONE (808) 586-4185
FACSIMILE (808) 586-4188

February 23, 1998

Ms. Virginia Goldstein, Director
Planning Department, County of Hawaii
25 Aupuni Street
Hilo, Hawaii 96720

Dear Ms. Goldstein:

Subject: Draft Environmental Assessment for the Kaawaloa Orchards
Agricultural Project District, Hawaii

Thank you for the opportunity to review the draft environmental
assessment. We have the following comments.

1. The project is located approximately 3,000 feet away from
Kealakekua Bay. What is the extent of grading for the
project? What specific mitigation measures are planned to
reduce storm water run-off from entering the bay.
2. Eighty-five percent of the project area is designated for
agricultural purposes. The project proposes to use potable
water for agricultural irrigation. Please consider other
alternatives such as use of non-potable water and water
conservation measures.
3. According to the environmental assessment, "the area utilized
for farmland purposes will be limited to 15% of the total
land area." 15% of a 3 acre lot is almost 20,000 square feet.
A very big house could be built on the lot. What limits on
the size of the dwellings will in place to ensure that very
big houses that are out of character with the surrounding area
are not built?
4. Please discuss the findings and reasons for supporting the
FONSI determination based on the significant criteria listed
in §11-200-12 of the EIS rules. Please see the enclosed
example.

Ms. Goldstein
Page 2

If you have any questions please call Jeyan Thirugnanam at 586-
4185.

Sincerely,


Gary Gill
Director

c: Seamount Enterprises
Rim Lui-Kwan

CARLSMITH BAIL WICHMAN CASE & ICHIKI

ATTORNEYS AT LAW

A PARTNERSHIP INCLUDING LAW COMPANIONS

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E-MAIL TK@CARLSMITH.COM

OUR REFERENCE NO.
024218-B

February 24, 1998

Mr. Gary Gill, Director
Office of Environmental Quality Control
State of Hawaii
235 S. Beretania Street, Suite 702
Honolulu, Hawaii 96813

Re: Draft Environmental Assessment for Subdivision and Related
Improvements, Ka'awaloa Orchards Agricultural Project District,
South Kona, Hawaii, TMK 3/8-1-9, parcel 19 and portion of parcel 20.

Dear Mr. Gill:

Thank you for your letter of February 23, 1998 commenting on the subject Draft Environmental Assessment ("DEA"). We offer the following responses in the respective order of your comments:

1. Extent of Grading. The only grading required in the proposed project will be limited to the extension by approximately 1,000 feet of the existing private roadway within a 20-wide right-of-way as shown on the Master Conceptual Plan attached as Exhibit 1 of the DEA. As discussed in the DEA, any anticipated short-term impacts arising during the construction of this roadway extension will be mitigated by Applicant's compliance with all County and State regulations for drainage, erosion and sedimentation control, including Chapter 10 of the Hawaii County Code, as required by Conditions F and G of Ordinance No. 97-133 attached as Exhibit 3 to the DEA. No additional agricultural grading is proposed or anticipated as the entire area was previously cleared and planted with the existing tropical fruit tree orchard over 10 years ago.

Mr. Gary Gill, Director
Office of Environmental Quality Control
February 24, 1998
Page 2

2. Use of Potable Water for Agricultural Purposes. It is anticipated that agricultural water usage would not exceed that currently used for the existing orchard of fully matured fruit trees which presently covers the entire project area. While county water is available and used for irrigation in current orchard operations, this water is considered an essential, though expensive, resource which is conserved by drip irrigation and other crop management practices. Water catchment reservoirs have been previously used (prior to the availability of county system water) on this parcel and in the surrounding area, however, reliance on this would make commercial agriculture more risky and extremely vulnerable in times of drought given the average rainfall (approximately 40 to 50 inches annually) in this part of South Kona. Moreover, acceptable treated effluent is not currently available in this area and requiring individual orchard owners to install a recycling system for nonpotable irrigation water would defeat the project's stated purpose of creating economic opportunities for small, family-owned commercial orchard operations. However, the Applicant will encourage the purchasers of the individual orchard parcels to continue sound crop management and water resource conservation practices, including the installation and use of supplemental water catchment systems for their irrigation.
3. Maximum Area Utilized for Farm Dwelling Purposes. The limitation imposed by the Hawaii County Council in its adoption of Ordinance No. 97-133 was not intended to encourage the construction of farm dwellings of 20,000 square feet but to require the actual use of not less than 85% of any parcel for agricultural purposes. Moreover, the restrictive maximum of 15% of the total land area is not a limitation on the size of the structure but a limitation of this 15% for any or all farm dwelling purposes, including carports, out-buildings, lawns, residential landscaping and structural setbacks. This is in keeping with the surrounding properties and further consistent with preserving the rural character of the area in which residential parcels are at a minimum 1/2 acre in size.

Mr. Gary Gill, Director
Office of Environmental Quality Control
February 24, 1998
Page 3

4. **Significance Criteria.** A discussion of the significance criteria that supports the anticipated Finding of No Significant Impact (FONSI) will be included in the Final Environmental Assessment.

Your letter, along with this response will be reproduced in the forthcoming Final Environmental Assessment. We appreciate your interest and participation in the consultation phase of the environmental review process.

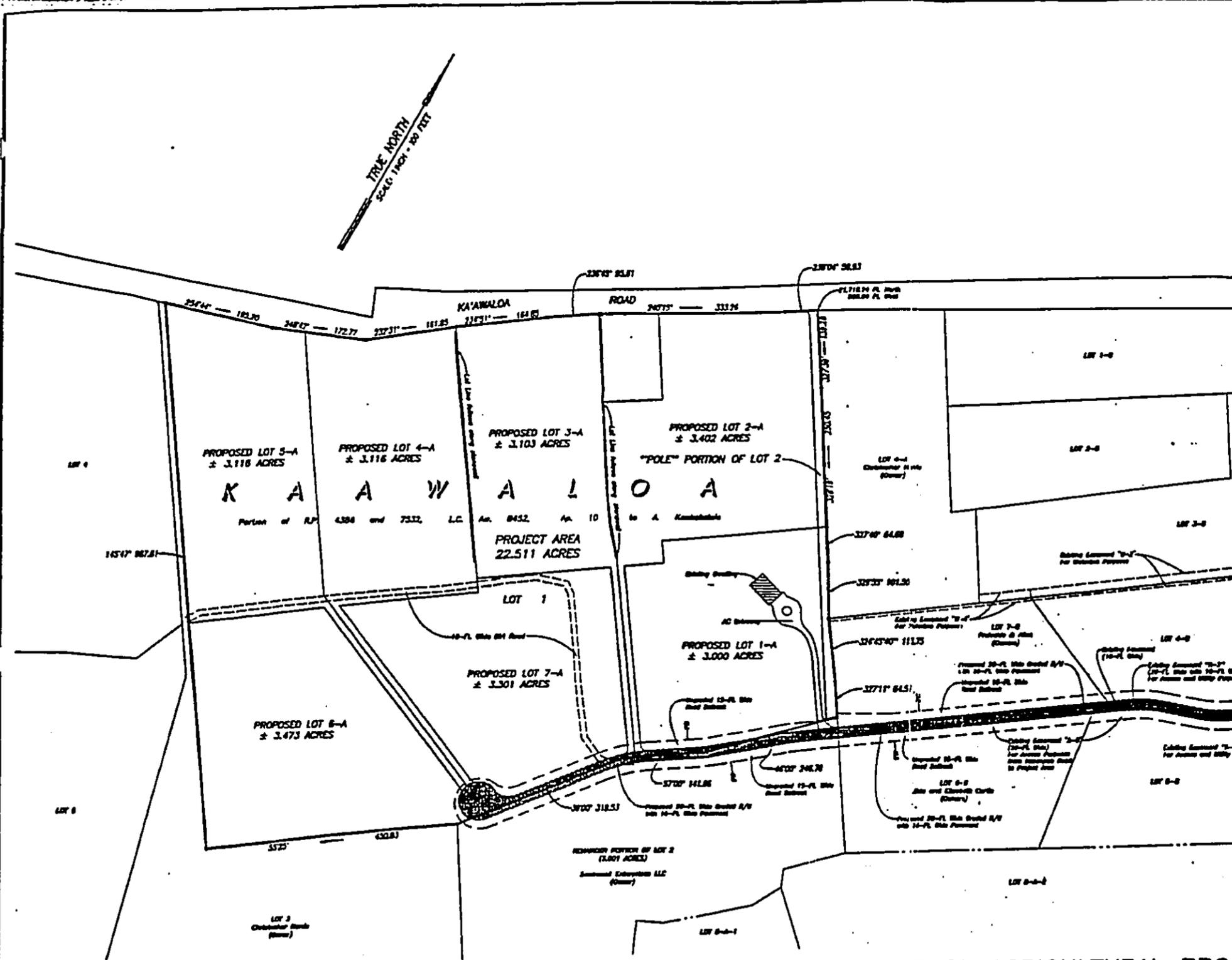
Thank you again for your thoughtful and helpful comments.

Sincerely yours,



Tim Lili-Kwan

cc: Hawaii County Planning Department
Seamount Enterprises, LLC



PROPOSED "KA'AWALO A ORCHARDS" AGRICULTURAL PROJECT

MAP SHOWING PROJECT AREA CONSISTING OF LOT 1 AND "POLE" PORTION OF LOT 2

Being Portions of R.P. 4386 and 7532, L.C. Aw. 8452, Ap. 10 to A. Keohokaha

At Ka'awaloa, South Kona Island and County of Hawaii, State of Hawaii

- NOTES:**
1. Azimuths and coordinates are referred to Government Survey Triangulation Station "LAE O KAHANI".
 2. Names of owners of adjoining parcels are from available Tax Map records.
 3. Land Uses proposed for Lots 1-A to 7-A, inclusive: Orchard and Farm Dwelling Uses.
 4. Proposed density: Only one farm dwelling per (3-acre) lot.



Prepared For:
SEAMOUNT ENTERPRISES LLC (OWNER)
 d.b.a. Ka'awaloa Orchards
 845 Delaware Pk. E., #305
 Seattle, Washington 98112



PROPOSED "KA'AWALOA ORCHARDS" AGRICULTURAL PROJECT DISTRICT

Land situated on the Southerly side of Ka'awaloa Road approximately 1,300 feet Westerly of Napoopoo Road at Ka'awaloa, South Kona, Island and County of Hawaii, State of Hawaii.

Being the whole of:

Lot 1;

Being also portions of:

Lot 2; and

Royal Patents 4386 and 7532, Land Commission Award 8452, Apana 10 to A. Keohokalole.

Beginning at the Northerly corner of this parcel of land, being also a point on the Southerly side of Ka'awaloa Road, the coordinates of said point of beginning referred to Government Survey Triangulation Station "LAE O KANONI" being 21,718.24 feet North and 969.04 feet West and running by azimuths measured clockwise from True South:

Thence, for the next four (4) courses following along Lot 4-A and along the remainder of Royal Patents 4386 and 7532, Land Commission Award 8452, Apana 10 to A. Keohokalole:

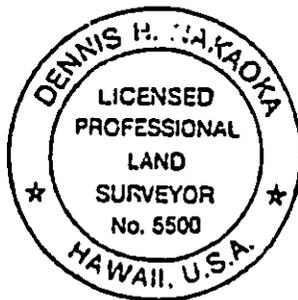
1. 327° 39' 139.28 feet to a point;
2. 328° 19' 250.45 feet to a point;
3. 327° 40' 64.68 feet to a point;
4. 329° 55' 101.50 feet to a point;

Thence, for the next seven (7) courses following along the remainder of Royal Patents 4386 and 7532, Land Commission Award 8452, Apana 10 to A. Keohokalole:

5. 324° 45' 40" 113.75 feet along Lot 7-B to a point;

- | | | |
|-----|----------|--|
| 6. | 327° 11' | 64.51 feet along Lot 7-B to a point; |
| 7. | 46° 00' | 246.78 feet along the remainder of Lot 2 to a point; |
| 8. | 57° 00' | 141.66 feet along the remainder of Lot 2 to a point; |
| 9. | 39° 00' | 319.53 feet along the remainder of Lot 2 to a point; |
| 10. | 55° 25' | 450.83 feet along Lot 3 to a point; |
| 11. | 145° 47' | 987.61 feet along Lot 3 to a point; |
- Thence, for the next seven (7) courses following along the Southerly side of Kaawaloa Road:
- | | | |
|-----|----------|--|
| 12. | 254° 44' | 195.20 feet to a point; |
| 13. | 248° 42' | 172.77 feet to a point; |
| 14. | 232° 31' | 161.85 feet to a point; |
| 15. | 234° 51' | 164.85 feet to a point; |
| 16. | 236° 45' | 95.61 feet to a point; |
| 17. | 240° 15' | 333.26 feet to a point; |
| 18. | 238° 04' | 58.93 feet to the point of beginning and containing an area of 22.511 Acres. |

TOGETHER WITH, Existing Easements "A-1" and "A-5" for Access and Utility Purposes.



WES THOMAS ASSOCIATES

Dennis H. Nakaoka
Licensed Professional Land Surveyor
State of Hawaii Certificate No. LS-5500

75-5749 Kalawa Street
Kailua-Kona, Hawaii 96740-1817
TMK: 8-1-09: Portion 18 through 24 (3rd Division)
April 24, 1997

COUNTY OF HAWAII STATE OF HAWAII

BILL NO. 129
(Draft 2)

ORDINANCE NO. 97 133

AN ORDINANCE AMENDING SECTION 25-8-4 (SOUTH KONA ZONE MAP), ARTICLE 8, CHAPTER 25 (ZONING CODE) OF THE HAWAII COUNTY CODE, BY CHANGING THE DISTRICT CLASSIFICATION FROM AGRICULTURAL (A-5a) TO AGRICULTURAL PROJECT DISTRICT (APD) AT KA'AWALOA, SOUTH KONA, HAWAII, COVERED BY TAX MAP KEY 8-1-9:18, 19, 21 AND PORTIONS OF 20, 22, 23 AND 24.

BE IT ORDAINED BY THE COUNCIL OF THE COUNTY OF HAWAII:

SECTION 1. Section 25-8-4, Article 8, Chapter 25 (Zoning Code) of the Hawaii County Code, is amended to change the district classification of property described hereinafter as follows:

The district classification of the following area situated at Ka'awaloa, South Kona, Hawaii, shall be Agricultural Project District (APD):

Beginning at the Northerly corner of this parcel of land, being also a point on the Southerly side of Ka'awaloa Road, the coordinates of said point of beginning referred to Government Survey Triangulation Station "LAE O KANONI" being 21,718.24 feet North and 969.04 feet West and running by azimuths measured clockwise from True South:

Thence, for the next four (4) courses following along Lot 4-A and along the remainder of Royal Patents 4386 and 7532, Land Commission Award 8452, Apana 10 to A. Keohokalole:

1. 327° 39' 139.28 feet to a point;
2. 328° 19' 250.45 feet to a point;
3. 327° 40' 64.68 feet to a point;
4. 329° 55' 101.50 feet to a point;

Thence, for the next seven (7) courses following along the remainder of Royal Patents 4386 and 7532, Land Commission Award 8452, Apana 10 to A. Keohokalole:

Exhibit 3

- 5. 324° 45' 40" 113.75 feet along Lot 7-B to a point;
- 6. 327° 11' 64.51 feet along Lot 7-B to a point;
- 7. 46° 00' 246.78 feet along the remainder of Lot 2 to a point;
- 8. 57° 00' 141.66 feet along the remainder of Lot 2 to a point;
- 9. 39° 00' 319.53 feet along the remainder of Lot 2 to a point;
- 10. 55° 25' 450.83 feet along Lot 3 to a point;
- 11. 145° 47' 987.61 feet along Lot 3 to a point;

Thence, for the next seven (7) courses following along the Southerly side of Kaawaloa Road:

- 12. 254° 44' 195.20 feet to a point;
- 13. 248° 42' 172.77 feet to a point;
- 14. 232° 31' 161.85 feet to a point;
- 15. 234° 51' 164.85 feet to a point;
- 16. 236° 45' 95.61 feet to a point;
- 17. 240° 15' 333.26 feet to a point;
- 18. 238° 04' 58.93 feet to the point of beginning and containing an area of 22.511 Acres.

All as shown on the map attached hereto, marked Exhibit "A" and by reference made a part hereof (herein after referred to as the "subject property").

SECTION 2. This change in district classification is conditioned upon the following:

- A. The applicant, its successors or assigns shall be responsible for complying with all of the stated conditions of approval.

- B. The applicant, its successors or assigns shall be responsible for complying with all requirements of Chapter 205, Hawaii Revised Statutes, relating to permissible uses within the State Land Use Agricultural District.
- C. The required water commitment payment shall be submitted to the Department of Water Supply in accordance with its "Water Commitment Guidelines Policy" within ninety (90) days from the effective date of this ordinance.
- D. Final Subdivision Approval within the proposed agricultural project district (APD) area shall not exceed seven lots and shall be secured from the Planning Director within five (5) years from the effective date of this ordinance. Subdivision plans shall delineate the 50-foot access easement, from Napo'opo'o Road to and within the subject property.
- E. Access to the subject property from Napo'opo'o Road shall meet the requirements of the Department of Public Works. Roadway improvements, if required, at the intersection of the access road and Napo'opo'o Road shall meet the requirements of the Department of Public Works.
- F. The roadway improvements for the access extending to the subject property and the interior roadway within the subject property shall be constructed to a 16-foot wide paved roadway within a 20-foot wide graded right-of-way, shall be engineered to follow the natural contours of the land not to exceed 20 percent in grade in any area and shall comply with the applicable grading, driveway, drainage and roadway standards of the Department of Public Works. No street lights will be required within the subject property.
- G. A drainage study of the subject property, if required, shall be prepared for review and approval by the Department of Public Works, prior to submittal of

plans for subdivision review. Drainage improvements, if required, shall be constructed meeting with the approval of the Department of Public Works prior to the issuance of Final Subdivision Approval.

