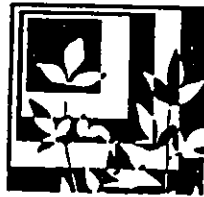


**LEEWARD DISTRICT
SANITARY LANDFILL**

**Revised
Environmental Impact
Statement**



0A

326

Office of Environmental Quality Control
235 S. Beretania #702
Honolulu HI 96813
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PROPOSED PROJECT:

LEEWARD SANITARY LANDFILL

APPLICANT:

CITY AND COUNTY OF HONOLULU
DEPARTMENT OF PUBLIC WORKS

DETERMINATION:

EIS REQUIRED

ACCEPTING AUTHORITY:

DEPARTMENT OF LAND UTILIZATION
CITY & COUNTY OF HONOLULU

CONTACT:

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CITY AND COUNTY OF HONOLULU
DEPARTMENT OF PUBLIC WORKS
REVISED
ENVIRONMENTAL IMPACT STATEMENT
FOR
LEEWARD SANITARY LANDFILL

AT

WAIMANALO GULCH SITE
(TMK: 9-2-03 Por 13, 2, 40)

AND

OHIKILOLO SITE
(TMK: 8-3-01)

This environmental document is submitted
pursuant to Chapter 343, HRS

Accepting Authority: Department of Land Utilization
City and County of Honolulu

Responsible Official:


Michael J. Chun 5-7-84
Director & Chief Date
Engineer

Prepared by: Environment Impact
Study Corporation
Honolulu & Maui, Hawaii

PROPOSED PROJECT: LEEWARD SANITARY LANDFILL

APPLICANT: CITY AND COUNTY OF HONOLULU
DEPARTMENT OF PUBLIC WORKS

DETERMINATION: EIS REQUIRED

ACCEPTING AUTHORITY: DEPARTMENT OF LAND UTILIZATION
CITY & COUNTY OF HONOLULU

CONTACT: FRANK J. DOYLE, CHIEF
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FOREWORD

During the completion of this Revised Environmental Impact Statement, the City and County of Honolulu accepted the Pricing Proposal submitted for the Honolulu Resource Recovery Project which will burn refuse, recover recyclable materials and generate electrical energy. With the implementation of this project, a major portion of Oahu's solid waste, which is presently landfilled as raw refuse, will be incinerated to ash and the volume to be disposed of will be reduced by ninety percent (90%). Existing and planned landfill life or capacity will therefore be increased threefold, and the required area for landfill operations will be decreased. With the large waste volume reduction associated with resource recovery, it is anticipated that the proposed Waimanalo Gulch (Leeward) and Kalaheo and Bellows (Windward) Sanitary Landfills will satisfy Oahu's disposal needs for 15 to 20 years.

As a result of this lessened demand for sanitary landfill sites, the City has decided not to pursue Ohikilolo as a site for the Leeward District Sanitary Landfill and to delete the site from the Public Facilities Map of The Oahu Development Plan. This decision is based on operational, and not environmental, considerations. Therefore, the City intends to include Ohikilolo as part of the Leeward District Sanitary Landfill EIS in order that the information and data gathered to date can be made available to all concerned parties.

Summary

SUMMARY

I. INTRODUCTION

The Department of Public Works proposes the development of the Leeward District Sanitary Landfill at Waimanalo Gulch and Qhikilolo to dispose of a portion of the 700,000 tons of refuse produced on Oahu annually.

Except for the amount disposed of at the Waipahu Incinerator, 120,000 tons per year, most of the refuse is disposed of at sanitary landfills. Until a resource recovery facility is constructed, sanitary landfilling of solid waste will continue to be the City's main method of refuse disposal.

Even with maximum use of resource recovery, sanitary landfilling will continue to be an important means of solid waste disposal because landfills will be used to dispose of the ash and residue produced by the resource recovery system and the unprocessable waste such as bulky items, demolition material, rock and soil. The landfills are also needed to serve as emergency backup facilities during shutdown of the resource recovery facility.

The City has a serious problem with the disposal of solid wastes. The existing sanitary landfills are nearly at capacity and new landfills are required to meet the needs of Oahu.

The Department of Public Works' objectives to meet the solid waste disposal problem on Oahu are: 1) to continue to operate a landfill in the Windward District to service the Windward side of the island and a portion of the heavily populated Honolulu district; 2) to construct a new landfill in Leeward Oahu to service the rapidly expanding Leeward area and a portion of the Honolulu District; and 3) to implement resource recovery as rapidly as possible.

The project will be designed to minimize significant environmental impacts during the construction and operational phases of the landfill. For example, leachate production will be minimized by installing a perimeter drainage system to divert storm water around the landfill. Leachate production is minimized by preventing water from entering the landfill. Also, monitoring wells and an collection system will be

installed as additional safeguards to immediately detect the production of leachate and to intercept the leachate before it can contaminate the ground water.

The landfill will be designed to control erosion by terracing and minimizing the slope. Also, siltation and debris basins will be installed to contain silt and debris on site.

II. WAIMANALO GULCH

A. SITE DATA

1. Location

In Waimanalo Gulch, 0.5 miles southeast of Kahe Valley, 1 mile northeast of Makaiwa Gulch, north/mauka of Farrington Gulch, north/mauka of Farrington Highway and 0.5 miles east of Kahe Point. See Figure 2-1.

2. Tax Map Key

9-2-03: 13, 40 and a portion of 2.

3. Total Area

260+ acres.

4. Owners

James Campbell Trust Estate, Robert and Audrey Au, Raymond and Betty Au, Edward and Lai Fong Au, Hawaiian Electric Company, Inc.

5. Present Use of Land

Agricultural and open space.

6. City Zone District

Agriculture, AG-1.

7. Ewa Development Plan

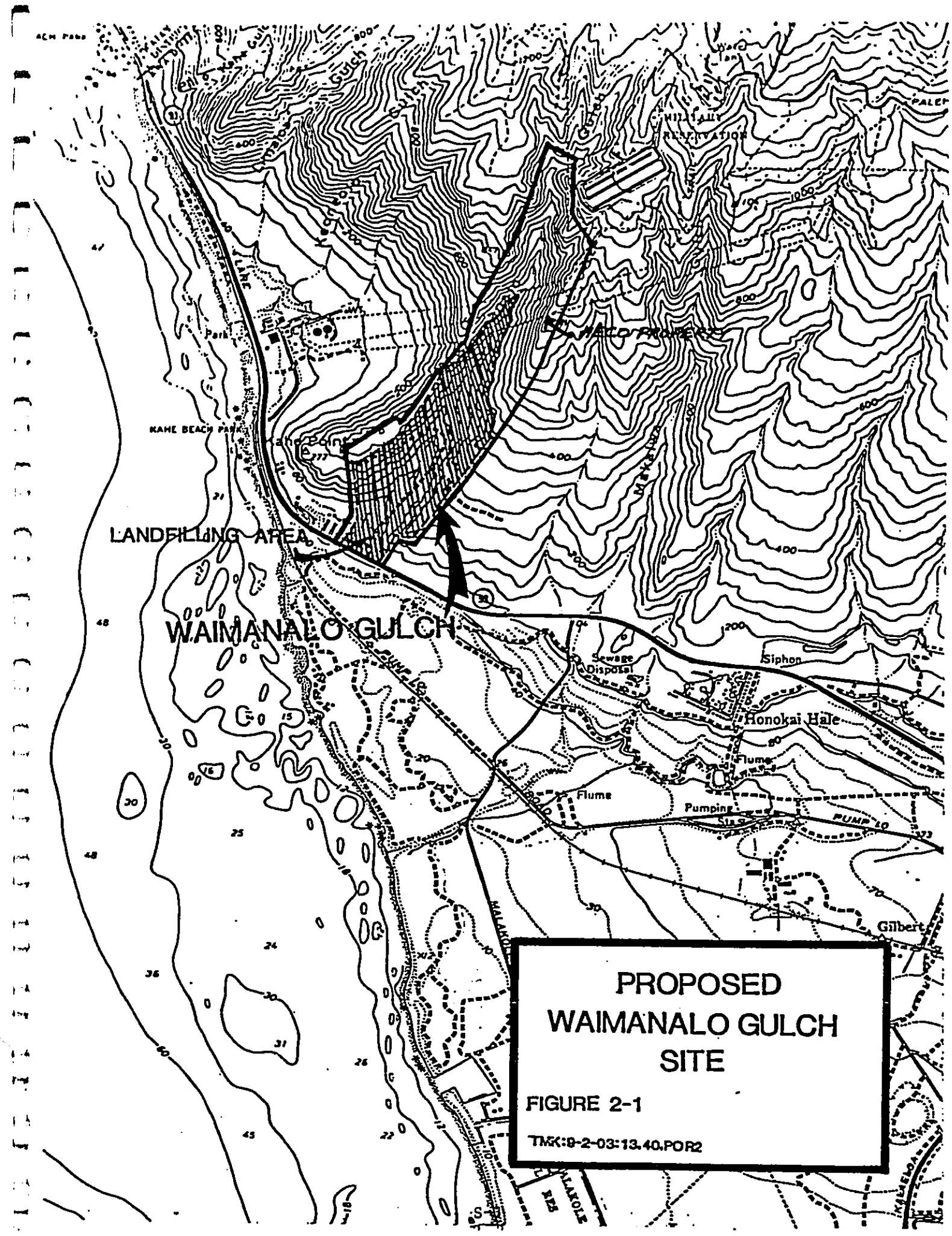
Agricultural

8. State Land Use District

Agriculture (Map 1)

9. Adjacent Land Uses, Zones, etc.

Industrial, Urban, Preservation.



**PROPOSED
WAIMANALO GULCH
SITE**

FIGURE 2-1

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10. Restrictions and Setbacks

Special Permit required from State for construction in Agricultural District and for access at Farrington Highway.

11. Existing Land Use of the Site

The project site contains vacant and undeveloped land. Two abandoned tunnels previously owned and occupied by the military are located at about elevation 275. Prior to 1960, the site was periodically used for cattle grazing. The site is presently unused.

12. Existing Land Use of the Adjacent Areas

Single-family dwellings are located adjacent to the project site. There are thirteen homes in the area (they are not located in the project boundary.) The existing Kahe Electric Power Plant is located approximately 3,000 feet northwest of the project site. Sugar cane fields are located directly south, across of Farrington Highway and a residential area (Hono Kai Hale) containing approximately 270 homes is located about one mile East and makai of the highway.

13. Historical and Archaeological

No sites are known to exist. An archaeological surface reconnaissance was conducted to determine the presence or absence of archaeological or historical sites.

14. Proximity to Population and Refuse Centers

Adjacent to an agricultural subdivision, 2 miles southeast of Nanakuli, 1 mile west of Honokai Hale and 20+ miles from Keehi Refuse Transfer Station.

B. Description of Site

1. Accessibility

Accessible from Farrington Highway. About 2,000+ feet of new access road required into site.

2. Topography

Long, narrow, well-defined, stony gulch about 1,500+ feet wide and 7,500 feet long. The lower end slopes at 8% and the upper end slopes at 18+%.

3. Soil Classification

Site consists of the following soils taken from the S.C.S.

Soil Survey:

- Lualualei extremely stony clay, 3 to 35% slopes
- Rock land
- Stony steep land

4. Availability of Cover Material

Little available on site and must be imported.

5. Surface Drainage

Surface runoff from Waimanalo Gulch traverses site.

6. Ground Water Supply

Outside BWS ground water zone.

7. Existing Utilities

Except for sanitary sewer, utilities are available from Farrington Highway adjacent to site. HECO power lines cross upper and middle portion of the site.

C. SITE AS LANDFILL

1. Usable Area

80+ acres.

2. Type of Operation

Combination of trench and area methods.

3. Capacity

6,000,000+ cubic yards.

4. Life

7 + years at a fill rate of 1,000 tons per day.

5. Land Use After Development

Open space, grass skiing, park.

D. ENVIRONMENTAL CONCERNS OF SITE

1. General Landfill Nuisances

Noise, dust, pests, odor, litter, etc., associated with landfill operations will be generated. Effective control measures can be installed to minimize landfill nuisances.

2. Visual Impacts

Site is highly visible to the public from Farrington Highway, from the subdivision adjacent to the site and from

the proposed West Beach development. Landscaping prior to, during and after landfilling operations will minimize visual impacts.

3. Ground Water Impacts

No protection measures required. Area is not a source of ground water supply. Leachate collection system will be incorporated into the landfill design as a precautionary measure.

4. Surface Drainage Works

Major site drain system must be constructed to route surface runoff from Waimanalo Gulch around the site and to minimize surface runoff infiltration.

5. Destruction of Natural Resources

Land and natural vegetation will be committed to landfill. However, the site can be reverted to open space after landfill operations are completed.

6. Displacement

None. Landfill will be constructed adjacent to existing agricultural residences.

7. Other Environmental Concerns

Traffic will increase on Farrington Highway and the addition of an intersection may increase traffic hazards unless properly designed.

Impacts on flora and fauna are not expected to be significant and these and other concerns will be discussed in an environmental impact statement.

8. Safety

Operational hazard to the public is minimal.

9. Objections by Owner and Adjacent Landowners

Opposition from the nearby residents can be expected. Adjoining communities and organizations may also express their objections.

E. Site Preparation for Landfill

1. Access Road

Improvements must be constructed on Farrington Highway to provide a safe intersection. About 1,000+ feet of new access road must be constructed on the site.

2. Operations and Maintenance Facilities

Temporary facilities will be constructed.

3. Utilities

Utilities will be extended from Farrington Highway. Sanitary sewer system must be installed. Portions of existing HECO power lines may require relocation.

4. Drainage System

A major drainage system will be constructed.

5. Leachate Control System and Gas Control

Will be required and the leachate and gas generation will be monitored.

F. Commentary on the Site

1. Discussion

The site is located in Waimanalo Gulch about two miles southeast of Nanakuli and one mile northwest of Honokai Hale. It contains about 80+ acres of usable land and is owned by Campbell Estate, the Au families and HECO. It is anticipated that no permanent residents will be displaced. Land costs will be high.

The site is presently open space. The site has a capacity of 6,000,000+ cubic yards and an estimated life of 7+ years (1,000 tons per day). It is located in the non-underground source of drinking water (USDW), makai of the UIC line and no one will be displaced.

Hauling costs will be moderate from other leeward areas. It is located adjacent to the four-lane divided Farrington Highway which connects into Interstate Route H-1.

The site is visible from Farrington Highway and the proposed West Beach development. A buffer strip with heavy landscaping will be required to screen landfill activity. Site preparation and improvement costs will be moderate due to requirements of a major drainage system and an intersection at Farrington Highway. Refuse hauling into this site will be moderate (\$8.90/ton for 1987).

Capital costs of land, site preparation and improvements at this site in comparison to the estimated life of landfill will be relatively high.

III. OHIKILOLO

A. Site Data

1. Location

In Ohikilolo in the north portion of Keaau Valley, three miles north of Makaha Valley, one mile south of Makua Valley on the northwestern coast of Leeward Oahu. See Figure 2-2.

2. Tax Map Key

8-3-01:13.

3. Total Area

182+ acres.

4. Owners

Elizabeth Marks, Elizabeth Stack, Cynthia Salley, Lester Marks.

5. Present Use of Land

Agriculture, open space and recreation.

6. City Zone Districts

Agriculture AG-1.

7. Waianae Development Plan

Agricultural

8. State Land Use District

Agriculture.

9. Adjacent Land Uses, Zones, etc.

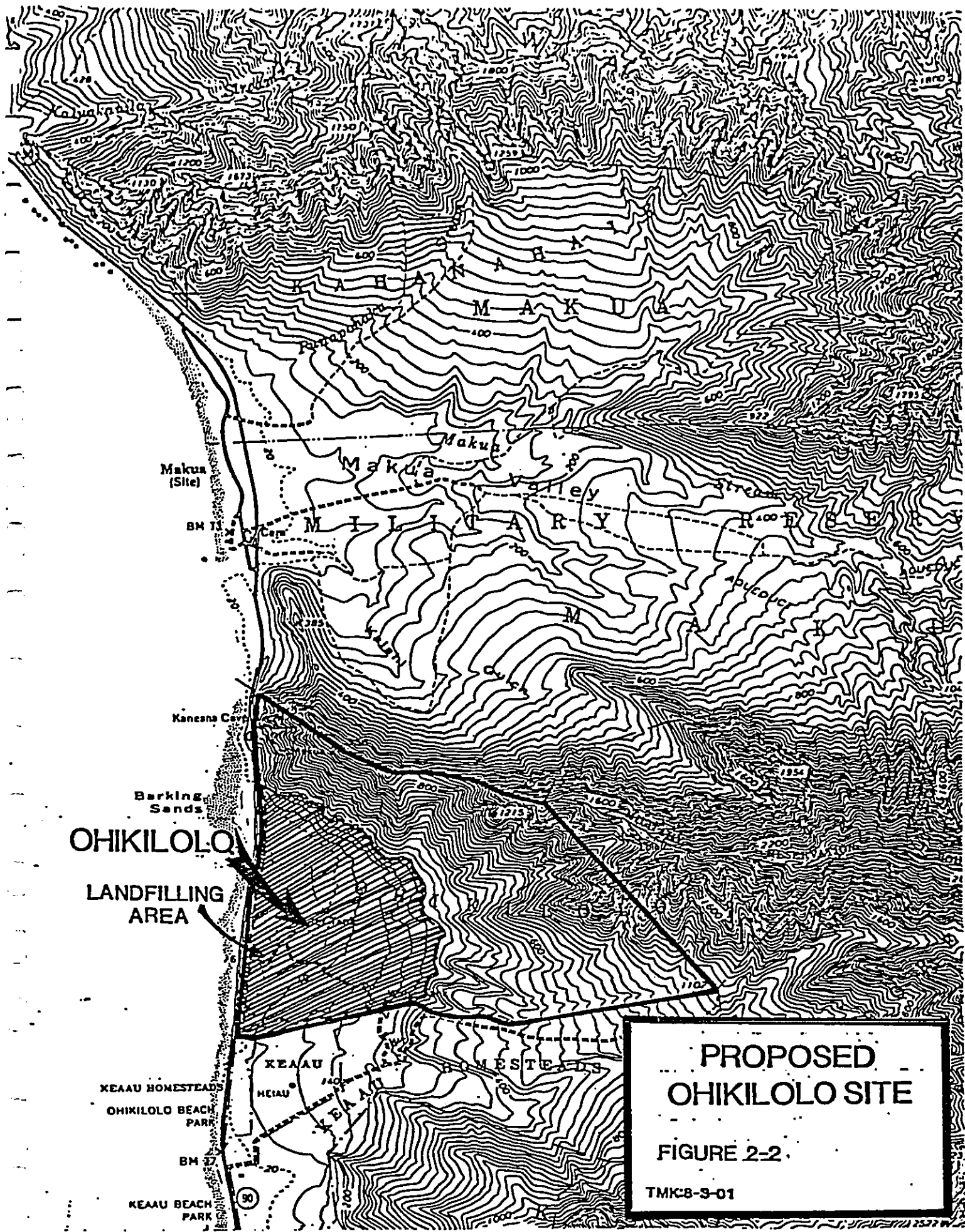
Agricultural, Preservation, Conservation.

10. Restrictions and Setbacks

Special Permit required from State for construction in an Agricultural District. This site is located at the Makua entrance to the Makua-Kaena State Park. First Hawaiian Bank's Recreation Center is located on the south portion of the site and Paniolo Country Ohikilolo Makua Ranch is located on the north portion of the site.

11. Historical and Archaeological Significance

Archaeological site complexes have been located within the landfilling area.



12. Proximity to Population and Refuse Centers

The landfill is located 6+ miles northwest of Waianae, 36+ miles from Keehi Refuse Transfer station and in a remote location.

B. Description of Site

1. Accessibility

Accessible from Farrington Highway, which narrows to a two-lane road beyond Waianae. About 1,000+ feet of new access road must be built from Farrington Highway into the project site.

2. Topography

North portion of Keaau Valley with many small gullies and openings to the ocean on the west. The valley floor near the highway has an elevation of about 20 feet and gradually rises to the ridges with elevations of over 1,600 feet. At the lower end of the valley, the ground slopes at about 1% and increases to over 100% at the upper reaches.

3. Soil Classification

Site consists of the following soils taken from the S.C.S Soil Survey:

Lolokaa silty clay, 15 to 25% slopes

Lualualei clay, 0 to 2% slopes

Lualualei stony clay, 2 to 6% slopes

Lualualei extremely stony clay,
3 to 35%

Pulehu clay loam, 0 to 3% slopes

Pulehu very stony clay loam, 0 to 12% slopes

Rock land

Rock outcrop

Stony land

Stony steep land

4. Availability of Cover Material

Some available on site but most must be imported.

5. Surface Drainage

Surface runoff from upper reaches collects in the many gullies which cross the site.

6. Ground Water Supply

There are five wells within the landfill area and the water source for the five wells is from rainfall along the upper ridges of the valley. The rain water flows underground through the valley and eventually into the ocean. The landfill will not affect the water source area but it will affect the wells below the 200-foot contour. These wells, which will conflict with the landfilling operation, will be sealed and abandoned.

The basal groundwater found beneath the landfill is located outside of the proposed Underground Injection Control Line (UIC) and not considered suitable for potable water source for municipal use (the low yield and high chloride content).

7. Existing Utilities

Electricity and telephone service available from Farrington Highway. Water and sanitary sewer system not available.

C. Site As Landfill

1. Usable Area

182+ acres (including area containing the archaeological sites).

2. Type of Operation

Combination of trench and area methods.

3. Capacity

18,460,000+ cu. yds.

4. Life

21+ years at 1,000 TPD (if all of the 182+ acres are used and less if only a portion of the 182+ acres is used because of the acres needed to be set aside for the protection of the archaeological sites).

5. Land Use After Development

Open space.

D. Environmental Concerns Of Site

1. General Landfill Nuisances

Noise, dust, pests, odor, litter, etc., associated with landfill operations will be generated. Effective control measures will be instituted to minimize landfill nuisances.

2. Visual Impact

Site is visible to the public from Farrington Highway. Landscaping prior to, during and after landfilling operations will minimize the visual impact.

3. Ground Water Impacts

Mauka portion of site is over the UIC area, and will not be used for landfilling. Makai portion of the site will be used for landfilling and is not over UIC area. Leachate is formed when landfills are located in areas having annual rainfall in excess of 30 inches. In areas having less than 30 inches of rainfall per year, the probability of leachate formation is minimum.

It is not anticipated that leachate will be produced at the Leeward landfills because of the low rainfall. However, as a precautionary measure, leachate collection systems and monitoring wells will be installed.

Also prior to landfilling, the bottom of the landfill will be sloped and compacted which will minimize infiltration of water into the ground and facilitate the collection of leachate.

4. Surface Drainage Works

Drain system will be constructed to route surface runoff from gullies around the site and to minimize surface runoff infiltration.

5. Destruction of Natural Resources

Land and natural vegetation will be committed to landfill. However, open space can be developed after landfill operations are completed.

6. Displacement

Paniolo Country Ohikilolo Makua Ranch and about four residences will require displacement. The production of cattle, grass hay, kiawe charcoal, and zoo meat will be curtailed. This will have severe economic impact to the ranch and directly affect the operation of the Honolulu Zoo.

7. Other Environmental Concerns

Traffic will increase on Farrington Highway through Nana-kuli, Maili, Waianae and Makaha. Impact on flora and fauna is not expected to be significant.

8. Safety

Hazard to the public is minimal.

9. Objection by Owner and Adjacent Landowners

Objections can be expected.

10. Objections by Public, Community Organizations, Environmental Groups and Others

Leeward communities, organizations and individuals have expressed their objections.

11. Archaeological

Significant archaeological site complexes were found in the proposed landfilling area.

E. Site Preparation For Landfill

1. Access Road

Improvements must be constructed on Farrington Highway to provide a safe intersection. About 1,000+ feet of new access road must be constructed into the site.

2. Operations and Maintenance Facilities

Permanent facilities must be constructed.

3. Utilities

Electricity and telephone service must be extended from Farrington Highway. Water for the operation of the landfill will be provided.

4. Drainage System

A major drainage system must be constructed.

5. Leachate Control System and Gas Control

Will be required and the leachate and gas generation will be monitored. A leachate collection system and monitoring wells will be installed. Gas monitoring wells will be installed.

F. Commentary On The Site

1. Discussion

The Ohikilolo Site is located in the north portion of Keaau Valley about one mile south of Makua Valley and three miles north of Makaha Valley. It contains about 150+ acres of usable land and is owned by Elizabeth Marks, et al.

The site is presently used for agriculture, open space and recreation. The capacity of the landfill is estimated at 21+ years at a fill rate of 1,000 tons per day assuming that all of the available area is used. This is equivalent to approximately 18,460,000+ cubic yards of refuse. However, it is anticipated that site restrictions will limit the capacity to perhaps 15+ years. The mauka portion of the site is over the USDW area and will not be used for sanitary landfilling.

Paniolo Country Ohikilolo Makua Ranch, First Hawaiian Bank's Recreation Center and about three residences are located on or near the project site.

Refuse hauling costs to this site will be high due to its remote location on the northwest leeward coast of Oahu (\$10.60/ton for 1987). It is 36+ miles from the City's Keehi Refuse Transfer Station. Traffic will increase on Farrington Highway through Nanakuli, Maile, Waianae and Makaha.

The site is visible from Farrington Highway and Barking Sands Beach. It is located at the Makua entrance to the Makua-Kaena State Park, and will require a buffered strip with heavy landscaping to screen landfill activities and minimize visual pollution.

Site preparation and improvement costs will be moderate due to requirements of a major drainage system and a water system.

Proposed Project

1

SECTION 1

DESCRIPTION OF THE PROPOSED PROJECT

I. INTRODUCTION

Everyone produces solid waste or refuse as a by-product of his or her existence. Increases in the amount of solid waste are not only a factor of an increase in population, but also of higher per capita waste generation.

Presently, over 700,000 tons of solid waste are disposed of on Oahu each year. Except for the amount disposed of at the Waipahu Incinerator, 120,000 tons per year, most of the refuse is disposed of at sanitary landfills. Until a resource recovery facility is constructed, sanitary landfilling of solid waste will continue to be the City's main method of refuse disposal.

Even with maximum use of resource recovery, sanitary landfilling will continue to be an important means of solid waste disposal because landfills will be used to dispose of the ash and residue produced by the resource recovery system and the unprocessable waste such as bulky items, demolition material, rock and soil. The landfills are also needed to serve as emergency backup facilities during shutdown of the resource recovery facility.

The City and County has a serious problem with the disposal of solid wastes. The existing sanitary landfills are nearly at capacity and new landfills are required to meet the needs of Oahu.

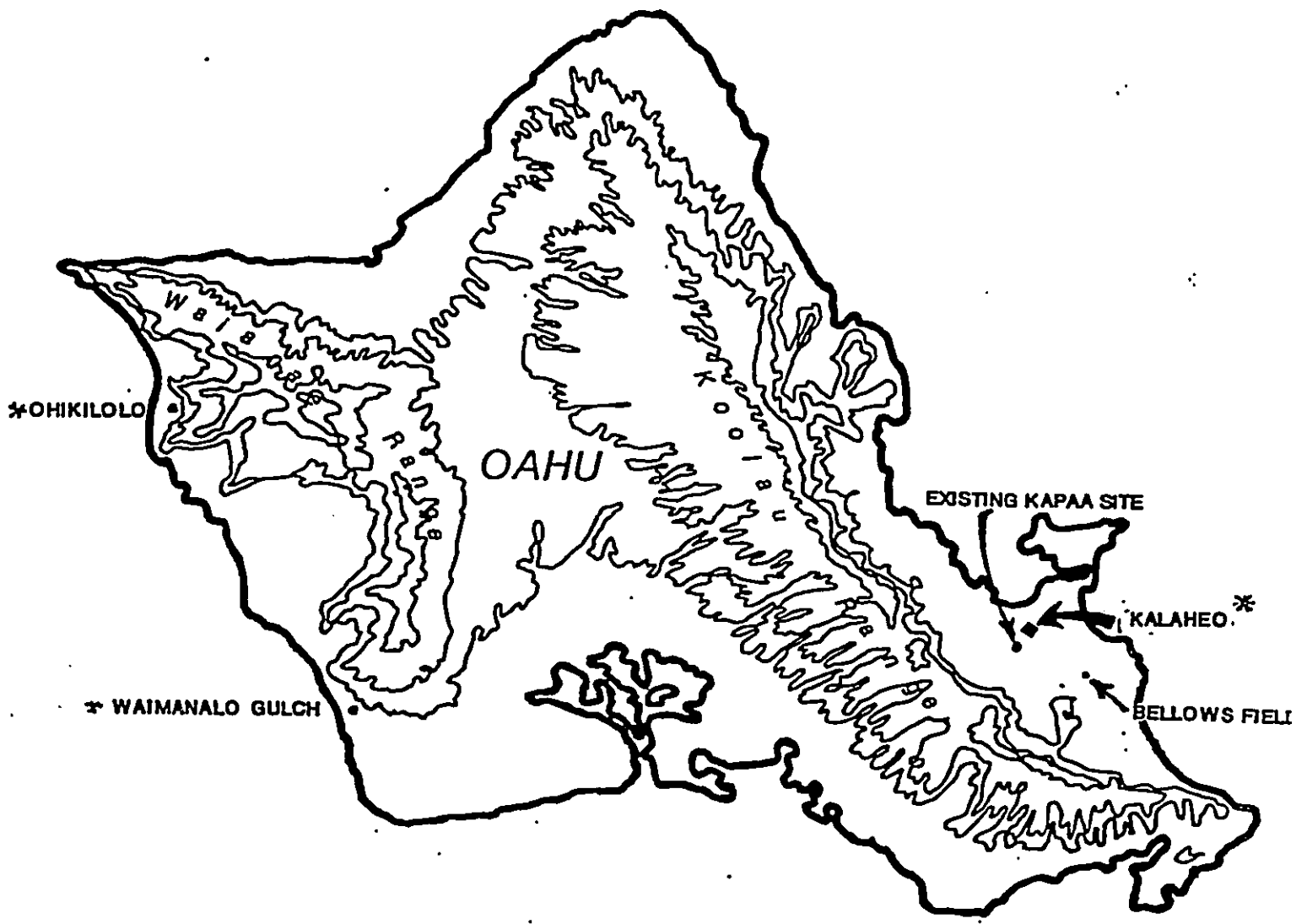
The Department of Public Works' objectives to meet the solid waste disposal problem on Oahu are: 1) to continue to operate a landfill in the Windward District to service the Windward side of the island and a portion of the heavily populated Honolulu district; 2) to construct a new landfill in Leeward Oahu to service the rapidly expanding Leeward area and a portion of the Honolulu District; and 3) to implement resource recovery as rapidly as possible.

There are several difficulties in selecting and developing landfill sites on Oahu [1.7]:

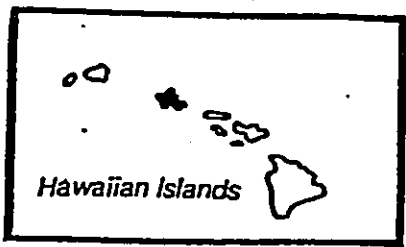
1. Limited land space.
2. Restrictions in the groundwater supply area imposed by the Safe Drinking Water Act and enforced by the Board of Water Supply and the State Department of Health.
3. Low cost, undeveloped, suitable lands are scarce.
4. Community objections to landfill.

Potential landfill sites are located in inland areas, away from population centers, but these sites are situated usually over the groundwater aquifers which supply potable water to the population or are potential sources of domestic water supply.

An inventory study of potential landfills on Oahu done in 1977 by Shimabukuro and Associates identified 26 sites. A supplement to this study done in 1979 identified another 10 sites. However, because most sites are; 1) within groundwater supply areas, 2) within close proximity to communities, or, 3) owned by the Federal or State governments and used for other purposes; only 5 sites were considered by the City. One site, Kapaa, has been developed into a landfill and is presently in use. The City plans to use the remaining four sites within the next fifteen years. These sites shown in Figure 1-1, are Kalaheo, and Bellows Field located on Windward Oahu; Waimanalo Gulch and Ohikilolo, located on Leeward Oahu. The Waimanalo Gulch and Ohikilolo sites, which will be used as the Leeward Sanitary Landfill, are further delineated on Figures 1-2 and 1-3.

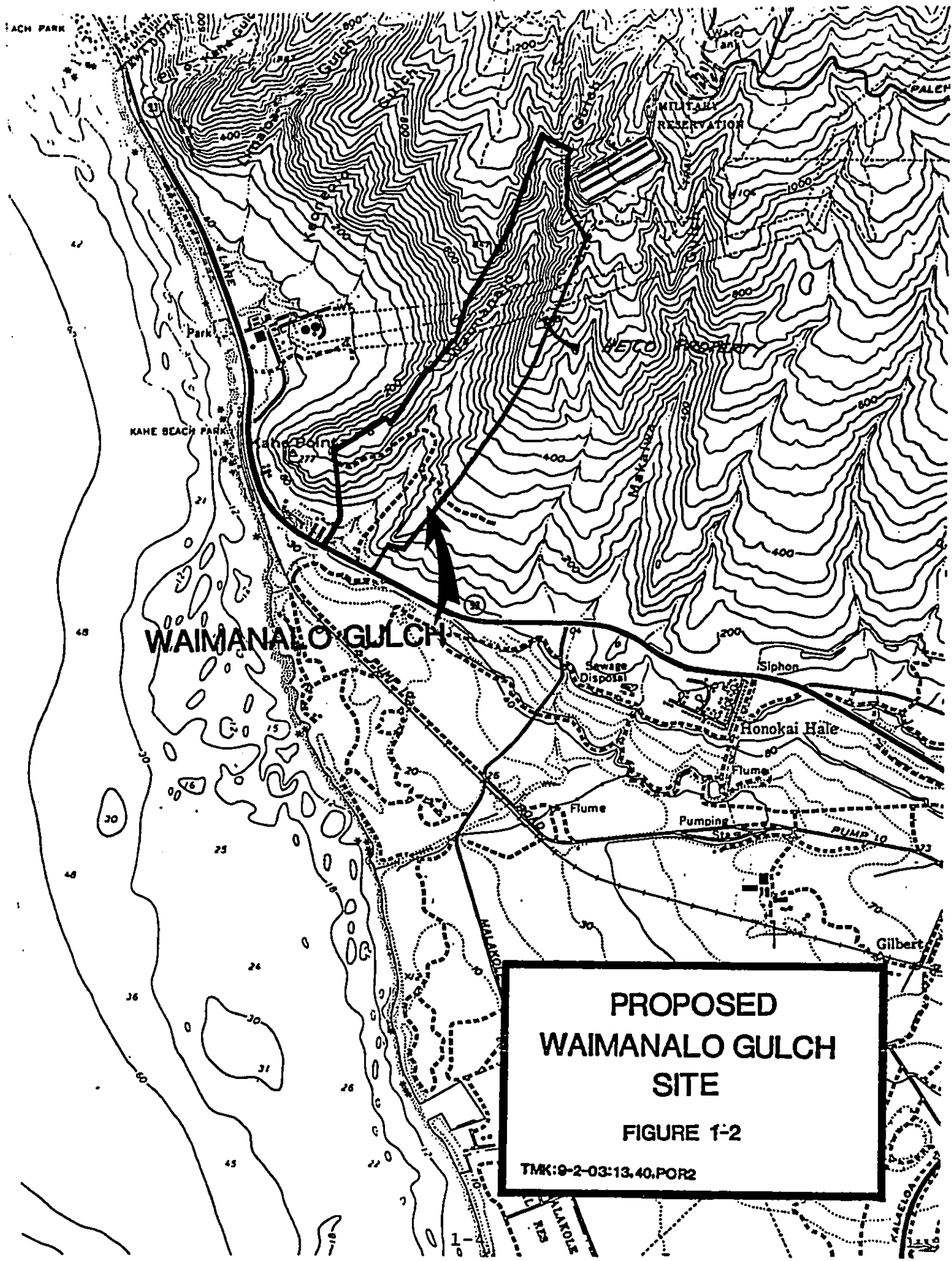


* PROPOSED SITES



E.I.S.C.

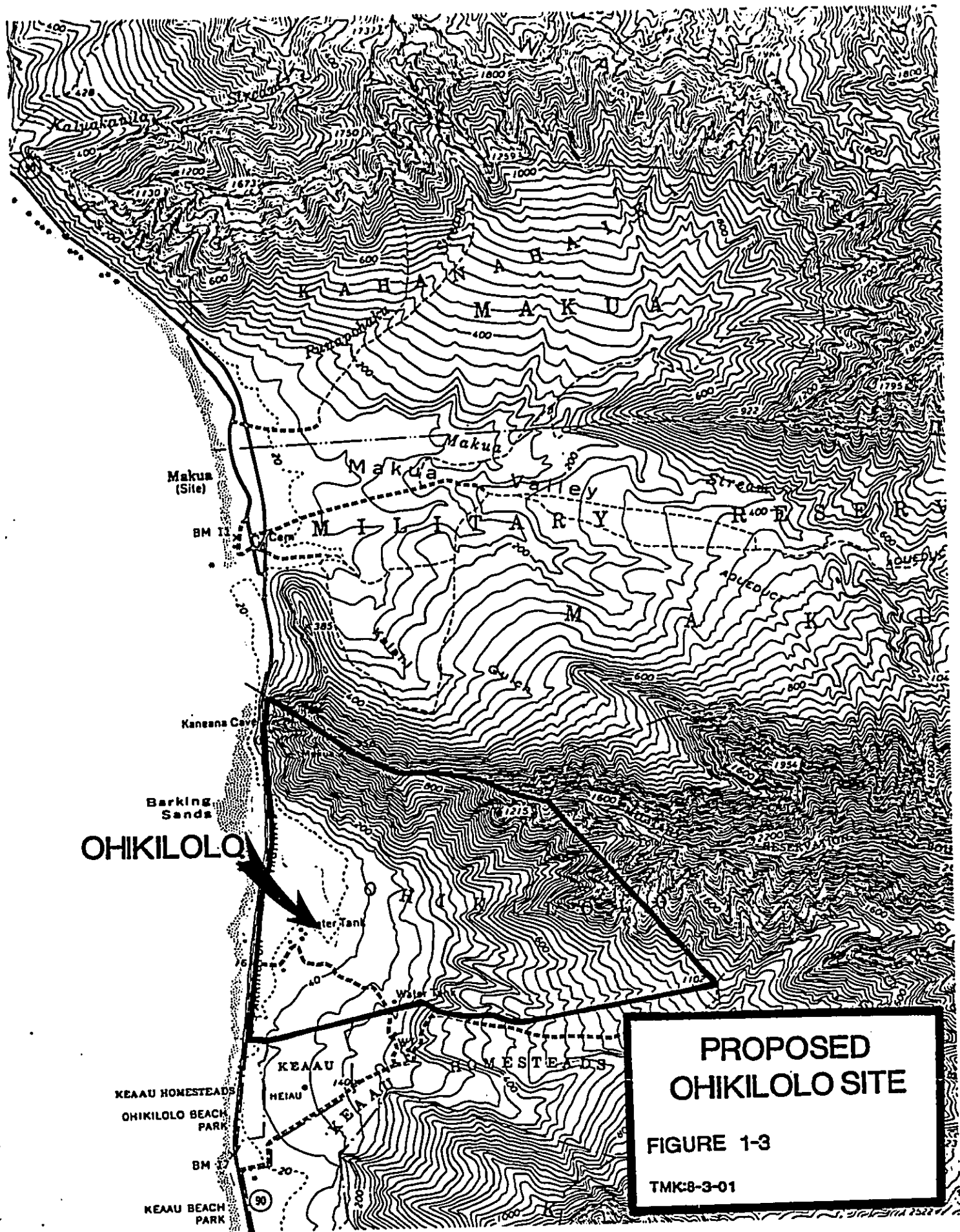
FIGURE 1-1
LOCATION MAP



**PROPOSED
WAIMANALO GULCH
SITE**

FIGURE 1-2

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**PROPOSED
OHIKILOLO SITE**

FIGURE 1-3

TMK-8-3-01

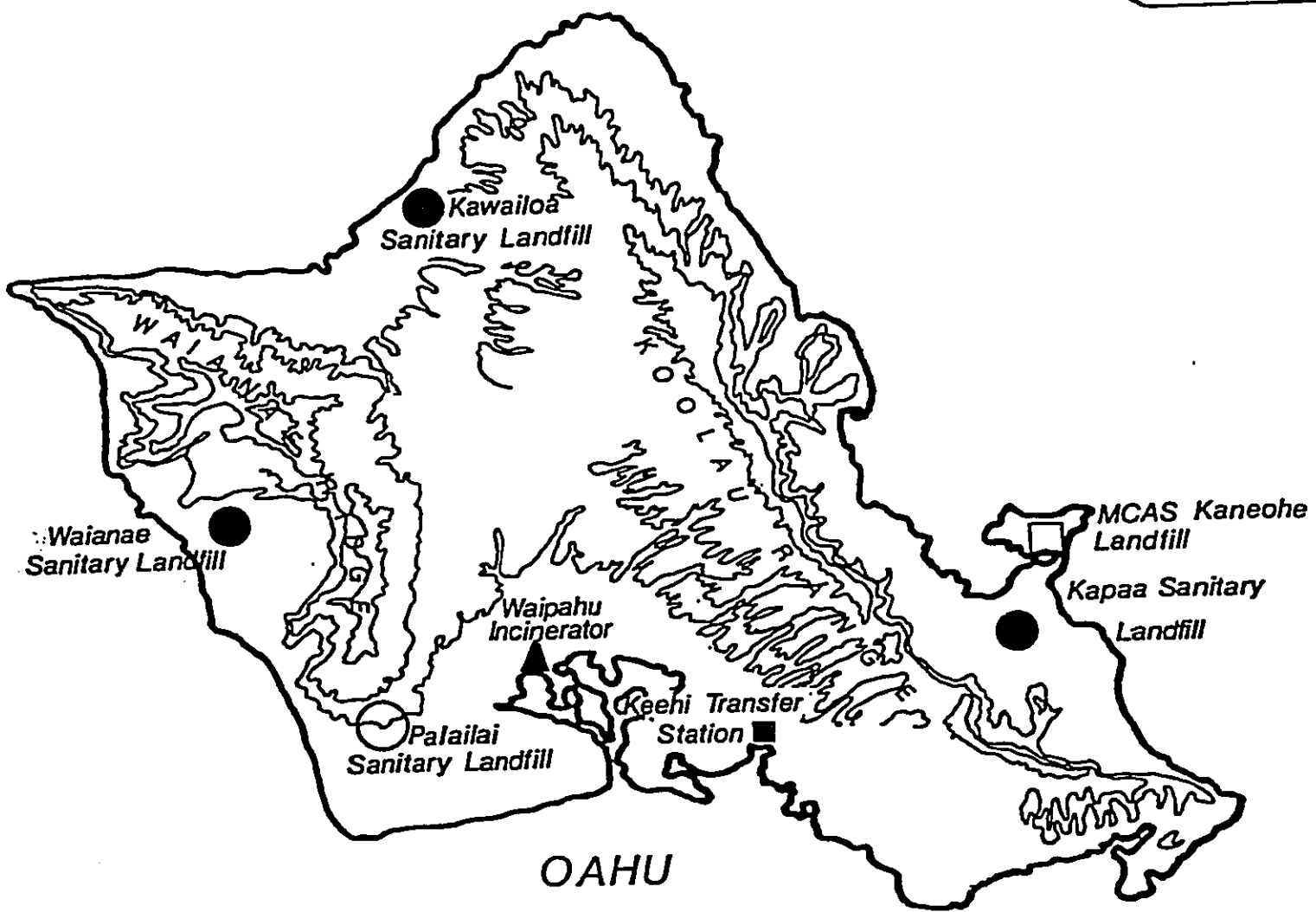
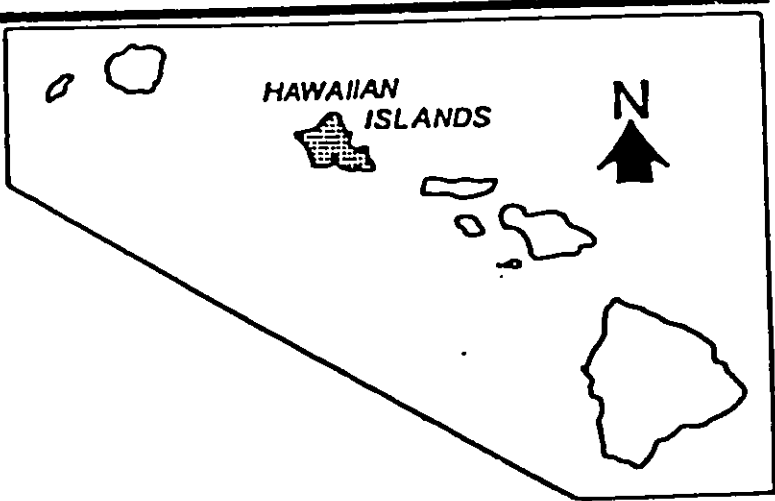
II. EXISTING SOLID WASTE PROCESSING AND DISPOSAL ON OAHU [1.1]

The Department of Public Works (DPW) collects almost all of the refuse generated by residences and smaller business establishments. Others involved in refuse collection or hauling services include: licensed private haulers; commercial establishments and construction contractors who haul their own refuse to disposal sites; the military; and the State of Hawaii. Generally, condominiums, hotels, and commercial and industrial establishments contract private haulers for collection services. The state and military either collect their own refuse or contract with private haulers for solid waste collection. The City and licensed private collectors haul approximately 75 percent of Oahu's solid waste. [Refer to Table 1-1.]

