DEPARTMENT OF DESIGN AND CONSTRUCTION
CITY AND COUNTY OF HONOLULU
650 SOUTH KING STREET, 11TH FLOOR
HONOLULU, HAWAII 96813
Phone: (808) 768-8480 • Fax: (808) 768-4567
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KIRK CALDWELL
MAYOR

CHRIS T. TAKASHIGE, P.E., CCM
DIRECTOR

MARK YONAMINE, P.E.
DEPUTY DIRECTOR

553689

March 12, 2014

FILE COPY

MAR 23 2014

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Ms. Jessica Wooley, Acting Director
Office of Environmental Quality Control
State of Hawai'i
235 South Beretania Street, Suite 702
Honolulu, Hawai'i 96813-2437

Dear Ms. Wooley:

Subject: Waiale'e Beach Park Master Plan
Tax Map Key: 5-8-001: Various, 5-8-006: Various, 5-7-005: 013
Portion Kaunala, Waiale'e, Portion Pahipahi'ālua
North Shore District, O'ahu

The Department of Design and Construction, City and County of Honolulu, has reviewed the Draft Environmental Assessment for the subject project and anticipates a Finding of No Significant Impact (FONSI) determination. Please publish this determination in the next Environmental Notice.

One (1) printed copy of the Draft Environmental Assessment and a CD with the document in .pdf format are enclosed. The Environmental Notice publication form will be e-mailed to the Office of Environmental Quality Control.

Please contact Mr. Clifford Lau, Chief of the Facilities Division, Department of Design and Construction, at 768-8478 if you have any questions.

Very truly yours,

for M. Yonamine

Chris T. Takashige, P.E., CCM
Director

CTT:ln

Enclosures

cc: Department of Parks and Recreation
Toni P. Robinson, Director

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

Project Name Waiale'e Beach Park Master Plan
Island: O'ahu
District: North Shore
TMK: 5-8-001: 010, 015, 016, 017, 041,
5-8-006: 007, 030, 058 (pending land dedication to City)
5-7-005: 013

Private property that may be acquired:

5-8-001: 021, 023, 029, 033, 034

Permits: Special Use Permi, Special Management Area Use Permits, Conditional Use Permit - Minor for Joint Development, Shoreline Setback Variance (As Needed), Grubbing, Grading, and Stockpiling Permit, Building Permit for Building, Electrical, Plumbing Sidewalk/Driveway and Demolition Work, Water and Water System Requirements for Developments, Individual Wastewater Systems, Variance From Pollution Controls, NPDES General Permits Discharges Associated with Construction Activities, Work within State Highway Right-of-Way

Proposing/Determination Agency:

Department of Design and Construction
City and County of Honolulu
650 South King Street
Honolulu, Hawai'i 96813

Clifford Lau
T: 768-8478

Consultant:

Gerald Park Urban Planner
95-595 Kanam'ee Street #324
Mililani, Hawai'i 96789

Gerald Park
T: 625-9626

Status (check one only):

X DEA-AFNSI

Submit the proposing agency notice of determination/transmittal on agency letterhead, a hard copy of DEA, a completed OEQC publication form, along with an electronic word processing summary and a PDF copy (you may send both summary and PDF to oeqchawaii@doh.hawaii.gov); a 30-day comment period ensues upon publication in the periodic bulletin.

Summary (Provide proposed action and purpose/need in less than 200 words. Please keep the summary brief and on this one page)**:**

The Waiale'e Beach Park Master Plan was conceived in part by unique physical and environmental features and land tenures where the park is to be located. The beach park features almost one mile of white sand beach interspersed with nearshore reefs that make the shoreline ideal for fishing, reef walking, diving, camping, limited swimming, and sunbathing. The park also borders Kalou Marsh, a wetland located near the center of the park, Kalou Fishpond a recorded historic feature, and two intermittent stream channels on the eastern and western ends.

The beach provides opportunities for a variety of ocean recreation activities but the depth of the lots comprising the park (which averages between 160 and 180 lineal feet) constrains the type of recreational uses and supporting facilities that the park can physically accommodate and in part shapes the park layout.

Park improvements have been kept to a minimum because of environmental conditions, physical characteristics of the land, and a decision by city park planners to foster informal, unstructured recreational uses. The planned improvements include three access roads from Kamehameha Highway (a fourth access road from Kamehameha Highway will be provided by others), parking, earthwork, utility line installation, landscaping, irrigation system, bathhouses, outdoor showers, and individual wastewater systems. A camping area for overnight camping is proposed for the eastern end of the park

The cost of improvements is estimated at $3.45 million and will be funded by the City and County of Honolulu. Improvements will be constructed over five (5) development phases.

DRAFT ENVIRONMENTAL ASSESSMENT

WAIALE'E BEACH PARK MASTER PLAN

Kaunala, Waiale'e, Pahipahi'ālua
North Shore District, O'ahu, Hawai'i




Prepared for

Department of Design and Construction
City and County of Honolulu
650 South King Street
Honolulu, Hawai'i 96813

February 2014

DRAFT ENVIRONMENTAL ASSESSMENT

WAIALE'E BEACH PARK MASTER PLAN

Kaunala, Waiale'e, Pahipahi'ālua
North Shore District, O'ahu, Hawai'i

Prepared in Fulfillment of the Requirements
of Chapter 343, Hawai'i Revised Statutes and
Hawai'i Administrative Rules, Title 11, Chapter 200
Department of Health, State of Hawai'i

Prepared for

Department of Design and Construction
City and County of Honolulu
650 South King Street
Honolulu, Hawai'i 96813

Prepared by

Gerald Park Urban Planner
95-595 Kaname'e Street #324
Mililani, Hawai'i 96789

and

Kim & Shiroma Engineers Inc.
1314 South King Street, Suite 325
Honolulu, Hawai'i 96814

February 2014

PROJECT SUMMARY

Project:	Waiale'e Beach Park Master Plan
Proposing Agency:	Department of Design and Construction City and County of Honolulu 650 South King Street Honolulu, Hawai'i 96813
Determining Agency:	Department of Design and Construction City and County of Honolulu
Location:	Portion Kaunala, Waiale'e, Portion Pahipahi'ālua, North Shore District, O'ahu
Tax Map Keys:	5-8-001: 010, 015, 016, 017, 041, 5-8-006: 007, 030, 058 (pending dedication) 5-7-005: 013 Private PropertyThat May Be Acquired: 5-8-001: 021 (Planned Phase 3) 5-8-001: 023 (Planned Phase 5) 5-8-001: 029 (Planned Phase 5) 5-8-001: 033 (Planned Phase 4) 5-8-001: 034 (Planned Phase 4)
Landowners:	City and County of Honolulu, State of Hawai'i, Private
Land Area:	34.487 acres (Existing Park Ara, incl. Pending)
State Land Use Designation: General Plan: Development Plan Area: Land Use Map: Public Facilities Map: Zoning:	Agricultural Rural North Shore Agriculture Park AG-2 General Agriculture
Existing Use:	Ocean Recreation
Need for Environmental Assessment::	Chapter 343, Hawaii Revised Statutes §343-5 (1), Propose the use of state or county lands or funds; 343-5 (3) Propose any use within the shoreline area as defined in 205A-41

PROJECT SUMMARY

Anticipated Determination:	Finding of No Significant Impact
Contact Person:	Terry Hildebrand Department of Design and Construction City and County of Honolulu 650 South King Street Honolulu, Hawaii 96813 Phone: 768-8401

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SECTION 1
DESCRIPTION OF THE PROPOSED ACTION

The Department of Design and Construction, City and County of Honolulu, proposes to develop a new public beach park in the ahupua'a of Waialeʻe, portion Kaunala, and portion Pahipahiʻālua, North Shore District, City and County of Honolulu, State of Hawaiʻi. The proposed Waialeʻe Beach Park is bounded by the Pacific Ocean to the north, the University of Hawaiʻi Waialeʻe Livestock Research Farm to the south, and part of Pahipahiʻālua Beach (TMK: 5-7-005:013): to the east. A Location Map is shown in Figure 1.

The developers of the Sunset Beach Colony Subdivision to the west of the University of Hawaiʻi's Waialeʻe Livestock Research Farm ("WLRF") will dedicate approximately 1.14 acres (TMK 5-8-006:058) to the City and County of Honolulu for inclusion into Waialeʻe Beach Park.

A. Conceptual Development Scheme

The Waialeʻe Beach Park Master Plan was conceived in part by unique physical and environmental features and land tenures where the park is to be located. The beach park features almost one mile of white sand beach interspersed with nearshore reefs that make the shoreline ideal for fishing, reef walking, diving, camping, limited swimming, and sunbathing. The park also borders Kalou Marsh, a wetland located near the center of the park, Kalou Fishpond a recorded historic feature, and two intermittent stream channels on the eastern and western ends.

Although the beach provides opportunities for a variety of ocean recreation activities, the depth of the lots comprising the park (which averages between 160 and 180 lineal feet) constrains the type of recreational uses and supporting facilities that the park can physically accommodate. This physical limitation in part shapes the park layout.

Park improvements have been kept to a minimum because of environmental conditions, physical characteristics of the land, and a decision by city park planners to foster informal, unstructured recreational uses. The planned improvements include three access roads from Kamehameha Highway, parking, earthwork, utility line installation, landscaping, irrigation system, bathhouses, outdoor showers, and individual wastewater systems.

The City and its consultants have been guided in the preparation of this Master Plan by the objectives and policies presented in the North Shore Development Plan and the North Shore *Sustainable* Communities Plan. The Master Plan attempts to balance the development of the coastal resource that is Waialeʻe in a manner consistent with policies that call for improved access to recreation resources at the shoreline, preservation of historic and cultural features, promotion of compatible recreational activities, and the preservation of open space, scenic resources, and environmental quality.

The proposed Master Plan and the phasing of improvements are shown in Figures 2a, 2b, 2c 2d, and 2e.

B. Technical Characteristics

Three driveways from Kamehameha Highway are proposed. Two existing dirt roads through the central sections of the WLRF will be improved for vehicles and pedestrians. A third route will be new construction.

Within the central area, the existing dirt road on the west lies within a 50-foot road and utility easement. The easement will be improved with a 24-foot wide asphalt concrete driveway about 1,100 feet long. The driveway will terminate in a 38-stall parking lot (Parking Lot 1B). A larger parking lot of 72 stalls (Parking Lot 1A) is located on the Sunset Beach side of the driveway. The larger lot is intended to accommodate people and surfers at Velzyland, a popular surfing spot located at the western end of the Park. A 100-foot long vehicle turnaround at the end of the parking lot will allow people to view the Velzyland surf from their vehicles.

The dirt road on the eastern side of the central area lies within a 40-foot road easement that also will be improved with a 24-foot wide asphalt concrete driveway approximately 700 feet in length. The driveway terminates at a 23-stall parking lot to be developed at the end of the roadway on the Kahuku side. This easement passes through a *kuleana* lot near Kamehameha Highway.

A third access will be built at the eastern end of the Park. The proposed driveway is a short, 24-foot wide paved driveway from Kamehameha Highway leading to a paved 62-stall parking lot fronting the Highway.

Turning radii from Kamehameha Highway into the access roads will be engineered for safe ingress and egress of vehicles at all intersections. Left-turn stacking lanes and right turn lanes on Kamehameha Highway are required for the new driveways per State Department of Transportation comments.

A fourth access constructed by others is aligned through the lot to be dedicated to the City and County of Honolulu by the developers of the Sunset Beach Colony Subdivision. The 1.14 acre lot provides a paved, 600-foot long, 24-foot wide asphalt concrete driveway linking Kamehameha Highway and Velzyland, a popular surf break. The driveway terminates at Velzyland but will connect to a parking lot to be constructed as part of the Waiale'e Beach Park improvements. Currently the driveway is secured by a gate and closed to the public pending Park development.

The roads will function also as utility corridors. Eight-inch water laterals will be installed in each roadway and connected to transmission mains along Kamehameha Highway. Water meters and fire hydrants will connect at the beach end of the laterals. At the eastern end of the Park water will be metered from an existing 16-inch line in Kamehameha Highway. Service lines to the bathhouses, showers, and water fountains at various locations in the Park will be taken from the nearest service laterals.

Existing overhead power and telephone lines along the existing dirt roads will be relocated within the utility easements and, if necessary, new distribution lines installed overhead from Kamehameha Highway. Public telephones may be provided at each of the parking areas.

Off-street parking will be provided in four areas in different sections of the Park. The largest parking area is proposed at the western end of the Park which is expected to attract the most users. Two parking areas, one fronting a popular surfing spot called Velzyland and a

second smaller area will accommodate 110 vehicles. The third parking area (23 stalls) is planned near the middle of the Park and the fourth at the eastern end (62 stalls) will accommodate beach goers and campers.

Four bathhouses are dispersed throughout the Park. Siting the bathhouses near the proposed parking lots was determined after considering convenience for park users, accessibility for maintenance purposes, and the need to provide individual wastewater systems for each bathhouse rather than a gang facility.

The area lacks a municipal wastewater collection and treatment system. Wastewater from the bathhouses will be collected in individual wastewater systems (IWS). Each IWS entails use of a septic tank for solids collection and a disposal field for effluent disposal. Solids will be retained in the septic tank and effluent discharged into disposal fields. Each will be regularly maintained.

An 8-foot wide esplanade will traverse almost the entire length of the Park. The concrete paved esplanade is envisioned as a multi-user pathway for strollers, joggers, bicyclists, the handicapped, and park maintenance vehicles. Convenience improvements include outdoor showers, water fountains, and benches for sitting and resting. A ford rather than a bridge will allow maintenance vehicles to cross Waiale'e and Pahipahi'ālua gulches.

A camping area for overnight camping is proposed for the eastern end of the Park. City camping staff have estimated that the area can accommodate 10 campsites (with 10 persons at each site) for a maximum of 100 campers. No permanent camping structures will be erected and camping will be regulated by permit. The bathhouse proposed for this area will be sized to accommodate the maximum camping population. The parking lot and bathhouse will be illuminated at night for security purposes. Light fixtures will be positioned and adjusted to illuminate primarily the camping area.

C. Economic Characteristics

The cost of improvements is estimated at $3.45 million dollars and will be funded by the City and County of Honolulu. Phase 1 construction will commence after all necessary permits and approvals are received.

A five phase construction schedule is proposed.

Phase 1 — Construct parking area, bathhouse, outdoor shower, individual wastewater system (IWS) and disposal field, lifeguard station, and portion of esplanade. The new roadway system will connect to the existing roadway and parking area created by the Sunset Beach Colony Subdivision.

Phase 2 — Develop camp sites at eastern end of Park. Construct driveway and parking area, lifeguard station, bathhouse, outdoor shower, IWS and disposal field, and portion of esplanade.

Phase 3 — Construct central access road (west), bathhouse, shower, IWS and disposal field, lifeguard station, parking area, connecting driveway to parking area and portion of esplanade constructed in Phase 1.

Phase 4 — Construct central access road (east), parking area, bathhouse, outdoor shower, IWS and disposal field, lifeguard station, and portion of esplanade.

Phase 5 Complete construction of esplanade between Phases 3 and 4.

1. Land Tenure

Waiale'e Beach Park consists of several coastal parcels belonging to the City and County of Honolulu, the State of Hawai'i, and private owners. A listing of parcels, acreage, and owner is presented in Table 1 and shown on Figures 3a, 3b, and 3c. Privately owned lands are *kuleana* lots. The lots are shown on the Master Plan and are planned to be acquired in the future, or alternatively. easements acquired over the lots for access. Public acquisition of all of these *kuleana* parcels would enhance the physical continuity of this relatively narrow shoreline park.

Table 1. Waiale'e Beach Park Parcels

Tax Map Key	Acres	Owner
5-8-001: 016	0.471	City and County of Honolulu
5-8-001: 017	0.208	City and County of Honolulu
5-8-006: 007	0.380	City and County of Honolulu
5-8-006: 030	0.089	City and County of Honolulu
5-7-005: 013	1.152	City and County of Honolulu
5-8-006: 058	1.142	Private – Pending Dedication to C/C of Honolulu
5-8-001: 010	0.310	State of Hawai'i
5-8-001: 015	24.690	State of Hawai'i
5-8-001: 041	3.697	State of Hawai'i
5-8-001: 021	0.460	Private – To Be Acquired
5-8-001: 023	0.690	Private – To Be Acquired
5-8-001: 029	0.930	Private – To Be Acquired
5-8-001: 033	0.288	Private – To Be Acquired
5-8-001: 034	0.340	Private – To Be Acquired
	34.847	

Source: Department of Design and Construction, 2012.

Tax Map Key 5-8-006: 058, which is part of the Sunset Beach Colony, will be dedicated to the City and County of Honolulu and added to Waiale'e Beach Park. The parcel is excluded from this environmental assessment. Improvements to this parcel were completed by the developer. Potential environmental impacts resulting from development of the parcel were previously disclosed in an environmental assessment prepared in 2001 (Wilson Okamoto & Associates).

D. Social Characteristics

A dwelling on Tax Map Key 5-8-01: 34 is currently occupied. The lot may be acquired during later development phases of the Park. There are no plans to relocate the possible occupants until such time that City acquires the land for park development.

The proposed improvements will be designed in compliance with rules, regulations, and accessibility standards for outdoor recreation areas to comply with the Americans with Disabilities Act.

E. History

A brief historical narrative of the Waiale'e area presented below is excerpted from "Archaeological Assessment of Proposed Master Plan Improvements for the Waiale'e Beach Park (Cultural Surveys Hawai'i)". The narrative covers the period 1900 to the present (with mention of the founding of the Kahuku Sugar Company in the 1890s). The history documents early uses of the property and the influence those uses have on the condition and uses that exist today.

In 1890, James Castle and Alexander Young started the Kahuku Sugar Company. In 1892 the first crop was harvested producing 4,356 tons of sugar annually. The mill camp became Kahuku's first 'modern' community, also at this time thirty miles of plantation railroad construction began (Dorrance 1998:120). Kahuku Plantation became the dominant economic factor in this portion of Ko'olauloa with direct physical effects on the project area.

According to the government census of 1900 there were then 2,372 persons living in the Ko'olauloa District with the increase related to plantation-organized immigration (Schmitt 1977: 12-13). No specific population figure for the ahupua'a was recorded. The district population increased dramatically, due to immigrant plantation workers, during subsequent years, up to 10,562 in 1970.

A 1903 map of Waiale'e indicates that settlement in the ahupua'a continued to be focused near the coastline. The pond (Kalou) is also depicted in the map along with the O.R.& L. Railroad. A dotted line shows an old government road that ran parallel to the coastline and was later rerouted closer to the coastline (remnants of this road were in trench 1). There were approximately seven or eight houses in the area of prior cane fields and the remainder of the houses were on non-cane fields.

Waiale'e Training School For Boys was the major entity of change, for Waiale'e in the early 20th century. The school began in 1903 with construction of various buildings continuing through 1934. The school consisted of 650 acres that held 42 buildings with a capacity of 175 inmates. In 1939, there were 150 "inmates" (Territorial Planning Board 1939:231,233 in this document the boys were referred to as "inmates"). The school conducted training activities such as agriculture and animal husbandry. The school was in use until the 1950s (Schmitt 1977:255). Presently, Crawford Convalescent Home uses some of the same grounds but with new buildings and some renovation of others. The school buildings are now mostly dilapidated remnants. From the early 1960s, The University of Hawai'i Experimental Station also began to use the former school grounds, as pasture land and associated farm buildings.

During World War II Kahuku was designated by the [U.S.] Army to house four eight-inch cannons between the mill and the shore. They also constructed a landing strip for fighter planes which was abandoned in 1950 (Dorrance 1998:121). Information about the Army's stay in Kahuku was also mentioned in our oral interview with Harry Kou. Mr. Kou related that the project area had been taken over by the military for housing. In this process local inhabitants were relocated to enable the military to use existing houses and provide new houses for their personnel.

On April 1, 1946 the Hawaiian Islands experienced one of the worst tsunamis in its history. The tsunami caused much property damage and loss of life. Paumalu which is about two miles northwest from the project area was devastated by the natural disaster. Records indicate that at Paumalu, the water rose 23 feet above sea level and threw sections of the railroad track inland across the adjacent highway (Shepard 1959:421). About one mile northeast of Waiale'e, Kawela Bay was also devastated. At the time, Mr. and Mrs. Shepard were living just west of Kawela Bay and lived to tell their experience:

> The third wave was observed from a point on the railroad at a height of 24 feet. It broke just outside the terrace, rising slightly above the horizon at eye level, so that this breaker must have been about 25 feet high. Crossing the terrace with a terrific noise of breaking cane, it swept across the railroad track to the west of us and left a mass of debris on the highway in land from the railroad (Shepard 1959:425).

The area described above is very close or possibly inclusive of the project area, and therefore directly applicable to the tsunami effect on Waiale'e.

The O'ahu Railway & Land Company went out of business on December 31, 1947 and the railway line through Waiale'e was discontinued (Condé & Best 1972:299). One cause of the railway's closure was the damage to the rail line from the 1946 tsunami.

A 1949 aerial photograph of the Waiale'e coastline shows Kalou Pond covered with marsh vegetation, sugarcane fields at the eastern end of the project area, cultivated land associated with Waiale'e Training School, and houses, along the coastline in the project area. Outside the project area land use was still dominated by farming and the associated structures of the Waiale'e Training School for Boys (Figure 8).

In 1950 The Waiale'e Training School for Boy's closed. In 1971 Kahuku Plantation closed. These two closures plus the 1947 O.R.&L. closure reduced land use within the project area to probably a few beach homes and University of Hawai'i Experimental Station use. Presently only a few beach homes remain and U.H. use has been reduced to pasturage just *mauka* of the project area.

Source: USGS National Map Viewer & C&C of Honolulu Website

LINEAL SCALE (FEET)
500 250 0 250 500 1000

NORTH

Gerald Park
Urban Planner
November 2000
December 2011

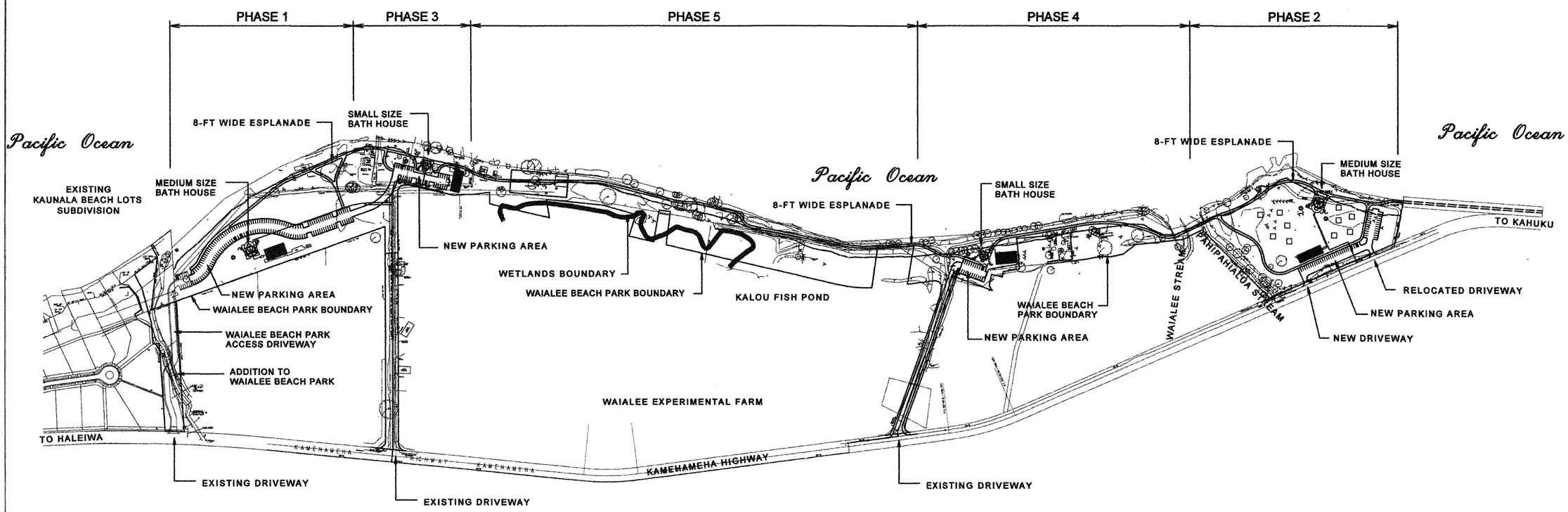
North Shore, Island of O'ahu

Figure 1
Vicinity Map
Waiale'e Beach Park Master Plan

DEVELOPMENT SUMMARY

PHASE 1		PHASE 2		PHASE 3		PHASE 4		PHASE 5		TOTAL	
STANDARD PARKING STALLS	155 STALLS	STANDARD PARKING STALLS	51 STALLS	STANDARD PARKING STALLS	28 STALLS	STANDARD PARKING STALLS	20 STALLS	STANDARD PARKING STALLS	NONE	STANDARD PARKING STALLS	254 STALLS
ACCESSIBLE STALLS	7 STALLS	ACCESSIBLE STALLS	4 STALLS	ACCESSIBLE STALLS	2 STALLS	ACCESSIBLE STALLS	1 STALLS	ACCESSIBLE STALLS	NONE	ACCESSIBLE STALLS	14 STALLS
BATH HOUSE	1 MEDIUM	BATH HOUSE	1 MEDIUM	BATH HOUSE	1 SMALL	BATH HOUSE	1 SMALL	BATH HOUSE	NONE	BATH HOUSE	2 SMALL
OUTDOOR SHOWER	1 EACH	OUTDOOR SHOWER	2 EACH	OUTDOOR SHOWER	1 EACH	OUTDOOR SHOWER	1 EACH	OUTDOOR SHOWER	NONE		2 MEDIUM
LIFEGUARD STATION	NONE	LIFEGUARD STATION	NONE	LIFEGUARD STATION	NONE	LIFEGUARD STATION	NONE	LIFEGUARD STATION	NONE	OUTDOOR SHOWER	5 EACH
WATER FOUNTAIN	1 EACH	WATER FOUNTAIN	3 EACH	WATER FOUNTAIN	1 EACH	WATER FOUNTAIN	1 EACH	WATER FOUNTAIN	2 EACH	LIFEGUARD STATION	NONE
BENCHES	3 EACH	BENCHES	4 EACH	BENCHES	2 EACH	BENCHES	3 EACH	BENCHES	4 EACH	WATER FOUNTAIN	8 EACH
PICNIC TABLES	6 EACH	CAMPSITES	10 EACH	PICNIC TABLES	3 EACH	PICNIC TABLES	4 EACH	PICNIC TABLES	3 NONE	BENCHES	16 EACH
		PICNIC TABLES	10 EACH							CAMPSITES	10 EACH
		BAR-B-QUES	6 EACH							PICNIC TABLES	26 EACH
		CHARCOAL RECEPTACLES	6 EACH							BAR-B-QUES	6 EACH
										CHARCOAL RECEPTACLES	6 EACH

TRUE NORTH



GENERAL PLAN

SCALE: 1"= 200'

REVISION	DATE	DESCRIPTION	MADE BY	APPROVED

DEPARTMENT OF DESIGN AND CONSTRUCTION
CITY & COUNTY OF HONOLULU

MASTER PLAN FOR WAIALEE BEACH PARK

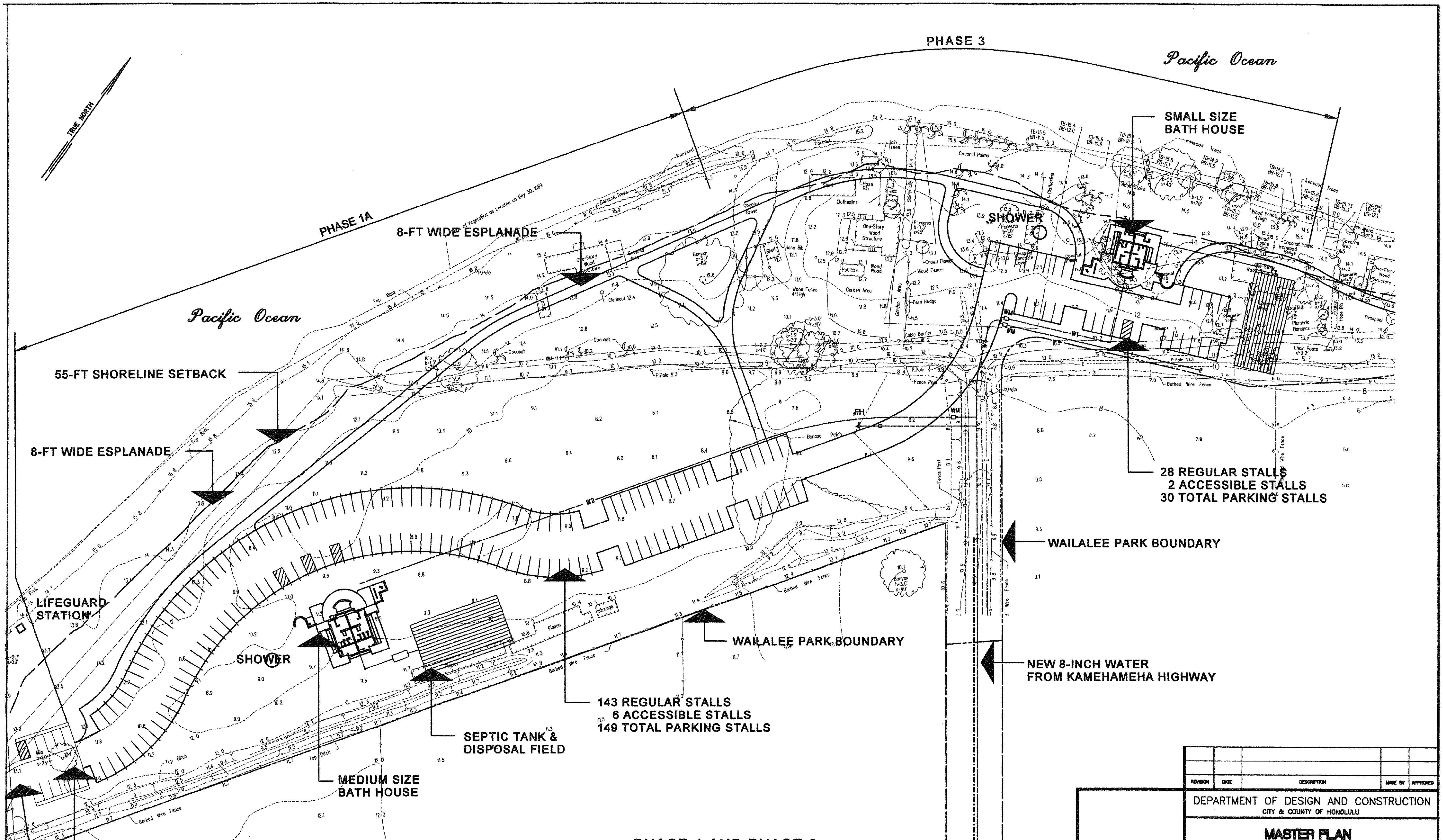
WAIALEE, KOOLAULOA, OAHU, HAWAII
TAX MAP KEY: 5-7-004b: 5-8-004b,15,16,17,4b 5-8-08:07

APPROVED:

Director, Department of Design and Construction — Date: 11-28-2011

CONCUR:

Director, Department of Parks and Recreation — Date: 11/28/11



PHASE 1 AND PHASE 3

SCALE: 1"= 40'

PHASE 1

STANDARD PARKING STALLS	155	STALLS
ACCESSIBLE STALLS	7	STALLS
BATH HOUSE	1	MEDIUM
OUTDOOR SHOWER	1	EACH
LIFEGUARD STATION		NONE
WATER FOUNTAIN	1	EACH
BENCHES	3	EACH
PICNIC TABLES	6	EACH

PHASE 3

STANDARD PARKING STALLS	28	STALLS
ACCESSIBLE STALLS	2	STALLS
BATH HOUSE	1	SMALL
OUTDOOR SHOWER	1	EACH
LIFEGUARD STATION		NONE
WATER FOUNTAIN	1	EACH
BENCHES	2	EACH
PICNIC TABLES	3	EACH

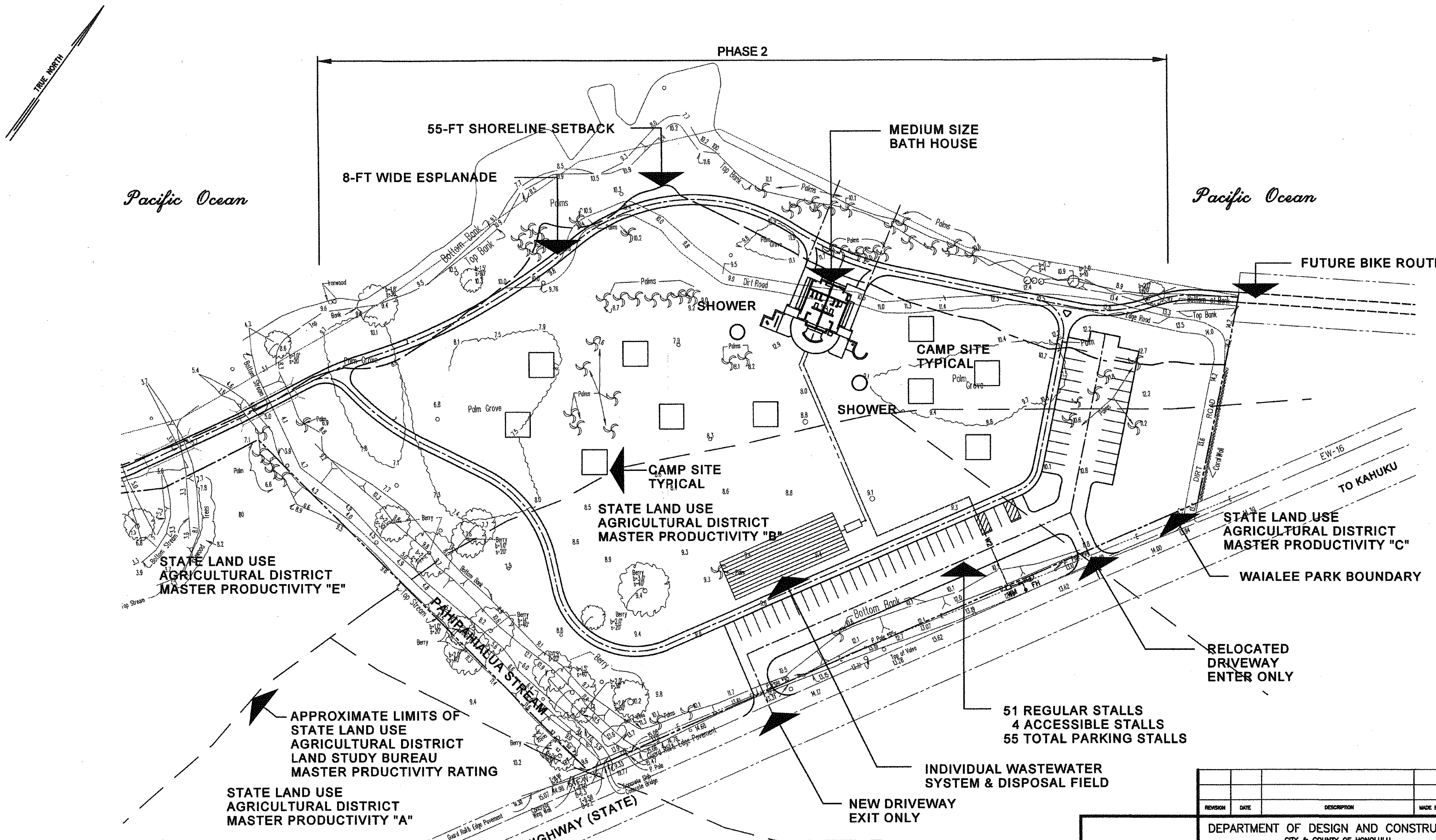
REVISION	DATE	DESCRIPTION	MADE BY	APPROVED

DEPARTMENT OF DESIGN AND CONSTRUCTION
CITY & COUNTY OF HONOLULU

MASTER PLAN
FOR
WAIALEE BEACH PARK
WAIALEE, KOOLAULOA, OAHU, HAWAII
TAX MAP KEY: 5-7-08:49; 5-8-01:10,11,16,17,41; 5-8-08:07

APPROVED:
11-28-2011
Director, Department of Design and Construction — Date

CONCUR:
11/28/11
Director, Department of Parks and Recreation — Date



PHASE 2

STANDARD PARKING STALLS	51	STALLS
ACCESSIBLE STALLS	4	STALLS
BATH HOUSE	1	MEDIUM
OUTDOOR SHOWER	2	EACH
LIFEGUARD STATION		NONE
WATER FOUNTAIN	3	EACH
BENCHES	4	EACH
CAMPSITES	10	EACH
PICNIC TABLES	10	EACH
BAR-B-QUES	6	EACH
CHARCOAL RECEPTACLES	6	EACH

PHASE 2

SCALE: 1"= 40'

GRAPHIC SCALE

40' 20' 0 40' 80'

REVISION	DATE	DESCRIPTION	MADE BY	APPROVED

DEPARTMENT OF DESIGN AND CONSTRUCTION

CITY & COUNTY OF HONOLULU

MASTER PLAN
FOR
WAIALEE BEACH PARK

WAIALEE, KOOLAULOA, OAHU, HAWAII

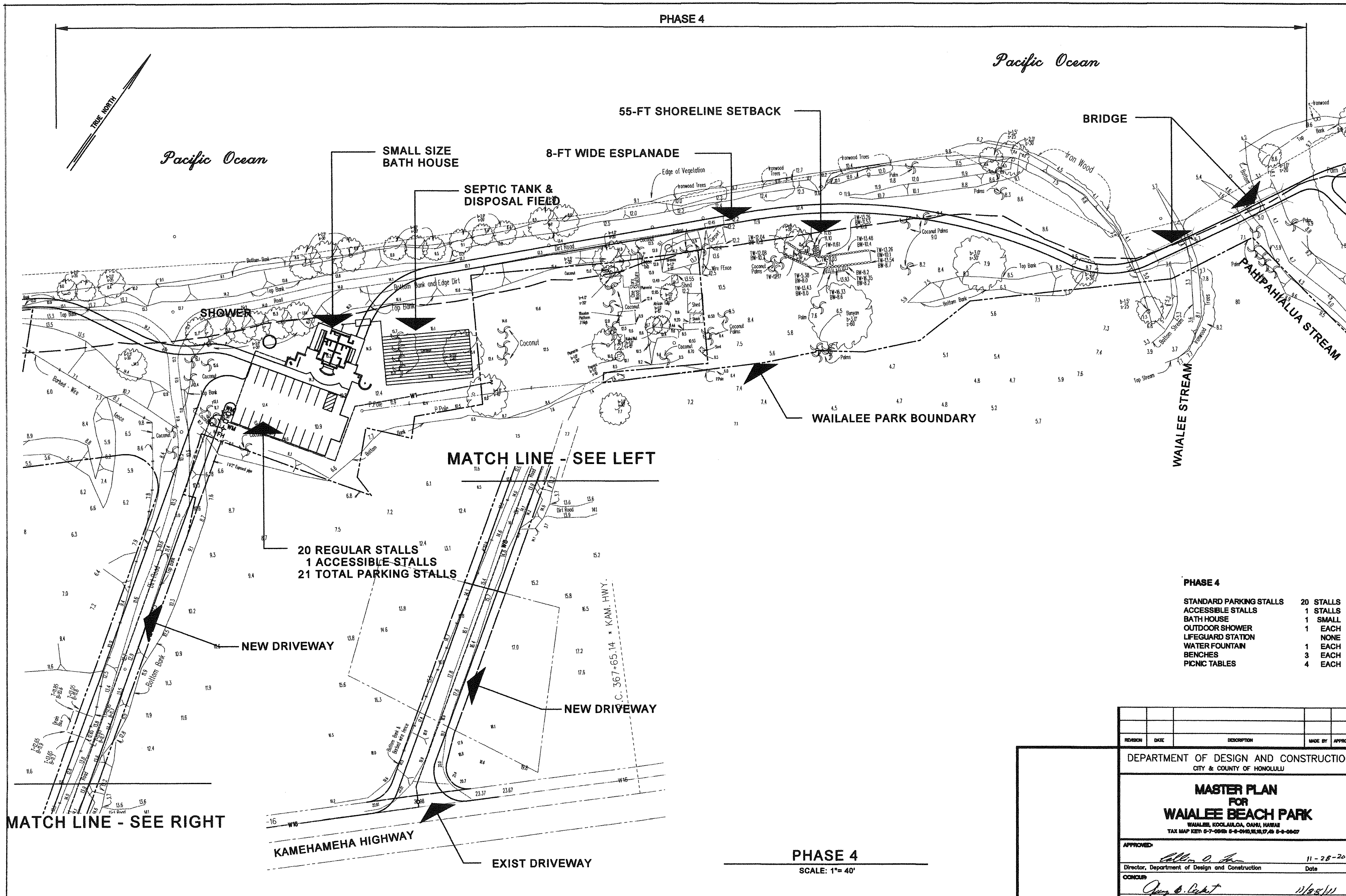
TAX MAP KEY: 5-7-05:15; 5-8-01:10,15,16,17,45; 5-8-03:07

APPROVED:

Director, Department of Design and Construction — Date

CONCUR:

Director, Department of Parks and Recreation — Date



PHASE 4
Pacific Ocean
TRUE NORTH
Pacific Ocean
SMALL SIZE BATH HOUSE
8-FT WIDE ESPLANADE
55-FT SHORELINE SETBACK
BRIDGE
SEPTIC TANK & DISPOSAL FIELD
SHOWER
PAHIPAHIALUA STREAM
WAIALEE STREAM
WAILALEE PARK BOUNDARY
MATCH LINE - SEE LEFT
20 REGULAR STALLS
1 ACCESSIBLE STALLS
21 TOTAL PARKING STALLS
NEW DRIVEWAY
NEW DRIVEWAY
KAMEHAMEHA HIGHWAY
EXIST DRIVEWAY
MATCH LINE - SEE RIGHT

PHASE 4

STANDARD PARKING STALLS	20	STALLS
ACCESSIBLE STALLS	1	STALLS
BATH HOUSE	1	SMALL
OUTDOOR SHOWER	1	EACH
LIFEGUARD STATION		NONE
WATER FOUNTAIN	1	EACH
BENCHES	3	EACH
PICNIC TABLES	4	EACH

PHASE 4

SCALE: 1"= 40'

REVISION	DATE	DESCRIPTION	MADE BY	APPROVED

DEPARTMENT OF DESIGN AND CONSTRUCTION
CITY & COUNTY OF HONOLULU

MASTER PLAN FOR WAIALEE BEACH PARK

WAIALEE, KOOLAULOA, OAHU, HAWAII

APPROVED:
Director, Department of Design and Construction — Date 11-28-2011

CONCUR:
Director, Department of Parks and Recreation — Date 11/28/11

PHASE 5

55-FT SHORELINE SETBACK

8-FT WIDE ESPLANADE

Pacific Ocean

Pacific Ocean

WETLANDS BOUNDARY

WAILALEE PARK BOUNDARY

SEPTIC TANK & DISPOSAL FIELD (PHASE 3)

MATCH LINE - SEE BELOW

PHASE 5

55-FT SHORELINE SETBACK

8-FT WIDE ESPLANADE

Pacific Ocean

Pacific Ocean

SHOWER

KALOU FISH POND

WAILALEE PARK BOUNDARY

MATCH LINE - SEE ABOVE

TRUE NORTH

PHASE 5

SCALE: 1"= 40'

PHASE 5

STANDARD PARKING STALLS		NONE
ACCESSIBLE STALLS		NONE
BATH HOUSE		NONE
OUTDOOR SHOWER		NONE
LIFEGUARD STATION		NONE
WATER FOUNTAIN	2	EACH
BENCHES	4	EACH
PICNIC TABLES	3	NONE

REVISION	DATE	DESCRIPTION	MADE BY	APPROVED

DEPARTMENT OF DESIGN AND CONSTRUCTION
CITY & COUNTY OF HONOLULU

MASTER PLAN FOR WAIALEE BEACH PARK

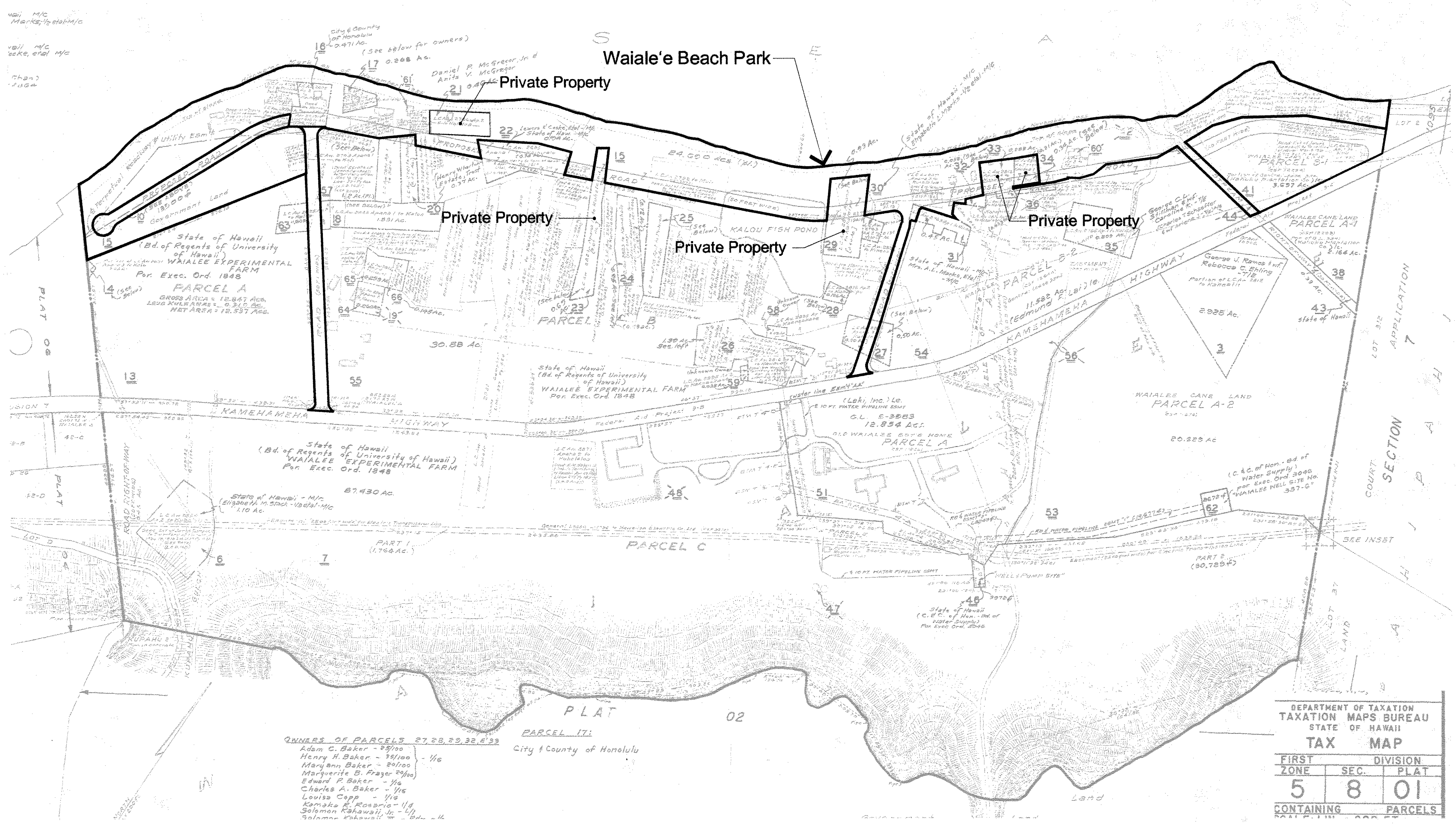
WAIALEE, KOOLAULOA, OAHU, HAWAII
TAX MAP KEY: 5-7-009: 5-6-010;11,16,17,45 5-6-006:7

APPROVED:

Director, Department of Design and Construction — Date: 11-28-2011

CONCUR:

Director, Department of Parks and Recreation — Date: 11/28/11



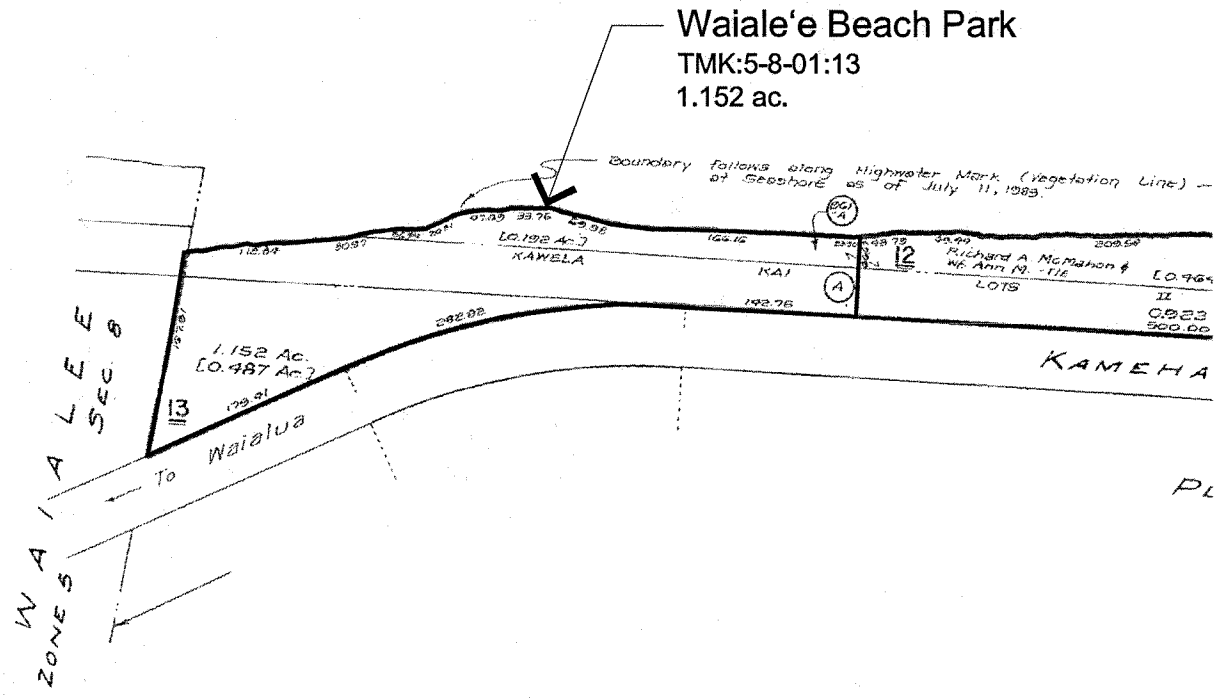
Source: City & County of Honolulu Website

Note: Private Property That May Be Acquired
5-8-001:021 Planned Phase 3
5-8-001:033 Planned Phase 4
5-8-001:034 Planned Phase 4
5-8-001:023 Planned Phase 5
5-8-001:029 Planned Phase 5

LINEAL SCALE (FEET) 100 50 0 50 100 200

NORTH

Figure 3A
Tax Map
Waiale'e Beach Park Master Plan



DEPARTMENT OF TAXATION
TAXATION MAPS BUREAU
STATE OF HAWAII

TAX MAP

FIRST		DIVISION
ZONE	SEC.	PLAT
5	8	01

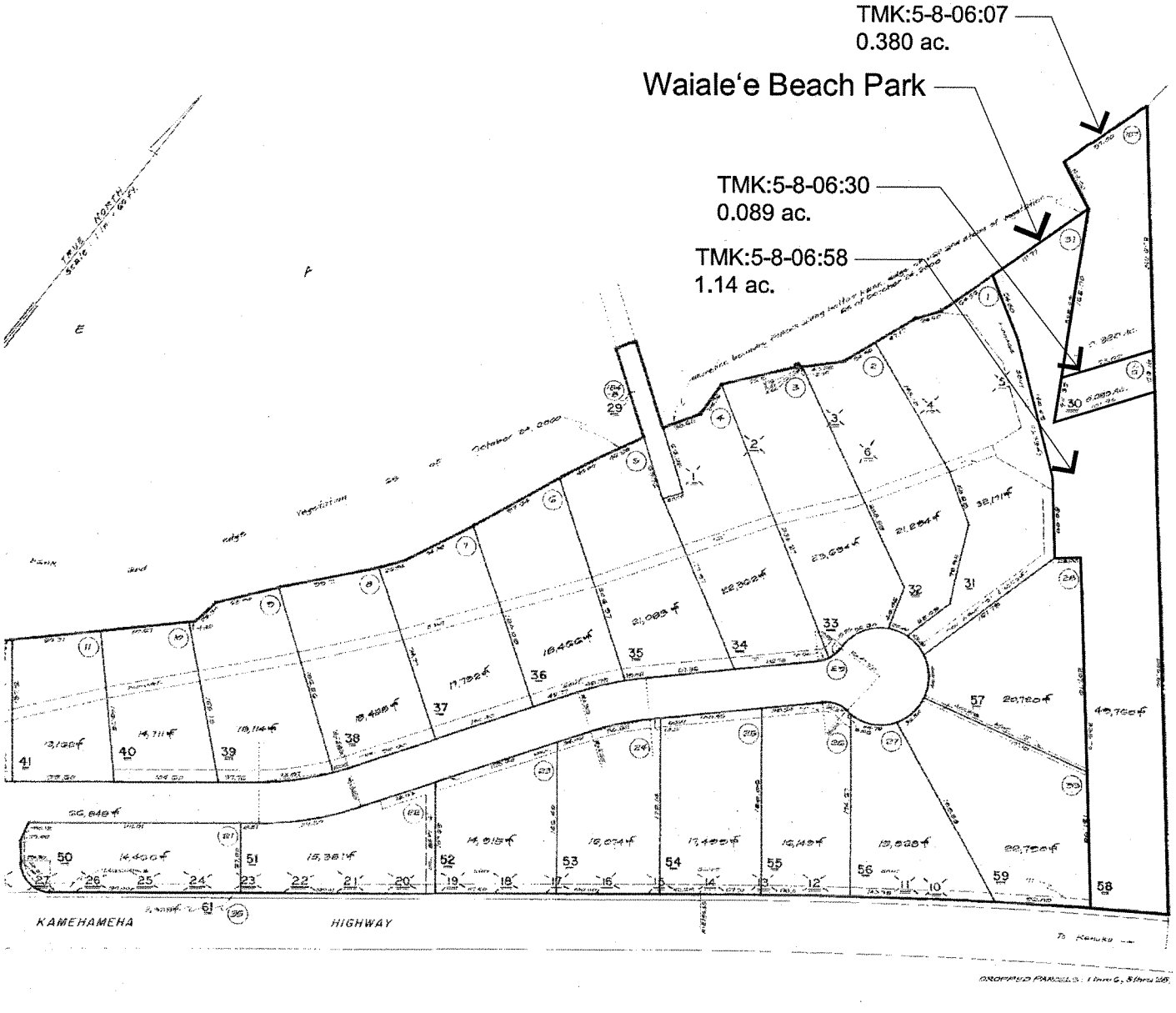
Source: City & County of Honolulu Website

LINEAL SCALE (FEET)
75 37.5 0 37.5 75 150

NORTH

Figure 3B
Tax Map
Waiale'e Beach Park Master Plan

Gerald Park
Urban Planner
November 2000
Dwecember 2011



Note: TMK:5-8-06:058 Pending Acquisition Through Dedication

Source: USGS National Map Viewer & C&C of Honolulu Website

LINEAL SCALE (FEET)
75 37.5 0 37.5 75 150

NORTH

Gerald Park
Urban Planner
November 2000
December 2011

Figure 3C
Tax Map
Waiale'e Beach Park Master Plan

SECTION 2
DESCRIPTION OF THE AFFECTED ENVIRONMENT

A. Existing Conditions

Although visible from Kamehameha Highway, Waiale'e Beach Park is a relatively isolated beach park. Residents of the area may be aware that it is an unimproved public beach park and they probably frequent its sandy beaches and a surfing area called Velzyland. People from outside the community may not have this knowledge and may think of it only as a beach which is difficult to access over several long, rutted, dirt roads. Moreover, the presence of grazing livestock and attendant odors, dense vegetation, and the absence of comfort stations and showers may discourage public use.

The Waiale'e shoreline extends westward from the developed section of Pahipahi'ālua Beach on the east approximately one mile to the mouth of Kaunala Gulch on the west. The City and County of Honolulu has acquired two lots west of Kaunala Gulch and a third lot that was improved by the developers of the Sunset Beach Colony Subdivision is in the process of being dedicated to the City.

Velzyland, a popular surfing spot, is located offshore on the western end and Kūka'imanini Islet is located offshore on the eastern end of the Park. People have been observed pole and line fishing, gill netting, sport diving, spear fishing, and sunbathing at various times. Swimming is only fair because beach rock and sections of coral reef are exposed along the entire shoreline (Clark, 1977).

Park operation and maintenance is under the jurisdiction of the Department of Parks and Recreation, City and County of Honolulu. With the exception of Pahipahi'ālua Beach, the park land has been land banked for future development and has not yet been opend for public use.

B. Climate

Rainfall along this section of the North Shore averages 44 inches per year with half of all rainfall occurring during the winter months. Temperatures are indicative of Hawaii's semi-tropical climate with temperatures averaging 80^0 F (and occasionally reaching into the low 90's during the summer months) with lows in the mid 60-70^0F for most of the year.

Waiale'e faces the northwest which exposes it to the northeast tradewinds. The tradewinds blow from the north and east facing quadrant about 80 percent of the year at speeds between 20 and 22 knots. Oftentimes, it seems that the wind blowing off Kahuku Point and out of Waimea Valley converge at Waiale'e which contributes to extreme wind conditions.

C. Landform

Featuring slightly more than a mile of shoreline, Waiale'e Beach Park is longer than it is wide. At its widest point near Pahipahi'ālua Beach the Park extends about 400 feet inland of the shoreline. Part of the western end reaches 180-200 feet inland of the shoreline. The middle section, however, ranges from 150 to 200 feet wide and in some places is less than 40 deep. The property boundary of the middle section extends into pasture land and portions of Kalou Marsh.

Ground elevation varies from about 4 feet above sea level (along the *makai* edge of Kalou Marsh) to a high of 16 feet near the proposed central parking lot. The majority of the park lands stands between 8 to 10 feet above sea level.

The seaward side is a sand beach with a limestone reef structure extending offshore. Parts of the beach, particularly on the eastern half, include outcrops of beachrock. The shore around the point opposite Kūka'imanini islet is a limestone outcrop, as is part of Kūka'imanini itself. The islet also includes a basalt portion. The islet is an exposed inner portion of a limestone shelf that extends far offshore. Depths are less than 6 feet for over 1,500 feet offshore (west) of the islet.

For the most part, the beach is rather narrow and there is strong evidence of erosion all along the backshore, most particularly the shore facing the northwest. In these areas, the backshore is a cliff of soil some 6 feet high with exposed roots of ironwood trees, some of which have been killed or toppled. Most of the erosion is occurring in sandy soil. The only prominent rocky outcrop is at the point inshore and west of Kūka'imanini.

D. Soils and Land Type

Makai of the vegetation line, most of the Waiale'e shoreline is a white calcareous sand beach. Low reef rock outcrops are exposed along sections of the shoreline and it is likely that the fossil reef underlies much of the coast. Inland of the vegetation line, Soil Conservation Service (1972) soil survey maps classify site soils as Jaucas sand. Kalou Marsh is classifed Pearl Harbor clay.

Detailed Land Classification Maps (1972) classify the land type of the Park and slightly inland of the ocean, E10. The letter indicates the master productivity rating and the numeral the land tyupe. The master procductivity rating evaluates land type according to its general productive capacity, not for a specific crop. The rating uses the letters, A, B, C, D, and E with "A" land being very good and "E" land very poor. The section of the Park proposed for overnight camping is classified B80, C71, and E10 (See Figure 4). The "B" and "C" rating means that productivity for agriculture is good and fair, respectively.

Agricultural Lands of Importance to the State of Hawaii (ALISH) maps do not designate the coastal lands at Waiale'e as prime, unique, or other important agricultural lands. The maps, however, rate most of the land area under control of the Waiale'e Livestock Research Facility as Prime (estimated 55% of the land area) and Other Important Agricultural Land (45%).

By definition, Prime Agricultural Land is land which has the soil quality, growing season, and moisture supply needed to produce sustained high yields of crops economically when treated and managed according to modern farming methods; Other Important Agricultural Land is land other than Prime or Unique Agricultural Land that is also of statewide or local importance for agricultural use.

E. Flood Hazard

The Park is within the coastal flood zone (Zone VE) and subject to inundation from high velocity waves striking the coastline and moving inland (Federal Emergency Management Agency, 2011). Base flood heights range from elevation 18 to 20 feet above sea level along the coast to elevation 14 feet above sea level inland (See Figure 5).

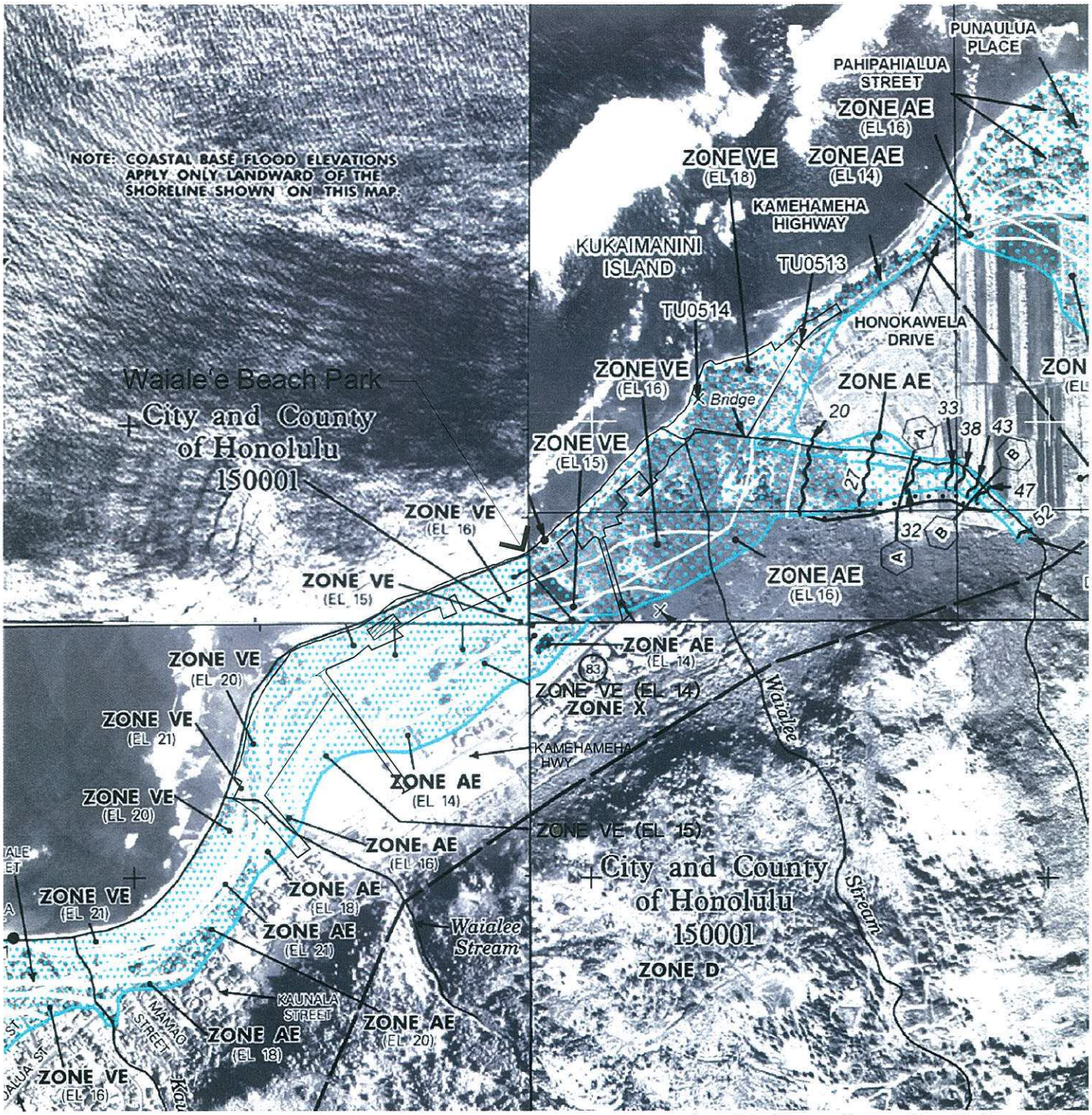
Source: Land Study Bureau, Detailed Land Classifications for the Island of Oahu, 1967

LINEAL SCALE (FEET)
500 250 0 250 500 1000

NORTH

Figure 4
Detailed Land Classification
Waiale'e Beach Park Master Plan

Gerald Park
Urban Planner
November 2000
December 2011



Source: Federal Emergency Management Agency Flood Insurance Rate Map 15003C0020F, Sept. 30, 2004, 15003C0030G, Jan. 19, 2011 & 15003C0040F, Sept. 30, 2004.

Legend

Special Flood Hazard Zone Subject to Inundation by the 1% Annual Chance Flood

- Zone A — No Base Flood Elevations Determined.
- Zone AE — Base Flood Elevation Determined.
- Zone VE — Coastal Flood Zone with Velocity Hazard (Wave Action); Base Flood Elevations Determined.

Other Flood Areas

- Zone X — Areas of 0.2% Annual Chance Flood; Areas of 1% Annual Chance Flood with Average Depths of Less than 1 Foot or with Drainage Areas Less than 1 Square Mile; and Areas Protected by Levees from 1% Annual Chance Flood.

Other Areas

- Zone X — Areas Determined to be Outside the 0.2% Annual Chance Floodplain.

LINEAL SCALE (FEET) 500 250 0 250 500 1000

NORTH

Gerald Park Urban Planner

November 2009
December 2011

Figure 5
Flood Insurance Rate Map
Waiale'e Beach Park Master Plan

The beach park per se is outside flood areas due to overland flow but at least half of the WLRF parallel with the beach park would flood from surface runoff (Zone AE with varying flood heights). Based on the FIRM for the area, flood waters from Pahipahi'ālua Stream *mauka* of Kamehameha Highway may contribute to flooding of the WLRF and portions of the beach park (See Figure 5).

F. Water Resources

1. Streams

Three stream outlets are evident in the area. Kaunala Gulch, just beyond the property on the west, is a normally dry stream and its outlet at Kaunala Beach is especially broad. Towards the eastern end is an outlet resulting from the confluence a short distance inland of three separate intermittent drainages, including Waiale'e and Pahipahi'ālua gulches. The mouth is a sand beach of substantially greater breadth than the rest of the shore.

2. Wetlands

The Park occupies natural and perhaps man-made (or enhanced) higher ground lying between the ocean shore and an extensive coastal wetland called Kalou Marsh. This physiography is fairly typical for a windward O`ahu coast, although in most other areas the coastal wetlands have been reduced substantially by development (land fill and channelizing of surface flow). Kalou Marsh is described briefly in Elliott and Hall (1977). This report points out that "... most of the marsh, though very wet, is utilized as pasture." Part of the wetland at Waiale'e has been modified as Kalouwai---a fishpond fed by a spring (AECOS, 1979; H. Mogi Planning, 1980). At the time of our survey, water was flowing through a system of *auwai* to a culvert beneath the elevated land of the coastal strip and out across the sand beach. A second drainage structure drains the middle part of the pastureland (H. Mogi Planning, 1980) but was not flowing during our visit (AECOS, 2000).

A water sample was made in the *auwai* just before the water entered the culvert and results of various analytical tests on this water are presented in Table 2 (AECOS, 2000). The water was slightly brackish with a low dissolved oxygen (DO) content (67% of saturation). pH and temperature were normal. However, turbidity (and TSS) were high and nutrient content moderately high.

Table 2. Water Quality Characteristics of the Wetland Sampled February 9, 2000.

	Time sampled	Temp. (°C)	DO (mg/l)	DO Sat. (%)	Salinity (ppt)	pH (pH units)
02-09-00	1340	23.8	5.60	67	1	7.28

		Turbidity (ntu)	TSS (mg/l)	Ammonia (µg N/l)	Nitrate + nitrite (µg N/l)	Total N (µg N/l)	Total P (µg P/l)
02-09-00	1340	15.6	23.4	17	235	730	122

Although it is not possible to assess compliance with Hawaii's water quality standards (DOH, 1998) on the basis of a single sample, it can be said that if the results obtained on February 9 are typical, the water would not be in compliance with State stream water quality criteria for DO, turbidity, TSS, nitrate + nitrite, total N, or total P. If the waters are classified as brackish (estuarine), then additionally ammonia would not be in compliance. Considering that the water is draining a large, shallow pond in the middle of a pasture, these results are not surprising. It is uncertain what, if any, adverse impacts the discharge is having on the marine environment.

A variety of aquatic insects and minnows (Family Poeciliidae) were observed in the pool and *auwai* as listed in Table 3. None here was a native species, and none would be regarded as special, unusual, or listed as threatened or endangered.

A second wetland may exist on the western end of the Park near the proposed parking area. This wetland is shown on the National Wetlands Inventory map and appears as a depression on the topographical map for the area. The boundary of this potential wetland should be established before finalizing plans for this particular area (AECOS, 2000).

3. Ocean Waters

The State Department of Health Water Quality Map for the Island of Oahu (1987) designates ocean waters at Waiale'e "Class A" waters. The objective of Class A waters is that "their use for recreational purposes and aesthetic enjoyment be protected. Any other use shall be permitted as long as it is compatible with the protection and propagation of fish, shellfish, and wildlife, and with recreation in and on these waters. These waters shall not act as receiving waters for any discharge which has not received the degree of treatment or control compatible with the criteria established for this class ...(State Department of Health, 2009)".

G. Botanical Resources

A botanical survey was conducted by AECOS, Inc.(2000) to ascertain the presence of significant botanical resources on the property. The site supports a mix of ornamentals, salt tolerant coastal species, and *Leucaena* scrub. A listing of the species encountered is presented in Appendix A. A total of 84 different species or subspecies were recognized in the project site (or immediately adjacent). Of these, only 12 or 14% can be considered as native to the Hawaiian Islands (or at least brought here by Polynesians before Capt. James Cook's visit in 1778. This ratio of introduced versus native species is fairly typical for lowland O`ahu. None of the plants encountered enjoy any special status as endangered or threatened species (USFWS, 1999) or other special recognition. The most interesting plant specimens encountered were small groves of kou at the mouths of the two dry gulch outlets. Kou is a widespread tropical tree found along seashores throughout the Western Pacific Ocean and thought to have been brought to Hawai'i and other central Pacific Islands by early Polynesian immigrants. The tree was widely used by the Hawaiian people as a source of wood for bowls and other utensils and for lei making. The seeds were eaten.

H. Wildlife Resources

During the winter, Kalou Marsh may be intermittently used for feeding by four endangered endemic species of waterbirds: the Hawaiian Duck, Hawaiian Stilt, Hawaiian Gallinule, and

Table 3. Checklist of Aquatic Biota Observed or Reported from the Outlet of Kalouwai Pond, Waiale`e, O`ahu.

Species	Common name	Status	QC Code	Abundance
INVERTEBRATES				
ARTHROPODA, CRUSTACEA				
PALAEMONIDAE				
Microbrachium lar (Fabricius)	Pacific island prawn	nat	10	P
ARTHROPODA, INSECTA				
DIPTERA, EPHYDRIDAE				
indet. (2 spp.)	marsh flies	nat	20	A
ODONATA, COENAGRIONIDAE				
Ischnura ramburi *(Selys-Longchamps)*	damselfly, adult	nat	10	O
ODONATA, LIBELLULIDAE				
Crocothemis servilia Drury	scarlet skimmer, adult	nat.	10	P
VERTEBRATES				
VERTEBRATA, PICES	fishes			
CICHLIDAE				
Tilapia sp.	tilapia, indet.	nat.	10	C
POECILIIDAE				
Gambusia affinis (Baird & Girard)	mosquitofish	nat.	10	P
Poecilia reticulata Peters	guppy	nat	10	C
Poecilia mexicana (Steindachner)	Mexican mollie	nat	10	A
VERTEBRATA, AMPHIBIA	amphibians			
BUFONIDAE				
Bufo marinus	marine toad tadpole	nat	10	C
RANIDAE				
Rana catesbeiana Shaw	American bullfrog adult	nat	10	C

KEY TO SYMBOLS USED:

Status:

nat. - naturalized. An introduced or exotic species.
ind. - indigenous. A native species also found elsewhere in the Pacific.
end. - endemic - A native species found only in the Hawaiian Islands.

QC Code:

01 - Reported elsewhere (e.g., Timbol & Maciolek, 1978).
10 - Observed and identified in the field on March 10, 1999.
20 - Collected; identified in the laboratory; specimen(s) not saved.
21 - Collected; identified in the laboratory; voucher specimen(s) saved.

Abundance at survey locations:

P - present; not common, but unable to assess abundance.
R - rare; only one or two individuals seen.
U - uncommon; several individuals seen, in some habitat places visited.
C - common; numerous individuals seen, or seen in most habitat places visited.
A - abundant; numerous in most habitat places visited
O - Occasional

Hawaiian Coot and the native Black-Crowned Night Heron. Kalou Marsh, however, is not suitable for waterbirds to nest. The wetland is artificially drained through a culvert allowing predators such as dogs and mongooses easy access to the Marsh and WLRF cattle disturb all parts of the Marsh.

Apart from native waterbirds and seasonal migratory birds, all other species of birds and animals present at the Park site were introduced to Hawai'i. Cattle egrets, mynahs, cardinals, and sparrows were observed on field trips.

Domesticated and/or feral dog is present in areas of human occupation.

I. Archaeological Resources

An archaeological assessment was conducted by Cultural Surveys Hawai'i, consulting archaeologists, to ascertain whether any archaeological sites are present on the Park property. Four archaeological features were found during field surveys and subsurface testing. Two previously recorded features---Kalou Pond (Site 50-08-01-257) and a cultural layer (Site 50-08-023735) on the eastern end of the Park---were located and inspected. A cultural layer was found at the western or Velzyland end of the Park and assigned Site No. 50-08-01-5790. The site is described as:

> "... a dark charcoal-stained stratum within the overall sand deposit (i.e. beach sand, Jaucus sands) that characterized the majority of the project area. The layer is not continuous and the bulk of cultural material observed was historic to modern trash, however, traditional food remain items of marine shell midden were also observed.
>
> The site appears to be the result of historic and modern residential use of the crest of the beach dune in this portion of the project area. The cultural layer is a mixed stratum of habitation debris with subsequent mechanical alteration, presumably related to the demolition of the previously-existing wood-framed house structures in the project area.
>
> However, besides the obvious historic components, there are indigenous midden components, which also suggest mixing of a possible pre-historic cultural layer."

The second site was assigned Site No. 50-80-01/02-579. This feature is best described as railroad infrastructure of the old Oahu Railway & Land Company (OR&L). This site "is the remnant of the 1899 pathway through Kahuku and Waiale'e. The railroad bed is only evident in discontinuous sections. Three concrete features were observed: a channelized outlet for letting water out of the marshy pasture lands; a foundation adjacent to the rail bed; and the remnants of the Waiale'e Stream crossing foundation on the western side of the stream. Basalt boulders that were the foundation for the stream crossing are now strewn about the beach. Sections of the railroad berm are now used as a roadway and driveways."

No other surface features were observed during the field survey. Previous archaeological work uncovered burials in caves and sand dunes in adjoining areas. At Kawela Bay, two human burials were recorded by Rosendahl (1988); remains were also found in a cave (Borthwick, 1998). Ten individual skeletal remains were found at Kuilima (Walker, 1993); and a burial was found in a cave at Sunset Beach (Bath & Kawachi, 1991). There are no records to indicate human burials eroding out of the beach deposits at Waiale'e. According to the consulting archaeologists, it seems very likely however, that burials are present in the project area but maybe not in large numbers.

Kalou Fish Pond is listed on the Hawai'i Register of Historic Places. The pond is a spring-fed inland pond which is now artificially drained by pumping (for WLRC irrigation) and by a culvert to the ocean. A rock and earth berm encircles the pond and fences around parts of its perimeter. The pond is only a fraction of its former size because of bulldozing and growth of vegetation (Department of Parks and Recreation, 1989).

At one time, overflow from Kalou Fish Pond was used to irrigate taro and other crops on parts of what is now Kalou Marsh. However, much of the area around the fish pond has been bulldozed and there are no visible artifacts of former Hawaiian agricultural uses (Ibid).

J. Cultural Resources

Cultural Surveys Hawai'i prepared a study of traditional practices associated with the beach park and surrounding area in general. Excerpts from their report are presented below.

1. Burials

There is no historical documentation with the State Historic Preservation Division (:SHPD") of any burials in the project area (the existing Waiale'e Beach Park). Community informants also were not aware of burials eroding out of the beach park. One of the informants who is also a resident of Waiale'e stated that certain members of the family *'ohana* are buried on their property. The burial locations were not physically verified and confirmed with SHPD.

2. Gathering Plant Resources

Specific documentation regarding gathering of plants was not found or mentioned by the informants. The literature on Land Commission Awards mention different types of plants that were grown such as wauke, noni, koa trees, banana, sugar cane, and sweet potato.

3. Hunting Resources

Hunting resources are not associated with Waiale'e. State designated hunting grounds are found in the neighboring *ahupua'a* of Kaunala in the Pūpūkea-Paumalū Forest Reserve where wild pigs and goats are legally hunted.

4. Marine Resources and Storied Places

The sea is a rich resource and the Hawaiian people traditionally were expert fishermen. Fish of all types supplied the Hawaiian diet with a rich source of protein. Informants talked about the abundant reef fish, *limu kohu*, puhi, and he'e.

A list of marine resources observed in the ocean waters off Waiale'e is found in Appendix A.

5. Surfing

Surfing (*Pae I Ka Nalu*) was one of the most popular activities in the old days of Hawai'i. Velzyland, a popular surf spot famous for great surfing, is located on the western side of the Park at Kaunala Beach and is famous for its great surfing. It is the northern most break of the collection of beaches typically known as the North Shore.
6. Trails

John Papa 'Iī mentions an ancient trail that ran just *mauka* (northwest) of the project area, possibly the current Kamehameha Highway that continued along the coast to Ko'olauloa and on to Waialua. Typically in the Hawaiian Islands the old trails were developed into roads and highways.

K. Marine Resources

Surveys of the marine environment offshore of the project were conducted in January 2000. Listings of marine animals observed are provided in Tables 4 (invertebrates) and 5 (fishes) of Appendix A. None of the observed species are considered rare, threatened, or endangered.

L. Shoreline Characteristics

The Waiale'e shoreline comprises an approximately 5,600 foot long continuous sand beach that is narrow at its eastern end and wide at its western end. The beach is directly exposed to winter swells from the northwest and indirectly exposed to easterly tradewind waves year-round (UH Coastal Geology Group). A shallow fringing reef extending more than 1,200 feet from the shore (Sea Engineering, 2010) protects the beach from the full energy of large winter swell (UH Coastal Geology Group). Beach rock and sections of reef rock are exposed at the beach toe at many locations.

The backshore shows signs of erosion along the entire reach with the most severe near the eastern end. The shoreline in this area is characterized by an eroding vegetation line as indicated by 3 to 10 foot high erosion scarps and exposed tree roots (Sea Engineering, 2010). This area and the eastern third of the Park in general feature a high density of ironwood trees and coconut marking the vegetation line. Ironwood trees are experiencing high tree mortality because of wave wash and subsequent erosion and exposure of their root structure.

The University of Hawai'i Coastal Geology Group has conducted an erosion study based on long-term shoreline position data collected from 1928 to 2006. The analysis for Waiale'e indicates the shoreline eroding (or has eroded) at a low long-term rate of $\leq$0.5 feet per year. The erosion rate is highest for the eastern third of the Park ($\leq$ 0.5 feet/year) gradually declining to 0.0 feet/year at Velzyland on the western end.

The City Beach Parks Erosion Hazard Assessment (Sea Engineering, Inc., 2010) evaluated and assigned an Erosion Priority Rating to each county beach park. Each park was rated *Low, Medium, High*, or *Critical* based on vulnerability of structures or facilities, shoreline erosion and recession, park frequency of use, and potential environmental impact of erosion. Waiale'e Beach Park was given a *Medium* rating because of the recession trend. A no action or shoreline retreat option was considered the best management strategy at this location (Ibid).

M. Land Use Controls

All property comprising the project area is classified Agricultural by the State Land Use Commission, shown as Rural on the General Plan for the City and County of Honolulu, designated Agriculture on the Ko'olauloa and North Shore Sustainable Communities Plan Land Use Maps*, and zoned AG-2 General Agriculture (See Figure 6). The Ko'olauloa and North Shore Public Infrastructure Map indicates that a site has been determined for Waiale'e

Beach Park and that improvements are programmed within six years (See also City Council Resolution 04-207, Adopting Revisions to the Public Infrastructure Map for the North Shore Sustainable Communities Plan Area, Waiale'e Beach, Hawai'i).

The North Shore Sustainable Communities Plan (Department of Planning and Permitting, 2011) identifies Waiale'e Beach Park as a beach park where improvements are proposed because it lacks facilities. The Plan also acknowledges that camping facilities are planned for the Park.

The beach park is outside of the Community Growth Boundary. Areas outside the Boundary include agriicultural lands as well as preservation lands. Permissible uses outside of the Community Growth Boundary include agriculture and limited low-intensity types of outdoor recreational uses where appropriate (Ibid).

The Waiale'e Beach Park Master Plan supports the general policies for recreational resources on the North Shore (Section 3.3.1 North Shore Sustainable Communities Plan). These policies state:

- Provide safe, suitable sites and facilities to meet residential and island-wide recreational needs for a variety of recreational activities on the North Shore.
- Expand recreational opportunities by providing greater access to recreational resources in the mountains, at the shoreline and in the ocean. Acquire and maintain additional lands for beach park development and *mauka* camping and hiking areas, as opportunities occur.
- Maintain and improve existing recreational areas and facilities to provide high quality recreational experiences for residents and visitors.
- Ensure that parks, recreational resources and recreational activities are compatible with the preservation and protection of open space, rural character, scenic, historic and cultural resources, and environmental quality. Wilderness and wildlife activities should be explored and promoted if appropriate.
- Provide safe and convenient access to parks and recreational resources.

The Coastal View Study (Chu and Jones, 1987) places Waiale'e in the North Shore Viewshed, Section E Sunset. The Section extends from Waimea Bay on the west to Kawela Bay on the east, a distance of approximately 6 miles. No significant stationary views are identified in the vicinity of Waiale'e but "[I]ntermittent makai views from Kamehameha Highway ... to include important open space (agriculture) and landscape features (ironwood trees)" can be viewed from the road.