H. Restrictive covenant(s) in the deeds of all the proposed agricultural lots within the subject property shall include the following:

- (1) As contained in the master conceptual plan, the APD for the subject property shall be subdivided into no more than seven (7) lots. Each of the proposed lots shall not be further subdivided for a period of forty (40) years from the effective date of Final Subdivision Approval. With the consent of a majority of the land owners within the APD, any further subdivision or increase in density will require an amendment to this ordinance.
- (2) A minimum of eighty five percent (85%) of the total land area within each proposed lot shall be retained in its existing orchard use or in other agricultural uses for crop production, floriculture, nurseries and similar uses dealing with the growing of plants. Accessory uses and facilities such as shade houses, agricultural storage sheds and other uses necessary to facilitate or process the primary agricultural products shall be permitted. Public retail sales of agricultural products shall be prohibited.
- (3) Only one farm dwelling will be permitted on each proposed lot, and the area utilized for the farm dwelling purposes shall be limited to fifteen (15%) of the total land area within each proposed lot. The remainder of each proposed lot shall continue to be utilized for agricultural uses indicated in H(2) above.

- (4) The existing tropical fruit orchards, which produce lychee, rambutan and avocado, shall be maintained on the newly created lots as long as they are viable. Prior to any new proposed agricultural use other than the existing agricultural use or other permitted agricultural uses identified in H(2) which may create any additional impact to the existing infrastructure or cause any adverse effects to the public's health, safety and welfare, the new proposed use will be considered as an amendment to this ordinance and processed for Council approval.

A copy of the proposed covenant(s) to be recorded with the Bureau of Conveyances shall be submitted to the Planning Director for review and approval prior to the issuance of Final Subdivision Approval. A copy of the approved covenant shall be recited in an instrument executed by the applicant and the County and recorded with the Bureau of Conveyances in conjunction with the issuance of Final Subdivision Approval for any portion of the subject property. A copy of the recorded document shall be filed with the Planning Department upon its receipt from the Bureau of Conveyances.

- I. Should any unidentified sites or remains such as artifacts, shell, bone, or charcoal deposits, human burials, rock or coral alignments, pavings or walls be encountered, work in the immediate area shall cease and the Department of Land and Natural Resources-Historic Preservation Division (DLNR-HPD) shall be immediately notified. Subsequent work shall proceed upon an archaeological clearance from the DLNR-HPD when it finds that sufficient mitigative measures have been taken.
- J. Should the Council adopt a Unified Impact-Fees Ordinance setting forth criteria for imposition of exactions or the assessment of impact fees, conditions included

herein shall be credited towards the requirements of the Unified Impact Fee Ordinance.

- K. Comply with all other applicable laws, rules, regulations and requirements of the affected agencies for the development of the subject property.

- L. An initial extension of time for the performance of conditions within the ordinance may be granted by the Planning Director upon the following circumstances:
 - 1. The non-performance is the result of conditions that could not have been foreseen or are beyond the control of the applicants, its successors or assigns, and that are not the result of their fault or negligence.
 - 2. Granting of the time extension would not be contrary to the General Plan or Zoning Code.
 - 3. Granting of the time extension would not be contrary to the original reasons for the granting of the change of zone.
 - 4. The time extension granted shall be for a period not to exceed the period originally granted for performance (i.e., a condition to be performed within one year may be extended for up to one additional year).

- M. Should any of the conditions not be met or substantially complied with in a timely fashion, the Director may initiate rezoning of the area within the subject property to its original or more appropriate designation.

SECTION 3. In the event that any portion of this ordinance is declared invalid, such invalidity shall not affect the other parts of this ordinance.

SECTION 4. This ordinance shall take effect upon its approval.

INTRODUCED BY:

Dr. David L. Todd
COUNCIL MEMBER, COUNTY OF HAWAII

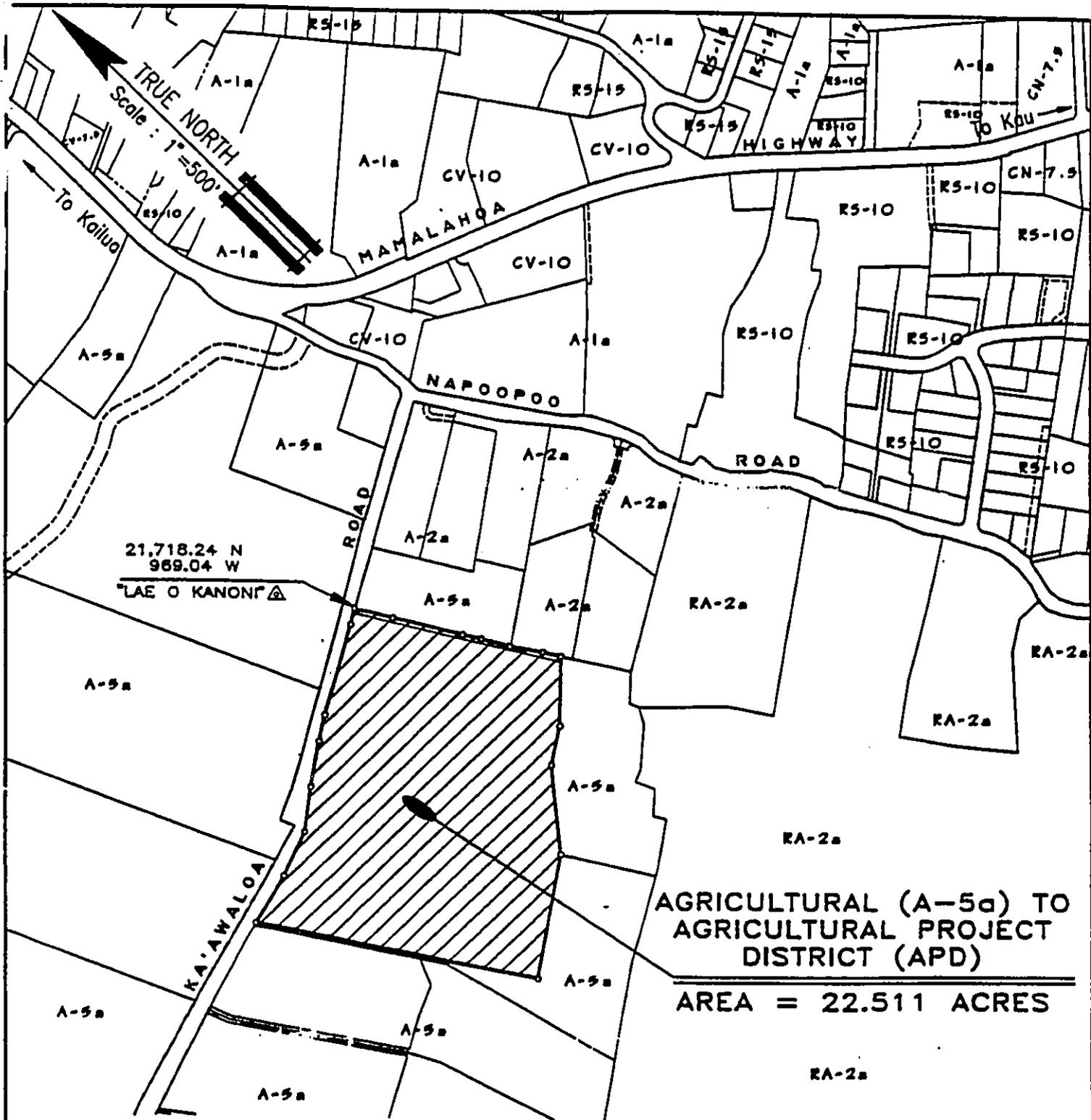
Hilo, Hawaii

Date of Introduction: September 17, 1997
Date of 1st Reading: September 17, 1997
Date of 2nd Reading: October 15, 1997
Effective Date: October 23, 1997

APPROVED AS TO FORM AND LEGALITY

Frederick L. Linn
DEPUTY CORPORATION COUNSEL

DATED: 10/18/97



AMENDMENT TO THE ZONING CODE

AMENDING SECTION 25-8-4 (SOUTH KONA ZONE MAP) ARTICLE 8, CHAPTER 25 (ZONING CODE) OF THE HAWAII COUNTY CODE, BY CHANGING THE DISTRICT CLASSIFICATION FROM AGRICULTURAL (A-5a) TO AGRICULTURAL PROJECT DISTRICT (APD) AT KA'AWALOA, SOUTH KONA, HAWAII.

PREPARED BY : PLANNING DEPARTMENT
COUNTY OF HAWAII

TMK : 8-1-9:18,19,21 and Portions of 20,22,23 & 24

JULY 18, 1997

EXHIBIT "A"

(SEAMOUNT ENTERPRISES LLC.
DBA KA'AWALOA ORCHARDS)

OFFICE OF THE COUNTY CLERK
 County of Hawaii
Hilo, Hawaii

(DRAFT 2) 23 OCT 1997

Introduced By: Bobby Jean Leithead-Todd (B/R)
 Date Introduced: September 17, 1997
 First Reading: September 17, 1997
 Published: N/A

REMARKS:
10/01/97 - Deferred on Council level.

ROLL CALL VOTE				
	AYES	NOES	ABS	EX
Arakaki	X			
Chung	X			
Leithead-Todd	X			
Ray	X			
Reynolds	X			
Santangelo	X			
Smith	X			
Tyler	X			
Yagong	X			
	9	0	0	0

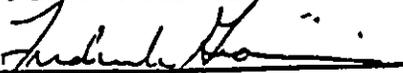
Second Reading: October 15, 1997
 To Mayor: October 17, 1997
 Returned: October 23, 1997
 Effective: October 23, 1997
 Published: November 5, 1997

REMARKS:

ROLL CALL VOTE				
	AYES	NOES	ABS	EX
Arakaki	X			
Chung	X			
Leithead-Todd	X			
Ray	X			
Reynolds	X			
Santangelo	X			
Smith			X	
Tyler	X			
Yagong			X	
	7	0	2	0

I DO HEREBY CERTIFY that the foregoing BILL was adopted by the County Council and published as indicated above. APPROVED AS TO

FORM AND LEGALITY:


 DEPUTY CORPORATION COUNSEL
 COUNTY OF HAWAII

Date 10/18/97

Approved/Disapproved this 23 day
 of October 19 97.


 MAYOR, COUNTY OF HAWAII


 COUNCIL CHAIRMAN

 COUNTY CLERK

Bill No.: 129 (Draft 2)
 Reference: C-452/PC-77
 Ord. No.: 97 133

CHINIAGO INC.

Archaeological Consulting
P. O. Box 2649
Kamuela, Hawaii 96743
(808) 885-7262

September 11, 1990

Mr. Christopher Norrie
P. O. Box 339
Captain Cook, Hawaii 96704

Dear Mr. Browne:

Subject: Archaeological Investigations at Kaawaloa, South Kona [TMK: 8-1-09: 2, 14, 16-27]

I am herewith transmitting to you three copies of our report entitled "Kaawaloa, South Kona: Hawaii Island: Archaeological Inventory Survey and Data Recovery."

I have taken the liberty of sending a copy to the Hawaii County Planning Department and, as a courtesy, one to Dr. Cordy at the Historic Preservation Office in Honolulu.

If you have any questions, please do not hesitate to contact me.

Sincerely yours,



William Barrera, Jr.
President

cc: County Planning Department
Historic Preservation Office

Exhibit 4

**KAAWALOA, SOUTH KONA, HAWAII ISLAND:
ARCHAEOLOGICAL INVENTORY SURVEY AND DATA RECOVERY**

Prepared for:

**KAAWALOA ORCHARDS
P. O.Box 339
Captain Cook, Hawaii 96704**

Prepared by:

**William Barrera, Jr.
CHINAGO INC..
P. O. Box 2649
Kamuela, Hawaii 96743**

SEPTEMBER 1990

I. INTRODUCTION

Archaeological investigations consisting of site inventory survey and data recovery were conducted on approximately 40 acres at Kaawaloa, South Kona, Hawaii Island [TMK: 8-1-09: 2, 14 and 16 through 27]. The fieldwork was done in two phases:

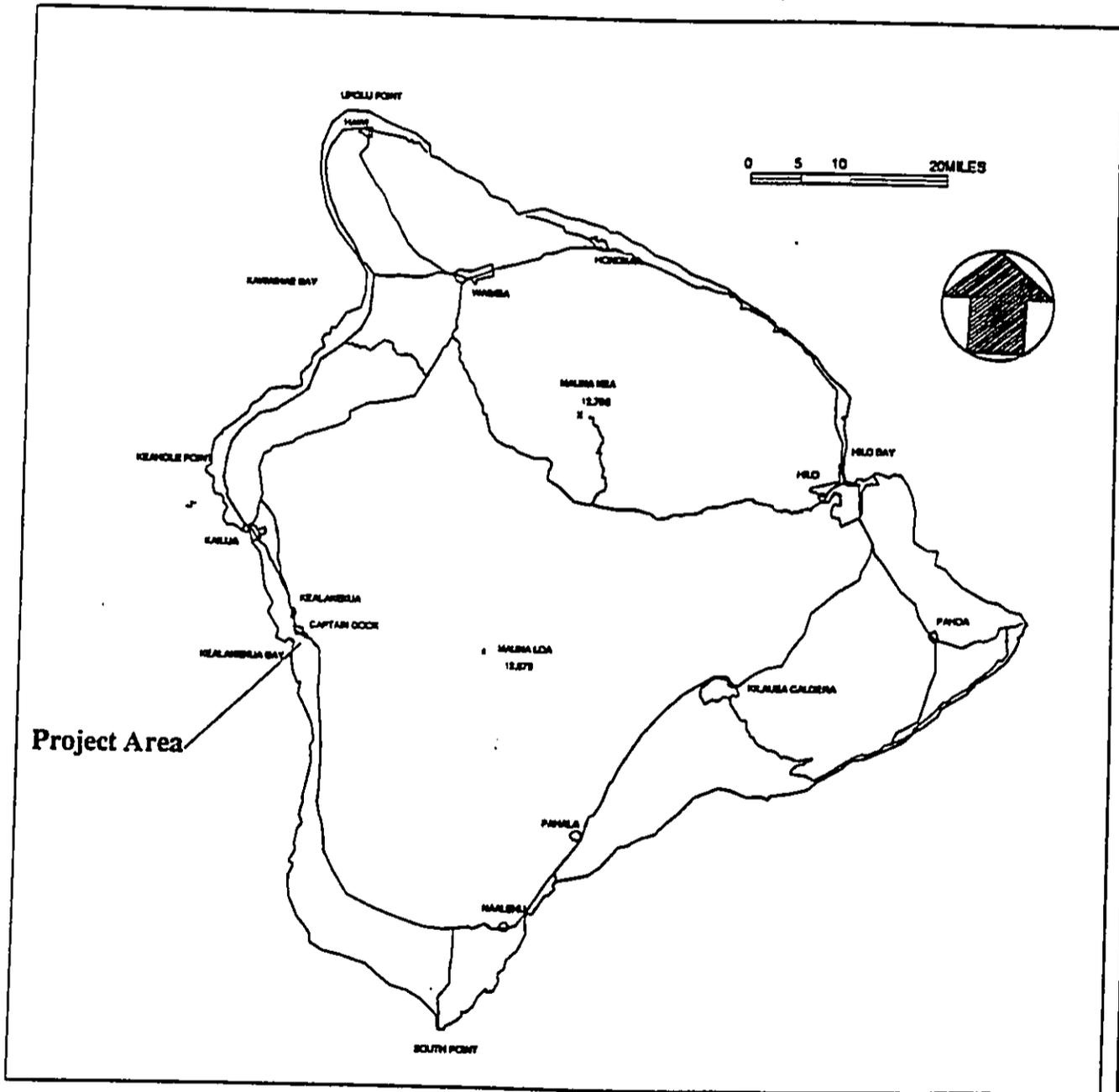
Phase One [March 1990] - This work involved an archaeological inventory

survey of approximately twenty acres in the east project area [TMK: 8-1-09: 21, 22 and portions of 23 and 24], and the bulldozer excavation of five trenches through features of the Kona Field System in this project area and three trenches through features in the Phase Two project area [TMK: 8-1-09: 25 through 27 and portions of 23 and 24]. This trenching was done in accordance with specific conditions imposed by the Historic Preservation Program of the