Presently on Oahu, solid waste is disposed in City (Waipahu Incinerator and the Kapaa, Kawaihoa and Waianae Sanitary Landfills), private (Palailai Sanitary Landfill), and military (Kaneohe MCAS) facilities. The location of these facilities are shown on Figure 1-4.

Based on present rates of disposal (refer to Table 1-2) the above sanitary landfills (SLF) are rapidly reaching their capacity. The Kapaa SLF (present Windward Sanitary Landfill) currently accomodates half of Oahu's total refuse and is estimated to be filled to capacity by the end of 1984. The Waianae and Kawaihoa SLF's are estimated to be closed by the summer of 1984. Palailai SLF is projected to have less than four years of capacity (1986). Only industrial/commercial wastes produced on base are disposed at the Kaneohe MCAS Landfill. While solid waste is incinerated at the Waipahu incinerator at a rate of 120,000 tons per year (TPY), the residue in turn must be deposited in a landfill. The ash disposal site adjacent to the Waipahu Incinerator has an estimated capacity of approximately 5 years.

The Keehi Transfer Station also plays an integral role in the City's solid waste disposal system. Refer to Figure 1-4. The purpose of Keehi Transfer Station is to increase cost-effective transporting of solid waste by consolidating several collection loads prior to transport



OAHU

EXISTING DISPOSAL FACILITIES ON OAHU

- Legend:
- ● ▲ Municipal
 - Private
 - Military

FIGURE 1-4

Table 1-1

OAHU SOLID WASTE SYSTEM - 1980 CALENDAR YEAR

DISPOSAL SITE	TOTAL TONS	COLLECTION BY			COLLECTION BY	
		CITY REFUSE DIVISION	MILITARY	PRIVATE REFUSE HAULERS	"OTHERS" CONTRACTORS, HOUSEHOLDERS, TREE TRIMMERS, ETC.	
<u>City</u>						
Kapaa L/F	361,000	48,000	-	172,000	141,000	
Waipahu Inc.	119,000	114,000	-	5,000	-	
Waianae L/F	14,000	10,000	-	-	4,000	
Kawailoa L/F	25,000	12,000	-	4,000	9,000	
	519,000 (70%)					
<u>Military</u>						
Kaneohe L/F	10,000	-	10,000	-	-	
Schofield L/F	* 12,000	-	1,000	11,000	-	
	22,000 (4%)					
<u>Privately Owned</u>						
Palailai L/F	196,000	67,000	33,000	96,000	Minor Amounts	
	196,000 (26%)					
TOTAL	737,000	251,000 (34%)	44,000 (6%)	288,000 (39%)	154,000 (21%)	
	2362 TPD**	804 TPD	141 TDP	923 TPD	494 TPD	
<u>Transfer Station</u>						
Keehi TS	121,000					
(City owned)	388 TPD					

* Schofield L/F closed (December 31, 1981)
 **Tonnage Per Day (TPD) based on a six-day week.

Source: [1.1]

Table 1-2

TONNAGE DISPOSITION TO YEAR 2000
(with Resource Recovery)

FY	TOTAL ¹ REFUSE	WINDWARD SANITARY LANDFILL	RESOURCE RECOVERY FACILITY	LEeward SANITARY LANDFILL ²	ADDITIONAL RESOURCE RECOVERY FACILITY ³	WAIPAHU INCIN.	PALAILAI SANITARY LANDFILL	WAIANAe SANITARY LANDFILL	KAWAILOA SANITARY LANDFILL	MILITARY SANITARY LANDFILL ⁴
79-80	2370	1050				390	750	40	70	70
81	2480	1260				390	690	40	70	70
82	2590	1330				390	690	40	70	70
83	2700	1460				390	720	40	70	20
84	2810	1250		500		390	750			20
85	2910	1260		1360		390				
86	2950	1280		1380		390				
87	2990	420	1800	900	890	390				
88	3020	160	1800	760	900	390				
89	3050	180	1800	770	900	390				
90	3080	190	1800	790	900	390				
91	3110	210	1800	800	900	390				
92	3140	220	1800	820	900	390				
93	3170	240	1800	830	900	390				
94	3200	250	1800	860	900	390				
95	3230	270	1800	860	900	390				
96	3250	280	1800	870	900	390				
97	3270	290	1800	880	900	390				
98	3290	300	1800	890	900	390				
99	3310	310	1800	900	900	390				
2000	3330	320	1800	910	900	390				

¹Refuse generated per day (based on a six-day week).

²Includes ash from Waipahu Incinerator and Resource Recovery Facilities.

³Additional Resource Recovery facilities alternatives include expansion of resource recovery facility, Waipahu Incinerator retrofit, and co-disposal.

⁴MCAS Kaneohe Sanitary Landfill closure FY 83/84 [information from Capt. M. Dallam, CEC, U.S. Navy, Facilities Engineer.]

Source: Refuse Division

Table 1-3

ASSUMED DISPOSAL LOCATIONS 1980 -- 2000
(Without Resource Recovery)

Fiscal Year	Total Refuse*	Waipahu Incinerator	Sanitary Landfill					
			Windward	Leeward**	Palailai	Wai'anae	Kawailoa	Military
1979-80	2,370	390	1,050	-	750	40	70	70
81	2,480	390	1,260	-	650	40	70	70
82	2,590	390	1,330	-	690	40	70	70
83	2,700	390	1,460	-	720	40	70	20
84	2,810	390	1,540	-	750	40	70	20
85	2,910	390	1,720	-	800	40	70	20
86	2,950	390	1,330	730	600	-	-	-
87	2,990	390	1,350	1,350	-	-	-	-
88	3,020	390	1,360	1,370	-	-	-	-
89	3,050	390	1,380	1,380	-	-	-	-
90	3,080	390	1,390	1,400	-	-	-	-
91	3,110	390	1,410	1,410	-	-	-	-
92	3,140	390	1,420	1,430	-	-	-	-
93	3,170	390	1,440	1,440	-	-	-	-
94	3,200	390	1,450	1,460	-	-	-	-
95	3,230	390	1,470	1,470	-	-	-	-
96	3,250	390	1,480	1,480	-	-	-	-
97	3,270	390	1,490	1,490	-	-	-	-
98	3,290	390	1,500	1,500	-	-	-	-
99	3,310	390	1,510	1,510	-	-	-	-
2000	3,330	390	1,520	1,520	-	-	-	-

*Refuse generated per day (based on a six-day week)

**Includes ash from Waipahu Incinerator

Source: [1.2]

to a disposal facility. Based on the operation of the facility with just one shift, an average of 388 tons per day (TPD) was processed in 1980. The feasibility of installing transfer stations at the existing Kawaiiloa, Waianae and Kapaa SLF's is being studied.

As stated previously, the need for additional landfills must be satisfied with or without a resource recovery project. The implementation of such a project will increase landfill life by reducing the volume of solid waste. However, landfilling will be necessary for final disposal.

The tonnage disposition shown for "Leeward Sanitary Landfill," in Table 1-2, is the amount of refuse which can be expected to be deposited at the proposed Leeward SLF if resource recovery is implemented. Table 1-3 shows the tonnage disposition if no resource recovery facilities are constructed.

III. SANITARY LANDFILLING

A sanitary landfill is an environmentally acceptable method for the disposal of solid waste (refuse). A sanitary landfill is an engineered method in which solid wastes are disposed of by spreading refuse in thin layers, compacting it to the smallest practicable volume and covering it with soil each day in a manner that minimizes environmental pollution.

A. Cell Construction

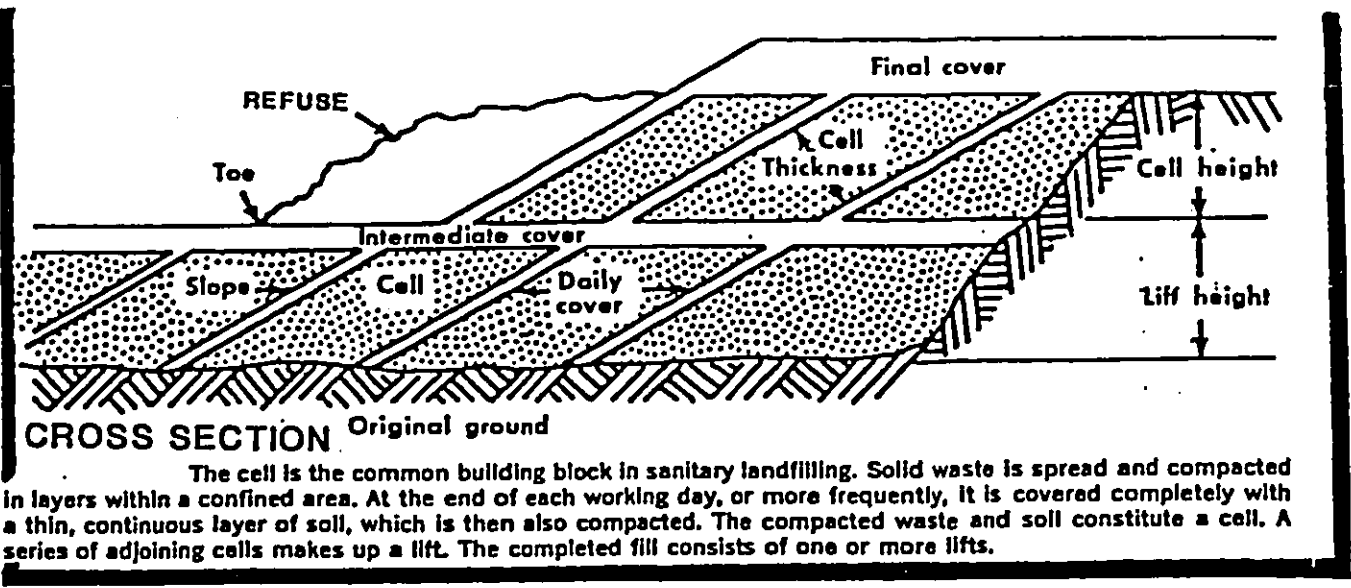
The building block of a sanitary landfill is the construction of a cell, which consists of compacted refuse contained within a soil enclosure. The cell is made by spreading and compacting the refuse in layers (two feet thick) within a confined area (up to 150 feet), and covering the compacted refuse with a thin, daily, continuous layer of soil, (six inches) which is also compacted (to 800-1,000 lb/cubic yard).

Generally the cell is 'square shaped' and its sides are sloped as steeply as practical operation will permit. The sloped sides of 20° to 30° not only minimizes the surface area and the amount of cover material required but also aids in the shredding of the refuse and obtaining a higher field compaction density (up to 800-1,000 lb/cubic yard) - if the refuse is spread in layers not greater than two feet thick and worked from the bottom of the slope to the top. A series of adjoining cells makes up a lift and a series of lifts constitute a sanitary landfill. Refer to Figure 1-5 for an illustrative description of the construction of a cell.

The two basic landfilling methods are the 'area' and 'trench'; other methods are modifications or combinations of the two basic methods. These two methods are further described in the following discussion.

B. Area Method of Sanitary Landfilling

In this method, the refuse is spread and compacted on the natural surface of the ground and cover material is spread and



The cell is the common building block in sanitary landfilling. Solid waste is spread and compacted in layers within a confined area. At the end of each working day, or more frequently, it is covered completely with a thin, continuous layer of soil, which is then also compacted. The compacted waste and soil constitute a cell. A series of adjoining cells makes up a lift. The completed fill consists of one or more lifts.

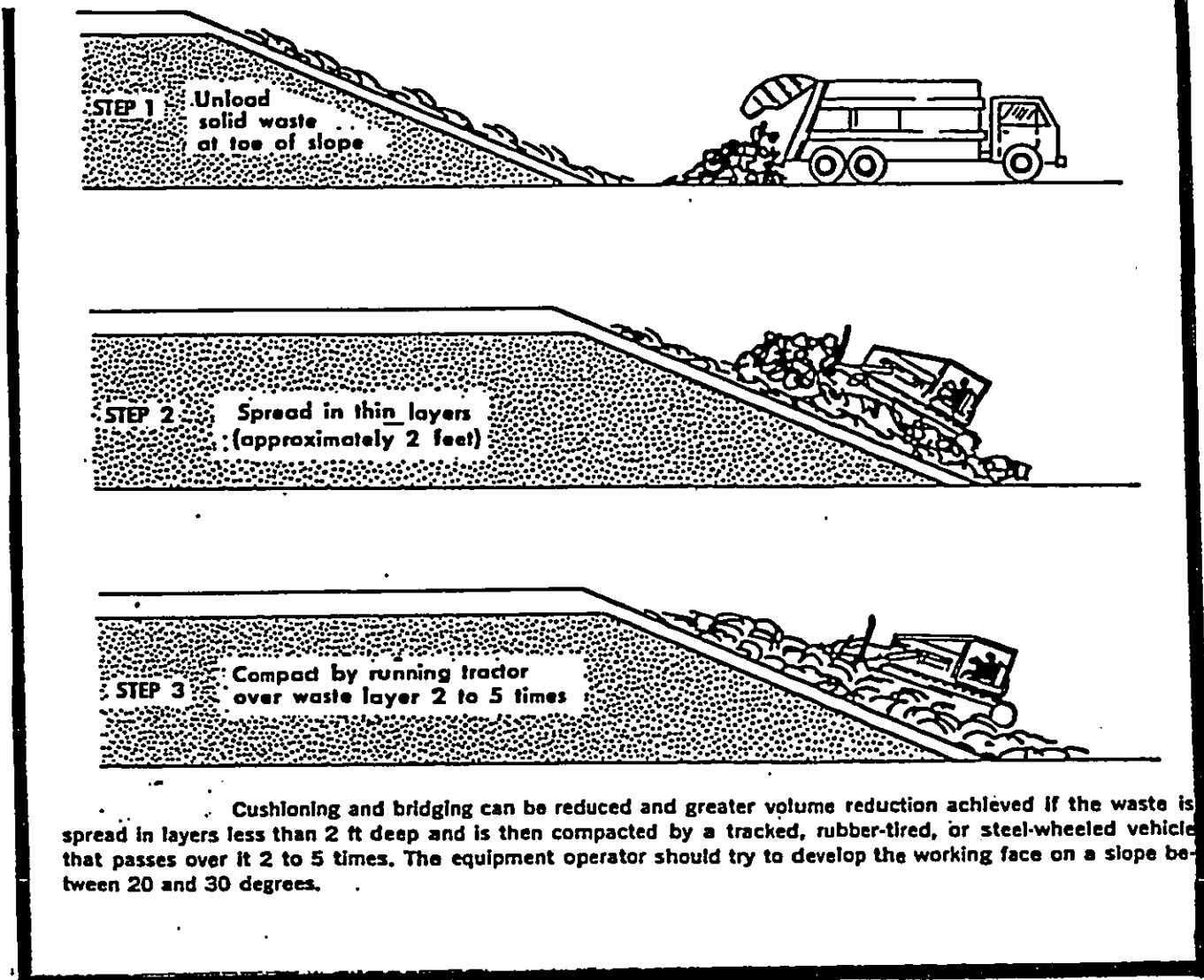


FIGURE 1-5
SOURCE (1.9)

CELL CONSTRUCTION

compacted over it. The area method is used on flat or gently sloping land and also in quarries, ravines, valleys or other land depressions. Refer to Figure 1-6.

C. Trench Method of Sanitary Landfilling

In the trench method, a long narrow excavation is made in the ground and the excavated soil is stockpiled. Refuse is placed in the excavation, spread and compacted. The cover material, which is taken from the spoil of the excavation, is spread and compacted over the deposited refuse to form the basic cell structure. In this method, the cover material is readily available as a result of the excavation and the spoil not needed for daily cover is stockpiled for later use. Refer to Figure 1-6.

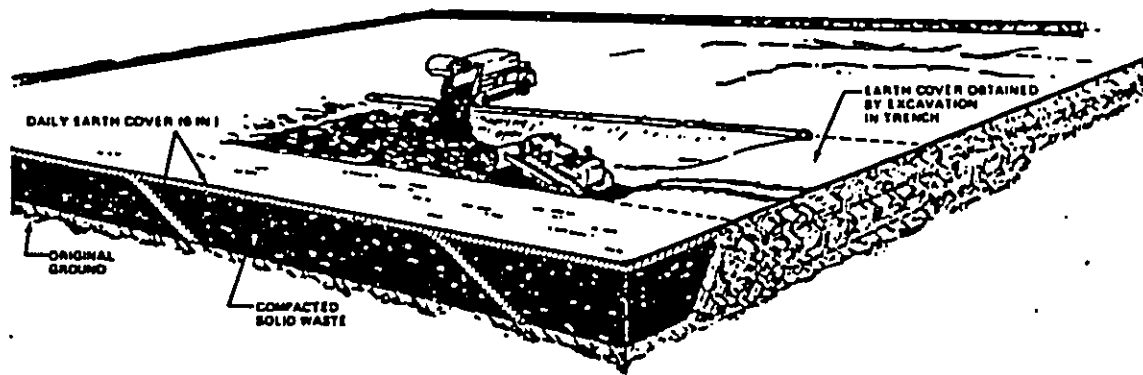
D. Combination Methods

As previously mentioned, the area and trench methods are the two basic methods of sanitary landfilling. However, a sanitary landfill does not need to be operated by using only the area or trench methods. Combinations of the two methods are possible and flexibility in the design and operation of a landfill is one of the greatest assets of a sanitary landfill.

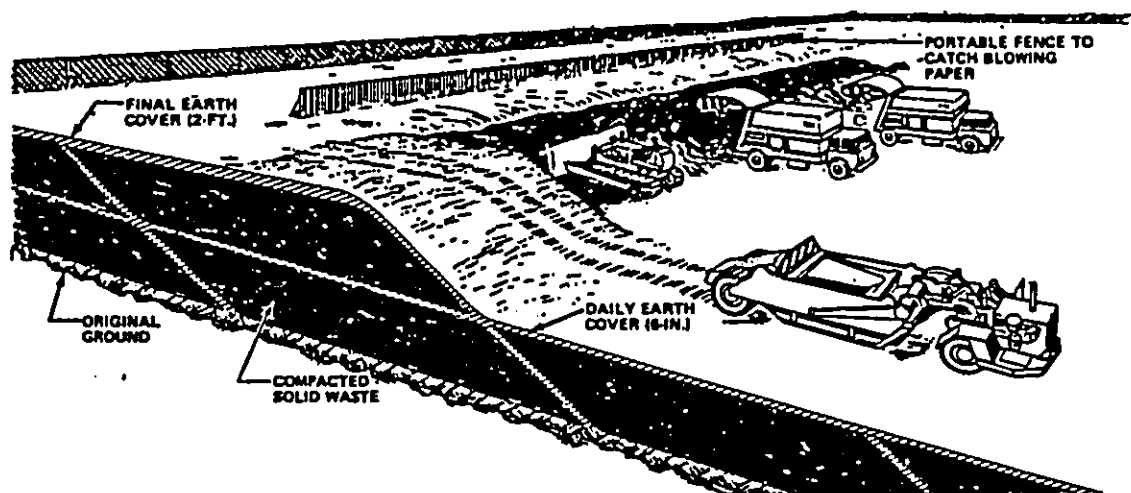
1. Slope or Ramp Method

A common variation is the 'progressive slope' or 'ramp' method, in which the refuse is spread and compacted on a slope. The cover material is obtained directly in front of the working face by daily excavation and the spoil is removed and stockpiled. In this way, a small excavation is made for a portion of the next day's refuse. Refer to Figure 1-6.

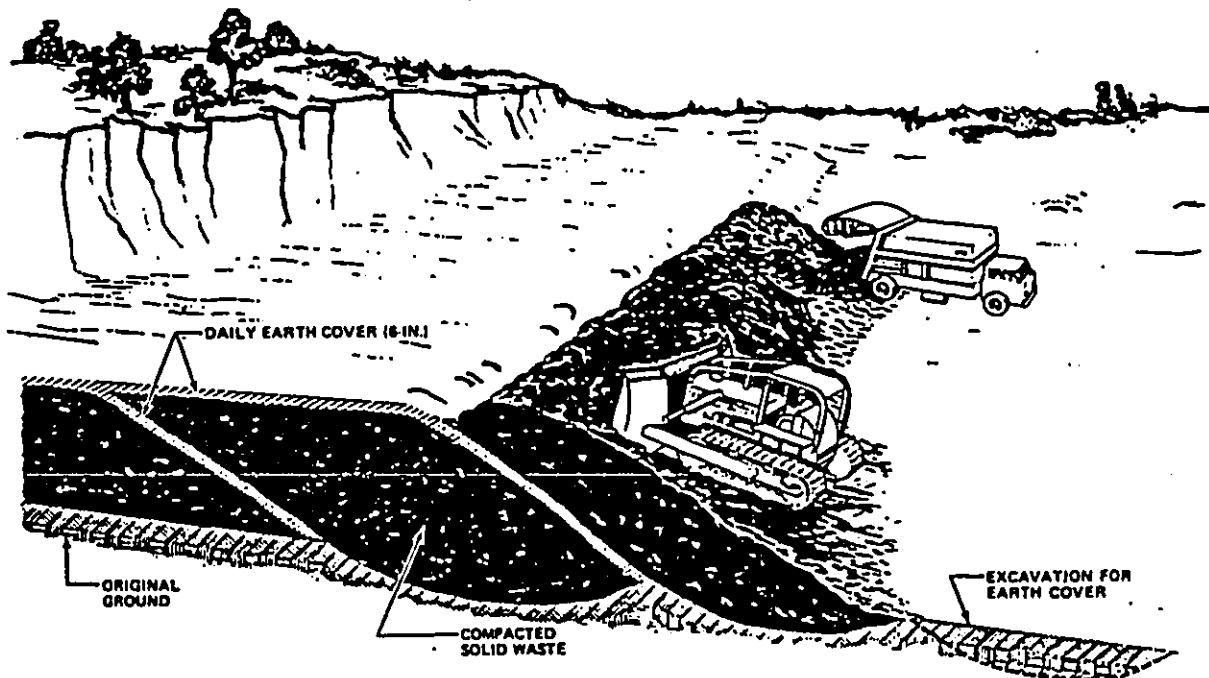
This method allows for more efficient use of the disposal site when a single lift is constructed than the area method does, because cover does not have to be imported and a portion of the waste is deposited below the original ground surface.



In the trench method of sanitary landfilling, the collection truck deposits its load into a trench where a bulldozer spreads and compacts it. At the end of the day, the trench is extended, and the excavated soil is used as daily cover material.



In the area method of sanitary landfilling, a bulldozer spreads and compacts the waste on the natural surface of the ground, and a scraper is used to haul the cover material at the end of the day's operations.



In the progressive slope or ramp method of sanitary landfilling, solid waste is spread and compacted on a slope. Cover material is obtained directly in front of the working face and compacted on the waste.

2. Combination Of Trench And Area Methods

The site conditions determines whether or not a combination of the area and trench method of landfilling is used. In many cases both methods are used within a landfill site if the site has a thick soil zone over much of it and only a shallow soil over the remainder. The initial stage will use the trench method in the thick soil zone and the extra soil material obtained from the trench to carry out the area method of landfilling over the remainder of the site. Once this has been completed, additional lifts can be constructed using the area method by having cover material hauled in.

E. Soil Cover and Placement of Cover Material

1. Soil Cover

The striking visual difference between a 'dump' and a properly designed and operated 'sanitary landfill' is the use of soil cover for the latter. The compacted solid waste is fully enclosed within a compacted earth layer at the end of each working day.

The soil cover material performs numerous functions at a sanitary landfill. The cover material controls flies and other insects by preventing the insects from entering the landfill and their larvae from emerging. Tests conducted on landfills show that a six inch layer of compacted sandy loam soil prevented fly emergence.

The cover material also discourages the entrance of rodents (mice and rats) seeking food and prevents scavenging birds from feeding on the refuse. The daily cover greatly reduces the attraction of birds to the waste and also discourages rodents from burrowing into the landfill to obtain food.

2. Placement of the Cover Material

Cover materials used at a sanitary landfill are generally classified as 'daily', 'intermediate' and 'final'. The classifications depend on the thickness of the soil used. The

thickness is determined by the soils susceptibility to wind and water erosion and to meet certain functional requirements. The guidelines for using different classes of cover material is determined by the length of time the cover material is to be exposed to wind and rain.

For example, if the cover is to be exposed for less than one-week, daily cover (six inches) will suffice. However, if more than a week but less than a year, intermediate cover (one foot) will suffice and if the cover is exposed longer than a year, final cover (two feet or more) should be used. Refer to Table 1-4. The cover material is generally compacted to a density of 100 to 135 pounds/cubic foot for coarse grained soils and 70 to 120 pounds/cubic foot for fine grained soils.

Table 1-4
Application of Cover Material

Cover Material	Minimum Thickness	Exposure Time*
Daily	6 inches	0-7 days
Intermediate	1 foot	7-365 days
Final	2 feet	> 365 days

*The length of time cover material will be exposed to erosion by wind and rain.

a. Daily Cover

The important function of daily cover is the control of vectors, litter, fire and moisture. The daily cover of soil is applied to the compacted refuse at the end of each working day or, when possible, the soil may also be spread and compacted on the top and sideslopes as construction of the cell progresses, leaving only the working face exposed during the day. The working face is closed at the end of each operating day.

b. Intermediate Cover

The functions of intermediate cover are the same as daily cover but may include provisions for gas control and may function as a temporary road base. It is applied in the same manner but differing in the compacted depth of one foot.

c. Final Cover

Final cover functions basically like intermediate cover with the exception that it must also support vegetation. At a minimum, two feet of soil should be used compacted into six-inch thick layers.

3. Grading

Grading is extremely important and the final grade of the landfill is designed to eliminate ponding of water on the landfill surface. Also the final grades are not to exceed two to four percent to prevent water erosion of the final cover material. The side slopes should be less than one vertical to three horizontal to minimize maintenance.

F. Fires

No burning wastes is permitted at a sanitary landfill, but fires occur occasionally because of spontaneous combustion and the delivery of "hot wastes".

The enforcement of the following is the first step in preventing fire. Rigid inspection of incoming refuse for smoldering embers and segregation of this waste. Controlled inspection and dumping of refuse at the operating face of the landfill and tight security of the landfill during nonworking hours.

In the event the inspection fails, and a small fire starts at the operating face, all equipment operators are trained to isolate and extinguish the small fires.

For larger fires, waste in the burning area will be isolated so that water and or dirt can be applied. At this stage, the fire department will also render assistance.

The use of daily cover and the design of the landfill to incorporate 'cells' limits fires to a cell rather than allowing it to spread throughout the entire landfill. This is an effective means of preventing as well as combating a fire once it has started.

G. Decomposition Gas Production

The natural decomposition of refuse produces gas as a byproduct of the decomposition process. The quantity of gas generated and its composition is dependent on the type and amount of refuse.

Methane and carbon dioxide are the major constituents of landfill decomposition gas but other gasses are also present and some may impart a repugnant odor. Landfill gas is important to consider because methane gas can explode when present in air at concentration between five and fifteen percent. Since there is no oxygen present in a landfill when methane concentration in it reaches this critical level, there is no danger of the landfill exploding. If the methane vents into the atmosphere, it may accumulate in buildings or other enclosed spaces and present a potential problem. This can be easily prevented by venting the gas and preventing its lateral movement by the use of impermeable barriers.

Methane gas production from sanitary landfills is not necessarily a liability. Recovering, purifying, and marketing methane gas produced in sanitary landfills are being explored as a means of controlling gas migration, and eliminating a potential hazard, while utilizing an otherwise unexploited resource. Los Angeles has been successful in recovering methane gas from its landfill since 1974. The extracted gas runs an internal combustion engine powering a generation that produces 200 kilowatts of electrical power for about 350 residences. The NRG NuFuel Co. and the sanitation districts of Los Angeles County are also trying to recover methane from a landfill. The extracted methane has been cleansed for insertion into a natural gas pipeline. "The city of Mountain View, California and the Pacific Gas & Electric Co. are cooperating with EPA in a pilot effort to define parameters involved in gas extraction and to investigate marketing alternatives." [1.5].

H. Leachate [1.11]

Groundwater or infiltrating surface water moving through refuse can produce leachate. Leachate is a solution containing dissolved and finely suspended solid matter and microbial waste products. The exact composition of the leachate varies from one location to another and is dependent on the composition of the refuse.

The leachate percolating through the soils underlying and surrounding the landfill is subject to purification of the contaminants by ion exchange, filtration, absorption complexing, precipitation and biodegradation.

Leachate production is dependent on the availability of water entering the landfill. Through sound engineering design and proper operation, leachate production and movement may be prevented or contained to the extent that it will not create a water pollution problem. Therefore, the most obvious means of controlling leachate production and movement is to prevent water from entering the sanitary landfill to the greatest extent possible. This can be accomplished by the installation of drainage system around the landfill, correct slopes and grades within the landfill and the use of proper soil cover.

IV. PROPOSED LEeward SANITARY LANDFILL DEVELOPMENT

A. Site Improvements

A sanitary landfill requires the following site improvements: 1) clearing and grubbing of the site; 2) permanent roads from the public road systems to the site; 3) a scale to record the weights of refuse; 4) office buildings; 5) utilities (electrical, water and sanitary services); 6) peripheral and portable fences for security and litter control; 7) surface drainage system; 8) green buffer zones, landscaped to screen a visually prominent site.

All of the site improvements will be required for the Leeward Sanitary Landfill - Waimanalo Gulch and Ohikilolo sites. The details will be worked out during the engineering design phase of this project.

B. Operation and Phasing

1. Operation

Municipal and private refuse collection trucks using either facility will first be weighed before proceeding to the deposition area. Private refuse collection trucks will be charged a fee based on the weight of the load. Homeowners' and non-profit-related vehicles are allowed to proceed directly to the landfill area but the number of vehicles is recorded.

Vehicles approaching the deposition area will be routed by a landfill attendant who will direct the vehicles to the area of the landfill accepting the type of refuse load. The type of refuse accepted at a municipally operated sanitary landfill is standard residential and commercial refuse, some dead animals, demolition materials, and dewatered and digested sludge from sewage treatment plants.

Refuse unloaded at the working surface will be spread in layers less than two feet deep. Tracked steel-wheeled vehicles will compact the refuse by passing over the layer two to five times. This procedure will be repeated as required according to incoming refuse quantities. At the end of each day, the compacted waste will be covered with a six-inch soil cover, in compliance with Chapter 58 of Title 11, Administrative Rules on Solid Waste Management Control, State Department of Health to mitigate possible vector, odor, fire, and litter problems [1.9]. Sufficient cover material is either available on-site or will be purchased. Hazardous wastes as defined under Resource Conservation and Recovery Act, 1976 (RCRA) will not be accepted in the proposed sanitary landfill.

As sections of the sanitary landfill attain their design capacities, these areas will be layered with a final soil cover and landscaped according to the engineering management plan. As previously discussed, the sanitary landfill will require periodic maintenance after completion to assure that proper gas and leachate monitoring and mitigative measures are maintained.

2. Phasing

The Waimanalo Gulch site will be opened first and then the Ohikilolo site. The landfill may be in operation by 1985.

V. FUNDING

The estimate project cost for the Leeward District Sanitary Landfill is \$23,440,000,00 and will be funded by the City and County of Honolulu.

TABLE 1-5

Project Costs (1983 Dollars)

<u>ITEM</u>	<u>COST</u>
Development Cost	
*Waimanalo Gulch	\$ 2,240,000.00
Ohikilolo Valley	3,200,000.00
Equipment Cost	<u>3,000,000.00</u>
	\$ 8,440,000.00
Administrative Operation & Maintenance & Supply Cost	<u>\$ 2,000,000.00</u> (per year)

*Preliminary cost estimate for opening landfill (May 1983).

REFERENCES TO SECTION 1

- [1.1] Interim Solid Waste Management Plan. July 1981. City and County of Honolulu Department of Public Works.
- [1.2] June 1982. Division of Refuse, Department of Public Works, City and County of Honolulu.
- [1.3] Sanitary Landfill Design and Operation. 1970. Prepared by D. R. Brunner and D. J. Keller for the U. S. Environmental Protection Agency, Washington, D.C.
- [1.4] Ibid.
- [1.5] Decision-Makers Guide in Solid Waste Management. 1976. Environmental Protection Agency. Page 89.
- [1.6] Leachate Study, Landfill Inventory Study, City and County of Honolulu. 1977. Prepared by EMCON Associates for City and County of Honolulu Department of Public Works.
- [1.7] Inventory of Potential Sanitary and Demolition Landfill Sites on the Island of Oahu. August, 1977. Prepared for the City and County of Honolulu Department of Public Works by Stanley S. Shimabukuro & Associates, Inc.
- [1.8] Draft Kalaheo Sanitary Landfill Alternative Access Road Study. 1982. Prepared by Austin, Tsutsumi & Associates for Environment Impact Study Corp.
- [1.9] Public Health Regulations Chapter 58 of Title 11, Administrative Rules on Solid Waste Management Control. State of Hawaii Department of Health. Honolulu, Hawaii.
- [1.10] Op. Cit., [1.3], p. 35, Table 6.
- [1.11] Op. Cit., [1.3], p. 4.

Affected Environment

2

SECTION 2

DESCRIPTION OF THE AFFECTED ENVIRONMENT

This section provides information on the biophysical and socioeconomic characteristics of the area involved with the proposed project. This information base is used in the evaluation of the impacts anticipated from the proposed project, as discussed in Section 4 of this report. The information is provided in two parts. Part A (Waimanalo Gulch) and Part B (Ohikilolo).

Section 2 is divided into two parts, Part A deals with the Waimanalo Gulch and Part B with the Ohikilolo Valley site.

The purpose of separating the information contained in section 2 is to facilitate review of the document. Not all reviewers will be concerned with both sites to be used for landfilling. Also, the two sites of the Leeward District Sanitary Landfill are separated from each other and must be described individually because of the different physical characteristics.

SECTION 2

DESCRIPTION OF THE AFFECTED ENVIRONMENT

PART A

Waimanalo Gulch

PART A WAIMANALO GULCH [TMK 9-2-03:13, 40 portion of 2]

I. PROJECT SITE DATA

A. Location

The project site is located in Waimanalo Gulch approximately 32.8 miles west of Honolulu, two miles south east of Nanakuli and one mile northwest of Honokai Hale. Refer to Figures 2-1 and 2-2.

B. Area and Ownership

The entire project area consists of approximately 260 acres, of the total, only 57+ acres will be used for the landfill.

The present owners of the land are James Campbell Trust Estate, Robert and Audrey Au, Raymond and Bett Au, Edward and Lai Fong Au, Hawaiian Electric Company, Inc.

C. Present land use of the Site

The project site contains vacant and undeveloped land. Two abandoned tunnels previously owned and occupied by the military are located at about elevation of 275 feet. Existing electrical transmission lines from the Kahe electrical generating plant transverse the project site between elevations 760 and 840 feet. Prior to 1960, the site was periodically used for cattle grazing. The project site is presently unused.

D. Present Land Use of Adjacent Area

Single-family dwellings are located adjacent to the project site. There are thirteen homes in the area (they are not located within the project boundary). The existing Kahe Electrical Power Plant is located approximately 3,000 feet northwest of the project site. Sugar cane fields are located directly south across Farrington Highway and a residential area (Honokai Hale) containing approximately 270 homes is located about one mile east and makai of the highway. Refer to Figure 2-2 for additional information.

E. Characteristics of the Site as a Landfill

1. Topography

The project site is long and narrow and only 57+ acres of the 260 total acres will be used as a landfill. The topography and slopes of 8% to 18% limits the useful area which can be used as a landfill.

2. Cover Material

There is little cover material available onsite and cover material will be imported to the landfill site.

3. Capacity

The capacity of the landfill is estimated at 7+ years at a fill rate of 1,000 tons per day. This is equivalent to approximately 6,000,000 + cubic yards of refuse.

4. Ground Water Supply

The project site is located in an area where sanitary landfills are permitted by the Board of Water Supply and the Department of Health.

5. Utilities

Except for sanitary sewer, utilities are available from Farrington Highway adjacent to the project site.

6. Drainage

The drainage area is 680+ acres and the Q is 3,000 CFS (Curve B C&C Standards).

II. PHYSICAL CHARACTERISTICS

A. Regional Geology

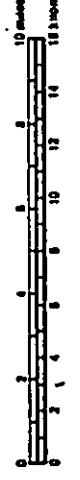
The island of Oahu represents eroded remnants of two shield (broadly rounded, dome-shaped) volcanoes, Waianae and Koolau. The Koolau volcano was the more recent of the two and its lavas, Koolau Volcanic Series, flowed and banked against the Waianae volcano shield to form the Schofield Plateau. After a long quiescent period during which erosion cut canyons several thousand feet deep another series of lava flows, Honolulu Volcanic Series, formed cinder and tuff cones [2.1]. Refer to Figure 2-3.