The state land use law (HRS 205-4.5) restricts the use of agricultural district lands classified Class A or B by the Land Study Bureau to twelve permitted uses. One of the permitted uses is "Public and private open area types of recreational uses including day camps, picnic grounds, parks... (Section 205-4.5 (a)(6)). Thus most of the park uses proposed for Waiale'e Beach Park are consistent with the state land use law. There is, however, a

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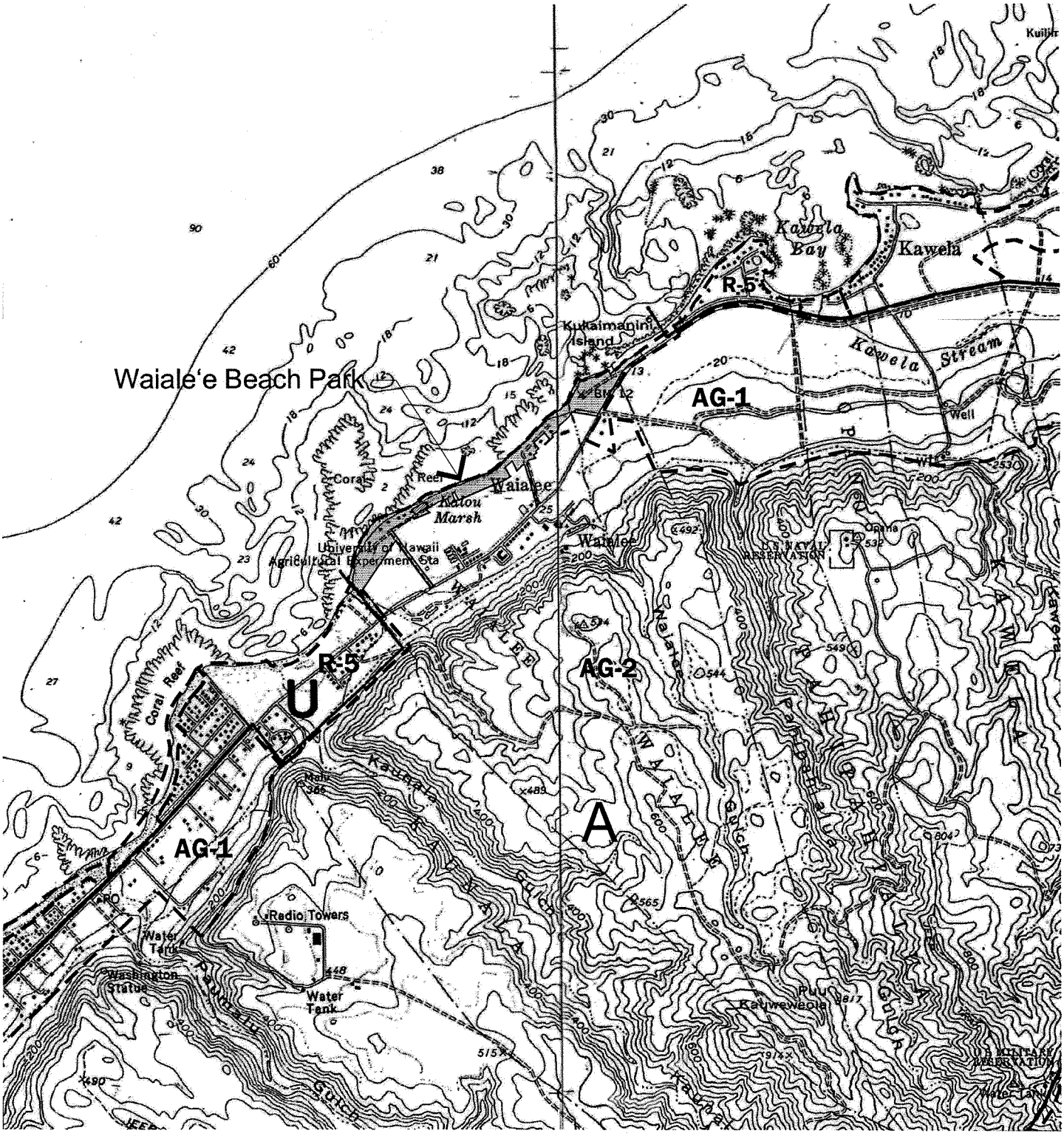
* Waiale'e Beach Park is located within the North Shore Sustainable Communities Plan area and the Ko'oloauloa *Sustainable* Communities Plan area. Because the former Plan describes it as a North Shore beach park, it is treated as being part of the North Shore Sustainable Communities Plan area.



Legend

Source: State Land Use Commision & City & County of Honolulu Website.

State Land Use		City & County of Honolulu Zoning	
U	Urban	R-5	Residential-(5,000 Min. Lots)
A	Agricultural	AG-1	Agriculture-(Restricted)
		AG-2	Agriculture-(General)

LINEAL SCALE (FEET) 1000 500 0 500 1000 2000

NORTH

Gerald Park
Urban Planner
November 2000
December 2011

North Shore, Island of O'ahu

Figure 6
Land Use Controls
Waiale'e Beach Park Master Plan

City & County of Honolulu

potential use conflict. The same section of the land use law continues "...but not including ... overnight camps." [Note: the term overnight camps is not defined.] The eastern end of Waiale'e Beach Park is proposed as a site for overnight camping. The site is also classified Class B land by the Land Study Bureau but surrounded by land with lower productivity rathings and, according to the land use law, overnight camping is prohibited from occurring on Class B rated lands.

Although prohibited as a permissible use in the Agricultural district, overnight camps could be allowed by Special Use Permit. Proposed camp sites are to be located on lands designated to have lower agricultural productivity ratings of "C" and "E".

Land uses in the Urban district are regulated by the respective counties. For Honolulu, the appropriate land use tool is the City and County of Honolulu's Land Use Ordinance ("LUO"). Waiale'e Beach Park is defined as a "public use" and is a permitted use in the AG-2 zoning district.

Waiale'e Beach Park is within the County delineated Special Management Area. The Department of Planning and Permitting has informed the Department of Design and Construction that two Special Management Area Use permits will be required for the proposed Park improvements. The permits would separately evaluate recreational uses and overnight camping and the potential impacts of each use on special management area objectives and policies.

Proposed improvements may encroach into the shoreline setback. The shoreline will be surveyed prior to each improvement phase and a shoreline setback variance applied for if needed for improvements encroaching into the setback.

All of Waiale'e Beach Park is susceptible to coastal velocity waves ranging from 18 to 20 feet above sea level at the shoreline down to 14 feet above sea level inland. City flood hazard district development standards regulate new development in areas determined to be within the floodway or coastal high hazard districts. Development of the new restroom facilties would have to comply with the Land Use Ordinance of the City and County of Honolulu.

N. Public Facilities

Kamehameha Highway, a two-lane undivided state highway, is the only road that passes Waiale'e Beach Park. In the vicinity of the Park, its 24 foot wide paved surface lies within a 50-foot right-of-way. The highway is without curbs, gutters, and sidewalks. The posted speed limit varies between 35 to 45 mph.

Board of Water Supply transmission mains include two 16-inch lines in Kamehameha Highway. Water is supplied by an 8-inch line Waiale'e Wells 1 and 2 located *mauka* of Crawford Convalescent Home. A 12-inch line interconnects the supply and transmission lines. A Board of Water Supply map also shows a 2-inch line extending from the interconnection eastward towards Kawela Bay.
Hawaiian Electric Company supplies electrical power to the WLRF and the two occupied residences in the park area. Power is brought in on overhead distribution lines from power lines along Kamehameha Highway.

There is no municipal sewerage system serving the project area. Wastewater from the WLRF is discharged into an oxidation pond located on the grounds of the WLRF.

O. Parks

Some of the most well-known beaches in the world are found along a five-mile section of Oahu's North Shore. Famous for its surf, places such as Waimea Bay, Pipeline, Sunset Beach, and Velzyland are the mecca for surfers and wave riders. All public beach parks between Waimea Bay and Waiale'e Beach Park are under City jurisdiction. The City's four major beach parks in this area---Waimea Bay, Pūpūkea, 'Ehukai, and Sunset Beach---total about 78 acres of shoreline and back beach areas for public recreation and convenience facilities (See Table 3).

Beach camping areas on the North Shore are located at Mokulē'ia Beach Park (15 campsites) and Kaiaka Bay Beach Park (7 campsites) in Hale'iwa about 10 miles to the west. To the east of Waiale'e, the nearest campsites are Kokololio Beach Park (5 family and 1 group site) in Hau'ula and Hau'ula Beach Park (20 camp sites).

Table 4. Beach Parks in the North Shore SCP Area

Waialua to Hale'iwa*	Acres*	Camping Allowed
Mokulē'ia	38.5	Yes
Makaleha	27.7	No
'Āweoweo	1.4	No
Kaiaka Bay	52.8	Yes
Hale'iwa Ali'i	19.3	No
Hale'iwa	15.7	No
Kawailoa to Waiale'e		
Kawailoa	.39	No
Waimea Bay	22.12	No
Pūpūkea	36.6	No
Banzai Rock Support Park	2.3	No
'Ehukai	1.2	No
Sunset Beach	17.7	No
Sunset Beach Support Park	2.1	No
Sunset Point	0.9	No
Waiale'e Beach Park	**25.7**	**Proposed**

Source: * Department of Planning and Permitting, 2011.

N. Protective Services

Fire protection originates from the Sunset Beach Fire Station about 4 miles west of Waiale'e Beach Park. If required, the fire apparatus stationed at the Kahuku Fire Station can be called for back up.

Police protection originates from the Wahiawā Police Station located in Central Oahu. There is no police substation in the North Shore area.

SECTION 3
SUMMARY OF POTENTIAL ENVIRONMENTAL IMPACTS AND MEASURES TO MITIGATE ADVERSE EFFECTS

A. Assessment Process

The scope of the project was discussed with planners of the Department of Design and Construction, the consulting engineers, and others comprising the design team. State and County agencies were consulted for information relative to their jurisdiction, expertise, and areas of concern. Time was spent in the field noting site conditions and conditions in the vicinity of the proposed Park and the Waiale'e Livestock Research Farm. From the discussions and field investigations, existing conditions and features that could be affected by or affect the project were identified. These influencing conditions are:

- The park site is located entirely within a coastal high hazard area;
- Kalou Pond, a historic feature, is listed on the Hawaii Register of Historic Places;
- Four historic sites have been identified on the grounds of the beach park;
- A section of the beach park includes Kalou Marsh, a coastal wetland;
- Endangered Hawaiian waterbirds have been observed frequenting Kalou Marsh;
- There are no rare, threatened, or endangered flora on the premises;
- The site is free of geological and hydrological hazards;
- The park properties are not used for agricultural activities; and
- One *kuleana* lot proposed to be acquired is currently occupied by the lot owner.

The environmental assessment process is the first step in obtaining a Special Management Area (SMA) Permit. Because the proposed improvements exceed $500,000 in valuation, the project is deemed "Major" and a Major SMA Permit will be required. After completing the environmental assessment process, an SMA application will be submitted to the Department of Planning and Permitting ("DPP"). After reviewing the application, the DPP will schedule a public hearing on the project. Hearing notices will be published in the local daily newspaper. Adjoining property owners and lessees will be notified by mail as to the time and place of the hearing.

Special Management Area Major permits are approved by the City Council. This application will be heard before the City Council Zoning Committee and the City Council. In addition, the Council can also schedule a public hearing if warranted. City Council hearing procedures provide the public with ample opportunity to offer comments on the application.

The discussion on environmental impacts incorporates potential impacts on coastal zone management resources and compliance with special management area guidelines for reviewing development in the special management area.

B. Short-term Impacts

No large structures are proposed for Waiale'e Beach Park. At this time, the proposed above grade structures are four bathhouses to be dispersed along the length of the Park. Parking areas and the esplanade are at-grade improvements, and wastewater disposal systems below grade.

The master development plan retains the openness and undeveloped qualities of the area along the shoreline. The proposed camping area adjoining Pahipahi'ālua Beach will be selectively cleared of trees and brush. Retaining some of the tree cover will provide shade and climatically comfortable camping areas.

Given the undeveloped status of property in this area, the absence of any planned major structures, and the scope and scale of improvements, it is anticipated that construction related impacts would be temporary in most locations and non-significant.

1. Air Quality

Construction will temporarily affect air quality and the acoustical environment. Grubbing, grading, trenching, stockpiling, backfilling and other soil (or sand) moving activities will raise fugitive dust at construction sites which can settle in adjoining areas. Windy conditions at Waiale'e coupled with exposed soil can pose severe dust and erosion problems. The general contractor will employ on and off-site dust control measures to prevent work sites from becoming significant dust generators. Control measures will comply with Chapter 60.1, Air Pollution Control, Title 11, State Department of Health (and revisions thereto). Alternatively, the Contractor may have to halt grubbing and grading activities during windy conditions.

Most construction equipment and vehicles are diesel powered and emit exhaust emissions typically high in nitrogen dioxide and low in carbon monoxide. The Federal and State nitrogen dioxide standard ---100mg/m^3 per annum---which is an annual standard is not likely to be exceeded during construction. Carbon dioxide emissions should be less than that generated by automobile traffic on adjoining streets. Aldehyde odors from diesel equipment may be detected but should be dispersed by the prevailing winds.

2. Noise

Construction noises emanating from the areas being improved will be audible over each development phase. The general contractor will ensure that all operating vehicles and machinery are equipped with mufflers in proper operating condition. All construction activities will comply with State Department of Health Administrative Rules, Chapter 46 Community Noise Control. Community Noise Control rules establish a maximum permissible sound level for construction activities occurring within various zoning districts. Agricultural zoned land is placed in the Class C zoning district and the maximum permissible sound level is 70 dBA between the hours of 7:00 AM and 10:00 PM (Chapter 46, Community Noise Control, 1996). Construction activities often produce noise in excess of the permissible daytime noise level and a noise permit (or variance) will be needed. The Contractor will be responsible for obtaining the permit and complying with conditions attached to the permit. Work will be scheduled between the hours of 8:00 AM to 3:30 PM, Mondays through Fridays.

3. Erosion

Site work will expose soil thus creating opportunities for fugitive dust, runoff, and erosion. Grubbing, grading, and stockpiling of excavated or imported material will be performed in accordance with site work plans approved by the Department of Planning and Permitting, City and County of Honolulu pursuant to Revised Ordinances of Honolulu, Chapter 14, Articles 13, 14, 15, and 16 pertaining to grubbing, grading, stockpiling, and erosion control.

Because the proposed improvements will exceed one acre in total area, an NPDES General Permit for construction activities will be required. The NPDES General Permit covers storm water discharges associated with construction activities that result in the disturbance of one acre or more of total land area. The City and County of Honolulu or its authorized representative will comply with the substantive requirements of the State Department of Health Administrative Rules Title 11, Chapter 54, Water Quality Standards and Chapter 55 Water Pollution Control, Appendix C.

4. Archaeological Features

An archaeological assessment was conducted by Cultural Surveys Hawai'i to ascertain whether any archaeological sites are present on the park property. Four archaeological features were found during field surveys and subsurface testing. Two previously recorded features---Kalou Pond (Site 50-08-01-257) and a cultural layer (Site 50-08-023735) on the eastern end of the Park---were located and inspected. A cultural layer was found at the western or Velzyland end of the Park and assigned Site No. 50-08-01-5790. The second site was assigned Site No. 50-80-01/02-5791 and is best described as railroad infrastructure of the old Oahu Railway & Land Company (OR&L).

No other surface features were observed during the field survey. Previous archaeological work uncovered burials in caves and sand dunes in adjoining areas. There are no records to indicate human burials eroding out of the beach deposits at Waiale'e. According to the consulting archaeologists, it seems very likely however, that burials are present in the project area but maybe not in large numbers.

Although the consulting archaeologists are confident that the archaeological assessment inventoried all known sites on the property, they have recommended a more intensive level of archaeological research be conducted. The research should further document three of the four sites recorded on the property (excluding Kalou Fishpond) and sub-surface testing in the densely vegetated areas on the eastern and western ends of the property. Testing is also proposed where the bathhouses, parking areas, and wastewater disposal fields would be located.

Further research and documentation of findings would proceed prior to each of the five development phases. The State Historic Preservation Division will be apprised of the work and findings submitted for their review. If archaeological features are discovered, a mitigation plan will be prepared to address the desired objectives for the feature (e.g. preservation, reburial).

Prior to site work, all identified historic features will be clearly marked or buffer areas established. Should subsurface archaeological sites or cultural deposits and artifacts be uncovered during excavation, work in the immediate area will cease and historic authorities notified for proper disposition of the finds.

5. Flora

The project parcel includes a few recognizable vegetation types common to lowland O'ahu, dominated by a Leucaena (koa-haole) scrub where the land is least disturbed or has not been disturbed for many years. For the most part, however, the property is either recently disturbed (ruderal) habitat, pasture, or landscaped and typically vegetated with introduced, weedy species of plants and various ornamentals in tended areas as well as abandoned

residential sites. This circumstance arises from the ongoing uses of the property supporting active pasture land (University of Hawaii WLRF) and residences.

No threatened or endangered plants were observed in the survey area. The greatest potential for occurrence of rare native plants in this situation is close to the shore in what is termed the strand habitat. At this site, most of the strand is dominated by ironwoods, a popular tree for planting in these situations because of the nearly indestructible nature of this species in the face of constant drying wind, salt in the air and soil, low natural nutrient contents of the soil, and often minimal rainfall.

6. Drainage

There is a need to improve the drainage system to accommodate storm flow from upland areas and to prevent lowland flooding.

Parking areas will be designed to slope away from the beach without a concrete curb such that there will be no concentration of flow onto grass suraces beyond the pavement. Runoff will pass through the grass and percolate through the soil layer below.

7. Circulation and Traffic

Construction notices will be posted to alert motorists of construction in the Kamehameha Highway right-of-way and flagmen will be posted to marshal vehicles around excavations in the roadway. One traffic lane will be kept open at all times to minimize inconveniences caused by construction. Trench areas and road sections affected by construction will be restored to pre-construction condition or better. Open trenches will be covered with steel plates at the end of each working day and safety devices posted during night hours.

Construction vehicles hauling men and material will contribute to traffic on Kamehameha Highway. Material deliveries will be scheduled to minimize impacts on local traffic.

C. Long-term Impacts

1. Recreation and Access

Development of the 32+-acre Waiale'e Beach Park will increase the number and acreage of shoreline parks on the North Shore and in the City and County of Honolulu. Development will open up a heretofore relatively inaccessible stretch of white sand beach for public recreation and enjoyment. The proposed project will provide vehicle and pedestrian access (and parking) to Waiale'e beach from Kamehameha Highway, improve lateral pedestrian access along the beach (in compliance with ADA requirements), and expand opportunities for public ocean recreation and activities.

An 8-foot wide walkway or esplanade will provide lateral access from one end of the Park to the other for pedestrians, joggers, the handicapped, and park maintenance vehicles (Cushman type vehicles). From the esplanade, users can access the shoreline. The Park is narrow in its central sections and although setback from the beach area per se, the walkway may encroach into the shoreline setback area in some sections. The shoreline and hence the shoreline setback area (that area 40 feet inland of the certified shoreline) will be established during the design phase of the park. One of the design guidelines for siting the esplanade will be to avoid encroaching into the shoreline setback area. Shoreline

"hardening" is not a desirable outcome but in some instances it cannot be avoided if the esplanade is to span almost the entire length of the Park and to serve beach users. The Department of Design and Construction will consult with the Department of Planning and Permitting to see if the walkway can qualify as a minor structure and if not, will apply for a shoreline setback variance for sections of the walkway that encroach into the shoreline setback.

The Kahuku section of Waiale'e Beach Park is proposed as an overnight campground. No permanent camping structures are proposed and overnight camping will be regulated by permit administered by the Department of Parks and Recreation. Although this end of the Park is sparsely inhabited, there are several residences located nearby and opposite the proposed camping area *mauka* of Kamehameha Highway. Residents in this area may be affected by the introduction of camping into what heretofore has been unimproved beach land and the noises and activities associated with overnight camping.

2. Scenic and Open Space

The proposed improvements should not affect coastal scenic and open space resources along the nearly 1-mile long Park. The Coastal View Study (Department of Land Utilization, 1987) did not identify any significant stationary view areas in the vicinity of the proposed Waiale'e Beach Park. The Study, however, identified significant roadway views in the North Shore Viewshed Sunset Section to include "intermittent makai views from Kamehameha Highway. Views also include important open space (agriculture) and landscape features (ironwood trees)."

The shoreline will remain largely intact. Overgrown and untended scrub vegetation at both ends of the Park will be grubbed thus improving the appearance and utility of these areas. No large structures are proposed to detract from the open space and recreation areas that will comprise the beach park. The beach or sections of beach will still be viewed from Kamehameha Highway over the farm buildings, wetlands, and agricultural fields comprising the WLRF.

3. Coastal Ecosystems

The proposed project should not directly affect Kalou Marsh, a coastal wetland. The marsh is intermittently used during the winter months for feeding by all four endangered endemic species of (Hawaiian Duck, Hawaiian Stilt, Hawaiian Gallinule, and Hawaiian Coot) and the native Black-Crowned Night Heron (Department of Parks and Recreation, 1989). None of these species, however, were observed during our field surveys. The appearance of these waterbirds is seasonal and the presence of predators makes the marsh unsuitable for nesting.

The functional wetlands within and close to the proposed park project are associated with the fishpond, Kalouwai. The portion of Kalouwai located within the City and County parcel is partly filled in and overgrown. Presently, springs which supply Kalouwai produce an outflow along the seaward edge of the pond through a series of small channels (*'auwai*) in need of repair and maintenance. The outlet is presently easily plugged by sediment and debris clogging parts of the *'auwai* and by sand and cobbles moved around by waves in front of the outlet on the beach side. Part of the problem may be that the outlet is being maintained too low on the shore in an attempt to keep interior areas drained.

Most of the present pastureland closest to the shore occupies former wetlands (Kalou Marsh) that are indicated on U.S. Fish and Wildlife maps of the area (National Wetlands Inventory). These areas are presently in pastureland. Only the parking area proposed for the west end of the property appears to be close to or possibly impinging on one of these inventoried wetlands. Boundaries should be established before finalizing plans for this particular area, indicated as a depression on the topographic map.

It is anticipated that the development of this property as a coastal access park will not have much if any impact upon existing marine resources. The offshore environment is shallow for a considerable distance out, especially on the east and west ends of the property, and is subject to substantial wave activity. Somewhat deeper water close to shore off the center of the property provides opportunity for snorkeling and spear fishing. Shore-casting occurs all along this coast and appears somewhat concentrated around Kūka'imanini Islet. This environment does not support extensive growth of coral bottom because of strong wave action regularly impinging on the shallow nearshore shelf. Current uses of the land (scattered residences and some pasture) will either continue or be replaced by short-term visits by beach-goers and perhaps more fishermen.

Fencing will keep the general public out of the WLRF agricultural area, Kalou Marsh, and Kalou Pond so there should be no direct impact on these resources. On the other hand, fencing may not be sufficient to stop litter and debris from being blown into fenced areas.

Two small groves of *kou* were found growing in Kaunala Gulch on the west and Pahipahi'ālua Gulch on the east. Although this native specimen is not rare, threatened or endangered and common throughout Hawaii, development plans for the park will retain both habitats. No permanent structures will be constructed in both gulches except for crossings for the pedestrian path.

The project is not proposed in an area of open waters, potential fisheries and fishing grounds, and wildlife habitats. Although sections of property comprising the beach park extend into Kalou Marsh, there are no plans at this time to improve or restore this coastal wetland.

4. Coastal Hazards

Waiale'e Beach Park is within a coastal flood zone with velocity waves (Federal Emergency Management Agency, 2011). Coastal waves would flood the entire Park to an elevation of 18 to 20 feet above sea level along the coast decreasing to about 14 feet above sea level inland.

The lower reach of Pahipahi'ālua Stream *mauka* of Kamehameha Highway is designated a floodway but the floodway does not extend into the beach park. The Park is not located within the delineated 100-year flood area but portions of the Waiale'e Livestock Research Farm *mauka* of the coastal flood zone are designated Zone AE with varying flood heights.

5. Shoreline Processes

Proposed bathhouses, showers, off-street parking areas, and individual wastewater systems are placed away from the beach to avoid natural shoreline processes and wave run-up. The facilities also are sited where available fast land can accommodate the improvement(s). Prior to constructing the proposed improvements engineering and surveying studies will be required to assure compliance with public health and shoreline regulations. For example,

each IWS location will require a site evaluation based on environmental factors such as flood hazard potential, slope, land area, and soil permeability. As needed, shoreline surveys will confirm the location of the shoreline and the shoreline setback. The Master Plan avoids placing park facilities within the shoreline setback area to the extent practical. The 55-foot shoreline waiver line was used as general guide for locating facilities (See the Development Phasing sheets).

Unlike the fixed improvements noted above, the esplanade meanders along the one mile long beach. On the western side, the beach is wide and the walkway placed adjoining the parking area where it will not interfere with shoreline processes or impede access to the shoreline. The beach narrows in its middle section with little separation between the ocean and Kalou Marsh (See Phase 5 of the Master Plan). An existing dirt road traverses this section between both natural features. Long-term impacts on Kalou Marsh and the shoreline are avoided by aligning the esplanade on the dirt road.

The beach also is narrow in the eastern end of the Park and the esplanade is aligned inland of the shoreline. It establishes the seaward edge of the proposed camping area and by its location should not affect shoreline processes.

6. Land Use and Agriculture

Although State and County land use controls designate the property for agricultural uses, since the early 1900s no active agricultural activity occurred widely on the premises and this continues to the present (See historical narrative in Section 1, E). Based in part on the historical uses of the property and the absence of active agricultural activity along the shoreline, it is anticipated that the proposed beach park will have no impact on agricultural lands.

It is also anticipated that park development will not adversely affect activities at the WLRF. Fencing now separates the Park from the WLRF and should keep beach users from interfering with grazing livestock (and vice-versa). Park users, however, may be indirectly affected by livestock activities. Depending on climatic conditions, in particular the direction and strength of the wind, the odor of manure may be smelled in sections of the Park.

7. Socio-Economic

The development of Waiale'e Beach Park is intended to benefit the general public. . Due to the existence of a number of kuleana lots in very close proximity to the Park, the City will very likely seek acquisition of some, or perhaps, all of the parcels to provide unhindered public park and shoreline access. Four *kuleana* lots are vacant (TMK Nos. 5-8-001:021, 023, 029, and 033) and and one lot is occupied (TMK No. 5-8-001:034). These lots, however, do not extend to the shoreline and do not preclude lateral access along the shoreline.

The City plans to acquire the *kuleana* lots in later phases of Park development. Improvements proposed for the portion of the Park slotted for Phase 3 are predicated on the City's ultimate acquisition of parcel TMK 5-8-001:021 by either negotiated sale, or through right of eminent domain, if necessary. In accordance with Federal and State laws and City ordinance, relocation benefits and assistance will be provided for renters and fair market compensation for owners of the land. Further, land acquisition may affect the status of a burial site on a *kuleana* lot (TMK No. 5-8-001:034) and the filial attachment to the family's deceased *'ohana*. The burial site is said by the parcel's present occupant to be documented with the State Historic Preservation Division and the O'ahu Burial Council. Should the City

acquire the affected lot and develop improvements on the site, then mitigating actions associated with the burial site will comply with the requirements of Title 13, Chapter 300, Hawai'i Administrative Rules, Department of Land and Natural Resources. Mitigating actions will require knowledge, understanding, cultural sensitivity, and respect for the skeletal remains.

Labor will be required to maintain Waiale'e and existing parks, both shoreline and inland, in the district. The need for up to two additional parks maintenance personnel is under consideration and funding. At this time, there are no plans to have a groundskeeper or caretaker residing on the premises.

Officers of the Honolulu Police Department would have the primary responsibility of routinely patrolling the park and removing violators of park rules and city ordinances.

8. Cultural Resources

The cultural impact evaluation for Waiale'e Beach Park noted the presence of a family burial on a *kuleana* lot near the coastline. The burial has been documented with the State Historic Preservation Division and the O'ahu Island Burial Council. Potential impacts on the family burial site was discussed previously under social costs.

Marine resources are plentiful, and as in the past, fishing is a common recreation activity at Waiale'e. At the western end of the Park, a surf break named Velzyland is known for its great surfing. Development of the Park should not adversely affect these resources and activities as the area is already fished by locals and frequented by surfers.

Gathering of plant resources and hunting may have been historical practices but are not current tradional practice associated with the area.

9. Public Facilities

a. Circulation and Parking

The development of an additional public beach park with significant parking capacity is expected to help distribute ocean recreation users over a longer stretch of the ocean's coast. Provision of access and off-street parking coupled with the white sandy beach will attract users to the beach park. It is expected that the number of weekday users will be less than weekend users. The greatest number of users would probably occur either over a three day weekend (ideal for camping) or a special event at Velzyland (a surf meet for example).

During these times, the parking lots will probably fill and overflow parking, if allowed, may be provided along the access roads or in other areas of the park set aside for that purpose. This scenario is no different from what now occurs at locations along the North Shore during surfing events when there are more vehicles than places to legally park. Event organizers would be responsible for developing parking management plans for their respective events in consultation with the Department of Parks and Recreation.

It is expected that traffic on Kamehameha Highway and the park access roads will slow as vehicles negotiate the congested road, parked vehicles, and pedestrians. Again, this is not an uncommon occurrence during the winter when storm surf rolls on to the North Shore and residents, visitors, surfers, and photographers clog the beaches and highways to watch

surfing, body surfing, or body boarding events or the spectacular ocean waves that rise and crash onto the shore.

b. Water

Water is available and adequate to serve the use and irrigation requirements for the park.

c. Wastewater

Wastewater from the bathhouses will discharge into individual wastewater systems. In lieu of a regional wastewater treatment works for the North Shore, this type of system is the only permitted wastewater treatment and disposal alternative. Cesspools can leak untreated effluent into coastal waters with concomitant deleterious impacts on water quality, public health, and marine resources and is not allowed as a disposal alternative. Chapter 62, Wastewater Systems, Hawai'i Administrative Rules, Department of Health allows individual wastewater systems in remote areas and areas of low density. As a regulatory mechanism, Chapter 62 has as its purpose(s) to insure that the disposal of wastewater from individual wastewater systems does not contaminate or pollute any drinking water or potential drinking water supply or the waters of any beaches, shores, or ponds and does not become a hazard to public health, safety and welfare.

Individual wastewater systems will not be approved unless the system complies with strict engineering and design standards governing flow rates, maintenance and operation, site evaluation, percolation tests, spacing, and specific standards for effluent treatment systems (per Chapter 62, Hawaii Administrative Rules). The wastewater system will be designed, installed, operated, and maintained pursuant to Chapter 62, Hawai'i Administrative Rules. It is anticipated that application of and adherence to these rules should preclude detrimental impacts on water quality and public health. Because of the concern for wastewater movement underground, the four proposed wastewater disposal fields have been located more than 50 feet from the ocean (the minimum standard) and placed near the *mauka* property lines where practicable for greater separation from the ocean. The design, location, and size of individual wastewater systems best suitable for conditions at Waiale'e will be determined during design development of the wastewater systems.

SECTION 4
ALTERNATIVES TO THE PROPOSED ACTION

A. No Action

A "No Action" alternative would preclude the occurrence of all impacts, short and long term, beneficial and adverse described in this Assessment. The No Action alternative would forego construction of public access to and along the shoreline, preclude public use of the beach for ocean activities and recreation opportunities, and maintain the status quo of the coastal lands. A No Action alternative is inconsistent with City land use plans that designate the area for a beach park and past City actions to acquire the coastal parcels in order to develop the land for a public beach park.

B. Alternative Site Plans

Alternative site plans were reviewed by the Department of Design and Construction. The alternative plans proposed different locations and configurations of the parking areas which in turn influenced the siting of the bathhouses and wastewater disposal systems. The environmental impacts of these alternatives would not be significantly different from that described for the selected development plan.

SECTION 5
AGENCIES AND ORGANIZATIONS TO BE CONSULTED

City and County of Honolulu

- Board of Water Supply
- Department of Environmental Services
- Department of Parks and Recreation Services
- Department of Planning and Permitting
- Police Department
- Fire Department

State of Hawai'i

- Department of Land and Natural Resources
  - Historic Preservation Division
  - Forestry and Wildlife
  - State Parks
- Department of Health
- Department of Transportation
- Disability and Communications Access Board
- Land Use Commission
- UH Department of Tropical Agriculture and Human Resources
  - Waiale'e Livestock Research Farm

Organizations and Elected Officials

- Crawford Convalescent Home
- Hawaiian Electric Company
- Hawaiian TelCom
- North Shore Neighborhood Board No. 27
- Koolauloa Neighborhood Board No. 28
- The Honorable Ernest Y. Martin, Chair, Honolulu City Council
- The Honorable Richard Fale, Representative, 47th Representative District
- The Honorable Donavan Dela Cruz, Senator, 22nd Senatorial District
- The Honorable Clayton Hee, Sentor, 23rd Senatorial Distirct
- Kahuku Public Library (Placement)
- Waialua Public Library (Placement)

SECTION 6
PERMITS AND APPROVALS

Permits and approvals required for the project are indicated below. Additional permits and approvals may be required pending final construction plans.

City and County of Honolulu

Honolulu Planning Commission
*Special Use Permit

Honolulu City Council
Special Management Area Use Permits (Park development and overnight camping)

Department of Planning and Permitting
Conditional Use Permit - Minor for Joint Development
Shoreline Setback Variance (As Needed)
Grubbing, Grading, and Stockpiling Permit
Building Permit for Building, Electrical, Plumbing Sidewalk/Driveway and Demolition Work

Board of Water Supply
Water and Water System Requirements for Developments

State of Hawai'i

Department of Health
Individual Wastewater Systems
Variance From Pollution Controls
NPDES General Permits
Discharges Associated with Construction Activities

Department of Transportation
Permit to Perform Work within State Highway Right-of-Way

* Special Use Permit for non-agricultural use (overnight camping) in the State Agricultural District.

SECTION 7
DETERMINATION OF SIGNIFICANCE

Chapter 200 (Environmental Impact Statement Rules) of Title 11, Administrative Rules of the State Department of Health, establishes criteria for determining whether an action may have significant effects on the environment (§11-200-12). The relationship of the proposed project to these criteria is discussed below.

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

Development of Waiale'e Beach Park will not result in the loss or destruction of natural and cultural resources occurring on the property. Important natural and cultural resources observed during field surveys of the property have been identified and their respective locations marked for inclusion in the development plan. It is anticipated that the preservation and protection of these resources will contribute to public knowledge about the history of the property and the natural resources thereon.

The matter of a family burial located on a *kuleana* lot will have to be addressed should the City choose to acquire the lot and plan Park improvements in its vicinity, provided that the said burial actually exists in that location. Park development does not mean the burial site will be destroyed as the site could be preserved *in situ*. The City will mitigate physical impacts to the burial site and the financial impacts associated with the family relocating from the *kuleana* lot.

The cultural impact evaluation indicates there are no on-going traditional practices associated with the area.

2) Curtails the range of beneficial uses of the environment;

The project will not curtail the range of beneficial uses of the environment. Since the late 1980s, the City and County of Honolulu has been acquiring land and planning for a beach park at this location. The project will expand the range of coastal recreational opportunities for residents, visitors, and the handicapped. Given physical constraints such as the narrow coastal area and potential tsunami hazards the proposed improvements are limited to providing accessible lateral access along the shoreline and providing for the health and sanitary needs of beach goers.

To date, Waiale'e Beach park has not been opened to the public because there has been limited and poor access to the beach from Kamehameha Highway and no restroom facilities. Driveways, paved parking, and other improvements will make the beach area accessible for the publi8c using various transportation modes.

A section of the Park will provide for recreational camping. There is a dearth of beach camping areas between Ka'ena Point on the west and Waiale'e although there are 15 beach parks within the North Shore District.

3) **Conflicts with the state's long-term environmental policies or goals and guidelines as expressed in chapter 344, Hawaii Revised Statutes, and any revisions thereof and amendments thereto, court decisions or executive orders;**

The project will not conflict with long-term environmental policies, goals, and guidelines of the State of Hawai'i. Improvements at Waiale'e Beach Park will establish a recreation area heretofore generally inaccessible to the public. Improvements will be limited to those that provide lateral shoreline access for all and provide for the sanitary needs of beach users. The scale and limited scope of improvements will promote open space and the beauty of the coastline as a natural resource.

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

The project will not substantially affect the economic or social welfare of the State. In the long-run, the City will likely move to acquire several *kuleana* lots that are now occupied. The occupants would have to relocate and the City will provide relocation assistance for renters consistent with City relocation rules and regulations. The City would attempt to negotiate a sale with the owner(s) of one or more these *kuleana* lot(s). If negotiations fail, the City would have recourse to use right of eminent domain, and a court would decide the fair market value compensation for the affected property.

5) **Substantially affects public health;**

Public health should not be adversely affected by the proposed project. Existing public health regulations and county ordinances pertaining to construction will mitigate potential construction related impacts on the physical environment and minimize effects on persons currently residing on-site.

The wastewater system will be designed, installed, operated, and maintained pursuant to Chapter 62, Wastewater Systems, Hawai'i Administrative Rules. It is anticipated that the design of wastewater systems and the application of and adherence to these rules should preclude detrimental impacts on water quality and public.

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

Substantial secondary impacts are not anticipated. The population of owners and renters currently residing at Waialee Beach Park will be relocated sometime in the future and there no longer will be a permanent resident population at Waiale'e. Property owners whose land is acquired will receive fair market value compensation to purchase similar property elsewhere, or rent suitable property.

Paved driveways from Kamehameha Highway and the provision of off-street parking will make it easier for the general public---surfers, fishers, divers, beach enthusiasts, and visitors--- to gain what is now difficult to access coastal land.

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

Substantial degradation of the natural resources at Waiale'e are not anticipated as a direct result of recreation use. At this time, the use of septic tanks (for solids collection) and disposal fields (for effluent disposal) is proposed. The area lacks a municipal sewer

system and cesspools are not a wastewater treatment and disposal option. The wastewater system designed for the Park will conform to all State health laws and regulations.

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

The project is not a precursor for a larger action.

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

There are no rare, threatened or endangered flora or fauna on the premises. During the winter months, endangered Hawaiian waterbirds have been observed feeding intermittently at Kalou Marsh. The presence of these birds are seasonal and measures can be taken to mitigate human disturbances during feeding. Kalou Marsh is not a suitable nesting habitat for waterbirds because of predators such as dogs and mongooses.

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

Ambient air quality will be affected by fugitive dust and combustion emissions but can be controlled by measures stipulated in this Assessment. Construction noise will be pronounced during site preparation work but should diminish once the bathhouses are completed. All construction activities will comply with air quality and noise pollution regulations of the State Department of Health.

Individual wastewater systems are proposed to be used for each bathouse because the area lacks a municaipal sewer system. Wastewater systems will be designed, installed, operated, and maintained pursuant to Chapter 62, Hawaii Administrative Rules. Application of and adherence to these rules should preclude detrimental impacts on water quality and public health.

11) **Affects an environmentally sensitive area such as a flood plain, tsunami zone, erosion prone area, geologically hazardous land, estuary, fresh water, or coastal waters.**

Waiale'e Beach Park is located within a coastal flood area subject to velocity waves. Flood elevations range from 18 to 20 feet above sea level along the coastline to 14 feet above sea level inland. The park itself is not in a 100-year flood hazard area but portions of the Waiale'e Livestock Research Farm *mauka* of the beach is prone to flooding.

The proposed bathhouses, individual wastewater facilities, off-street parking areas, and esplanade should not increase the water surface elevation of the regulatory flood for the Park. The proposed esplanade and off-street parking areas will be constructed generally at grade and the bathouses and wastewater facilities slightly above grade.

Proposed bathhouses, showers, off-street parking areas, and individual wastewater systems are placed away from the beach to avoid natural shoreline processes and wave run-up. The facilities also are sited where available fast land can accommodate the improvement(s). The esplanade is placed inland of and above the beach where it should not affect shoreline processes.

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

The low-rise, low-density improvements will not significantly affect scenic vistas identified in county plans for the area. Clearing of overgrown vegetation on the eastern and western ends of the beach will create new panoramic views to, and of, the coastline and ocean from public upland areas.

13) Requires substantial energy consumption.

Electrical power will be needed to operate the wastewater disposal systems and lights at the proposed bathhouses. Power can be extended from electrical systems along Kamehameha Highway to the respective facility. Substantial energy consumption for the aforementioned facilities is not anticipated.

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APPENDIX A Biological Resources Survey for the Waialeʻe Beach Park Development Plan

Biological resources survey for the Waialeʻe Beach Park Development Plan[1]

May 30, 2000 *AECOS* No. 732

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Introduction

Waialeʻe Park is comprised of several coastal parcels owned by the City & County of Honolulu. Waialeʻe Beach extends westward from the developed section of Pahipahiʻālua Beach Park to the mouth of Kaunala Gulch (Figure 1). This 25-acre parcel is mostly developed with unimproved roadways and four or five scattered residences. It lies between the ocean shore and the University of Hawaiʻi, Animal Science Research Farm (North Shore), and includes some land presently used as pasture and some land that is currently undeveloped.