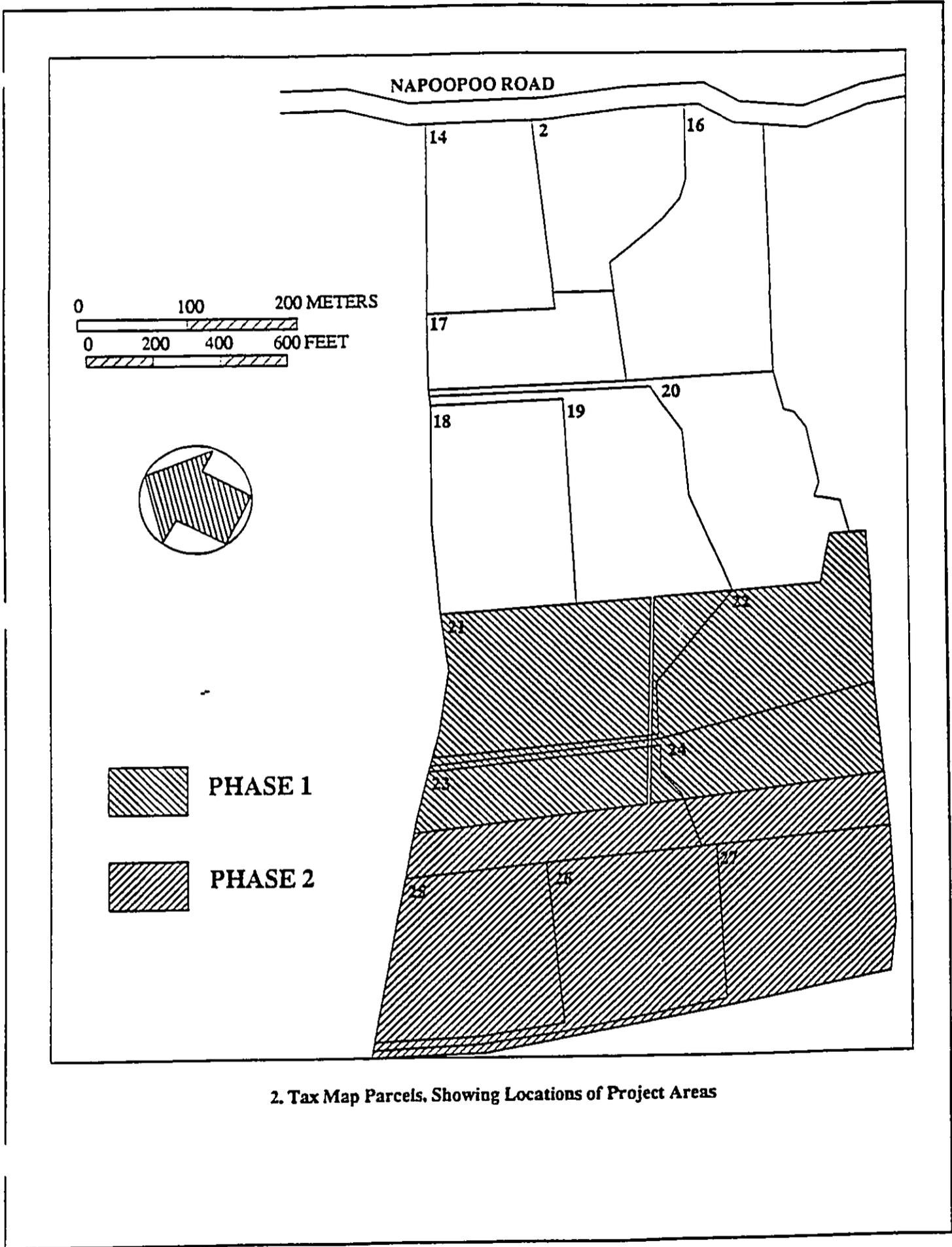
Department of Land and Natural Resources [Appendix I].

Phase Two [May 1990] - This consisted of an archaeological inventory survey of approximately twenty acres in the west project area.

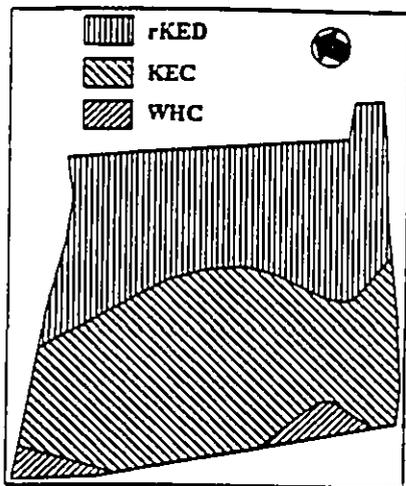
The project area is located on the west side of Napoopoo Road, approximately one-half mile from Kealakekua Bay at an elevation of



1. Hawaii Island, Showing Location of Project Area



2. Tax Map Parcels, Showing Locations of Project Areas



3. USDA Soil Types

between 850 and 1100 feet. It is located within the boundaries of both the Kealahou Bay Historic District [Site 50-10-47-7000] and the Kona Field System (50-10-37-6601). Historic land use has been truck farming and cattle grazing.

The Soil Conservation Service of the United States Department of Agriculture recognizes three soil types in the project area, as follows:

"Kaimu extremely stony peat, 6 to 20 percent slopes (rKED). - This soil is at low elevations on Mauna Loa.

"In a representative profile the surface layer is very dark brown extremely stony peat about 3 inches thick. It is underlain by fragmental Aa lava. This soil is neutral in reaction.

"Representative profile, Naalehu Quadrangle, lat. 19°32'40"N. and long. 155°32'40" W.:

"O2 - 3 inches to 0, very dark brown (10YR 2/2) extremely stony peat; weak, very fine, granular structure; very friable, nonsticky, and nonplastic; many roots; many fine pores; Aa lava fragments from gravel to stone size make up 50 to 80 percent of the volume; neutral; clear, smooth boundary.

"IIC - 0 to 20 inches, fragmental Aa lava; very little soil material in voids and cracks.

"The O2 horizon ranges from 2 to 8 inches in thickness and from 5YR to 10YR in hue.

"Included in mapping are small areas of Very stony land.

"Permeability is rapid, runoff is slow, and the erosion hazard is slight.

"This soil is not suitable for cultivation. Most of it is in native woodland. Small areas are used for pasture, macadamia nuts, papaya, and citrus fruits. (Capability subclass VII, nonirrigated; pasture group 5)" [USDA Soil Conservation Service 1973: 22].

"Kainaliu extremely stony silty clay loam 12 to 20 percent slopes (KEC). - This soil is at low elevations on Mauna Loa and Hualalai.

"In a representative profile the surface layer is very dark brown extremely stony silty clay loam about 10 inches thick. The subsoil consists of dark-brown very stony silty clay loam and silt loam. It is about 16 inches thick and is underlain by fragmental Aa lava.

"The surface layer is medium acid, and the subsoil is neutral.

"Representative profile, Kealahou Quadrangle, lat. 19°32'23" N. and long. 155°56'15" W.:

"Ap - 0 to 10 inches, very dark brown (10YR 2/2) extremely stony silty clay loam; strong, medium and fine, subangular blocky structure; hard, friable, slightly sticky, and plastic; many roots; many very fine pores; 10 to 15 percent Aa lava fragments from gravel to stone size; medium acid; abrupt, smooth boundary. (6 to 12 inches thick)

"B21 - 10 to 18 inches, dark-brown (7.5YR 3/2) stony silty clay loam; weak, medium and fine, subangular blocky structure; slightly hard, friable, slightly sticky, and plastic; many roots; many medium and fine pores; 20 to 40 percent Aa lava fragments from gravel to stone size; neutral; clear, smooth boundary. (8 to 10 inches thick)

"B22 - 18 to 26 inches, dark-brown (7.5YR 3/3) very stony silt loam; weak, medium and fine, subangular blocky structure; slightly hard, friable, slightly sticky, and slightly plastic; few roots; many medium and fine pores; 50 to 60 percent Aa lava fragments from gravel to stone size;

neutral; gradual, wavy boundary. (6 to 10 inches thick)

"IIR - 26 inches, fragmental Aa lava.

"The depth to fragmental Aa lava ranges from 20 to 40 inches. The hue of the solum ranges from 5YR to 10YR. The structure of the A horizon is moderate to strong, and that of the B horizon is weak to moderate.

"Included in mapping are small areas of soils underlain by pahoehoe lava at a depth of less than 30 inches. Also included are soils at lower elevations that are similar to the Waiaha soils, except that they are underlain by fragmental Aa lava.

"Permeability is rapid, runoff is slow, and the erosion hazard is slight. Roots penetrate to a depth of 26 inches or more.

"This soil is used for coffee, macadamia nuts, and pasture. (Capability subclass VII, nonirrigated; pasture group 5; woodland group 2)" [Ibid: 22-3].

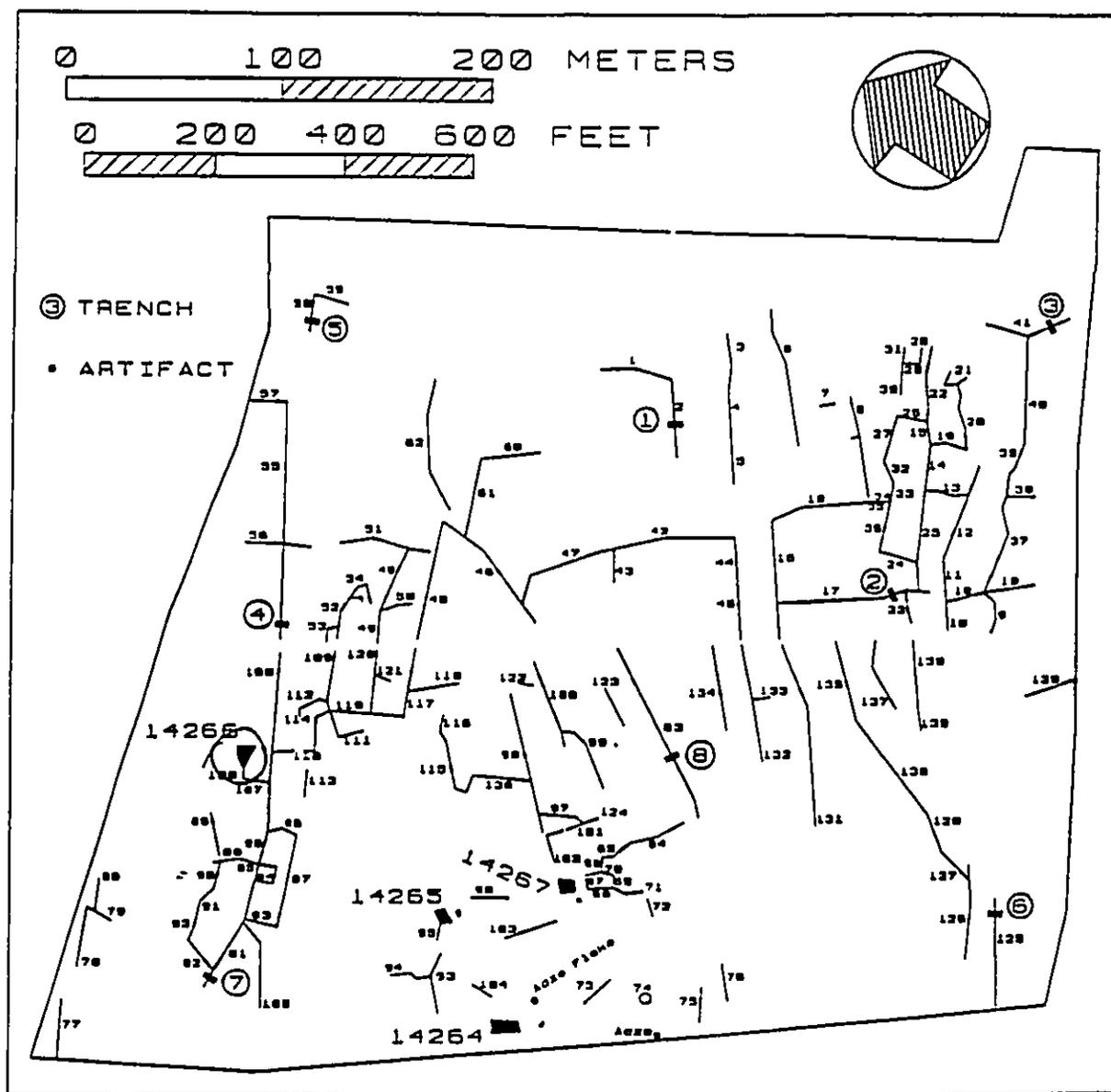
"Waiaha extremely stony silt loam, 6 to 12 percent slopes (WHC). - This soil is low on the leeward side of Hualalai and Mauna Loa.

"In a representative profile the surface layer is very dark brown extremely stony silt loam about 4 inches thick. The sub-stratum is pahoehoe lava bedrock. The surface layer is slightly acid. The sub-soil is neutral to mildly alkaline. In places the surface layer is nonstony.

"Representative profile, Kealahou Quadrangle, lat. 19°32'12" N. and long. 155°56'47" W.:

"A1 - 0 to 4 inches, very dark brown (10YR 2/2) extremely stony silt loam; dark brown (10YR 4/4) when dry; weak, fine and very fine, granular structure; soft, friable, nonsticky, and slightly plastic; many roots; many very fine and fine pores; stones make up 5 to 10 percent of the horizon; slightly acid; clear, wavy boundary. (3 to 6 inches thick)

"B21 - 4 to 10 inches, dark-brown (7.5YR 3/2) stony silt loam; strong brown (7.5YR 4/6) when dry; weak, fine and very fine, subangular blocky structure; slightly hard, friable, nonsticky, and nonplastic; many roots; many very fine and fine pores; basalt fragments make up about 15 percent



4. Site 13662 [Kona Field System Remnant] and Other Sites

of the horizon: neutral; clear, wavy boundary. (6 to 8 inches thick)

"B22 - 10 to 18 inches, dark-brown (7.5 YR 3/3) very stony silt loam; dark brown (7.5YR 4/4) when dry; weak, fine and very fine, subangular blocky structure; a few small pockets of material that is massive; slightly hard, friable, slightly sticky, and slightly plastic; common roots; many very fine and fine pores; scattered remnants of sea shells; mildly alkaline; clear, wavy boundary; basalt fragments ranging from gravel to stone size make up about 50 percent of the horizon. (6 to 8 inches thick)

"IR - 18 inches, hard pahoehoe lava.

"The depth to underlying pahoehoe lava bedrock ranges from 15 to 20 inches. The structure of the A horizon ranges from weak to moderate. Near sea level, calcium carbonate encrusts the rocks or extends into the cracks of the bedrock.

"Permeability is moderately rapid, runoff is slow, and the erosion hazard is slight. Roots can penetrate to bedrock. (Capability subclass VIIs, nonirrigated; pasture group 3)" [Ibid: 52]

Previous research in the vicinity includes a field inspection in the *ahupua'a* of Waipunaula [Rosendahl 1984], various reconnaissance and survey level projects in Kealakekua [Clark 1983; Kaschko and Rosendahl 1987; Barrera 1989], and a field inspection and inventory survey in Ilioa, Kalamakumu and Kalamakowali [Rosendahl 1989; Barrera 1990a].

NUMBER	TYPE	WIDTH	HEIGHTS		COMMENTS
1	Crude Retaining Wall	300	0E	100W	
2	Crude Retaining Wall	200	0N	60S	
3	Earth and Rock Berm	300	35N	60S	
4	Irregular Linear Mound	3-400	60N	60S	
5	Crude Retaining Wall	150	0N	100S	
6	Irregular Linear Mound	200	40N	40S	
7	Crude Retaining Wall	150	0E	80W	
8	Irregular Linear Mound	200	60N	100S	
9	Irregular Linear Mound	200	60N	60S	
10	Crude Retaining Wall	2-300	40E	90W	
11	Irregular Linear Mound	3-400	60N	40S	
12	Crude Retaining Wall	2-300	120N	20S	
13	Irregular Linear Mound	2-300	100E	100W	
14	Crude Retaining Wall	2-300	0N	120S	
15	Irregular Linear Mound	2-300	60N	80S	
16	Crude Retaining Wall	250	0N	50S	
17	Crude Retaining Wall	200	20E	50W	
18	Crude Retaining Wall	2-300	30E	120W	
19	Crude Retaining Wall	2-300	20E	130W	
20	Irregular Linear Mound	2-300	50N	50S	
21	Crude Retaining Wall	2-300	20E	20W	Is a faced freestanding wall in places
22	Crude Retaining Wall	2-300	100N	20-50S	
23	Irregular Linear Mound	200	60N	60S	
24	Crude Retaining Wall	2-300	20E	100W	
25	Crude Retaining Wall	200	20N	80S	
26	Crude Retaining Wall	2-300	20E	130W	
27	Irregular Linear Mound	2-250	60N	60S	
28	Crude Retaining Wall	2-300	60N	100S	
29	Crude Retaining Wall	200	120W	20E	
30	Irregular Linear Mound	2-300	80N	80S	
31	Irregular Linear Mound	1-400	80N	130S	
32	Irregular Linear Mound	1-150	60NW	60SE	
33	Irregular Linear Mound	2-250	80E	80W	
34	Crude Retaining Wall	1-200	0E	60W	
35	Earth Berm	1-200	0E	60W	
36	Irregular Linear Mound	1-150	80N	80S	
37	Crude Retaining Wall	2-250	25N	80S	
38	Irregular Linear Mound	150-200	30E	50W	
39	Irregular Linear Mound	2-300	90N	90S	
40	Crude Retaining Wall	2-300	130N	50S	
41	Crude Retaining Wall	1-200	20E	110W	
42	Earth Berm and Crude Retaining Wall	1-150	20E	60W	
43	Crude Retaining Wall	1-150	0N	60S	
44	Crude Retaining Wall	1-150	0N	60S	
45	Earth Berm	1-150	0N	60S	
46	Irregular Linear Mound	300	80E	40W	
47	Irregular Linear Mound	1-150	70N	70S	
48	Irregular Linear Mound	1-300	70N	80S	
49	Irregular Linear Mound	2-250	90N	90S	One small fragment of porites coral on surface
50	Freestanding Wall	100	90NE	90SW	
51	Crude Retaining Wall	1-150	25E	120W	
52	Irregular Linear Mound	300	60N	60S	
53	Freestanding Wall	100	80N	130S	
54	Freestanding Wall	100	100N	100S	
55	Irregular Linear Mound	300	40N	50S	
56	Crude Retaining Wall	200	0E	90W	
57	Crude Retaining Wall	200	0E	100W	
58	Irregular Linear Mound	200	60N	80S	
59	Crude Retaining Wall	150	0E	70W	