The Waianae Volcanic Series is divided into lower, middle and upper members. Figure 2-3. The lower member comprises the lava flows and associated pyroclastic rocks that built the main portion of the Waianae shield volcano. The middle member consists of rocks that accumulated in the caldera and gradually filled the cladera. The upper member is the thin cap that appears to cover the entire top of the shield volcano. [2.2]

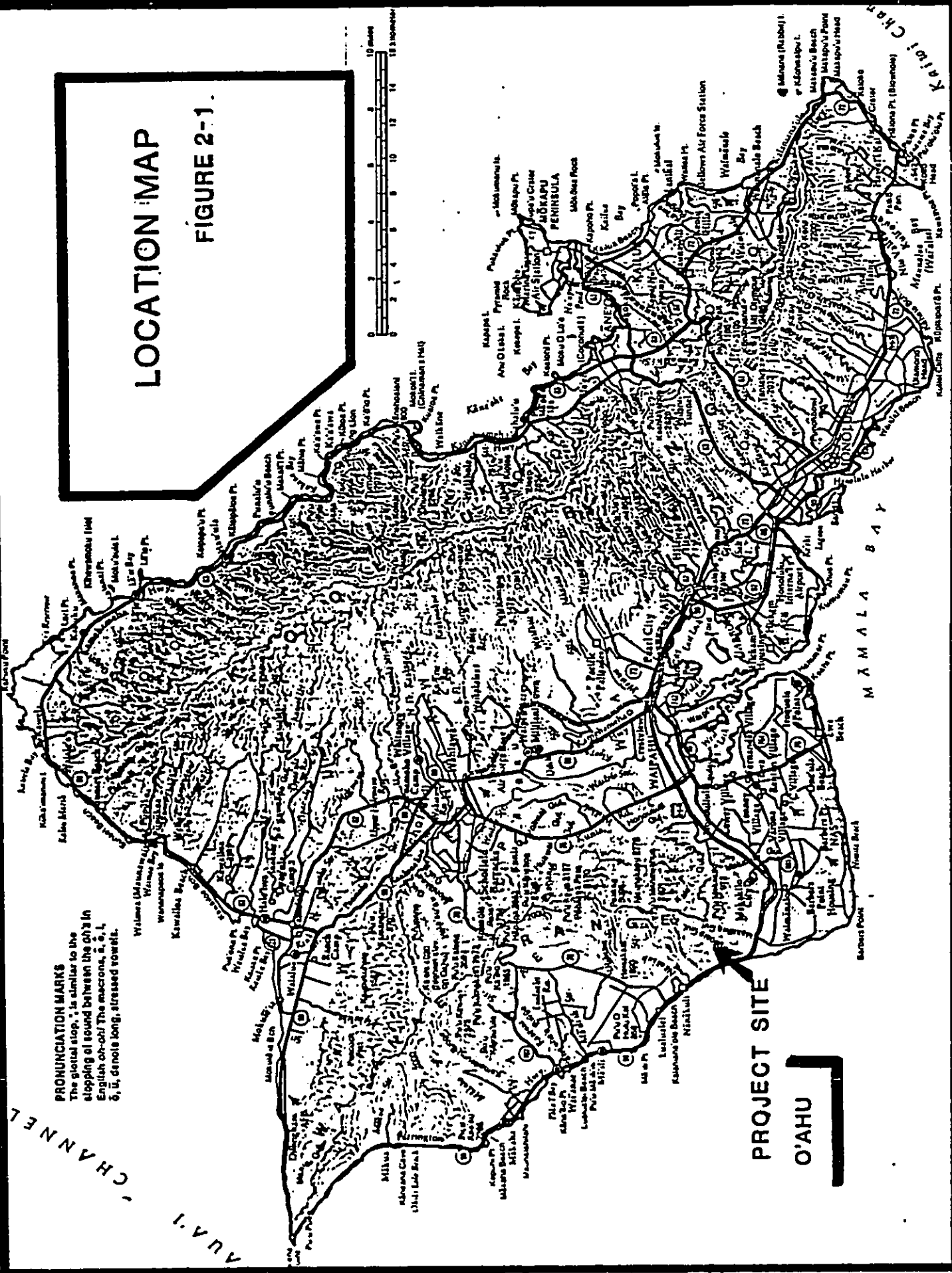
The rocks found in the various members consists of the tholeiitic group in the lower and middle members and a transition

LOCATION MAP

FIGURE 2-1

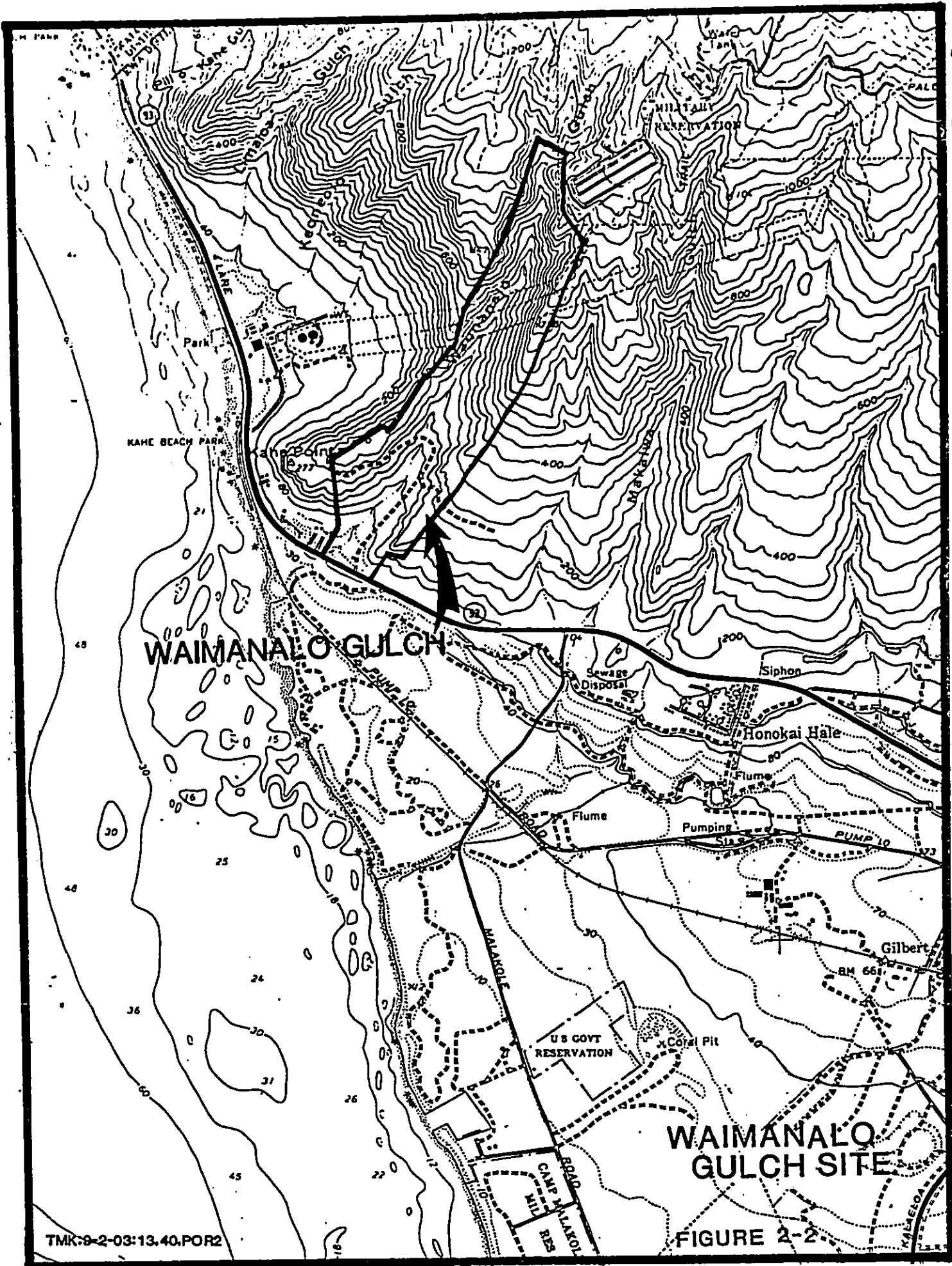


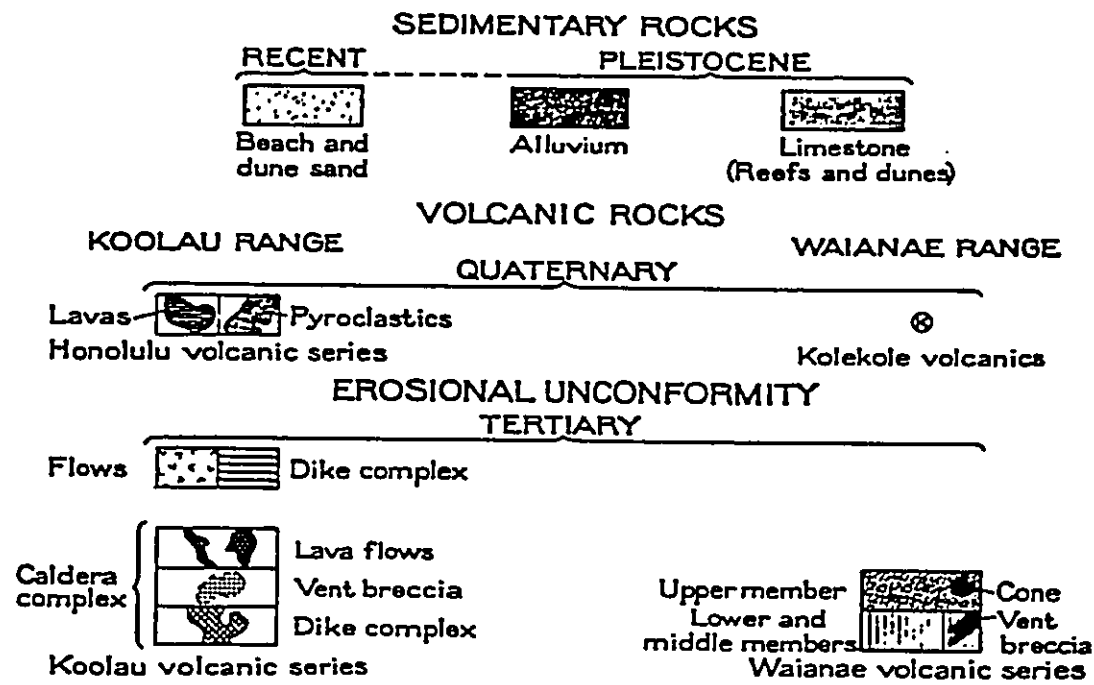
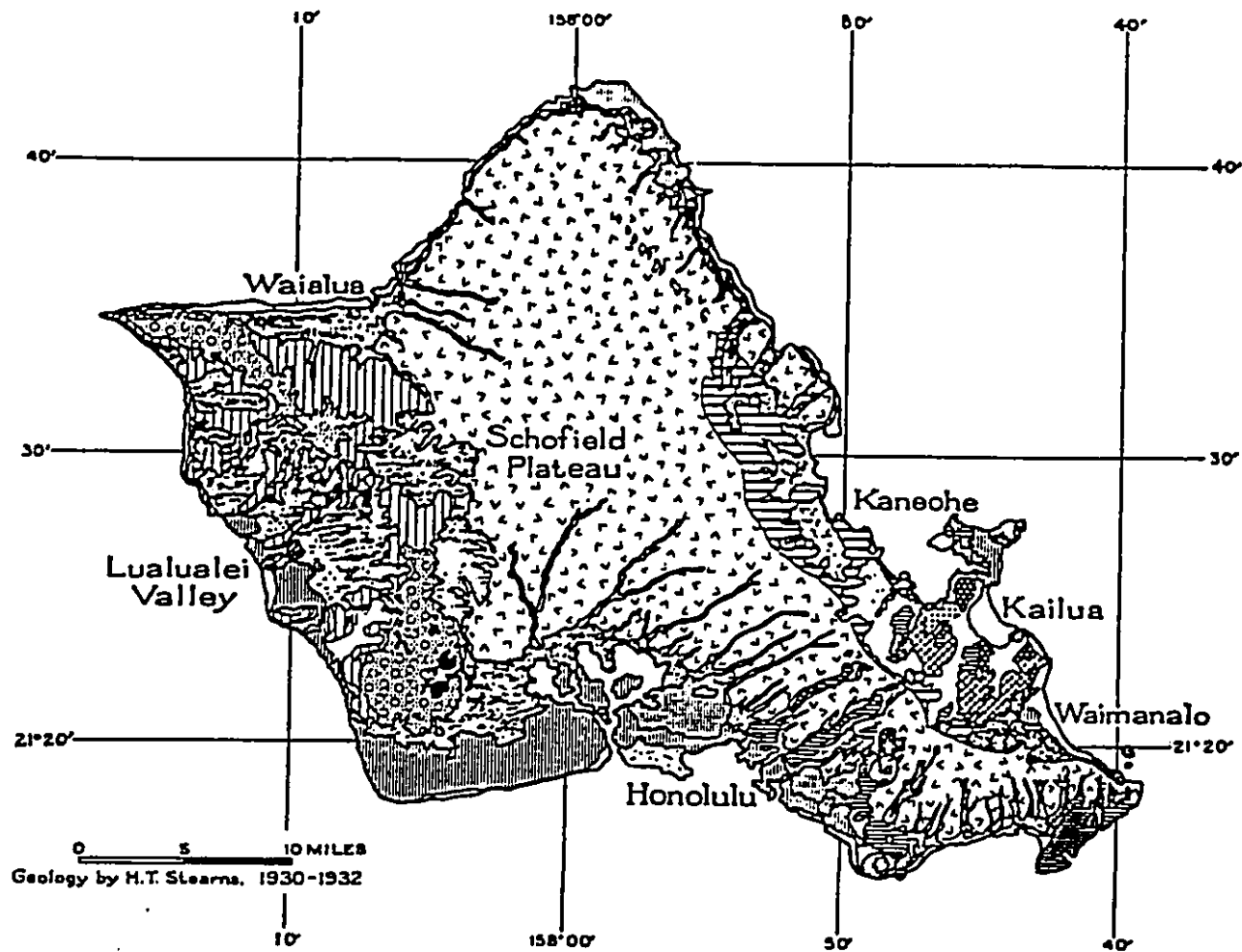
PRONUNCIATION MARKS
 The glottal stop, ' , is similar to the
 stopping of sound between the o's in
 English on-off. The macrons, ā, ē, ī,
 ō, ū, denote long, stressed vowels.



PROJECT SITE

O'AHU





SOURCE: [2-3]

GEOLOGIC MAP
FIGURE 2-3

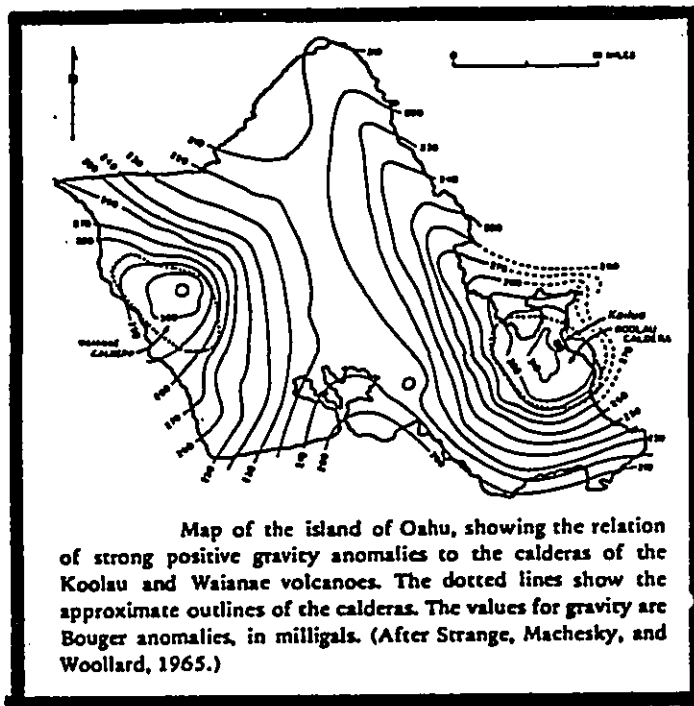


Figure 2-4

WAIANAEE VOLCANO CALDERA

Source: Fig.174 p.283 (2.1)
Volcanos in the Sea. The Ecology of Hawaii.1970.
 MacDonald,Gordon;Agatin T. Abbott. U.H. Press

to the alkalic basalts in the upper portion of the middle member. The upper member consists mainly of hawaiite with lesser amounts of alkalic olivine basalt.

Erosion has removed most of the western slope of the Waianae shield and exposed the internal structure of the volcano. The shield was built by eruptions that took place along three rift zones. The two principal rifts zones trended northwestward and southeastward from the summit and a lesser one trended northeastward.

The caldera of the Waianae volcano lay in the region just west of the Kolekole Pass and extended for about 9 miles, from the northern side of Makaha Valley to the head of Nanakuli Valley. Refer to Figure 2-4. The lavas that accumulated in the caldera are thick and massive compared with the thin flows that poured out of the caldera.

Along the lower southeastern slope of the Waianae range is a row of five very late cones; Puu Kuua, Puu Kapuai, Puu Makakilo, Puu Palailai and Puu Kapolei. At Puu Palailai former quarrying activities has removed most of the former crater fill consisting of a varied mixture of cinder, spatter and lava flows. The valleys of the Waianae Range are filled with enormous deposits of alluvium and colluvium.

B. Soils

As shown in Figure 2-5, soils found on the project site are:
Lualualei extremely stony clay 3 to 5% slope (LPE) [2.3]

This soil occurs on talus slopes of Oahu and Kauai. The slope range is from 3 to 35%, but in most places the soil is moderately sloping to steep. It is impractical to cultivate this soil unless the stones are removed. Runoff is medium to rapid and the erosion hazard is moderate to severe.

The Lualualei soil series (LPE) is characterized as poor for the construction of roadways due to having a high shrink-swell potential, the presence of numerous stones and the steep slopes. The soil series is also a poor source for topsoil and roadfill because it is very sticky and plastic. [2.4] The high shrink-swell potential



----- Approximate landfill boundary

SOILS

FIGURE 2-5

and low shear strength and slow permeability of water adversely affects the foundations for low buildings and septic tank fields.

Rock Land (rRK) [2.5]

Rock land (rRK) is made up of areas where exposed rock covers 25% to 90% of the surface. The rock outcrops and very shallow soils are the main characteristics. These rock outcrops are composed of basalt and andesite. The soil material associated with rock land is very plastic and sticky and has a very high shrink-swell potential. These characteristics cause buildings to slide and foundations and retaining walls to crack when the soil becomes saturated with water.

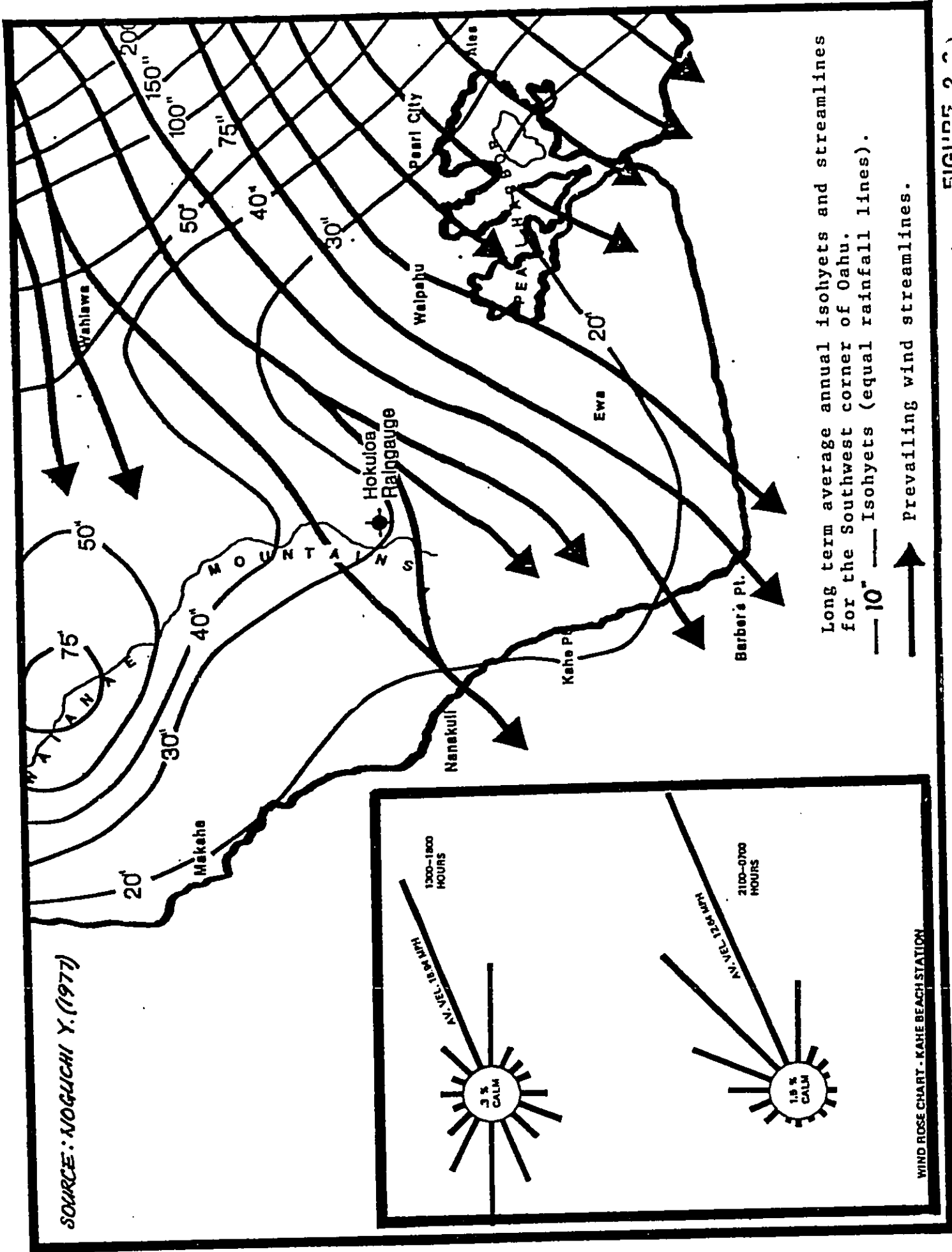
C. Topography

The topography of the project site consists of a deep gulch. At the lower end, the elevation of the gulch is 50 feet and rises to 450 feet over a distance of 4,800 feet. At its widest point, the gulch is approximately 1,000 feet wide. The mauka-makai slope of the gulch varies from 8 percent at the lower end to 18 percent at the upper end.

D. Climate

Figure 2-6 shows the long term average annual rainfall of 20 inches for the southwest corner of Oahu. The project site is located in an area that receives between 20 and 30 inches of rainfall per year. The nearby Waianae Coast, located in the "rain shadow" of the Waianae mountains is the driest in Oahu. Rainfall increases substantially with elevation and reaches average annual amounts in excess of 75 inches at the top of Mt. Kaala.

The rain gauge station nearest the project site is located at Hokuloa, at an elevation of 2,220 feet (Figure 2-6). During the 1965-1975 period [2.7] the Hokuloa station recorded an average annual rainfall of 42.88 inches with a monthly distribution as shown in Figure 2-7. It has the typical seasonal distribution of rainfall for Hawaiian stations with a dry summer and a wet winter. The Hokuloa station recorded very heavy rainfalls for several winter months during 1965-1975: 17.95 inches in January of 1971, 15.91 inches in November of 1975, and 15.51 inches in January of 1969. These heavy rainfalls are a result of sporadic



SOURCE: NOGUCHI Y. (1977)

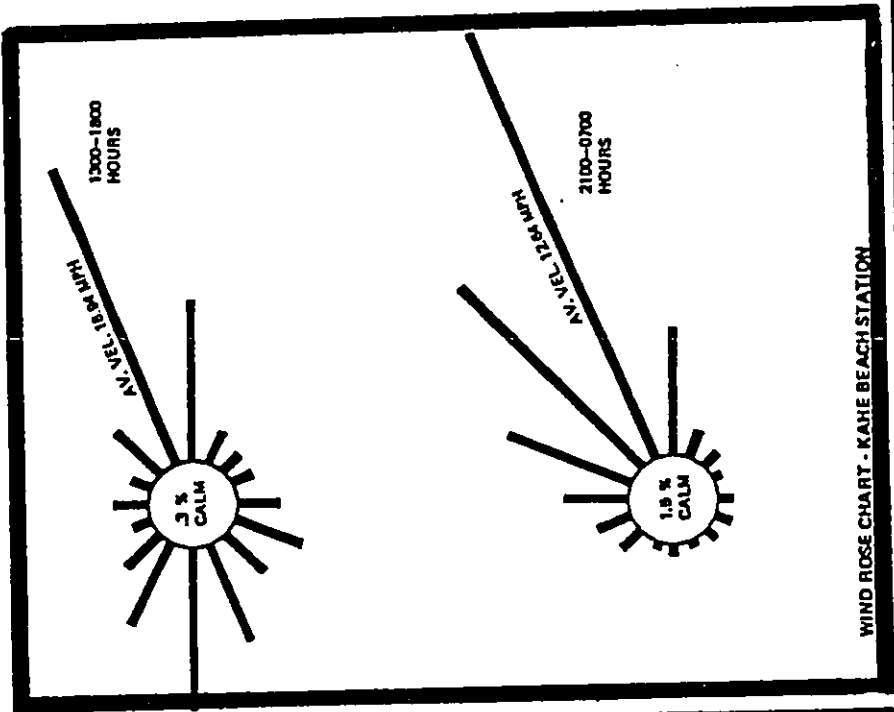
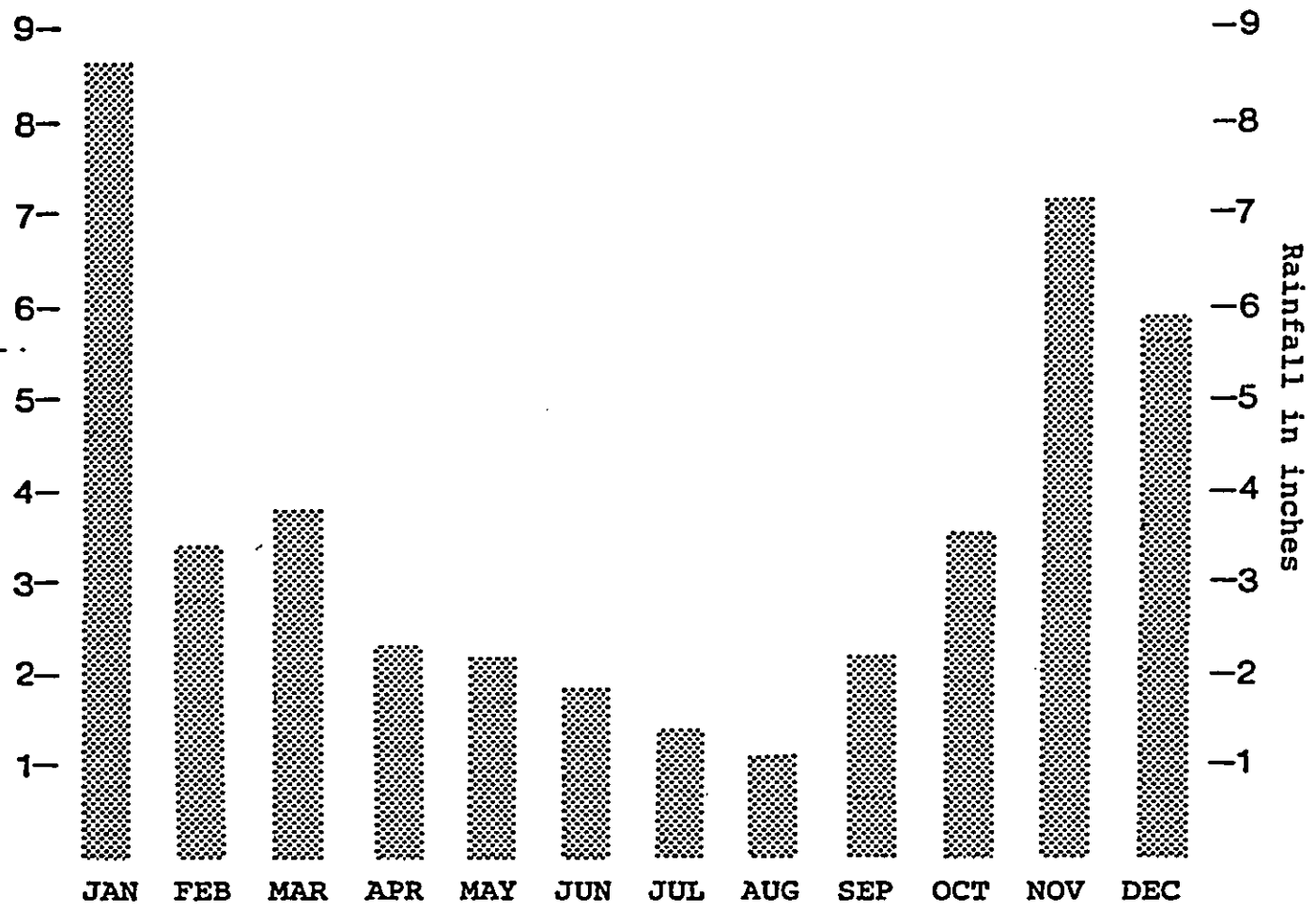


FIGURE 20



Rainfall Climate at Hokuhoa Station, period of record, June 1965 to December 1975. Station location 21° 24'N, 158° 06'W.

FIGURE 2-7.

"Kona storms" that affect the area during the winter months and are a contributing factor to the extensive soil erosion observed in the area.

There are no wind data available for Waimanalo Gulch. In general, the flanking ridges of mountain ranges exposed to trade winds experience enhanced wind speeds. Local and nearby streamlines and speed of prevailing winds can be seen in Figure 2-6, 2-8, and 2-9.

The temperature at Hawaiian stations is mainly a function of the station's elevation. The typical daily temperature range of a low-lying station in the Leeward side of Oahu ranges from the low 60's to the upper 70's during the winter and from the lower 70's to upper 80's in the summer. The temperature decreases with elevation at the rate of approximately 1 to 2°F per 1,000 feet.

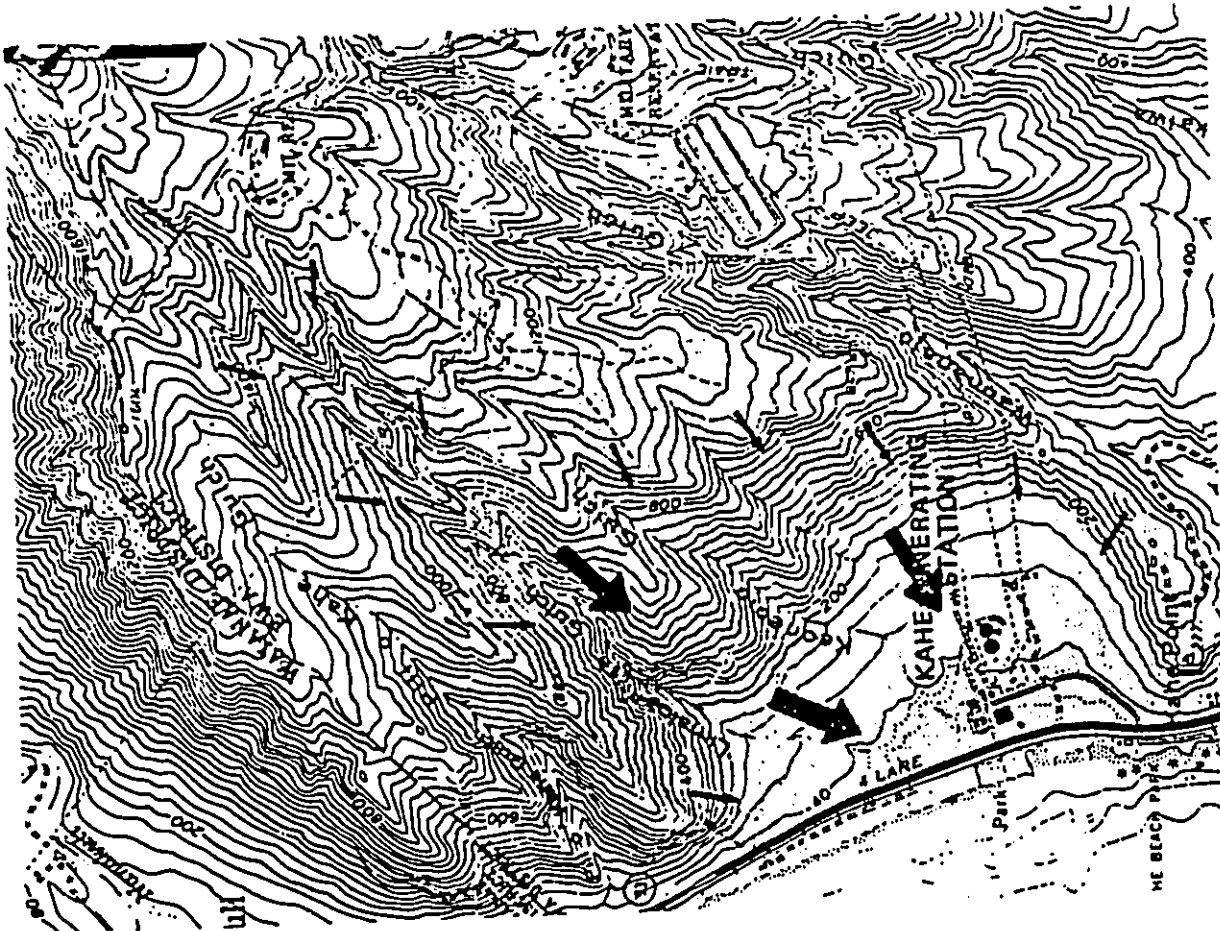
E. Groundwater

The ground water found below Waimanalo Gulch is brackish and not suitable for domestic use. The salinity ranges from 250 ppm to 19,000 ppm (chloride content). [2.8]

The project site is located in an area where sanitary landfills are permitted by the Board of Water Supply. [Refer to Figure 2-10] The Technical Review Committee for Underground Injection Control (UIC) is reviewing the exempt aquifer areas of Oahu. It is expected that while the size of the areas where sanitary landfills are permitted will decrease, the Waimanalo site will remain in the exempted area.

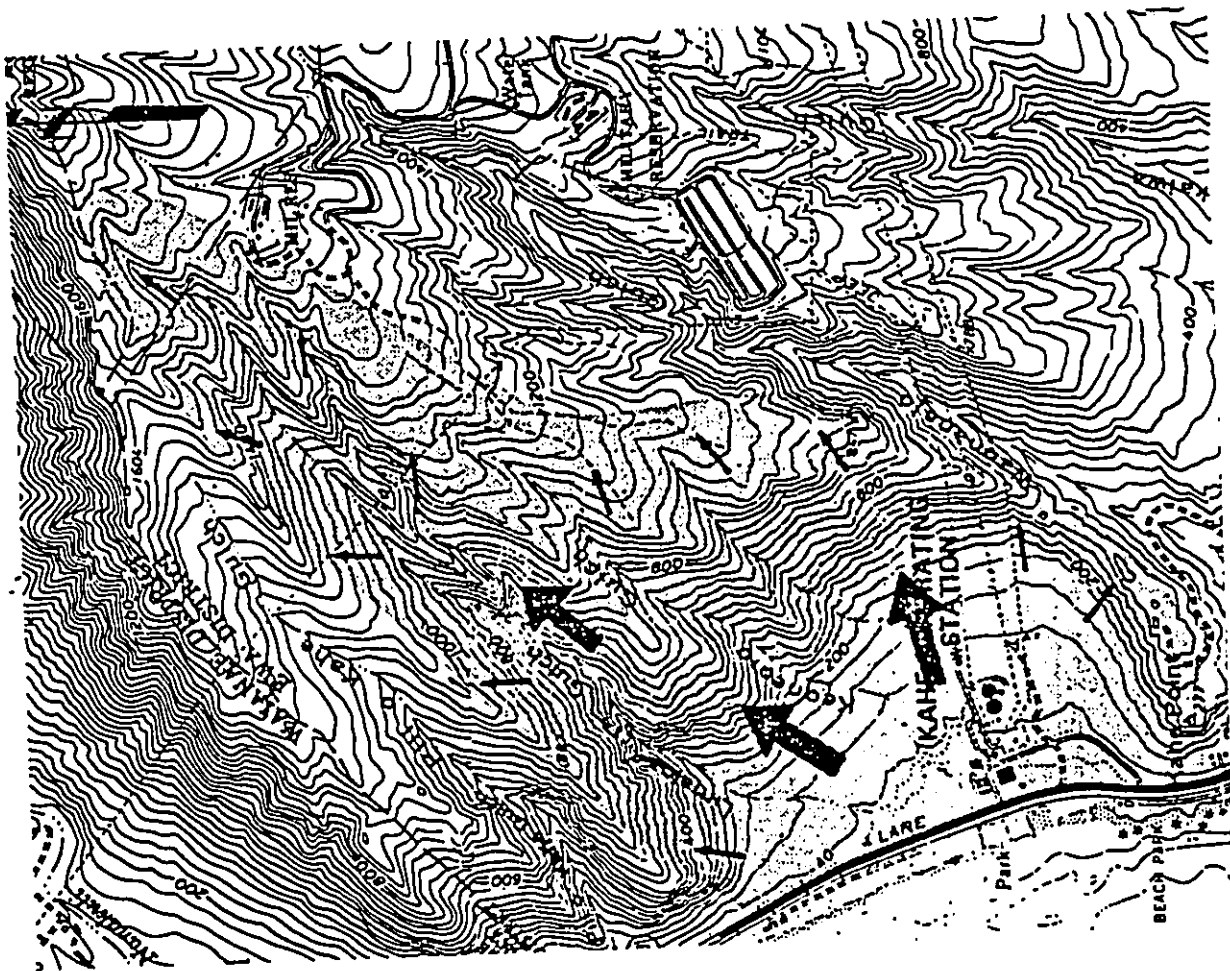
F. Agricultural Lands

The project site is not classified by the Agricultural Lands of Importance to the State of Hawaii (ALISH) system. Refer to Figure 2-11.

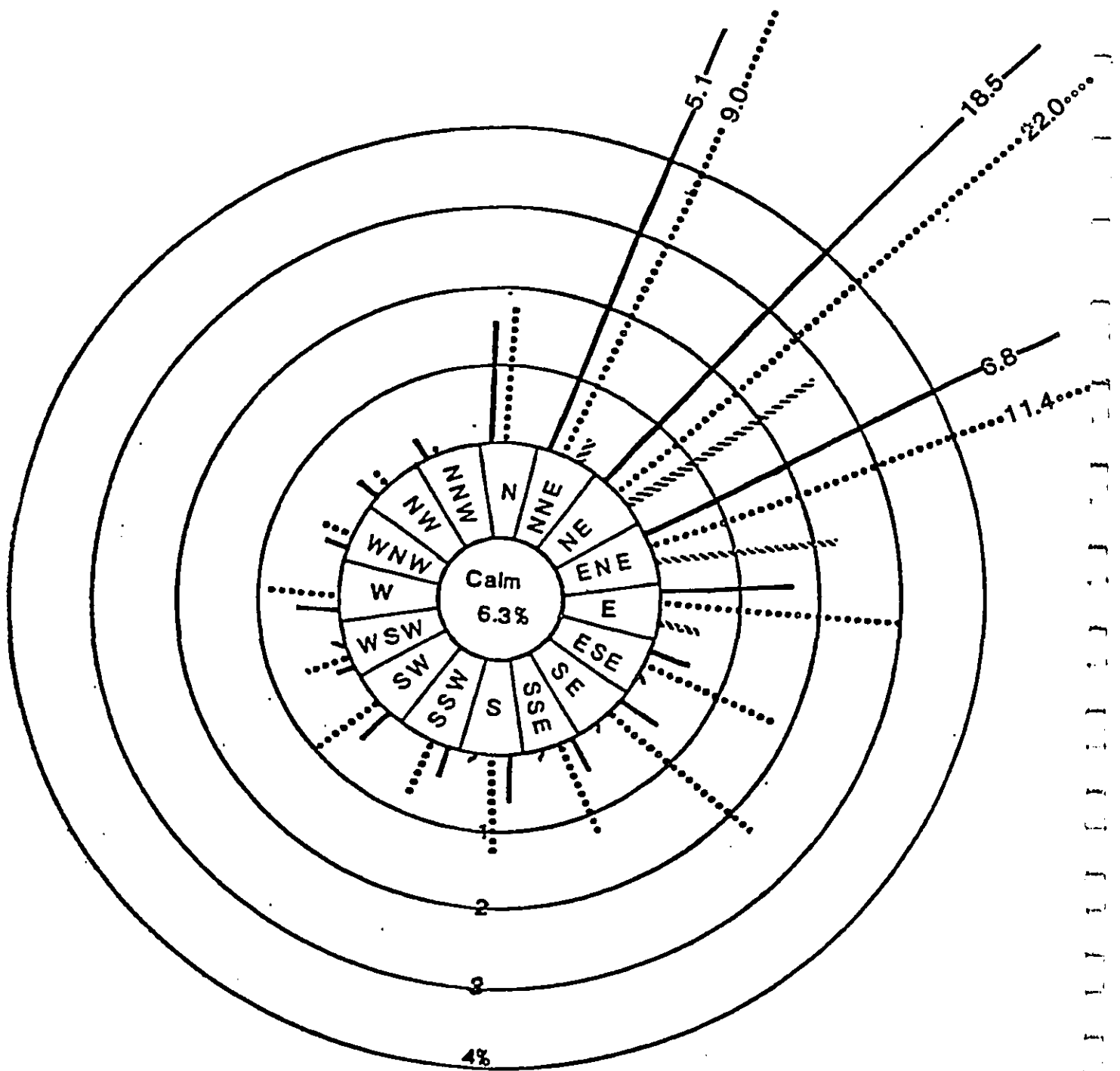


DOWNSLOPE MOTION AND COLLECTION OF COLDER AIR NEAR THE GROUND PRODUCED BY NIGHTTIME RADIATION IN THE AREA SURROUNDING KAHE STATION.

FIGURE 2-8



UPSLOPE MOTION NEAR EARTH'S SURFACE ON SLOPES OF HILLSIDE SURROUNDING KAHE STATION WHEN STRONG SURFACE HEATING OCCURS AN AFTERNOON SEA BREEZE IS DEVELOPED BELOW 1000 FEET NEAR THE COAST.