Our report presents the results of a survey of the property and the nearshore environment for the purposes of creating an inventory of biological resources and assessing potential impacts of future park development on whatever important resources are found. The site includes lands heavily impacted by human uses; but also has potentially some undisturbed coastal strand environment, coral reef environment, and wetland environment.

Methods

A botanical survey was conducted on February 9 and a revisit made on April 6, 2000. The initial survey involved walking over most of the property and creating a checklist of plant species observed. It was possible to make this listing semi-quantitative by describing each species in terms of its abundance within defined

[1] Report prepared for Gerald Park Urban Planner for "Environmental Assessment: Waialeʻe Beach Park Development Plan." This report will become part of the public record.

categories (see Table 1). At the same date as the botanical survey, a reconnaissance was made of the wetlands bordering a portion of the property. On April 6, only the large parcel at the northeast end of the property was revisited to confirm earlier plant observations.

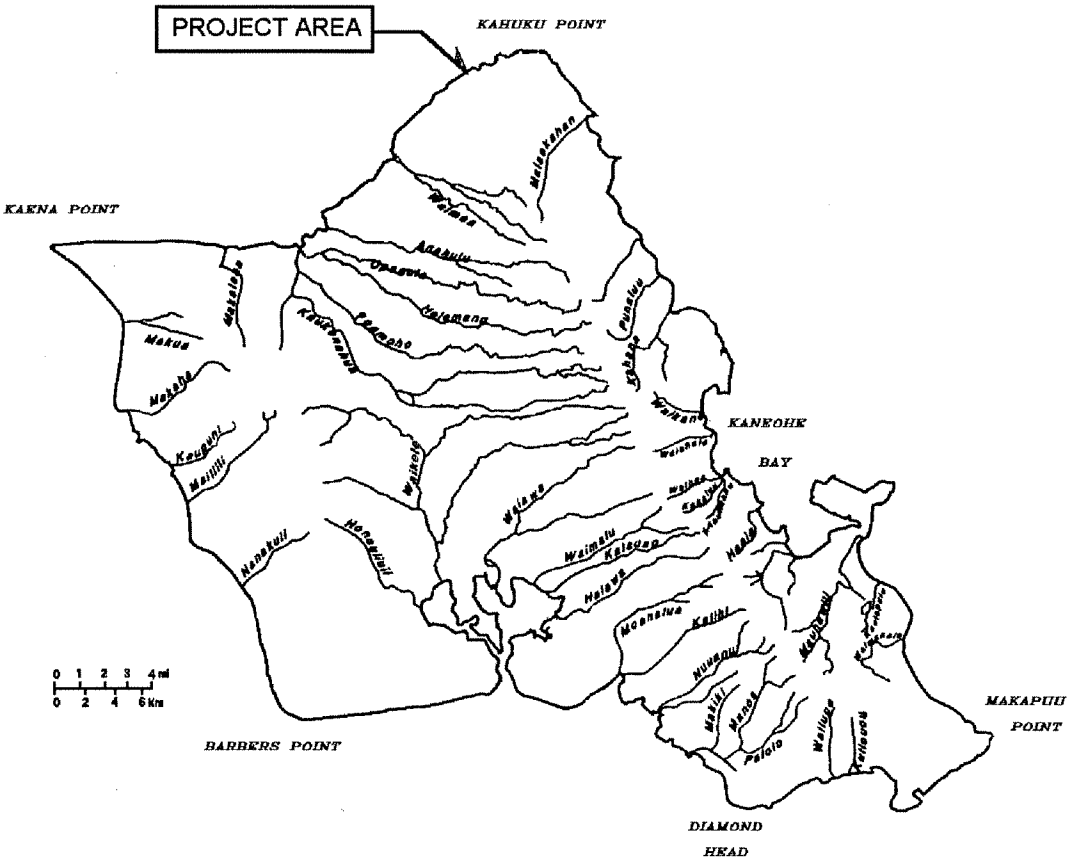

Figure 1. Location of Waiale'e Beach Park on O'ahu's North Shore.

The surveys conducted for plants and for the wetland involved walking over the property and noting all of the species of plants growing there. At the wetland, in addition to visual observations, insect nets and fine-mesh sweep nets were used to collect flying insects and small aquatic organisms. Flowing water was present, and water samples were collected for analyses.

On February 10, 2000 a marine reconnaissance survey was conducted off of Waiale'e Beach Park. The survey area extended from Pahipahi'ālua Beach Park south

along the coast for approximately 1,100 meters (3,000 feet) and offshore between 150 meters (500 feet) up to 300 meters (1,000 feet) at its widest point, generally following the shallower parts of the fringing reef. Depths in the area ranged from less than 0.2 meter (1 foot) to about 2 meters (6 feet).

General observations made before the survey began revealed a strong current running eastward off the shoreline. To make use of this current, the survey was started from the western end of the project area. Using snorkeling gear, an inventory of the various species of fish, coral, and other invertebrates was generated and relative abundance of these species estimated.

Environment Description

Waiale'e Beach Park consists of a narrow swath of land, mostly between 8 and 55 meters (25 and 175 feet) wide. However, at both the west and east ends, the property includes lots that extend further inland: on the east to Kamehameha Highway, and on the west up to 115 meters (375 feet), encompassing a large field presently used for cattle grazing. Within the middle part of the property, the boundary extends into pastureland and portions of Kalou Marsh.

The seaward side is a sand beach with a limestone reef structure extending offshore. Parts of the beach, particularly on the eastern half, include outcrops of beachrock. The shore around the point opposite Kūka'i-manini islet is a limestone outcrop, as is part of Kūka'i-manini itself. The islet also includes a basalt portion. The islet is an exposed inner portion of a limestone shelf that extends far offshore. Depths are less than 2 meters (6 feet) for over 500 meters (1,500 feet) offshore (west) of the islet.

The limestone bottom is fairly shallow off the middle of the long parcel. A broadly curved limestone shelf running parallel to the existing shore and less than 2 meters (6 feet) under the water surface extends some 120 m (400 feet) off the shore. This feature is an ancient beachrock deposit that formed when the shoreline was about 120 m (400 feet) offshore from the present-day shoreline. In the vicinity of Kūka'i-manini, the ancient beachrock lies some 300 m (1,000 feet) seaward of the shore.

East of the limestone point is Pahipahi'ālua Beach, consisting of a sand beach in a small cove fronting the developed portion of the park, and limestone shore further east. Another point towards the western end includes limestone beachrock at the shore and an extensive, shallow shelf extending off the shore. West of this unnamed point is Kaunala Beach, which curves around to Sunset Point. The surf

site known as "Velzyland" is found on the Sunset Point side of the shallow shelf off the east end of Kaunala Beach.

For the most part, the beach in the project area is rather narrow and there is strong evidence of erosion all along the backshore, most particularly the shore facing northwest (the east end of coves here). In these areas, the backshore is a cliff of soil some 2 meters (6 feet) high, with exposed roots of ironwood trees, some of which have been killed or toppled in the past. Most of the erosion is occurring in sandy soil. The only prominent rocky outcrop is at the point inshore and west of Kūka'i-manini.

Inland, the land is covered by scrub growth or tended yards (lawns, etc.) of occupied dwellings. Further inland still, the land slopes down to wetlands, most of which is used as pastureland by the livestock research station.

Three stream outlets are evident in the area. Kaunala Gulch, just beyond the property on the west, is a normally dry stream, and at the outlet Kaunala Beach is especially broad (measured from the waterline inland). Towards the eastern end is an outlet resulting from the confluence a short distance inland of three separate intermittent drainages, including Waiale'e and Pahipahi'ālua gulches. The mouth is a sand beach of substantially greater breadth than the rest of the shore. A little less than 460 meters (1,500 feet) west of the latter stream mouths is a culvert outlet for Kalouwai Pond.

Terrestrial Plants

For the most part, the site is almost an eclectic mix of ornamentals, salt tolerant coastal species, and *Leucaena* scrub. A listing of the species encountered is given in Table 1. Relative abundance of the species is indicated in the right-most columns of the table. The first abundance column ("A") is for the site as a whole, and the second ("B") is for the parcel at the eastern end of the survey area occupied by *Leucaena* scrub.

A total of 84 different species or subspecies were recognized in the project site (or immediately adjacent). Native and early Polynesian introduced (brought here by Polynesians before Capt. James Cook's visit in 1778) plants have their status in bold. Of the 84 species listed, only 12 (14%) can be considered as native to the Hawaiian Islands (or early Polynesian). This ratio of introduced verses native species is fairly typical for lowland O'ahu. None of the plants encountered enjoys any

Table 1. Checklist of plants found along the coastline at the proposed O'ahu north shore park at Waiale'e.

Species	Common name	Status	Abundance "A"	Abundance "B"
	FERNS			
POLYPODIACEAE				
Phymatosorus grossus (L. & F.) Brownlie	*lauaʻe*	nat.	U	
NEPHROLEPIDAE				
Nephrolepis exaltata (L.) Schott	sword fern	**ind.**	U	U
	FLOWERING PLANTS			
	DICOTYLEDONE			
ACANTHACEAE				
Asystasia gangetica (L.) T. Anderson	Chinese violet	nat.	AA	
AIZOACEAE				
Tetragonia tetragonioides (Pall.) Kuntze.	New Zealand spinach	nat.	AA	
AMARANTHACEAE				
Achyranthes aspera L.	---	nat.	C	A
Alternanthera pungens Kunth	khaki weed	nat.	U	
Amaranthus spinosus L.	spiny amaranth	nat.	O	
Amaranthus viridis L.	slender amaranth	nat.	R	
ANACARDIACEAE				
Schinus terebinthifolius Raddi	Christmas berry	nat.	C	C
ARALIACEAE				
Schefflera actinophylla (Endl.) Harms	octopus tree	nat.	R	U
ASCLEPIADACEAE				
Calotropis gigantean (L.) W.T. Aiton	crown flower	orn.	R	
ASTERACEAE (COMPOSITAE)				
Bidens alba (L.) DC	Spanish needle	nat.	A	
Calyptocarpus vialis Less.		nat.	U	
Conyza canadensis (L.) Cronq.	horseweed	nat.	R	
Conyza bonariensis (L.) Cronq.	hairy horseweed	nat.	P	
Crassocephalum crepidiodes (Benth.) S. Moore	---	nat.	R	
Emilia fosbergii Nicolson	Flora's paintbrush	nat.	U	
Pluchea indica (L.) Less	Indian fleabane	nat.	C	U
Pluchea symphytifolia (Mill.) Gillis	sourbush	nat.	O	U
Sonchus oleraceus L.	*pualele*, sow thistle	nat.	C	

Table 1 (continued).

Species	Common name	Status	Abundance "A"	Abundance "B"
BORAGINACEAE				
Cordia subcordata Lam.	*kou*	**pol.**	O	
Heliotropium procumbens Mill.	---	nat.	U	
Tournefortia argentea L. fil.	tree heliotrope	nat.	C	
CARICACEAE				
Carica papaya L.	papaya	nat.	U	U
CASUARINACEAE				
Casuarina equisetifolia L.	ironwood tree	nat.	AA	C
CHENOPODIACEA				
Atriplex semibaccata R. Br.	Australian saltbush	nat.	C	
Chenopodium murale L.	*'aheahea*	nat.	O	
COMBRETACEAE				
Terminalia catappa L.	false *kamani*	nat.		
CONVOLVULACEAE				
Convolvulus arvense L.	field bindweed	nat.	U	
Ipomoea obscura (L.) Kerr-Gawl		nat.	U	
Ipomoea pes-caprae (L.) R. Br.	*pōhuehue*, beach morninglory	**ind.**	U	
*CUCURBITACEAE				
Coccinia grandis (L.) Voigt	scarlet-fruited gourd	nat.	C	A
Momordica charantia L.	balsam apple	nat.	U	
EUPHORBIACEAE				
Chamaesyce hirta (L.) Millsp.	garden spurge	nat.	O	
Chamaesyce hypericifolia (L.) Millsp.	graceful spurge	nat.	R	
Chamaesyce prostrata (Aiton) Small	prostrate spurge	nat.	R	
Euphorbia cyathophora J. A. Murray	Mexican fire plant	nat.	R	
Ricinus communis L.	castor bean, *pa'aila*	nat.	U	O
FABACEAE				
Leucaena leucocephala (Lam.) deWit	*koa haole*	nat.	AA	AA
Medicago polymorpha L.	bur clover	nat.	U	
indet.	unknown bean	nat.	R	U
GOODENIACEAE				
Scaevola sericea Vahl (seedling)	*naupaka*	**ind.**	C	
MALVACEAE				
Hibiscus tiliaceus L.	hau	**pol.**	O	
Malva parviflora L.	cheeseweed	nat.	U	
Malvastrum coromandelianum (L.) Garck	false mallow	nat.	U	
Sida rhombifolia L.	Cuba jute	nat.	P	

Table 1 (continued)

Species	Common name	Status	Abundance "A"	Abundance "B"
MALVACEAE (continued)				
Thespesia populnea (L.) Sol. ex Correa	*milo*	**pol.**	A	
MORACEAE				
Ficus benjamina L.	Benjamin tree	orn.	R	R
Ficus microcarpa L. fil.	Chinese banyan	nat.	U	
MYRTACEAE				
Syzygium cumini (L.) Skeels	Java plum (juv)	nat.		U
NYCTAGINACEAE				
Boerhavia coccinea Mill.	---	nat.	U	
ONAGRACEAE				
Ludwigia octovalvis (Jacq.) Raven	primrose willow	nat.	P	
OXALIDACEAE				
Oxalis corniculata L.	yellow wood sorrel, *'ihi'ae*	**pol.**	U	
Oxalis corymbosa DC	pink wood sorrel	nat.	R	
PASSIFLORACEAE				
Passiflora suberosa L.	wild passionfruit	nat.	O	C
PLANTAGINACEAE				
Plantago lanceolata L.	narrow-leaved plantain	nat.	U	
POLYGONACEAE				
Coccoloba uvifera (L.) L.	sea grape	orn.	U	
RUTACEAE				
Murraya paniculata (L.) Jack	mock orange	orn.	U	
SAPOTACEAE				
Chrysophyllum oliviforme L.	satin leaf	nat.	R	
SOLANACEAE				
Lycopersicon esculentum Mill.	cherry tomato	nat.	U	
Solanum americanum Mill.	*popolo*	**?ind.**	R	
Solanum seaforthianum Andr.	---	nat.	O	C
VERBENACEAE				
Vitex trifolia var. *?subtrisecta* (Ktze.) Mold.	blue vitex	nat.	U	
Vitex trifolia var. *varigata* Mold.	blue vitex	nat.	R	
	MONOCOTYLEDONE			
AGAVACEAE				
Cordyline fruticosa (L.) A. Chev.	*ki*, ti	**pol.**	R	

Table 1 (continued)

Species	Common name	Status	Abundance "A"	Abundance "B"
ARECACEAE				
Cocos nucifera L.	*niu*, coconut palm	**pol.**	C	
Phoenix sp.	Phoenix palm	nat.	C	A
AMARYLLIDACEAE				
Hymenocallis littoralis (Jacq.) Salisb.	spider lily	orn.	U	
COMMELINACEAE				
Commelina diffusa L.	*honohono*	nat.	U	
CYPERACEAE				
Schoenoplectus sp.	bulrush	**ind.**	P	
LILIACEAE				
Aloë barbadensis Mill.	aloe	orn.	R	
MUSACEAE				
Musa x *paradisiaca* L.	banana	**pol.**	P	
POACEAE (GRAMINEAE)				
Brachiaria mutica (Forssk.) Stapf	California grass	nat.	C	
Chloris barbata (L.) Sw.	swollen fingergrass	nat.	R	
Cynodon dactylon (L.) Pers.	Bermuda grass	nat.	A	
Digitaria insularis (L.) Mez ex Ekman	sourgrass	nat.	U	
Eleusine indica (L.) Gartn.	beach wiregrass	nat.	C	
Panicum maximum Jacq.	Guinea grass	nat.	AA	AA
Pennisetum polystachion (L.) Schult.	elephant grass	nat.	AA	
Saccharum officinarum L.	sugar cane	**pol.**	R	
Setaria verticillata (L.) P. beauv.	bristly foxtail	nat.	R	
Sporobolus virginicus (L.) Kunth	beach dropseed	**ind.**	C	
Stenotaphrum secundatum (Walter) Kuntze	St. Augustine grass	nat.	C	
TYPHACEAE				
Typha latifolia L.	cattail	nat.	P	

Status = distributional status
- **end.** = endemic; native to Hawaii and found naturally nowhere else.
- **ind.** = indigenous; native to Hawaii, but not unique to the Hawaiian Islands.
- nat. = naturalized, exotic, plant introduced to the Hawaiian Islands since the arrival of Cook Expedition in 1778, and well-established outside of cultivation.
- orn. = exotic, ornamental; plant not naturalized (not well-established outside of cultivation).
- **pol.** = Polynesian introduction before 1778.

Abundance = occurrence ratings for plants under "A" = all of survey area and "B"
- R - Rare - only one or two plants seen.
- U - Uncommon - several to five plants observed.
- O - Occasional - found between five and ten times; not abundant anywhere.
- C - Common - considered an important part of the vegetation and observed numerous times.
- A - Abundant - found in large numbers; may be locally dominant.
- AA - Abundant - abundant and dominant; defining vegetation type.
- P - Present - found outside of study area; abundance not noted.

special status as endangered or threatened species (USFWS, 1999) or other special recognition. The most interesting plant specimens encountered were groves of *kou* at the mouths of the two dry gulch outlets. *Kou* is a widespread tropical tree found along seashores throughout the Western Pacific ocean and thought to have been brought to Hawai`i and other central Pacific Islands by early Polynesian immigrants. The tree was widely used by the Hawaiian people as a source of wood for bowls and other utensils and for lei making. The seeds were eaten. It is sparingly naturalized and therefore somewhat uncommon, except where planted. Unfortunately a moth destroys many of the trees (Neal, 1965; Wagner, Herbst, and Sohmer, 1990). Typically these days, a related species (*Cordia sebestena*) from the West Indies is planted as an ornamental along streets and in beach areas, instead of the larger "native" *kou*.

Wetland Environment

The project site occupies natural dunes and man-made higher ground lying between the ocean shore and an extensive coastal wetland called Kalou Marsh. This physiography is fairly typical for a windward O'ahu coast, although in most areas the coastal wetlands have been reduced substantially by development (land fill and channeling of surface flow). Kalou Marsh is described briefly in Elliott and Hall (1977). This report points out that "...most of the marsh, though very wet, is utilized as pasture." Part of the wetland at Waiale`e has been modified as Kalouwai —a fishpond fed by a spring (*AECOS*, 1979; H. Mogi Planning, 1980). At the time of our survey, water was flowing through a system of *auwai* to a culvert beneath the elevated land of the coastal strip and out across the sand beach. A second drainage structure drains the middle part of the pastureland (H. Mogi Planning, 1980), but was not flowing during our visit. Drainage improvements described in the 1980 "Waialee Livestock Research Center EIS" (H. Mogi, Planning, 1980) were apparently never implemented.

A water sample was collected in the *auwai* just before the water entered the culvert and results of various analytical tests on this water are presented in Table 2. The water was slightly brackish with a low dissolved oxygen (DO) content (67% of saturation). pH and temperature were normal. However, turbidity (and TSS) were high and nutrient content moderately high. Although it is not possible to assess compliance with Hawaii's water quality standards (DOH, 1998) on the basis of a single sample, it can be said that if the results obtained on February 9 are typical, then the water would not be in compliance with state stream water quality criteria for DO, turbidity, TSS, nitrate + nitrite, total N, or total P. If the waters are classified as brackish (estuarine), then additionally ammonia would not be in compliance. Considering that the water is draining a large, shallow pond in the middle of a

pasture, these results are not surprising. It is uncertain what, if any, adverse impacts the discharge is having on the marine environment. However, nothing unusual was noted by the marine biologists conducting the marine survey.

Table 2. Water quality characteristics of the wetland sampled February 9, 2000.

Kalouwai Outlet	Time	Temp. (°C)	DO (mg/l)	DO Sat. (%)	Salinity (ppt)	pH (pH units)	
02-09-00	1340	23.8	5.60	67	1	7.28	
		Turbidity (ntu)	TSS (mg/l)	Ammonia (µg N/l)	Nitrate + nitrite (µg N/l)	Total N (µg N/l)	Total P (µg P/l)
02-09-00		15.6	23.4	17	235	730	122

Kalou Pond was described in 1977 as supporting several geese (presumably from the agricultural research facility) and in part "filled with weeds." Tall stands of *Brachiaria mutica, Scirpus validus* (=*Schoenoplectus lacustris*), and *Ludwigia octivalvis...*" grow around the pond margin (Elliott and Hall, 1977). These same species were note in the area during our recent survey. However, there are now stands of cattails—a wetland species not mentioned in the 1977 report (species unknown on O'ahu before 1979).

A variety of aquatic insects and top minnows (Family Poeciliidae) were observed in the pool and *auwai* as listed in Table 3. None here was a native species, and none would be regarded as special, unusual, or is listed as threatened or endangered (USFWS, 1999). It is likely that large numbers of tilapia inhabit the fishpond itself. Possibly, wetland birds utilize Kalouwai. None was observed during our survey, but only the north (*makai*) end of the pond was visited.

Marine Environment

Listings of marine animals observed off the project site are provided in Tables 4 (invertebrates) and 5 (fishes). Relative abundance is given in three columns representing three different areas of the fringing reef, arranged progressively

Table 3. Checklist of aquatic biota observed or reported from the outlet of Kalouwai Pond, Waiale'e, O'ahu.

Species	Common name	Status	QC Code	Rel. Abund.
INVERTEBRATES				
ARTHROPODA, CRUSTACEA				
PALAEMONIDAE				
Microbrachium lar (Fabricius)	Pacific island prawn	nat.	10	P
ARTHROPODA, INSECTA				
DIPTERA, EPHYDRIDAE				
indet. (2 spp.)	marsh flies	nat.	20	A
ODONATA, COENAGRIONIDAE				
Ischnura ramburi (Selys-Longchamps)	damselfly, adult	nat.	10	O
ODONATA, LIBELLULIDAE				
Crocothemis servilia Drury	scarlet skimmer, adult	nat.	10	P
VERTEBRATES				
VERTEBRATA, PICES	fishes			
CICHLIDAE				
Tilapia sp.	tilapia, indet.	nat.	10	C
POECILIIDAE				
Gambusia affinis (Baird & Girard)	mosquitofish	nat.	10	P
Poecilia reticulata Peters	guppy	nat.	10	C
Poecilia mexicana (Steindachner)	Mexican mollie	nat.	10	A
VERTEBRATA, AMPHIBIA	amphibians			
BUFONIDAE				
Bufo marinus	marine toad tadpole	nat.	10	C
RANIDAE				
Rana catesbeiana Shaw	American bullfrog adult	nat.	10	C

KEY TO SYMBOLS USED:

Status:

nat. - naturalized. An introduced or exotic species.

QC Code:

01 - Reported elsewhere (e.g., Timbol & Maciolek, 1978).
10 - Observed and identified in the field on March 10, 1999.
20 - Collected; identified in the laboratory; specimen(s) not saved.
21 - Collected; identified in the laboratory; voucher specimen(s) saved.

Abundance at survey locations:

P - present; not common, but unable to assess abundance.
R - rare; only one or two individuals seen.
U - uncommon; several individuals seen, in some habitat places visited.

Table 3 (continued).

C - common; numerous individuals seen, or seen in most habitat places visited.
A - abundant; numerous in most habitat places visited

by increasing distance off the shore of the project site. Within the survey area, coral rubble with small patches of sand surrounding coral heads of *Porites evermanni* and *P. lobata* characterized the bottom where depths exceeded 1 meter (3 to 4 feet). In areas with a depth of 1.2 meters (4 feet) or less, there was coral rubble exclusively.

Table 4. Checklist of marine invertebrates observed on the reef off Waile'e, O'ahu.

		Abundance on reef		
Species	**Common Name**	**Inner**	**Middle**	**Outer**
PORIFERA				
	Gray Sponge			R
CNIDARIA				
Cyphastrea ocellina	Rusty Coral		R	R
Montipora capitata	Rice Coral		C	C
Montipora flabellate	Blue Rice Coral	C	C	C
Montipora patula	Ringed Rice Coral		O	R
Pavona duerdeni	Porkchop Coral	R	R	
Pavona varians	Brain Coral		R	R
Pocillopora damicornis	Lace Coral	O	O	R
Pocillopora meandrina	Cauliflower Coral	C	C	C
Porites compressa	Finger Coral	R	O	O
Porites evermanni	Brown Lobe Coral	O	C	C
Porites lobata	Lobe Coral	O	C	C
Anthelia edmondsoni	Octocoral	C	A	A
POLYCHAETA				
Loimia medusa	Spaghetti Worm	R	O	C
MOLLUSCA				
Conus ebraeus	Hebrew Cone	R	R	O
Cypraea caputserpentis	Snakehead Cowry		R	R
Hexabranchus auromarginatus	Spanish Dancer			R
Chama iostoma	Rock Oyster	R	R	
Isognomon sp.	Oyster	C	R	

Table 4 (continued).

Species	Common Name	Abundance on reef		
		Inner	Middle	Outer
ARTHROPODA				
Mantis Shrimp	indet.		R	R
Calcinus sp.	Hermit Crab		C	C
Lybia edmondsoni	Pompom Crab		R	R
Panulirus penicillatus	Green Lobster			R
Parribacus antarcticus	Slipper Lobster	R		
Percnon planissimum	Rock Crab		O	
ECHINODERMATA				
Ophiocoma sp.	Brittle Star		C	C
Actinopyga mauritiana	Whitespotted Sea Cuc.	C	C	C
Actinopyga obesa	Brown Sea Cucumber		R	R
Holothuria arenicola	White Sea Cucumber	R		
Holothuria atra	Black Sea Cucumber	C	C	R
Holothuria pardalis	Leopard Sea Cuc.		R	
Holothuria whitmaei	Hard Sea Cucumber	C	C	C
Echinometra mathaei	Pale Boring Urchin	A	C	A
Echinometra oblonga	Black Boring Urchin	C	O	
Echinothrix calamaris	B&W Urchin	R	O	
Tripneustes gratilla	Collector Urchin	O	O	O

NOTE: Abundance categories are defined at the end of Table 5.

The shallow bottom off Kalou (Waiale'e) was described in 1979 (*AECOS*, 1979) as covered by a variety of benthic algae, with *Hypnea* most abundant. Moderately large heads of the coral, *Porites lobata*, were present in the channel approaching shore at an angle off the center of the project area. Other species noted as fairly common at that time were the encrusting coral, *Montipora flabellata*, sea cucumbers, *Holothuria atra* and *H. cinerascens*, and sea urhins, *Tripneustes gratilla* and *Echinometra mathaei*. These, and many other species, were noted as generally common by the survey conducted in 2000 (see Table 4) indicating probably a greater level of effort in the most recent survey, involving three biologist divers. *Montipora flabellata* remains one of the more abundant and characteristic hard coral species off this shore.

Table 5. Checklist of marine fishes observed in the waters off Waile'e, O'ahu north shore.

		Abundance		
Species Name	**Common Name**	**Inner**	**Middle**	**Outer**
Acanthurus blochii	Ringtail Surgeonfish		O	O
Acanthurus dussumieri	Whitespine Surgeonfish		O	O
Acanthurus leucopareius	Whitebar Surgeonfish		O	O
Acanthurus nigrofuscus	Brown Surgeonfish	A	A	A
Acanthurus nigroris	Bluelined Surgeonfish		O	O
Acanthurus olivaceus	Orangeband Surgeonfish		O	O
Acanthurus triostegus	Convict Tang	A	A	A
Ctenochaetus strigosus	Goldring Surgeonfish		O	O
Apogon kallopterus	Iridescent Cardinalfish	R	R	R
Atherinomorus insularum	Hawaiian Silverside	C	C	C
Aulostomus chinensis	Trumpetfish			R
Rhinecanthus rectangulus	Reef Triggerfish	O	O	O
Platybelone argalus	Keeltail Needlefish	R		
Blenniella gibbifrons	Bullethead Rockskipper			O
Cirripectes vanderbilti	Scarface Blenny	O	O	O
Exallias brevis	Shortbodied Blenny	R		
Plagiotremus goslinei	Gosline's Blenny			R
Scomberoides lysan	Leatherback	R		
Chaetodon auriga	Threadfin Butterflyfish	O	O	O
Chaetodon fremblii	Bluestripe Butterflyfish	O	O	O
Chaetodon lunula	Racoon Butterflyfish	O	O	O
Chaetodon miliaris	Milletseed Butterflyfish	O	O	O
Chaetodon quadrimaculatus	Fourspot Butterflyfish	O	O	O
Chaetodon unimaculatus	Teardrop Butterflyfish		O	O
Cirrhitus pinnulatus	Stocky Hawkfish		O	O
Diodon holocanthus	Clearfin Porcupinefish	R		
Fistularia commersonii	Cornetfish	R		
Asterropteryx semipunctatus	Bluespotted Goby			R
Sargocentron punctatissimum	Peppered Squirrelfish			O
Kuhlia sandvicensis	Hawaiian Flagtail			R
Kyphosus vaigiensis	Lowfin Chub		O	O
Anampses cuvier	Pearl Wrasse	O	O	O
Cheilio inermis	Cigar Wrasse	R		R
Coris flavovittata	Yellowstripe Wrasse	R	O	R
Coris venusta	Elegant Wrasse	A	C	C
Gomphosus varius	Bird Wrasse	O	C	C

Table 5 (continued).

Species Name	Common Name	Abundance Inner	Middle	Outer
Macropharyngodon geoffroy	Shortnose Wrasse			O
Novaculichthys taeniourus	Rockmover	R		R
Stethojulis balteata	Belted Wrasse	C	C	A
Thalassoma ballieui	Blacktail Wrasse		R	R
Thalassoma duperrey	Saddle Wrasse	A	A	A
Thalassoma trilobatum	Christmas Wrasse	O	C	C
Pervagor spilosoma	Fantail Filefish	R		
Mulloidichthys flavolineatus	Yellowstripe Goatfish	O	O	O
Mulloidichthys vanicolensis	Yellowfin Goatfish	O	O	O
Parupeneus bifasciatus	Doublebar Goatfish			R
Parupeneus cyclostomus	Blue Goatfish		R	R
Parupeneus multifasciatus	Manybar Goatfish	R		O
Parupeneus porphyreus	Whitesaddle Goatfish		O	O
Gymnomuraena zebra	Zebra Moray			R
Gymnothorax eurostus	Stout Moray	R	R	R
Lactoria fornasini	Thornback Cowfish	R		
Ostracion meleagris	Spotted Boxfish	O	O	O
Abudefduf abdominalis	Sergeant Major	O	O	R
Abudefduf sordidus	Blackspot Damselfish	C	C	O
Abudefduf vaigiensis	Indo-Pacific Sergeant	R		
Chromis hanui	Chocolate-dip Chromis		R	
Dascyllus albisella	Hawaiian Dascyllus		R	R
Plectroglyphidodon imparipennis	Brighteye Damselfish	A	O	C
P. johnstonianus	Blue-eye Damselfish		R	
Stegastes fasciolatus	Yelloweye Damselfish	A	A	A
Calotomus carolinus	Stareye Parrotfish		O	R
Scarus psittacus	Palenose Parrotfish	C	C	C
Scarus rubroviolaceus	Redlip Parrotfish			O
Dendrochirus barberi	Hawaiian Lionfish		R	R
Scorpaenopsis cacopsis	Titan Scorpionfish			R
Sebastapistes ballieui	Spotfin Scorpionfish	O	O	
Synodus dermatogenys	Clearfin Lizardfish	R		
Arothron meleagris	Spotted Puffer			R
Canthigaster amboinensis	Ambon Toby	O	O	O
Canthigaster jactator	Hawaiian Whitespotted Toby	C	C	C

Table 5 (continued).

		Abundance		
Species Name	**Common Name**	**Inner**	**Middle**	**Outer**
Enneapterygius atriceps	Hawaiian Triplefin			O
Zanclus cornutus	Moorish Idol	O	O	O

Abundance = occurrence ratings for marine animals
R - Rare - only one to five individuals seen.
O - Occasional - three to 5 individuals seen; not abundant anywhere.
C - Common - five to 10 individuals seen.
A - Abundant - More than 10 individuals seen over area; may be locally dominant.

Impacts Assessment

Impact on Vegetation

The project parcel includes a few recognizable vegetation types common to lowland O'ahu, dominated by a *Leucaena* (*koa haole*) scrub where the land is least disturbed or has not been disturbed for many years. For the most part, however, the property is either recently disturbed (ruderal) habitat, pasture, or landscaped and typically vegetated with introduced, weedy species of plants and various ornamentals in maintained areas as well as abandoned residential sites. This circumstance arises from the ongoing uses of the property supporting active pastureland (University of Hawai'i, Animal Science Research Farm) and residences.

Some 84 different plants were identified during our survey, of which only 11 (14 %) may be regarded as "native" species (indigenous, endemic, or Polynesian introduction). No threatened or endangered plants as listed in the Federal Register (USFWS, 1999) were observed in the survey area. The greatest potential for occurrence of rare native plants in this situation is close to the shore in what is termed the strand habitat. At this site, most of the strand is dominated by ironwoods, a popular tree for planting in these situations because of the nearly indestructible nature of this species in the face of constant drying wind, salt in the air and soil, low natural nutrient content of the soil, and often minimal rainfall. Ironwood often forms monotypic stands under which little else grows. The lack of undergrowth beneath trees suggests the release of an allelopathic agent (chemical that prevents seeds from germinating), although Neal (1965) has suggested that they exhaust the nutrients in the soil (UH Botany, 1998).

Much of the shoreline is eroding away, which limits the extent of strand habitat. Typically here, the active beach extends back to an eroded bank supporting ironwoods (many undercut), fronting maintained lawn and ornamentals, or fenced off pastureland. Thus habitat for native strand vegetation is severely limited. An outcrop of limestone extending around the point on the east end of the parcel provides the best opportunity for several native strand species that prefer this habitat, but the rocky surface is barren, perhaps due to extensive use by fishermen, or some unrecognized factor. The most stable beach and strand areas, or at least sites with the greatest expanse of sand, occur off the stream mouths: one site just off the property on the west and the other near the east end. Here, *milo* and *kou* form a border along the dry stream outlets. Also, some *pōhuehue* or beach morning glory was present at the time of our survey and may well be more extensive at other times. These strand areas are the only locations observed that supported significant native floral elements and are worth retaining. Given their location at the mouth of streams that sometimes carry considerable flow, it is unlikely anything will be constructed here in the future except for a crossing for the trail/bikeway. A bridge would seem unnecessary.

Plans for the park development include improving access roads, developing parking areas, building beachside shower and restrooms, and constructing a walkway/bikeway trail along the length of the park. Areas proposed for parking lots, and the walkway/bikeway are not areas of concern with respect to vegetation. The largest parking area located on the west is sited within the depression that might become flooded during unusually high runoff periods, although much of this location is presently active pasture. The other parking lot sites involve areas of scrub growth or grassland.

Impact on Wetlands

The functional wetlands within and close to the proposed park project are associated with the fishpond, Kalouwai. The portion of Kalouwai located within the City & County parcel is partly filled in and overgrown. This area could benefit from restoration work, and the habitat possibly improved for waterbirds. Improved wetlands can provide a scenic backdrop to the walkway/bikeway proposed for the project. Where circulation can be improved, this should be considered. Presently, springs which supply Kalouwai produce an outflow along the seaward edge of the pond through a series of small channels (*auwai*) in need of repair and maintenance. The outlet structure is presently easily plugged by sediment and debris clogging parts of the *auwai* and by sand and cobble moved around by waves in front of the outlet on the beach side. Part of the problem may be that the outlet is being maintained too low on the shore in an attempt to keep interior areas drained. Obviously, some improvements will need to be considered for this system, and

many solutions will require cooperation with the interior property owners. The State (University of Hawai'i) may eventually have to confront the fact that marshland is inappropriate for livestock grazing.

Much of the present pastureland closest to the shore occupies former wetlands (Kalou marsh) that are indicated on U.S. Fish and Wildlife maps of the area (National Wetlands Inventory; USFWS, undated). These areas are presently in pastureland, and were described in an EIS for the Waialee Livestock Research Center (H. Mogi Planning, 1980, p. 13) as "...not fully usable [as cattle pasture] due to swampy conditions especially during the wet winter season." Only the parking area proposed for the west end of the property appears to be close to or possibly impinging on one of these inventoried wetlands. Boundaries should be established before finalizing plans for this particular area, which is indicated as a depression on the topographic map.

Impact on Marine Environment

The offshore environment is shallow for a considerable distance out, especially on the east and west ends of the property, and is subject to substantial wave activity. Somewhat deeper water close to shore off the center of the property provides opportunity for snorkeling and spear-fishing. Shore-casting occurs all along this coast and appears somewhat concentrated around Kūka'i-manini Islet (*AECOS*, 1979). This environment does not support extensive growth of coral bottom, the primary limitation is assumed to be a physical one due to strong wave action regularly impinging on the shallow nearshore shelf.

It is not anticipated that the development of this property as a coastal access park will have much if any impact upon existing marine resources. Current uses of the land (scattered residences and some pasture) will either continue or be replaced by short term visits by beach-goers and perhaps more fishermen (access is presently not much restricted).

Disposal of waste from rest stations developed in the park could be a potential problem. Wastes from houses presently deposited in cesspools along the coast and some animal wastes from the agricultural facility fields more than likely move readily as dissolved substances (especially nitrates) into nearshore waters (*AECOS*, 1979). The UH Animal Science Research Farm presumably treats concentrated animal waste generated in various pens in a local treatment facility (H. Mogi Planning, 1980), although it is unclear where the waste stream eventually ends up. Net water transport off the shore is toward the south or southwest, and coastal waters are rapidly replenished offshore (Bathen, 1978). Eutrophication of local waters is therefore very unlikely. Promotion of benthic seaweeds, including

nuisance species, may occur. However, leach fields and cesspools are poor choices of waste disposal at this location given the high wet season water table and planned promotion of the area as a public park and marine recreation area.

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APPENDIX B Archaeological Assessment of Proposed Master Plan Improvements For the Waialeʻe Beach Park, Waialeʻe Ahupuaʻa, Koʻolauloa District, Oʻahu

ARCHAEOLOGICAL ASSESSMENT OF PROPOSED MASTER PLAN IMPROVEMENTS FOR THE WAIALE'E BEACH PARK, WAIALE'E AHUPUA'A, KO'OLAULOA DISTRICT, O'AHU

TMK 5-8-01:10, 15, 16, 17, por. 18, por. 20, 21, 22, por. 23, por. 27, por. 29, por. 31, 32, 33, 34, 41, por. 54. 5-8-06: 7, 30 (formerly por. 29), 5-7-05: 13

by

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Prepared for
Gerald Park Urban Planner

Cultural Surveys Hawaii
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ABSTRACT

Cultural Surveys Hawai'i, Inc., conducted an archaeological assessment for the proposed Waiale'e Beach Park, Ko'olauloa District, O'ahu Hawai'i (TMK 5-8-01:15 & 41). The archaeological assessment included background research, surface survey, and limited sub-surface testing. The assessment resulted in the documentation of four historic properties, two of which were previously identified.

The four sites include: Kalou Fishpond, Site 50-80-01-257, Cultural Layers 50-80-02-3735 and 50-80-01-5790, and the remnant section of the O.R.&L. Rail Line 50-80-01/02-5971.

Limited sub-surface testing included seven backhoe trenches. The trenching revealed historic and modern mixed strata, two areas of which coincide with the designated cultural layers. No burials were encountered during the testing, and no burials have been reported as naturally eroding out of the sand dune deposits that characterize the project area.

The assessment included a complete surface survey and thorough review of background studies. The limited sub-surface testing, however, was not sufficient to sample all portions of the project area. Based on the assessment, including the sub-surface work, an inventory level survey is recommended. Further archaeological studies should be located in specific areas where sub-surface construction such as foundations for bath houses, wastewater disposal systems, and main water lines are proposed.

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I. INTRODUCTION

A. Project Background

At the request of Gerald Park Urban Planner, Cultural Surveys Hawai'i Inc. completed an Archaeological Assessment for Waiale'e Beach Park (approximately 32 acres), Waiale'e Ahupua'a, Ko'olauloa District, O'ahu TMK 5-8-01:10, 15, 16, 17, por. 18, por. 20, 21, 22, por. 23, por. 27, por. 29, por. 31, 32, 33, 34, 41, por. 54. 5-8-06: 7, 30 (formerly por. 29); 5-7-05: 13 (Figure 1 to Figure 3). Parcel 5-8-06: 58 is in the process of being dedicated to the City & County of Honolulu as was not included in the 2000 archaeological assessment. TMK parcels 5-8-01:033 and 034 are to be acquired by, or before, phase 4 is commenced. TMK parcel 5-8-01: 21to be acquired by, or before, phase 5 is commenced.

The project area is a narrow strip of coastline, *makai* (seaward) of The University of Hawai'i Agricultural Experiment Station, Waiale'e Livestock Research Farm.

B. Scope of Work

The purpose of the archaeological assessment was to ascertain whether any archaeological sites are present on the subject parcel. Additionally, background research was conducted to provide the historical and archaeological context from which the project area's land use could be synthesized. The assessment does not meet the SHPD/DLNR requirements for a more intensive inventory-level survey but does provide sufficient data to assess the sites present and to make recommendations for future treatment.