Table 1. Site 13662, List of Features

NUMBER	TYPE	WIDTH	HEIGHTS	COMMENTS
60	Crude Retaining Wall	150	0NE 90SW	
61	Crude Retaining Wall	200	20N 100S	
62	Crude Retaining Wall	200	0NE 100SW	
63	Irregular Linear Mound	290	30NW 60SE	
64	Irregular Linear Mound	260	70E 50W	
65	Crude Retaining Wall	270	40E 100W	
66	Regular Retaining Wall	110	30E 130W	
67	Irregular Linear Mound	160	50N 50S	
68	Regular Retaining Wall	150	30E 120W	
69	Irregular Linear Mound	140	20E 50W	
70	Irregular Linear Mound	170	40NW 100SE	
71	Crude Retaining Wall	150	20E 80W	
72	Irregular Linear Mound	160	60N 60S	
73	Crude Retaining Wall	160	0N 50S	
74	Rock Mound	3.0 by 3.0	70	
75	Irregular Linear Mound	210	40N 40S	
76	Irregular Linear Mound	210	70N 70S	
77	Freestanding Wall	160	70N 70S	
78	Irregular Linear Mound	200	50N 50S	
79	Crude Retaining Wall	170	30E 60W	
80	Irregular Linear Mound	140	50N 50S	
81	Irregular Linear Mound	200	80N 80S	
82	Crude Retaining Wall	160	30E 70W	
83	Freestanding Wall	110	80E 80W	
84	Freestanding Wall	120	100E 100W	
85	Freestanding Wall	120	110N 110S	
86	Freestanding Wall	120	110N 110S	
87	Freestanding Wall	80	60N 60S	
88	Freestanding Wall	120	60E 60W	
89	Irregular Linear Mound	180	70N 50S	
90	Irregular Linear Mound	180	60N 60S	
91	Irregular Linear Mound	160	50N 50S	
92	Freestanding Wall	110	90N 90S	
93	Irregular Linear Mound	160	50N 50S	
94	Crude Retaining Wall	100	0E 80W	
95	Freestanding Wall	220	80N 80S	
96	Crude Retaining Wall	80	0E 50W	
97	Irregular Linear Mound	120	40E 40W	
98	Irregular Linear Mound	210	60NW 60SE	
99	Crude Retaining Wall	190	30E 60W	
100	Irregular Linear Mound	160	40NW 40SE	
101	Freestanding Wall	110	50NE 50SW	
102	Irregular Linear Mound	190	60NW 60SE	
103	Crude Retaining Wall	150	0NE 60SW	
104	Irregular Linear Mound	200	50E 80W	
105	Irregular Linear Mound	180	70N 70S	
106	Irregular Linear Mound	180	60N 50S	
107	Crude Retaining Wall	110	40E 90W	
108	Irregular Linear Mound	200	70N 70S	
109	Irregular Linear Mound	210	70N 70S	
110	Irregular Linear Mound			
111	Crude Retaining Wall	160	20E 100W	
112	Regular Retaining Wall	230	110NE 40SW	
113	Freestanding Wall	120	80NW 80SE	
114	Irregular Linear Mound	130	60NW 60SE	
115	Freestanding Wall/Irregular Linear Mound	120	80NW 80SE	
116	Irregular Linear Mound	120	80N 60S	
117	Irregular Linear Mound	200	60NW 60SE	
118	Regular Retaining Wall	130	30N 80S	
119	Crude Retaining Wall	200	30N 80S	

Table 1. Site 13662, List of Features

NUMBER	TYPE	WIDTH	HEIGHTS	COMMENTS
120	Irregular Linear Mound	150	50N 50S	
121	Irregular Linear Mound	150	80E 80W	
122	Crude Retaining Wall	100	20E 90W	
123	Crude Retaining Wall	100	0E 100W	
124	Crude Retaining Wall	150	40NE 60SW	
125	Crude Retaining Wall	120	20NW 60SE	
126	Crude Retaining Wall	100	20NW 80SE	
127	Irregular Linear Mound	200	50E 80W	
128	Crude Retaining Wall	200	30NW 60SE	
129	Crude Retaining Wall	150	0N 60S	
130	Crude Retaining Wall	150	50N 100S	
131	Irregular Linear Mound	280	80NW 80SE	
132	Irregular Linear Mound	270	80NW 80SE	
133	Crude Retaining Wall	80	0NE 60SW	
134	Irregular Linear Mound	210	40NW 60SE	
135	Irregular Linear Mound	240	30NW 60SE	
136	Earth and Rock Berm	200	0NW 60SE	
137	Irregular Linear Mound	300	60NW 30SE	
138	Irregular Linear Mound	200	50NW 50SE	
139	Freestanding Wall	130	50NW 50SE	

Table 1. Site 13662, List of Features

II. RESULTS

50-10-47-13662

This site number includes those features of the Kona Field System located within the project area as well as possible historic walls built on existing aboriginal walls. Each feature (or section of a feature if it changed character) has been categorized and indicated on the map. The heights in Table 1 include the compass direction of the side on which the measurement was taken.

The feature types are defined as follows:

Freestanding Walls - Relatively narrow, nearly vertically-sided walls that stand to approximately an equal height above the base on both sides. These are of multiple-stacked construction using basalt cobbles and boulders. No mortar or other binding material is present.

Irregular Linear Mounds - Crudely piled accumulations of rocks resembling collapsed free-standing walls, which many of them probably are.

Regular Retaining Walls - Relatively narrow, nearly vertically-sided walls that are built against a slope, forming a terrace. These are well-built of basalt

cobbles and boulders, and are basically equivalent to the free-standing walls except that one side is built against a slope.

Irregular Retaining Walls - Equivalent to the Irregular Linear Mounds except that they are built against a slope, forming a crude terrace. They are constructed of basalt rocks in an earth matrix.

Earth and Rock Berms - Low linear features similar to Irregular Linear Mounds except that they are not as distinct and contain a higher proportion of earth to rock. These may be Irregular Linear Mounds the upper section of which have been removed by bulldozing.

50-10-47-14264

This is a rectangular habitation terrace measuring 7.3 by 13.0 meters [78.7 square meters] and standing to a height of 90 centimeters. The wall, which is constructed of stacked cobbles and boulders, covers an area of 50.6 square meters and encloses an area of 27.9 square meters. No midden was seen, and the only artifact found was a possibly worked fragment of basalt on top of the wall in the southeast corner. It was not collected.

50-10-47-14265

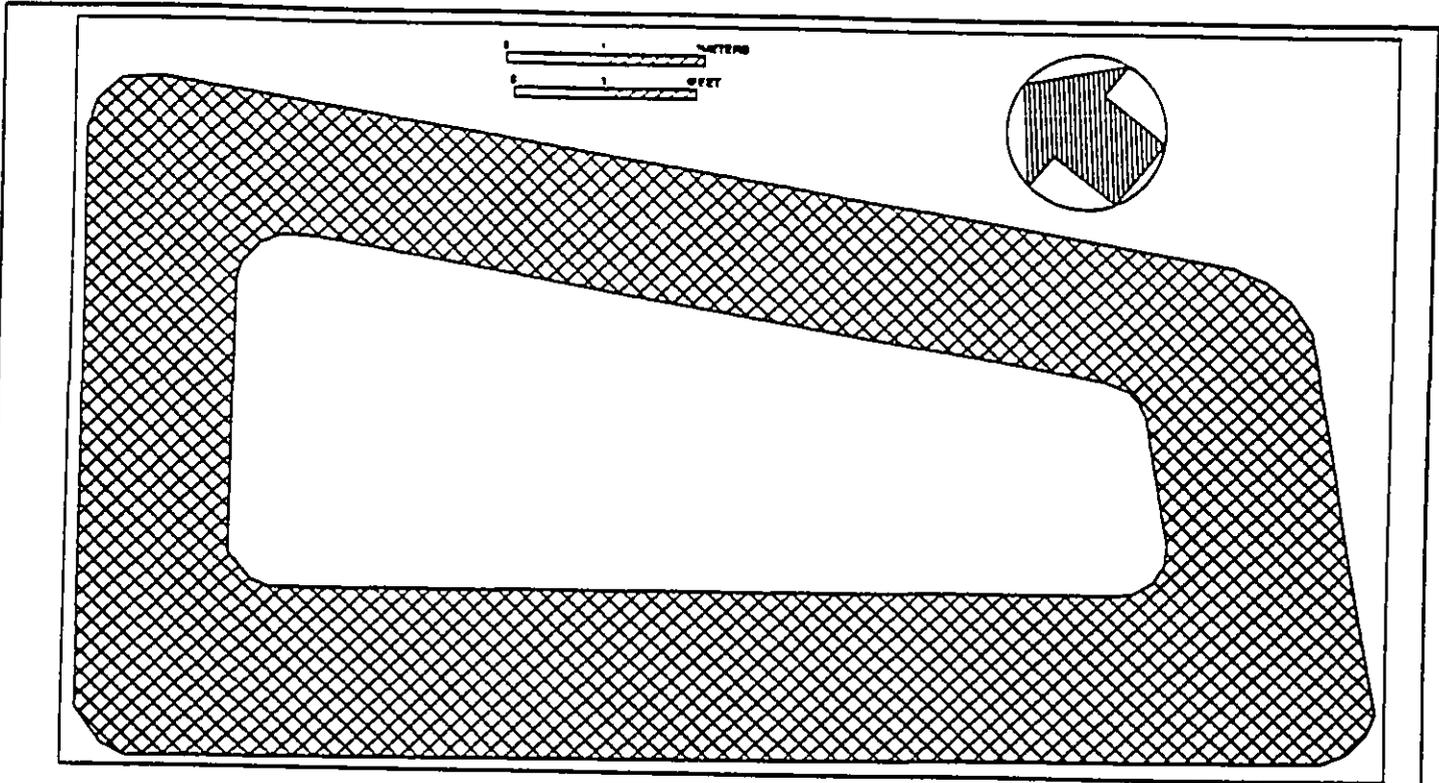
This is a rectangular habitation terrace measuring 5.2 by 6.9 meters [32.8 square meters] and standing to a height of 80 centimeters. The wall of stacked basalt cobbles and boulders covers an area of 20.8 square meters and encloses an area of 11.9 square meters. No midden or artifacts were found.

50-10-47-14266

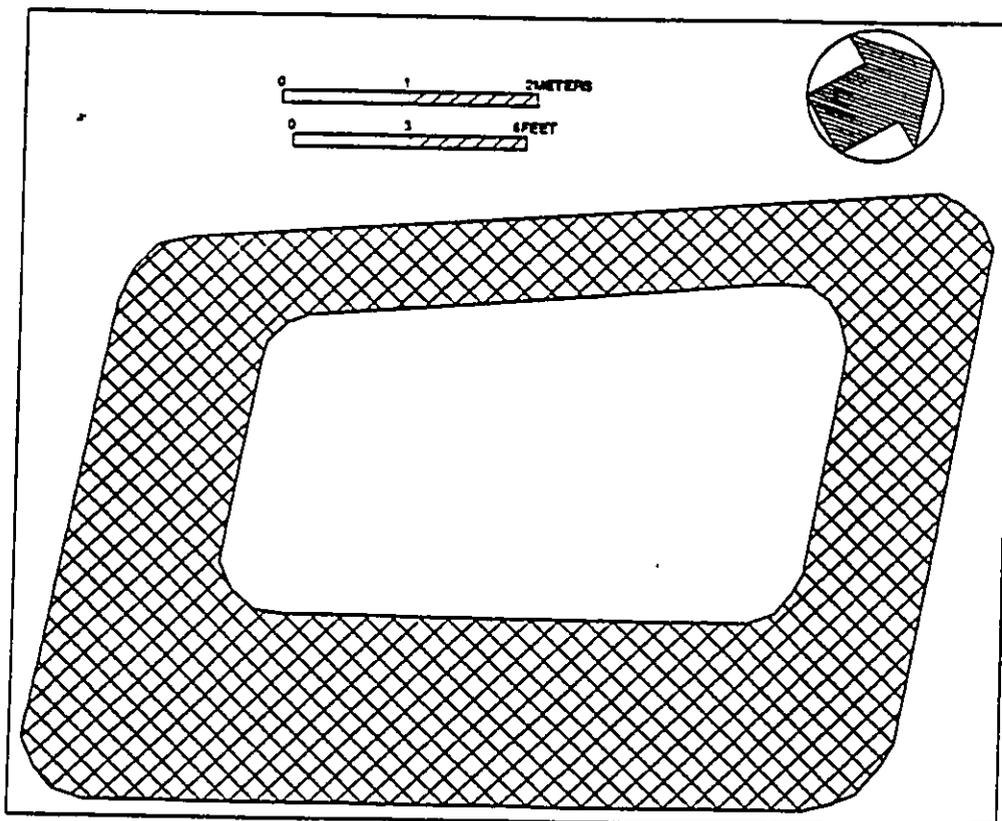
This is a roughly triangular possible habitation enclosure measuring 11.7 by 13.6 meters [89.0 square meters] and standing to a height of 60 centimeters. The walls are 2.0 meters wide and cover an area of 59.9 square meters and enclose an area of 29.0 square meters. No midden or artifacts were found.

50-10-47-14267

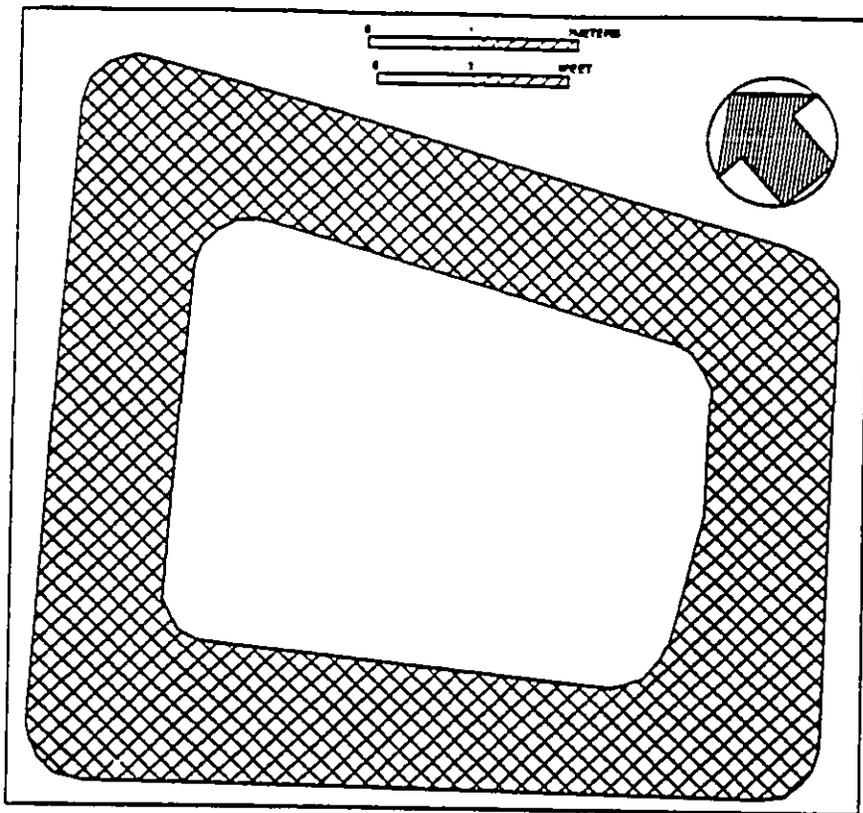
This is a rectangular habitation terrace measuring 6.4 by 7.4 meters [46.3 square meters] and standing to a height of between 50 and 100 centimeters. The wall of stacked basalt cobbles and boulders covers an area of 27.5 square meters and encloses



5. Plan of Site 14264



6. Plan of Site 14265



7. Plan of Site 14267

an area of 18.9 square meters. No midden or artifacts were observed.

III. ARTIFACTS

Two artifacts were collected from the surface of bulldozed fence lines. The first, which was found twelve meters southeast of Site 14264, is a basalt adze chip with two polished surfaces. It measures 3.02 by 3.88 centimeters and is 0.75 centimeter thick. The second artifact is a broken basalt adze found 24 meters west of Feature 75. It measures 15.85 centimeters in length, 4.54 centimeters in width, and 3.22 centimeters in thickness. The bit end has been broken off, and the resulting scar shows evidence of having been used as a hammerstone.

IV. EXCAVATIONS

Eight trenches were cut through features of the Kona Field System, as per conditions set by the State of Hawaii Historic Preservation Program [see Appendix]. The locations were chosen to

sample a wide area of the Kona Field System features.

Trench 1 was cut through Feature 2, a crude retaining wall, revealing two layers. The lowermost was a dark brown [7.5YR 3/2] earth fill resting on pahoehoe bedrock. Above this was the deposit which constituted Feature 2 itself, consisting of subangular cobbles and boulders in a matrix of this same dark brown earth. No midden or artifacts were found in either layer.

The absence of rocks in the lowermost layer suggests that this feature was constructed over a cultivated field from which the rocks had already been removed.

Trench 2 was cut through Feature 17, a crude retaining wall. The lowermost materials here, which were resting on weathered basalt bedrock that was decomposing into boulders, consisted of a layer of subangular boulders and cobbles in a brown to dark brown [7.5YR 4/2] earth matrix. Above this

was a layer consisting of these same cobbles and boulders in point to point contact, which constituted Feature 17.