LEGEND: KNOTS

—— 1-6

..... 7-16

////// MORE THAN 16

WIND ROSE

BARBERS POINT NAS

FIGURE 2-9

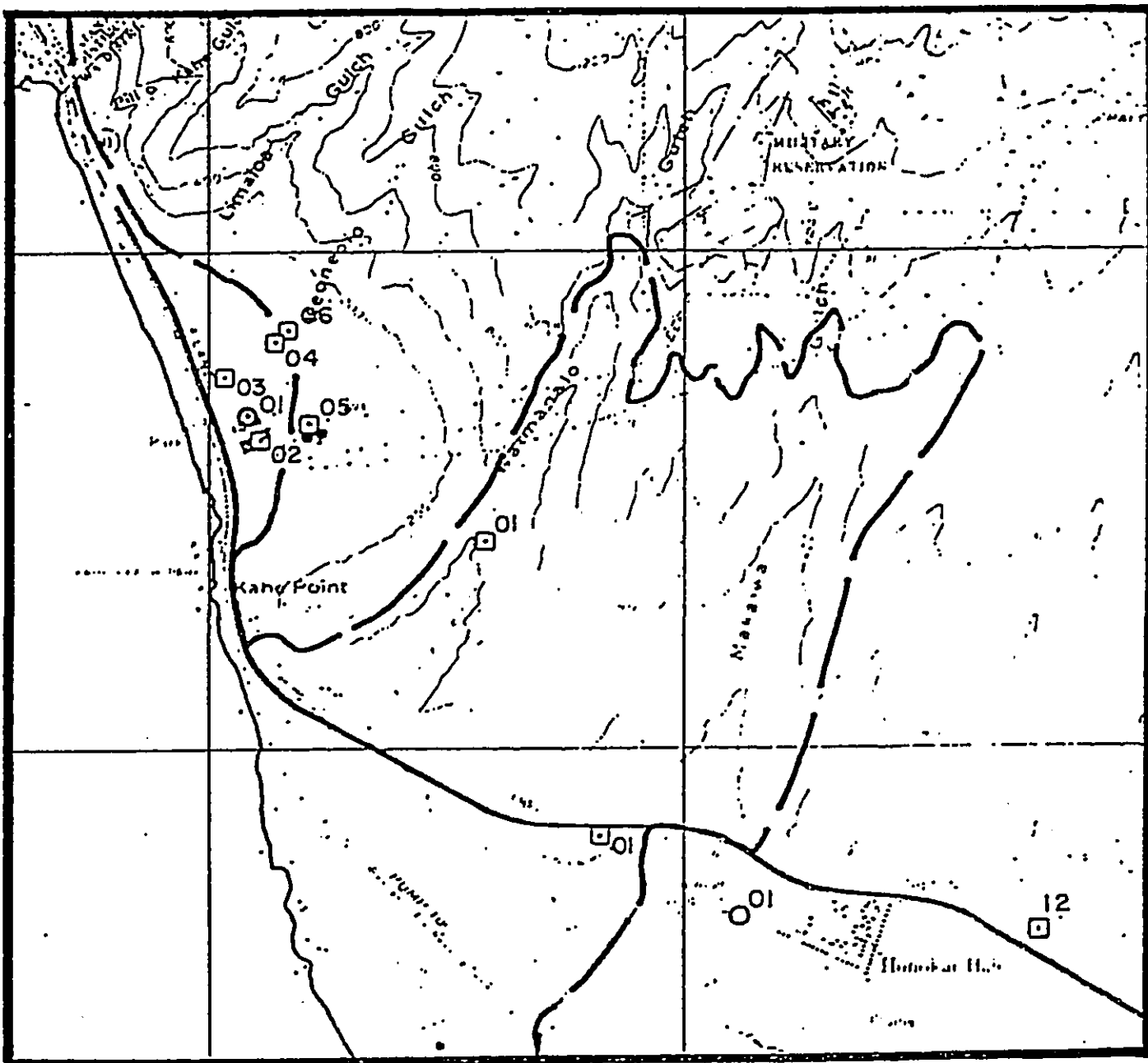


FIGURE 2-10

*The elevation contour depicted on this figure should be corrected to follow the 800-foot contour. (Letter dated Oct. 14, 1983 between DOH & C&C)

UNDERGROUND INJECTION CONTROL [UIC] LINE



AGRICULTURAL LANDS OF IMPORTANCE

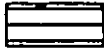




-  **PRIME AGRICULTURAL LAND** - Land which has the soil quality, growing season, and moisture supply needed to produce sustained high yields of crops economically when treated and managed according to modern farming methods.
-  **UNIQUE AGRICULTURAL LAND** - Land that has the special combination of soil quality, location, growing season, moisture supply, and is used to produce sustained high quality and/or high yields of a specific crop when treated and managed according to modern farming methods.
-  **OTHER IMPORTANT AGRICULTURAL LAND** - Land other than Prime or Unique Agricultural Land that is also of state-wide or local importance for agricultural use.
-  **EXISTING URBAN DEVELOPMENT** - Land which has been developed for urban type use.
-  **U.S. GOVERNMENT** - Land which is currently under the jurisdiction of the U.S. Government.

FIGURE 2-11

III. BIOLOGICAL CHARACTERISTICS OF WAIMANALO GULCH (LANDFILLING SITE)

A. Plants (Flora)

The plants found within the area to be used for landfilling consist primarily of exotic species of plants. The predominant vegetation is an overstory of Kiawe trees mixed with koa haole and an understory of grass. The site has been modified over the years and very little native vegetation exists. (Refer to Appendix B for a check list of plants found within the area to be used for landfilling.)

B. Animals (Fauna)

The project site (landfilling area) is not considered a sensitive wildlife habitat and the birds and mammals found on the project site are not rare or endangered species. (Refer to Appendix B for a check list of birds and mammals found within the area to be used for landfilling.)

The birds commonly found include the Barred Dove, Lacenecked Dove, Cardinal, Common Mynah, Japanese white-eye, and House finch. Mammals found within the project site include mongoose, cat, dogs and mice.

IV. INFRASTRUCTURE

A. Utilities

1. Water

Water for the project site will be provided from Board of Water Supply water mains. There is sufficient water available to meet the minor water needs of the project.

2. Electricity

Electrical power is available near the project site and no problems are anticipated in providing electrical power to the project site.

Major electrical transmission lines from the Kahe Generating plant (HECO) traverse the middle and upper portions of the project site. Existing easements for the transmission lines and right-of-way for the utility access road are held by HECO.

The project will be coordinated with Hawaiian Electric (HECO) to prevent disruption to their activities.

B. Police & Fire

1. Police

The project site is located in an area routinely patrolled by the police. The project will not adversely affect the police department.

2. Fire

The Nanakuli Fire Station is located approximately three miles from the project site and response time is approximately 4 minutes. Additional supportive services are available from the Makakilo and Waianae Fire Stations and the response times are approximately 7-10 minutes.

The fire protection for the project site is adequate.

V. SOCIO-ECONOMIC CHARACTERISTICS

A. Population

The population of the census tract (86.01) where the Waimanalo site will be located is 8,559 and there are 2,337 households. Refer to Table 2-1 for additional information.

The nearest major residential area is Makakilo City with a 1980 population of 7,691 and encompassing an area of 1,791 acres - this population is contained within the census tract 86.01.

B. Schools, Hospitals, Rest Homes, Community Centers

The landfill is not located adjacent or in close proximity to schools, hospitals, elderly housing and community centers.

C. Employment

The project will not provide for a significant number of jobs.

VI. ARCHAEOLOGICAL SITES

A surface archaeological reconnaissance of the project site was conducted. There are no significant archaeological sites on the project site. The results of the surface survey can be found in Appendix C of this report.

REFERENCES TO SECTION 2

Part A: Waimanalo Gulch

- [2.1] Macdonald, Gordon A. and Agatin T. Abbott. 1970. Volcanoes in the Sea. University of Hawaii Press, Honolulu, Hawaii. Pages 352-353.
- [2.2] Ibid. p. 358.
- [2.3] Soil Conservation Service, U. S. Department of Agriculture. August, 1972. Soil Survey of the Islands of Kauai, Oahu, Maui, Molokai, and Lanai, State of Hawaii. Prepared in cooperation with the University of Hawaii Agricultural Experiment Station. p. 84.
- [2.4] Ibid. p. 202
- [2.5] Ibid. p. 205.
- [2.6] University of Hawaii, Department of Geography. Atlas of Hawaii. 1973.
- [2.7] U. S. Dept. of Commerce, NOAA. Climatologicaal Data, Hawaii and Pacific. Annual Summary, Vol. 72 No. 13. 1976.
- [2.8] Oahu Water Plan. Board of Water Supply. City and County of Honolulu. 1963. p. 55.

SECTION 2

DESCRIPTION OF THE AFFECTED ENVIRONMENT

PART B

Ohikilolo Valley

PART B OHIKILOLO VALLEY [TMK 8-3-01:13]

I. PROJECT SITE DATA

A. Location

The project site is located in the mouth of Ohikilolo Valley approximately 36 miles from Honolulu. Refer to Figures 2-1 and 2-2.

B. Area and Ownership

The entire project area consists of approximately 706+ acres, of this total, only 182+ acres will be used for the landfill.

The owners of the property are Elizabeth Marks, Elizabeth Stack, Cynthia Salley and Lester Marks.

C. Present Land Use of the Site [2.1]

The site is presently used for agriculture, open space and recreation. The Paniolo County Ohikilolo Makua Ranch operated by Mr. and Mrs. Albert Silva has been in operation for numerous years. In addition to raising cattle (500 head) the ranch produces grass hay, kiawe charcoal and meat for the Honolulu Zoo. Other activities held on the ranch property include a yearly party, open to all, for up to 3,000 people. The Silva's life style represents a typical rural "Hawaiian life style" characterized by openness and representing the qualities of "aloha aina."

D. Present Land Use of Adjacent Area

The land fronting the project site (TMK 8-3-01:14) is owned by Lester Marks, Elizabeth Stack and Cynthia Salley. On this parcel, wooden residential homes (4) can be found.

Approximately 1,000 feet south of the project site, is located the First Hawaiian Bank's staff recreational facilities (TMK 8-3-01:04). The project was initiated by John D. Bellinger and a committee of employees who selected the site, and coordinated the development of this recreational center which opened in 1971. Approximately \$2 million was used for the purchase of the land (58 acres) and the construction of the facilities. The existing facilities consist

of "long house," swimming pool (33'/75'), tennis courts (2), cabins (8) and an active recreational area (softball field, volleyball court, etc.) Approximately 13,220 people use this facility yearly. These facilities are contained on 26 acres, the remaining 32 acres remains in its natural state (this provides a buffer area in the event future development occurs in the adjacent area). [2.2]

The City and County's Keaau Beach Park is located south of the project site (approximately 1,500 feet). The existing facilities include restrooms, picnic areas and camping sites. Future plans call for the expansion of the park northward. [2.3]

North of the project site, the State operated Kaena Park and the Makua Valley Military Reservation are located. The State Park provides ocean related recreational activities (fishing, swimming, picnicking, etc.) and a rest room. [2.4]

The military reservation at Makua Valley is a World War II installation established in 1943 as a maneuver and impact area. It contains a total of 4,921 acres, of which 170 acres are owned fee simple, 3,236 acres are ceded land and 1,515 acres are leased. The training area is used jointly by all services for varied training uses, including a live firing impact area. [2.5]

E. Characteristics of the Site as a Landfill

1. Topography

The project site is relatively flat and only 182+ acres of the 706 total acres will be used for landfilling. The landfilling will be limited to the area below the 200 foot elevation.

2. Cover Material

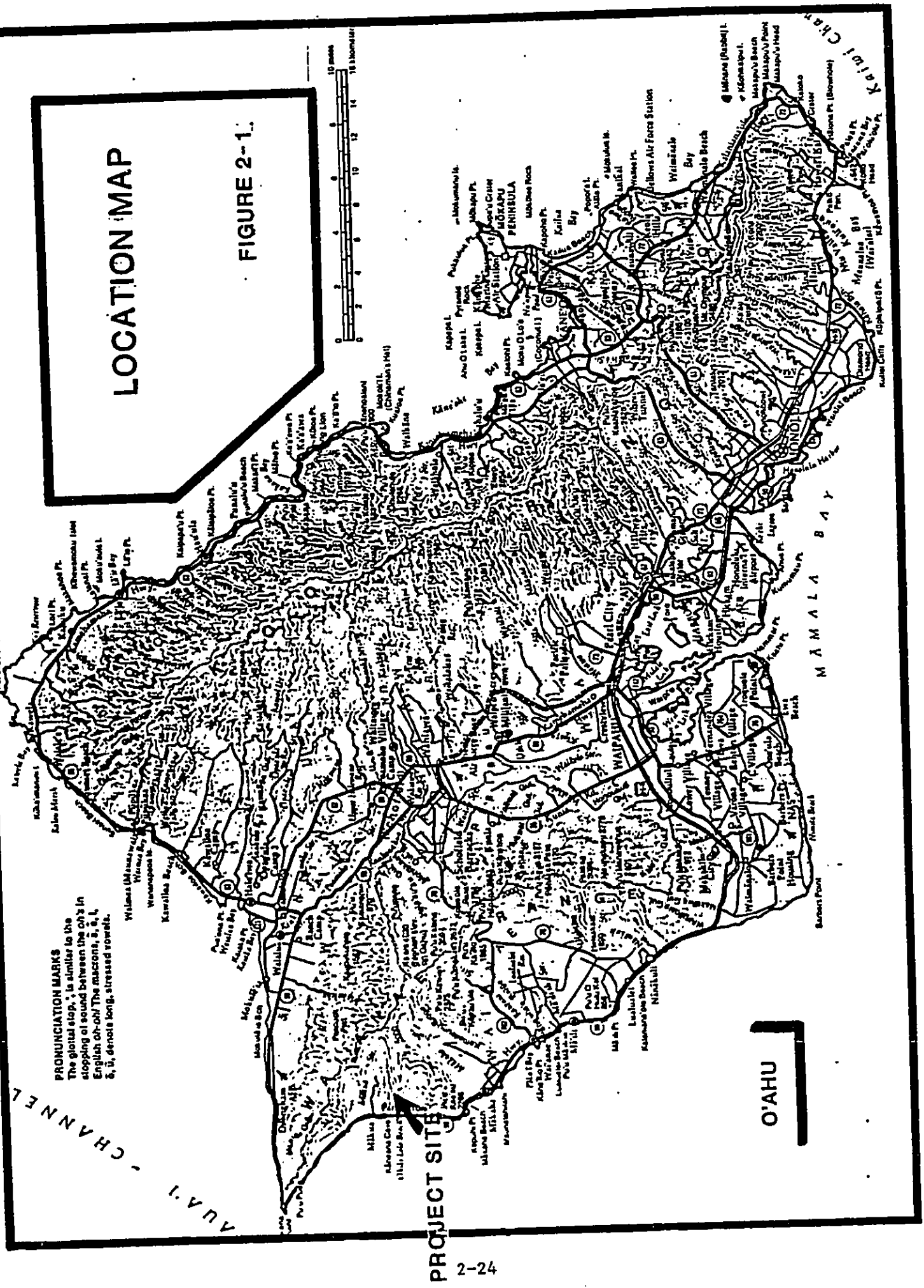
Some cover material is available onsite but most of the cover material will be imported to the landfill site.

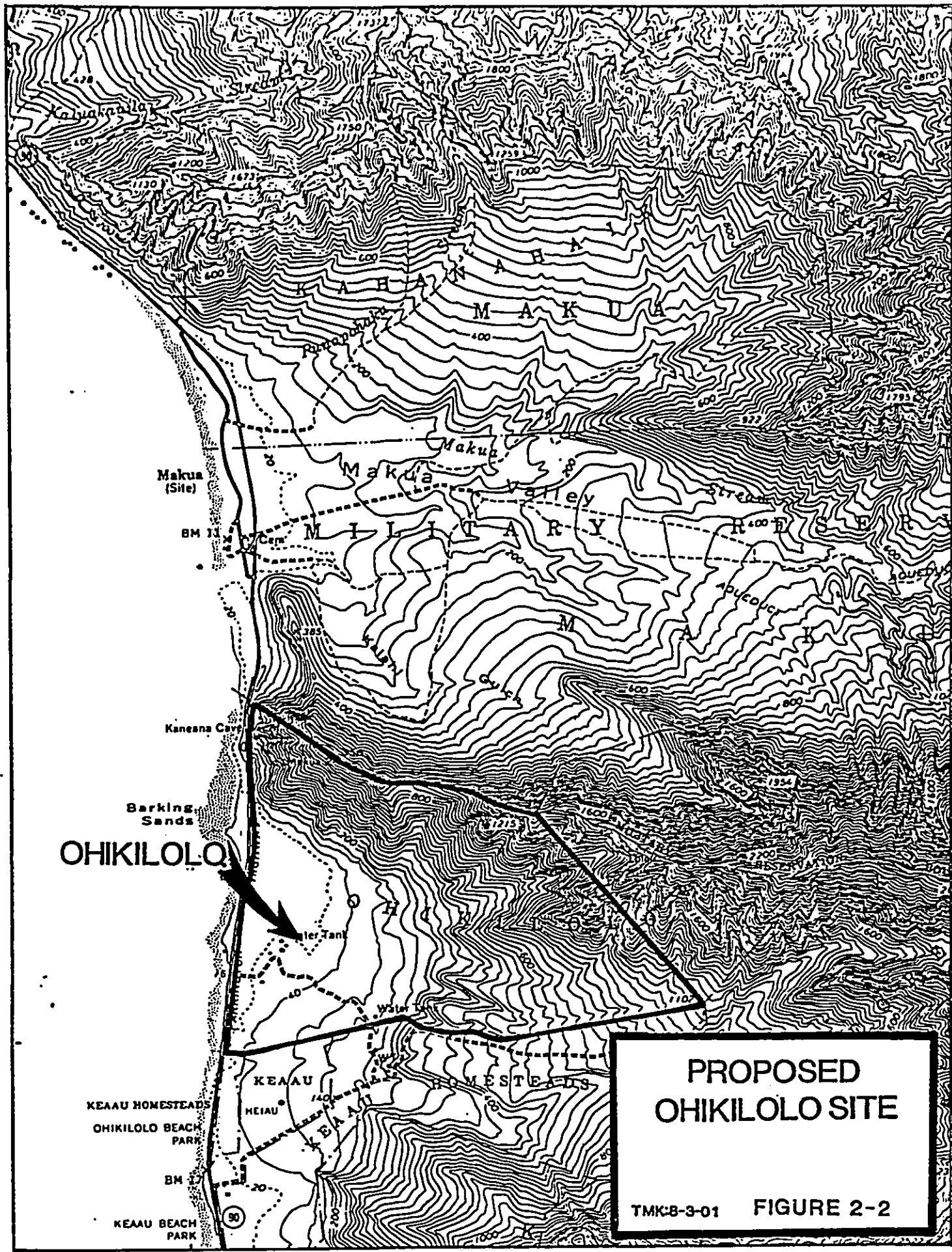
3. Capacity

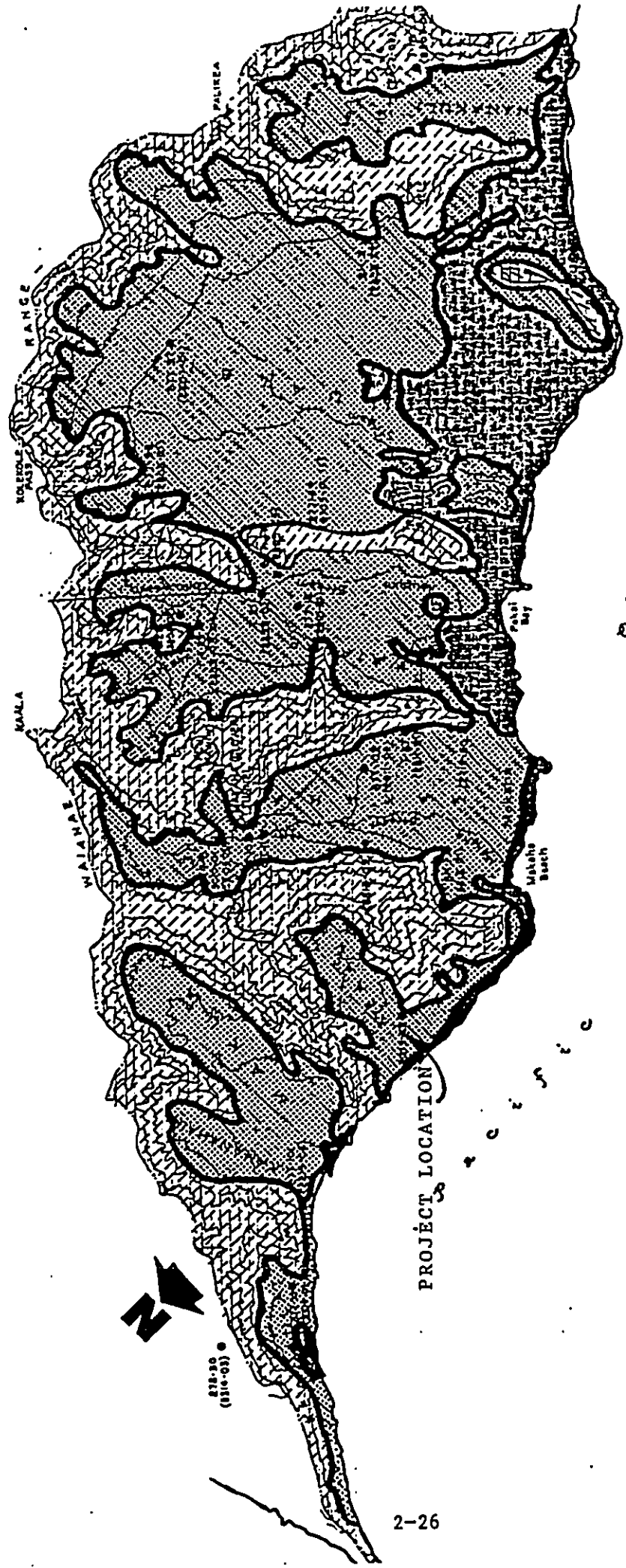
The capacity of the landfill is estimated at 21+ years at a fill rate of 1,000 tons per day, assuming that all of the available area is used. This is equivalent to approximately 18,460,000+ cubic yards of refuse. However, it is anticipated that site restrictions will limit capacity to perhaps 15+ years.




LOCATION MAP

FIGURE 2-1.







-  WAIANAE VOLCANIC SERIES
-  NONMARINE SEDIMENTS
-  MARINE SEDIMENTS

**GEOLOGIC MAP
WAIANAE COAST**

FIGURE 2-3

AFTER MINK, 1978

4. Ground Water Supply

The project site is located in an area where sanitary landfills are permitted by the Board of Water Supply.

5. Utilities

Except for sanitary sewer, utilities are available from Farrington Highway fronting the project site.

6. Drainage

The drainage area is 638+ acres and the Q is 2,800+ CFS (Curve B, C&C Standards).

II. PHYSICAL CHARACTERISTICS

A. Regional Geology

The island of Oahu represents eroded remnants of two shield (broadly rounded, dome-shaped) volcanoes, Waianae and Koolau. The Koolau volcano was the more recent of the two and its lavas, Koolau Volcanic Series, flowed and banked against the Waianae volcano shield to form the Schofield Plateau. After a long quiescent period during which erosion cut canyons several thousand feet deep another series of lava flows, Honolulu Volcanic Series, formed cinder and tuff cones [2.1]. Refer to Figure 2-3.

The Waianae Volcanic Series is divided into lower, middle and upper members. Figure 2-3. The lower member comprises the lava flows and associated pyroclastic rocks that built the main portion of the Waianae shield volcano. The middle member consists of rocks that accumulated in the caldera and gradually filled the caldera. The upper member is the thin cap that appears to cover the entire top of the shield volcano. [2.2]

The rocks found in the various members consists of the tholeiitic group in the lower and middle members and a transition to the alkalic basalts in the upper portion of the middle member. The upper member consists mainly of hawaiite with lesser amounts of alkalic olivine basalt.

Erosion has removed most of the western slope of the Waianae shield and exposed the internal structure of the volcano. The shield was built by eruptions that took place along three rift zones. The two principal rifts zones trended northwestward and southeastward from the summit and a lesser one trended northeastward.

The caldera of the Waianae volcano lay in the region just west of the Kolekole Pass and extended for about 9 miles, from the northern side of Makaha Valley to the head of Nanakuli Valley. Refer to Figure 2-4. The lavas that accumulated in the caldera are thick and massive compared with the thin flows that poured out of the caldera.

Along the lower southeastern slope of the Waianae range is a row of five very late cones; Puu Kuua, Puu Kapuai, Puu Makakilo, Puu Palailai and Puu Kapolei. At Puu Palailai former quarrying activities has removed most of the former crater fill consisting of a varied mixture of cinder, spatter and lava flows. The valleys of the Waianae Range are filled with enormous deposits of alluvium and colluvium.

B. Soils

As shown in Figure 2-5, soils found on the project site are:

Lualualei clay, 0 to 2 percent slopes (LuA) [2.6]

This soil is found on alluvial fans. A representative profile consists of a surface layer about 10 inches thick, very dark grayish-brown in color, sticky and very plastic clay that has prismatic structure. The next layer about 37 to 42 inches thick, is very dark grayish-brown, very sticky and very plastic clay that has a prismatic structure. The soil is underlain by coral, gravel, sand or clay at depths below 40 inches. This soil cracks widely upon drying. Permeability is slow. Runoff is slow and the erosion hazard is no more than slight. This soil is used for sugarcane, truck crops, pasture, wildlife habitat, urban development and military installations. The very sticky and very plastic nature of clay makes cultivation difficult and practical only within a narrow range of moisture content. Because of the high shrink-swell potential, considerable care is necessary when using this soil as a site for buildings or highways.

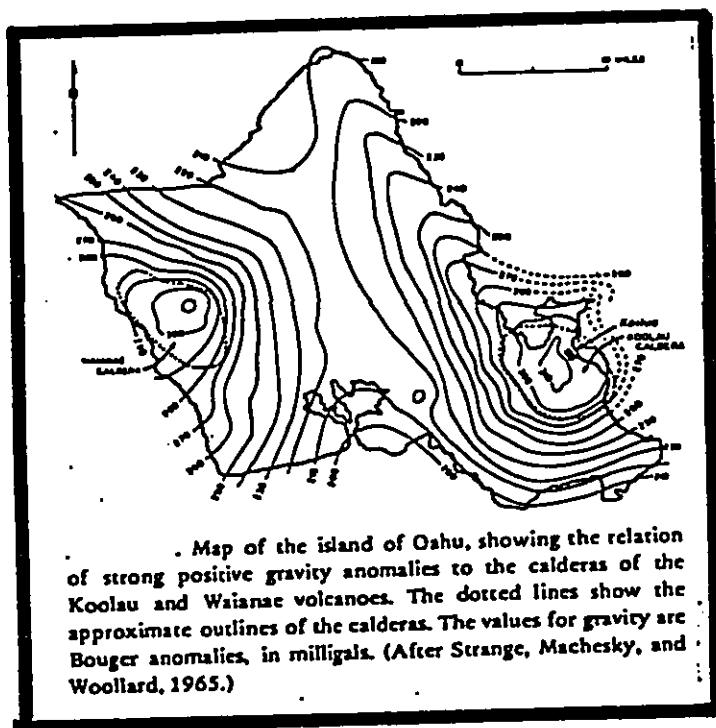
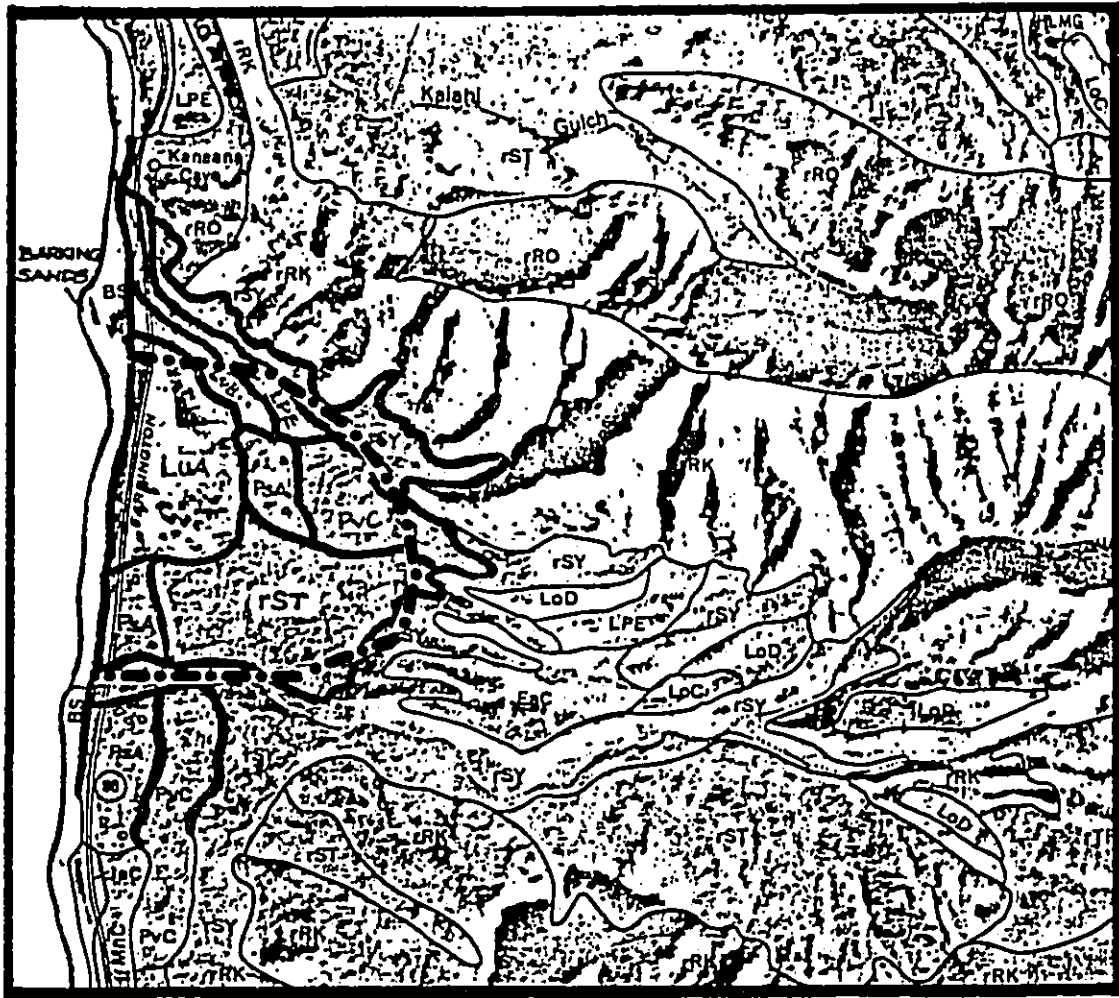


Figure 2 -4

WAIANAEE VOLCANO CALDERA

Source: Fig.174 p.283 (2.1)
Volcanos in the Sea. The Ecology of Hawaii.1970.
 MacDonald,Gordon;Agatin T. Abbott. U.H. Press



SOILS
FIGURE 2-5

----- approximate landfill boundary

Lualualei stony clay, 2 to 6 percent slopes (LvB) [2.7]

This soil occurs on Oahu adjacent to drainageways. It is similar to Lualualei clay [0 to 2% slopes (LuA)], except that there are enough stones to hinder machine cultivation. Runoff is slow, and the erosion hazard is slight. This soil is used for urban development, military installations, pasture, truck crops, and sugarcane.

Lualualei extremely stony clay, 3 to 35 percent slopes (LPE) [2.8]

This soil occurs on talus slopes on Oahu and Kauai. The slope range is 3 to 35 percent, but in most places the soil is moderately sloping to steep. This soil is similar to Lualualei clay [0 to 2% slopes, (LuA)], except that there are many stones on the surface and in the profile. It is impractical to cultivate this soil unless the stones are removed. Runoff is medium to rapid, and the erosion hazard is moderate to severe. This soil is used for pasture.

Pulehu clay loam, 0 to 3 percent slopes (PsA) [2.9]

This soil is on alluvial fans and stream terraces and in basins. In a representative profile the surface layer is dark-brown clay loam about 21 inches thick. This is underlain by dark-brown, dark grayish-brown, and brown, massive and single grain, stratified loam, and loamy sand, fine sandy loam, and silty loam about 39 inches thick. Below this is coarse gravelly or sandy alluvium. Permeability is moderate. Runoff is slow and the erosion hazard is no more than slight. This soil is used for sugarcane, truck crops, and pasture.

Pulehu very stony clay loam, 0 to 12 percent slopes (PvC) [2.10]

This soil is very similar to Pulehu clay loam 0 to 3% (PsA), except that as much as 3 percent of the surface is covered with stones. Runoff is slow to medium and erosion hazard is slight to moderate. Workability is difficult because of the stones. This soil is used for pasture and wildlife habitat.

Stony steep land (rsy) [2.11]

Stony steep land (rsy) consists of a mass of boulders and stones deposited by water and gravity on side slopes of drainageways. It occurs on the island of Oahu. The slope ranges from 40 to 70 percent. Stones and boulders cover 50 to 90 percent of the surface. There is a small amount of soil among the stones that provides a foothold for plants. Rock outcrops occur in many places. Used for wildlife habitat.

Stony land (rST) [2.12]

Stony land (rST) occurs in valleys and on side slopes of drainage-ways on the island of Oahu. It is mainly between Barbers Point and Kaena Point. It consists of a mass of boulders and stones deposited by water and gravity. The slope ranges from 5 to 40 percent. Stones and boulders cover 15 to 90 percent of the surface. This land type is used for wildlife habitat and recreation.

C. Topography [2.13]

The topography of the project site consists of flat area fronting a deep valley. At the lower end, the elevation of the valley is 50 feet and rises to 200 feet over a distance of approximately 1,400 feet.

D. Climate [2.14]

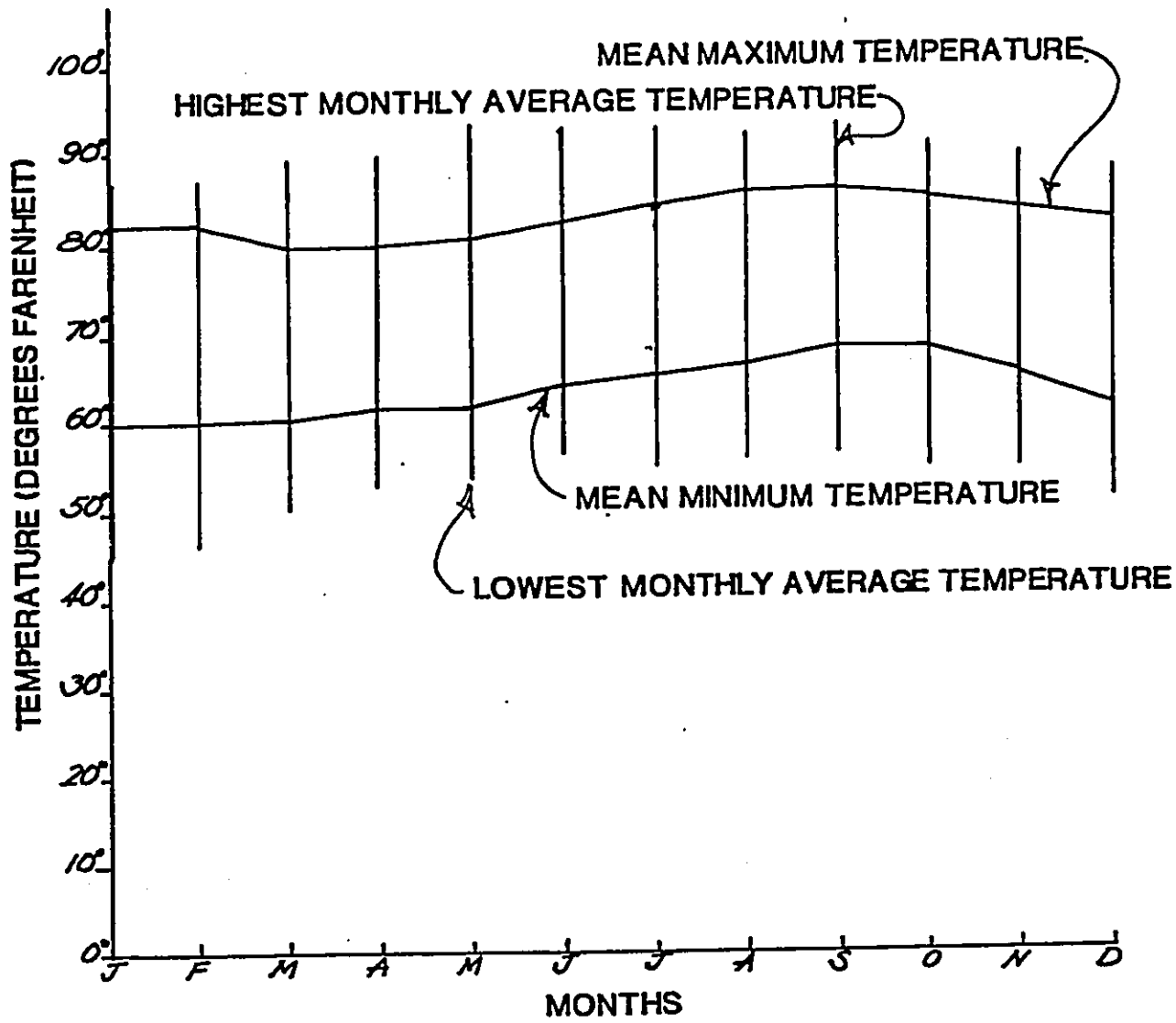
The climate in the vicinity of the project site is hot and dry. Winter temperatures range from the low 60's to the low 80's. Summer temperature ranges from the high 60's to the mid 80's. The average annual temperature near the coast is 76°F.

During the winter months, sub-tropical storms (Kona storms) occasionally buffet the area, bringing with them heavy showers. The showers account for much of the rain which falls in the Waianae area. On many days a sea breeze rather than trade windflow is dominant along the Waianae Coast. Starting in the late afternoon, air from the sea moves inland, then drifts back to the sea at night.

More than two-thirds of the Ewa-Waianae District receives an annual average rainfall of between 20 and 30 inches. Only above a valley of 400 foot elevation does the rainfall gradient increase to produce a maximum annual average of approximately 100 inches. Average annual rainfall at the project site is approximately 20 inches. Refer to Figures 2-6 and 2-7.

E. Groundwater

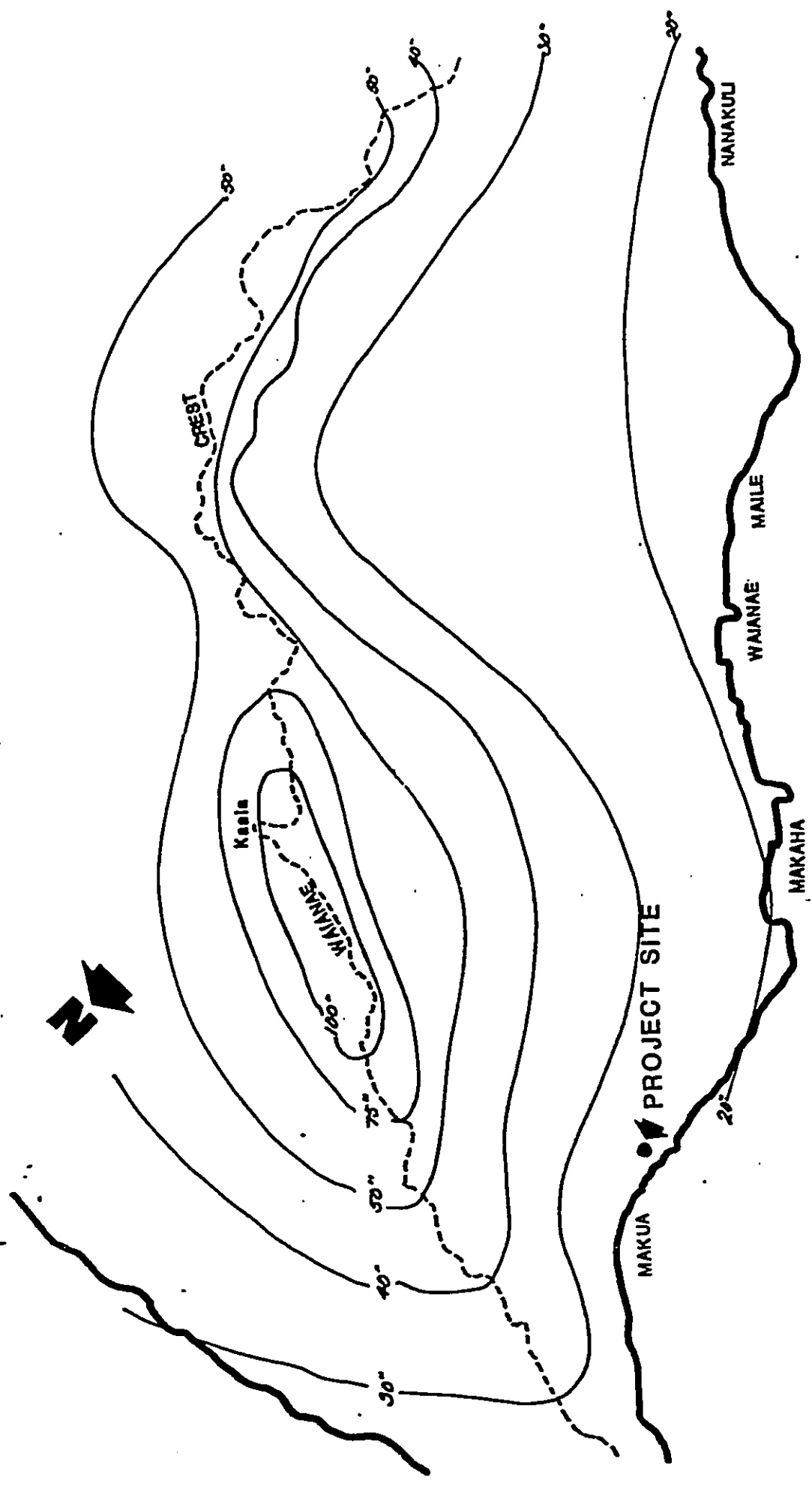
Attempts have been made to find potable water for municipal use in a 12 square mile area from Keeau Valley to Kaena Point but none have succeeded in providing an acceptable sustainable yield. [2.15] The most widespread aquifers are of the marginal dike-basal type. The hydrologic balance prepared by Mink (1978)



TEMPERATURE: DEGREES F
 WAIANAE, OAHU
 FIGURE 2-6

SOURCE: ATLAS OF HAWAII

UNIVERSITY OF HAWAII



2-34

RAINFALL ISOHYETS WAIANAE COAST

FIGURE 2-7

SOURCE: OAHU WATER PLAN, 1963

suggests that several mgd could be developed on Makua-Kahanahaiki and perhaps 1 mgd in Keeau if aquifer configuration were favorable. The most likely choice being Makua, controlled and used by the military.