The scope of work for the assessment includes:

A surface inspection of the ~32 acre property to locate and describe surface sites and potential site areas

Limited sub-surface testing to assess potential for sub-surface cultural deposits.

Historical background research to include study of archival sources, historic maps, Land Commission Awards and previous archaeological reports to construct a history of land use and to determine what archaeological sites have been recorded on or near this property.

Preparation of a report to include the results of the historical research, the surface survey and the sub-surface fieldwork with an assessment of archaeological potential based on that research, and with recommendations for further archaeological work, if appropriate. It will also provide mitigation recommendations if there are archaeologically sensitive areas that need to be taken into consideration.

C. Methodology

As indicated above, the assessment included a surface survey of the ~32 acre parcel and historical research. The surface survey took place on November 10, 1999 and limited sub-surface testing on November 23, 1999, and December 12, 1999 with background studies initiated just prior to that. The surface survey was conducted by five archaeologists: Douglas Borthwick, Kehaulani E. Souza, Tony Bush, David Perzinski and Ka'ohulani McGuire.

The survey consisted of pedestrian sweeps oriented generally west and east. Archaeologists were spaced 5 to 10 meters apart, depending on ground visibility and terrain.

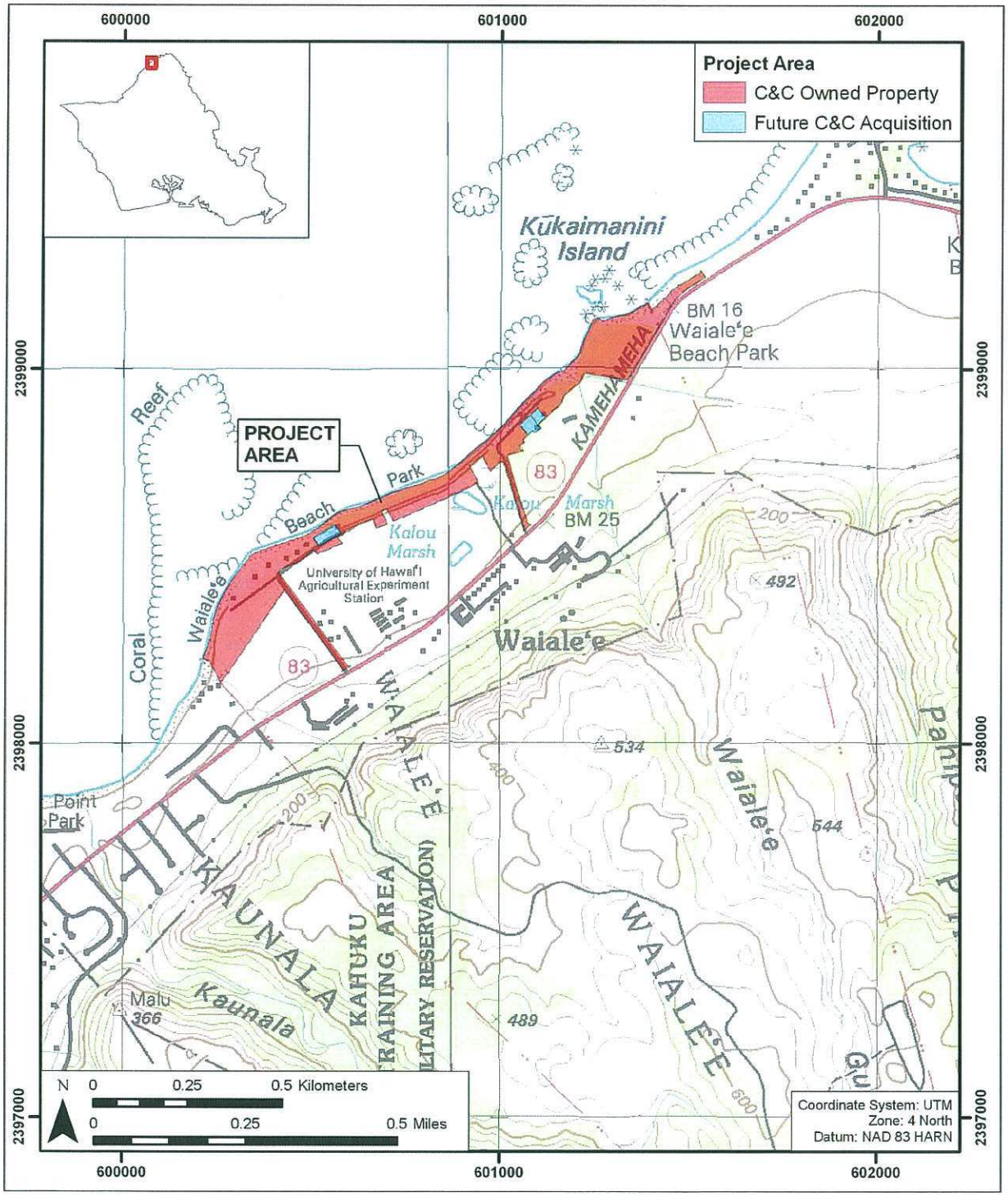

Figure 1 Portion of USGS 7.5 Minute Series Topographic Map, Waimea and Kahuku Quadrangles, Showing Project Area (Hatched) in Waiale'e *Ahupua'a*

Figure 2. 2007 Google Earth aerial photograph depicting the Project area (Google Earth 2007)

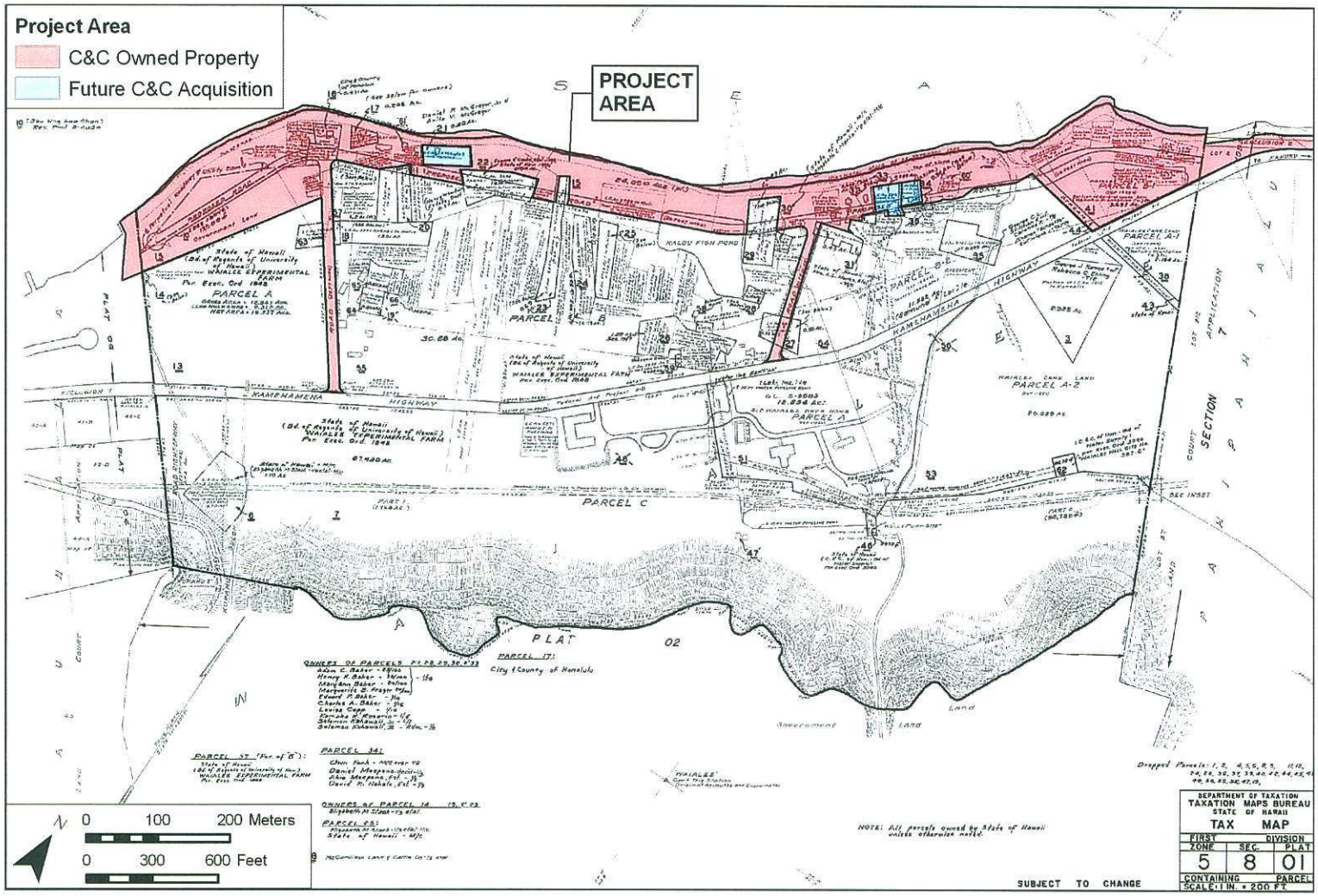

Figure 3 Tax Map Key (TMK) [1] 5-8-001 Showing Project Area (Hatched)

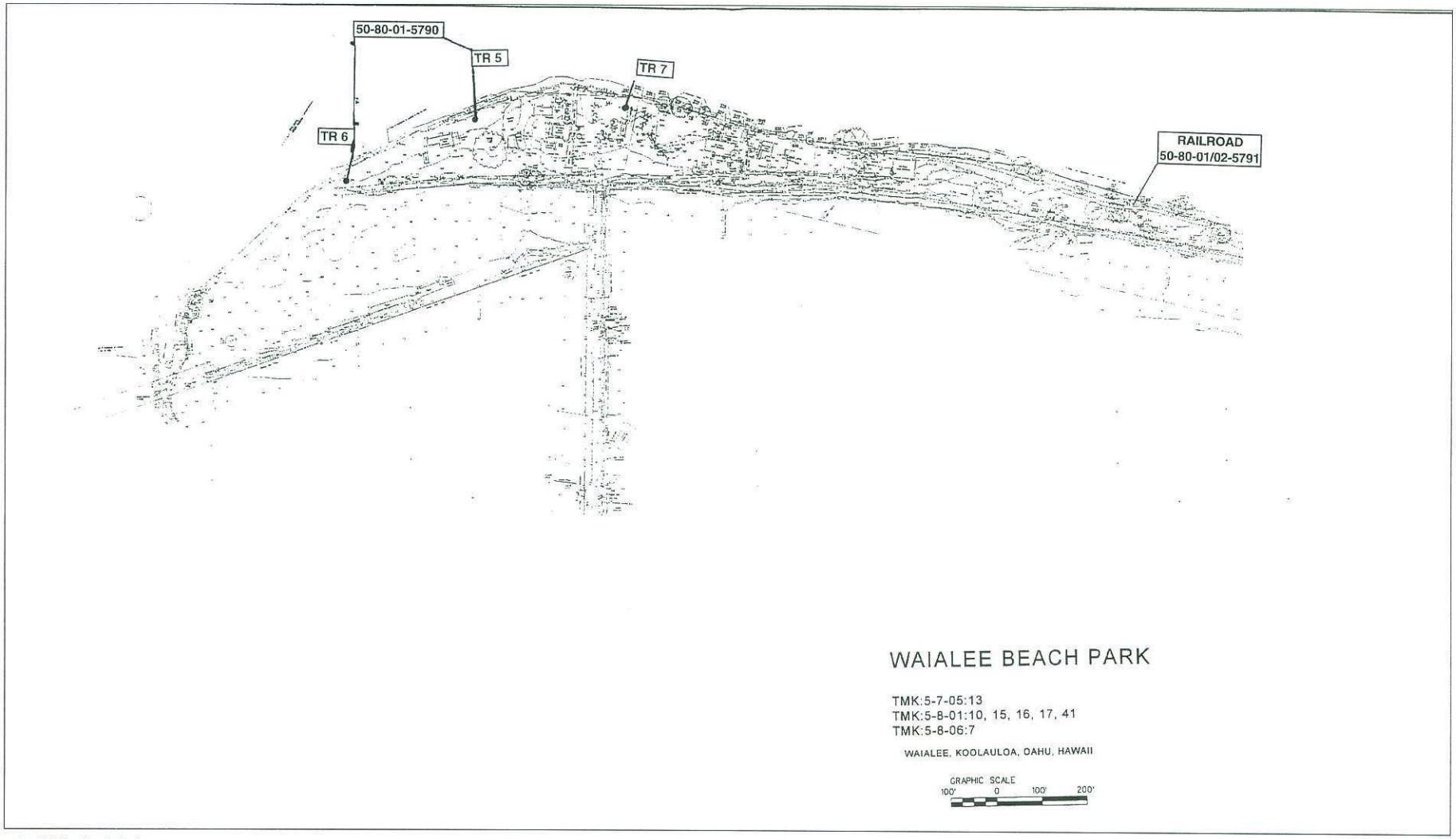

Figure 4 Wailee Beach Park

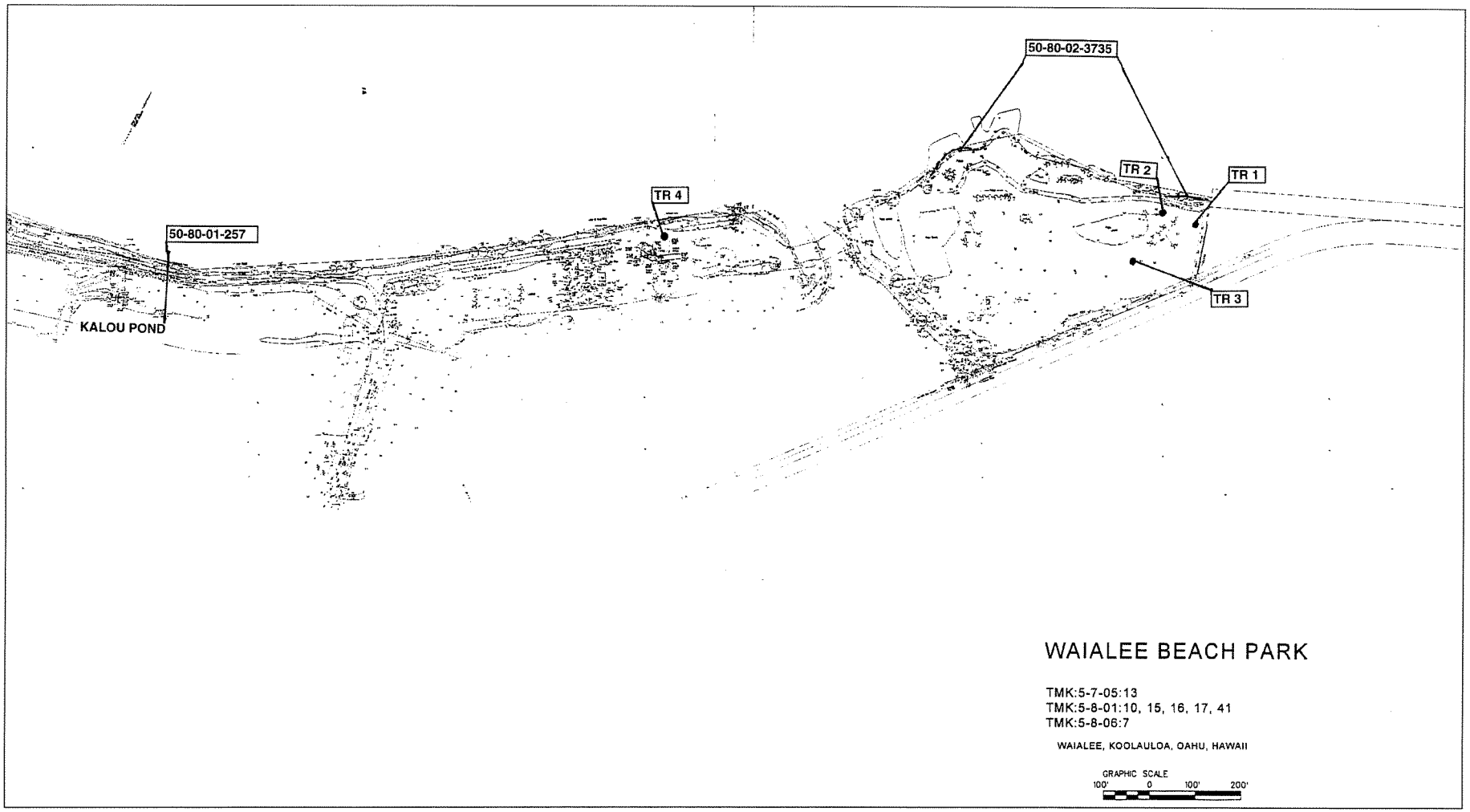

Figure 5 Project Area Showing Location of Test Trenches and Archaeological Sites (Eastern Portion)

Photographs were taken of the project area and of four sites (i.e., a pond, cultural layers and railroad remnants). Besides the photographs, site documentation included: plotting site locations on the provided topographic map, drawing samples of the cultural layer(s) profiles, and collecting of a charcoal sample for possible later analysis.

One of the sweeps also included oral history conversation with Darlene and Harry Kou who occupy privately owned land in the central portion of the project area (Land Commission Award 2766).

Limited sub-surface testing consisted of two shovel and trowel created profiles along the wave cut beach berm and seven backhoe trenches. The shovel and trowel profiles were created to sample and delineate the buried cultural layer (50-80-02-3735). The backhoe trenching consisted of seven trenches (See Figure 4 and Figure 5 for location of backhoe trenches) measuring approximately 7 meters by I meter. The backhoe trenches were distributed throughout the project area with the focus of trenches being placed just back-shore and on top of the existing beach dune as the most likely place to encounter sub-surface sites. All backhoe trenches were photographed, and a representative sample of at least one face was profiled.

Background research included a review of previous archaeological studies on file at the State Historic Preservation Division of the Department of Land and Natural Resources, review of documents at Hamilton Library of the University of Hawai'i, the Hawai'i State Archives, the Hawai'i Public Library, and study of historic photographs at the Hawai'i State Archives and study of historic maps at the Survey Office of the Department of Land and Natural Resources.

D. Project Area Description

The project area is situated at Waiale'e *Ahupua'a* , Ko'olauloa district on the north shore of O'ahu . Waiale'e *Ahupua'a* is situated between Pahipah'ālua to the northeast and Kaunala to the Northwest. The majority of the project area is relatively level with a maximum elevation of 15 a.m.s.l. The proposed beach park consists of a narrow strip of shoreline from the existing Pahipah'alua Beach Park at the eastern end to the drainage at the popular surf spot, Velzyland at the western end.

The project area includes flat alluvial coastal plains and beach deposits. Soil types consist of beach sand (BS), Jaucas sand (JaC), Mokuleia loam (Ms), Waialua silty clay (WkB), and Pearl Harbor clay (Ph) (Foote et al. 1974). Beach and Jaucas sand deposits dominate the makai portion of the project area. Mokuleia loam, Waialua silty clay and Pearl Harbor clay dominate back-shore where the University of Hawaii Experimental Station pastures and Kalou Fishpond are located. Rainfall ranges between 40 and 50 inches per year. Vegetation consists mainly of various grasses, beach naupaka (Scaevola), Ironwood, Christmasberry (Schinus Terebinthifolius), koa haole (Leucanaglaaca), Milo (Thespesia Populnea), coconut and date palms

II. WAIALE'E *AHUPUA'A* CULTURAL AND HISTORICAL DOCUMENTATION

A. Pre-Contact to early 1800s

The project area is located within Waiale'e *Ahupua'a* in the Ko'olauloa district of O'ahu . The *ahupua'a's* resources which would have been utilized by the pre-Western contact Hawaiian population, were still in evidence well into the 20th century. Though there are relatively few traditional accounts specifically mentioning Waiale'e limited early historic accounts and place names provide clues to past land use.

In referring to the early mid-1800's John Papa Ī'i revealed that " Waiale'e was a delightful land, well provisioned. There was a pond (Kalou) there, surrounded by taro patches and there were good fishing places inside the reef (Ī'i 1959:24). In the early to mid 1900's Waiale'e *Ahupua'a* and surrounding *ahupua'a* were briefly described:

> Rounding the northern tip past Kahuku onto the 'sunset coast,' the next sizable wet-taro area is the deep valley of Waimea. Before reaching Waimea the intervening stream beds, shown on the map as Hanaka'oe, Pahipah'ālua, and Kaunala, had not sufficient flatlands for taro cultivation under the old system. Two exceptions to non cultivation in this region were to be found. One was in 'Opana (The-squeezing) adjoining Hanaka'oe, where there was formerly a small spring-watered terrace area named Ka-wela (The-heat), which is also the name of the bay below. The other was in Waiale'e, next before Kaunala, where there were another small group of terraces anciently named Kaneali'i. In 'Opana the legend is told that the gods Kane and Kanaloa struck spring water from a rock known as Wai-kana, to give life to this hitherto waterless region around Kawela Bay (Handy and Handy 1972:462-463).

The Place name, Waiale'e, was given because of the characteristics of the area:

> Waiale'e means "rippling or stirring waters." At one time, on calm days when the tide was low, people on shore could see freshwater bubbling up in small fountains above the offshore reef. Possibly this upwelling of freshwater in the ocean influenced Hawaiians in naming the area. The small island just offshore was called Kuka'imanini, "manini fish procession" (Clark 1946:130-131).

In the 1832 census, the population of the island of O'ahu was recorded as 29,755 with the population of the Ko'olauloa district at 2,891 (Schmitt 1977:12-13). Though no specific population numbers are available for Waiale'e, based on John Papa Pi's accounts, and with the mid 1800's *kuleana* data a fairly dense local population, focused on taro farming and marine resources exploitation, permanently occupied Waiale'e.

B. Māhele and Land Commission Award Documentation

The Organic Acts of 1845 and 1846 initiated the process of the *Māhele* - the division of Hawaiian lands - which introduced private property into Hawaiian society. In 1848 the crown and the ali'i (royalty) received their land titles. All of Waiale'e *Ahupua'a* was designated as Crown Land (Indices 1929:28). Kuleana awards for individual parcels within the *ahupua'a* were subsequently granted in 1850. Forty-four Land Commission Awards (LCAs) for individual parcels were recorded in Waiale'e *Ahupua'a* of which six were not awarded. Nineteen kuleana

or portions thereof were within the present project area. A 1957 map shows that the LCAs were located in the coastal flats of Waiale'e and extended to the shoreline (See Figure 6).

Data from the forty-four (LCAs) awards are presented in Table #l which has columns for *ahupua'a*, Īl'i, land use and land marks, and number of parcels and acreage per award, if awarded. The LCA documentation indicates that these award parcels were primarily for taro *lo'i*, cultivated *kula*, garden with *wauke*, sweet potato, and associated house sites (See Table #l). Additionally the kuleana awards also included parcels in the surrounding *ahupua'a's* Pahipah'ālua, Kaunala, Paumalū were also included in these (LCAs).

Based on the LCA data, a pattern consisting of permanent habitations (i.e houses) with associated taro *lo'i* were within the well watered (i.e. spring fed *auwai* and fishpond) coastal flats. Up-slope and in adjacent *ahupua'a* were additional parcels for banana, upland taro, sugarcane, sweet potato and even tree crops such as Koa are mentioned. The pattern is indicative of a subsistence oriented lifestyle with few introduced plants mentioned.

C. 1850-1900

An eighteenth-century government document on land matters (on file at the Hawai'i State Archives) to Jonah Pi'ikoi, (1804-1859) who was a Kaua'i chief, lists the "lands of the King entitled to prohibited fish on the Island of O'ahu, pali Koolau-poko and Loa." The document, in the English translation, notes: "Waielee Ahupuaa pali koolauloa, the fish is squid." However, other records in the archives make it clear that actually the octopus *(he'e)* was made *kapu* by the king. The document, though undated, was likely written in the mid- 1800s. and suggests that octopus was abundant and a treasured resource of Waiale'e. The list also included other *ahupua'a's kapu* resources, such as Paumalū with the alalaua, and Pupukea's *kapu* fish was the *uhu* (parrot fish).

According to the government census of 1853 there were 1,345 persons living in the Ko'olauloa District; a reduction of some 1,546 persons compared to the 1832 census figure for Ko'olauloa District (Schmitt 1977:12-13). No specific population figure for Waiale'e was recorded, however based on the *Māhele* data indicating some 44 (LCAs) with approximately 21 house sites suggest that a fairly substantial portion of that population was presumably living in Waiale'e.

The Oahu Railway & Land (O.R.&L.) Company, organized by Benjamin Dillingham in1889, was designed to connect outlying areas of O'ahu to Honolulu. During the last decade of the 19th century, the railroad would reach from Honolulu to Pearl City in 1890, to Wai'anae in 1895, to Waialua Plantation in 1898, and to Kahuku in 1899 (Kuykendall 1967:100) thus the portion of the (O.R.&L.) through the project area was one of the last to be constructed.

In 1890, James Castle and Alexander Young started the Kahuku Sugar Company. In 1892 the first crop was harvested producing 4,356 tons of sugar annually. The mill camp became Kahuku's first 'modern' community, also at this time thirty miles of plantation railroad construction began (Dorrance 1998:120). Kahuku Plantation became the dominate economic factor in this portion of Ko'olauloa with direct physical effects on the project area.

Table 1 Land Commission Claims in Waiale'e and Pahipahi'ālua

Claim #	Claimant	*Ahupua'a*, (Īli)	Land Use, Landmarks	# pieces & acerage or not awarded (na)
2672*	Aie	Waiale'e	4 lo'i	.47 Ac.
2688	Laiehau	Waiale'e	5 lo'i	.43 Ac.
2695	Wahinalo	Waiale'e	2 lo'i, kula, house gov.road, garden-wauke, banana, sugarcane, noni, sweet potato, gourd	1.44 Ac. Na
2703*	Holi	Waiale'e Pahipahi'ālua	1.5 lo'i 1 shared lo'i, house wauke, noni	1.25 Ac. Na
2720*	Pooluku	Waiale'e	3.5 lo'i, house cultivated upland	.68 Ac. Na
2721	Pahua	Waiale'e	2 lo'i, sweet potato, kula, house, gov. road	.37 Ac.
2722	Puhiele	Waiale'e	4 lo'i, kula, house, garden-wauke, sweet potato, gourd, ti, sugarcane, upland, taro, banana, yam, koa	.83 Ac. Na
2728	Poonui	Waiale'e	2 lo'i, house kula	.71 Ac.
2755	Namohala	Waiale'e	2 lo'i, sweet potato, kula, kuahiwi	.96 Ac.
2756*	Nahuaka	Waiale'e	2 lo'i, kula, 1 lo'i	.48 Ac. na
2760*	Nua	Waiale'e, (Kauakahiloko) Pahipahi'ālua	7 lo'i, kula, house kalou (pond) .5 lo'i,, kual-pili grass, ti. wauke	1/15 Ac. na na
2763	Niheu	Waiale'e Pahipahi'ālua	1 lo'i, not awarded 2 lo'i, kula, cultivated upland house	na 1.53 Ac.

Claim #	Claimant	*Ahupua'a*, (Īli)	Land Use, Landmarks	# pieces & acerage or not awarded (na)
2766*	Naloloa	Waiale'e	4 lo'i , house, gov. road	1.2 Ac.
2769*	Mano	Waiale'e Pahipahi'ālua	3 lo'i, adjoining Kalou (pond) house, kula-sweet potato, gourd, wauke, banana, sugar cane, ti, also mauka garden	? 1.27 Ac.
2776*	Mahoe	Waiale'e (kuaimalolo) Pahipahi'ālua	3 lo'i, house, garden, banana, wauke, sugarcane, koa	.69 Ac.
2780*	Muli	Waiale'e Pahipahi'ālua	1 lo'i, near kalou (pond) 1 lo'i, house, kula, sweet potato, wauke, noni, gourd, tobacco	1.13 Ac. na
2812	Kaneali'i	Waiale'e (Kapunaiki)	8 lo'i, kula, kai house	2.75 Ac.
2814*	Kauaua	Waiale'e Pahipahi'ālua	5.5 lo'i, 2 lo'i, kula, house cultivated upland	.38 Ac. .13 Ac. .21 Ac.
2815	Kauaua	Waiale'e Pahipahi'ālua	2 lo'i, garden-gourd, sweet potato	.58 Ac.
2816*	Kahaleipu	Waiale'e Pahipahi'ālua	2 li, gov. road kalou (pond), house 2 house	1.87 Ac. 1.11 Ac.
2817	Kimo	Waiale'e	2 lo'i, 1 lo'i shard	1.16 Ac.
2819*	Keliikui	Waiale'e	5 lo'i, house	.76 Ac.
2820	Kuaua	Waiale'e (keokea)	1 lo'i	na

Claim #	Claimant	*Ahupua'a*, (Īli)	Land Use, Landmarks	# pieces & acerage or not awarded (na)
2821*	Kaneiahuea	Waiale'e (keokea) Pahipahi'ālua	6 lo'i house garden-wauke, sweet potato, banana sugarcane	1.21. Ac. Na
2823	Kamahalo	Waiale'e	3 lo'i, cultivated kula	.72 Ac.
2824	Kuheleloa	Waiale'e	5 lo'i, kula, upland	2.04 Ac.
2825*	Kalua	Waiale'e Pahipahi'ālua	5 lo'i, upland-sweet potato,koa	1.64 Ac. na
2829	Keoho	Waiale'e	Hala	na
2831*	Kahuku	Waiale'e	3 lo'i, house	.61 Ac.
2836	Kelemana	Waiale'e	1 lo'i, 2 hala trees	na na
2841	Kalauokekapu	Waiale'e	5 lo'i	na
2842	Kaaina	Waiale'e	1 lo'i, house	.51 Ac.
2844*	Laili	Waiale'e (mokuhala) Pahipahi'ālua	4 lo'i, house, gov. road, kula, cultivated upland	.17 Ac. .47 Ac.
2853	Keiiwaiwaiole	Waiale'e	2 lo'i, kula-sweet potato, gourd	na
2854	Kaiwi	Waiale'e	1 lo'i, house kalou (pond), sweet potato	na
2858	Kahuewaa	Waiale'e	1 lo'i	.73 Ac.
2873	Kaunahi	Waiale'e Pahipahi'ālua	1 lo'i 1 lo'i, kula	na na

Claim #	Claimant	*Ahupua'a*, (Īli)	Land Use, Landmarks	# pieces & acerage or not awarded (na)
2877*	Kuheleloa	Waiale'e Pahipahi'ālua	1 lo'i 1 lo'i, cultivated upland, house	.72 Ac. na
2891	Kaio	Waiale'e (Kalalahili) Pahipahi'ālua	2 lo'i 2 lo'i	.61 Ac. na
2894	Kaauwaepaa	Waiale'e (kaooiki)	1 lo'i, kula	na
2895	Kaenaokane	Waiale'e (kilawai)	2 lo'i, upland-noni	.47 Ac.
2921	Kaumailiula	Waiale'e (kamanawa)	8 lo'i, house, wauke, sweet potato	2.73 Ac.
4266*	Kalawaia	Waiale'e Pahipahi'ālua	2 lo'i, house, kula-hala tree 1 lo'i	1.09 Ac. na

*Land Commission Award Claims in Project Area

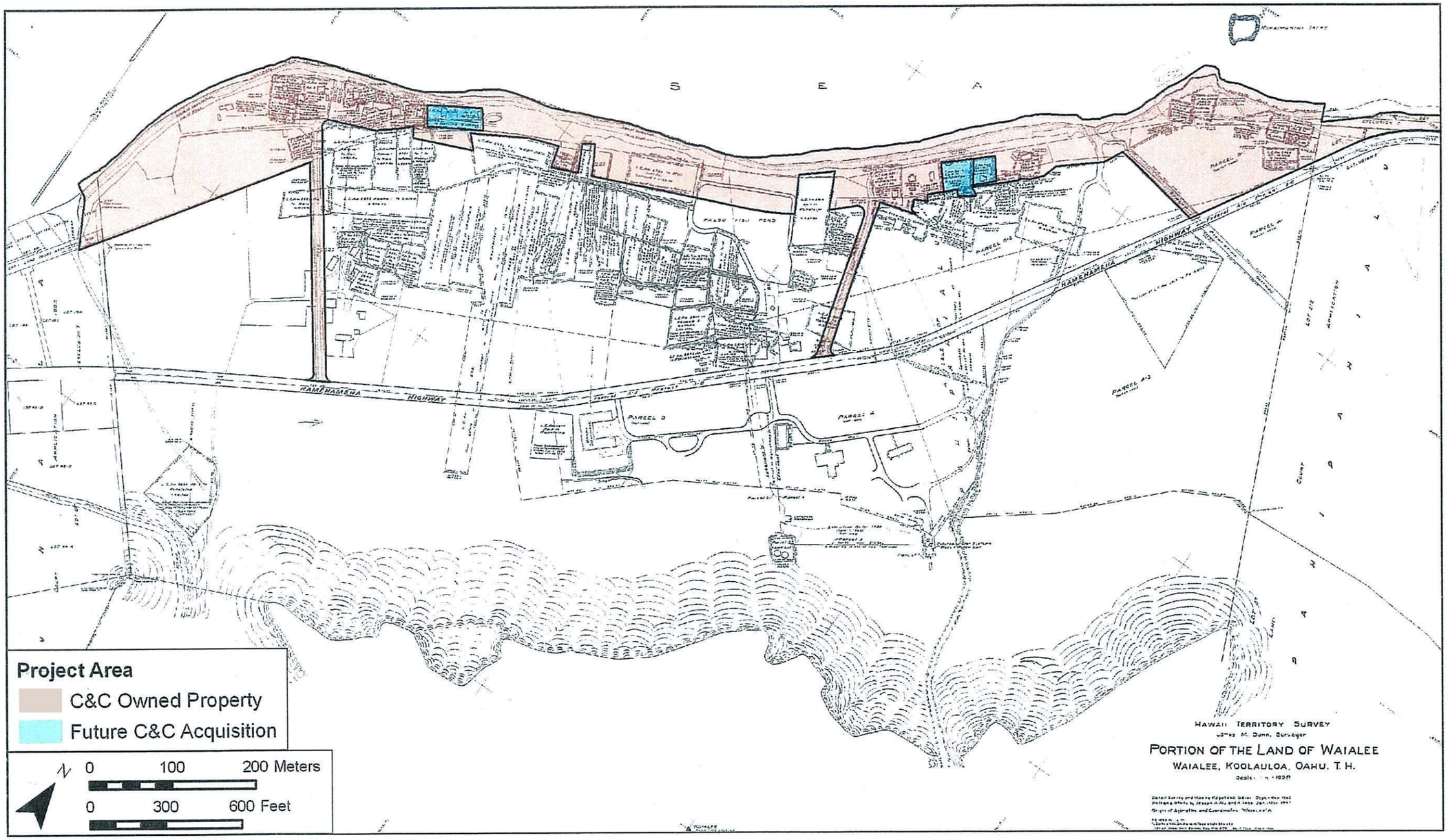

Figure 6 Portion of the Land of Waiale'e Map, Surveyor, James M. Dunn, traced from Gov't survey Reg. Map # 4081 in 1957, Showing Land Commission Awards (LCAs)

D. 1900 to Present

According to the government census of 1900 there were then 2,372 persons living in the Ko'olauloa District with the increase related to plantation-organized immigration (Schmitt 1977: 12-13). No specific population figure for the *ahupua'a* was recorded. The district population increases dramatically, due to immigrant plantation workers, during subsequent years, up to 10,562 in 1970.

A 1903 map of Waiale'e indicates that settlement in the *ahupua'a* continued to be focused near the coastline. The pond (Kalou) is also depicted in the map along with the O.R.& L. Railroad. A dotted line shows a old government road that ran parallel to the coastline and was later rerouted closer to the coastline (remnants of this road were in trench 1). There were approximately seven or eight houses in the area of prior cane fields and the remainder of the house's were on non cane fields. (Figure 7).

The Waiale'e Training School For Boys was the major entity of change, for Waiale'e in the early 20th century. The school began in 1903 with construction of various buildings continuing through 1934. The school consisted of 650 acres that held 42 buildings with a capacity of 175 inmates. In 1939, there were 150 'inmates' (Territorial Planning Board 1939:231,233 in this document the boys were referred to as 'inmates'). The school conducted training activities such as agriculture and animal husbandry. The school was in use up till the 1950s (Schmitt 1977:255). Presently, Crawford Convalescent Home uses some of the same grounds but with new buildings and some renovation of others. The school buildings are now mostly dilapidated remnants. From the early 1960s, the University of Hawaii Experimental Station also began to use the former school grounds, as pasture land and associated farm buildings.

During World War II Kahuku was designated by the army to house four eight-inch cannons between the mill and the shore. They also constructed a landing strip for fighter planes which was abandoned in 1950 (Dorrance 1998:121). Information about the army's stay in Kahuku was also mentioned in our oral interview with Harry Kou. Mr. Kou related that the project area had been taken over by the military for housing (Figure 8). In this process local inhabitants were relocated to enable the military to use existing houses and provide new houses for their personnel.

On April 1, 1946 the Hawaiian Islands experienced one of the worst tsunamis in its history.

The *tsunami* caused much property damage and loss of life. Paumalū which is about two miles northwest from the project area was devastated by the natural disaster. Records indicate that at Paumalu, the water rose 23 feet above sea level and threw sections of the railroad track inland across the adjacent highway (Shepard 1959:421). About one mile northeast of Waiale'e, Kawela Bay was also devastated. At the time, Mr. and Mrs. Shepard were living just west of Kawela Bay and lived to tell their experience:

The third wave was observed from a point on the railroad at a height of 24 feet. It broke just outside the terrace, rising slightly above the horizon at eye level, so that this breaker must have been about 25 feet high. Crossing the terrace with a terrific noise of breaking cane, it swept across the railroad track to the west of us and left a mass of debris on the highway in land from the railroad (Shepard 1959:425).