The layer of earth and rocks produced three pieces of charcoal weighing 0.3 gram.

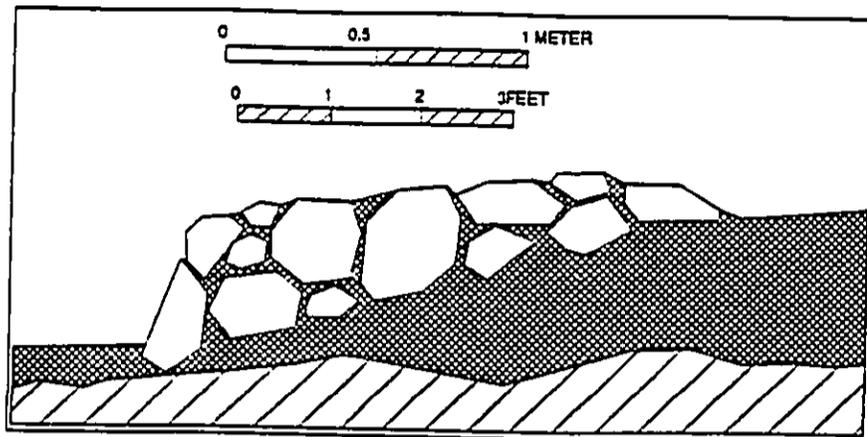
Trench 3 was cut through Feature 41, a crude retaining wall. It revealed a dark brown [7.5YR 3/2] earth overlying a strong brown [7.5YR 4/6] sterile ash layer and weathered boulders over pahoehoe. At the top of the section was Feature 41 itself, which consisted of subangular basalt cobbles and boulders in point to point contact in its upper section and these same rocks surrounded by the earth matrix in its lower. No midden or artifacts were found.

The absence of rocks in that part of the dark brown earth layer situated between Feature 41 and the sterile layer indicates that Feature 41 was constructed over a previously cultivated field.

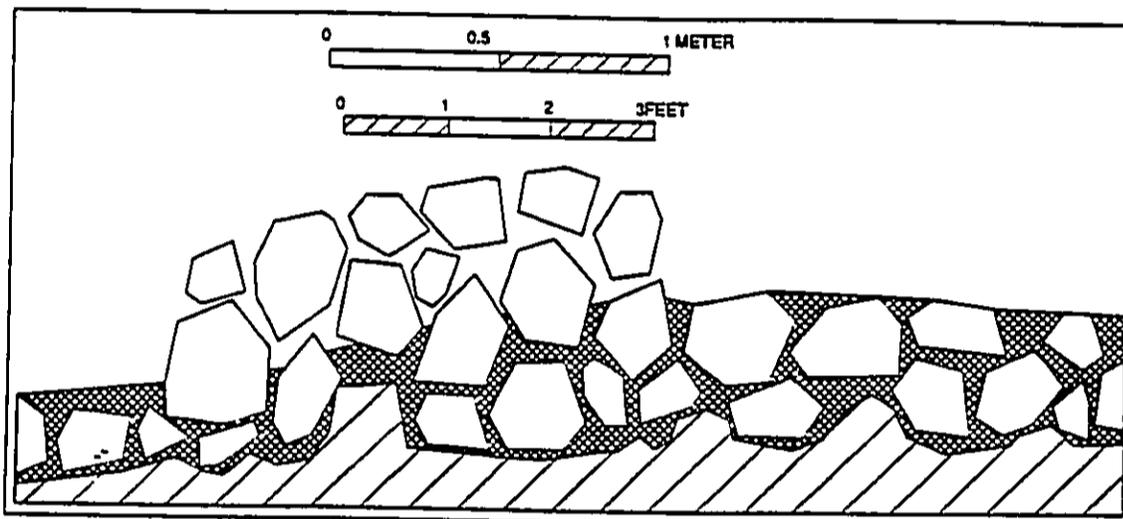
Trench 4 was cut through Feature 55, an irregular linear mound. The profile revealed a layer of subangular boulders and cobbles and dark brown [7.5YR 3/2] earth resting on a sterile dark brown [7.5YR 3/4] ash. The rocks that comprised the feature consisted of these same subangular boulders and cobbles in point to point contact, extending above the ground surface. No midden or artifacts were recovered.

Trench 5 was cut through Feature 58, an irregular linear mound. At the bottom of the profile was a sterile deposit of dark brown [7.5YR 3/4] earth. Above this was a deposit of subangular basalt cobbles and boulders in a matrix of dark brown [7.5YR 3/2] soil. At the very top of the section there was no soil, leaving the boulders and cobbles in point to point contact. Two fragments of charcoal weighing less than a gram were recovered from the earth and soil layer.

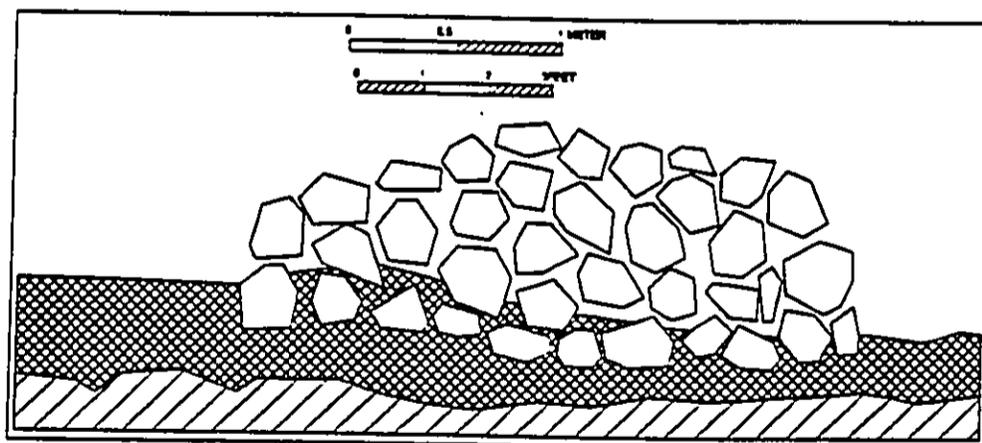
Trench 6 was cut through Feature 125, a crude retaining wall. It revealed a deposit of subangular



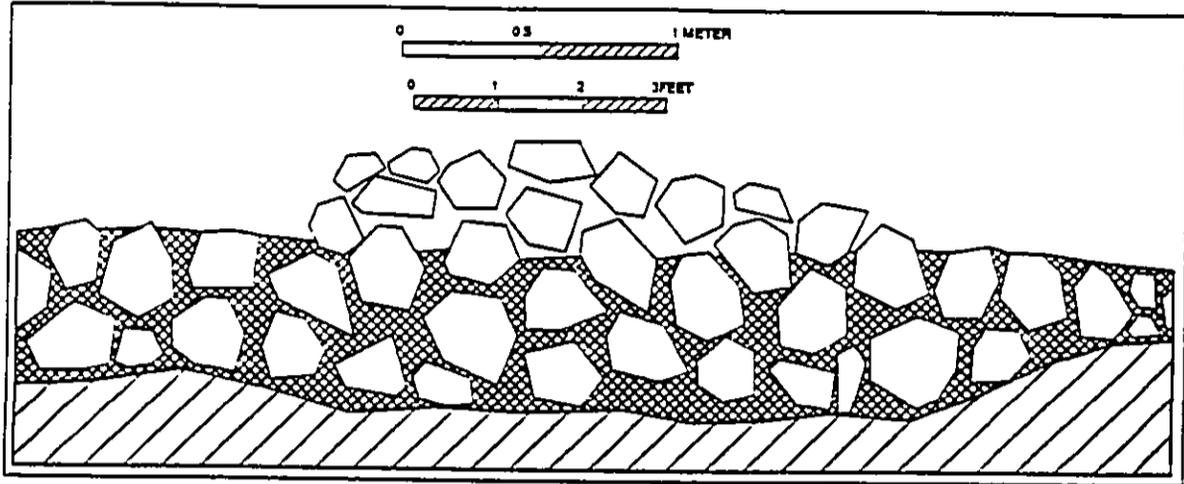
8. Site 13662 Feature 2, Trench 1, Profile of West Face



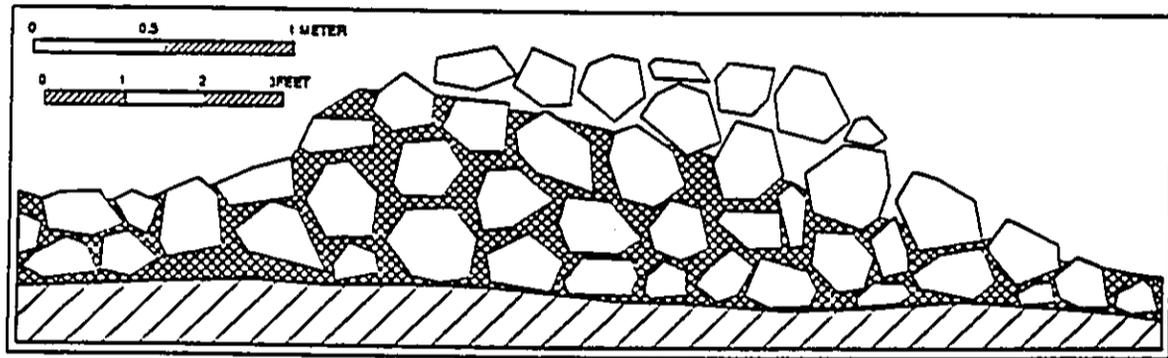
9. Site 13662 Feature 17, Trench 2, Profile of North Face



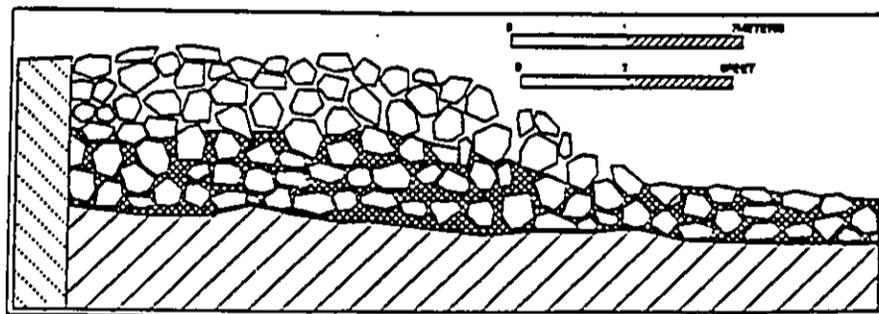
10. Site 13662 Feature 41, Trench 3, Profile of East Face



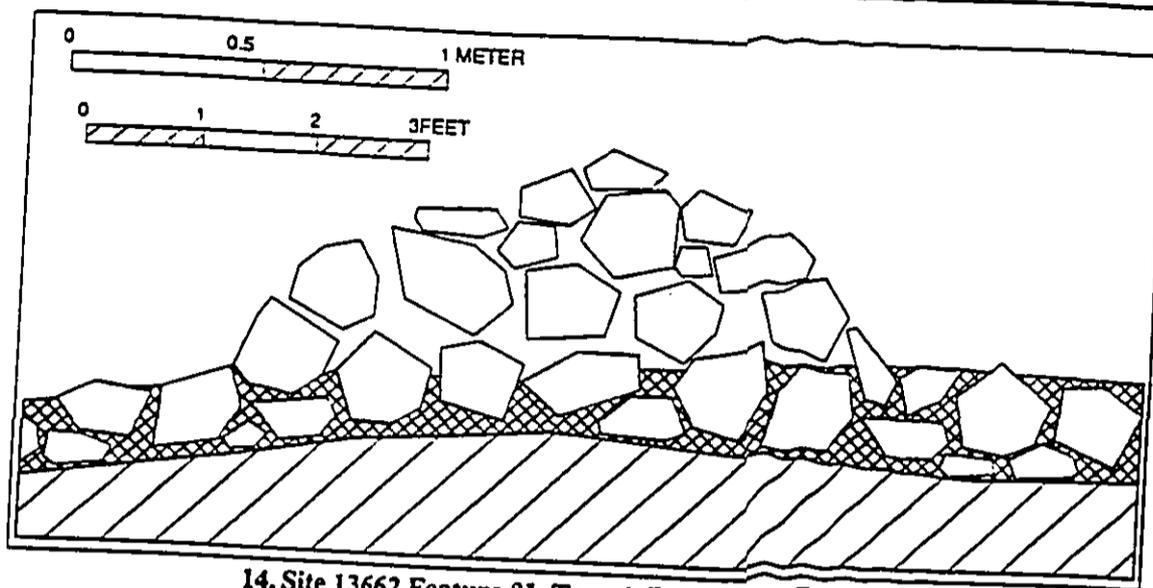
11. Site 13662 Feature 55, Trench 4, Profile of East Face



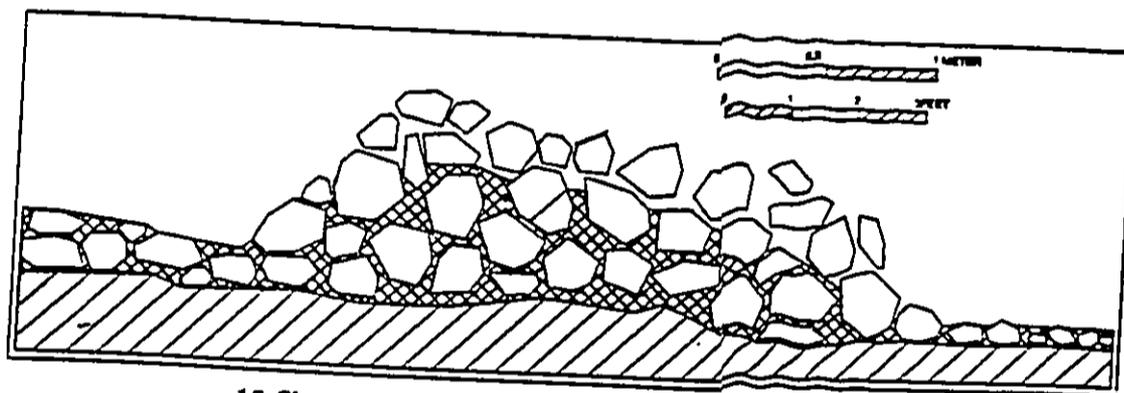
12. Site 13662 Feature 58, Trench 5, Profile of East Face



13. Site 13662 Feature 125, Trench 6, Profile of NE Face



14. Site 13662 Feature 81, Trench 7, Profile of East Face



15. Site 13662 Feature 63, Trench 8, Profile of East Face

cobbles and boulders in a matrix of dark brown [7.5YR 3/2] earth, above which were the subangular basalt cobbles and boulders in point to point contact that constituted Feature 125. At the bottom of the section was a sterile dark brown [7.5YR 3/4] dirt on pahoehoe bedrock. No midden or artifacts were recovered.

Trench 7 was cut through Feature 81, an irregular linear mound. The uppermost deposit consisted of subangular cobbles and boulders in point to point contact, below which was a deposit of these same cobbles and boulders in a matrix of dark brown [7.5YR 3/2] earth that extended to the sterile deposit of brown to dark brown [7.5YR 4/4] ash and weathered boulders. The only midden recovered was a single fragment of

Cypraea maculifera weighing 11.7 grams from the earth and rock layer.

Trench 8 was cut through Feature 63, an irregular linear mound. This revealed a layer of subangular cobbles and boulders in a matrix of dark brown [7.5YR 3/2] earth, on top of which was a relatively thin layer of subangular cobbles and boulders in point to point contact. The sterile basal layer consisted of weathered pahoehoe bedrock and boulders. Two pieces of unidentified bone, probably *Rattus* sp. were recovered from the rock and earth layer.

These excavations indicate that the survey area is underlain by a non-cultural basement of weathered bedrock and volcanic ash, above which is a modified soil deposit with numerous

rocks. Human modification of the latter soil, which was derived from volcanic ash, is inferred from the presence of charcoal fragments. This soil was further modified in two instances [Trench 1 at Feature 2 and Trench 3 at Feature 41] by the removal of rocks, which were undoubtedly subsequently used in the construction of various agricultural features. The profile of a typical feature shows a vertical continuation of cobbles and boulders from the surface right into the soil. The only difference between the upper layer and the lower layer is that the lower layer of rocks has a soil matrix, while the upper layer rocks are in point to point contact. This demonstrates that the construction of these features was an on-going, long-term process concur-

rent with the continuing modification of the soil by cultivation and the removal of relatively modest amounts of rocks. There certainly does not appear to have been an attempt to render the soil completely rock-free.

V. DISCUSSION

Much of the Kona Field System remains represented at Site 13,662 have been modified by historic agricultural pursuits. These modifications are more evident in the northeast, southeast and southwest quadrants. This phenomenon is quite commonly observed in the Kona Field System, and of course limits the precision with which the prehistoric condition can be discussed.

Given this difficulty, it is still obvious that the arrangement and types of features are typical of Kona Field System remains. The major features are irregular linear mounds and crude retaining walls oriented along as well as at roughly right angles to the contour. These features, which have respectively come to be called *cross-walls* and *kuaiwi* by many archaeologists, served as boundaries between garden plots and were formed by the intentional accumulation of rocks removed from the fields during cultivation.