The First Hawaiian Bank's well (3013-09) located adjacent to the project site was drilled from elevation 190 to 45 feet below sea level and gave poor quality water (1,000 to 1,600 mg/l chloride) during a 30 hour pump test at 75 gpm. The well has been sealed.

There is good indication that the ground water below the area to be used for landfilling is not of sufficient quantity and quality as to constitute a municipal water source. However, the existing well located above the 200 foot contour line provides potable water for the occupants of Ohikililo Valley. The amount of water consumed by the occupants is minimal.

The project site is located in an area where sanitary landfills are permitted by the Board of Water Supply and the Department of Health. Refer to Figure 2-8.

F. Agriculture Lands

The Ohikilolo site is classified by the Agricultural lands of Importance to the State of Hawaii (ALISH) system. Approximately 95 acres of the Ohikilolo site is classified as "Other Important Agricultural Land" by ALISH. The State Department of Agriculture (letter dated April 6, 1983), states that "The majority of the 95 acres would be Prime if irrigation were provided." Refer to Figure 2-9.

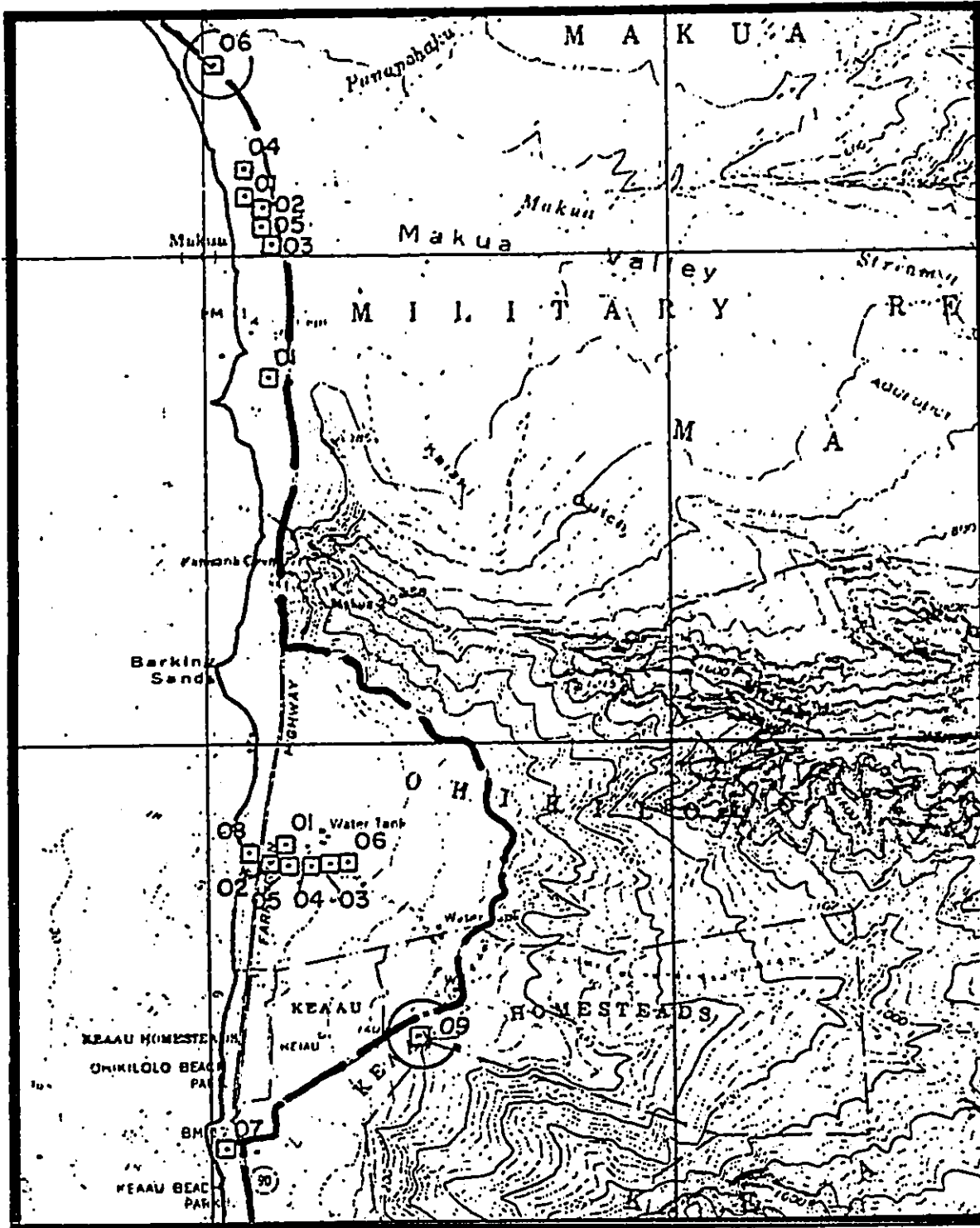
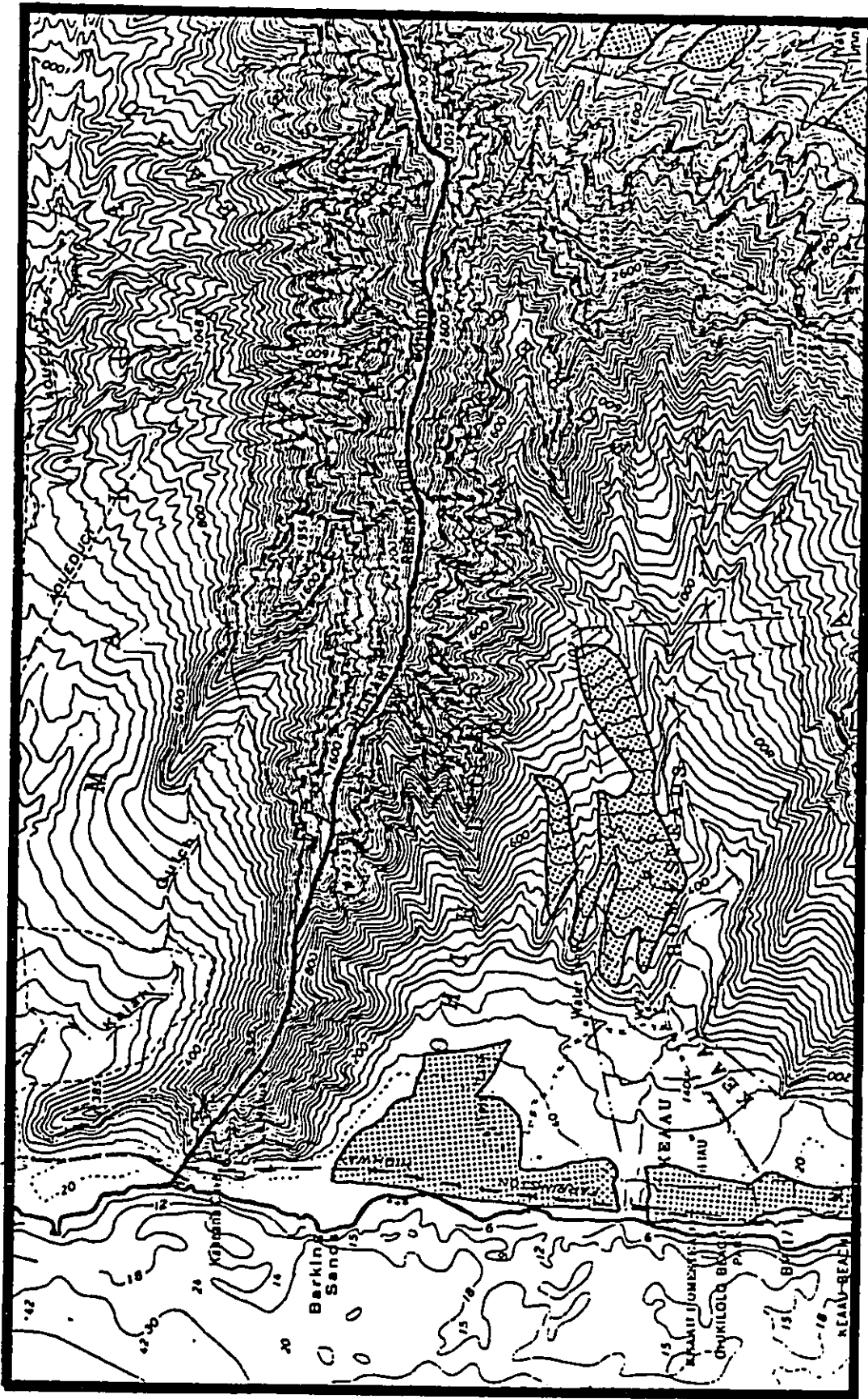


FIGURE 2-8

Underground Injection
Control Line (UIC)







- 
UNIQUE AGRICULTURAL LAND - Land that has the special combination of soil quality, location, growing season, moisture supply, and is used to produce sustained high quality and or high yields of a specific crop when treated and managed according to modern farming methods.
- 
OTHER IMPORTANT AGRICULTURAL LAND - Land other than Prime or Unique Agricultural Land that is also of state-wide or local importance for agricultural use.
- 
EXISTING URBAN DEVELOPMENT - Land which has been developed for urban type use.
- 
U.S. GOVERNMENT - Land which is currently under the jurisdiction of the U.S. Government.

FIGURE 2-9: AGRICULTURAL LANDS OF IMPORTANCE

III. BIOLOGICAL CHARACTERISTICS OF OHIKILOLO VALLEY (Landfilling Area)

A. Plants (Flora)

The plants found within the area to be used for landfilling consist primarily of exotic species of plants. The predominant vegetation is an overstory of Koa haole/Kiawe trees mixed with a few Wiliwili and Kukui nut trees. The understory consists of grasses and weeds. Most of the area has been used for grazing of cattle, horses, donkeys and goats. (Refer to Appendix B for a check list of plants found within the area to be used for landfilling.)

B. Animals (Fauna)

The project site (landfilling area) is not considered a sensitive wildlife habitat and the birds and animals found on the project site are not rare or endangered species. (Refer to Appendix B for a check list of the birds and mammals found within the area to be used for landfilling.)

The birds commonly found include the Barred Dove, Lacenecked dove, Cardinal, Common Mynah, Japanese white-eye, and House finch. The mammals observed were, mongoose, dogs, cats, cattle, donkeys, horses, goats and mice. The land is actively used for the raising of cattle, horses, donkeys and goats.

IV. INFRASTRUCTURE

A. Utilities

1. Water

Water necessary for the operation of the landfill will be provided.

2. Electricity

Electrical power is available near the project site and no major problems are anticipated in providing electrical power to the project site.

B. Police and Fire

1. Police

The project is located in an area routinely patrolled by the police. The project will not adversely affect the police department.

2. Fire

The Waianae Fire Station is located approximately 5.5 miles from the project site and the response time is approximately 7 minutes. Water tankers from the Waianae and Nanakuli Fire Stations are also available and their response times are approximately 7 and 18 minutes, respectively.

The information provided from the Fire Department (letter date April 5, 1983), the response time from the Waianae Fire Station would be within the guidelines from the National Fire Protection Association (10 minutes), only minimal fire fighting effectiveness is available. The companies are only capable of extinguishing small fires and/or possibly preventing the extension of fires to other structures. Water necessary for the operation of the landfill will be provided.

V. SOCIO-ECONOMIC CHARACTERISTICS

A. Population [2.16]

The population of the census tract (98) where the Ohikilolo site is located is 5,928 and there are 1,748 households. Refer to Table 2-1 for additional information.

The nearest major residential area is Makaha with a 1980 population of 6,582 and encompassing an area of 1,600 acres.

B. Schools, Hospitals, Rest Homes, Community Centers

The landfill is not located adjacent or in close proximity to schools, hospitals, elderly housing or major residential centers. However, a major recreational center maintained and operated by First Hawaiian Bank is located approximately 1,500 feet south of the project site. The City and County operated beach park is also located adjacent to the First Hawaiian Bank's recreational center and to the north is the Kaena State Park.

The existing ranch and homes are located within the proposed project site. The project will have a significant adverse environmental impact on the families residing within the landfilling area and on the ranch activities - cattle raising, hay production, kiawe charcoal production, rodeo events, meat production for the Honolulu Zoo, papaya production and on the goat herd.

TABLE 2-1

POPULATION OF LEeward OAHU WITHIN LANDFILL LOCATION

<u>Census Tract</u>	<u>Land Area (acres)</u>	<u>Resident Population</u>		<u>% Change</u>	<u>1980 Population Per Acre</u>	<u>1980 Households</u>
		<u>1980</u>	<u>1970</u>			
State Total	4,112,256	964,681	764,913	25.3	0.2	294,052
City & County of Honolulu	881,248	762,565	630,528	20.9	2.0	230,214
Honolulu CCD	57,899	365,048	324,871	12.4	6.3	127,139
(Waimanalo) 86.01	21,780	8,559	4,226	102.5	0.4	2,337
(Ohikilolo) 98	13,989	5,928	4,403	34.6	0.4	1,742

Source: Table 9 page 27. The State of Hawaii Data Book 1982. DPED. November 1982

VI. ARCHAEOLOGICAL SITES

A preliminary surface archaeological reconnaissance revealed the presence of a significant number of archaeological site complexes. The results of the surface survey can be found in the Appendix C of this report.

References to Section 2

Part B: Ohikilolo

- [2.1] Interview conducted with Mr. and Mrs. Silva, June 1983.
- [2.2] Brochure "A place where time isn't money". First Hawaiian Bank. Interview of First Hawaiian Bank Official and field trips conducted May 7, 1983.
- [2.3] Interview conducted with City and County, Department of Parks and Recreation.
- [2.4] EIS for Makua-Kaena Park. Prepared by Environment Impact Study Corp. March 1977.
- [2.5] Military Property Requirements In Hawaii (MILPRO-HI). State of Hawaii. Department of the Navy, Pacific Division, 8 May 1979. p. E-15.
- [2.6] Soil Conservation Service, U.S. Department of Agriculture, August 1972. Soil Survey of the Islands of Kauai, Oahu, Maui, Moloaki, and Lanai, State of Hawaii. Prepared in cooperation with the University of Hawaii Agriculture Experiment Station. p. 84.
- [2.7] Ibid. p. 84.
- [2.8] Ibid. p. 84.
- [2.9] Ibid. p. 84.
- [2.10] Ibid. p. 115.
- [2.11] Ibid. p. 121.
- [2.12] Ibid. p. 120.
- [2.13] Stanley Shimabukuro & Associated, Inc. May 16, 1983. Preliminary "Ultimate Schematic Development Plan".
- [2.14] Environment Impact Statement, Makaha Wells. Board of Water Supply. City and County of Honolulu. Prepared by Environment Impact Study Corp. 1981.
- [2.15] Waianae Water Development Study. Board of Water Supply, City and County of Honolulu. Prepared by John R. Mink. February, 1978. pp. 96-99.
- [2.16] Data Book, State of Hawaii. Department of Planning and Economic Development. 1982. p. 31.

**Land Use Plans
Policies
Controls**

3

SECTION 3

RELATIONSHIP OF THE PROPOSED ACTION TO LAND USE
PLANS, POLICIES AND CONTROLS FOR THE AREAS

I. LAND USE DESIGNATION

A. State Land Use Districts:

Waimanalo Gulch Site

State Land Use Designation for the project site is Agriculture.

Ohikilolo Valley Site

State Land Use Designation for the project site is Agriculture.

A State Special Use Permit must be obtained through the Department of Land Utilization. The County Planning Commission will hold the required public hearing and has the final decision in case of a denial. If approved by the Planning Commission, the petition for the permit and the Planning Commission's decision will be forwarded to the State Land Use Commission for its review and final action. The Planning Commission must receive concurrence of the State Land Use Commission in case of an approval.

B. City and County Land Use Designation:

Waimanalo Gulch Site

The Ewa Development Plan designates this site as Agricultural.

Ohikilolo Valley Site

The Waianae Development Plan designates the Ohikilolo site as Agricultural. The Public Facilities Map shows that a solid waste facility is "planned for future (7 years-beyond)." The landfills are consistent with City and County land use designations.

II. CITY AND COUNTY ZONING (Comprehensive Zoning Code Requirements)

Waimanalo Gulch Site

The City and County zoning for the site is AG-1 Restricted Agricultural District. A public sanitary landfill is a permitted use in the AG-1 district. However, a conditional use approval will be required

for the site improvements and facilities (offices, storage, maintenance facilities, scales, etc.)

Ohikilolo Valley Site

The City and County zoning for the site is AG-1 Restricted Agricultural District. A public sanitary landfill is a permitted use in the AG-1 district. However, a conditional use approval will be required for the site improvements and facilities (offices, storage, maintenance facilities, scales, etc.)

III. SPECIAL MANAGEMENT AREA (SMA)

Waimanalo Gulch Site

A portion of the Waimanalo Gulch Site is located within the SMA. An SMA Use Permit (SMP) will be required prior to the construction of the landfill and the necessary support facilities.

Ohikilolo Valley Site

A portion of the Ohikilolo Valley Site is located within the SMA. An SMA Use Permit (SMP) will be required prior to the construction of the landfill and the necessary support facilities.

**Probable
Environmental
Effects**

4

SECTION 4

ANTICIPATED ENVIRONMENTAL IMPACTS AND MITIGATIVE MEASURES TO BE TAKEN TO MINIMIZE ADVERSE IMPACTS

PART A

Waimanalo Gulch

ANTICIPATED PRIMARY IMPACTS

I. INTRODUCTION

This section discusses the anticipated environmental impacts which can occur from the construction and the operation of a typical sanitary landfill. The impacts are then discussed specifically for the project site.

II. AIR QUALITY

A. During Construction

During initial development and preparation of the site for sanitary landfilling activities, portions of the area will be cleared and grubbed of vegetation. Dust will be generated during site excavation and grading. However, dust levels will be controlled by using standard water sprinkling methods. Air pollutants from construction equipment will be generated, but the amounts are expected to be insignificant.

B. During Operation

Throughout the life of the sanitary landfill, dust will be generated with landfilling activities. The best mitigative measure to control dust generated by sanitary landfill activities is to establish a schedule for water sprinkling. The control of the dust generated will be according to the Air Pollution Control Regulations Title 11 (Chapter 60) of the State Department of Health [4.1].

Associated with the operations of a sanitary landfill will be daily traffic made up of municipal compactor trucks, transfer trailers, commercial vehicles, and public self-haul vehicles. Air pollution emissions from these vehicles collectively are anticipated to be insignificant.

The proposed sanitary landfill will generate gases. Major constituents of sanitary landfill decomposition gas are carbon dioxide and methane; lesser amounts of nitrogen, and occasionally a trace of hydrogen sulfide. Composition of typical sanitary landfill gas samples is shown in Table 4-1 [4.2]. Composition of sanitary landfill gas evolves as waste decomposes, and goes through aerobic, then anaerobic, processes. This evolution develops in four phases (Figure 4-1) [4.3].

The first phase ranges from several days to weeks. Oxygen present at the time of waste disposal is used for decomposition. Carbon dioxide is produced during this stage. During the second phase, anaerobic conditions occur, since free oxygen has been depleted. At the onset of anaerobic decomposition, significant amounts of carbon dioxide and some nitrogen and hydrogen are produced. The third phase is characterized by the first formation of methane, a reduction in carbon dioxide production, and depletion of hydrogen. The fourth phase differs from the third in that gas production and composition approach steady state conditions. At this stage, the percentage of methane in the gas may range from 50 to 70 percent; carbon dioxide, from 30 to 50 percent [4.4].

Carbon dioxide is a colorless, odorless, noncombustible gas and is highly soluble in water at atmospheric pressures. The solubility of CO₂ in 1 liter of water at 1 atmosphere is 1,688 mg/l. This can increase acidity, corrosivity, and hardness of the water, and carbon dioxide in excess of 20 ppm affects iron, steel, and concrete. Relatively little concern needs to be addressed to the adverse impact of CO₂ on groundwater or surface water, since little or no water quality degradation is attributable to CO₂ gas [4.5].

Methane is generated by the action of methane-producing bacteria on organic components of refuse. Methane, an odorless hydrocarbon, is the principal constituent of natural gas, and has

TABLE 4-1

TYPICAL LANDFILL GAS COMPOSITION

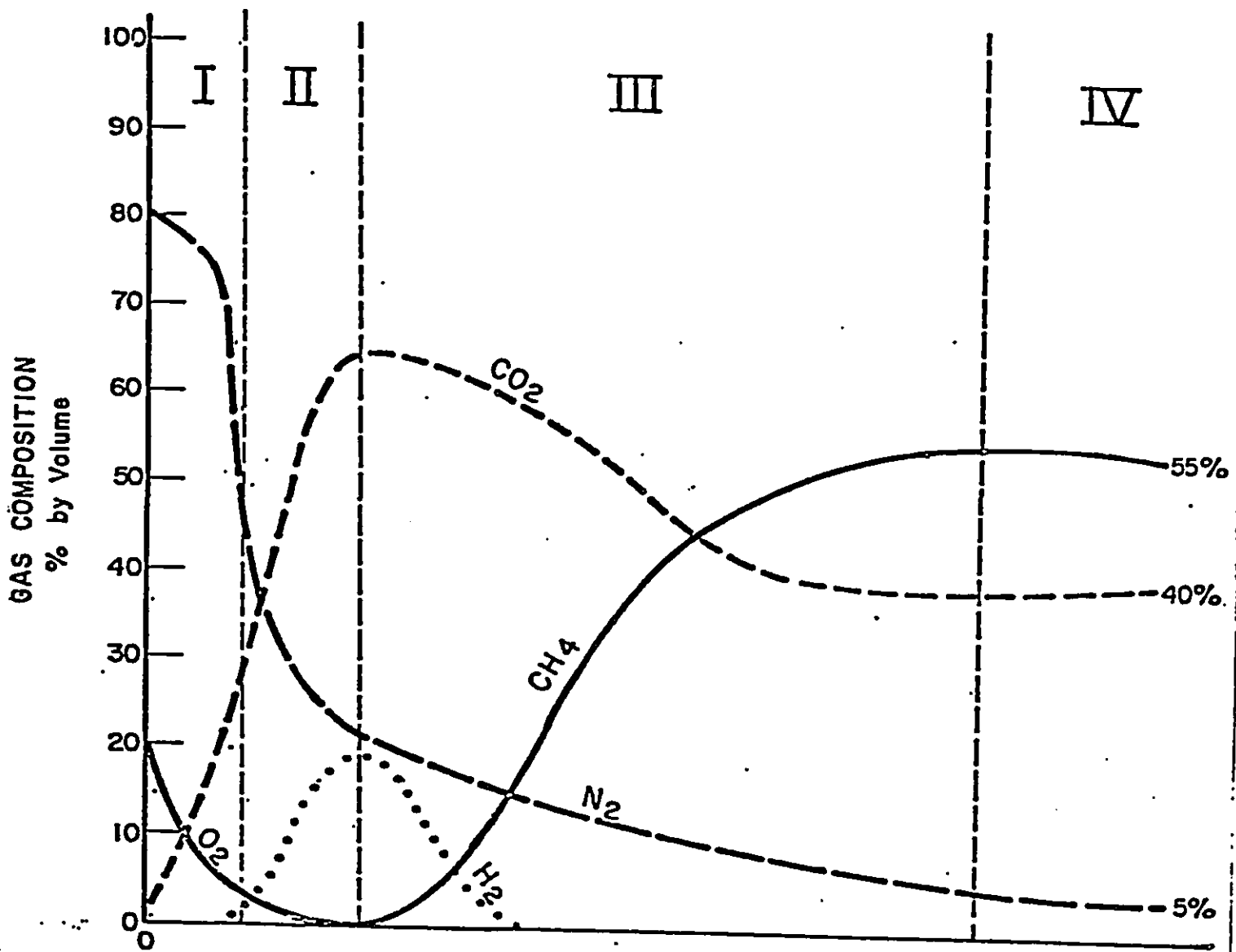
<u>LANDFILL</u>	Methane %	Carbon Dioxide %	Nitrogen %	Oxygen %	Other %
Azusa Western Azusa, CA	50.0	50.0	-	-	-
Bradley Los Angeles, CA	50.0	50.0	-	-	-
Branford Los Angeles, CA	46.0	40.0	?	?	?
Hewitt Los Angeles, CA	45.0	55.0	-	-	-
Mountain View Mountain View, CA	44.0	34.2	20.8	1.0	-
Palos Verdes Rolling Hills, CA	52.6	43.5	2.9	0.3	0.7
Scholl Canyon Glendale, CA	40.5	50.8	7.0	1.7	-
Sheldon Arleta. Los Angeles, CA	55.0	45.0	T	T	-
P.I.I. Denver, CO	45.0	55.0	-	-	-
G.R.O.W.S. Morristown, PA	46.0	53.0	0.5	0.1	0.4

T - Trace

Source: [4.2]

FIGURE 4-1.

EVOLUTION OF TYPICAL LANDFILL GAS COMPOSITION



TIME AFTER PLACEMENT →
(after Farquhar)

- I. Aerobic
- II. Anaerobic, Non-Methanogenic
- III. Anaerobic, Methanogenic, Unsteady
- IV. Anaerobic, Methanogenic, Steady

Source: (4.2)

an average heat content of 1000 Btu's per standard cubic foot (SCF). Since only about 50 percent of the sanitary landfill gas composition is methane, the heat content produced by a sanitary landfill is about 500 Btu's per scf [4.6].

Methane is highly combustible in concentrations between 5 and 15 percent by volume in air, a characteristic which can be an asset or a liability. As an asset, methane can, in certain situations, be an economically recoverable energy resource. As a liability, uncontrolled release of methane may produce such hazards as fire or explosion in confined areas [4.7].

Migration of gas to the sanitary landfill edge and into surrounding soils or overlying structures (lateral migration), occurs by two basic processes: convection (movement in response to pressure gradients) and diffusion (movement from areas of high gas concentration to areas of lower gas concentration). Gas flow is greater in materials with large pore spaces and high permeability (i.e., sands, gravels) and lower in materials of lower permeability (i.e., clays). Generally, therefore, there is greater vertical and lateral movement of gases in a sand-gravel environment than in a clay environment. Gas migration can be limited by methane's insolubility in water so groundwater may limit migration of methane [4.8].

Since methane is lighter than air, it tends to rise and exit through landfill cover which is sufficiently permeable. A cover of clay is relatively impermeable and will restrict vertical gas flow through the cover [4.9].

Sufficient rain can render any type of soil less permeable, encouraging lateral migration of gas. Precipitation can also infiltrate into landfill areas, increase moisture of refuse, and stimulate the rate of waste decomposition and gas production. Decreased permeability of the cover and increased gas production may cause a significant increase in lateral gas migration during the rainy season. Typically, most of the gas (+ 80%) will exit through the soil cover [4.10].

Methods to control sanitary landfill gas migration, if required, include one or a combination of the following: [4.11]

1. Placement of impervious liner materials to block the flow of gas.
2. Selective placement of granular materials and piping for gas venting and/or collection.
3. Evacuation and venting of gas from the sanitary landfill itself.

Carbon dioxide and methane gases will be generated by the proposed sanitary landfill. Gas vents in the sanitary landfill probably will not be required since the proposed landfill should vent naturally through the cover material. The project site will be specifically evaluated to determine if lateral migration control of gases is required and, if so, the type of barrier that would be necessary. This will be done during final design of the sanitary landfill, specifically for the project site.

Gases produced within the sanitary landfill should vent and dissipate readily with surrounding air. Significant impacts resulting from concentrations of gas should not be a problem with a properly engineered and designed sanitary landfill. The proposed sanitary landfill will incorporate a gas monitoring program to assure that methane concentrations in the area of the sanitary landfill are within safe limits.

Anaerobic decomposition results in production of odors from gases. The best mitigative measure is rapid and continuous coverage of refuse with soil and continued maintenance of surface cracks at completed areas. Certain factors should be considered in evaluation of odors: [4.12]

1. The olfactory sense becomes fatigued after continuous perception of an odor.

2. An odor is usually detected whenever there has been a significant change in odor quality or intensity. A pleasant odor can become objectionable to one who has become used to it under continuous exposure, when it increases in intensity.

3. Odors do not, in themselves, cause physical disease. The odor of many toxic materials (e.g., chlorine, sulfur dioxide, hydrogen sulfide) may serve as a warning agent, however. Odors, also, may bring on nausea and have an adverse effect on asthmatics.

4. A person's ability to perceive odors varies from day to day.

5. Compounds of different constitution may yield similar odors, whereas compounds of very similar constitution may yield different odors.

6. An unfamiliar odor is more likely to cause complaints than a familiar one.

7. The perception level of odors decreases with increasing humidity. High humidity tends, however, to concentrate odors in a given locality.

8. Odor quality may change upon dilution.

9. Some persons can detect certain odor qualities but not others.

C. Project Site

Dust will be the primary air pollutant produced during the construction and operational phases of the landfill. A water wagon will be provided at the site to control dust as it is generated during construction and landfilling activities.

During the life of the landfill, gases will be generated from the natural decomposition of the solid waste. The method which could be used to control the migration of the gas will be the selective placement of granular material and piping for gas venting and/or collection. The evaluation and design details will be developed during the preliminary design phase of the project.

Odors are not anticipated to be significant problem at this site. The prevailing winds should dilute any offensive odors and there is no major concentration of residences located directly downwind from the project.

III. WATER QUALITY

A. Leachate [4.13]

1. General

Production of leachate, containing organic and inorganic matter, in suspended and dissolved form, is dependent upon the presence of excess water. Water is introduced into a sanitary landfill by infiltration through the soil cover or by subsurface seepage. When the net water infiltration into a sanitary landfill exceeds the absorptive and/or retention ability of the refuse, leachate will be produced.

Leachate is made up of both organic and inorganic matter, suspended and dissolved. Table 4-2 illustrates typical ranges of leachate one can expect from a sanitary landfill.

The operating phase of most sanitary landfills may be a period of non-steady state leachate production if there is high rainfall (30 inches or more) and the soil cover and grades are insufficient to shed surface water. The refuse, on initial placement, has a tremendous capacity to absorb moisture before leachate is produced. If the refuse lifts are covered daily with moderately impermeable soil and interim drainage provisions protect against heavy infiltration, then leachate should not be produced during the operational phase. If, however, the cover soil is pervious, the lifts are not sloped to drain, or heavy infiltration of surface or groundwater is permitted, significant leachate generation can occur during the operational phase.

Because the rainfall on Oahu occurs predominantly during major storms, it is probable that the landfills can shed the bulk of this water by runoff, virtually eliminating leachate

TABLE 4-2

SUMMARY OF TYPICAL RANGES FOR VARIOUS LEACHATE PARAMETERS

PARAMETER (mg/l unless otherwise noted)	LABORATORY STUDIES			FIELD STUDIES			THIS STUDY		
	California	M. Virginia	Brezel	Georgia Tech.	California	Illinois	Cell A	Cell C	Cell D
Acetic Acid				4,000-8,000					
Acidity	730-9,500	500-3,000		1,500-3,200	243	100-10,000	1,000-8,500	2,000-2,500	2,000-8,000
Alkalinity		8,000-18,000		2,000-21,500	255-1,125	0.05-2.2			
Aluminum						0.1-6.9			
Arsenic						0.15-8.5			
Barium						0.1			
Beryllium	81-33,000	9,000-30,000		40-130	0.6-59	50-50,000	12,000-31,000	4,000-28,000	400-33,000
BOD						0.1-12			
Bromide				500-2,500					
Butyric Acid						0.05			
Cadmium	115-2,570	500-3,000		68-355	5.94	100-300	500-2,500	400-1,600	500-1,600
Calcium	96-2,350	500-2,000		72-865		25-1,500	500-2,000	200-2,000	1,000-2,000
Chloride				200-2,000		0.05-0.2			
Chromium				1,000-10,000		10-50,000	15,000-55,000	4,000-10,000	1,000-38,000
CO ₂				1-4.5		0.05	0.15-0.7	0.02-0.6	0.04-0.35
Copper						0.005-0.024			
Cyanide						0.05-0.89			
Fluoride						100-10,000			
Hardness, Total	650-8,120	5,000-12,000	1,000-5,000	1,000-5,000	305-1,175	302			
(as CaCO ₃)						0.02-0.5			
HBS						0-350			
Hexane Solubles									
Iron, Ferrous	2.0-93	100-800	100-1,400	0.02-24.0	0-4.0	0.2-5,000	700-1,100	200-300	62-300
Iron, Total	6.5-305				0.07		0.1-1.8	0.1-0.8	0.01-2.0
Lead					13-110		600-1,100	100-1,000	300-700
Magnesium	64-410								
Manganese	0.05-1.66								
Nickel									
Nitrogen, Total	0.22-890	400-2,000	0.01-0.9	20-250	0.12-8.5	2.4-6.5	40-700	100-800	200-900
Nitrogen,		300-1,000	30-400						
Ammonia							0.1-1	0.1-9	0.1-9
Nitrogen,									
Nitrate							5-100	10-900	10-900
Nitrogen,	2.4-550	200-1,000	0-480	50-150	0-2.3				
Organic									
Pesticides (ppb)									
Phosphata	5.6-7.6	5.3-6.3	5.0-3.0	100-800	7.31	6.5-8.5	4.5-5.2	4.4-5.3	4.5-6.6
Potassium	0.16-29	20-120	1-130	7.0	6.85-7.78	0.5-7.0	1-15	1-40	1-40
Propionic Acid	28-1,860	700-3,500		1.0-7.0	0.01-1.6	2-790	200-300	70-800	300-800
Selenium				2,000-5,000					
Sodium	65-1,805	300-1,200	200-3,800		67-710	0.1-2.7	80-900	100-950	600-1,000
Solids, Total		18,000-50,000	5,000-40,000			50-1,200	12,000-26,000	3,000-20,000	4,000-22,000
Solids,									
Dissolved									
Solids,									
Suspended									
Solids, Volatile									
Sulphate	39-730	10,000-28,000	50-400	25-700		25-800	150-800	100-800	100-900
Tannin and Lignin									
TOC									
Veteric Acid									
Volatile Acids,									
Total							10,000-19,000	3,000-12,000	1,000-14,000
Zinc							0.2-60	0.6-42	1.12-95

Source: EPCON Associates, 1977.
 Notes: 1. Refer to Tables in Appendix B for identification of laboratory and field studies.
 2. BOD and volatile acids and suspended and total solids should be at high end of spectrum in the fresh leachate due to high percentage of readily decomposable organics in refuse.

production. The proposed sanitary landfill can be filled in a manner that prevents heavy infiltration and assures that the absorptive capacity is not exceeded during construction.

Post-construction leachate generation is dependent upon infiltration of rainfall through the final soil cover and/or groundwater infiltration. If a sanitary landfill is located over a groundwater source, provisions can be taken in its final design to prevent groundwater seepage into the sanitary landfill.

Infiltration of rainfall through the soil cover is the principal potential mode of leachate generation after the sanitary landfill has been completed. The majority of this precipitation will be shed as surface water runoff from a relatively impervious soil cover. Precipitation that does not exit the site as surface runoff will be partially removed by the processes of evapo-transpiration and soil absorption. Any amount in excess of that accounted for in the above processes would enter the refuse as "net" infiltration.

The "net" infiltration rate will establish the maximum post-construction rate of leachate production. Areas receiving 30 inches or less of annual precipitation generate little or no leachate if operated as sanitary landfills. However, where precipitation approaches 50 inches per year or greater a percentage of the annual precipitation in excess of 30 inches may infiltrate into the landfill. The percentage figure will vary depending on final cover soil, final slope, vegetative growth, etc. Previous studies estimate that the percentage figure will range from 10 percent for relatively steep slopes to 20 percent for slopes flatter than 10 percent.

2. Project Site

The possibility of the production of leachate at this site is minimized by the low annual average rainfall. As noted in the previous discussion on leachate, leachate is

generally produced in areas having average rainfall in excess of 30 inches, which is not the case for the project site nor of the leeward coast. Therefore, there is no indication that leachate which will have adverse long-term impacts on basal ground water and coastal water quality will be produced.

B. Erosion

1. General

Since landfilling activities result in denuded areas, erosion and resultant sedimentation into surrounding surface waters is a potential adverse impact, but proper design and construction will mitigate this problem. A sanitary landfill can be constructed in terraces and the steepness of the sloping faces of the terraces reduced to prevent significant erosion. The flat surfaces of the terraces can be graded not only to mitigate infiltration of water into the sanitary landfill, but also graded to hold much of the cover material on terraces. When necessary, a peripheral drainage system can be constructed to intercept and divert surface runoff around the sanitary landfill. Off-site and on-site runoff can be collected by interceptor ditches and clarified in siltation basins before discharge. The drainage system can be designed to reduce the velocity of flow to approximate the velocity of runoff under normal conditions. Debris barriers can be provided at the inlets of collection pipes.

2. Project Site

The first phase of the landfill development will entail the construction of drainage channels around the perimeter of the landfill, interceptor ditches, a siltation basin with debris rack and energy dissipator. This should alleviate most of the siltation problems as the site is developed and operated as a landfill.

The siltation basin will be designed to remove most of the suspended particles from the storm runoff water. The

perimeter drains around the landfilling area prevent storm-water from passing through the landfill and thereby prevents erosion of the landfill and the formation of leachate.

Since the landfill site is not located adjacent to the ocean or a standing body of water (pond or lake) and there are no flowing streams in Waimanalo Gulch, the landfill will not impact surface water.

The project site is located in an area acceptable to the Board of Water Supply and the Department of Health for the development of a sanitary landfill [outside of the UIC line].

Erosion can be reduced by disturbing only those areas necessary for a particular phase of landfilling. As portions of the sanitary landfill are completed, they can be revegetated to prevent further erosion of completed portions.

IV. NOISE

A. General

During initial site preparation of the landfill, various types of construction equipment and vehicles will be utilized. Conventional construction equipment and their respective noise levels are illustrated in Figure 4-2.

As part of the landfilling procedure, certain types of equipment will be used. These would include trucks, bulldozers, graders and scrapers. Noise levels that will be generated by this equipment are expected to be similar to that presented in Figure 4-2. Two to three of these types of heavy equipment can be expected to operate simultaneously 50 percent of the time. These noise levels will conform to regulations specified by the State of Hawaii Occupational Safety and Health Standards.

Noise anticipated with sanitary landfilling operations will also be created by traffic traveling to and from the sanitary landfill. A refuse truck generates a level of approximately 80

FIGURE 4-2
CONSTRUCTION EQUIPMENT NOISE RANGES

		NOISE LEVEL (dba) AT 50 FT					
		60	70	80	90	100	110
EARTH MOVING	COMPACTERS (ROLLERS)		H				
	FRONT LOADERS						
	BACKHOES						
	TRACTORS						
	SCRAPERS, GRADERS						
	PAVERS				H		
	TRUCKS						
MATERIALS HANDLING	CONCRETE MIXERS						
	CONCRETE PUMPS			H			
	CRANES (MOVABLE)						
	CRANES (DERRICK)				H		
STATIONARY	PUMPS		H				
	GENERATORS						
	COMPRESSORS						
IMPACT EQUIPMENT	PNEUMATIC WRENCHES						
	JACK HAMMERS AND ROCK DRILLS						
	PILE DRIVERS (PEAKS)						
OTHER	VIBRATOR						
	SAWS						

Note: Based on Limited Available Data Samples

Source: Noise From Construction Equipment and Operations Building Equipment, and Home Appliances, EPA, 1971

dB(A). The greatest amount of traffic noise will be generated by refuse vehicles, both municipal and commercial.

As sound waves move uniformly in all directions, the amplitude decreases with increasing distance from the source. In air, when the distance doubles, the amplitude drops by half, which is a drop of 6 dB. Therefore, as the distance from the source increases from one meter to two meters, the sound pressure level will drop by 6 dB. If increased to four meters, it will drop by 12 dB, eight meters by 18 dB, etc. [4.15]. These particular estimates are true only when there are no reflecting or blocking objects in the sound path. These conditions would be termed "free-field" conditions.

With an obstacle in the sound path, part of the sound will be reflected, part absorbed, and the remainder transmitted through the object. The amount or degree the sound is reflected, absorbed or transmitted depends upon the absorbing properties of the object, its size, and wavelength of the sound. Therefore, with effective vegetation zones and creation of earth berms, the sound path can be attenuated considerably and potential adverse impacts from noise at the sanitary landfill to adjacent areas can be mitigated.

Adverse impacts associated with refuse traffic to and from the landfill site, however, cannot be effectively mitigated if these vehicles must travel on an access which goes through residential areas or sensitive wildlife habitats.

Noise exists when unwanted sounds intrude into the environment. Because of this, noise includes a value judgment; however, there are adverse impacts associated with noise [4.16].

Except for hearing loss, there is no human illness known to be directly caused by noise. Several studies, however, have implicated noise as an important cause of physical and psychological stress and stress has been linked with other health disabilities and diseases, including heart disease, high blood pressure, headaches, fatigue and irritability [4.17].