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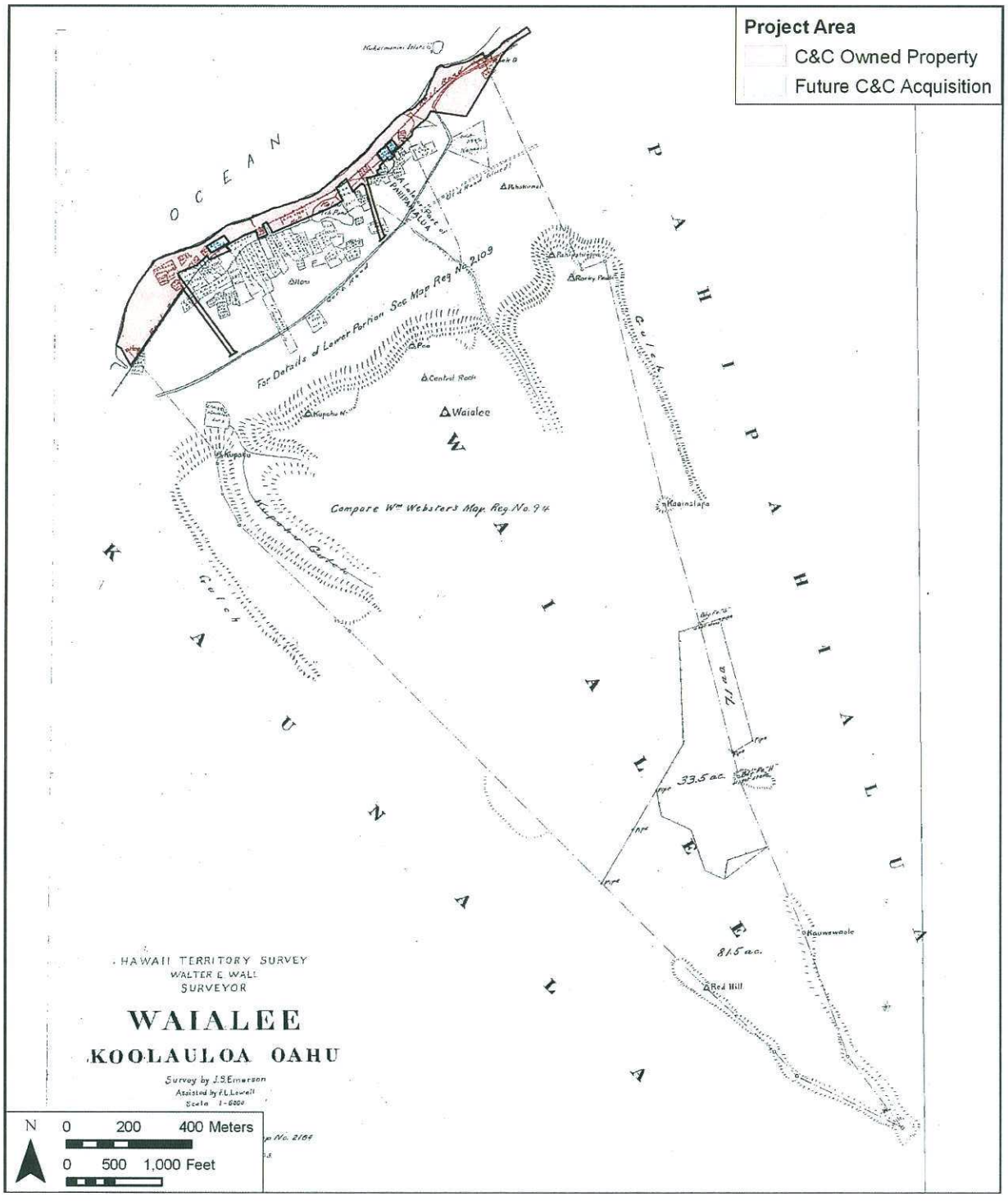

Figure 7 Waiale'e Ko'olauloa O'ahu Map, walter E. Wall Surveryor, Traced from Gov't Survey Reg. Map #2184 by R.D. King in 1903

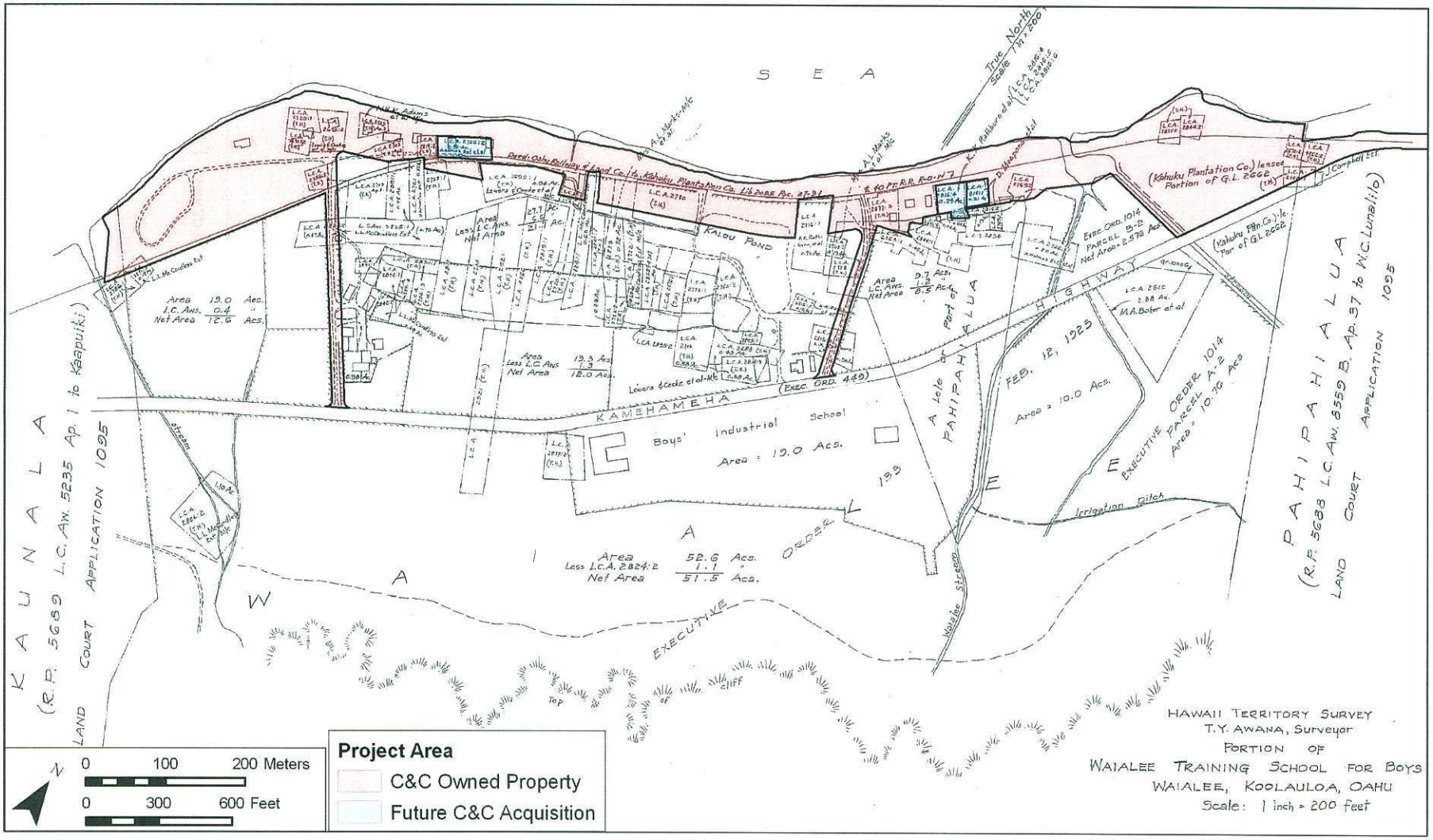

Figure 8 Waiale'e Training School for Boys Map, Surveryor T. Y. Awana, and Compiled from Gov't Survey Reg Map # 2109, Map by J. S. Emerson, 1951 Showing Kahuku Plantation Lessee Portion.

The area described above is very close or possibly inclusive of the project area, and therefore directly applicable to the tsunami effect on Waiale'e.

The O'ahu Railway & Land Company went out of business on December 31, 1947 and the railway line through Waiale'e was discontinued (Conde & Best 1972:299). One cause of the railways closure was the damage to the rail line from the 1946 *tsunami*.

A 1949 aerial photograph of the Waiale'e coastline shows Kalou Pond covered with marsh vegetation, sugarcane fields at the eastern end of the project area, cultivated land associated with Waiale'e Training School, and houses, along the coastline in the project area. Outside the project area land use was still dominated by farming, and the associated structures of the Waiale'e Training School for Boys (Figure 9).

In 1950 The Waiale'e Training School for Boy's closed followed by the Kahuku Plantation in 1971. These two closures plus the 1947 O.R.&L. closure reduced land use within the project area to probably a few beach homes and University of Hawaii Experimental Station use. Presently only a few beach homes remain and U.H. use has been reduced to pasturage just *mauka* of the project area.

Figure 9 1949 Aerial Photograph Showing Project Area (R.M. Towill)

III. PREVIOUS ARCHAEOLOGICAL RESEARCH

Based upon previous archaeological research there were only two sites documented in the project area, an inland fishpond and what is referred to as a Prehistoric Habitation Site which is a prehistoric/historic cultural layer. There are two other recorded sites in Waiale'e outside of the project area, Terrace Complex (#50-80-02-4882) and Kaneali'i Agricultural Terraces (#50-80-02-9517) which were documented by Ogden Environmental and Energy Services Co., Inc. in 1996.

The fishpond known as Kalou Fishpond, (State Site 50-08-01-257) is on the State Register of Historic Places and has been described by McAllister (1933), Kikuchi 1973, Yent and Ota (1981) and Simons and Davis (1988). The pond is fed by a spring on its south side and is situated partially in the project area.

Kalou Pond was said to have been in its best conditions when Kaluhi was Konohiki (a man in charge of a land division) of this district. There was formerly a "Kane stone" in the immediate vicinity. This is also the place where Kahuku is attached to Waiale'e. (McAllister 1933:152)

Kalou pond is categorized as a loko wai, meaning any shape pond that has been altered by man. There are two demigods associated with this pond, Malaekahana and Laleikawai who formed the pond where a fishhook (lou) fell and dug into the ground. There is also reference to a retaining wall about 4 feet high, a kane stone nearby, and the name of the Konohiki Kaluhi (Kikuchi 1973:240).

A letter from Department of Land and Natural Resources to Tamotsu Sahara presented the following description:

> The fishpond is roughly L-shaped and measures approximately 50 meters (150', east-west) by 70 meters (200') (north-south). The fishpond banks and adjacent lands are presently overgrown with California grass along with several coconut trees on the north (makai) side and banyan trees on the south (mauka) side. The California grass and reeds have filled in portions in the northwestern quadrant of the fishpond. The actual bank of the fishpond can be defined only on the south side where there is the remnant of a basalt boulder retaining wall that was built into the bank. This wall is presently 2-3 boulders out of the bank and into the pond. The roots of the banyan tree have also caused the disturbance of the wall in several sections. (Yent and Ota 1981:1)

The previously recorded cultural layer (State Site 50-08-02-3735) is situated on a point of land opposite the islet ofKukaimanini. The site contained artifacts, midden, charcoal, and intact hearths. On the surface, a portion (mouth) of a nineteenth century bottle and a fine- grained basalt flake were found. Also collected from a hearth was "the distal half of the tarsometatarsus of a relatively large male chicken (Gallus gallus; Personal communication, Alan Ziegler)" (Simons and Davis 1988:2).

In an archaeological inventory survey at Kahuku Training Area, for the U.S. Army Garrison, Ogden Environmental and Energy Services Co., Inc. recorded (State Site 50-80- 02-4887) a small terrace complex located between Pahipahi'alua and Waiale'e. There was also an unrecorded heiau discovered at the mouth of Pahipahi'alua Gulch, it was disturbed and only a few features could be observed. Around the feature large pieces of coral branch fragments were

observed and recorded. Also in the same vicinity is (State Site 50-80-02- 4888) which is an earthen depression with scattered charcoal. Another (State Site 50-80- 02-9517), KanealFi Agricultural Terraces were previously recorded, but have since been destroyed. Sub-surface sampling for chronological and functional determination was recommended (Patolo 1996:29).

> There is a small group of terraces formerly known as Kanealii, now abandoned for lack of water, around the house of Mrs. John Baker, just east of the Boy's Industrial School and inland of Kamehameha Highway. The large terraces now cultivated seaward of the Industrial School are of recent construction (Handy 1972:88).

Burials

In the Ko'olauloa district, burials have been documented in caves and sand. In the Kawela Bay Archaeological Area, four cultural deposits and two human burials have been recorded (Rosendahl 1988:ii). The Kawela Bay Archaeological area was suggested to date to AD 1300 to present (Ibid).

During the Kuilima Resort Expansion Project 10 individual skeletal remains were recovered from sand deposits (Walker 1993). In 1989, Bath and Kawachi of SHPD/DLNR recorded a burial in a cave at Sunset Beach, Kaunala, O'ahu. Wood was removed and analyzed but no date was given in the report (Bath & Kawachi 1991).

Archaeological inventory survey and sub-surface testing at Puaena, Kawailoa documented a human burial in sand deposits that was presumed historic in age (Borthwick 1998:53). Research on an adjacent parcel recorded nine burials (Moore et al. 1993). Human remains were also found in a small overhang cave in Kawela (Borthwick 1998:). The pattern indicated by the burials noted above includes isolated cave burials and both clusters and isolated burials in sand deposits.

IV. SETTLEMENT PATTERNS AND PREDICTIVE MODEL

Based on the background studies there are two previously identified sites in the project area; Kalou Fishpond (State Site 50-08-01-257) and the cultural layer (State Site 50-08-02- 3735). Based on the LCA data the primary use of the project area during early historic times, and presumably prehistorically, was a traditional Hawaiian community primarily focused on the coastal flats. The area was rich in natural resources, such as a spring fed pond, good fishing grounds with a fringing reef, and well-watered agricultural land.

The mid-1800s Land Commission documents place the focus of agriculture and habitation within the alluvial flood plain where there was extensive taro lo'i terracing with dispersed permanent residences. A total of 44 kuleana (LCAs) were awarded for Waiale'e; nineteen of which, at least in part, were within in the project area.

Waiale'e was intensively utilized throughout the historic period by a number of agents. These included the O'ahu Railroad that ran through the project area, and the former sugar cane fields of Kahuku Sugar Company. Also affecting the project area were the Boy's Industrial School (1903-1950),WWII era housing, and the University of Hawai'i Experimental Station.

The bulk of the project area terrain is sand. Thus, other cultural layers containing both prehistoric and early historic material, like the previously recorded Site- 3735, are anticipated to be present in the project area. In addition, based upon the Hawaiian tradition of burying human remains in sand and previous burials found in similar areas just east of project area, Kawela Bay, Kuilima and Kahuku and other sand deposit burials suggest that burials may be encountered in the project area.

In the late 19th century, the O.R.& L. railroad traversed through the project area. Therefore it is probable that traces of the railroad berm and/or remnants of the infrastructure will be present. Also research shows that the far eastern portion of the project area was utilized for sugarcane. Thus, this portion of the project area experienced a lot of surface modification, such as bulldozing. Based on sugarcane cultivation, pasture use, hog farm, and other agriculture pursuits, few surface sites other than historic era structures are anticipated.

A 1949 aerial photograph depicts houses, pasture land, and animal holding pens. Modern area maps show the Waiale'e Training School, Kalou Pond and houses, however these maps are not updated and do not indicate any structures in the present project area other than the few remaining beach houses.

V. RECONNAISSANCE SURVEY RESULTS

Four archaeological sites; two previously recorded and two new sites, were found and documented during the three-day surface survey and one limited sub-surface testing (Figure 4 and Figure 5). The previous sites include Kalou Pond (Site 50-08-01-257), cultural layers (Site 50-08-02-3735); the new sites include a cultural layer (Site 50-80-01-5790) and the Railroad Infrastructure (Site 50-80-01/02-5791).

The vast majority of the project area appears to have been historically impacted by sugar cane cultivation, pasture land modification, Railroad construction, and housing. Based on observed characteristics it is probable that bulldozing of sugarcane fields resulted in large quantities of rock and soil being pushed around and into the project area. Pastoral use is evidenced by old fence lines, pig pens, old overgrown roadways, and pasture-type grasses. The construction of the railroad so close to the shoreline also modified the landscape. Housing construction, including cesspools and subsequent demolition, has also significantly impacted the sand dune beach berm.

Vegetation is another clue to past land use. Most of the thickets in the project area are relatively recent growths of christmasberry, *koa haole*, and Ironwood trees. This suggests past bulldozing for "pasture improvements," as do the old overgrown roadways.

Presented below are descriptions of the two newly recorded sites and the two previously recorded sites.

VI. SITE DESCRIPTIONS

State Site # 50-80-01-257

Site Type: Pond

Function: Aquaculture

Features: I

Description: Site 50-08-01-257 Kalou Fishpond is only partially within the project area and is periodically cared for by University of Hawaii Experimental Station workers. The pond is fenced and over grown with grass and marsh. Discussions with the UH Experimental Station staff indicate that the pond has prawns, and other fish, but is no longer used for irrigation.

Kalou pond is categorized as a loko wai, meaning any shape pond that has been altered by man. There are two demigods associated with this pond, Malaekahana and Laleikawai who formed the pond where a fishhook (lou) fell and dug into the ground. There is also reference to a retaining wall about 4 feet high, a kane stone nearby, and the name of the Konohiki Kaluhi (Kikuchi 1973:240).

A letter from Department of Land and Natural Resources to Tamotsu Sahara presented the following description:

> The fishpond is roughly L-shaped and measures approximately 50 meters (150', east-west) by 70 meters (200') (north-south). The fishpond banks and adjacent lands are presently overgrown with California grass along with several coconut trees on the north (makai) side and banyan trees on the south (mauka) side. The California grass and reeds have filled in portions in the northwestern quadrant of the fishpond. The actual bank of the fishpond can be defined only on the south side where there is the remnant of a basalt boulder retaining wall that was built into the bank. This wall is presently 2-3 boulders out of the bank and into the pond. The roots of the banyan tree have also caused the disturbance of the wall in several sections. (Yent and Ota 1981:1)

State Site # 50-08-02-3735

Site Type: Cultural layer

Function: Habitation

Features: Multiple Hearths Reported

Description: Site 50-08-02-3735 previously recorded, was revisited with additional profiles and descriptive analysis added. This site was described as a "prehistoric habitation site containing artifacts, midden, charcoal, and intact hearths and other pit features. The site also seems to have a historic component of uncertain status. A fine-grained basalt flake and the finished (mouth) portion of a nineteenth century bottle were found unprovenienced from the surface" (Simmons and Davis 1988:2).

Based on our measurements. Site- 3735, the discontinuous cultural layer, is roughly 500 feet, extending north eastward from the point of land opposite Kukaimanini Islet to Pahipahi'alua Park boundary.

The stratigraphy of the exposed portion of Site -3735 consists of three strata (I, II, and III). Stratum I consists of black (10 YR 2/1) sandy loam with charcoal fragments. Stratum I contained some shell midden and the lower boundaries are abrupt and wavy. Stratum II consists of dark brown fine sand (7.5 YR 3/2) with scattered charcoal fragments. Stratum III consist of reddish/yellow fine calcareous beach sand (7.5 YR 7/6) (Figure 10).

The traditional midden observed within the stratum suggests a pre-contact or early post contact age range. A sample from a charcoal concentration was collected for later analysis. Though based on historic disturbance the usefulness of the sample is questionable.

Based on observed characteristics, the cultural layer probably represents pre-contact and post-contact habitational use of this narrow shoreline bench. The cultural layer has been disturbed from bulldozing as evidenced by buried car parts observed approximately one meter below the surface. The bulldozing came from the makai side pushing away accumulated rubbish, seaward to the edge of the active beach creating a narrow raised berm of mixed cultural material. Further research may clarify whether there is any intact and undisturbed pre-contact cultural deposits.

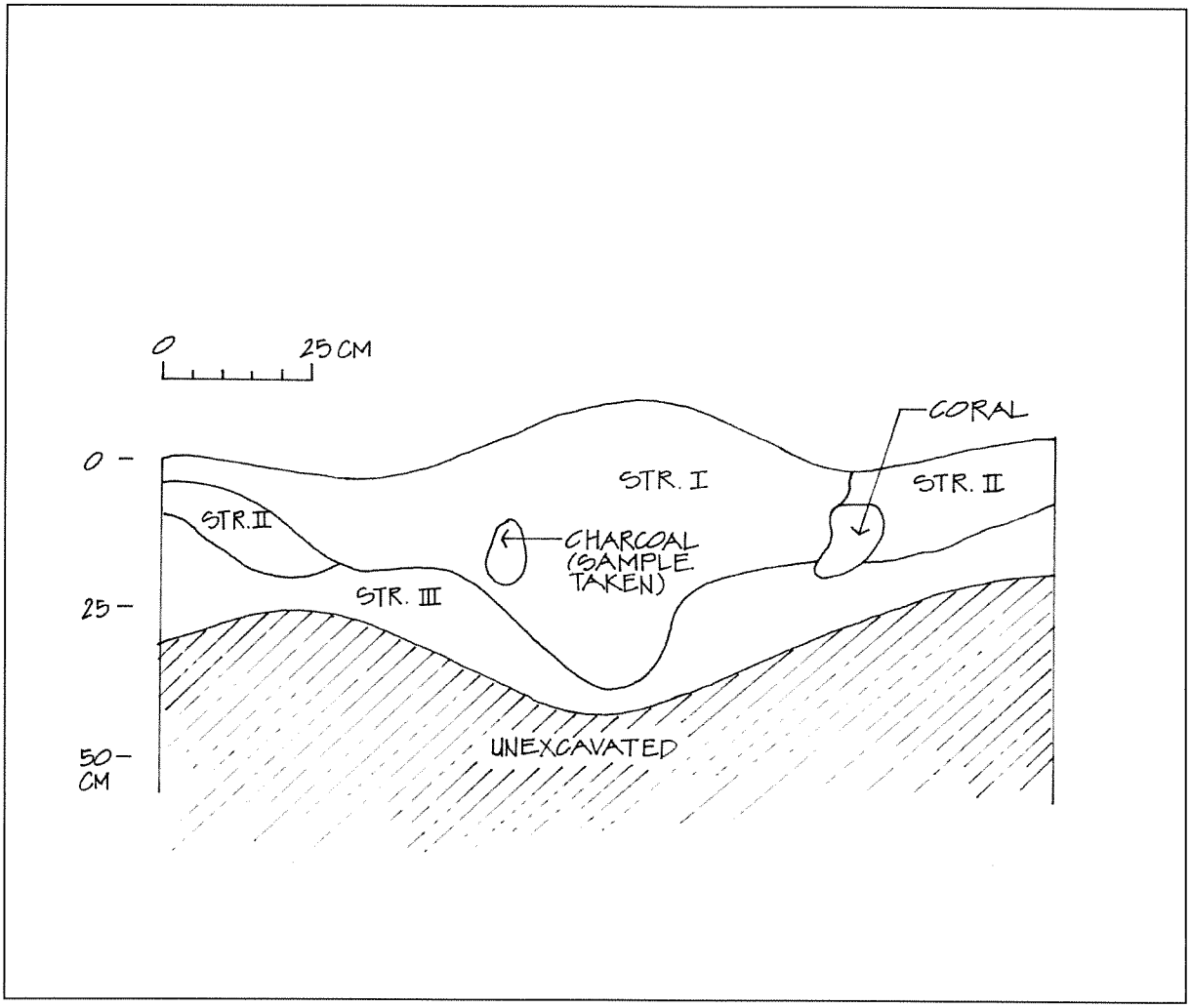

Figure 10 Profile of Site 50-08-02-3735

State Site # 50-80-01-5790

Site Type: Cultural Layer

Function: Habitation

Features: I

Description: Site 50-80-01-5790. The newly documented cultural layer is situated at the western or 'Velzyland' end of the project area. It was observed in backhoe trench 7 as a dark charcoal-stained stratum within the overall sand deposit (i.e. beach sand, Jaucus sands) that characterize the majority of the project area. The layer is not continuous and the bulk of cultural material observed was historic to modern trash. However, traditional food remains consisting of marine shell midden were also observed.

The site appears to be the result of historic and modern residential use of the crest of the beach dune in this portion of the project area. The cultural layer is a mixed stratum of habitation debris with subsequent mechanical alteration, presumably related to the demolition of the previously existing wood-framed house structures in the project area. However, besides the obvious historic components, there are indigenous midden components, which also suggest mixing of a possible pre-historic cultural layer.

State Site # 50-80-01/02-5791

Site Type: Railroad Infrastructure

Function: Transportation

Description: Site 50-80-01/02-5791 is the remnants of the 1899 pathway through Kahuku and Waiale'e. The railroad bed is only evident in discontinuous sections. Three concrete features were observed; a channelized outlet for letting water out of the marshy pasture lands; a foundation adjacent to the rail bed; and the remnants of the Waiale'e Stream crossing foundation on the western side of the stream. Basalt boulders that were the foundation for the stream crossing are now, strewn about the beach. Sections of the railroad berm are now used as a roadway and driveways (See Figures 19-21).

Based on historic research the rail line carried both passengers and freight. The line was severely damaged by the 1946 tsunami. The 0. R.& L. ceased operation in 1947. There remains little evidence of the rail line within the project area, no tracks, and just the aforementioned concrete remnants with the berm visible in discontinuous sections, as a slightly raised and level path.

A. Stratigraphic Summary

Seven backhoe trenches were excavated within the project area. The trenching was viewed as the most economical method for sampling the sand dune deposits that dominate the project area soil types. Testing was limited to one day, to excavate, document, and backfill all trenches. Limitations upon the placement of test trenches included two large areas of dense vegetation (one at the eastern and one at the western end of the project area) and private and/or 'occupied' parcels.

The trenches ranged from 4 to 7 meters long, averaged I meter wide and ranged from 1.2 to 2 meters deep. The stratigraphic sequence was relatively consistent within the seven trenches documented. The sequence observed was entirely beach sand in origin. A standard sequence of strata (I, II, III, IV) was utilized to provide a consistent stratigraphic description across the project area.

Stratum I and IV are consistent, with some color variations, for all trenches. Stratum I refers to the modern A-horizon of lawn-type grasses in a sandy loam matrix and is the present surface layer. Stratum IV represents the basic sterile sand layer that was observed in all trenches.

The stratigraphy within Trenches 3, 4, 5, and 6 was essentially a strata I and IV sequence where the surface layer directly overlaid sterile sand. Trenches 1, 2, and 7 contained mixed cultural layers designated either stratum II or III over sterile sand (i.e. St IV).

The following stratigraphic descriptions are the generalized soil descriptions per strata encountered. Stratum specific descriptions are included with each profile.

Stratum I represents the modern A-horizon which consists of dark grayish brown sand to sandy loam deposits. This stratum contained asphalt within trenches I & 2, presumably from the old government road. Stratum I also contained trash bags, wood, and metal fragments from recent bulldozing and trash pit use.

Stratum II represent mixed cultural strata and was used as evidence for designating cultural layers (Site 50-80-02-3735) and (Site 50-80-01-5790). Stratum II designation was only utilized in trenches I & 7. In trench I stratum II was predominately light gray to pale brown sand with dark grayish brown mottling and marbling. In trench 7 stratum II was predominately very dark grayish brown to black sand but with mottling and marbling of light gray to pale brown sand. In both cases historic era artifacts were observed in association with the layer.

Stratum III (only encountered in I & 2 trenches) consisted of dark reddish brown sandy loam. It contained much historic to modern trash apparently from house demolition or dumping.

Stratum IV consisted of sterile white beach sand. However, in trenches I & 2, the sand had turned a pinkish color, possibly from iron staining, as these trenches were in an area of former sugar cultivation. The stratum also contained bands of water-rounded coral cobbles and pebbles suggesting tsunami and/or high surf inundation.

One of the interesting observation of the testing was the reddish to pinkish stained sand in trenches I & 2. The unusual color(s) is believed to be the result of decades of sugar cane cultivation-related iron staining. Map documentation depicts the area as having been a Kahuku Plantation field, the only one in the project area.

The testing did not reveal any burials or well defined solely prehistoric cultural layers. Observations suggest a substantial amount of historic and modern activity has either obliterated or mixed cultural containing strata.

B. Trench Descriptions

Table 2 Trench 1:Length: 7.8 m. Width: 1 m. Dept 2 m Orientation: 151 TN. Profile of East face (Figure 11)

Stratum	Depth (cm)	Description
IA	0-12	10 YR 3/3 dark brown, fine to medium sandy loam, loose, containing abundant roots and rootlets, with a clear boundary, modern A-horizon, asphalt was present on the south end of the trench.
IB	10-37	10 YR 6/4 light yellowish-brown sand mixed and mottled with dark stratum I material and light stratum II material
II	12-28	10 YR 8/4 very pale brown fine sand, loose, with a clear and smooth boundary.
III	28/65	5 YR 3/4 dark reddish brown sandy loam, loose, gritty, abrupt and smooth boundary, contains historic to modern trash, including wire, plastic, and bottles.
Feature 1	40-90	Probable post hole, sand is 10 YR 6/4 yellowish-brown, feature originates from Stratum III. 2.5 YR 5/8 reddish medium to coarse sand, loose, and sterile.

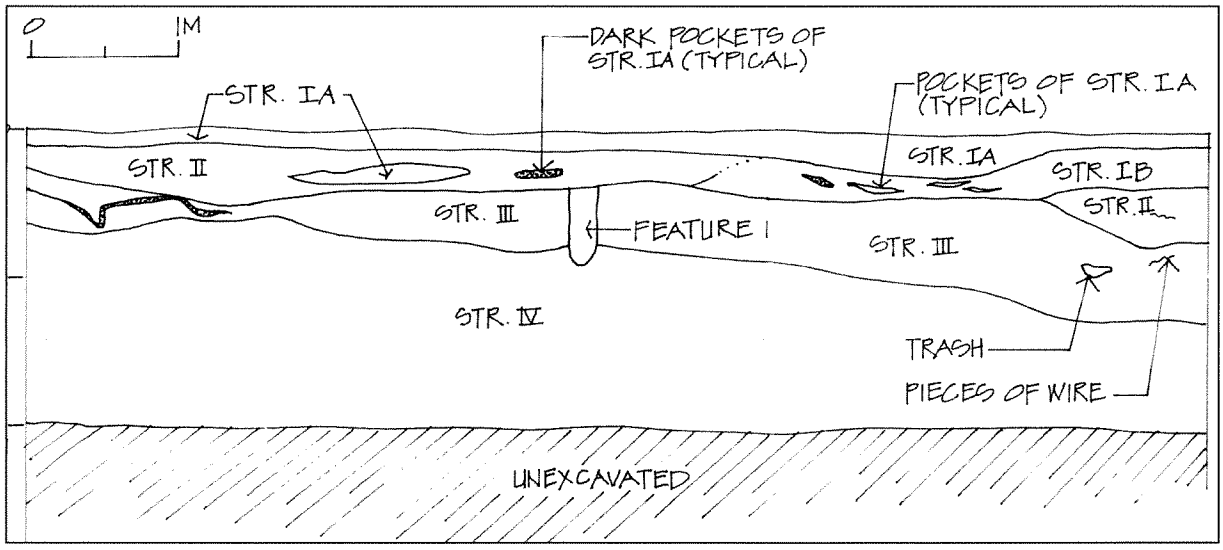

Figure 11 Trench 1 Profile

Table 3 Trench 2: Length:? m. Width: I m. Depth: 1.4 m. Orientation 150 TN Profile of Southwest face (Figure 12)

Stratum	Depth (cm)	Description
I	0-25	10 YR 3/3 dark brown fine to medium sandy loam, loose, containing abundant roots and rootlets, with a clear and smooth boundary modern A-horizon. Asphalt was present on the south end of the trench.
III	25-50	5 YR 3/4 dark reddish brown sandy loam, loose, gritty, abrupt and smooth boundary containing historic to modern trash, similar to Trench 1
IV	50-140	2.5 YR 5/8 reddish medium to coarse sand, loose, and sterile.

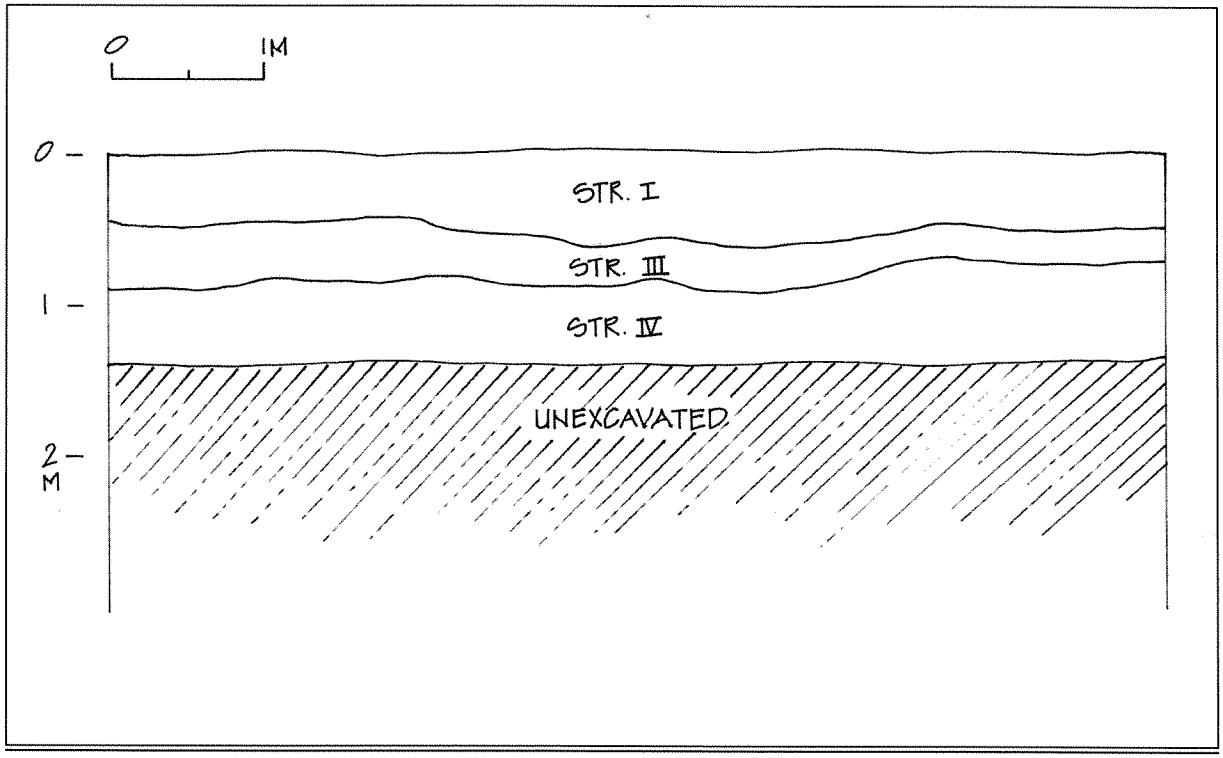

Figure 12 Trench 2 Profile

Table 4 Trench 3: Length: 6.5 m. Width: 1.3 m. Depth: 1.2 m. Orientation 146 TN Profile of Southwest face (Figure 13)

Stratum	Depth (cm)	Description
I	0-50	10 YR 3/3 dark brown fine to medium sandy loam, loose, containing abundant roots and rootlets, with abrupt and smooth boundary, modern A-horizon
IV	50-120	.5 YR 6/8 light red fine to medium sand, loose and sterile.

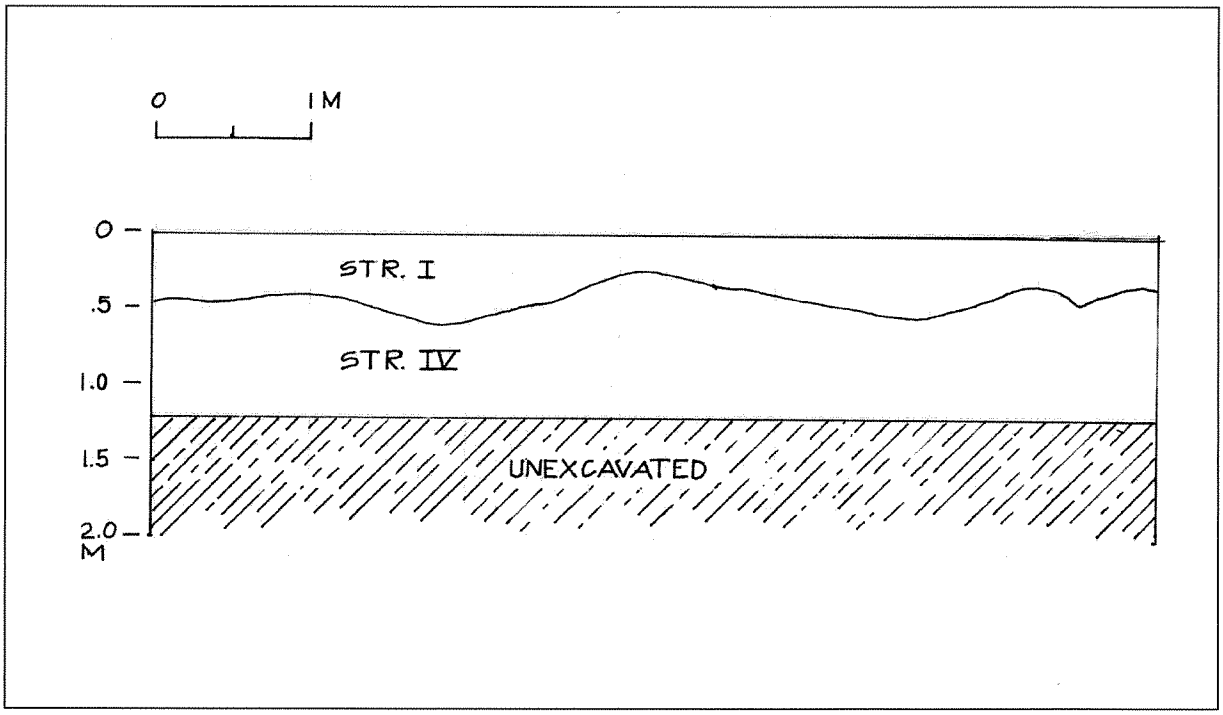

Figure 13 Trench 3 Profile

Table 5 Trench 4: 4.5 m. Width 1 m. Depth: 1.3m. Orientation 111.5 TN Profile of Southwest face (Figure 14)

Stratum	Depth (cm)	Description
I	0-65	10 YR 3/3 dark brown, loamy sand, loose, abrupt and smooth boundary, modern A-horizon with organic material from present vegetation. Modern trash bags, fragments of wood, and metal, concrete, area used for recent trash dump and yard clippings.
IV	65-130	10 YR 8/4 pale brown medium sand sterile.

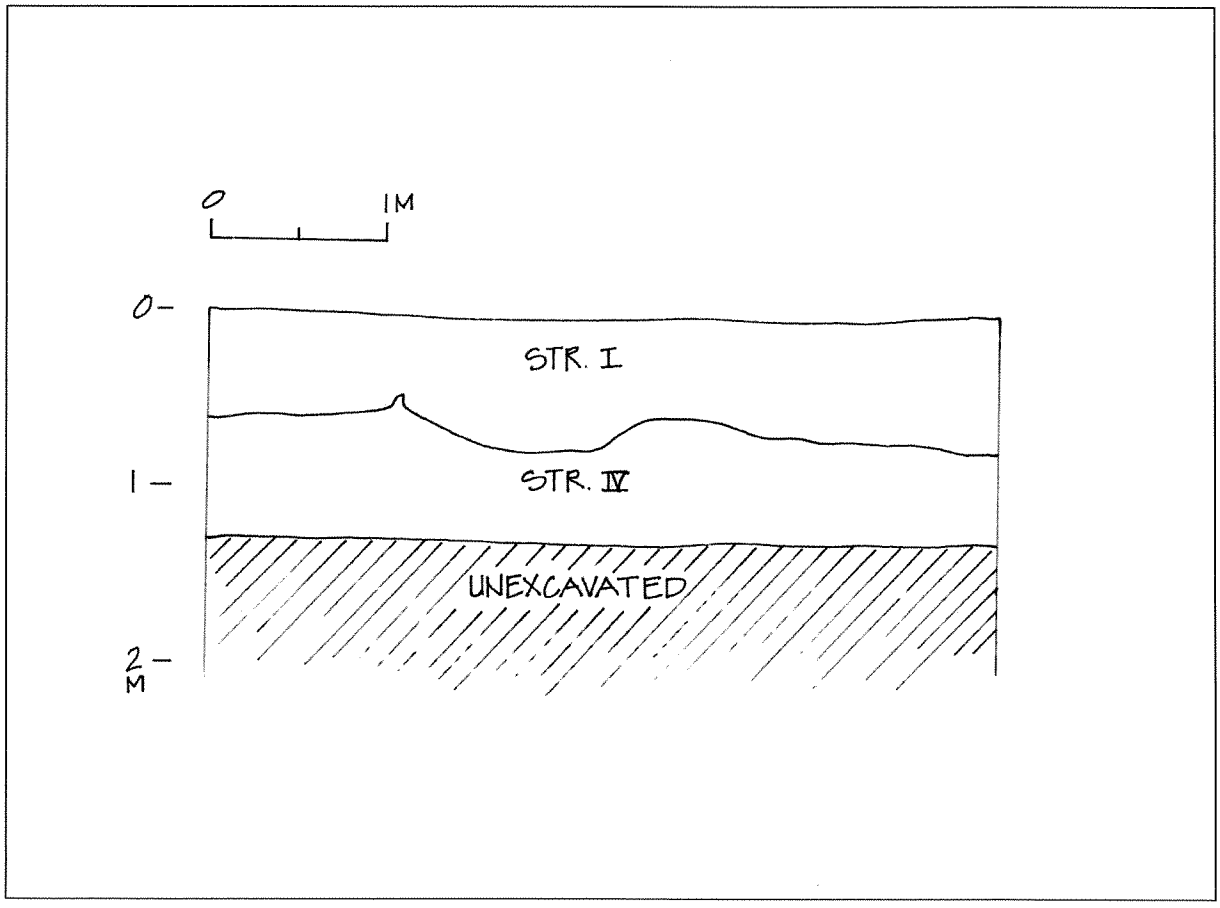

Figure 14 Trench 4 Profile

Table 6 Trench 5: Length: 6.8 m. Width:.80 m. Depth: 2. m. Orientation 126 TN Profile of Northeast (Figure 15)

Stratum	Depth (cm)	Description
I	0-50	10 YR 3/3 dark greyish brown loamy sand, mottled and marbled with very pale brown white sand, loose, abrupt smooth boundary, containing abundant roots and rootlets, and modern A-horizon. Ashy charcoal deposit mixed in top surface, from recent fire.
Feature 1	50-70	Represents a modern BBQ or small fire in a shallow pit, associated with stratum 1.
Feature 2	50-60	Also represents a shallow BBQ pit feature associated with stratum 1.
IV	50-2.0	10 YR 8/4 pale brown medium sand with dark sand mottling from ironwood tree roots, sterile dune sand.

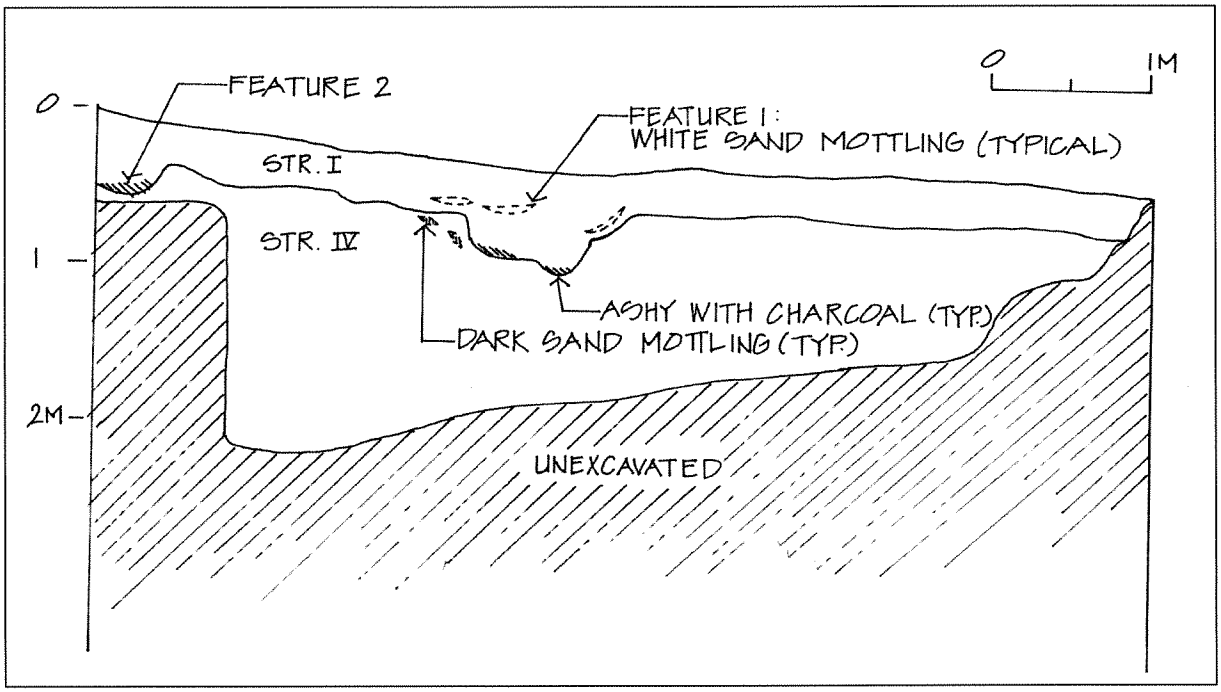

Figure 15 Trench 5 Profile

Table 7 Trench 6: Length: 4.7 m. Width: .9 m. Depth: 1.4 m. Orientation 217 TN Profile of Southeast face (Figure 16)

Stratum	Depth (cm)	Description
I	0-50	10 YR 3/3 dark greyish brown loamy sand to sand mottled and marbled with very pale brown to white sand, loose, abrupt and smooth boundary. Modern A-horizon with sparse organic material from present vegetation, also ashy charcoal deposit of recent fires (i.e. BBQ).
Feature 1	20-100	Modern trash pit with some pre 1950s rubbish that appears to be from the demolition of the former on site residence. This feature is a mix of I and IV..
IV	50-2.0	10 YR 8/2 white medium sand, with a band of pebbles and cobbles probably representing high surf or tsunami inundation.