Identical archaeological features have been observed throughout the Kona Field System. Examples from the Kealakekua Bay area include the *ahupua'a* of Waipunaula at an elevation of about 600 feet (Rosendahl 1984: 3), Ililoa, Kalamauami and Kalamakowali at about the same elevation (Barrera 1990a), Kealakekua at an elevation of between about 1000 and 1200 feet (Clark 1983; Kaschko and Rosendahl 1987; Barrera 1989), Kalamakapala at an elevation of between 300 and 500 feet (Soehren 1981), although a later researcher was unable to locate them and apparently believes that Soehren had identified features of the historic period (Komori 1984: 35), and Kahauloa at an elevation of about 500 feet (Barrera 1990b).

Valuable data are available in early accounts of visitors to the Kealakekua Bay area. Lieutenant James King, who accompanied Captain James Cook in

1779, recounts that these very sorts of features had been observed by John Ledyard during his exploration of the countryside inland of Kealakekua Bay:

"They travelled 3 or 4 miles & found the Country as above represented, after which were the regular & very extensive plantations. The Plantain trees are mixed amongst the breadfruit trees & did not compose any part of the plantation except some in the Walls: these walls separate their property & are made of the Stones got on clearing the Ground: but they are hid by the sugar cane being planted on each side, whose leaves or stalk make a beautiful looking edge. The Tarrow or Eddy root & the Sweet Potatoe with a few cloth plants are what grow in these cultivated spots" (Beaglehole 1967: 521).

And further:

"Before they enter'd the first Wood, they also observ'd Arms or branches stretchg towards the Sea side, in a direction at right Angles to the Main wood, & that these reach within a Mile or two of the beach, these Arms separated the great Plantations which has been observ'd to be 4 or 5 miles broad, & which are again divided into Small fields by stone hedges" (Ibid:608).

Ledyard has also left us his own description of his trip to the interior from the village of Napoopoo:

"Our course lay eastward and northward from the town...about two miles without the town the land was level, and continued of one plain of little enclosures separated from each other by low broad walls: Whether this circumstance denoted separate property, or was done solely to dispense with the lava that overspread the face of the country, and of which the walls are composed, I cannot say, but probably it denotes a distinct possession. Some of these fields were planted, and others by their appearance were left fallow: In some we saw the natives collecting the coarse grass that had grown upon it during the time it had lain unimproved, and burning it in detached heaps. Their sweet potatoes are mostly raised here, and indeed are the principal object of their agriculture, but it requires an in-

finite deal of toil on account of the quantity of lava that remains on the land notwithstanding what is used about the walls to come at the soil, and besides they have no implements of husbandry that we could make use of had the ground been free from the lava. If any thing can recompence their labor it must be an exuberant soil, and a beneficent climate. We saw a few patches of sugar cane interspersed in moist places, which were but small: But the cane was the largest and as sweet as any we had ever seen, we also passed several groups of plantain-trees.

"These enclosed plantations extended about 3 miles from the town, near the back of which they commenced, and were succeeded by what we called the open plantations. Here the land began to rise with a gentle ascent that continued about one mile when it became abruptly steep. These were the plantations that contained the bread-fruit trees.

"After leaving the bread-fruit forests we continued up the ascent to the distance of a mile and a half further, and found the land thick covered with wild fern, among which our botanist found a new species. It was now near sun-down, and being upon the skirts of those woods that so remarkably surrounded this island at a uniform distance of 4 and 5 miles from the shore, we concluded to halt" (Ledyard 1963: 118-20).

Samwell, of the same expedition, also made a similar note in his journal:

"Their plantations are divided from each other by thick low walls built with Lava. Here we found the Breadfruit Trees, Plantains, Tarrow root, Sweet potatoes, Ginger root and Sugar Canes..." (Ibid: 1166).

Archibald Menzies, who accompanied Vancouver in 1793, recounts an excursion through the agricultural fields:

"The forenoon was far spent in arranging and equipping the party before we left the village, and as our

route lay directly back from it, over a dry barren rocky country, up a steep ascent, in the scorching heat of the day, the first part of our journey was rather fatiguing, before we gained the summit of the eminence over the bay, where we met a refreshing breeze, and had an extensive prospect of the country and villages to the southward of us. The tract which extended along shore, if we might judge from its appearance and our knowledge of that which we had already traveled over, we were ready to pronounce a dreary naked barren waste, if we except a few groves of cocoa palms here and there near the villages. But that which stretched higher up along the verge of the woods from the manner it was industriously laid out in little fields exhibited a more pleasing and fertile appearance.

"On leaving this station, we soon lost sight of the vessels, and entered their bread-fruit plantations, the trees of which were a good distance apart, so as to give room to their boughs to spread out vigorously on all sides, which was not the case in the crowded groves of Tahiti, where we found them always planted on the low plains along the sea side. But here the size of the trees, the luxuriance of their crop and foliage, sufficiently show that they thrive equally well on an elevated situation. The space between these trees did not lay idle. It was chiefly planted with sweet potatoes and rows of cloth plant [*wauke*, *Broussonetia papyrifera*]. As we advanced beyond the bread-fruit plantations, the country became more and more fertile, being in a high state of cultivation. For several miles round us there was not a spot that would admit of it but what was with great labor and industry cleared of the loose stones and planted with esculent roots or some useful vegetables or other. In clearing the ground, the stones are heaped up in ridges between the little fields and planted on each side, either with a row of sugar cane or the sweet root of these islands [*Dracena ferrea*, Linn] [*Dracaena terminalis*, or *Cordyline terminalis*, ti or ki], where they afterwards continue to grow in a wild state, so that even these stony, uncultivated banks are by this means made useful to the proprietors, as well as ornamental to the fields they intersect.

"The produce of these plantations, besides the above mentioned, are the cloth plant [*Morus papyrifera* Linn], taro and sweet potatoes. The latter are here planted three or four feet apart and earthed up around their stems much in the same manner as the common potatoes are treated in England. When they dig up any, we remarked that, after stripping off the potatoes, they carefully put the old plant back again in the ground for the ensuing crop. But the taro being naturally an aquatic plant, required in this dry soil a very different treatment. There were generally two or three of them planted together in a hole about nine inches below the surface of the ground. These holes were about four feet apart, and as the plants grow up, the earth is gathered round their stems in the form of a basin to retain the water, either from rain or otherwise, about their roots. The whole field is generally covered with a thick layer of hay, made from long, coarse grass or the tops of sugar cane, which continually preserves a certain degree of moisture in the soil that would otherwise be parched up by the scorching heat of the solar rays. In this way they rear up these roots to very great perfection on a dry elevated situation.

"The land here is divided into plantations, called *ili*, which take their rise at the sea side and proceed up the country, preserving a certain breadth without any limitations, or as far as the owner chooses to cultivate them, and without the protection either of high walls or gates.

"After breakfast, we pursued our course onward with a fair prospect of a fine day and soon after entered the wood by a well trodden path, on both sides of which were luxuriant groves of plantains and bananas reared up with great industry in the neatest order of cultivation. These being tender vegetables, required a sheltered situation and good soil to bring them to perfection" [Menzies 1920: 74-80].

Thirty years later, in 1823, the missionaries Thurston, Goodrich and Harwood explored the region behind Kailua-Kona, about twelve miles to the north, and noted similar features:

"The path now lay though a beautiful part of the country, quite a garden compared with that though which they had passed on first leaving the town. It was generally divided into small fields, about fifteen rods square, fenced with low stone walls, built with fragments of lava gathered from the surface of the enclosures. These fields were planted with banana, sweet potatoes, mountain taro, paper mulberry plants, melons, and sugar-cane, which flourished luxuriantly in every direction" [Ellis 1963:45].

In 1970 Newman, working from these and other early accounts in conjunction with field inspections and aerial photograph interpretations, saw a "basic division between a lower elevation, drier area with breadfruit trees, sweet potatoes, and *wauke*; a middle zone of sweet potatoes and taro with fields bounded by planted sugarcane and *ti*; and an upper area where bananas and plantains were grown" [Newman 1970:130]. Going strictly by elevation criteria, the present survey area would fall at the boundary between Newman's lower and middle zones.

Of note with regard to the present survey area is the lack of minor features such as mounds and short retaining walls such as are commonly found interspersed throughout the major pattern of linear features in the Kona Field System. Their absence is possibly the result of the extensive grubbing for farm lots which obliterated minor features while leaving major ones relatively unscathed, but this does not explain the lack of such features in the relatively undisturbed northwest quadrant.

The presence of only a few habitations fits the pattern expected in the Kona Field System. Such features are relatively scarce, indicating a population scattered throughout the agricultural fields. The early explorers' accounts address this point. Lieutenant King, for example, gives us the following:

"How far property is secur'd against the craving appetites of the

great Chiefs we cannot say, but it should seem that it is sufficiently secure against private invaders, for in the very extensive Plantations few Cottages were seen, & not people enough to guard them if there was any occasion for such caution" [Beaglehole 1967: 617].

And Samwell notes:

"Three of us today...made a short Excursion up the country towards the Snowy Mountain. As we ascended the Hills we came among their Plantations where we saw a few Houses..." [Ibid: 1166].

This pattern is also supported by various archaeological investigations in the vicinity. Scattered habitations in the form of cave sites, habitation terraces and an open midden deposit were present at Kealakekua [Barrera 1989], at Kahauloa there were no surface habitation structures but there was a lava tube containing habitation features throughout its 170 meter length [Barrera 1990b, d], and at Kalamakowali there was a single habitation feature on thirty acres, although it should be recognized that the property had been extensively bulldozed [Barrera 1990a]. Ranging further afield, several habitations and a probable Men's House were found scattered amongst the agricultural features at Kohanaiki, North Kona [Barrera 1988], and at Pahoehoe and Kaumalumu, North Kona, where a half dozen habitations were scattered over a hundred acres [Barrera 1990c].

VI. SIGNIFICANCE

The archaeological importance of the Kona Field System, of which the presently recorded Site 13,662 is a part, is attested to by the fact that it was declared eligible to the National Register of Historic Places in 1977. The nomination form includes the following paragraph:

"The Kona Field System is without equal in Hawaii, and probably in the nation in terms of the extensiveness of a prehistoric modification of the land. It is quite comparable in terms of complexity and size with the well known field systems of Central and South America, although differing in specific

characteristics. It is a physical demonstration of the highly developed farming economy of ancient Hawaii and illustrates the complexity and advanced state of aboriginal Hawaiian culture. The system is so extensive that it cannot be seen in its entirety except from extremely high altitudes, but the physical remains are sufficiently well preserved and in such generally good condition that they may still be detected on the ground, although it is difficult to realize what is viewed is part of such a massive system" [Newman 1974].

Site 13662, the features of the Kona Field System that are located within the present survey area, have been determined by the Historic Sites Section to be significant for their information content, that the completed excavations represent sufficient recovery of data from this site, and that the site is No Longer Significant. Development therefore does not represent an adverse impact.

The three habitation sites and one possible habitation site [Sites 14264, 14265, 14266 and 14267] are significant for their information content.

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Archaeological Consulting

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Kamuela, Hawaii 96743

(808)885-7262

March 18, 1990

Dr. Ross Cordy
Historic Sites Section
Department of Land and Natural Resources
1151 Punchbowl Street
Honolulu, Hawaii 96813

Dear Dr. Cordy:

**Subject: SMA Application - Grubbing for Kaawaloa Orchards
Kaawaloa, South Kona, Hawaii
TMK: 8-1-9:21, 22 and por. 23 and 24**

This is to certify that we have completed the on-site mitigation requirements for the above-referenced project as detailed in Conditions 1 and 2 of your office's letter of February 22, 1990 to Duane Kanuha, Hawaii County Planning Department Director. In particular, the following tasks have been accomplished:

- An archaeological inventory survey has been completed. No habitation sites or features other than the previously noted Kona Field System walls were found.
- Five trenches were excavated through individual wall features at representative locations. The exposed faces were drawn in profile and photographed, and samples were collected from each stratigraphic layer.

All data necessary for the generation of a final report as set out in Condition 4 have been collected, and that report will be submitted to your office by September 17, 1990.

Sincerely yours,



William Barrera, Jr.
President

cc: Christopher Norrie
Norman Hayashi

ADDENDUM

by

James Head, B.A.
Archaeological Consultant

This report shall serve as an addendum to the report:

Barrera, W.J.

1990 KAAWALOA, SOUTH KONA, HAWAII ISLAND:
ARCHAEOLOGICAL INVENTORY AND DATA RECOVERY.
Chiniago Inc. Prepared for Kaawaloa Orchards, Captain Cook, Hawaii.

This addendum was prepared to address issues raised in the correspondence dated February 8, 1991 (DLNR review of the above-named draft report) and another dated June 23, 1993 which memorialized a meeting between the landowner (Christopher Norrie) and Kanalei Shun (DLNR-SHPD). Both letters are reproduced in their entirety in Appendices A & C. The paragraphs which follow will address specific issues beginning on page 2 of the letter from Dr. Don Hibbard (DLNR-SHPD) to Mr. Christopher Norrie of Ka'awaloa Orchards dated February 8, 1991 (Appendix A).

SURVEY METHODOLOGY

1) The Phase One and Two project areas were examined by two-three archaeologists walking a series of parallel transects spaced approximately ten meters between sweeping crew members. Sweeps began at the *mauka* boundary of the project area and progressed to the *makai*. As sites and features were encountered, they were marked with flagging tape to be recorded later. After completion of the initial survey, the archaeologists returned to record the sites. In response to specific DLNR conditions, trenching of eight features in the project were done with a bulldozer. A total of 9 person-days were used in the fieldwork. Further information on these tests is presented in 3) below.

Exhibit 5

PROJECT AREA VEGETATION

2)Vegetation observed in the project area is composed primarily of a dense cover of grasses and introduced weeds with an overstory of both introduced and endemic shrubs and trees. Dominant species within the general area include koa hāoie (*Leucaena leucocephala* [Lam.] de Wit) and monkeypod (*Samanea saman* [Jacq.] Merr.). Other trees present include guava (*Psidium guajava* L.), papaya (*Carica papaya* L.), mango (*Mangifera indica* L.), kukui (*Aleurites moluccana* [L.] Willd.), avocado (*Persea americana* Mill.), and 'opiuma (*Pithecellobium dulce* [Roxb.] Benth.). Shrubs observed in the project area include lantana (*Lantana camara* L.), castor bean (*Ricinus communis* L.), and guinea grass (*Panicum maximum* Jacq.)

At the time of the inventory survey, conditions were dry and the extant vegetation was dry. This was furthered aided by cattle grazing in the project area. Due to these two factors, visibility was adequate.

DESCRIPTION OF THE KONA FIELD SYSTEM REMNANT

3A)An examination of Table 1 in Barrera (1990:5-7) produced a definition for Irregular Retaining Walls, but no examples are found in Table 1. The category of Crude Retaining Walls are, however, noted throughout Table 1. The examples of this formal feature type were then examined and it was determined whether they lie across slope, *mauka-makai*, or whether they are angled.

TABLE 1.
CRUDE RETAINING WALLS @ SITE 13662

Number	Comments
1	Across slope, then turns slightly makai
2	Mauka-makai (Trench #1)
5	Mauka-makai
7	Across slope
10	Mostly across slope
12	Mostly mauka-makai
14	Mauka-makai
16	Mauka-makai
17	Across slope (Trench #2)
18	Across slope, then turning slightly makai on north
19	Across slope
21	Angled to the southeast

- 22 Across slope, then angles to
the southeast
- 24 Mostly across slope
- 25 Mauka-makai
- 26 Mostly across slope
- 28 Mauka-makai
- 29 Across slope (connecting w/ #
28)
- 34 Possibly across slope
- 37 Mauka-makai
- 40 Mauka-makai
- 43 Mauka-makai
- 44 Mauka-makai
- 51 Across slope
- 56 Across slope
- 57 Across slope
- 59 Across slope, south end
slightly downslope
- 60 Across slope, south end
slightly upslope
- 61 Mauka-makai
- 62 Mauka-makai, slight slope to
south on downslope
- 65 Across slope, with slight
upslope to southeast
- 71 Across slope with slight
upslope to north
- 79 Across slope (almost north-
south)
- 82 Angled northeast-southwest
- 94 Across slope with slight jog
- 96 Across slope
- 99 Mostly mauka-makai with
slight hook back to the north
- 103 Across slope with southeast-
northwest orientation
- 107 Across slope
- 111 L-shaped wall
- 119 Across slope
- 122 Short across slope wall
- 123 Mostly mauka-makai
(northeast-southwest)

- 124 Mostly mauka-makai
(northwest-southeast)
- 125 Mauka-makai (TRENCH #6)
- 126 Mauka-makai
- 128 Mostly mauka-makai
(northeast-southwest)
- 129 Across slope (northwest-
southeast)
- 130 NOT FOUND
- 133 Across slope, perpendicular to
Feature 132?

As can be noted from an examination of Table 1, there a number of Crude Retaining Walls and they do not appear to run in any specified direction. We propose, therefore, to drop the formal feature type - Irregular Retaining Walls (since there are no examples) and replace it with a new type (of which are over 40 examples).

Crude Retaining Walls - Crudely piled to roughly stacked accumulations of cobbles to small boulders which appear to travel both across slope, perhaps serving as terrace/retaining walls, or running mostly mauka-makai to serve as historic *kuaiwi* or other field markers.

TOPOGRAPHIC MAP OF PROJECT AREA

3B) A portion of the relevant USGS topographic map (Honaunau, Hawai'i-7.5'-1982) has been included as Figure 1. The boundary of the current project area is clearly marked.