There is evidence to support statements regarding effects on people of noise exposure of sufficient intensity and duration; [4.18]

- it can permanently damage the inner ear with resulting permanent hearing losses that can range from slight impairment to nearly total deafness
- it can result in temporary hearing losses and repeated exposures to noise can lead to chronic hearing losses
- it can interfere with speech communication and perception of other auditory signals
- it can disturb sleep
- it can be a source of annoyance
- it can interfere with the performance of complicated tasks and can disturb performance when speech communication or response to auditory signals is demanded
- it and other acoustical considerations can reduce the opportunity for privacy
- it can adversely influence mood and disturb relaxation

B. Project Site

Noise from landfill operations is found in Table 4-3 and the ambient noise levels for Waimanalo Gulch is presented in Table 4-4. Using this data, it is reasonable to assume that the noise levels generated during construction and landfilling will be within a range which will not be a significant impact.

The mouth of the gulch is presently impacted by the noise levels generated from the highway [52-68 dB(A)] and the noise from the land filling activities at 220 feet will range from 64-70 dB(A). As the landfilling proceeds into the gulch, the noise from the machinery and trucks will decrease with distance from Farrington Highway. The noise levels of 50 to 70 dB(A) can be characterized as representing a level found in a quiet automobile, to sound level found in the interior of a department store (Figure 4-3); or that found in suburban, low density area to that of a dense urban area with heavy traffic (Figure 4-4).

The operation of the landfill will conform to the requirements of Title 11, Administrative Rules Chapter 43, Community Noise Control for Oahu and Chapter 42, Vehicular Noise Control for Oahu.

TABLE 4-3 [4.19]

Noise Levels From Landfilling Activities¹

<u>Distance from the Working Surface in Feet</u>	<u>Noise Levels in dB(A)</u>
50	74-83
100	72-78
200	64-70
300	60-66
400	58-64
500	54-60
600	52-58
700	52-58
800	51-56

¹Data for this table were obtained from the Kapaa Sanitary Landfill using a B&K Sound level meter.

TABLE 4-4 [4.20]

Ambient Noise Levels For Waimanalo Gulch¹

<u>Distance from Farrington Highway in Feet</u>	<u>Noise Levels in dB(A)</u>
220	52-68*
2,400	40-45**
4,600	50-55

* Noise level from existing highway traffic, higher range represents heavy trucks.

** Noise level altered by air traffic from the Barbers Pt. Naval Air Station and Honolulu International Airport.

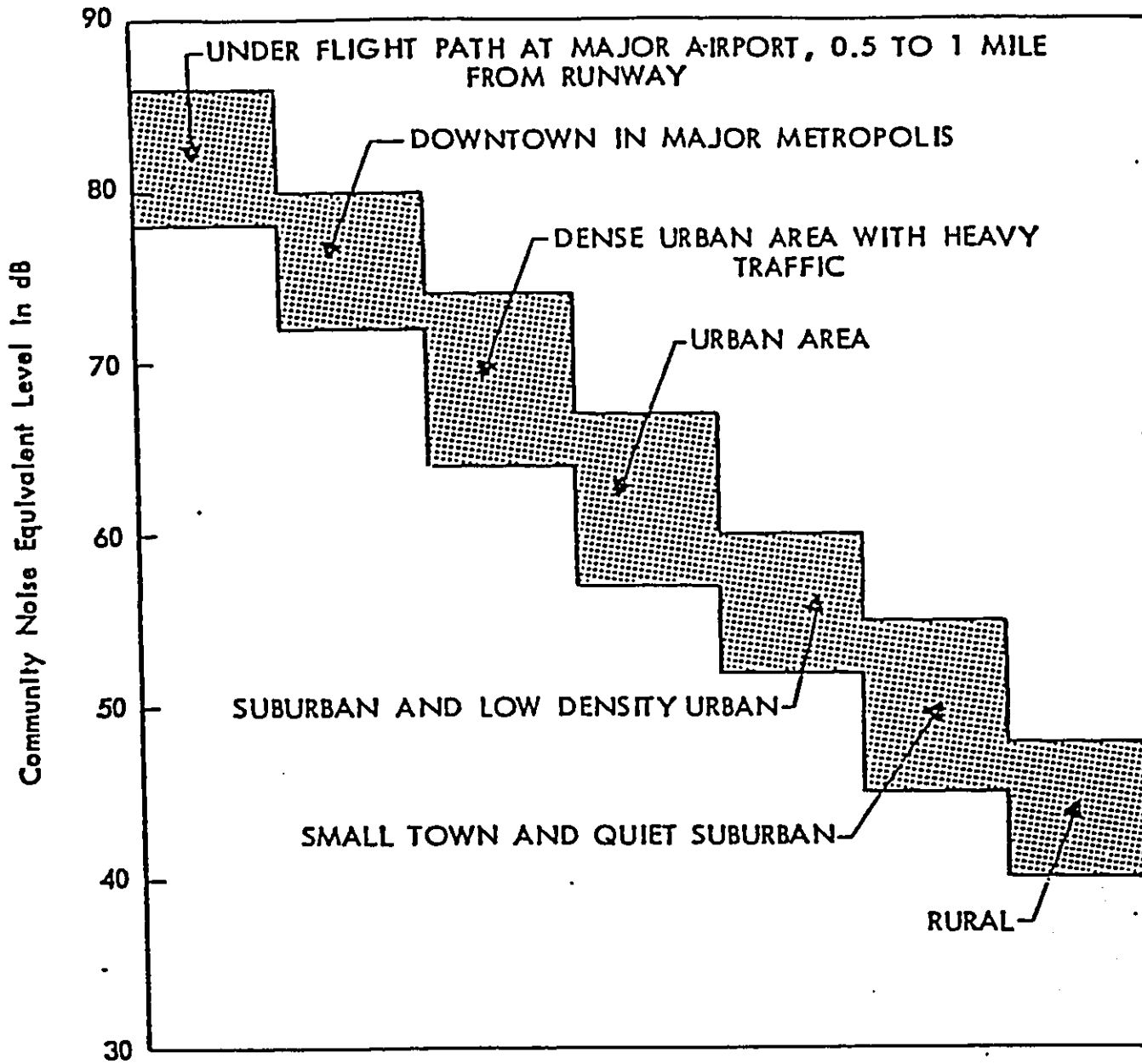
FIGURE 4-3

SOUND LEVELS OF COMMON SOUNDS

Sound	Sound Level dB(A)	Relative Loudness (Approximate)
Jet Plane, 100 Feet	130	128
Rock Music with Amplifier	120	64
Thunder, Danger of Permanent Hearing Loss	110	32
Boiler Shop, Power Mower	100	16
Orchestral Crescendo at 25 Feet, Noisy Kitchen	90	8
Busy Street	80	4
Interior of Department Store	70	2
Ordinary Conversation, 3 Feet away	60	1
Quiet Automobile at Low Speed	50	1/2
Average Office	40	1/4
City Residence	30	1/8
Quiet Country Residence	20	1/16
Rustle of Leaves	10	1/32
Threshold of Hearing	0	1/64

Source: (4.14)

FIGURE 4-4



GRAPH 1 TYPICAL RANGE OF OUTDOOR COMMUNITY NOISE EXPOSURE LEVELS

Source: (4.14)

V. NUISANCES

A. Litter

1. General

Litter can be a potential problem as refuse is deposited at the working face.

2. Project Site

The best mitigative measure for controlling litter includes prompt compaction and covering with soil. Portable litter fences will also be installed at the working face in relation to the prevailing winds to confine windblown litter if necessary. Illegal and indiscriminate dumping of refuse during non-operating hours can be prevented by the hiring of a private guard service, if necessary.

B. Vectors

1. General

Vectors, insects and rodents must be controlled at a landfill site.

2. Project Site

The proposed sanitary landfill is not expected to have problems with insects or rodents. Compacting and covering the deposited refuse are important procedures in achieving effective vector control. Six inches of compacted cover soil will mitigate emergence of flies from the deposited refuse and discourage burrowing by rodents. Birds may also frequent a sanitary landfill, but with proper operations and effective covering of deposited refuse, birds will be kept at a minimum.

If rodents should become a nuisance at the landfill, a baiting program will be implemented and supervised by an experienced exterminator. Generally, such programs last two to three weeks and are an effective short-term control in reducing numbers of rats. However, rats have not been a problem at municipal landfills and are not anticipated to be a problem at the proposed sanitary landfill.

VI. LANDFORM ALTERATION AND VISUAL IMPACT

A. General

All landfills alter the landform by filling in gulches, valleys, and alter the slope of the land. The visual impact of the landfill depends upon the site in relationship to nearby residents.

These visual impacts are associated with not only the change in land form, but the existence of denuded areas, and general landfill operations.

Methods to mitigate the visual impact include placement of vegetative buffer zones, vegetative earth berms to screen land-filling activities and an on-going landscaping program. As portions of the sanitary landfill are completed, they can be graded, contoured and revegetated according to the specifications of the final use of the landfill.

B. Project Site

1. During Construction

Construction of the landfill, maintenance facilities, access road and siltation basin will involve clearing and grubbing of the existing vegetation. The vegetation consists of an overstory of Kiawe/Haole Koa and an understory of dry grass, there are no rare or endangered species of plants.

The clearing and excavation activities will be done in increments to minimize erosion from wind and water. All of these activities will comply with the City Grading Ordinance.

The clearing activities will be visible from Farrington Highway by motorist for approximately ten to fifteen seconds (assume motorists are traveling at the 45 mph speed limit).

2. Landfilling Phase

The existing landform will be altered as the floor and sides of the gulch are filled with solid waste. The slopes of the gulch will be reduced as the gulch floor is filled.

Upon completion of the sanitary landfill, the site will be graded and the surface maintained as necessary. The exact details of closure of the landfill will be contained in the Closure Plan which will be prepared at a later date.

The landfilling activities will be visible from a portion of Farrington Highway and the cane field, directly fronting the project site.

The installation of a buffer strip 400 feet wide along the eastern portion and the north-south separation (800 to 1,000 feet) will help mitigate some of the visual impacts.

3. Final Use of the Land

The final use of the landfill has not been determined. It is recommended that the landfill, after the area has been stabilized, be used for open-space, outdoor recreation such as hiking, and possibly grass skiing.

VII. BIOLOGICAL

A. Flora

The project site contains a mixture of trees and plants generally found along the dry leeward coast. This area is characterized by an overstory of trees consisting of a mixture of Kiawe and Haole koa and an understory of grass. A biological reconnaissance of the project area did not reveal the presence of rare or endangered species of plants. A recent brush fire in July, 1983 burnt most of the grass and trees within the center and back portion of the gulch.

B. Fauna

The project site does not contain a sensitive wildlife habitat nor are there any rare or endangered species of mammals or birds.

VIII. ARCHAEOLOGICAL AND HISTORICAL

A. Archaeological

An archaeological surface reconnaissance of the project area was conducted and no significant archaeological sites were found. The results of the study are found in Appendix C of this report.

B. Historical

A historical sampling of the literature was undertaken and there is no evidence to indicate the site is historically significant. The historical documentation is found in Appendix C of this report.

IX. TRAFFIC IMPACT

A traffic analysis was conducted and the results of the study and conclusion are found in Appendix D of this report. The conclusion is that the projected traffic generated by the proposed landfill operations should not significantly increase the traffic volume on Farrington Highway because the proposed Leeward District Sanitary Landfill sites generate relatively low traffic volumes.

X. INFRASTRUCTURE

1. Police

The intersection improvements proposed for the new access road and Farrington Highway will provide safe ingress and egress for the trucks. This should prevent undue traffic problems for the police.

2. Fire

The response time from the Nanakuli Fire Station located 3 miles from the project site is approximately 4 minutes. Supportive services are available from the Makakilo and Waianae Fire Stations.

The fire protection for the project site is adequate. In addition to the fire stations, the landfill itself will have a fire break (50 to 70 feet wide) to prevent fires from entering and exiting the landfill.

3. Utilities

Water, electrical and telephone services are available within the project area. The minor needs of the landfill operation can be satisfied with the existing water, electrical and telephone services.

XI. ECONOMIC IMPACT

The economic impact of providing additional jobs will be minor. The exact terms and cost for the use of the land for landfilling have not been worked out with the landowners. It is anticipated that the landowners will be compensated for the use of the land.

Cost is an important consideration in development of a sanitary landfill. Distance of the sanitary landfill from refuse generating centers and the extent of improvements required to make the sanitary landfill environmentally acceptable are factors which will increase the overall development and the operation and maintenance costs of the sanitary landfill.

Besides its necessity, regardless of a resource recovery program, a sanitary landfill is presently the most cost effective method for refuse disposal.

XII. IMPACT TO THE LANDOWNERS AND/OR TENANTS

The landowners will be denied the use of the land for approximately 7 or more years while landfilling operations occur. After the completion of the landfilling operations, the land will probably revert back to the landowners. The use of the land after landfilling will be limited to pasture and open space recreational use, but not for the construction of buildings or intensive irrigated agricultural use.

PROJECT SITES ATTRIBUTES

There are many attributes of the site which make it suitable for a landfill. These factors are:

Infrastructure

Water, electrical, and telephone services are available. Access to and from the project site is available from Farrington Highway.

ANTICIPATED SECONDARY ENVIRONMENTAL IMPACTS

I. INTRODUCTION:

Secondary environmental impacts are those which are indirect results from the project. Short-term impacts are those which result during the construction phase and long-term impacts are those which may result for the life of the project.

II. SHORT-TERM SECONDARY IMPACT

During the clearing activities for the landfill and the construction of the siltation basin, rocks will be excavated, which can be made available to the existing moss rock activity presently occurring within the front portion of the project site.

The clearing activities will also remove the grass and trees which are potential combustible material for brush fire. This may prevent future outbreaks of brush fires in the gulch.

III. LONG-TERM SECONDARY IMPACT

The location of a convenient landfill operation may decrease the illegal dumping of trash and other materials along the roadsides and cane fields.

The close proximity of the landfill to a major highway and the visibility from a proposed major resort development will require aesthetic considerations to be a major factor in the design and operation of the landfill.

REFERENCES TO SECTION 4

Waimanalo Gulch

- [4.1] Title II Chapter 60. Air Pollution Control.
- [4.2] City and County of Honolulu. 1977. Leachate Study, Landfill Inventory Study. Prepared by EMCON Associates.
- [4.3] Ibid. [4.2].
- [4.4] Ibid. [4.2].
- [4.5] Ibid. [4.2].
- [4.6] Ibid. [4.2].
- [4.7] Ibid. [4.2].
- [4.8] Ibid. [4.2].
- [4.9] Ibid. [4.2].
- [4.10] Ibid. [4.2].
- [4.11] Ibid. [4.2].
- [4.12] U. S. Environmental Protection Agency. 1972. Field Operations and Enforcement Manual for Air Pollution Control. Volume II: Inspection Procedures for Specific Industries.
- [4.13] Ibid. [4.2].
- [4.14] U. S. Environmental Protection Agency. 1971. Noise from Construction Equipment and Other Operations, Building Equipment and Home Appliances. Prepared by Bolt, Beranek and Newman under contract 68-04-0047.
- [4.15] B & K Instruments, Inc. Measuring Sound.
- [4.16] U. S. Environmental Protection Agency. 1978. Noise: A Health Problem.
- [4.17] Ibid. [4.16].
- [4.18] U. S. environmental Protection Agency. 1971. Effects of Noise on People. Prepared by the Central Institute for the Deaf under contract 68-01-05000.

REFERENCES TO SECTION 4 - Cont'd

Waimanalo Gulch

- [4.19] Kapaa Sanitary Landfill Revised EIS. 1978. Prepared by Environment Impact Study Corp. p. 4-26.
- [4.20] EISC Noise Level Readings taken May 1983 and June 1983. B & K noise level meter, set at slow response.

SECTION 4

ANTICIPATED ENVIRONMENTAL IMPACTS AND MITIGATIVE MEASURES TO BE TAKEN TO MINIMIZE ADVERSE IMPACTS

This section discusses the anticipated environmental impacts from the implementation of the sanitary landfills. The environmental impacts are discussed under primary and secondary impacts, including short-term and long-term impacts.

Primary environmental impacts result directly from the proposed project, and these impacts can be separated into short-term and long-term impacts. Short-term impacts are construction related, lasting no longer than the construction period. Long-term impacts last for the entire life of the project and are directly related to the project.

Secondary environmental impacts are those which are indirect results from the implementation of the project. The anticipated short-term secondary impacts are those which result during the construction and long-term secondary impacts are those which may indirectly result from the implementation of the project.

The anticipated environmental impacts from the proposed sanitary landfills will be discussed separately because of the different environmental impacts which may result from the projects.

SECTION 4

ANTICIPATED ENVIRONMENTAL IMPACTS AND MITIGATIVE
MEASURES TO BE TAKEN TO MINIMIZE ADVERSE IMPACTS

PART A

Waimanalo Gulch

SECTION 4

ANTICIPATED ENVIRONMENTAL IMPACTS AND MITIGATIVE
MEASURES TO BE TAKEN TO MINIMIZE ADVERSE IMPACTS

PART B

Ohikilolo Valley

SECTION 4

ANTICIPATED ENVIRONMENTAL IMPACTS AND MITIGATIVE
MEASURES TO BE TAKEN TO MINIMIZE ADVERSE IMPACTS

PART B

Ohikilolo Valley

ANTICIPATED PRIMARY IMPACTS

I. INTRODUCTION

This section discusses the anticipated environmental impacts which can occur from the construction and the operation of a typical sanitary landfill. The impacts are then discussed specifically for the project site.

II. AIR QUALITY

A. During Construction

During initial development and preparation of the site for sanitary landfilling activities, portions of the area will be cleared and grubbed of vegetation. Dust will be generated during site excavation and grading. However, dust levels will be controlled by using standard water sprinkling methods. Air pollutants from construction equipment will be generated, but the amounts are expected to be insignificant.

B. During Operation

Throughout the life of the sanitary landfill, dust will be generated with landfilling activities. The best mitigative measure to control dust generated by sanitary landfill activities is to establish a schedule for water sprinkling. The control of the dust generated will be according to the Air Pollution Control Regulations Title 11 (Chapter 60) of the State Department of Health [4.1].

Associated with the operations of a sanitary landfill will be daily traffic made up of municipal compactor trucks, transfer trailers, commercial vehicles, and public self-haul vehicles. Air pollution emissions from these vehicles collectively are anticipated to be insignificant.

The proposed sanitary landfill will generate gases. Major constituents of sanitary landfill decomposition gas are carbon dioxide and methane; lesser amounts of nitrogen, and occasionally a trace of hydrogen sulfide. Composition of typical sanitary landfill gas samples is shown in Table 4-1 [4.2]. Composition of sanitary landfill gas evolves as waste decomposes, and goes through aerobic, then anaerobic, processes. This evolution develops in four phases (Figure 4-1) [4.3].

The first phase ranges from several days to weeks. Oxygen present at the time of waste disposal is used for decomposition. Carbon dioxide is produced during this stage. During the second phase, anaerobic conditions occur, since free oxygen has been depleted. At the onset of anaerobic decomposition, significant amounts of carbon dioxide and some nitrogen and hydrogen are produced. The third phase is characterized by the first formation of methane, a reduction in carbon dioxide production, and depletion of hydrogen. The fourth phase differs from the third in that gas production and composition approach steady state conditions. At this stage, the percentage of methane in the gas may range from 50 to 70 percent; carbon dioxide, from 30 to 50 percent [4.4].

Carbon dioxide is a colorless, odorless, noncombustible gas and is highly soluble in water at atmospheric pressures. The solubility of CO₂ in 1 liter of water at 1 atmosphere is 1,688 mg/l. This can increase acidity, corrosivity, and hardness of the water, and carbon dioxide in excess of 20 ppm affects iron, steel, and concrete. Relatively little concern needs to be addressed to the adverse impact of CO₂ on groundwater or surface water, since little or no water quality degradation is attributable to CO₂ gas [4.5].

Methane is generated by the action of methane-producing bacteria on organic components of refuse. Methane, an odorless hydrocarbon, is the principal constituent of natural gas, and has

TABLE 4-1

TYPICAL LANDFILL GAS COMPOSITION

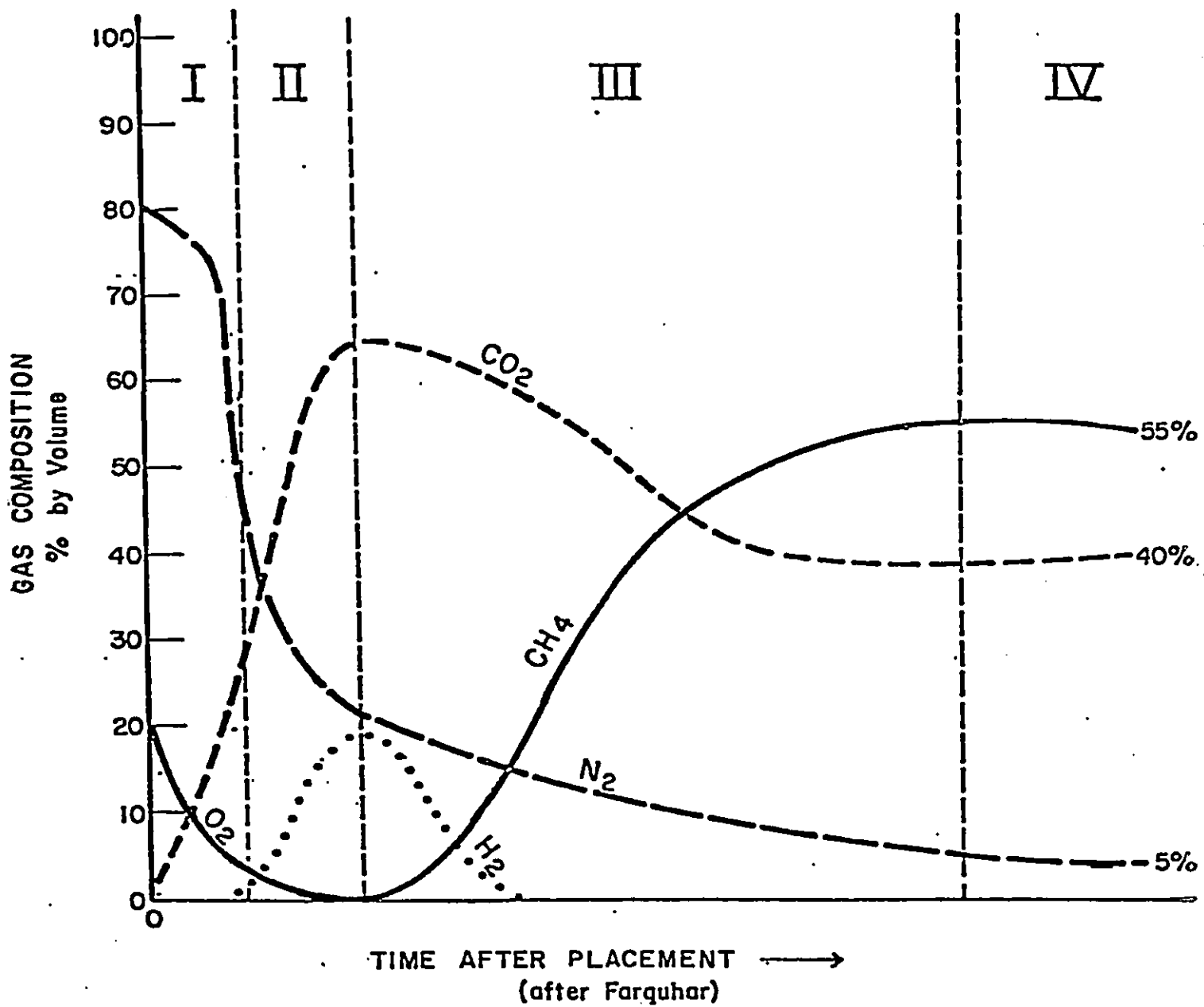
<u>LANDFILL</u>	Methane %	Carbon Dioxide %	Nitrogen %	Oxygen %	Other %
Azusa Western Azusa, CA	50.0	50.0	-	-	-
Bradley Los Angeles, CA	50.0	50.0	-	-	-
Branford Los Angeles, CA	46.0	40.0	?	?	?
Hewitt Los Angeles, CA	45.0	55.0	-	-	-
Mountain View Mountain View, CA	44.0	34.2	20.8	1.0	-
Palos Verdes Rolling Hills, CA	52.6	43.5	2.9	0.3	0.7
Scholl Canyon Glendale, CA	40.5	50.8	7.0	1.7	-
Sheldon Arleta Los Angeles, CA	55.0	45.0	T	T	-
P.I.I. Denver, CO	45.0	55.0	-	-	-
G.R.O.W.S. Morristown, PA	46.0	53.0	0.5	0.1	0.4

T - Trace

Source: [4.2]

FIGURE 4-1 .

EVOLUTION OF TYPICAL LANDFILL GAS COMPOSITION



- TIME AFTER PLACEMENT →
(after Farquhar)
- I. Aerobic
 - II. Anaerobic, Non-Methanogenic
 - III. Anaerobic, Methanogenic, Unsteady
 - IV. Anaerobic, Methanogenic, Steady

Source: (4.2)

an average heat content of 1000 Btu's per standard cubic foot (SCF). Since only about 50 percent of the sanitary landfill gas composition is methane, the heat content produced by a sanitary landfill is about 500 Btu's per scf [4.6].

Methane is highly combustible in concentrations between 5 and 15 percent by volume in air, a characteristic which can be an asset or a liability. As an asset, methane can, in certain situations, be an economically recoverable energy resource. As a liability, uncontrolled release of methane may produce such hazards as fire or explosion in confined areas [4.7].

Migration of gas to the sanitary landfill edge and into surrounding soils or overlying structures (lateral migration), occurs by two basic processes: convection (movement in response to pressure gradients) and diffusion (movement from areas of high gas concentration to areas of lower gas concentration). Gas flow is greater in materials with large pore spaces and high permeability (i.e., sands, gravels) and lower in materials of lower permeability (i.e., clays). Generally, therefore, there is greater vertical and lateral movement of gases in a sand-gravel environment than in a clay environment. Gas migration can be limited by methane's insolubility in water so groundwater may limit migration of methane [4.8].

Since methane is lighter than air, it tends to rise and exit through landfill cover which is sufficiently permeable. A cover of clay is relatively impermeable and will restrict vertical gas flow through the cover [4.9].

Sufficient rain can render any type of soil less permeable, encouraging lateral migration of gas. Precipitation can also infiltrate into landfill areas, increase moisture of refuse, and stimulate the rate of waste decomposition and gas production. Decreased permeability of the cover and increased gas production may cause a significant increase in lateral gas migration during the rainy season. Typically, most of the gas (+ 80%) will exit through the soil cover [4.10].

Methods to control sanitary landfill gas migration, if required, include one or a combination of the following: [4.11]

1. Placement of impervious liner materials to block the flow of gas.
2. Selective placement of granular materials and piping for gas venting and/or collection.
3. Evacuation and venting of gas from the sanitary landfill itself.

Carbon dioxide and methane gases will be generated by the proposed sanitary landfill. Gas vents in the sanitary landfill probably will not be required since the proposed landfill should vent naturally through the cover material. The project site will be specifically evaluated to determine if lateral migration control of gases is required and, if so, the type of barrier that would be necessary. This will be done during final design of the sanitary landfill, specifically for the project site.

Gases produced within the sanitary landfill should vent and dissipate readily with surrounding air. Significant impacts resulting from concentrations of gas should not be a problem with a properly engineered and designed sanitary landfill. The proposed sanitary landfill will incorporate a gas monitoring program to assure that methane concentrations in the area of the sanitary landfill are within safe limits.

Anaerobic decomposition results in production of odors from gases. The best mitigative measure is rapid and continuous coverage of refuse with soil and continued maintenance of surface cracks at completed areas. Certain factors should be considered in evaluation of odors: [4.12]

1. The olfactory sense becomes fatigued after continuous perception of an odor.

2. An odor is usually detected whenever there has been a significant change in odor quality or intensity. A pleasant odor can become objectionable to one who has become used to it under continuous exposure, when it increases in intensity.
3. Odors do not, in themselves, cause physical disease. The odor of many toxic materials (e.g., chlorine, sulfur dioxide, hydrogen sulfide) may serve as a warning agent, however. Odors, also, may bring on nausea and have an adverse effect on asthmatics.
4. A person's ability to perceive odors varies from day to day.
5. Compounds of different constitution may yield similar odors, whereas compounds of very similar constitution may yield different odors.
6. An unfamiliar odor is more likely to cause complaints than a familiar one.
7. The perception level of odors decreases with increasing humidity. High humidity tends, however, to concentrate odors in a given locality.
8. Odor quality may change upon dilution.
9. Some persons can detect certain odor qualities but not others.

C. Project Site

Dust will be the primary air pollutant produced during the construction and operational phases of the landfill. A water wagon will be provided at the site to control dust as it is generated during construction and landfilling activities.

During the life of the landfill, gases will be generated from the natural decomposition of the solid waste. The method which could be used to control the migration of the gas will be the selective placement of granular material and piping for gas venting and/or collection. The evaluation and design details will be developed during the preliminary design phase of the project.

Odors are not anticipated to be a significant problem at this site. The prevailing winds should dilute any offensive odors and there is no major concentration of residences located directly downwind from the project.

III. WATER QUALITY

A. Leachate [4.13]

1. General

Production of leachate, containing organic and inorganic matter, in suspended and dissolved form, is dependent upon the presence of excess water. Water is introduced into a sanitary landfill by infiltration through the soil cover or by subsurface seepage. When the net water infiltration into a sanitary landfill exceeds the absorptive and/or retention ability of the refuse, leachate will be produced.

Leachate is made up of both organic and inorganic matter, suspended and dissolved. Table 4-2 illustrates typical ranges of leachate one can expect from a sanitary landfill.

The operating phase of most sanitary landfills may be a period of non-steady state leachate production if there is high rainfall (30 inches or more) and the soil cover and grades are insufficient to shed surface water. The refuse, on initial placement, has a tremendous capacity to absorb moisture before leachate is produced. If the refuse lifts are covered daily with moderately impermeable soil and interim drainage provisions protect against heavy infiltration, then leachate should not be produced during the operational phase. If, however, the cover soil is pervious, the lifts are not sloped to drain, or heavy infiltration of surface or groundwater is permitted, significant leachate generation can occur during the operational phase.

Because the rainfall on Oahu occurs predominantly during major storms, it is probable that the landfills can shed the bulk of this water by runoff, virtually eliminating leachate

TABLE 4-2

SUMMARY OF TYPICAL RANGES FOR VARIOUS LEACHATE PARAMETERS

PARAMETER (mg/l unless otherwise noted)	LABORATORY STUDIES			FIELD STUDIES			THIS STUDY			
	California	W. Virginia	Brazel	Georgia Tech.	California	S. Dakota	Illinois	Cell A	Cell C	Cell D
Acetic Acid				4,000-8,000						
Acidity		500-3,000		1,500-3,300						
Alkalinity	730-9,500	8,000-18,000		2,000-2,500	259-1,125	243	100-10,000	1,000-8,500	2,000-2,500	2,000-8,000
Aluminum							0.05-2.2			
Arsenic							0.1-6.9			
Barium							0.15-8.5			
Beryllium							0.1			
BOD	81-33,000	9,000-30,000		40-130	0.6-59		50-50,000	12,000-31,000	4,000-28,000	400-33,000
Bromide				500-2,500			0.1-12			
Butyric Acid							0.05			
Cadmium					68-355		100-300	500-2,500	400-1,600	500-1,600
Calcium	115-2,570	500-3,000		100-350	72-865	5.94	25-1,500	500-2,000	200-2,000	1,000-2,000
Chloride	96-2,350	500-2,000					0.05-0.2			
Chromium							10-50,000			
COO				1,000-40,000	6,000-18,000		0.05	15,000-55,000	4,000-40,000	1,000-38,000
Copper				1-4.5			0.005-0.024	0.15-0.7	0.02-0.6	0.04-0.35
Cyanide							0.05-0.89			
Fluoride							100-10,000			
Hardness, Total (as CaCO ₃)	650-8,120	5,000-12,000	1,000-5,000	1,000-5,000	305-1,175	302	0.02-0.5			
HBS							0-350			
Hexane Solubles										
Iron, Ferrous	2.0-93	100-800	100-1,400	0.02-24.0	0-4.0		0.2-5,000	700-1,100	200-300	62-300
Iron, Total	6.5-305				0.07		0.5-1.3	0.1-1.8	0.1-0.8	0.01-2.0
Lead					13-110		25-300	600-1,100	100-1,000	300-700
Magnesium	64-410	100-400								
Manganese	0.05-1.66									
Nickel										
Nitrogen, Total		400-2,000	0.01-0.9					40-700	100-800	200-900
Nitrogen, Ammonia	0.22-890	300-1,000	30-400	20-250	0.12-8.5	9.8	2.4-6.5			
Nitrogen, Nitrate								0.1-1	0.1-9	0.1-9
Nitrogen, Organic	2.4-550	200-1,000	8-480	50-150	0-2.3			5-100	10-900	10-900
Pesticides (ppb)										
PH	5.6-7.6	5.3-6.3	5.0-3.0	100-800	6.85-7.78	7.31	6.5-8.5	4.5-5.2	4.4-5.3	4.5-6.6
Phosphate	0.16-29	20-120	1-130	7.0	0.01-1.6		0.5-7.0	1-15	1-40	1-40
Potassium	28-1,860	700-3,500		1.0-7.0	4.4-190	0.16	2-790	200-900	70-800	300-800
Propionic Acid				2,000-5,000						
Selenium							0.1-2.7	80-900	100-950	600-1,000
Sodium Solids, Total	65-1,805	300-1,200	200-3,800		67-710	10.2	50-1,200	12,000-26,000	3,000-20,000	4,000-22,000
Solids, Total		18,000-50,000	5,000-40,000							
Solids, Dissolved				5,000-25,000						
Solids, Suspended										
Solids, Volatile		10,000-28,000			25-700		25-800	150-800	100-800	100-900
Sulphate	39-730	200-800	50-400							
Tannin and Lignin		300-1,000								
TOC				3,000-5,000						
Voleric Acid				30-1,800						
Volatile Acids, Total								10,000-19,000	3,000-12,000	1,000-14,000
Zinc							0.05-40	0.2-60	0.6-42	1.12-95

Source: ENCON Associates, 1977.

Notes: 1. Refer to Tables in Appendix 8 for identification of laboratory and field studies.

2. 800 and volatile acids and suspended and total solids should be at high end of spectrum in the fresh leachate due to high percentage of readily decomposable organics in refuse.

production. The proposed sanitary landfill can be filled in a manner that prevents heavy infiltration and assures that the absorptive capacity is not exceeded during construction.

Post-construction leachate generation is dependent upon infiltration of rainfall through the final soil cover and/or groundwater infiltration. If a sanitary landfill is located over a groundwater source, provisions can be taken in its final design to prevent groundwater seepage into the sanitary landfill.

Infiltration of rainfall through the soil cover is the principal potential mode of leachate generation after the sanitary landfill has been completed. The majority of this precipitation will be shed as surface water runoff from a relatively impervious soil cover. Precipitation that does not exit the site as surface runoff will be partially removed by the processes of evapo-transpiration and soil absorption. Any amount in excess of that accounted for in the above processes would enter the refuse as "net" infiltration.

The "net" infiltration rate will establish the maximum post-construction rate of leachate production. Areas receiving 30 inches or less of annual precipitation generate little or no leachate if operated as sanitary landfills. However, where precipitation approaches 50 inches per year or greater a percentage of the annual precipitation in excess of 30 inches may infiltrate into the landfill. The percentage figure will vary depending on final cover soil, final slope, vegetative growth, etc. Previous studies estimate that the percentage figure will range from 10 percent for relatively steep slopes to 20 percent for slopes flatter than 10 percent.

2. Project Site

The possibility of the production of leachate at this site is minimized by the low annual average rainfall. As noted in the previous discussion on leachate, leachate is

generally produced in areas having average rainfall in excess of 30 inches, which is not the case for the project site nor of the leeward coast. Therefore, there is no indication that leachate which will have adverse long-term impacts on basal ground water and coastal water quality will be produced.

B. Erosion

1. General

Since landfilling activities result in denuded areas, erosion and resultant sedimentation into surrounding surface waters is a potential adverse impact, but proper design and construction will mitigate this problem. A sanitary landfill can be constructed in terraces and the steepness of the sloping faces of the terraces reduced to prevent significant erosion. The flat surfaces of the terraces can be graded not only to mitigate infiltration of water into the sanitary landfill, but also graded to hold much of the cover material on terraces. When necessary, a peripheral drainage system can be constructed to intercept and divert surface runoff around the sanitary landfill. Off-site and on-site runoff can be collected by interceptor ditches and clarified in siltation basins before discharge. The drainage system can be designed to reduce the velocity of flow to approximate the velocity of runoff under normal conditions. Debris barriers can be provided at the inlets of collection pipes.

2. Project Site

The first phase of the landfill development will entail the construction of drainage channels around the perimeter of the landfill, interceptor ditches, a siltation basin with debris rack and energy dissipator. This should alleviate most of the siltation problems as the site is developed and operated as a landfill.

The siltation basin will be designed to remove most of the suspended particles from the storm runoff water. The

perimeter drains around the landfilling area prevents storm-water from passing through the landfill and thereby prevents erosion of the landfill and the formation of leachate.

As an additional precaution, leachate monitoring wells and interceptor trenches will be installed to detect the formation of leachate, and to remove the leachate in the event it is produced.

There are no standing bodies of water or flowing streams within the area to be used for landfilling, therefore, adverse impacts are precluded.

The installation of the perimeter drains, siltation basins, leachate interceptor trenches, and the low rainfall of the area lessen the possibility of underground and near-shore water contamination from the landfill. Two other factors, the location of the landfill in an area permitted by the Board of Water Supply and the Department of Health because there is no major potable water source located under the project site and the City and County's policy of not accepting hazardous or toxic waste in the landfill preclude the possibility of long-term contamination of underground water supplies or the near-shore waters.

IV. NOISE

A. General

During initial site preparation of the landfill, various types of construction equipment and vehicles will be utilized. Conventional construction equipment and their respective noise levels are illustrated in Figure 4-2.

As part of the landfilling procedure, certain types of equipment will be used. These would include trucks, bulldozers, graders and scrapers. Noise levels that will be generated by this equipment are expected to be similar to that presented in Figure 4-2. Two to three of these types of heavy equipment can be expected to operate simultaneously 50 percent of the time. These noise levels will conform to regulations specified in the State of Hawaii Occupational Safety and Health Standards.

FIGURE 4-2
CONSTRUCTION EQUIPMENT NOISE RANGES

		NOISE LEVEL (dba) AT 50 FT					
		60	70	80	90	100	110
EARTH MOVING	EQUIPMENT POWERED BY INTERNAL COMBUSTION ENGINES	COMPACTERS (ROLLERS)		H			
		FRONT LOADERS		-----			
		BACKHOES		-----			
		TRACTORS		-----			
		SCRAPERS, GRADERS			-----		
		PAVERS				H	
		TRUCKS				-----	
MATERIALS HANDLING	EQUIPMENT POWERED BY INTERNAL COMBUSTION ENGINES	CONCRETE MIXERS		-----			
		CONCRETE PUMPS			H		
		CRANES (MOVABLE)		-----			
		CRANES (DERRICK)				H	
STATIONARY	EQUIPMENT POWERED BY INTERNAL COMBUSTION ENGINES	PUMPS		H			
		GENERATORS		-----			
		COMPRESSORS		-----			
IMPACT EQUIPMENT	EQUIPMENT POWERED BY INTERNAL COMBUSTION ENGINES	PNEUMATIC WRENCHES			-----		
		JACK HAMMERS AND ROCK DRILLS			-----		
		PILE DRIVERS (PEAKS)				-----	
OTHER	EQUIPMENT POWERED BY INTERNAL COMBUSTION ENGINES	VIBRATOR		-----			
		SAWS		-----			

Note: Based on Limited Available Data Samples

Source: Noise From Construction Equipment and Operations Building Equipment, and Home Appliances, EPA, 1971

Noise anticipated with sanitary landfilling operations will also be created by traffic traveling to and from the sanitary landfill. A refuse truck generates a level of approximately 80 dB(A). The greatest amount of traffic noise will be generated by refuse vehicles, both municipal and commercial.

As sound waves move uniformly in all directions, the amplitude decreases with increasing distance from the source. In air, when the distance doubles, the amplitude drops by half, which is a drop of 6 dB. Therefore, as the distance from the source increases from one meter to two meters, the sound pressure level will drop by 6 dB. If increased to four meters, it will drop by 12 dB, eight meters by 18 dB, etc. [4.15]. These particular estimates are true only when there are no reflecting or blocking objects in the sound path. These conditions would be termed "free-field" conditions.

With an obstacle in the sound path, part of the sound will be reflected, part absorbed, and the remainder transmitted through the object. The amount or degree the sound is reflected, absorbed or transmitted depends upon the absorbing properties of the object, its size, and wavelength of the sound. Therefore, with effective vegetation zones and creation of earth berms, the sound path can be attenuated considerably and potential adverse impacts from noise at the sanitary landfill to adjacent areas can be mitigated.

Adverse impacts associated with refuse traffic to and from the landfill site, however, cannot be effectively mitigated if these vehicles must travel on an access which goes through residential areas or sensitive wildlife habitats.

Noise exists when unwanted sounds intrude into the environment. Because of this, noise includes a value judgment; however, there are adverse impacts associated with noise [4.16].

Except for hearing loss, there is no human illness known to be directly caused by noise. Several studies, however, have implicated noise as an important cause of physical and psychological stress and stress has been linked with other health disabilities

and diseases, including heart disease, high blood pressure, headaches, fatigue and irritability [4.17].