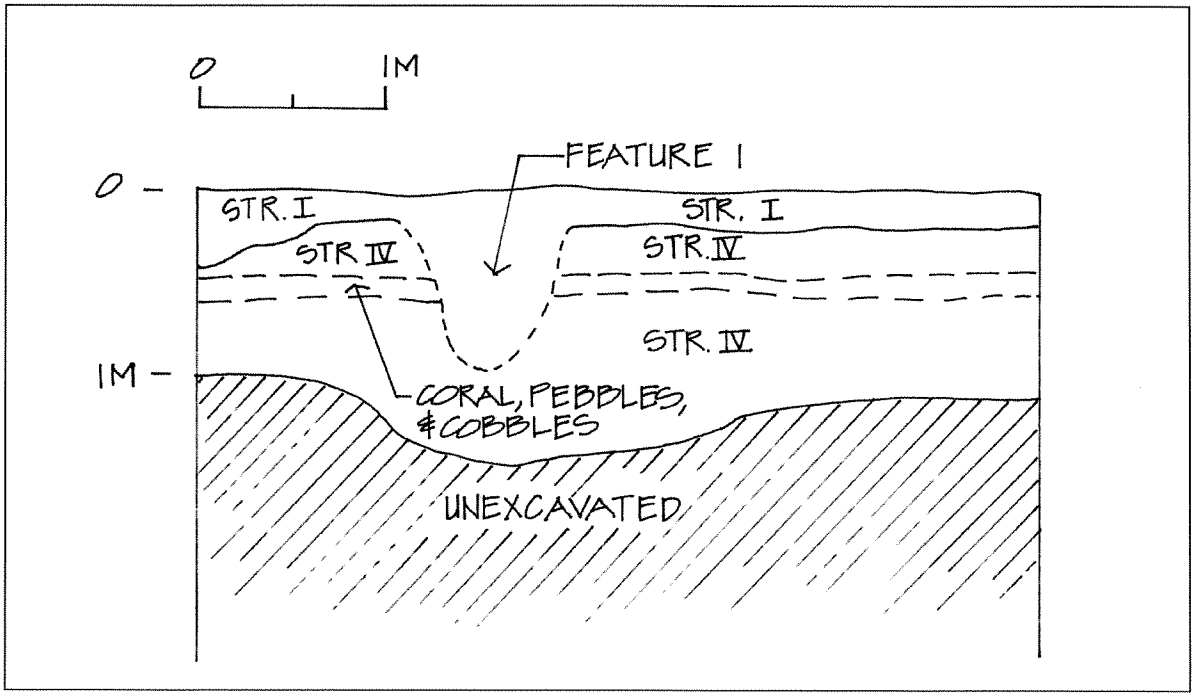

Figure 16 Trench 6 Profile

Table 8 Trench 7: Length: 4.8 m. Width: .80 m. Depth: 1.2 m. Orientation 154 TN Profile of Southeast face (Figure 17)

Stratum	Depth (cm)	Description
I	0-40	10 YR 3/3 dark greyish brown loamy sand, loose containing abundant roots and rootlets. Modern A-horizon with organic material from present vegetation.
II	40-60	10 YR 2/1 black loamy sand, containing dark ashy charcoal and abundant roots and rootlets, abrupt and smooth boundary strata appears to represent historic to modern activity associated with a WWII era house and subsequent recent demolition and bulldozed clearing.
IVA	60-125+	10 YR 7/2 light gray sand, loose and sterile.
IVB	125+	10 YR 8/2 white medium to coarse sand with large to medium water-rounded coral pebbles possibly due to tsunami or high surf inundation.

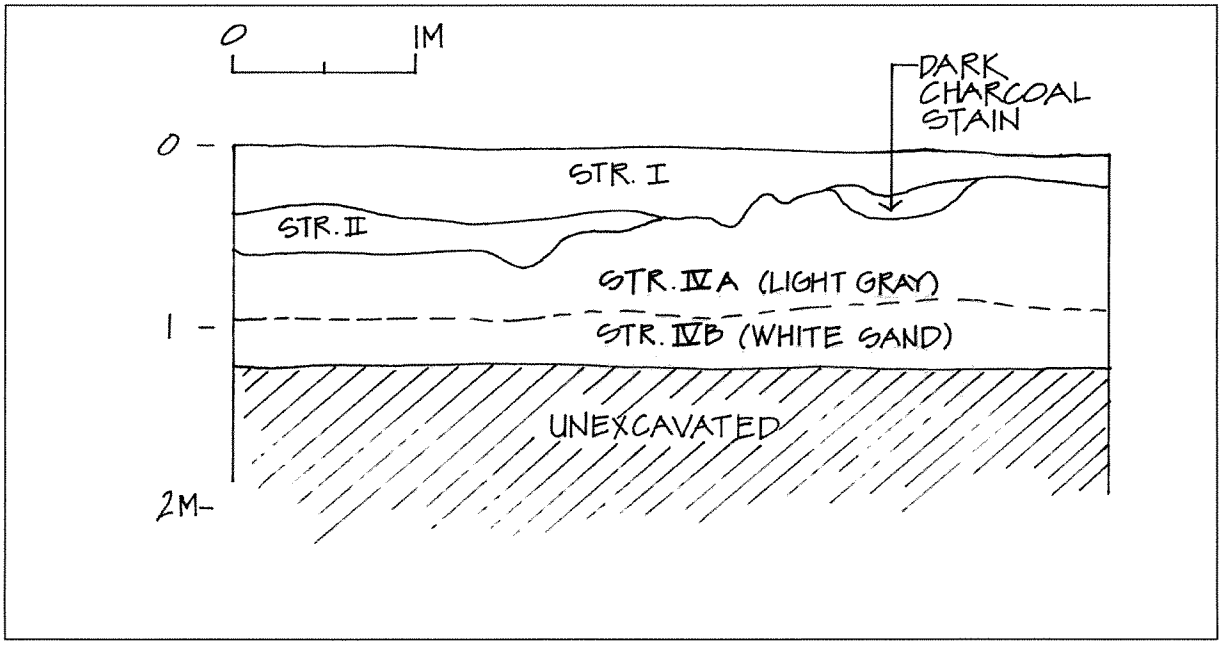

Figure 17 Trench 7 Profile

VII. SUMMARY, SIGNIFICANCE AND RECOMMENDATIONS

A. Summary

Background research indicated that within Waiale'e ahupua'a a major area of Hawaiian habitation and activity was focused within the coastal flats just back shore of the coastline. In this coastal area there was a fresh water spring that would have provided water for drinking, irrigation of lo'i and provide the brackish water environment of Kalou Pond. This coastal focus of habitation continued into the 19th century, as evidenced by the relatively large number (44) of Land Commission Awards in this area.

Nineteenth-century documents also recorded that the octopus (he'e) of Waiale'e was kapu or restricted to the King's use and John Papa li'i account of Waiale'e indicate that marine resources were abundant and this abundance was well-known in the Ko'olauloa district. The combination of resources would have been an attraction for long-term and temporary habitation at the Waiale'e coastline where the present project area is located.

Beginning in the early 20th century this coastal area has been the location of the Waiale'e Training School for Boy's, O.R.&L. right- of- way, and the still functioning University of Hawai'i Experimental Station.

During the reconnaissance survey portion of this study, two new archaeological sites were recorded: a Cultural Layer (Site 50-80-01/02-5790) and the Railroad Infrastructure (Site 50-80-01/02-5791). Additionally, two sites that were previously recorded; Kalou Pond (Site 50-80-01-257) and a cultural layer (Site 50-08-02-3735) were re-inspected and documented.

The newly-documented cultural layer is situated at the western or 'Velzyland' end of the project area. It was observed in backhoe trench 7 as a dark charcoal stained strata within the overall sand deposit (i.e. beach sand Jaucus sands) that characterize the majority of the project area. The layer is not continuous and the bulk of cultural material observed was historic to modern trash however traditional food remain items of marine shell midden were also observed.

Based on the sub-surface observations it appears as if much historic to modern house construction, use, and subsequent mechanized (i.e. bulldozing) demolition and clearing has created mixed and discontinuous cultural layers. This analysis is inclusive of the previously identified cultural layer at the eastern end of the project area (Site 50-08-02-3735).

Inspections of wave cut banks in the central portion of the project area did not reveal a similar dark strained cultural layer(s). However no sub-surface testing was undertaken in this narrow portion of the project area, thus the presently reported absence of cultural layers (or burials) is probably more a factor of absence of sub-surface testing.

The railroad related infrastructure (Site 50-80-01/02-5791) is related to the now defunct O.R.&L. line that stretched from Honolulu to Kahuku. The O.R.&L. right- of- way has various state site numbers, but was allotted a new number for the remnant section within the present project area. The infrastructures within the project area includes raised berms, a concrete culvert, a concrete building foundation, a concrete bridge support, and strewn basalt boulders from a former stream crossing. In the center portion of the project area the remnant berm is utilized as a driveway to an existing private residence. The concrete culvert provides a route for water drainage from the marshy pasture area to the sea but no rail tracks exist. The concrete bridge

support at the western side of Waiale'e Stream mouth is askew to the alignment due to wave action. The basalt boulders that were once the base foundation of the stream span are now strewn about the beach also the result of wave action.

Kalou Fishpond (Site 50-08-01-257) still contains open water sections though marsh- related vegetation has clearly encroached upon the interior and exterior of the pond. The present project area actually includes only the makai half of the pond and based on our understanding of the park plans no construction related activity is proposed in the vicinity of the pond.

The archaeological assessment involved background research, surface survey and limited sub-surface testing. Based on the accumulated data the project area was intensively utilized during the pre-contact era as part of a well defined loci of permanent occupation. The terrestrial and marine resources of Waiale'e (e.g. well watered coastal alluvial flats, near shore fringing reef, and offshore fisheries) provided for what was apparently a fairly densely populated ahupua'a, of the Ko'olauloa district. The mid-1800's LCA data supports this interpretation.

In the late 1800's and early 1900's the Waiale'e Training School for Boy's, commercial sugar cane cultivation, and the O.R.&L. Railway brought about major changes to Waiale'e. Gone were the once numerous subsistence farmers from their *kuleana*. The once prime taro lo'i gave way to open pasture, hog farms, and industrial arts buildings related to the Boy's School.

During WWII military authorities took over existing houses and added more for their personnel stationed along the north shore especially the airfield at Kahuku. Most of these houses were along the crest of the beach dune which is the majority of the present project area.

The houses were occupied, mainly by renters, from just after the war till the few that remain today. The post WWII era included the 1946 tsunami, closing of the railroad in 1947, the closing of the Boy's School in 1950, and the closure of Kahuku Plantation in 1971. These factors led to the gradual abandonment of houses, cane fields and hog farms that once were within the project area.

In recent times houses have been demolished from the western end of the project area gradually making way for the proposed park. Based on the limited sub-surface testing it is evident that the late 1800's, early 1900's constructions and their late 1900's demolition(s) has altered pre-existing cultural layers. Sites 50-08-02-3735 and 50-80-01-5790 appear to be primarily the result of 20th century activity which has incorporated earlier materials.

In the predictive model we stated that due to the coastal sand deposits and presumed fairly dense pre-contact and mid-1800's Hawaiian population that burials would likely be present. Discussions with residents Darlene and Harry Kou, U.H. Experimental Station staff (Richard), and a Waiale'e resident (Leiona) as well as SHPD/DLNR records all indicate that no human burials have been reported as eroding out of the beach deposits. No burials were encountered during the limited sub-surface testing. It still seems very likely, however that burials are present in the project area but maybe not in large numbers. However in discussion with Leiona, a current resident of Waiale'e, she said she believes that a family member is buried mauka of her house, which is just outside of the present project area.

B. Significance

Significance assessments are based on the broad criteria established for the National and State Registers of Historic Places.

The five criteria are:

1. Site reflects major trends or events in the history of the state or nation.
2. Site is associated with the lives of persons significant in our past.
3. Site is an excellent example of a site type.
4. Site may be likely to yield information important in prehistory or history.
5. Site has cultural significance; probable religious structures (shrines, heiau) and/or burials present. (State of Hawaii criterion)

Kalou Fishpond Site 50-08-01-257 is assessed under criteria A and D. Criterion A seems appropriate for the pond based on: (1) fishponds were a unique Hawaiian adaptation to the environment; (2) pond construction would have required political and social resource control for the labor investment necessary; (3) use of the pond's resources would have been strictly controlled indicative of well established political and social hierarchy; and (4) the gradual abandonment of the pond and its resources is a trend throughout Hawai'i.

Criterion D is also appropriate given that existing data provides significant information such as, type of pond, pond construction techniques, pond name etc. additional information that pond research may yield includes further cultural data, chronology of construction, and paleoenvironmental data

Site 50-80-02-3735 originally described as a prehistoric habitation site is a discontinuous cultural layer that extends eastward from the point of land opposite Kukaimanini Islet to the existing Pahipahi'alua Beach Park. Surface observation with sample profiling in the exposed wave cut bank and sub-surface testing indicate that the cultural layer is a mix of Historic era and indigenous material. Artifacts observed were historic with some traditional midden components (i.e. marine shell). Based on observation characteristics the site-3735 is assessed solely under criterion D for data already reported on and the potential to provide further significant information.

Site 50-80-01-5790 refers to a similar cultural layer situated at the western end of the project area. The cultural layer is also discontinuous and contains a mix of historic and indigenous materials. The site,-5790, is assessed solely under criterion D based on information already collected and the potential to provide additional significant data.

Site 50-80-01/02-5791 refers to the remnants section of the O.R.&L. railroad within the present project area. The section is characterized as in poor condition with no railroad tracks observed. The right of way is non-distinct, and there are three concrete remnants: a culvert, house foundation and a stream crossing foundation. Based on the present condition this particular

section should not be assessed under criterion C (i.e. excellent example of a site type). The site is however assessed under criteria A, B, and D.

Criterion A refers to major historic trends which is appropriate for the O.R.&L. The railroad serviced communities and plantations from the late 1800's till 1947. It was part of a major transportation trend in Hawaii where at one time trains were employed in nearly all plantations. Additionally, in association with Hale'iwa Hotel, the O.R.&L. was also a tourist oriented endeavor.

Criterion B infers a relationship to significant person or persons in history. The O.R.&L. was directly associated with the Dillingham family, having seen started by Benjamin F. Dillingham and run by and expanded upon by son Walter Dillingham.

Site-5791 and associated research has yielded information such as location, use, and construction chronology and has the potential to yield (i.e. criterion D) further significant data.

The significant assessment includes A and D for Kalou Fishpond Site 50-80-01-257; D for Sites 50-80-02-3735 and 50-80-01-5790; the two cultural layers and A, B and D for Site 50-80-01/02-5791, the remnant section of the O.R.&L. Rail line.

C. Recommendations

The archaeological assessment of the roughly ~32 acre project area proposed for the Waiale'e Beach Park included background literature research, surface survey and limited sub-surface testing. The background studies indicated the presence of two previously recorded historic properties, Kalou Fishpond (Site 50-80-01-257) and a cultural layer (Site 50-80-02-3735). Additionally historic data indicated the presence of the O.R.&L. rail line which has been allotted site number 50-80-01/02-5791. Historic research also revealed that Waiale'e was once fairly densely populated with some 44 Land Commission Awards (LCA) 19 claims of which were either wholly or in part within the present project area.

In the 20th century, much of Waiale'e including the project area was subjected to intensive land alterations. Land altering activities including: construction use and demolition of the O.R.& L. Line; commercial sugarcane, pastoral related bulldozing; construction, use and demolition of wood framed home at the crest of the beach dune; construction, use and demolition of industrial school buildings inclusive of the piggery in the present project area; and alterations to Kalou Fishpond inclusive of tapping the spring for irrigation water and periodic dredging by Kahuku Plantation (Yent and Ota 1981:2).

The surface survey of the entire project area resulted in the observation and documentation of four sites: the two previously recorded Sites 50-80-01-257 and 50-80-02- 3735 and two newly recorded sites 50-80-01-5790 and -50-80-01/02-5791. Based on the complete surface survey, no other surface sites are anticipated.

Sub-surface testing was limited to seven backhoe trenches all of which were close to the shoreline, on top of the existing beach dune. The testing revealed relatively thin and mixed cultural layers (i.e. sites -3735 and -5790). No burials were observed and no burials have been reported as being naturally eroded out of the beach dune sands (per our background research).

Testing did not extend into the dense vegetation at the eastern and western ends of the project area. The areas of dense vegetation, mostly recent koa haole, grasses and vine growth, are presumed to be, based on testing and surface observations, sand based terrain. These are also, based on proposed park plans to date, going to be the most heavily altered portions of the beach park. Infrastructure such as parking and bath houses are planned for these two areas. Historic data including the 1949 aerial photo (See Figure 9) depicts these area as a commercial sugarcane field for the eastern portion and the piggery and associated agricultural fields for the western portion.

Based on available data 'preservation as is' is recommended for Kalou Fishpond (Site 50-80-01-257) which is on the State Historic Register. A more intensive level of archaeological research is recommended for the remaining three sites (50-80-01-5790), (50-80-02-3735), (50-80-01/02-5791) and certain areas of the proposed park. The inventory survey, primarily a sub-surface survey, should focus directly on park plans. Excavations could be specifically located to test areas where sub-surface construction such as foundations for the bath house, wastewater disposal system, and main water lines are proposed.

VIII. REFERENCES

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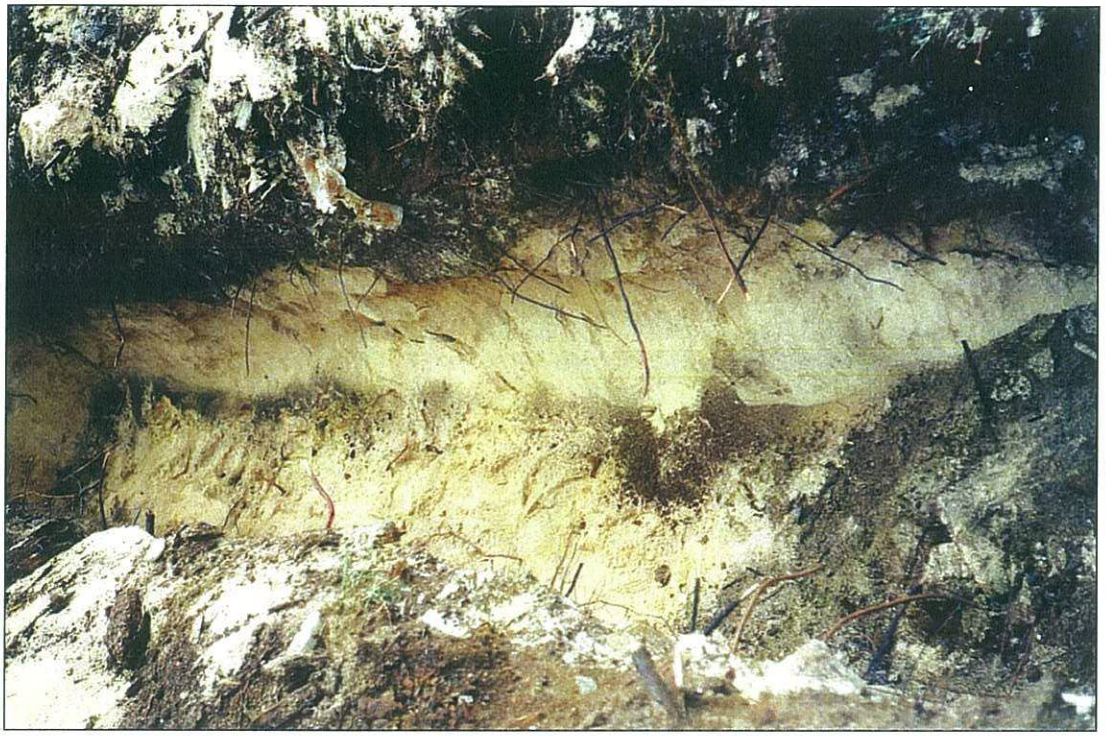

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APPENDIX C A Cultural Impact Evaluation of Proposed Master Plan Improvements for the Waialeʻe Beach Park, Waialeʻe Ahupuaʻa, Koʻolauloa District, Oʻahu

A CULTURAL IMPACT EVALUATION OF PROPOSED MASTER PLAN IMPROVEMENTS FOR WAIALE'E BEACH PARK, WAIALE'E AHUPUA'A, KO'OLAULOA DISTRICT, O'AHU

TMK 5-8-01:10, 15, 16, 17, por. 18, por. 20, 21, 22, por. 23, por. 27, por. 29, por. 31, 32, 33, 34, 41, por. 54; 5-8-06: 7, 30 (formerly por. 29), 5 5-7-05: 13

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I. INTRODUCTION

A. Project Background

At the request of Gerald Park Urban Planner, Cultural Surveys Hawai'i Inc. completed a Cultural Impact Evaluation for Waiale'e Beach Park (approximately 32 acres), Waiale'e Ahupua'a, Ko'olauloa District, O'ahu TMK 5-8-01:10, 15, 16, 17, por. 18, por. 20, 21, 22, por. 23, por. 27, por. 29, por. 31, 32, 33, 34, 41, por. 54. 5-8-06: 7, 30 (formerly por. 29); 5-7-05: 13 (Figure 1 to Figure 3). Parcel 5-8-06: 58 is in the process of being dedicated to the City & County of Honolulu and was not included in the 2000 archaeological assessment. TMK parcels 5-8-01:033 and 034 are to be acquired by, or before, phase 4 is commenced. TMK parcel 5-8-01: 21 to be acquired by, or before, phase 5 is commenced.

The project area is a narrow strip of coastline, *makai* (seaward) of The University of Hawai'i Agricultural Experiment Station, Waiale'e Livestock Research Farm. Cultural Surveys Hawai'i also conducted an Archaeological Assessment with limited sub-surface excavations for the subject parcel (Souza et al 2013).

B. Scope of Work

The scope of work for the Cultural Impact Evaluation comprised:

1. Examining historical documents, Land Commission Awards, and historic maps, with the specific purpose of identifying traditional Hawaiian activities including gathering of plant, animal and other resources or agricultural pursuits as may be indicated in the historic record.
2. Reviewing existing archaeological information pertaining to the sites on the property as they may allow us to reconstruct traditional land use activities and identify and describe the cultural resources, practices and beliefs associated with the parcels and identify present uses, if appropriate.
3. Consulting with persons knowledgeable about the historic and traditional practices in the project area and region.
4. Preparing a report on items 1-3 summarizing the information gathered related to traditional practices and land use. The present report assesses the impact of the proposed action on the cultural practices and features identified.

C. Methods

Historical documents, maps, and photographs were researched at: the Hawai'i State Archives, the Survey Office of the Department of Accounting and General Services, the Hawai'i State Library, the Bernice Pauahi Bishop Museum archives and library, Hamilton Library at the University of Hawai'i at Mānoa, the Mission House Museum Library, the State Historic Preservation Division (SHPD) library, and the library of Cultural Surveys Hawai'i. Land Commission Awards was accessed through Waihona Aina Corporation at waihona.com (1999, Mahele Database, Waihona Aina).

Hawaiian organizations, government agencies, community members and cultural and lineal descendants with ties to Waiale'e were contacted to: (1) identify potentially knowledgeable

individuals with cultural expertise and knowledge of the project area and the surrounding vicinity, and (2) identify cultural concerns and potential impacts within the project area. A list of contacts can be found in Table 2.

D. Project Area Description

The project area is situated in Waiale'e Ahupua'a, Ko'olauloa District on the north shore of O'ahu. Waiale'e is situated between Pahipahi'ālua to the northeast and Kaunala to the southwest. The majority of the project area is relatively level with a maximum elevation of 15 above mean sea level. The proposed beach park consists of a narrow strip of shoreline from Pahipahi'ālua Beach Park on the east to a natural drainage outlet at the popular surf spot, Velzyland, off shore from Kaunala on the west.

The project area includes flat alluvial coastal plains and beach deposits. Soil types consist of beach sand (BS), Jaucas sand (JaC), Mokuleia loam (Ms), Waialua silty clay (WkB), and Pearl Harbor clay (Ph) (Foote et al. 1974). Beach and Jaucas sand deposits dominate the makai portion of the project area. Mokuleia loam, Waialua silty clay and Pearl Harbor clay dominate back-shore where the University of Hawaii Experimental Station pastures and *Kalou* Fishpond are located. Rainfall ranges between 40 and 50 inches per year. Vegetation consists mainly of various grasses, beach naupaka (*Scaevola*), Ironwood (*Casuarina equisetifolia*), Christmas berry (*Schinus terebinthifolius*), koa haole (*Leucaena leucocephala*), Milo (*Thespesia populnea*), coconut (*Cocos nucifera*) and date palms (*Phoenix dactylifera*).

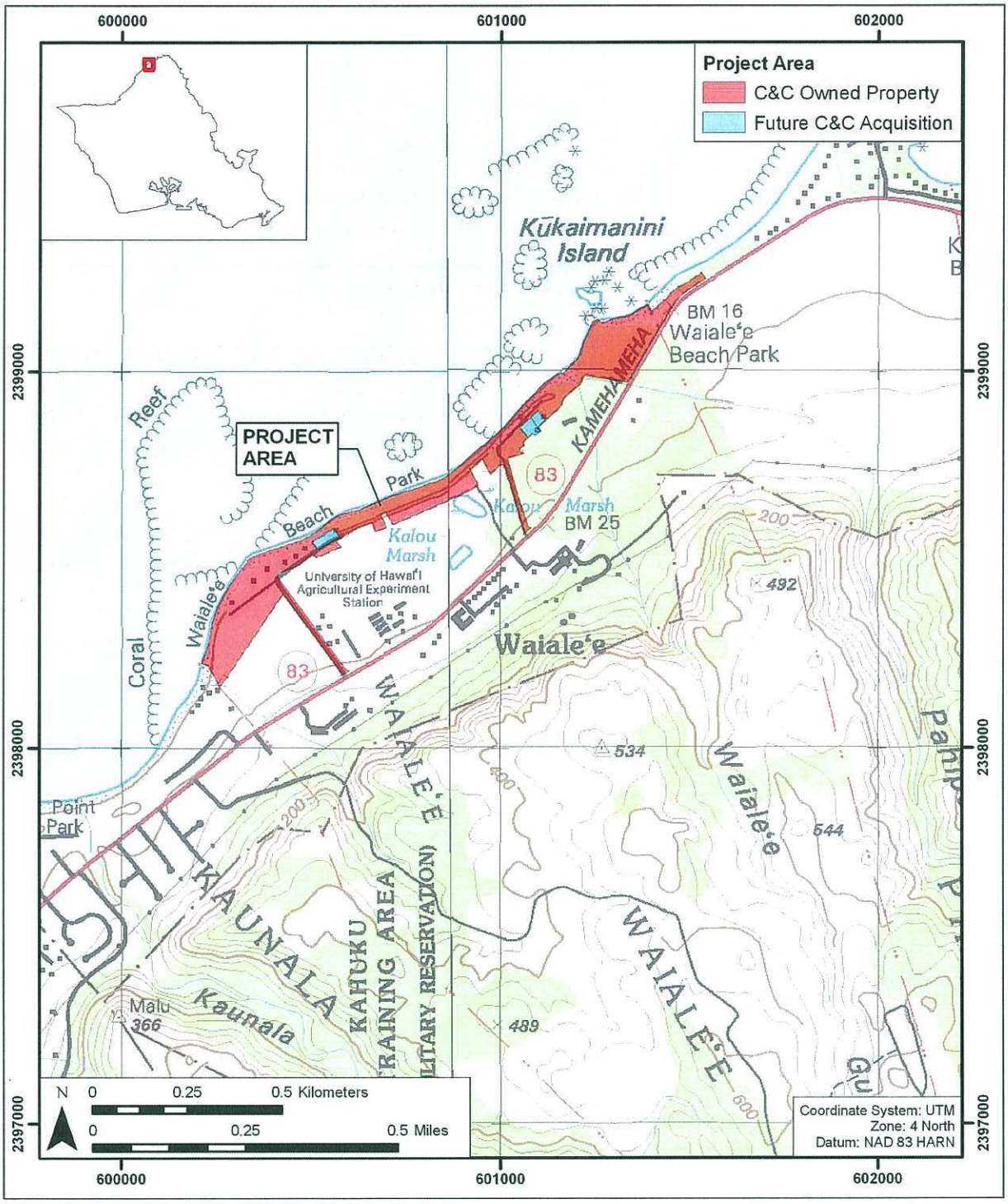

Figure 1. Portion of USGS 1998 Topographic Map, Waimea and Kahuku Quadrangles, Showing Project Area (Hatched) in Waiale'e Ahupua'a

Figure 2. 2007 Google Earth aerial photograph depicting the Project area (Google Earth 2007)

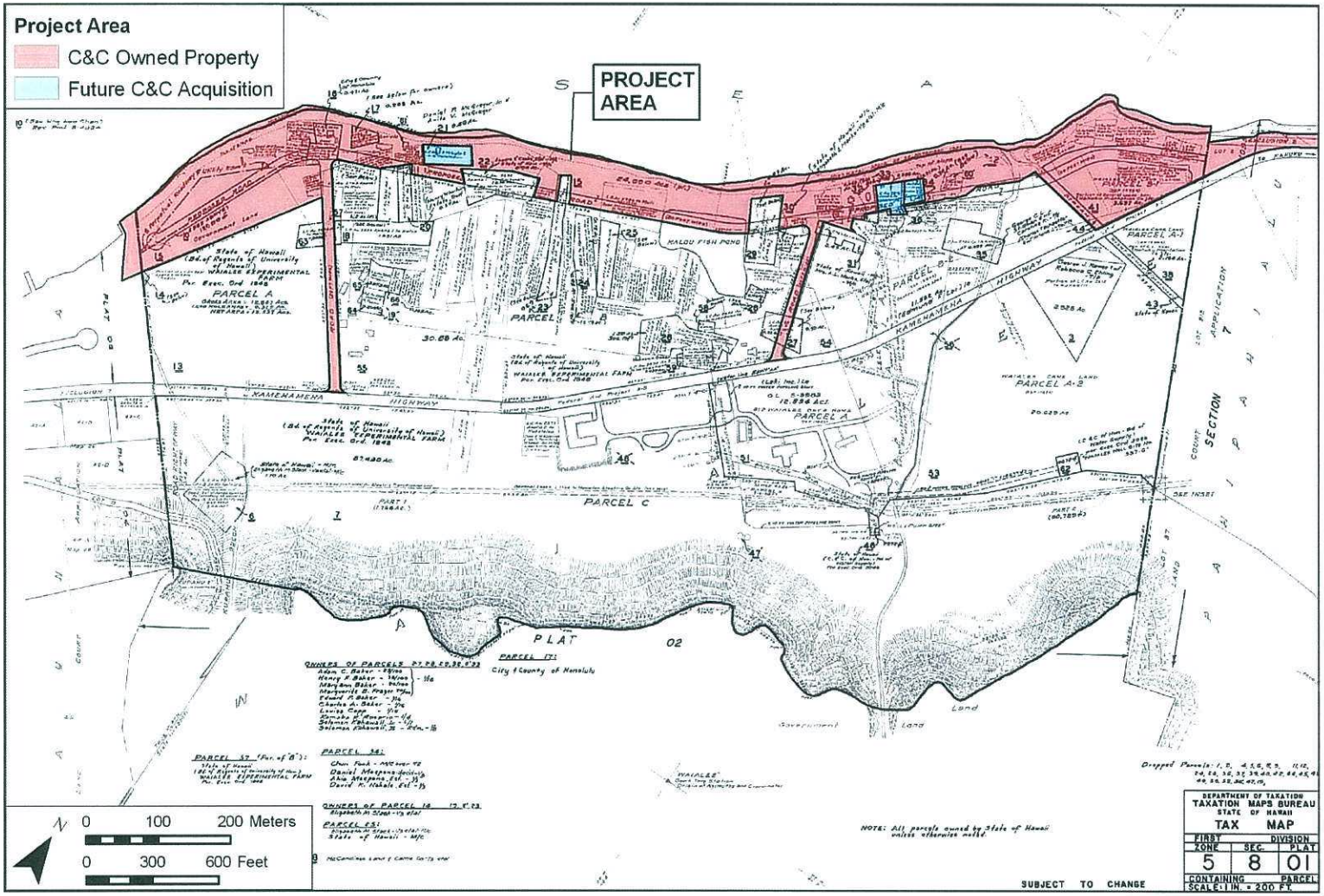

Figure 3. Tax Map Key (TMK) [1] 5-8-001 showing Project area.

II. CULTURAL AND HISTORICAL BACKGROUND

The project area is located within Waiale'e Ahupua'a in the Ko'olauloa District of O'ahu. Clues to the history of land use and activity within the *ahupua'a* and the project area are found in journals, government records, scholarly studies, memoirs, archaeological studies, maps, historic photographs, and oral histories. The *ahupua'a* resources, which would have been utilized by the pre-Western contact Hawaiian population, were still in evidence well into the 20th century. Though there are relatively few traditional accounts specifically mentioning Waiale'e, limited early historic accounts and place names provide clues to past land use.

The place name, Waiale'e, was given because of the characteristics of the area:

> Waiale'e means "rippling or stirring waters." At one time, on calm days when the tide was low, people on shore could see freshwater bubbling up in small fountains above the offshore reef. Possibly this upwelling of freshwater in the ocean influenced Hawaiians in naming the area. The small island just offshore was called Kuka'imanini, "manini fish procession" (Clark 1946:130-131).

In the early to mid 1900's Waiale'e Ahupua'a and surrounding *ahupua'a* were briefly described:

> Rounding the northern tip past Kahuku onto the 'sunset coast,' the next sizable wet-taro area is the deep valley of Waimea. Before reaching Waimea the intervening stream beds, shown on the map as Hanaka'oe, Pahipah'ālua, and Kaunala, had not sufficient flatlands for taro cultivation under the old system. Two exceptions to non cultivation in this region were to be found. One was in 'Opana (The-squeezing) adjoining Hanaka'oe, where there was formerly a small spring-watered terrace area named Ka-wela (The-heat), which is also the name of the bay below. The other was in Waiale'e, next before Kaunala, where there were another small group of terraces anciently named Kaneali'i. In 'Opana the legend is told that the gods Kane and Kanaloa struck spring water from a rock known as Wai-kana, to give life to this hitherto waterless region around Kawela Bay (Handy and Handy 1972:462-463).

Within the project area there is a fishpond known as Kalouwai and two demigods, Malae Kahana and Laleikawai (Laieikawai) are associated as its creators (Apple and Kikuchi 1975). A pond was formed when these two demigods dug a fishhook out of the ground. Land Commission Awards surrounding the fishpond, such as a claimant by the name of Mano who testified to having three *lo'i* that are adjoining *Kalou* (pond), a house lot, *kula*-in which sweet potato, gourd, *wauke*, banana, sugar cane, *ti,* were grown as well as the historical accounts recorded by John Papa ' Ī'ī and Pi`ikoi attest to its continued significance through time.

A. Pre-Contact to early 1800s

In the 1832 census, the population of the island of O'ahu was recorded as 29,755 with the population of the Ko'olauloa district at 2,891 (Schmitt 1977:12-13). Though no specific population numbers are available for Waiale'e, based on John Papa ' Ī'ī's accounts, and with the mid 1800's *kuleana* data a fairly dense local population, focused on taro farming and marine resources exploitation, permanently occupied Waiale'e.

B. Māhele and Land Commission Award Documentation

The Organic Acts of 1845 and 1846 initiated the process of the Māhele - the division of Hawaiian lands - which introduced private property into Hawaiian society. In 1848 the crown and the *ali'i* (royalty) received their land titles. All of Waiale'e Ahupua'a was designated as Crown Land (Indices 1929:28). Kuleana awards for individual parcels within the *ahupua'a* were subsequently granted in 1850. Forty-four Land Commission Awards (LCAs) for individual parcels were recorded in Waiale'e Ahupua'a of which six were not awarded. Nineteen *kuleana* or portions thereof were within the present project area. A 1957 map shows that the LCAs were located in the coastal flats of Waiale'e and extended to the shoreline (Figure 4).

Data from the 44 (LCAs) awards are presented in Table 1 which has columns for *ahupua'a*, *'ili*, land use and land marks, and number of parcels and acreage per award, if awarded. The LCA documentation indicates that these award parcels were primarily for taro *lo'i*, cultivated *kula*, garden with *wauke*, sweet potato, and associated house lots (See Table 1). The Kuleana awards also included parcels in the Pahipahi'ālua, Kaunala, and Paumalū Ahupua'a.

Based on the LCA data, a pattern consisting of permanent habitations (i.e house lots) with associated taro *lo'i* were within the well watered (i.e. spring fed *auwai* and fishpond) coastal flats. Up-slope and in adjacent *ahupua'a* were additional parcels for cultivating banana, upland taro, sugarcane, sweet potato and even tree crops such as koa. The pattern is indicative of a multiple *āpana* subsistence oriented lifestyle with few introduced plants.

C. 1850-1900

According to the government census of 1853, 1,345 people were living in the Ko'olauloa District; a reduction of some 1,546 persons compared to the 1832 census figure for Ko'olauloa District (Schmitt 1977:12-13). No specific population figure for Waiale'e was recorded, however, the Māhele data indicate some 44 LCAs with approximately 21 house lots, which suggest that a fairly substantial portion of that population was presumably living in Waiale'e. In the Hawaiian newspaper, *Ke Aluala* (1867), an article mentions a parade of young children of Sabbath schools from Kawailoa, Waiale'e, Waimea, Mokulē'ia. This gives light of where the first schools of Christianity were established.

The Oahu Railway & Land (O.R.&L.) Company, organized by Benjamin Dillingham in1889, was designed to connect outlying areas of O'ahu to Honolulu. During the last decade of the 19th century, the railroad would reach from Honolulu to Pearl City in 1890, to Wai'anae in 1895, to Waialua Plantation in 1898, and to Kahuku in 1899 (Kuykendall 1967:100). Thus, the portion of the O.R.&L. through the project area was one of the last to be constructed.

In 1890, James Castle and Alexander Young started the Kahuku Sugar Company. In 1892 the first crop was harvested producing 4,356 tons of sugar annually. The mill camp became Kahuku's first 'modern' community, also at this time thirty miles of plantation railroad

construction began (Dorrance 1998:120). Kahuku Plantation became the dominant economic factor in this portion of Ko'olauloa.