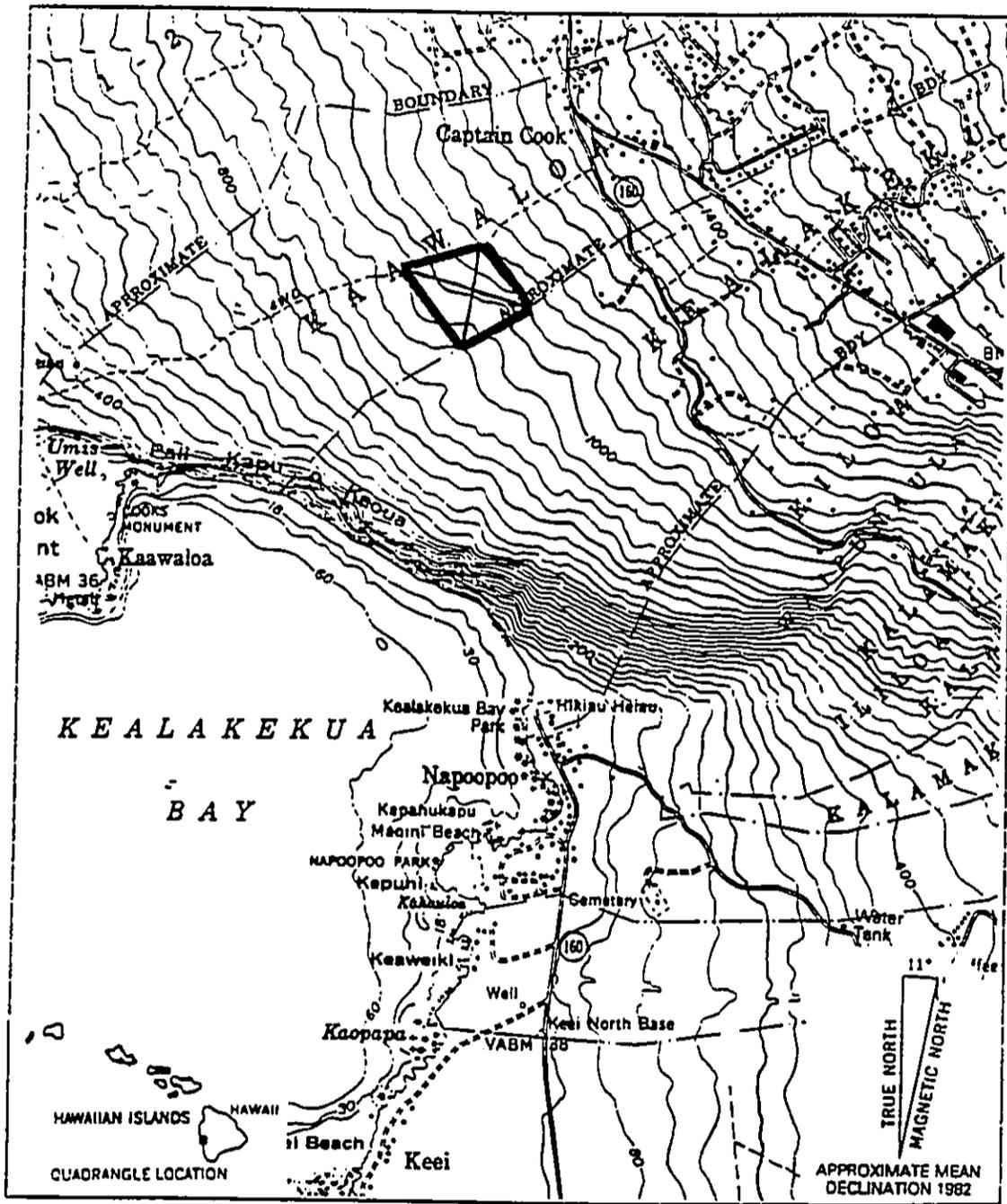


Figure 1. Project Area Location..

As stated above, the features which are called Crude Retaining Walls are found running with and also cutting across the contours. It appears those walls which run with the contour appear to have accumulated slope wash which then provided gardening areas. Others (especially those which are running *with* or at a slight angle to the slope) are likely to be the result of attempts at clearing plots for agriculture.

PROFILE MAPS (FIGURE 8-15 [BARRERA 1990:10-12])

3C) A series of profile descriptions, based on Barrera 1990, were done. The following profiles examine each trench

Measurements will be taken with top of feature being zero point.

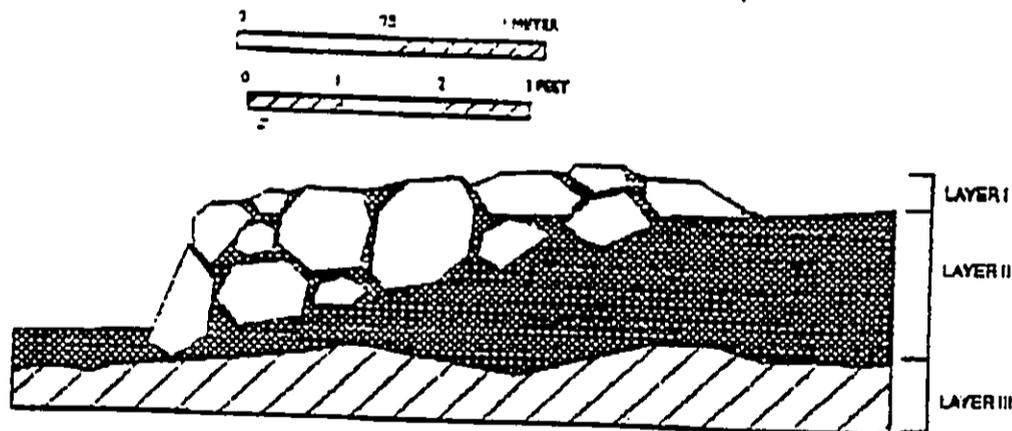


Figure 2. Site 13662, Feature 2, Trench 1, Profile of West Face.

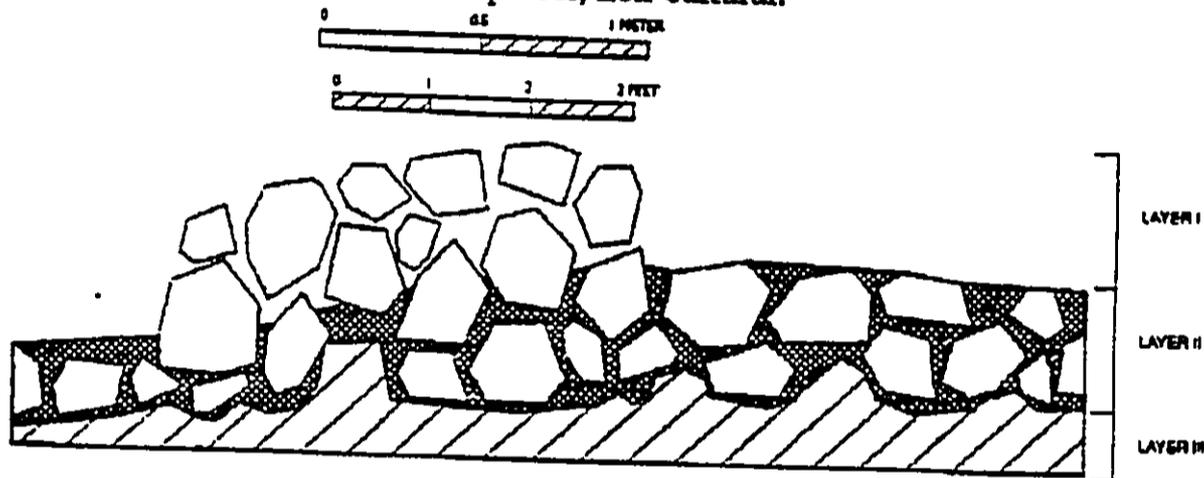
Site 13662, Feature 2, Trench 1 (Figure 2)

Trench 1 was cut northeast/southwest (across slope) through Feature 2, a crude retaining wall, revealing two layers. Layer I was the architectural level consisting of subangular cobbles and boulders in a matrix of dark brown (7.5YR 3/2) earth fill. Layer II was immediately below and also consisted of this same dark brown earth. From the profile, there appears not to be rocks present in this stratum. Layer III is an unspecified sterile layer. No artifacts or midden were encountered during excavation of either Layer I or Layer II. The unit displayed the following stratigraphy:

**Feature 2
Trench 1, West Face**

Layer

- I 0-40 cmbs, subangular cobbles and boulders in a matrix of dark brown (7.5YR 3/2) earth; cultural;
- II 40-50 cmbs, continuance of the above matrix; non-cultural;
- III 50-75 cmbs, unspecified sterile level (possibly pahoehoe or aa lava as both are found in this parcel; non-cultural.



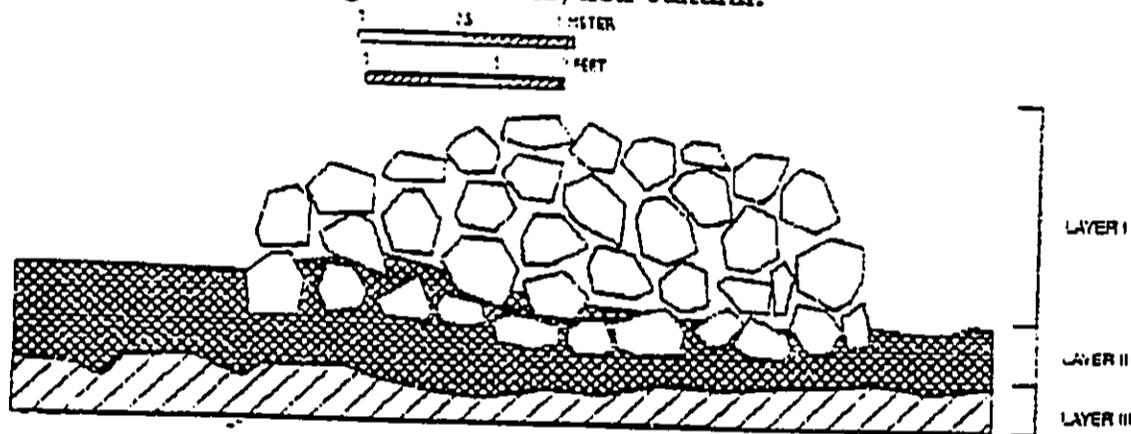
**Figure 3. Site 13662 Feature 17, Trench 2, Profile of North Face.
Site 13662, Feature 17, Trench 2 (Figure 3)**

Trench 2 was cut northeast/southwest (with the slope) through Feature 17, a crude retaining wall. The upper layer (Layer I) consisted of a layer of subangular boulders and cobbles in point to point contact which constituted the architectural element of the feature. Layer II (immediately below) is composed of a layer of subangular cobbles and boulders in a brown to dark brown (7.5YR 4/2) earth matrix. Layer II produced three pieces of charcoal weighing 0.3 gram. Layer III consisted of sterile bedrock. The unit displayed the following stratigraphy:

**Feature 17,
Trench 2, West Face**

Layer

- I 0-35 cmbs. subangular cobbles and boulders in point to point contact: cultural;
- II 45-85 cmbs, ranges from 15-45 cm thick: brown to dark brown (7.5YR 4.2) unspecified earth; several subangular boulders and cobbles: cultural;
- III 85-102 cmbs, ranges from 10-40 cm thick; weathered basalt bedrock decomposing into boulders; non-cultural.



**Figure 4. Site 13662 Feature 41, Trench 3. Profile of East Face.
Site 13662, Feature 41, Trench 3 (Figure 4)**

Trench 3 was cut northeast/southwest (with the slope) through Feature 41, a crude retaining wall. Layer I is the architectural layer consisting of cobbles and boulders. Layer II is apparently two undifferentiated layers: the upper is a dark brown unspecified earth over a sterile ash and weather boulders; Layer III is sterile pahoehoe bedrock. The unit displayed the following stratigraphy:

**Feature 41
Trench 3, East Face**

Layer

- I 0-95 cmbs. subangular cobbles and boulders in point to point contact: cultural:
- II 95-125 cmbs, upper layer is a dark brown (7.5YR 3/2) unspecified earth also containing cobbles and boulders in the matrix; cultural; lower is strong brown (7.5YR 4/6) ash layer and weathered boulders; non-cultural:
- III 125-150 cmbs. pahoehoe bedrock: non-cultural.

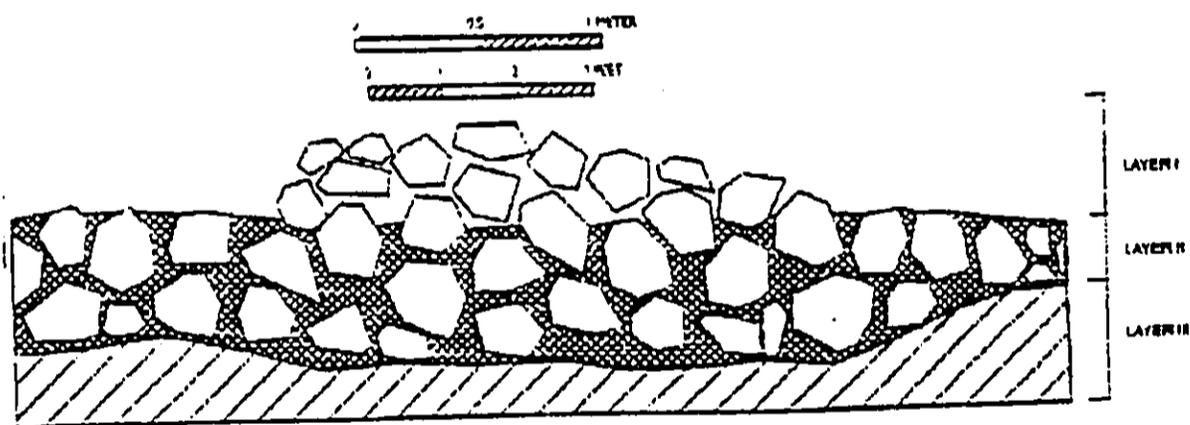


Figure 5. Site 13662 Feature 55. Trench 4. Profile of East Face.

Site 13662, Feature 55, Trench 4 (Figure 5)

Trench 4 was cut northwest/southeast (across slope) through Feature 55, an irregular linear mound. Layer I consisted of subangular boulders and cobbles in point to point contact which comprised the feature. Layer II was a layer of cobbles and boulders within dark brown earth. Layer III was the underlying sterile dark brown earth. The unit displayed the following stratigraphy:

Feature 55
Trench 4, East Face

Layer

- I 0-45 cmbs: subangular cobbles and boulders in point to point contact; cultural;
- II 45-100 cmbs, ranges from 25-60 cm thick: subangular cobbles and boulders in a matrix of dark brown (7.5 YR 3/2) unspecified earth; non-cultural;
- III 100-125 cmbs: sterile dark brown (7.5 YR 3/4) ash; non-cultural.

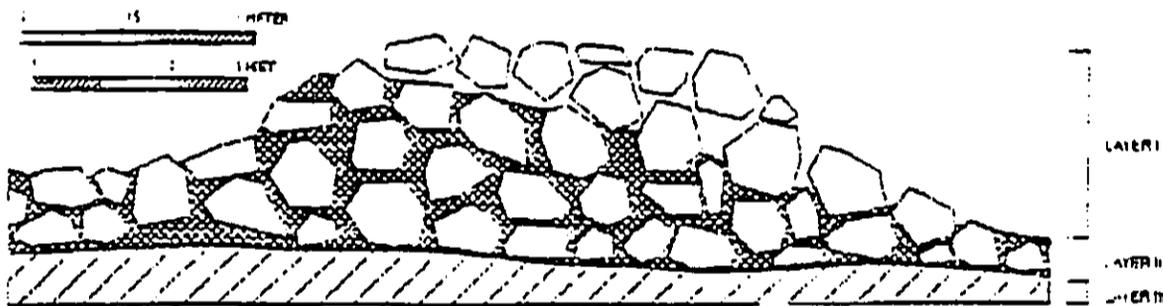


Figure 6. Site 13662 Feature 58. Trench 5. Profile of East Face.

Site 13662, Feature 58, Trench 5 (Figure 6)

Trench 5 was cut north/south (across slope) through Feature 58, an irregular linear mound. Layer I was the feature itself, and consisted of boulders and cobbles in point to point contact. Layer II was a deposit of subangular cobbles and boulders in a matrix of dark brown soil. Layer III was the underlying deposit of sterile dark brown earth. The trench displayed the following stratigraphy:

Feature 58
Trench 5, East Face

Layer

- I 0-50 cmbs. ranges from 20-50 cm thick: subangular cobbles and boulders with no soil: cultural:
- II 20-90 cmbs, ranges from 30-75 cm thick: subangular cobbles and boulders with a matrix of dark brown (7.5YR 3/2) unspecified soil; cultural:
- III 90-12 cmbs; sterile dark brown (7.5YR 3/4) unspecified earth; non-cultural.

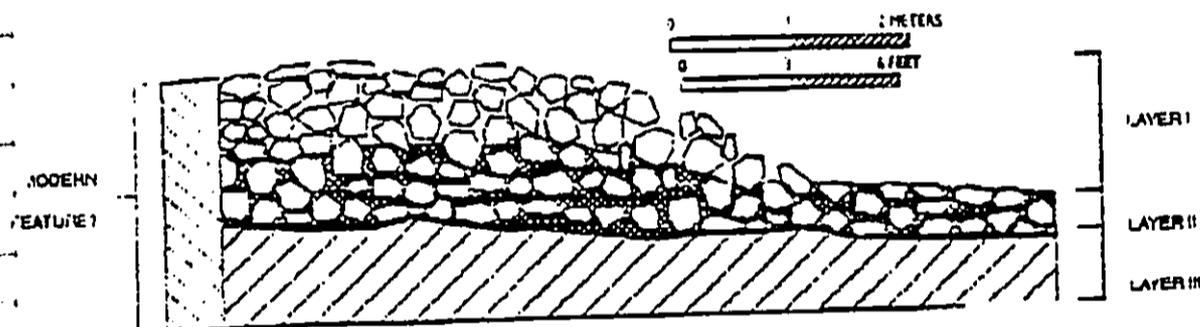


Figure 7. Site 13662 Feature 125, Trench 6, Profile of NE Face.