There is evidence to support statements regarding effects on people of noise exposure of sufficient intensity and duration; [4.18]

- it can permanently damage the inner ear with resulting permanent hearing losses that can range from slight impairment to nearly total deafness
- it can result in temporary hearing losses and repeated exposures to noise can lead to chronic hearing losses
- it can interfere with speech communication and perception of other auditory signals
- it can disturb sleep
- it can be a source of annoyance
- it can interfere with the performance of complicated tasks and can disturb performance when speech communication or response to auditory signals is demanded
- it and other acoustical considerations can reduce the opportunity for privacy
- it can adversely influence mood and disturb relaxation

B. Project Site

Noise from landfill operations is found in Table 4-3 and the ambient noise levels for Ohikilolo Valley is presented in Table 4-4. Using this data, it is reasonable to assume that the noise levels generated during construction and landfilling will be within a range which will not be a significant impact.

The mouth of the valley is presently impacted by the noise levels generated from the highway [45-50 dB(A)] and the noise from the land filling activities at the 200-foot elevation will be below 50 dB(A). As the landfilling proceeds into the valley, the noise from the machinery and trucks will decrease with distance from Farrington Highway. The noise levels of 40 to 50 dB(A) can be characterized as representing a level found in a quiet automobile or a quiet office (Figure 4-3); or that found in a small town or rural environment (Figure 4-4).

The operation of the landfill will conform to the requirements of Title 11, Administrative Rules Chapter 43, Community Noise Control for Oahu and Chapter 42, Vehicular Noise Control for Oahu.

TABLE 4-3 [4.19]

Noise Levels From Landfilling Activities¹

<u>Distance from the Working Surface in Feet</u>	<u>Noise Levels in dB(A)</u>
50	74-83
100	72-78
200	64-70
300	60-66
400	58-64
500	54-60
600	52-58
700	52-58
800	51-56

¹Data for this table were obtained from the Kapaa Sanitary Landfill using a B&K Sound level meter.

TABLE 4-4 [4.20]

Ambient Noise Levels For Ohikilolo Valley¹

<u>Elevation in Feet</u>	<u>Noise Levels in dB(A)</u>
10	45-50*
50	40-42
100	40-45
230	35-40

* The ambient noise level is affected by the surf sounds and the existing traffic along Farrington Highway. Most of the traffic sounds were generated from automobile traffic. When the military uses Makua Valley for live ordinance practice, strafing by helicopters and jet ground support, the project site is impacted by high noise levels.

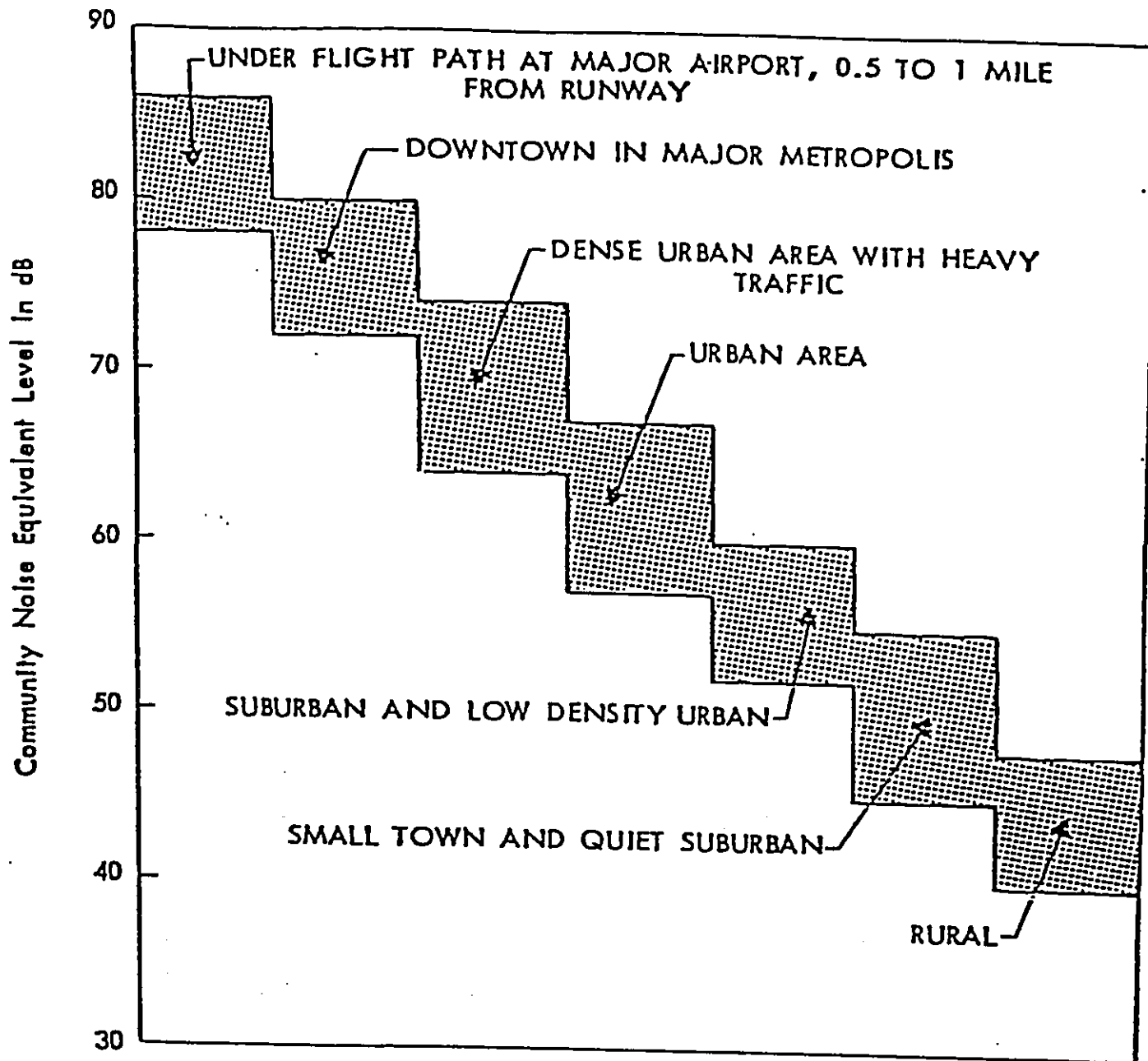
FIGURE 4-3

SOUND LEVELS OF COMMON SOUNDS

Sound	Sound Level dB(A)	Relative Loudness (Approximate)
Jet Plane, 100 Feet	130	128
Rock Music with Amplifier	120	64
Thunder, Danger of Permanent Hearing Loss	110	32
Boiler Shop, Power Mower	100	16
Orchestral Crescendo at 25 Feet, Noisy Kitchen	90	8
Busy Street	80	4
Interior of Department Store	70	2
Ordinary Conversation, 3 Feet away	60	1
Quiet Automobile at Low Speed	50	1/2
Average Office	40	1/4
City Residence	30	1/8
Quiet Country Residence	20	1/16
Rustle of Leaves	10	1/32
Threshold of Hearing	0	1/64

Source: (4.14)

FIGURE 4-4



GRAPH 1

TYPICAL RANGE OF OUTDOOR COMMUNITY NOISE EXPOSURE LEVELS

Source: (4.14)

V. NUISANCES

A. Litter

1. General

Litter can be a potential problem as refuse is deposited at the working face.

2. Project Site

The best mitigative measure for controlling litter includes prompt compaction and covering with soil. Portable litter fences will also be installed at the working face in relation to the prevailing winds to confine windblown litter if necessary.

B. Vectors

1. General

Vectors, insects and rodents must be controlled at a landfill site.

2. Project Site

The proposed sanitary landfill is not expected to have problems with insects or rodents. Compacting and covering the deposited refuse are important procedures in achieving effective vector control. Six inches of compacted cover soil will mitigate emergence of flies from the deposited refuse and discourage burrowing by rodents. Birds may also frequent a sanitary landfill, but with proper operations and effective covering of deposited refuse, birds will be kept at a minimum.

If rodents should become a nuisance at the landfill, a baiting program will be implemented and supervised by an experienced exterminator. Generally, such programs last two to three weeks and are an effective short-term control in reducing numbers of rats. However, rats have not been a problem at municipal landfills and are not anticipated to be a problem at the proposed sanitary landfill.

VI. LANDFORM ALTERATION AND VISUAL IMPACT

A. General

All landfills alter the landform by filling in gulches, valleys, and alter the slope of the land. The visual impact of the landfill depends upon the site in relationship to nearby residents. These visual impacts are associated with not only the change in land form, but the existence of denuded areas, and general landfill operations.

Methods to mitigate the visual impact include placement of vegetative buffer zones, vegetative earth berms to screen land-filling activities and an on-going landscaping program. As portions of the sanitary landfill are completed, they can be graded, contoured and revegetated according to the specifications of the final use of the landfill.

B. Project Site

1. During Construction

Construction of the landfill, maintenance facilities, access road and siltation basins and fire break will involve clearing and grubbing of the existing vegetation. The vegetation consists primarily of an overstory of tall koa haole, few kiawe, and isolated wiliwili and kukui nut trees. There are no rare or endangered species of plants within the area to be used for landfilling. The area adjacent to the highway, elevation 7 feet to the 25 foot contour line, contains a grass field under cultivation for grass hay. This area will be used for a buffer strip (150 to 200 feet wide) and landfilling. The buffer strip area will remain in grass and the landfilling area will be cleared and grubbed.

The clearing and excavation activities will be done in increments to minimize erosion from wind and water. All of these activities will comply with the City and County Grading Ordinance. The clearing activities will be visible from Farrington Highway.

2. Landfilling Phase

The existing landform will be altered as the floor and upper slopes of the valley fronting Farrington Highway are filled with solid waste. The flat area will be converted into a hill as refuse is added.

Upon completion of the sanitary landfill, the site will be graded and the surface maintained as necessary. The exact details of closure of the landfill will be contained in the Closure Plan which will be prepared at a later date.

The landfilling activities will be visible along the eastern portion of Farrington Highway directly fronting the project site.

The installation of a buffer strip (150 feet) wide along the eastern portion (3,800 feet) will help mitigate some of the visual impacts.

3. Final Use of the Land

The final use of the landfill has not been determined. It is recommended that the landfill, after the area has been stabilized, be used for open space outdoor recreation such as hiking, and possibly grass skiing.

VII. BIOLOGICAL

A. Flora

The project site, the area to be used for landfilling (200-foot contour) has been extensively modified. The flora consists primarily of an overstory of Koa haole/Kiawe trees with an understory of grass. The area found between the 15 to 200-foot contour line is used for livestock grazing (cattle, horses, donkeys and goats) and the vegetation has been modified.

Scattered within the dry stream beds, a few wiliwili and kukui nut trees can be found, generally within the archaeological complexes.

The plant life is characteristic of that found along the dry leeward coastline. There are no rare or endangered species of plants found within the landfilling area.

B. Fauna

The project site does not contain a sensitive wildlife habitat nor are there any rare or endangered species of mammals or birds.

VIII. ARCHAEOLOGICAL AND HISTORICAL

A. Archaeological

An archaeological surface reconnaissance of the landfilling area was conducted and numerous archaeological site complexes were located. The results of the survey can be found in Appendix C of this report.

The significance of these sites is that very little work and, therefore, information exists on archaeological sites on dry-land environments on Oahu. The physical characteristics of the sites are different. They are atypical, and differ from sites found in Makaha Valley, Oahu and Makena, Maui.

Considerable amount of work will have to be undertaken before any construction activities could occur on the project site.

B. Historical

A historical sampling of the literature was undertaken and there was some information on the original acquisition of the land. The historical documentation is found in Appendix C of this report.

IX. TRAFFIC IMPACT

A traffic analysis was conducted and the results of the study and conclusion are found in Appendix D of this report. The conclusion states the projected traffic generated by the proposed landfill operations should not significantly increase the total traffic volume on Farrington Highway because the proposed Leeward District Sanitary Landfill sites generate relatively low traffic volumes.

X. INFRASTRUCTURE

1. Police

The intersection improvements proposed for the new access road and Farrington Highway will provide safe ingress and egress for the trucks. This should prevent undue traffic problems for the police.

2. Fire

The response time from the Waianae Fire Station located 5.5 miles from the project site is approximately 7 minutes. Supportive service, water tankers from Waianae and Nanakuli Fire Stations are available (18 minutes from Nanakuli).

The Waianae Station's response time to the project site is within the 10 minute response time established as guidelines from the National Fire Protection Association. However, the Waianae and Nanakuli Fire Stations are only capable of extinguishing small fires and/or possibly preventing the extension of fires to other structures (containment).

The construction plans for the landfill will require a fire break (50 to 70 feet wide) to prevent fires from entering and exiting the landfill.

3. Utilities

Electrical and telephone services are available within the project area. The minor needs of the landfill operation can be provided with telephone and electrical services. Potable water requirements for the landfill and for irrigation will be required. The Board of Water Supply's water main will need to be extended to the project site to provide the water for drinking and irrigation. A cesspool will be provided for the dispersal of liquid waste.

XI. ECONOMIC IMPACT

The economic impact of providing additional jobs will be minor.

The exact terms and cost for the use of the land for landfilling have not been worked out with the landowners. It is anticipated that the landowners will be compensated for the use of the land.

Cost is an important consideration in development of a sanitary landfill. Distance of the sanitary landfill from refuse generating centers and the extent of improvements required to make the sanitary landfill environmentally acceptable are factors which will increase the overall development and the operation and maintenance costs of the sanitary landfill.

Besides its necessity, regardless of a resource recovery program, a sanitary landfill is presently the most cost effective method for refuse disposal.

XII. IMPACT TO THE LANDOWNERS AND/OR TENANTS

The landowners will be denied the use of the land for approximately 21 years while the landfilling operations occur. After the completion of the landfilling operations, the land will probably revert back to landowners. The use of the land after landfilling will be limited to pasture, open space recreational use but not for buildings or intensive, irrigated agricultural use.

The impact to the existing users and operators of the ranch will be significant. Approximately three to four families will require relocation. The total number of people impacted is from 12 to 30. Most or all of the people associated with the ranching activities either obtain a portion or their entire livelihood from the ranch.

The loss of the ranch activities would mean the loss of the cattle operation (about 500 head), loss of the grass hay production, loss of the goat herd, loss of the kiawe charcoal operation, loss of the donkey herd (sold to the Honolulu Zoo for meat) and the loss of the area for the yearly gathering sponsored by the Silva family and the Leeward Community.

The proposed project will have an adverse impact on the tenants, the owners and users of Ohikilolo Valley. It is anticipated that the loss of the hay and meat production of the ranch will have an adverse impact on the operation of the Honolulu Zoo. The zoo is dependent on the hay and meat for feeding of the animals.

PROJECT SITES ATTRIBUTES

The major attribute of the project site is the amount of area available for landfilling. It is estimated that the capacity of this site will be for 21 years. This translates to approximately 1,000 tons of refuse per day, six days per week or a total of 18,460,000 cubic yards of refuse. The landfill life can easily be tripled with the implementation of the City's proposed "Solid Waste Processing Resource Recovery Facility."

Water Contamination

The site is located outside of the UIC line and within an area permitted to be used for landfilling. The site is located in an area where leachate production from the landfilling will not occur.

Location to Urban Areas

The project site is not located adjacent to a school, hospital or day care center. However, there will be residents displaced.

Infrastructure

Electrically and telephone services are available. Access to and from the project site is available from Farrington Highway.

ANTICIPATED SECONDARY ENVIRONMENTAL IMPACTS

I. INTRODUCTION:

Secondary environmental impacts are those which are indirect results from the project. Short-term impacts are those which result during the construction phase and long-term impacts are those which may result for the life of the project.

II. SHORT-TERM SECONDARY IMPACT

The scarring of the land during site preparation and operation of the landfill will cause a secondary visual impact.

III. LONG-TERM SECONDARY IMPACT

The long distance from the centers of refuse generation to the Ohikilolo landfill site, may create additional problems of illegal dumping of refuse along Farrington Highway and along the coastal areas.

The loss of the valley's visual aesthetic qualities presently enjoyed by resident and visitors will result in the lowering of the quality of life. This section, from Makaha Valley to Kaena Point represents the last remaining area on the Leeward Coast which has not been altered by development - either urban or commercial. The landfill will temporarily scar the land and alter the landform and by doing this, alter the quality of life.

REFERENCES TO SECTION 4

Ohikilolo Valley

- [4.1] Title II Chapter 60. Air Pollution Control.
- [4.2] City and County of Honolulu. 1977. Leachate Study, Landfill Inventory Study. Prepared by EMCON Associates.
- [4.3] Ibid. [4.2].
- [4.4] Ibid. [4.2].
- [4.5] Ibid. [4.2].
- [4.6] Ibid. [4.2].
- [4.7] Ibid. [4.2].
- [4.8] Ibid. [4.2].
- [4.9] Ibid. [4.2].
- [4.10] Ibid. [4.2].
- [4.11] Ibid. [4.2].
- [4.12] U. S. Environmental Protection Agency. 1972. Field Operations and Enforcement Manual for Air Pollution Control. Volume II: Inspection Procedures for Specific Industries.
- [4.13] Ibid. [4.2].
- [4.14] U. S. Environmental Protection Agency. 1971. Noise from Construction Equipment and Other Operations, Building Equipment and Home Appliances. Prepared by Bolt, Beranek and Newman under contract 68-04-0047.
- [4.15] B & K Instruments, Inc. Measuring Sound.
- [4.16] U. S. Environmental Protection Agency. 1978. Noise: A Health Problem.
- [4.17] Ibid. [4.16].
- [4.18] U. S. environmental Protection Agency. 1971. Effects of Noise on People. Prepared by the Central Institute for the Deaf under contract 68-01-05000.

REFERENCES TO SECTION 4 - Cont'd

Ohikilolo Valley

- [4.19] Kapaa Sanitary Landfill Revised EIS. 1978. Prepared by Environment Impact Study Corp. p. 4-26.
- [4.20] EISC Noise Level Readings taken June 1983 and July 1983. B & K noise level meter, set at slow response.

**Adverse
Environmental
Effects**

5

SECTION 5

PROBABLE ADVERSE ENVIRONMENTAL IMPACTS WHICH
CANNOT BE AVOIDED

This section summarizes the adverse impacts presented in the previous section entitled, "Anticipated Environmental Impacts and Mitigative Measures to Minimize Adverse Impacts," and presents mitigative measures to minimize these impacts.

WAIMANALO GULCH SITE

I. PRIMARY IMPACTS OF THE PROPOSED PROJECT

A. Short-Term Adverse Impacts

Short-term adverse environmental impacts are construction related and are of short duration, lasting only for the construction period.

The dust generated during the construction phase should not create significant problems. The dust problem will be mitigated in the field by using water-wagons spraying water. Exhaust emissions from the construction equipment should be insignificant and will not adversely affect the ambient air quality.

The distance of the project site from the ocean and the absence of a flowing stream preclude water pollution from sediments.

B. Long-Term Adverse Impacts

1. Air Quality

Dust will be the primary air pollutant produced during the operation of the sanitary landfill. Also, gases will be generated from the natural decomposition process of the solid waste.

The dust problem will be mitigated in the field using water wagons and/or a sprinkling system spraying water on

the exposed ground surface. The completed portions of the landfill will be graded and grassed, this will prevent soil erosion from wind and water.

The gas generated from the decomposition process will be vented into the atmosphere or collected for recovery purposes.

2. Water Quality

A siltation basin will be installed to prevent adverse impacts from silt.

The production of leachate is minimized by the low annual average rainfall. Leachate is generally produced in areas having average annual rainfall in excess of 30 inches, which is not the case for the project site (less than 20 inches). Therefore, the production of leachate resulting in adverse long-term impacts to the basal ground water and coastal water should not occur. In the remote event that leachate is produced, or as a precautionary measure, monitoring wells and leachate collection system will be installed.

3. Landform Alteration and Visual Impact

Clearing, excavation and landfilling of the site will result in exposing the soil and rock layer and, during the day, the disposed refuse at the operating face of the landfill.

The landfilling activities will be visible from a portion of Farrington Highway and the cane field, directly fronting the project site. The installation of a buffer strip (400 feet) along the east portion and the north-south separation of 800 to 1,000 feet will help to mitigate some of the visual impacts.

The significant long-term and unavoidable impact that will result from the implementation of the proposed project is the reduction of the present slopes of the gulch when the landfill is completed.

II. SECONDARY IMPACTS OF THE PROPOSED PROJECT

There are no short-term or long-term adverse secondary environmental impacts from the implementation of the project.

OHIKILOLO VALLEY SITE

I. PRIMARY IMPACTS OF THE PROPOSED PROJECT

A. Short-Term Adverse Impacts

Short-term adverse environmental impacts are construction related and are of short duration, lasting only for the construction period.

The dust generated during the construction phase should not create significant problems. The dust problem will be mitigated in the field by using water-wagons spraying water. Exhaust emissions from the construction equipment should be insignificant and will not adversely affect the ambient air quality.

The drainage system and siltation basins will be constructed first to minimize the effects of erosion during initial construction of the site. The amount of erosion during this phase of construction is not anticipated to be significant.

The noise that will be generated during the construction and operation phases of the landfill is unavoidable. Construction and landfilling vehicles will increase the current noise levels.

B. Long-Term Adverse Impacts

Long-term adverse environmental impacts result from the operation of the sanitary landfill.

1. Air Quality

Dust will be the primary air pollutant produced during the operation of the sanitary landfill. Also, gases will

be generated from the natural decomposition of the solid waste.

The dust problem will be mitigated in the field using water wagons and/or a sprinkling system spraying water on the exposed ground. The likely sources include the use of existing wells and extension of the Board of Water Supply's line to the project site. The completed portions of the landfill will be graded and grassed, this will prevent soil erosion from wind and water.

The gas generated from the decomposition process will be vented into the atmosphere or collected for recovery purposes..

2. Water Quality

Two siltation basins will be installed to minimize adverse impacts from silt.

The production of leachate is minimized by the low annual average rainfall. Leachate is generally produced in areas having average annual rainfall in excess of 30 inches, which is not the case for the project site (less than 20 inches). Therefore, the production of leachate resulting in adverse long-term impacts to the basal ground water and coastal water should not occur. In the remote event that leachate is produced, or as a precautionary measure, monitoring wells and leachate collection system will be installed.

3. Landform Alteration and Visual Impact

Clearing, excavation and landfilling of the site will result in exposing the soil and underlying rock layer and, during the day, the disposed refuse at the operating face of the landfill.

The landfilling activities will be visible from the Farrington Highway, directly fronting the project site. The

installation of a buffer strip (150 to 200 feet deep) along the entire length of the project will help mitigate some of the visual impacts.

The significant long-term and unavoidable impact that will result from the implementation of the proposed project will be the creation of a hill (30 to 210 feet high) out of the existing flat terrain.

4. Archaeological Sites

Numerous archaeological site complexes are located in the area to be landfilled. The significance of this site is in the fact that this is the only intact site remaining on the Leeward coast of Oahu which has not been extensively investigated. Even after extensive investigation and salvage, the sites will be lost because of the landfill.

5. Impact to the Landowners and/or Tenants

The landowners will be denied the use of the land for approximately 21 years while the landfilling operations occur.

The impact of this project on the users and operators of the ranch will be significant. The project will require displacement of all residents of the valley (4 families), curtail the existing grass hay, cattle, goat, kiawe charcoal and zoo meat production. This will be a significant adverse economic impact to the current residents of the valley.

II. SECONDARY IMPACT OF THE PROPOSED PROJECT

The long-term adverse secondary impacts will be the loss of the valley's aesthetic qualities and the use of the valley by the Leeward community. The loss of the valley, presently enjoyed by residents and visitors represents a lowering of the quality of life.

Alternatives

6

SECTION 6

ALTERNATIVES TO THE PROPOSED ACTION

I. NO ACTION

If the proposed project is not implemented, refuse disposal for the island will be severely impacted. The resulting effect of a no action would probably be the curtailment of disposal services at the existing sanitary landfills to extend the landfill life. Curtailment of services can include denial of permission to dispose of non-city collected refuse and waste at the landfills.

Without a Leeward landfill site, most of the refuse from this side of the island would be hauled to the Windward sanitary landfill. The result would be that the Windward sanitary landfill will fill up at a faster rate than expected. Since approximately three to five years are required to construct a new landfill, the City would have no sanitary landfill on Oahu by the end of 1985.

II. ALTERNATIVE SITES

The City and County of Honolulu Department of Public Works (DPW) has investigated several potential landfill sites on the Leeward side of the island. This evaluation and search for a landfill site has been an on-going process since the seventies. Serious efforts have been made to negotiate for the use of Federal lands at Waipio Peninsula, Honouliuli, Ewa No. 2 and Makua. These sites have been rejected because they are either over municipal groundwater supplies or the Federal Government is currently using them for other purposes and is unwilling to relinquish them for landfill sites.

The only other viable sites for landfilling, other than the Waimanalo Gulch and the Ohikilolo sites, are Nanakuli (TMK 8-7-9:1&3 and TMK 8-7-21:26) and Makaiwa (TMK 9-2 03). The Nanakuli and Makaiwa sites were evaluated for landfilling in 1978 (a Revised EIS was prepared (4/18/78).

The two sites, Makaiwa and Nanakuli cannot be developed as landfills without overcoming significant community opposition, which prevented their use in 1978. Refer to Table 6-1, Landfill Sites Status 1982 for additional information.

III. ALTERNATIVE PROCESSING METHODS

The City and County of Honolulu Department of Public Works has indicated that there are presently only two viable methods to reduce the volume of solid waste -- incineration and energy recovery.

TABLE 6-1

LANDFILL SITES STATUS (1983)

	Code
1. Kapaa #2 and #3 Landfill Sites	SLF
2. Kapaa #1 Landfill Site	PA
3. Kalaheo Landfill Site	PS
4. Heeia Uka Landfill Site	2
5. Waimanalo North Landfill Site	3
6. Auloa Landfill Site	6
7. Waimanalo South Landfill Site	1
8. Kahaluu, Waihee, Waiahole, Waikane, Kaawa, and Punaluu Landfill Sites	1
9. Olomana Landfill Site	6
10. Bellows Field Landfill Site	3 & 4
11. Heeia Kai Landfill Site	1
12. Makaiwa Landfill Site	2
13. Nanakuli Landfill Site	2
14. Kaloi Landfill Site	1
15. Honouliuli Landfill Site	1
16. Kaukonahua and Waipahu Landfill Sites	1
17. Maili Landfill Site	Q
18. Koko Crater Landfill Site	7
19. Waipio Landfill Site	3
20. Mililani Landfill Site	1
21. Poamoho Landfill Site	1
22. Keekee Landfill Site	1
23. Kaena Quarry Landfill Site	1
24. Makua Landfill Site	3
25. Ohikilolo Landfill Site	5
26. Waimanalo Gulch Site	5
27. Barbers Point	1
28. Diamond Head	3
29. Ewa No. 1	1
30. Ewa No. 2	1 & 3
31. Halawa Sites	1
32. Kahe	1
33. Kunia	1
34. Pearl Harbor	WL
35. Sand Island	3
36. Waianae	2

Code

- 1. Site located within ground water supply area
- 2. Site located within close proximity to communities
- 3. Land owned by Federal or State government and/or in use, unavailable for use as a sanitary landfill
- 4. Site considered for Windward landfill
- 5. Site considered for Leeward landfill
- 6. Alternative site considered for Windward landfill.
- 7. Alternative site considered for Leeward landfill.
- SLF Presently used as a sanitary landfill
- PA Prior agreement not to be used as a landfill in order to obtain the use of Kapaa #2 and #3; and Kalaheo as landfills
- PS The proposed project site
- WL Wetland area, under Federal Regulations
- Q Site is presently being used for quarry operations. It is not contemplated the owners will allow the City to develop a landfill on this site.

**Short
Term Uses · Long
Term Productivity**

7

SECTION 7
RELATIONSHIP BETWEEN LOCAL SHORT-TERM USES
OF MAN'S ENVIRONMENT AND THE MAINTENANCE AND
ENHANCEMENT OF LONG-TERM PRODUCTIVITY

Man will continually produce solid waste and the quantities produced will increase as the population increases. A safe and efficient means to dispose of the waste produced must be developed. Sanitary landfills will continue to be the most economic means of solid waste disposal until resource recovery methods can be implemented. Also sanitary landfills will continue to be the ultimate disposal site for all solid waste processing residue.

A properly operated landfill is a safe method of waste disposal. A properly operated sanitary landfill is generally free of vector, odor, fire, litter, leachate, soil erosion and aesthetic problems. Although the landfill will be committed to only that purpose during its life, once completed the site can be used for permanent outdoor recreation or open space. Agricultural potential of the completed site will be limited.

Commitment of Resources

8

U.S. DEPARTMENT OF AGRICULTURE

SECTION 8

IRREVERSIBLE AND IRRETRIEVABLE COMMITMENTS OF RESOURCES

General City funds, human labor, construction and operating equipment, building materials, fuel, and soil for cover material will be committed to the project and, therefore, unavailable for other projects.

Using the site as a landfill will make it unavailable for other uses during the life of the landfill. However, this use will not result in the loss of rare and endangered vegetation or animal species. Because of uneven settlement of the landfill there can be no development of the land for residential or other urban uses. Once the landfill is completed, its land use can be returned to open space or to passive recreation.

The cultural, historical, archaeological and aesthetic resources of Ohikilolo Valley will be lost.

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100

Government Policies to Offset Adverse Effects

9

SECTION 9

AN INDICATION OF WHAT OTHER INTERESTS AND CONSIDERATIONS OF
GOVERNMENTAL POLICIES ARE THOUGHT TO OFFSET THE ADVERSE
ENVIRONMENTAL EFFECTS OF THE PROPOSED ACTION

Since solid waste will continue to be generated, new sites are always being sought for solid waste disposal. Increased urbanization and development on the island of Oahu has reduced the amount of land remote from urban areas. Consequently, it is difficult to find a site for solid waste disposal that is remote from urban areas, yet close enough to make transfer and hauling of disposal to these sites economically reasonable.

Environmental considerations make ocean disposal undesirable; moreover, it is presently prohibited by EPA regulations. The costly processing techniques of shredding and baling extend landfill life but do not eliminate the need for a landfill. Incineration is more costly than landfilling and also requires a landfill for the residue. Resource recovery will not be implemented until 1987 at the earliest. Until that time, landfilling will remain the most economical means of waste disposal. When resource recovery facilities are finally in operation, landfills will still be required to accommodate their residue. Even with maximum use of resource recovery, sanitary landfilling will continue to be an important means of solid waste disposal because landfills will be used to dispose of the ash and residue produced by the resource recovery system and the unprocessable waste such as bulky items demolition material, rock and soil. The landfills are also needed to serve as emergency backup facilities during shut down of the resource recovery facility.

The proposed project would provide for the safe and efficient disposal of waste for the leeward side of Oahu. The Kapaa SLF is expected to close by the end of 1984, Waianae and Kawaihoa SLF by the middle of 1984 and Palailai SLF by the middle of 1986. At least three years of lead time will be required to develop a resource recovery facility, or a new SLF other than the proposed project. This project would meet a critical need of the Oahu population.

Approvals

10

11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100

SECTION 10

LIST OF NECESSARY APPROVALS

1. Certificate of Compliance and Solid Waste Management Permit, from the Department of Health.
2. A permit for grading, excavation and fill pursuant to ordinance No. 3968 (1972). The contractor will obtain said permit from the Department of Public Works, Division of Engineering.
3. Construction Plan Approval from the Board of Water Supply.
4. Construction Plan Approval from the Hawaiian Electric Company.
5. Construction Plan Approval from the Hawaiian Telephone Company.
6. SMA Use Permit required for portions of Waimanalo Gulch and Ohikilolo Valley.
7. Stockpiling permit (City and County of Honolulu).
8. State DOH - permit to conduct work within State Right-of-Way Highways Division.
9. Conditional use permit from DLU for structures within AG-1 (Restricted Agricultural District).
10. Special Use Permit.
11. Disinterment Permit (DOH/DLNR) for grave at Ohikilolo.
12. Building Permit - Building Department.

**Unresolved
Issues**

11

SECTION 11
UNRESOLVED ISSUES

There are some issues which will be resolved during the preliminary engineering phase of the project.

The final use of the land after landfilling has not been determined nor preliminary plans developed. These plans will be developed after the preliminary engineering plans have been finalized.

The cost and acquisition of the land for landfilling have not been worked out. These matters will be negotiated with the landowners.

SECTION 12

ORGANIZATIONS AND PERSONS
CONSULTED DURING THE PREPARATION OF THE EIS

The following list includes those agencies and organizations to whom Preparation Notices were sent or from whom comments were received during the review process. Those with an asterisk sent in written comments, and the comments and corresponding responses are presented on the indicated pages.*

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<u>Federal</u>	
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*U.S. Department of Agriculture, Soil Conservation Service	12- 6
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American Lung Association	
American Lung Association	
Hawaii Thousand Friends	
Oahu Development Conference	
League of Women Voters	
McCandless Trust Estate	
Robert Au	

12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32



DEPARTMENT OF THE ARMY
PACIFIC OCEAN DIVISION, CORPS OF ENGINEERS
FT. SHAFTER, HAWAII 96858

April 11, 1983

Dr. Michael J. Chun, Director
and Chief Engineer
Department of Public Works
City and County of Honolulu
650 South King Street
Honolulu, Hawaii 96813

Dear Dr. Chun:

Thank you for the opportunity to review the Environmental Impact Statement Preparation Notice (EIS/N) for the proposed Leeward Sanitary Landfill, Waimanalo Gulch Site and Ohikilolo Site, Oahu, Hawaii. Based on our review, we provide the following comments:

- a. A Department of the Army (DA) permit will not be required for the proposed project. However, the Environmental Protection Agency (EPA) regulates sanitary landfills in waters of the United States. Therefore we recommend the City and County coordinate with the EPA.
- b. According to the Flood Insurance Study for Oahu prepared by the Federal Insurance Administration (FIA), the entire site for the proposed Waimanalo Gulch Landfill and most of the proposed Ohikilolo Landfill site are located in a Zone D, or area of undetermined but possible hazards. (See enclosures 1 and 2). However, a portion of the Ohikilolo site in Keana, west of Farrington Highway, is subject to 100-year riverine flooding (Zone A designation) and to 100-year tsunami inundation (Zones V22 and A4 designation) along the coast. The 100-year event has a one percent chance of being equalled or exceeded in any given year. The proposed landfill site should be located outside any identified flood plain areas as shown on the FIA flood hazard map.

Sincerely,

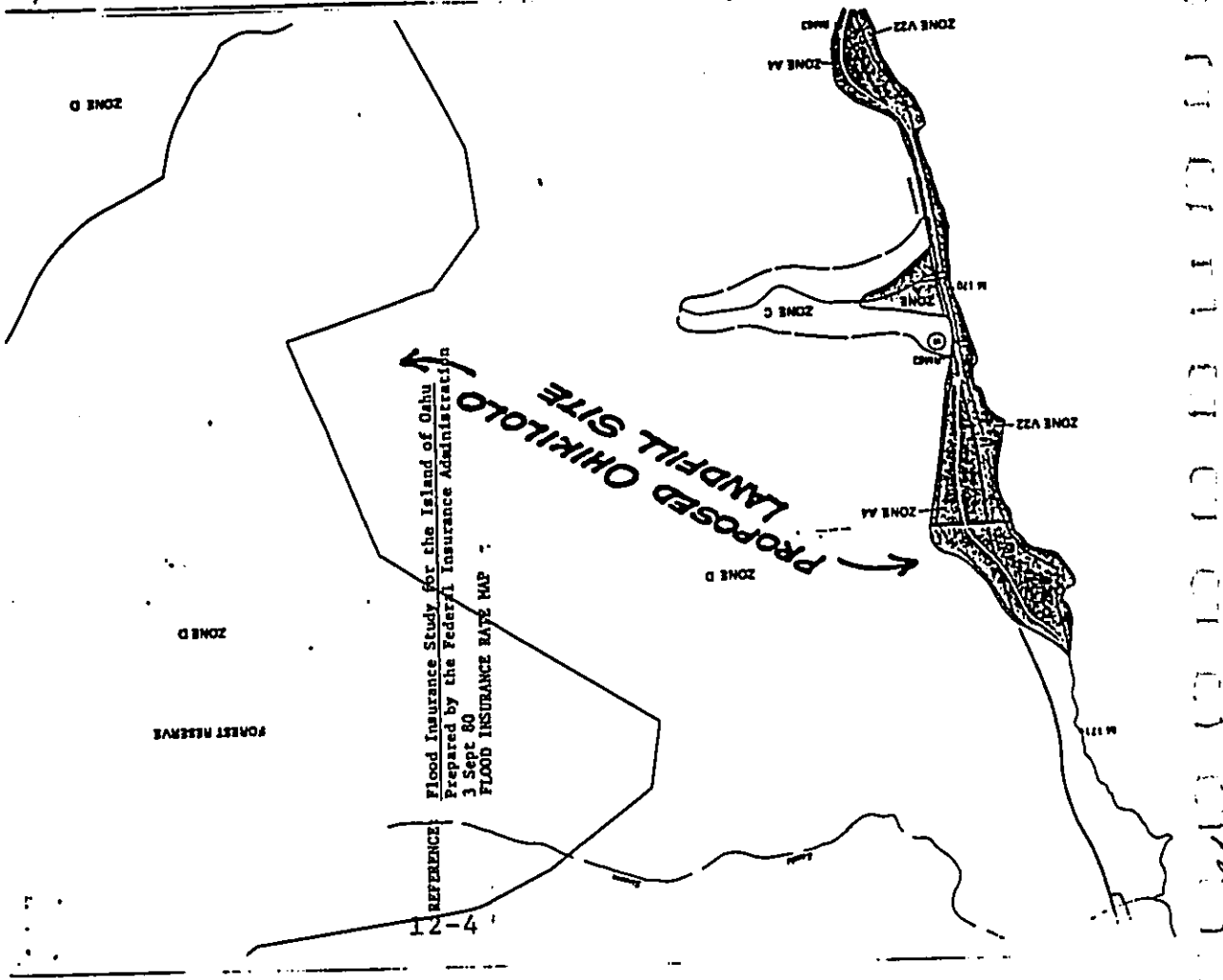
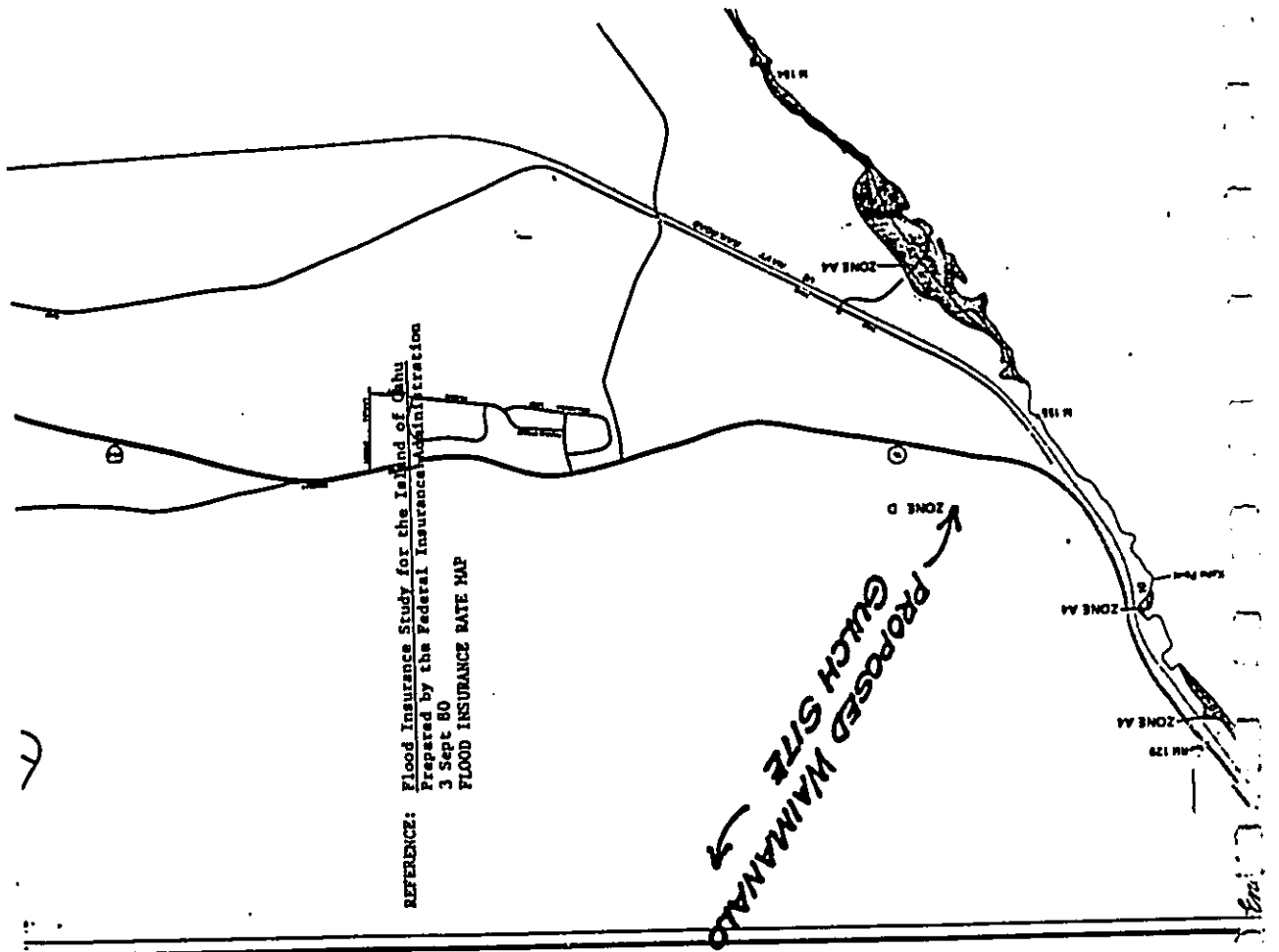
Kisuk Cheung
Kisuk Cheung
Chief, Engineering Division