Table 1 Land Commission Claims in Waiale'e and Pahipahi'ālua

Claim	Claimant	Ahupua'a, (Īli)	Land Use, Landmarks	'Āpana (lots) & acreage or not awarded (*na*)
2672*	Aie	Waiale'e	4 *lo'i*	.47 Ac.
2688	Laiehau	Waiale'e	5 *lo'i*	1 *'āpana* .43 Ac.
2695	Waihinalo	Waiale'e	1 *lo'i, kula*, house lot, gov. road, garden-*wauke*, banana, sugarcane, *noni*, sweet potato, gourd	2 *'āpana* 1.44 Ac.
2703*	Holi	Waiale'e Pahipahi'ālua	1.5 *lo'i* 1 shared *lo'i*, house lot, *wauke*, *noni*	2 *'āpana* 1.258 Ac. na
2720*	Pooluku	Waiale'e	3.5 *lo'i*, house lot, cultivated upland	.68 Ac. na
2721	Pahua	Waiale'e	2 *lo'i*, sweet potato, *kula*, house lot, gov. road	.37 Ac.
2722	Puhiele	Waiale'e	4 *lo'i, kula*, house lot, garden-*wauke*, sweet potato, gourd, *ti*, sugarcane, upland, *taro*, banana, yam, *koa*	.83 Ac. na
2728	Poonui	Waiale'e	2 *lo'i*, house lot, *kula*	.71 Ac.
2755	Namohala	Waiale'e	2 *lo'i*, sweet potato,	1 *'āpana* .96 Ac.
2756*	Nahuaka	Waiale'e	2 *lo'i, kula, wauke*, sweet patato, banana,	2 *'āpana* .48 Ac.
2760*	Nua	Waiale'e, (Kauakahiloko) Pahipahi'ālua	7 *lo'i, kula*, house lot, *Kalou* (pond) 1 *lo'i, kula, wauke*	na 3 *'āpana* 1.53 Ac.
2763	Niheu	Waiale'e Pahipahi'ālua	1 *lo'i*, not awarded 4 *lo'i, kula*, cultivated upland house lot,	na

Claim	Claimant	Ahupua'a, (Īli)	Land Use, Landmarks	'Āpana (lots) & acreage or not awarded (*na*)
				1.53 Ac.
2766*	Naloloa	Waiale'e	4 *lo'i*, house lot, gov. road	2 *'āpana* 1.2 Ac.
2769*	Mano	Waiale'e Pahipahi'ālua	3 *lo'i,* adjoining *Kalou* (pond) house lot, *kula*-sweet potato, gourd, *wauke*, banana, sugar cane, *ti,* also *mauka* garden	na. 1.27 Ac.
2776*	Mahoe	Waiale'e (kuaimalolo) Pahipahi'ālua	3 *lo'i,* house lot, garden, banana, *wauke*, sugarcane, *koa*	2 *'āpana* .69 Ac.
2780*	Muli	Waiale'e Pahipahi'ālua	1 *lo'i*, near *Kalou* (pond) 1 *lo'i,* house lot, *kula*, sweet potato, *wauke*, *noni*, gourd, tobacco	1 *'āpana* 1.13 Ac. na
2812	Kaneali'i	Waiale'e (Kapunaiki)	8 *lo'i*, *kula*, *kai* house lot,	1 *'āpana* 2.75 Ac.
2814*	Kauaua	Waiale'e Pahipahi'ālua	*Kula,* house lot, cultivated upland 2 *lo'*i 5.5 *lo'i*	1 *'āpana* .21 Ac. 1 *'āpana* .13 Ac. 1 *'āpana* .38 Ac.
2815	Kauaua	Waiale'e	2 *lo'i*, garden-gourd, sweet potato	1 *'āpana* .58 Ac.
2816*	Kahaleipu	Waiale'e Pahipahi'ālua	2 *lo'i*, gov. road *Kalou* (pond), house lot, 2 house lot's,	4 *'āpana* 1.87 Ac. 2 *'āpana* 1.11 Ac.
2817	Kimo	Waiale'e	2 *lo'i*, 1 *lo'*i shared	1 *'āpana* 1.16 Ac.

Claim	Claimant	Ahupua'a, (Īli)	Land Use, Landmarks	'Āpana (lots) & acreage or not awarded (*na*)
2820	Kuaua	Waiale'e (keokea)	1 *lo'i*	na
2821*	Kaneiahuea	Waiale'e (keokea) Pahipahi'ālua	6 *lo'i,* house lot, garden-*wauke*, sweet potato, banana sugarcane	2 *'āpana* 1.21. Ac. na
2823	Kamahalo	Waiale'e	3 *lo'i,* cultivated *kula*	1 *'āpana* .72 Ac.
2824	Kuheleloa	Waiale'e	5 *lo'i*, *kula*, upland	3 *'āpana* 2.04 Ac.
2825*	Kalua	Waiale'e Pahipahi'ālua	5 *lo'i*, upland-sweet potato, *koa*	3 *'āpana* 1.64 Ac. na
2829	Keoho	Waiale'e	*Hala*	na
2831*	Kahuku	Waiale'e	3 *lo'i*, house lot,	2 *'āpana* .61 Ac.
2836	Kelemana	Waiale'e	1 *lo'i*, 2 *hala* trees	Gave up land
2841	Kalauokekapu	Waiale'e	5 *lo'i*	na
2842	Kaaina	Waiale'e	1 *lo'i*, house lot,	2 *'āpana* .51 Ac.
2844*	Kauku	Waiale'e (mokuhala) Pahipahi'ālua	4 *lo'i*, house lot, gov. road, *kula*, cultivated upland	1 *'āpana* .17 Ac. 1 *'āpana* .47 Ac.
2853	Keiiwaiwaiole	Waiale'e	2 *lo'i, kula*-sweet potato, gourd	na
2854	Kaiwi	Waiale'e	1 *lo'i*, house lot, *Kalou* (pond), sweet potato	na

Claim	Claimant	Ahupua'a, (Īli)	Land Use, Landmarks	'Āpana (lots) & acreage or not awarded (*na*)
2858	Kahuewaa	Waiale'e	1 *lo'i*	2 *'āpana* .73 Ac.
2873	Kaunahi	Waiale'e Pahipahi'ālua	1 *lo'i* 1 *lo'i, kula*	na na
2877*	Kuheleloa	Waiale'e Pahipahi'ālua	1 *lo'i* 1 *lo'i*, cultivated upland, house lot,	2 *'āpana* .72 Ac. na
2891	Kaio	Waiale'e (Kalalahili) Pahipahi'ālua	2 *lo'i* 2 *lo'i*	2 *'āpana* .61 Ac. na
2894	Kaauwaepaa	Waiale'e (kaooiki)	1 *lo'i, kula*	na
2895	Kaenaokane	Waiale'e (kilawai)	2 *lo'i*, upland-*noni*	2 *'āpana* .47 Ac.
2921	Kaumailiula	Waiale'e (kamanawa)	8 *lo'i*, house lot, *wauke*, sweet potato	1 *'āpana* 2.73 Ac.
4266*	Kalawaia	Waiale'e	2 *lo'i*, house lot, *kula-wauke, noni hala* sweet potato, banana, gourd, sugar cane, *hala* tree	1 *'āpana* 1.09 Ac.

*Land Commission Award Claims in Project Area

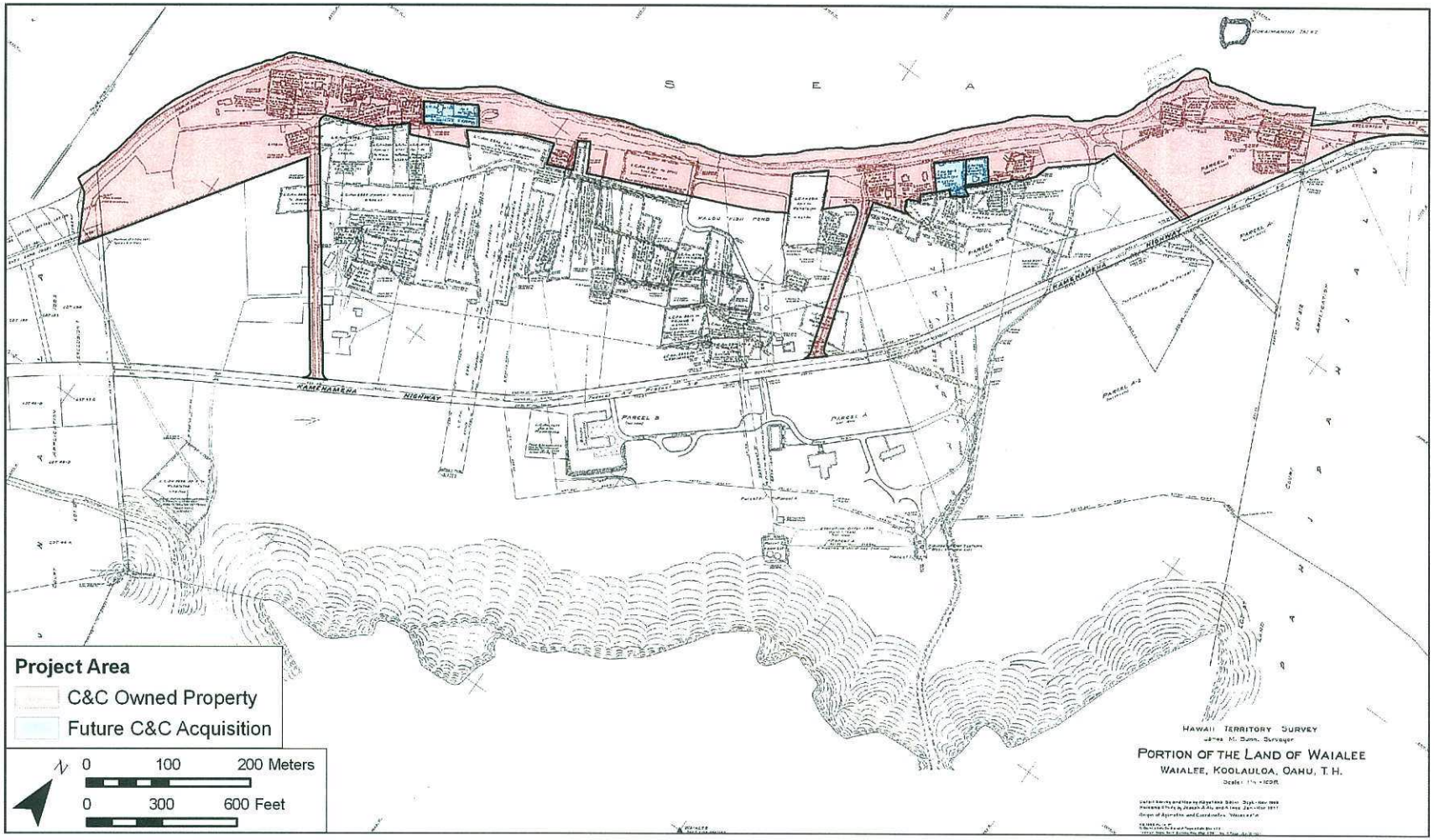

Figure 4. Portion of the Land of Waiale'e Map, Surveyor, James M. Dunn, traced from Gov't survey Reg. Map # 4081 in 1957, Showing Land Commission Awards (LCAs)

D. 1900 to Present

The government census of 1900 enumerated 2,372 persons living in the Ko'olauloa District with the increase related to plantation-organized immigration (Schmitt 1977: 12-13). No specific population for the *ahupua'a* was recorded. The district population increased dramatically due to immigrant plantation workers, during subsequent years, up to 10,562 in 1970.

A 1903 map of Waiale'e indicates that settlement in the *ahupua'a* continued to be focused near the coastline. Kalou Pond is also depicted in the map along with the O.R.& L. Railroad. A dotted line shows an old government road running parallel to the coastline (Figure 5).

Waiale'e Training School For Boys (Figure 6) was the major entity of change for Waiale'e in the early 20th century. Initially called the Boy's Industrial School, this reform school began in 1903 and continued through 1934. This facility for delinquent boys consisted of 650 acres and 42 buildings with a capacity of 175 "inmates" (Territorial Planning Board 1939:231, 233). The school conducted training activities such as agriculture and animal husbandry. The school was in use until 1950 (Schmitt 1977:255). Presently, Crawford Convalescent Home uses some of the same grounds but with new buildings and some renovation of others. The school buildings are now mostly dilapidated remnants. The University of Hawai'i Agricultural Experiment Station (Waialee Livestock Research Farm) began use of the former school grounds in the 1960's for pasture land and associated farm buildings.

During World War II, Kahuku was designated by the army to house four eight-inch cannons between the Kahuku sugar mill and the shore. They also constructed a landing strip for fighter planes which was abandoned in 1950 (Dorrance 1998:121). Information about the army's stay in Kahuku was also mentioned in an oral interview with Harry Kou. Mr. Kou related that the project area had been taken over by the military for housing. In this process local inhabitants were relocated to enable the military to use existing houses and provide new houses for their personnel.

On April 1, 1946 the Hawaiian Islands experienced one of the worst tsunamis in its history. The *tsunami* caused much property damage and loss of life. Paumalū which is about two miles southwest from the project area was devastated by the natural disaster. Records indicate that at Paumalū, the water rose 23 feet above sea level and threw sections of the railroad track inland across the adjacent highway (Shepard 1959:421). About one mile northeast of Waiale'e, Kawela Bay was also devastated. At the time, Mr. and Mrs. Shepard were living just west of Kawela Bay and lived to tell their experience:

> The third wave was observed from a point on the railroad at a height of 24 feet. It broke just outside the terrace, rising slightly above the horizon at eye level, so that this breaker must have been about 25 feet high. Crossing the terrace with a terrific noise of breaking cane, it swept across the railroad track to the west of us and left a mass of debris on the highway inland from the railroad (Shepard 1959:425).

The areas of Kawela and Paumalū described above surround the project area, and therefore may indicate the type of effects the tsunami had on Waiale'e. Furthermore the Overall Hazard Assessment (OHA) for the Waimea Coast including Waiale'e is moderate to high (5) which is mainly the result of the high surf conditions or high wave energy and stream flooding where applicable. (USGS Geological Investigations Series I-2761, Oahu)

The O.R.&L Company ceased operation on December 31, 1947 and the railway line through Waiale'e was discontinued (Conde & Best 1972:299). One cause of the railways closure was the damage to the rail line from the 1946 tsunami.

A 1949 aerial photograph of the Waiale'e coastline shows Kalou Pond covered with marsh vegetation, sugarcane fields at the eastern end of the project area, cultivated land associated with Waiale'e Training School, and house lots along the coastline in the project area. Outside the project area land use was still dominate by farming, and the associated structures of the Waiale'e Training School for Boys (Figure 7).

In 1950, the Waiale'e Training School for Boys closed down followed by the Kahuku Plantation in 1971. These two closures plus, the 1947 O.R.&L. closure, reduced land use within the project area to probably a few beach homes and University of Hawaii Experimental Station use. Presently only a few beach homes remain and UH use has been reduced to pasturage just *mauka* of the project area.

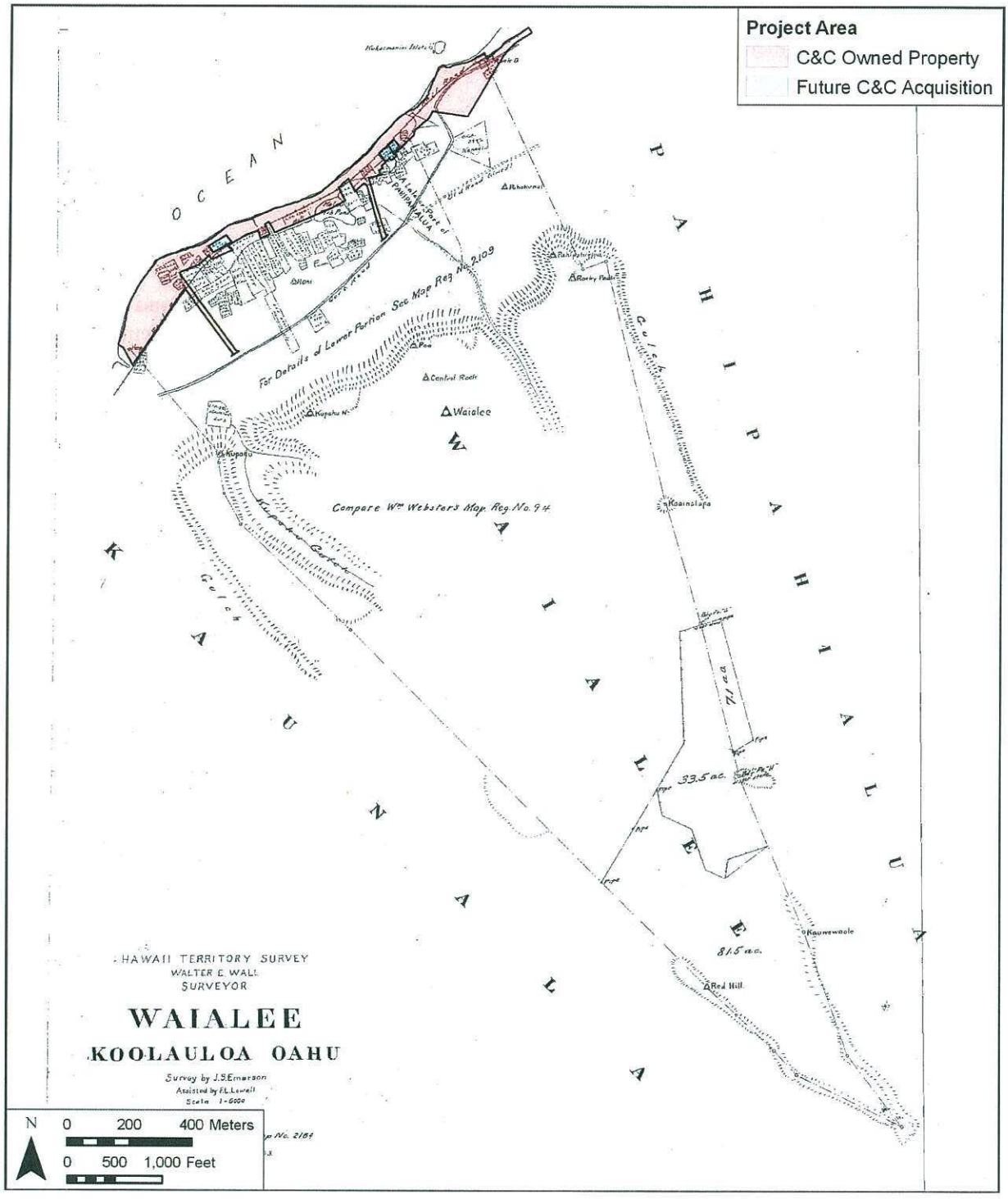

Figure 5. Waiale'e Ko'olauloa O'ahu Map, Walter E. Wall Surveyor, Traced from Gov't Survey Reg. Map #2184 by R.D. King in 1903

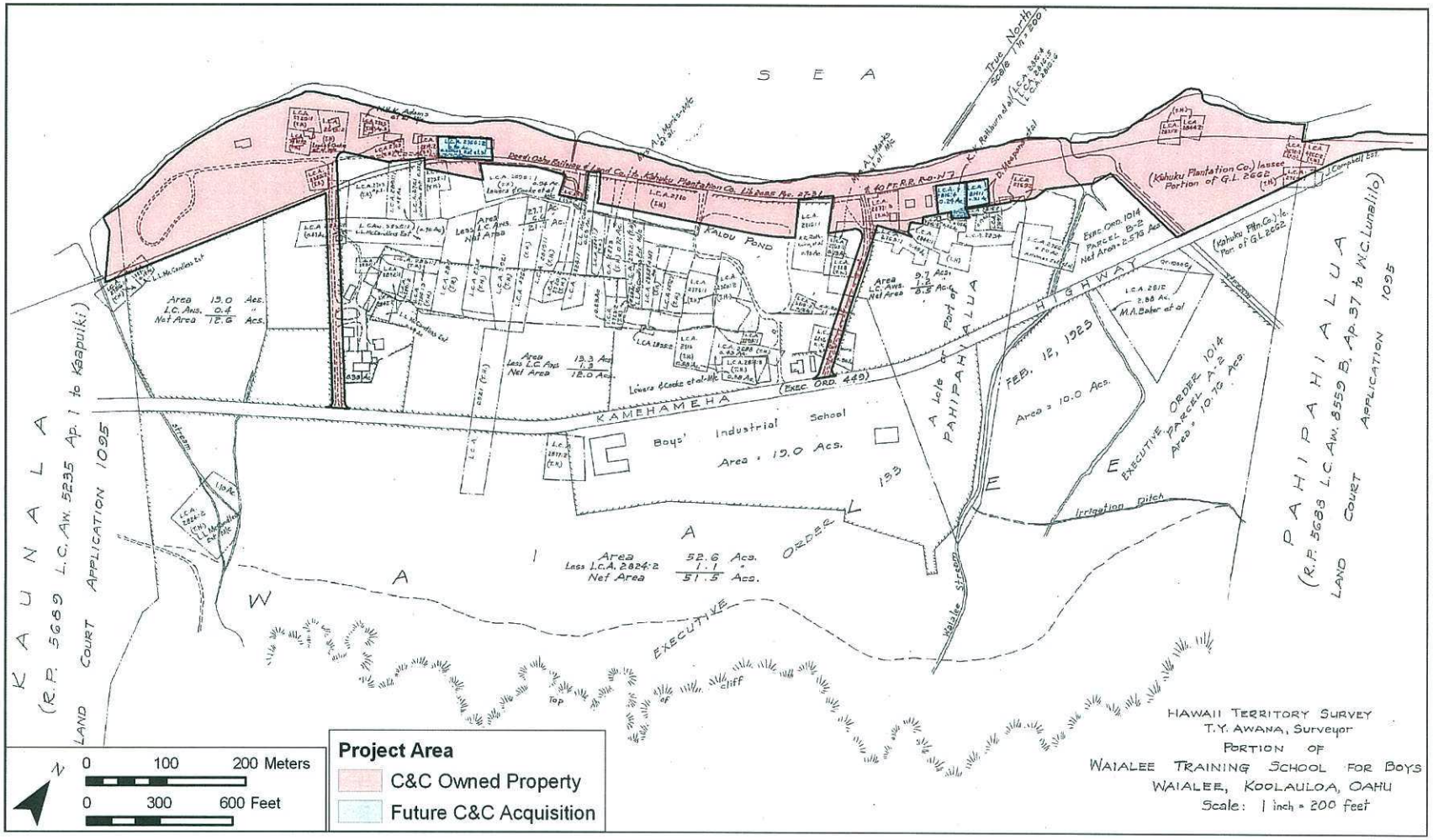

Figure 6. Waiale'e Training School for Boys Map, Surveyor T. Y. Awana, and Compiled from Gov't Survey Reg Map # 2109, Map by J. S. Emerson, 1951 Showing Kahuku Plantation Lessee Portion.

Figure 7. 1949 Aerial Photograph Showing Project Area (R.M. Towill)

III. PREVIOUS ARCHAEOLOGICAL RESEARCH

Based upon previous archaeological research there are four sites documented in the project area: an inland fishpond (SIHP 50-80-01-257), the railroad infrastructure (SIHP 50-80-01/02-5791), and two cultural layers (SIHP 50-80-01/02-5790, SIHP 50-80-01-3735). Two other recorded sites in Waialeʻe outside of the project area include a terrace complex (SIHP 50-80-02-4882) and Kanealiʻi Agricultural Terraces (SIHP 50-80-02-9517), which were documented by Ogden Environmental and Energy Services Co., Inc. in 1996.

Kalou Pond (SIHP 50-80-01-257) is listed on the State Register of Historic Places and has been described by McAllister (1933), Kikuchi (1973), Yent and Ota (1981) and Simons and Davis (1988). The pond is fed by a spring on its south side and is situated partially in the project area.

Kalou Pond was said to have been in its best conditions when Kaluhi was *konohiki* (a man in charge of a land division) of this district. There was formerly a "Kane stone" in the immediate vicinity. This is also the place where Kahuku is attached to Waialeʻe. (McAllister 1933:152)

Kalou Pond is categorized as a *loko wai*, meaning any shape pond that has been altered by man. There are two demigods associated with this pond, Malaekahana and Laleikawai (Laieikawai) who formed the pond where a fishhook (*lou*) fell and dug into the ground. There is also reference to a retaining wall about 4 feet high, a Kāne stone nearby, and the name of the *konohiki* Kaluhi (Kikuchi 1973:240).

A letter from Department of Land and Natural Resources to Tamotsu Sahara presented the following description:

> The fishpond is roughly L-shaped and measures approximately 50 meters (150', east-west) by 70 meters (200') (north-south). The fishpond banks and adjacent lands are presently overgrown with California grass along with several coconut trees on the north (*makai)* side and banyan trees on the south (*mauka*) side. The California grass and reeds have filled in portions in the northwestern quadrant of the fishpond. The actual bank of the fishpond can be defined only on the south side where there is the remnant of a basalt boulder retaining wall that was built into the bank. This wall is presently 2-3 boulders out of the bank and into the pond. The roots of the banyan tree have also caused the disturbance of the wall in several sections. (Yent and Ota 1981:1)

The previously recorded cultural layer (SIHP 50-80-02-3735) is situated on a point of land opposite the islet of Kukaʻimanini. The site contained artifacts, midden, charcoal, and intact hearths. On the surface, a portion (mouth) of a nineteenth century bottle and a fine- grained basalt flake were found. Also collected from a hearth was "the distal half of the tarsometatarsus of a relatively large male chicken (*Gallus gallus*; Personal communication, Alan Ziegler)" (Simons and Davis 1988:2).

In an archaeological inventory survey at Kahuku Training Area, for the U.S. Army Garrison, Ogden Environmental and Energy Services Co., Inc., recorded a small terrace

complex (SIHP 50-80-02-4887) located between Pahipahi'ālua and Waiale'e. An unrecorded *heiau* was also discovered at the mouth of Pahipahi'ālua Gulch. The *heiau* was disturbed and only a few features could be observed. Around the feature large pieces of coral branch fragments were observed and recorded. Also in the same vicinity is an earthen depression with scattered charcoal (SIHP 50-80-02- 4888). Kaneali'i Agricultural Terraces (SIHP 50-80-02-9517) were previously recorded, but have since been destroyed. Sub-surface sampling for chronological and functional determination was recommended (Patolo 1996:29).

> There is a small group of terraces formerly known as Kanealii, now abandoned for lack of water, around the house lot, of Mrs. John Baker, just east of the Boy's Industrial School and inland of Kamehameha Highway. The large terraces now cultivated seaward of the Industrial School are of recent construction (Handy 1972:88).

In an archaeological assessment of the present project area two archaeological sites were recorded: a cultural layer (SIHP 50-80-01/02-5790) and the railroad infrastructure (SIHP 50-80-01/02-5791). Additionally, two sites that were previously recorded—Kalou Pond (SIHP 50-80-01-257) and a cultural layer (SIHP 50-80-02-3735)—were re-inspected and documented. The cultural layer was not continuous and the bulk of cultural material observed was historic to modern trash; however, traditional food remain items of marine shell midden were also observed (Souza et al. 2000).

E. Burials

In the Ko'olauloa District, burials have been documented in caves and sand. In the Kawela Bay Archaeological Area, four cultural deposits and two human burials have been recorded (Rosendahl 1988:ii). The Kawela Bay Archaeological Area was suggested to date from AD 1300 to present (Ibid).

During the Kuilima Resort Expansion Project, 10 individual skeletal remains were recovered from sand deposits (Walker 1993). In 1989, Bath and Kawachi of SHPD/DLNR recorded a burial in a cave at Sunset Beach, Kaunala, O'ahu (Bath & Kawachi 1991).

An archaeological inventory survey was conducted on 19.19-acres in Kaunala Ahupua'a west of the current project area. The survey identified four sites: the historic O.R.&L. railroad berm and two bridge foundations (SIHP 50-80-01/02-5791), a historic house lot foundation (50-80-02-5912), a cultural deposit (50-80-02-5912), and another cultural deposit with human remains (50-80-02-5913) (Haun and Henry 2001).

Human remains were also found in a small overhang cave in Kawela (Borthwick 1998). The pattern indicated by the burials noted above includes isolated cave burials and both clusters and isolated burials in sand deposits.

IV. RESULTS OF COMMUNITY CONSULTATION

Throughout the course of this study, an effort was made to contact and consult with Hawaiian cultural organizations, government agencies, and individuals who might have knowledge of and/or concerns about traditional cultural practices specifically related to the project area. This effort was made by letter, e-mail, telephone or in-person contact. In the majority of cases, letters along with a map of the project area were mailed with the following text:

In collaboration with Gerald Parks Urban Planner Cultural Surveys Hawai`i is conducting a Cultural Impact Assessment for the proposed Waiale'e Beach Park Ko'olauloa District, O`ahu (TMK 5-8-01:10, 15, 16, 17, por. 18, por. 20, 21, 22, por. 23, por. 27, por. 29, por. 31, 32, 33, 34, 41, por. 54. 5-8-06: 7, 30 (formerly por. 29); 5-7-05: 13). A map and a preliminary land use overview are enclosed for your information.

The purpose of this assessment is to identify any traditional cultural practices associated with the project area, past or present. We are seeking your *kōkua* and guidance regarding the following aspects of our study:

1. General history and present and past land use of the study area.
2. Knowledge of cultural sites which may be impacted by the project – for example, historic sites, archaeological sites, and burials.
3. Knowledge of traditional gathering practices in the study area–both past and on-going.
4. Cultural associations with the study area through legends, traditional use or otherwise.
5. Referrals of *kūpuna* or anyone else who might be willing to share their general cultural knowledge of the study area.

Any other cultural concerns the community might have related to cultural practices in the Waiale'e area.

The individuals, organizations, and agencies contacted and the results of consultations are presented in Table 2. A few informal interviews were conducted with residents and former residents of Waiale'e. It was difficult to find *kama'āina* or *kūpuna* in the area, as most of them moved to different areas or are deceased.

Table 2 Community Contacts and Comments

NAME	ORGANIZATION, AFFILIATION	COMMENTS
Adams, Isaac	His *'ohana* lived at Waiale'e	He said he would talk to his *'ohana* and get back to us (3/19 04). Tried to re-contact since 4/5/04; no response.
Aiu, Pua	Office of Hawaiian affairs	Sent a letter stating, "Waialee is an area rich in fish and Hawaiians still fish for *kala, uhu* squid and *kumu* on the reef. Fishermen from out of the area often camp at various sites along the beach from Velzyland to Taylor Camp." Made referrals to Harry Kon and other fishermen and residents in the area.
Awai, James	North Shore Neighborhood Board	Made referral to Mr. Kon.
Boile, Nona	Local resident	Her family (Moepono) has lived on their property in Waiale'e since 1847. Her mother would feed the *puhi* that lived in the reef fronting their house. They would also gather *limu kohu.* Her *'ohana* are buried on the property. She does not know of any other burials within the project area, her property is in the eastern portion of the project area.
Bunda, Robert	Senator	Made referrals.
Fuginaga Kenui, Mary	Local resident	Her aunty Daisy Kapiko would feed the *puhi* which was their 'aumakua. Her family would gather *limu kohu* and different types of reef fish. She referred to other families who were from the area: Morris, Baker and the Martins.
Fuyumura, Danny	Local resident and employed for University of Hawaii Experimental Station at Waiale'e.	He does not know of anyone who uses the land for gathering or who has cultural concerns. He has lived there for the past twenty years.

NAME	ORGANIZATION, AFFILIATION	COMMENTS
Kalama, David	Local north shore resident	Made referral to Mary Kenui Fuginaga.
Kapeliela, Kana'i	Cultural specialist for the SHPD/DLNR burials sites program	"We know of families in Paumalū but not in Waiale'e. I did do a recent investigation for the Boile family".
Kawananakoa, Quentin		Left message with his wife. No response.
Kon, Harry	Local Resident	He has lived on the property (project area) for twenty years. He is an avid fisherman and does not know of any burials.
Markell, Ka'iana	Burial Staff Program	Went out to project area LCA# 2814 and documented an unmarked burial, and is not aware of any other family burials in the area.
Masutani, Glenn	Crawford's Convalescent Home in Waiale'e	He said there was this man that knew a lot about Waiale'e but he is very ill now.
Matoon, Cathleen	Ko'olauloa Hawaiian Civic Club	Made referrals to Chad Daniels, and Ralph Makaaiau. Tried contacts no response.
Matoon, Creighton	Ko'olauloa Neighborhood Board	Made referral.
McGregor, Sandra	Family lived in the area	Made referral to Quentin Kawananakoa; no response.
Troost, Robert	Local Resident	Has lived in Waiale'e for twenty-eight years and does not see anyone gathering any types of plants, only fishing.

V. TRADITIONAL PRACTICES

Traditional cultural practices are based on profound awareness concerning harmony between man and their natural resources. The Hawaiians of old depended on these cultural practices for survival. Based on their familiarity with specific places and through much trial and error, Hawaiian communities were able to devise systems that fostered sustainable use of nature's resources. Many of these cultural practices have been passed down from generation to generation and are still practiced in some of Hawaii's communities today.

This section will express the different types of traditional practices, cultural resources and Mo'olelo associated with Waiale'e. Excerpts from talk story sessions are incorporated throughout this section where applicable.

A. Burials

There is no historical documentation with SHPD/DLNR of any burials in the project area. Community members were not aware of any burials eroding out of the beach park. However, Nona Boile who is a resident of Waiale'e, states that certain members of her *'ohana* are buried on her property, LCA 2814, which dates to the Māhele of 1850. This property is located in the northwest section of the project corridor near Kūka'imanini Island. The burial locations were not physically verified and confirmed with SHPD. Based on this testimony and the large number of LCAs within the project area, the fact that the area contains Jaucas sand deposits (a type of sediment in which Hawaiians preferred to bury their dead), and burials uncovered in neighboring Kaunala Ahupua'a, there is a high potential for encountering burials in the project area.

B. Gathering for Plant Resources

No specific documentation was found regarding gathering of plants in the project area. A number of LCAs mentioned different types of plants that were grown such as *wauke*, *noni*, *koa* trees, banana, sugar cane and sweet potato. Waiale'e was well known for *wauke* because planting *wauke* was mentioned in almost every LCA. The project area has primarily introduced species and the areas just backshore were cultivated with historic crops including sugar cane (see Figure 6).

C. Hunting Resources

In the neighboring *ahupua'a* of Kaunala in the Pūpūkea-Paumalū Forest Reserve there are current State designated hunting grounds. Hunting Unit C includes a portion of the Pūpūkea-Paumalū Forest Reserve and is open Saturday, Sunday, and State holidays year round. Currently, the game animals that are legally hunted here are wild pigs and wild goats (State of Hawai'i 1999:13 and 28).

D. Marine Resources and Storied Places

The sea is a rich resource and the Hawaiian people were traditionally expert fishermen. Fish of all types supplied the Hawaiian diet with a rich source of protein. Informants were quick to talk about coastal resources. Nona Moepono Boile spoke about the abundant reef fish, *limu kohu* that was gathered from the ocean fronting their house. Ms Boile also mentioned that her mother would feed the *puhi* that lived in the reef fronting their house. She also mentioned the natural springs in the reef, at certain times during the day you could see the bubbling of the fresh water coming out of the reef. In a phone interview with Mary Fuginaga she stated that her aunty Daisy Kapiko would feed their *'aumakua* the *puhi*, they would also gather *limu kohu* and different

types of reef fish within the project area. Harry Kon who has lived in the project area for the past twenty years mentioned that this is his favorite place to gather he'e and other reef fish.

Kalou fishpond is mentioned by John Papa 'Ī'ī on his travels to Waiale'e "Waiale'e was a delightful land, well-provisioned. There was a pond there, surrounded by taro patches, and there were good fishing places inside the reef"

An eighteenth-century government document on land matters (on file at the Hawai'i State Archives) to Jonah Pi'ikoi, (1804-1859) who was a Kaua'i chief, lists the "lands of the King entitled to prohibited fish on the Island of O'ahu, pali Koolau-poko and Loa." The document, in the English translation, notes: "Waielee Ahupuaa pali koolauloa, the fish is squid." However, other records in the archives make it clear that actually the octopus (*he'e*) was made *kapu* by the king. The document, though undated, was likely written in the mid- 1800s and suggests that octopus was abundant and a treasured resource of Waiale'e. The list also included other *ahupua'a's kapu* resources, such as Paumalū with the *alalaua*, and Pupukea's *kapu* fish was the *uhu* (parrot fish).

Here is a story of what types of fish was caught in Waiale'e and note that the fish was caught by a wahine (female);

> At Waialee a few days later, when the strangeness had begun to wear off, the boy took his calabash and salt dish and sat outside of the door of the house. There he ate, for he respected the gods and was somewhat religious. While he ate, he seemed to relish his salt as he would meat, judging by the large scoops of poi he took. His kaikuahine was watching from inside the house, and, seeing his great relish, asked, "What kind of 'meat' have you?
>
> "Just salt," answered the boy.
>
> "Oh, my poor 'brother,'" she said. Then she came out of the house and went to the beach. She returned shortly with four *manini* and two *'opule* fishes. She scaled the *'opule*, stripped off the skins of the *manini*, and laid a sufficient number of fishes before him. Thus the boy knew that his *kaikuahine* was concerned over him. He was to remember all of the things she did for him while he remained there. Not long after, he and his *kaikua'ana* returned to Ewa and told their parents about their visit ('Ī'ī 1959:24).

E. Surfing

Surfing (*Pae I Ka Nalu*) was one of the most popular activities in the old days of Hawai`i. It is said that Hawaiians would leave home, and work when they would hear the call "*Ua pi`i mai ka nalu*!" "Surf's up" There was even a Hawaiian god, La'amaoao, that they would pray to bring on the required waves. The following are different versions of chants to call forth the waves (Gutmanis 1983):

'Alo, 'alo po`I pu	Come break together,
'Iuka I ka pohuehue	Run up to the pohuehue vines
Ka ipu nui lawe mai	Bring the big wind calabash

Ka ipu iki waiho aku	Leave behind the small.
Ku mai! Ku mai!	Arise! Arise!
Ka nalu nui mai kahiki mai	Great surfs from Kahiki
'Alo po`I pu	Waves break together!
Ku mai I ka pohuehue	Rise with the pohuehue
Hu! Kaiko`o loa	Well up, raging surf
Ku mai, ku mai	Stand, stand
Ka`ale nui maiKahiki mai	Waves from Kahiki
Ka ipu nui lawe mai	Bring the large wind-gourd
Ka ipu iki waiho aku	Leave the small one.
Ho`a`e , ho a`e iluna	Go, go up to the beach
I ka pohuehue	Morning glory
Ka ipu nui lawe mai	Bring the large wind-gourd
Ka ipu iki waiho aku	Leave the small one.

Kahikilani a chief who lived on Kaua'i later moved to Paumalū (west of Waiale'e) O'ahu to practice his favorite sport of surfing:

> Long ago there lived on Kauai a chief who was very fond of surfing. He had won every surfing contest on his own home island and now came to Oahu to try his skill. As the surf at Waikīkī was not to his liking, he went on to the Koolau side of the island. There he found just what he wanted.
>
> While he was surfing he noticed some birds circling about him. One old bird in particular would fly a short distance away and then return to circle about him as if urging him to follow. He did so, and the bird led him into a cave where he met a beautiful girl who had fallen in love with him as she watched him surfing and had sent her pets, the sea-birds, to lead him to her. She asked him to become her husband and he accepted her proposal. Each morning before he left her for his favorite sport she made him two lehua wreaths to wear, one for his head and one for his neck,

> For a long time they lived thus happily until one day as he came ashore from surfing, another girl greeted him and threw about his neck several strands of the golden ilima. The old seabird flew home and reported to his mistress what he had seen. When she saw her lover returning with the ilima wreaths about his neck in addition to the lehua strands which she had braided for him, she was very angry and called upon her ancestral gods (aumakua) to punish him. As he ascended the hill he felt his body becoming heavy and, as he turned to look once more at his beloved surfing beach, there he remained transfixed in stone and is so to this day (Washington Stone) (Sterling and Summers 1978:146).

Fronting the project area on the western side is Kaunala Beach ("the plaiting" or "the weaving") also known as Velzyland, which is famous for its great surfing. Velzyland was named after the California surfboard manufacture Dale Velzy in the early 1960s (Clark 77:130). In modern times Velzyland has evolved into a primarily 'local' favorite spot with only local surfers who live in the area or are long time veteran surfers. Velzyland is the northern most break of the collection of beaches typically known as the North Shore.

F. Trails

Trails served to connect the various settlements throughout O'ahu. John Papa 'Ī'ī mentions an ancient trail that ran just *mauka* (northwestern) of the project area, possibly the current Kamehameha Highway that continued along the coast to Ko'olauloa and on to Waialua ('Ī'ī 1959:24). Typically in the Hawaiian Islands the old trails were developed into roads and highways.

VI. SUMMARY

Based on the LCA data the primary use of the project area during the historic era was a traditional Hawaiian community located on the coastal flat. The *ahupua'a* was rich in natural resources, such as a spring fed pond (Kalou), good fishing grounds with a fringing reef, and well-watered agricultural land. A total of 44 *kuleana* LCAs were awarded for Waiale'e; nineteen of which, at least in part, were within in the project area. Because of the high number of LCA's there is a high probability of finding burials within the project area.

Nineteenth-century documents also recorded that the octopus (*he'e*) of Waiale'e was *kapu* or restricted to the King's use. John Papa 'Ī'ī's account of Waiale'e indicates that marine resources were abundant and this abundance was well-known in the Ko'olauloa District. The combination of resources would have been an attraction for long-term and temporary habitation at the Waiale'e coastline where the present project area is located.

Based on the background studies there are four identified sites in the project area: Kalou Pond (SIHP 50-80-01-257), two cultural layers (SIHP 50-80-02-3735 and SIHP 50-80-01/02-5790), and the railroad infrastructure (SIHP 50-80-01/02-5791).

Waiale'e was intensively utilized throughout the historic period by a number of agents. These included the O'ahu Railroad that ran through the project area, and the former sugar cane fields of Kahuku Sugar Company. Also affecting the project area were the Boy's Industrial School (1903-1950), WWII era housing, and the University of Hawai'i Agricultural Experiment Station.

During the process of researching this specific area it was difficult to find *kūpuna* or even *kama'āina* who lived in this area. Most of the people have moved away or are deceased. The *kama'āina* and *kūpuna* that were consulted mentioned fishing as a cultural practice; no other traditional practices were mentioned such as archeological sites, gathering of plants, or trails, specific to the project area. However there is a former traditional practice of burials on the Moepono property. Nona Moepono Boile stated that her *'ohana* are buried on her property, LCA 2814. These burials have been preserved in place and have been documented with SHPD/DLNR and the O'ahu Island Burial Council.

The individuals consulted mentioned that overall the park is a good idea as long as park rules are enforced. Most of the people consulted spoke about the rich ocean resources including all types of fishing, and gathering *limu*. A few people mentioned the *puhi* (eel) as their *'aumakua*. They would feed and take care of the *puhi* that lived on the shore fronting the project area. The coast along the project area is still used today for its great fishing and world famous surfing.

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