Site 13662, Feature 125, Trench 6 (Figure 7)

Trench 6 was cut northwest/southeast (across slope) through Feature 125, a crude retaining wall. Layer I appeared cultural since it consisted of the man-made feature itself. Materials in Layer I consisted of basalt cobbles and boulders. Layer II was comprised of similar cobbles and boulders contained within a matrix of unspecified dark brown earth. Layer III is a dark brown dirt (of unknown thickness) on top of pahoehoe bedrock. No midden or artifacts were recovered. An unknown feature is also shown on the profile. This is thought (based on shape) this is a modern feature also included in the profile. The unit displayed the following stratigraphy:

Feature 125
Trench 6, NE Face

Layer

- I 0-85 cmbs. ranges in thickness from 25-85 cm: subangular basalt cobbles and boulders in point to point contact: cultural:
- II 85-170 cmbs, ranges in thickness from 35-85 cm: subangular basalt cobbles and boulders in a matrix of dark brown (7.5YR 3/2) unspecified structure earth: non-cultural:
- III 170-240 cmbs; sterile dark brown (7.5YR 3.4) dirt (of unspecified thickness or character) on top of pahoehoe bedrock: non-cultural.

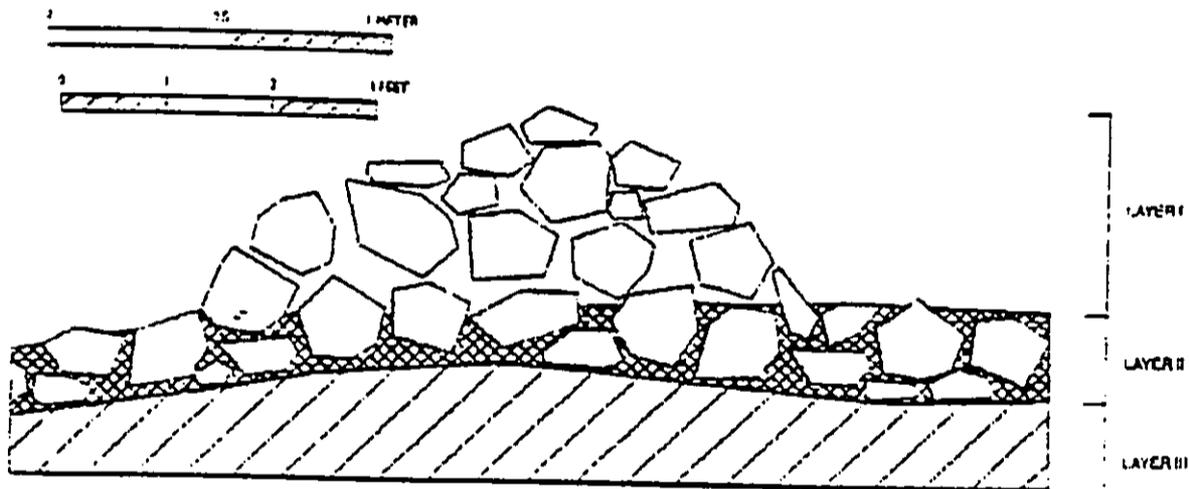


Figure 8. Site 13662 Feature 81, Trench 7, Profile of East Face.

Site 13662, Feature 81, Trench 7 (Figure 8)

Trench 7 was cut north/south (across slope) through Feature 81, an irregular linear mound. Layer I consisted of subangular cobbles and boulders which comprised the feature itself. Layer II was a deposit of the same cobbles and boulders contained within a matrix of dark brown earth. Layer III was a sterile deposit of ash and weathered boulders. A single fragment of *Cypraea* sp. was recovered from Layer II. The trench displayed the following stratigraphy:

Feature 81
Trench 7, East Face

Layer

- I 0-60 cmbs: subangular cobbles and boulders of unspecified diameter in point to point contact: cultural:
- II 60-95 cmbs, ranges from 15-30 cm thick; subangular cobbles and boulders in a matrix of dark brown (7.5YR 3/2) unspecified earth: cultural:
- III 95-120 cmbs; sterile brown to dark brown (7.5YR 4/4) ash and weathered boulders: non-cultural.

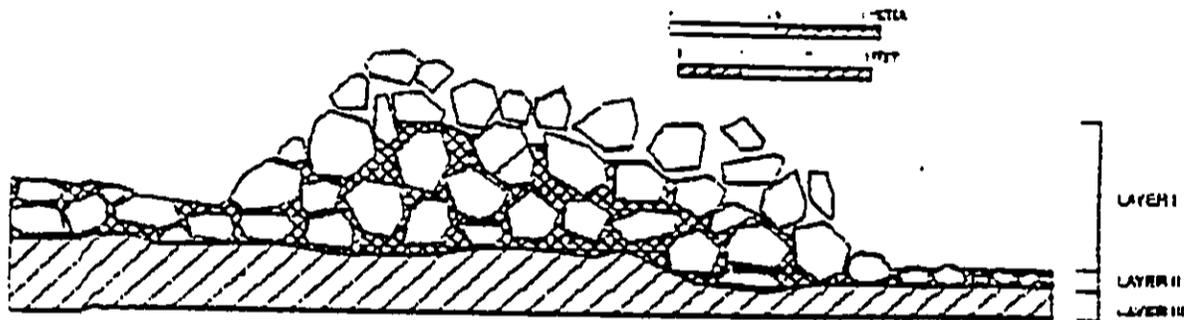


Figure 9. Site 13662 Feature 63, Trench 8. Profile of East Face.

Site 13662, Feature 63, Trench 8 (Figure 9)

Trench 8 was cut east/west (mostly across slope) through Feature 63, an irregular linear mound. Layer I was a relatively thin layer of subangular cobbles and boulders in the architectural layer. Layer II was a layer of similar stones in a matrix of dark brown soil. Two pieces of unidentified bone (poss. *Rattus* sp.) were recovered from this layer. Layer III was a sterile layer consisting of weathered pahoehoe bedrock and boulders. The unit displayed the following stratigraphy:

Feature 63
Trench 8, East Face

Layer

- I 0-45 cmbs: subangular cobbles and boulders in point to point contact: cultural;
- II 45-100 cmbs; ranges in thickness from 20-65 cm; subangular cobbles and boulders in a matrix of dark brown (7.5YR 3/2) unspecified earth; non-cultural;
- III 100-130 cmbs; weathered pahoehoe bedrock and boulders; non-cultural.

ABSENCE OF ROCKS IN THE LOWERMOST LAYER

3D)The conclusions as twice stated in both Part IV. EXCAVATIONS, suggest that portions of Site 13662 was constructed over a cultivated field from which rocks had been removed. When the profiles of Feature 2 and Feature 41 (Trenches 1 & 3) are compared with other profiles, it can be seen that the overall number of stones both within the features themselves and in the underlying soil are noticeably fewer than in others. The explanation that these features were built on previously cleared areas is one possibility. Another might have to do with slope wash deposited in the feature area prior to feature construction. Schilt (1983:270) writes that most cultivation on the *kula* occurred in soils that had been transported downslope by water from higher slopes as the *mauka* gardens were being developed. This project area is located higher and further south than the *kula* slopes of the Kona Field System near Kailua, but deposition in these two areas (Feature 2 and Feature 41) may have been significant enough to cover the extant stones with a "dark brown earth layer." The features then could have been constructed on soils that were less rocky than those nearby.

Another alternative concerns the amount of volcanic ash deposition deposited prior to construction of the features. It is likely that differential deposition of this ash has taken place and may have been effected by weather patterns, water erosion, etc. If the ash deposits are greater in the Feature 2 and Feature 41 areas than in other tested locations within the project area, this could account for the absence of rocks.

The underlying sterile areas appear to differ within the project area. Features 2, 41, 125, and 63 (Trenches 1, 3, 6, and 8) were lying on top of a basal layer of "weathered pahoehoe." Features 55 and 81 (Trenches 4 and 7) were "dark brown ash" (with weathered boulders at Feature 81) Feature 58 (Trench 5) had a "sterile

deposit of dark brown earth", and Feature 17 (Trench 2) was "weathered basalt bedrock...decomposing into boulders.

When these results are plotted on the project area map, it appears that the pahoehoe areas (along with Trench 2 which possessed weathered bedrock) lie in the southeastern half of the area. The two features underlain by ash are on the north and northwest and the final unit (underlain by undefined brown earth) is located in the extreme northern portion of the study area. This data may indicate that the southern portion of the project area has a basal flow of pahoehoe, while on the north, the pahoehoe may also be present, but is covered by some unknown amounts of volcanic ash.

According to Lockwood et al. (1988), the project area is generally made up of Group I flows (greater than 4,000 yrs before present) which are mostly overlain by discontinuous ash deposits (Pahala Ash), especially on the northeast and southeast. The flows in the Kealakekua area appear to generally be composed of pahoehoe flows.

These interpretations are, of course, based upon very sketchy evidence. It is unlikely by the time the project area was utilized by Hawaiians for agricultural or residential purposes little of the underlying lava would have been exposed in this heavily vegetated region.

RADIOMETRIC AGE DATA

3E) Radiocarbon samples were collected during excavation of Trench 2 and Trench 5 (Barrera 1990:9 and 12). These were submitted and are on file with DLNR-SHPD. The receipt of a report concerning the dating results was confirmed by R. Cordy (DLNR-SHPD) to the landowner in June of 1993. No further information is available.

PRESERVATION OF PROBABLE HOUSE SITES (According to Mitigation Plan as outlined in Document dated May 13, 1992 - Appendix C).

4) The three probable house sites, sites -12464, -12465, and -12467 are slated for preservation. To insure this, a 3 m buffer zone around each of the three sites has been established. The perimeters of the buffer zone were flagged in the field by the consulting archaeologist. Stakes were not driven at this time, since Charlie

Aipia said they would be taken down by cows in the pasture. He agreed to see the stakes would be placed when the cows were removed. The tops of these posts will then be flagged with ca. 1 m lengths of orange survey flagging tape. This will be done to warn any equipment operators of the preservation zone and prevent intrusion by heavy equipment. These activities were monitored and observed by the author on January 16, 1994. This has been done in response to the mitigation plan as set forth in the letter (Appendix C) of May 13, 1992 from Don Hibbard, Administrator, State Historic Preservation Division, to Mr. Christopher Norrie.

A further request, by Mr. Hibbard concerns additional archaeological data recovery of the Kona Field System deposits in the project area. Staff from DLNR-SHPD wishes to record soils and stratigraphy in this part of the Kona Field System. The landowner has agreed to inform DLNR-SHPD of the schedule and commencement of these grubbing activities.

HISTORIC MODIFICATIONS OF THE KONA FIELD SYSTEM

5) The project area is near to what has been described as the core of the Kona Field System in the uplands of Kealakekua *ahupua'a*, near the town of Captain Cook.

Barrera (1990:13) states:

Much of the Kona Field System remains represented at Site 13,662 have been modified by historic agricultural pursuits. These modification are more evident in the northeast, southeast and southwest quadrants. This phenomenon is quite commonly observed in the Kona Field System, and of course limits the precision with which the prehistoric condition can be discussed.

For additional confirmation on this point, see Paris letter (Appendix D).

During the walk-through of the project area on January 16, 1994 by the author, the map of Site 13662 (Barrera 1990:4) was observed to generally reflect the features in the project area. During this observation, an attempt was made to determine (among the features mapped by Barrera) which ones appeared to have been *severely* modified in the historic period. This was based on construction techniques such as facing, coursing, regularity, etc. From this quick inspection, it appears that all observed agricultural features were either modified or constructed

for historic agricultural purposes.

During conversations with Mr. Charlie Aipia, a local long-term resident, it was disclosed that the whole area was chain-dug and cleared when the land was owned by Ethel Paris (See Appendix D). Mr. Aipia states there are no prehistoric walls left in the project area. He further indicated that there was a cattle corridor just north of the project area that was used to drive cattle *mauka* to loading pens from holding areas and pens in the *makai* portion. The long *mauka-makai* walls are the remains of holding pens for cattle and donkeys.

The eastern-most portion of the project area has been heavily manipulated by chain-dragging and the walls as indicated in Barrera's map are somewhat idealized. Overall, however, the map appears to reflect placements and alignments as observed on the ground.

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DOCUMENT CAPTURED AS RECEIVED

JOHN WADSWORTH
GOVERNOR OF HAWAII



To
Tim Liu Kwan

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
STATE HISTORIC PRESERVATION DIVISION
33 SOUTH KING STREET, 6TH FLOOR
HONOLULU, HAWAII 96813

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CONSERVATION AND RESOURCES ENFORCEMENT CONVEYANCES
FORESTRY AND WILDLIFE HISTORIC PRESERVATION DIVISION
LAND MANAGEMENT STATE PARKS WATER AND LAND DEVELOPMENT

August 22, 1994

Mr. Christopher Norrie
P.O. Box 339
Captain Cook, Hawaii 96704

LOG NO: 12517
DOC NO: 9408PM13

Dear Mr. Norrie:

**SUBJECT: Completion of Archaeological Compliance Work at
Ka'awaloa Orchards
Ka'awaloa, South Kona, Island of Hawaii
TMK: 8-1-09: 2, 14, 16-27**

This is in reference to our letter of June 8, 1994 at which time we indicated that our staff would conduct additional archaeological investigations on your property for the purpose of completing the earlier unfinished survey, that would then enable you to apply for a grading/grubbing permit.

On August 11, 1994 Pat McCoy and Marc Smith of our office spent the day reviewing the results of the earlier survey and collecting new information. Their review of the site distribution map revealed a number of shortcomings in the identification and recording of the predominantly agricultural features. While most of the major field boundary features (mounds and walls) had been noted, only a small number of the many terraces had been mapped. The earlier report failed to convey the extent of the terracing and, thus, the degree to which the landscape has been culturally modified. Some of this new information was recorded in the time available.

McCoy and Smith also collected additional information on the three house sites that had been originally recommended for preservation. In the process of collecting this information and establishing a buffer zone around each site, they determined that site 14264 is not a habitation site. At the same time they were rather more impressed with site 14267 and adjacent features, only some of which were recorded earlier as part of site 13662. McCoy and Smith met very briefly with Sally Rice in the afternoon and suggested that the original preservation plan be slightly modified to accommodate the new thinking about sites 14264 and 14267. They proposed that rather than preserve site 14264, that a larger area be set aside for preservation around site 14267. She agreed to the change then and noted your concurrence with the new plan in a phone conversation with Pat McCoy on August 17, 1994.

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C. Norrie
Page 2

The final item of work that had been agreed to earlier was the excavation of new trenches through agricultural field boundary walls. Three trenches were excavated using a backhoe. McCoy and Smith photographed all three excavations and made a stratigraphic profile drawing of two of the trench walls. New information was obtained regarding the development of the walls and the agricultural soils, but unfortunately there was no charcoal to collect for radiocarbon dating.

With the collection of this new information and agreement to preserve sites 14265 and 14267, we believe that the compliance issues are completed. The property can now, from the historic preservation viewpoint, undergo grading/grubbing. It is our understanding, based on conversations with Sally Rice and Charlie Aipia, that the two sites will be fenced. Once this is done would you please notify Marc Smith (933 4346) so that he make sure that the buffer zone around each site is the one that we had marked in the field.

If you have any questions please contact Pat McCoy (587-0007).

Sincerely,



DON HIBBARD, Administrator
State Historic Preservation Division

PM.amk

c. Virginia Goldstein, Planning Director, Hawaii County

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STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
P.O. BOX 821
HONOLULU, HAWAII 96808

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LAND MANAGEMENT
STATE PARKS
WATER AND LAND DEVELOPMENT
WATER RESOURCES MANAGEMENT

JUL 18 1997

REF:LD-AJ
FILE NO. A172

Honorable Virginia Goldstein, Planning Director
County of Hawaii, Planning Department
25 Aupuni Street, Room 109
Hilo, Hawaii 96720

Dear Ms. Goldstein:

SUBJECT: Change of Zone Application (RRE 97-8)
Applicant: Seamount Enterprises, LLC, dba Kaawaloa Orchards
Request: A-5a to Agricultural Project District
Tax Map Key: 3rd/8-1-09, 18, 19, 21 and pora. of 20, 22, 23 & 24

We have reviewed the subject application and would like to offer the following comments:

Historic Preservation Division:

Several archaeological surveys were conducted in this area before the land was grubbed. Two sites (14265 and 14267) are being preserved, but both are located outside of the project area as defined in the application. We believe that the proposed project, the conversion of an existing tropical fruit orchard on 22.511 acres of land at Ka'awaloa into a planned agricultural community, will have "no effect" on significant historic sites.

State Parks Division:

We note the subdivision is near Kealakakua Bay State Historical Park and adjoins Kaawaloa Road, a public access to the park. However, there are no objections to the project.

Thank you for the opportunity to review the subject application. We have no further comments to offer at this time. If you have any questions, please contact Al Jodar of the Land Division at 587-0424.

HAWAII: Earth's Best!

Aloha,

Michael D. Wilson
MICHAEL D. WILSON

c: Hawaii Land Board Member
Hawaii District Land Office
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Exhibit 6