Enclosures

EXPLANATION OF ZONE DESIGNATIONS

EXPLANATION

ZONE	EXPLANATION
A	Areas of 100-year flood; base flood elevations and flood hazard factors not determined.
A0	Areas of 100-year shallow flooding where depths are between one (1) and three (3) feet; average depths of inundation are shown, but no flood hazard factors are determined.
A1	Areas of 100-year shallow flooding where depths are between one (1) and three (3) feet; base flood elevations are shown, but no flood hazard factors are determined.
A1-100*	Areas of 100-year flood, base flood elevations and flood hazard factors determined.
A99	Areas of 100-year flood to be protected by flood protection system under construction; base flood elevations and flood hazard factors not determined.
B	Areas between limits of the 100-year flood and 500-year flood; or certain areas subject to 100-year flooding with average depths less than one (1) foot or where the contributing drainage area is less than one square mile; or areas protected by levees from the base flood. (Medium shading)
C	Areas of minimal flooding. (No shading)
D	Areas of undetermined, but possible, flood hazards.
F	Areas of 100-year coastal flood with velocity (wave action); base flood elevations and flood hazard factors not determined.
V1-750*	Areas of 100-year coastal flood with velocity (wave action); base flood elevations and flood hazard factors determined.
*	The numerals indicate the magnitude of difference between the 100-year and 10-year flood elevations. For numerals between 1-20, the difference is one half of the value; for values greater than 20, the difference is 10 less than the numeral shown. This information is used in establishing insurance rates.
—	100-year tsunami or riverine elevation line, with elevation in feet above mean sea level.
—	Zone boundary line

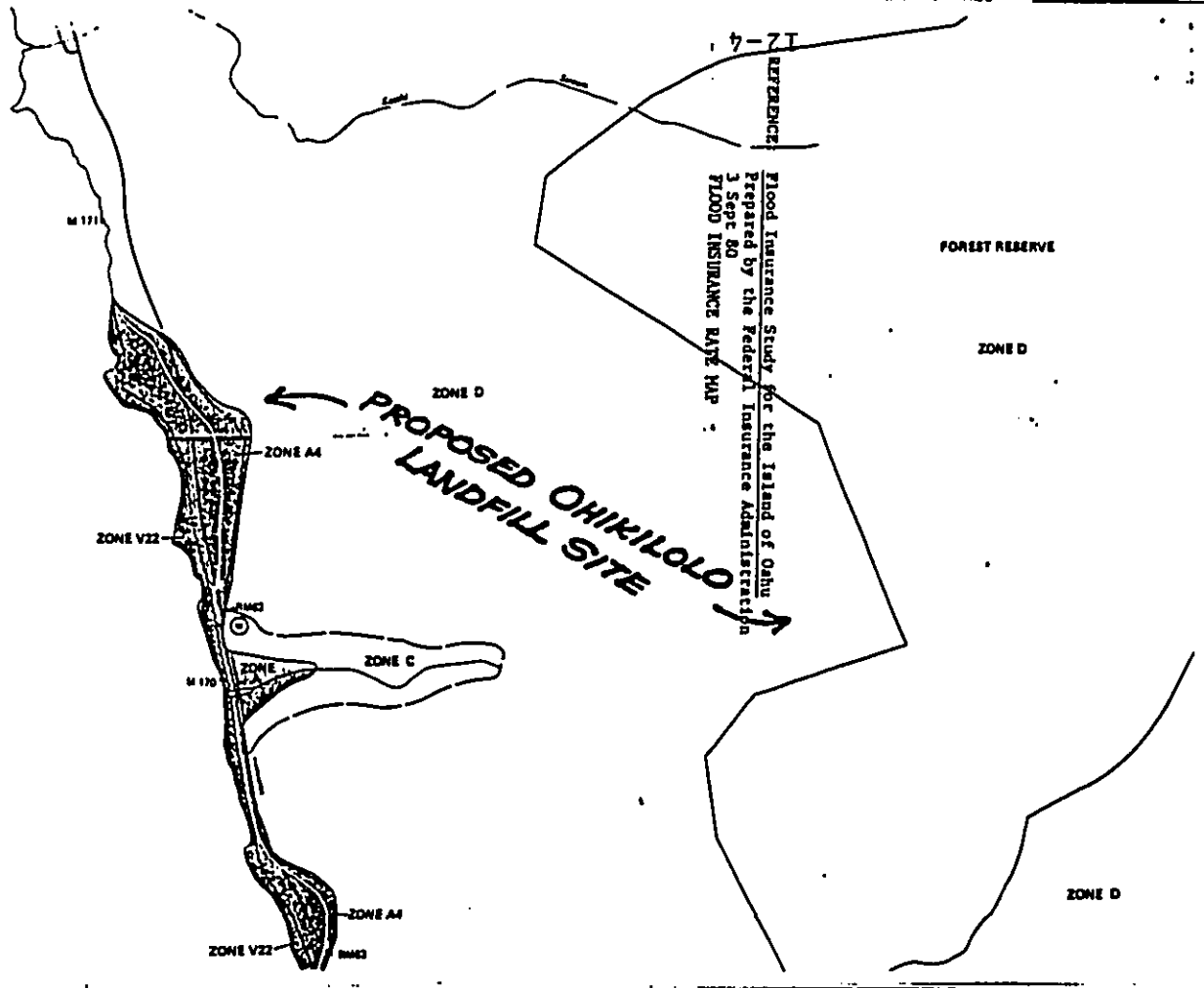


REFERENCE:
Flood Insurance Study for the Island of Oahu
Prepared by the Federal Insurance Administration
3 Sept 80
FLOOD INSURANCE RATE MAP

FOREST RESERVE

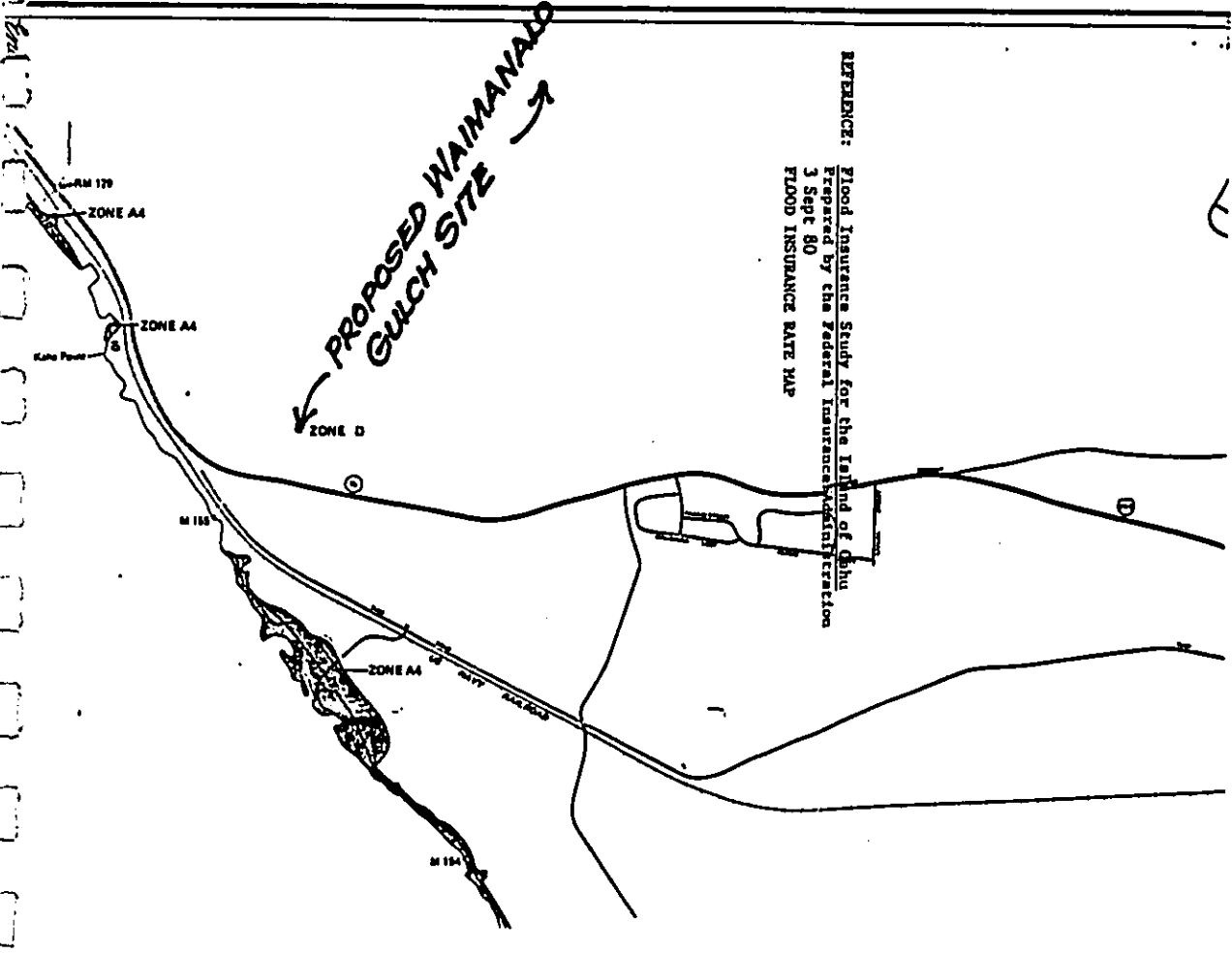
ZONE D

PROPOSED OHIKILOLO
LANDFILL SITE



REFERENCE:
Flood Insurance Study for the Island of Oahu
Prepared by the Federal Insurance Administration
3 Sept 80
FLOOD INSURANCE RATE MAP

PROPOSED WAIMANALO
GULCH SITE



DEPARTMENT OF PUBLIC WORKS
CITY AND COUNTY OF HONOLULU
630 SOUTH KING STREET
HONOLULU, HAWAII 96813



MICHAEL J. CHUN, P.E., D.D.
DIRECTOR AND CHIEF ENGINEER
HAURICE H. WATA
SAFETY DIRECTOR
R 83-471

June 23, 1983

Mr. Kiuik Cheung
Chief, Engineering Division
Department of the Army
Pacific Ocean Division
Corps of Engineers
Ft. Shafter, Hawaii 96858

Dear Mr. Cheung:

Subject: Leeward District Sanitary Landfill Environmental Impact
Statement Preparation Notice

We appreciate your review of the document and the valuable comments contained in your letter dated April 11, 1983.
We offer the following responses to your comments.

Comment:

"a. A Department of the Army (DA) permit will not be required for the proposed project. However, the Environmental Protection Agency (EPA) regulates sanitary landfills in waters of the United States. Therefore we recommend the City and County coordinate with the EPA."

Response:

Thank you for confirming that a Department of the Army (DA) permit will not be required for the project. We have been in contact with the local office of the Environmental Protection Agency (EPA) to determine if a permit will be required from EPA. No permit from EPA is required.

Comment:

"b. According to the Flood Insurance Study for Oahu prepared by the Federal Insurance Administration (FIA), the entire site for the proposed Waimanalo Gulch Landfill and most of the proposed Ohikilolo Landfill site are located in a Zone D, or area of undetermined but

Mr. Kiuik Cheung
June 23, 1983
Page 2

Comment: Continued

(See enclosures 1 and 2). However, a portion of the possible hazards. (See enclosures 1 and 2). However, a portion of the Ohikilolo site in Kanae, west of Farrington Highway, is subject to 100-year riverine flooding (Zone A designation) and to 100-year tsunami inundation (Zones V22 and A4 designation) along the coast. The 100-year event has a one percent chance of being equalled or exceeded in any given year. The proposed landfill site should be located outside any identified flood plain areas as shown on the FIA flood hazard map."

Response:

The information contained in the attachment will be passed on to the design engineer. The landfill will be located outside of the flood plain areas shown on the FIA flood hazard map.

Your letter will be incorporated into the Environmental Impact Statement and a copy will be sent to you for review and comment.

Please contact John Lee at 527-5366 if there are any questions.

Very truly yours,

MICHAEL J. CHUN
Director and Chief Engineer



United States
Department of
Agriculture

Soil
Conservation
Service

P. O. Box 50006
Honolulu, HI
96850

SILEEN M. ANDERSON
MAIL ROOM

DEPARTMENT OF PUBLIC WORKS
CITY AND COUNTY OF HONOLULU
650 SOUTH KING STREET
HONOLULU, HAWAII 96813



MICHAEL J. CHUN, Ph.D.
DIRECTOR AND CHIEF ENGINEER
MAURICE H. KAYA
DEPUTY DIRECTOR

R 83-434 ✓

June 15, 1983

Mr. Stratford L. Whiting
District Conservationist
United States Department of Agriculture
Soil Conservation Service
P. O. Box 50006 Harbor
Honolulu, Hawaii 96850

Dear Mr. Whiting:

Subject: Leeward District Sanitary Landfill Environmental Impact
Statement Preparation Notice

We appreciate your review of the document. Your letter will be incorporated into the Environmental Impact Statement and a copy will be sent to you for review and comment.

Please contact John Lee at 527-5366 if there are any questions.

Very truly yours,

Michael J. Chun

MICHAEL J. CHUN
Director and Chief Engineer

April 15, 1983

R 83-195

Dr. Michael J. Chun
Director and Chief Engineer
Department of Public Works
City and County of Honolulu
650 South King Street
Honolulu, HI 96813

Dear Dr. Chun:

Subject: Environmental Impact Statement Preparation Notice for the
Proposed Leeward Sanitary Landfill, Waimanalo Gulch Site
(TRK: 9-2-03; For. 13,2, and 40) and Ohikilolo Site
(TRK: 8-3-01).

We have reviewed the subject notice and feel it adequately covers our areas of concern and expertise.

Thank you for the opportunity to review this document.

Sincerely,

Stratford L. Whiting

Stratford L. Whiting
District Conservationist



11 10 09 08 07 06 05 04 03 02 01



United States Department of the Interior
FISH AND WILDLIFE SERVICE
100 ALA MOANA BOULEVARD
P. O. BOX 50187
HONOLULU, HAWAII 96850

NO ENTRY OTHER THAN
EIS
ROOM 6307
MAR 30 1983

Mr. Michael J. Chum
Director and Chief Engineer
Department of Public Works
City and County of Honolulu
650 South King Street
Honolulu, Hawaii 96813

Dear Mr. Chum:

The Service has reviewed the Environmental Impact Statement (EIS) Preparation Notice for the proposed Leeward Sanitary Landfill which was forwarded to us with your letter of March 18, 1983. The proposed action at either the Waimanalo Gulch or Ohikilolo Gulch site will have little direct impact on significant fish and wildlife resources in the proposed project area.

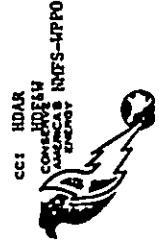
We recommend that the EIS give special consideration to fire prevention and containment. The Ohikilolo Valley west ridge is habitat for several plants which are included on the December 15, 1980 Federal Register Notice of Review (45/FR/8247) as Category 1 candidate species for listing as Endangered. These taxa include:

- Tetramolopium filiforme Sherff
- Dubautia herbatobates Carr
- Lobelia nifhaensis var. meridiana St. John
- Bonania benziesii Gray
- Shiodes nani St. John

The capability to effect prompt fire control must be maintained at the proposed site to prevent accidental destruction of these plants by wildfires originating at the landfill.

The long-term effects of leachates upon basal ground water and coastal water quality should be evaluated and thoroughly discussed in the EIS. We appreciate this opportunity to comment.

Sincerely yours,
Ernest Kosaka
Ernest Kosaka
Project Leader
Office of Environmental Services



Save Forever and You Serve America!

DEPARTMENT OF PUBLIC WORKS
CITY AND COUNTY OF HONOLULU
650 SOUTH KING STREET
HONOLULU, HAWAII 96813



MICHAEL J. CHUM, P.E.
DIRECTOR AND CHIEF ENGINEER
MAURICE H. WATA
CHIEF ENGINEER
R 83-510

July 12, 1983

Mr. Ernest Kosaka
Project Leader
Office of Environmental Services
United States Department of the Interior
Fish and Wildlife Service
300 Ala Moana Boulevard
P. O. Box 50167
Honolulu, Hawaii 96850

Dear Mr. Kosaka:

Subject: Leeward District Sanitary Landfill Environmental Impact Statement Preparation Notice

We appreciate your review of the document and your valuable comments. We offer the following response to your comment and concern on fire containment and leachate production for Ohikilolo Valley.

The landfilling area will be up to the 200-foot elevation and will not affect the flora and fauna of the ridge. As part of the construction documents, a fire break (10 to 50 feet wide) will be installed and maintained to prevent adverse impacts by fire to the vegetation located at the higher elevations.

The possibility of the production of leachate at both sites is minimized by the low annual average rainfall. Leachate is generally produced in areas having average rainfall in excess of 30 inches. This is not the case for the leeward coast. We do not anticipate the production of leachate which will result in adverse long-term impacts to the basal ground water and coastal water quality.

Mr. Ernest Kozaka
July 12, 1983
Page 2

Your letter will be incorporated into the Environmental Impact Statement
and a copy will be sent to you for review and comment.

Please contact John Lee at 527-5166 if there are any questions.

Very truly yours,



MICHAEL J. CHUN
Director and Chief Engineer

12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100



HEADQUARTERS
NAVAL BASE PEARL HARBOR
BOX 110
PEARL HARBOR, HAWAII 96860

IN REPLY REFER TO
002B:MKL:jam
Ser 763
14 APR 1983

Dr. Michael J. Chun
Director and Chief Engineer
Department of Public Works
City and County of Honolulu
650 South King Street
Honolulu, Hawaii 96813

Dear Dr. Chun:

Environmental Impact Statement Preparation Notice
Proposed Leeward Sanitary Landfill, Māhānalo Gulch Site

Thank you for the opportunity to review the subject Environmental Impact Statement Preparation Notice provided by your letter R 83-213 of 29 March 1983. The Navy has no comments to offer at this time.

Please provide us with a copy of the Final Environmental Impact Statement.

Sincerely,

M. M. DALLAM
CAPTAIN, CEC, U. S. NAVY
FACILITIES ENGINEER
BY DIRECTION OF THE COMMANDER

DEPARTMENT OF PUBLIC WORKS
CITY AND COUNTY OF HONOLULU
650 SOUTH KING STREET
HONOLULU, HAWAII 96813



EILEEN R. ANDERSON
SALES

MICHAEL J. CHUN, Ph. D.
DIRECTOR AND CHIEF ENGINEER
MAURICE M. BATA
DEPUTY DIRECTOR

R 83-434

June 15, 1983

Captain M. M. Dallam
CEC, U. S. Navy
Facilities Engineer
Headquarters
Naval Base Pearl Harbor
Pearl Harbor, Hawaii 96860

Dear Captain Dallam:

Subject: Leeward District Sanitary Landfill Environmental Impact Statement Preparation Notice - 002B:MKL:jam Ser 763
14 Apr 1983

We appreciate your review of the document. Your letter will be incorporated into the Environmental Impact Statement and a copy will be sent to you for review and comment.

Please contact John Lee at 527-5366 if there are any questions.

Very truly yours,

MICHAEL J. CHUN
Director and Chief Engineer

GEORGE B. ANIYOSHI
GOVERNOR



JACK K. SUNA
CHAIRMAN, BOARD OF AGRICULTURE
SUZANNE D. PETERSON
DEPUTY TO THE CHAIRMAN

State of Hawaii
DEPARTMENT OF AGRICULTURE
1428 So. King Street
Honolulu, Hawaii 96814

Mailing Address:
P. O. Box 27159
Honolulu, Hawaii 96822

April 6, 1983

MEMORANDUM

To: Mr. Michael J. Chun
Director and Chief Engineer
Department of Public Works
City and County of Honolulu

Subject: Environmental Impact Statement Preparation Notice for
the Proposed Leeward Sanitary Landfill, Waimanalo Gulch
Site (TRK: 9-2-03; por. 13, 2, and 40) and Ohikilolo
Site (TRK: 8-3-01)

The Department of Agriculture has reviewed the subject notice and offers the following comments.

The Waimanalo Gulch site is not classified by the Agricultural Lands of Importance to the State of Hawaii (ALISH) system. Approximately 95 acres of Ohikilolo site is classified as "Other Important Agricultural Land" by ALISH. The majority of the 95 acres would be Prime if irrigation were provided.

We believe that the Environmental Impact Statement should thoroughly discuss the potential impacts of the proposed project on the Panolo Country Ohikilolo Makua Ranch should the Ohikilolo site be chosen. We also suggest that the EIS should consider the impact on potential agricultural production of the removal of the area classified as "Other Important Agricultural Land."

Thank you for the opportunity to comment.

Jack K. Suna
JACK K. SUNA
Chairman, Board of Agriculture

DEPARTMENT OF PUBLIC WORKS
CITY AND COUNTY OF HONOLULU
190 SOUTH KING STREET
HONOLULU, HAWAII 96813



EILEEN M. ANDERSON
MAYOR

MICHAEL J. CHUN, Ph.D.
DIRECTOR AND CHIEF ENGINEER
HAUNICEE M. RAYA
DEPUTY DIRECTOR

R 83-434

June 15, 1983

Mr. Jack K. Suna
Chairman, Board of Agriculture
State of Hawaii
Department of Agriculture
1428 So. King Street
Honolulu, Hawaii 96814

Dear Mr. Suna:

Subject: Leeward District Sanitary Landfill Environmental Impact Statement Preparation Notice

We appreciate your review of the document and offer the following responses to your comments.

Comment:

"The Waimanalo Gulch site is not classified by the Agricultural Lands of Importance to the State of Hawaii (ALISH) system. Approximately 95 acres of Ohikilolo site is classified as "Other Important Agricultural Land" by ALISH. The majority of the 95 acres would be Prime if irrigation were provided."

Response:

The evaluation that the majority of the 95 acres of the Ohikilolo site, if irrigated, would be prime is noted. However, there is no indication that sufficient water suitable for irrigation is readily available on the project site. Therefore, we believe that the ALISH system of "Other Important Agricultural Land" is appropriate.

Comment:

"We believe that the Environmental Impact Statement should thoroughly discuss the potential impacts of the proposed project on the Panolo Country Ohikilolo Makua Ranch should the Ohikilolo site be chosen. We also suggest that the EIS should consider the impact on potential agricultural production of the removal of the area classified as "Other Important Agricultural Land."

Mr. Jack Suwa
June 15, 1983
Page 2

Response:

We will work closely with you to determine the impact of the removal of the ranching activities and the 95 acres of agricultural lands.

Your letter will be incorporated into the Environmental Impact Statement and a copy will be sent to you.

Please contact John Lee at 527-5366 if there are any questions.

Very truly yours,



MICHAEL J. CHUN
Director and Chief Engineer



STATE OF HAWAII
DEPARTMENT OF HEALTH

P.O. BOX 2271
HONOLULU, HAWAII 96813

April 22, 1983

CHARLES G. CLARK
DIRECTOR OF HEALTH

JOHN F. CHAMBERS, M.D.
DEPUTY DIRECTOR OF HEALTH

HELENE M. THOMPSON, M.A.
DEPUTY DIRECTOR OF HEALTH

MELVIN S. BERTMAN
DEPUTY DIRECTOR OF HEALTH

MELVIN S. BERTMAN
DEPUTY DIRECTOR OF HEALTH

Mr. Michael J. Chun
Director and Chief Engineer
Department of Public Works
City & County of Honolulu
650 S. King St.
Honolulu, Hawaii 96813

Dear Mr. Chun:

Subject: Request for Comments on Proposed Environmental Impact Statement
(EIS) for Leeward Sanitary Landfill, Waipaanalo Gulch Site and Ohikilolo
Site

Thank you for allowing us to review and comment on the subject proposed
EIS.

We submit the following comments for your information and consideration:

1. Waipaanalo Gulch

The UIC Line was drawn to allow this site to be a possible landfill. However, at the upper end of the gulch, the landfill boundary outline and the UIC Line do not coincide. The UIC Line follows topographic features and falls short of the landfill boundary which is apparently drawn to follow existing property or land use features. If no actual landfilling will be conducted above the 400-foot elevation which is the upper UIC boundary, there should be no problems due to the differing boundary lines.

2. Ohikilolo

As noted in the Notice of Preparation (EIS) document, the mauka portion of the landfill site is over a designated USDM. The exempted aquifer extends to the 200-foot elevation in this valley. If no actual landfilling will be conducted above the 200-foot elevation which is the upper UIC boundary, there should be no problems due to the differing boundary lines.

There is a source of drinking water located south of the southeast corner of the area proposed for actual landfilling purposes. This existing source is 3013-09, a well used to supply the First Hawaiian Bank Recreation Center.

Mr. Michael J. Chun

-2-

April 22, 1983

If you should have any questions, please contact Ms. Marti Ikehara at 548-6767.

We realize that the statements are general in nature due to preliminary plans being the sole source of discussion. We, therefore, reserve the right to impose future environmental restrictions on the project at the time final plans are submitted to this office for review.

Sincerely,

Melvin S. Bertman
MELVIN S. BERTMAN
Deputy Director for
Environmental Health

DEPARTMENT OF PUBLIC WORKS
CITY AND COUNTY OF HONOLULU
650 SOUTH KING STREET
HONOLULU, HAWAII 96813



EILEEN M. ANDERSON
MAYOR

MICHAEL J. CHUN, Ph.D.
DIRECTOR AND CHIEF ENGINEER
HAUNOUEE M. BATA
DEPUTY DIRECTOR

R 83-445

June 22, 1983

Mr. Melvin K. Koizumi
Deputy Director for
Environmental Health
State of Hawaii
Department of Health
P. O. Box 3378
Honolulu, Hawaii 96801

Dear Mr. Koizumi:

Subject: Leeward District Sanitary Landfill Environmental Impact
Statement Preparation Notice - EPHS-SS

12-13

Mr. Melvin K. Koizumi
June 15, 1983
Page 2

Comment:

"2. Ohikilolo"

"As noted in the Notice of Preparation (NIP) document, the
southeast portion of the landfill site is over a designated USDM. The
exempted aquifer extends to the 200-foot elevation in this valley.
If no actual landfilling will be conducted above the 200-foot
elevation which is the upper UIC boundary, there should be no
problems due to the differing boundary lines."

Response:

Landfilling will not exceed the 200-foot elevation and will therefore
conform to the UIC boundary.

Comment:

"There is a source of drinking water located south of the south-
east corner of the area proposed for actual landfilling purposes. This
existing source is J013-09, a well used to supply the First Hawaiian
Bank Recreation Center."

Response:

Interviews conducted by our consultants with the resident manager of the
First Hawaiian Bank's Recreation Center are contrary to your statement.
The potable water source for the recreational center is from Board of
Water Supply lines located with the Farrington Highway right-of-way.
The well is capped and no longer used for irrigation because of the
salinity.

Our Department and consultants will keep your staff apprised of the plans
for the landfill.

Your letter will be incorporated into the Environmental Impact Statement
and a copy will be sent to you for review and comment.

Please contact John Lee at 527-5366 if there are any questions.

Very truly yours,

MICHAEL J. CHUN
Director and Chief Engineer

We appreciate your valuable comments and offer the following responses.

Comment:

"1. Waimanalo Gulch"

"The UIC Line was drawn to allow this site to be a possible
landfill. However, at the upper end of the gulch, the landfill
boundary outline and the UIC Line do not coincide. The UIC Line
follows topographic features and falls short of the landfill bound-
ary which is apparently drawn to follow existing property or land
use features. If no actual landfilling will be conducted above the
400-foot elevation which is the upper UIC boundary, there should be
no problems due to the differing boundary lines."

Response:

No landfilling activities will be conducted above the 400-foot contour
line. You are correct in the assumption that the boundary lines shown
are the approximate property lines and not the area which will be used
for landfilling.

GEORGE H. JANTON
Governor of Hawaii



STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
P. O. BOX 821
HONOLULU, HAWAII 96809

Assistant Dir., Cultural Resources
Division of Land & Natural Resources
EDGAR A. MALONEY
Special Agent in Charge
DIVISION OF LAND & NATURAL RESOURCES
CULTURAL RESOURCES
ARCHAEOLOGICAL INVESTIGATIONS
ARCHAEOLOGICAL RESEARCH
ARCHAEOLOGICAL CONSULTING
ARCHAEOLOGICAL MONITORING
ARCHAEOLOGICAL RECORDS
ARCHAEOLOGICAL SURVEYS
ARCHAEOLOGICAL TRENCHES
ARCHAEOLOGICAL WALLS
ARCHAEOLOGICAL WINDOWS
ARCHAEOLOGICAL YARDS

Your: R83-195
RECEIVED
DEPT OF PUBLIC WORKS
APR 12 3 19 PM '83

Honorable Michael J. Chun
Director and Chief Engineer
Department of Public Works
City and County of Honolulu
650 So. King Street
Honolulu, Hawaii 96813

12-14

Dear Dr. Chun:

Thank you for notifying us that an environmental impact statement will be prepared for the proposed Leeward Sanitary Landfill. We recommend that the statement cover some of the concerns we have on this matter.

Recreation Concerns:

The preparation notice indicates the need to screen the Ohikilolo site from Kaena Point State Park (page 2-14). We concur.

Keauau Beach Park and its expansion makai of Farrington Highway to Ohikilolo (according to the City and County of Honolulu, Department of Parks and Recreation 1980 Long Range Plan) will be affected as much or more by the proposed site.

Apart from visual concerns, other recreation concerns include odors, litter, vectors, and leachate which reach the neighboring shoreline areas and coastal waters. Good sanitary landfill management may prevent adverse environmental impacts. While some management practices are indicated in the preparation notice, there is no indication that a well planned, continual monitoring system will also be provided to assure proper management and alert the public in the event public health hazards do occur.

Historic Sites Concerns:

Our records indicate that this project does not occur on historic properties listed on the Hawaii Register or the National Register of Historic Places, or eligible for inclusion on the National Register of Historic Places. However, a survey conducted in the vicinity revealed the existence of resources that may meet the criteria for listing on either register. It is likely that other previously unidentified resources also exist in the proposed project area.

Dr. M. J. Chun
Proposed Leeward Sanitary Landfill
Page 2
APR 11 1983

Therefore, we recommend that, prior to any project activity that may have an effect on resources, a reconnaissance survey be conducted by a qualified archaeologist within the proposed area, and that the survey results be forwarded to our historic sites office for evaluation. Should the existence of significant resources be substantiated, we may provide additional recommendations to avoid, mitigate, or negate any adverse effects.

If the undertaking has any federal involvement (e.g. funding, loan guarantee, permit, or license), the applicant should verify with the federal agency that the provisions of 36 CFR 800 (Advisory Council on Historic Preservation's Procedures for the Protection of Historic and Cultural Properties) are being complied with.

Sincerely,

SUSUMU ONO

Chairman of the Board
and

State Historic Preservation Officer

DEPARTMENT OF PUBLIC WORKS
CITY AND COUNTY OF HONOLULU
630 SOUTH KING STREET
HONOLULU, HAWAII 96813



SILEEN A. ANDERSON
DIRECTOR

MICHAEL J. CHUN, PH. D.
DIRECTOR AND DEPT. COUNSEL
MAURICE W. KATA
DEPT. ASSISTANT
R 83-528

July 20, 1983

Mr. Susumu Ono
Chairman of the Board and
Historic Preservation Officer
State of Hawaii
Department of Land and Natural Resources
P. O. Box 621
Honolulu, Hawaii 96806

Dear Mr. Ono:

Subject: Leeward District Sanitary Landfill Environmental Impact
Statement Preparation Notice

We appreciate your valuable comments and offer the following responses.

Comment:

"The preparation notice indicates the need to screen the Ohikilolo site from Kaena Point State Park (page 2-14). We concur."

Response:

No response required.

Comment:

"Keolu Beach Park and its expansion makai of Farrington Highway to Ohikilolo (according to the City and County of Honolulu, Department of Parks and Recreation 1980 Long Range Plan) will be affected as much or more by the proposed site."

Response:

The front portion of the Ohikilolo site will be landscaped within the 200-foot buffer zone. We will be working closely with the City and County's Department of Parks and Recreation.

Mr. Susumu Ono
July 20, 1983
Page 2

Comment:

"Apart from visual concerns, other recreation concerns include odors, litter, vectors, and leachate which reach the neighboring shore-line areas and coastal waters. Good sanitary landfill management may prevent adverse environmental impacts. While some management practices are indicated in the preparation notice, there is no indication that a well planned, continual monitoring system will also be provided to assure proper management and alert the public in the event public health hazards do occur."

Response:

The presence of odor, litter and vectors at the landfill would signify that the landfill was not being operated correctly and would be in violation of the permit, other Department of Health conditions imposed for the operation of the landfill and this Department's "RULES FOR CITY AND COUNTY LANDFILLS" (3/1/80). We will design and operate the landfill as a "Sanitary Landfill."

The possibility of the production of leachate at both sites is minimized by the low average rainfall. Leachate is generally produced in areas having an average rainfall in excess of 30 inches, which is not the case for these areas of the leeward coast. We do not anticipate the production of leachate which will result in adverse long-term impacts to the basal ground water and coastal water quality.

Comment:

"Historic Sites Concerns:"

"Our records indicate that this project does not occur on historic properties listed on the Hawaii Register or the National Register of Historic Places, or eligible for inclusion on the National Register of Historic Places. However, a survey conducted in the vicinity revealed the existence of resources that may meet the criteria for listing on either register. It is likely that other previously unidentified resources also exist in the proposed project area."

"Therefore, we recommend that, prior to any project activity that may have an effect on resources, a reconnaissance survey be conducted by a qualified archaeologist within the proposed area, and that the survey results be forwarded to our historic sites office for evaluation. Should the existence of significant resources be substantiated, we may provide additional recommendations to avoid, mitigate, or negate any adverse effects."

Mr. Susumu Ono
July 20, 1983
Page 3

Comment: Continued:

"If the undertaking has any federal involvement (e.g. funding, loan guarantee, permit, or license), the applicant should verify with the federal agency that the provisions of 36 CFR 800 (Advisory Council on Historic Preservation's Procedures for the Protection of Historic and Cultural Properties) are being complied with."

Response:

An archaeological surface survey of the area to be used for landfilling has been conducted. The report will be included in the Environmental Impact Statement.

The project will not have federal involvement including the requirements for license, permits, etc.

Your letter will be incorporated into the Environmental Impact Statement and a copy will be sent to you for review and comment.

Please contact John Lee at 527-5366 if there are any questions.

Very truly yours,



MICHAEL J. CHUH
Director and Chief Engineer



DEPARTMENT OF PLANNING AND ECONOMIC DEVELOPMENT

COMMUNITY BUILDING, 700 SOUTH KING STREET, HONOLULU, HAWAII 96813

GEORGE B. ARTOCH
DIRECTOR
HERBERT M. HARRIS
PLANNING MANAGER

Ref. No. 7357

Dr. Michael J. Chun
Page 2
April 21, 1983

April 21, 1983

Dr. Michael J. Chun
Director and Chief Engineer
Department of Public Works
City and County of Honolulu
650 South King Street
Honolulu, Hawaii 96813

Dear Dr. Chun:

Subject: Preparation Notice for EIS Leeward District Sanitary Landfills

We have reviewed the subject preparation notice and offer the following comments with respect to the relevant objectives and policies of the Hawaii Coastal Zone Management Program.

Scenic and Open Space: Insure that new developments are compatible with their visual environment by designing and locating such developments to minimize the alteration of natural landforms and existing public views to and along the shoreline.

Both proposed landfill sites will abut and be visible from Farrington Highway. The Ohikilolo site in particular will be visible along the highway for a distance of approximately one mile as well as from the adjacent Keau Homesteads which is located on the eastern slopes of Ohikilolo Valley. The use of vegetative buffer zones, suggested in the preparation notice, should be addressed at both sites to protect existing vistas from coastal areas. Revegetation and landscaping following closure of the sites should also be an integral part of the proposed activity.

Historic Resources: Protect, preserve and where desirable restore those natural and man-made historic and pre-historic resources in the coastal zone area that are significant in Hawaiian and American history and culture.

The subject notice indicates that an archaeological surface reconnaissance will be conducted at the Waimanalo Gulch site to determine the presence of archaeological or historical sites. Similar indications are not provided in the discussion of the Ohikilolo site. Inasmuch as the Ohikilolo site is close to several historic sites including a heiau and wall complexes, surface reconnaissance should be addressed at this site as well.

Coastal Ecosystems: Minimize disruption or degradation of coastal water ecosystems by effective regulation of stream diversions, channelization, and similar land and water uses, recognizing competing needs.

The Waimanalo Gulch site is approximately 1,000 feet from the shoreline; the Ohikilolo site abuts Farrington Highway which is immediately inland of the coast. While the median annual rainfall at both sites is between 20 and 30 inches, drainage systems are proposed at both sites to accommodate periods of heavy rainfall. The EIS should address the potential impacts on receiving waters from the resultant silt and leachates. With respect to leachate control, the statement should elaborate on any anticipated monitoring program.

We appreciate this opportunity to provide our preliminary comments.

Sincerely,

Hideto Kono

cc: Office of Environmental Quality Control

DEPARTMENT OF PUBLIC WORKS
CITY AND COUNTY OF HONOLULU
150 SOUTH KING STREET
HONOLULU, HAWAII 96813



EILEEN R. ANDERSON
DIRECTOR

MICHAEL J. CHUN, Ph.D.
DIRECTOR AND CHIEF ENGINEER

MAURICE M. HATA
DEPUTY DIRECTOR

R 83-539

July 26, 1983

Mr. Kent M. Keith
Director
Department of Planning and Economic Development
State of Hawaii
P. O. Box 2359
Honolulu, Hawaii 96804

Dear Mr. Keith:

Subject: Leeward District Sanitary Landfill Environmental Impact
Statement Preparation Notice

We appreciate your valuable comments and offer the following responses.

Comment: Reference page 1 "Scenic and Open Space"

"Both proposed landfill sites will abut and be visible from Farrington Highway. The Ohikilolo site in particular will be visible along the highway for a distance of approximately one mile as well as from the adjacent Keau Homesteads which is located on the eastern slopes of Ohikilolo Valley. The use of vegetative buffer zones, suggested in the preparation notice, should be addressed at both sites to protect existing vistas from coastal areas. Vegetation and landscaping following closure of the sites should also be an integral part of the proposed activity."

Response:

Vegetative buffer zones of approximately 200 feet will separate the landfill from adjacent areas for both the Ohikilolo and Waimanalo Gulch sites.

We are in complete agreement with your recommendation that revegetation and landscaping following closure of the sites be an integral part of the proposed activity.

Mr. Kent M. Keith
July 26, 1983
Page 2

Comment: Reference page 1 "Historic Resources"

"The subject notice indicates that an archaeological surface reconnaissance will be conducted at the Waimanalo Gulch site to determine the presence of archaeological or historical sites. Similar indications are not provided in the discussion of the Ohikilolo site. Inasmuch as the Ohikilolo site is close to several historic sites including a heiau and wall complexes, surface reconnaissance should be addressed at this site as well."

Response:

Archaeological surface reconnaissance surveys for both sites have been conducted. The report will be included in the Environmental Impact Statement.

Comments: Page 2 "Coastal Ecosystem"

"The Waimanalo Gulch site is approximately 1,000 feet from the shoreline; the Ohikilolo site abuts Farrington Highway which is immediately inland of the coast. While the median annual rainfall at both sites is between 20 and 30 inches, drainage systems are proposed at both sites to accommodate periods of heavy rainfall. The EIS should address the potential impacts on receiving waters from the resultant silt and leachates. With respect to leachate control, the statement should elaborate on any anticipated monitoring program."

Response:

Energy dissipators and siltation basins will be installed at both of the sites to minimize adverse impacts to the coastal waters from silt.

The possibility of the production of leachate at both sites is minimized by the low annual average rainfall. Leachate is generally produced in areas having average rainfall in excess of 30 inches, which is not the case for these areas of the leeward coast. We do not anticipate the production of leachate which will result in adverse long-term impacts to the basal ground water and coastal water quality.

Your letter will be incorporated into the Environmental Impact Statement and a copy will be sent to you for review and comment.

Please contact John Lee at 527-5366 if there are any questions.

Very truly yours,

MICHAEL J. CHUN
Director and Chief Engineer

GEORGE R. ARYIOS
GOVERNOR



STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
180 PUNCHBOWL STREET
HONOLULU, HAWAII 96813

March 31, 1983

RODOLFO PULSONA, P.D.
DIRECTOR

DEPUTY DIRECTOR
WAYNE J. YAMAGUCHI
JAMES B. MCCORMACK
JONATHAN K. SHIMADA, P.D.

IN REPLY REFER TO:
STP
8-8973

DEPARTMENT OF PUBLIC WORKS
CITY AND COUNTY OF HONOLULU
650 SOUTH KING STREET
HONOLULU, HAWAII 96813



WILEM H. ANDERSON
DIRECTOR

MICHAEL J. CHUN, Ph.D.
DIRECTOR AND CHIEF ENGINEER
MORNING STAR
DEPUTY DIRECTOR

R 83-471

June 23, 1983

12-19

Dr. Michael Chun
Director & Chief Engineer
Department of Public Works
City and County of Honolulu
650 South King Street
Honolulu, Hawaii 96813

Dear Dr. Chun:

Environmental Impact Statement Preparation Notice
for the Proposed Leeward Sanitary Landfill,
Waimanalo Gulch Site (TKM: 9-2-03; Por. 13, 2,
and 40) and Ohikilolo Site (TKM: 8-3-01)

Thank you for informing us of the subject projects and
for the opportunity to comment on the Environmental Assess-
ment.

We do not anticipate your projects significantly affect-
ing our State highway programs in the area. Please be
advised, however, that any construction work within the
State highway right-of-way will require a permit from our
Highways Division. Section 10 of your document, Approvals,
should be amended to include this requirement.

Very truly yours,

Ryokichi Higashionna
Ryokichi Higashionna
Director of Transportation

Dr. Ryokichi Higashionna
Director of Transportation
State of Hawaii
Department of Transportation
889 Punchbowl Street
Honolulu, Hawaii 96813

Dear Dr. Higashionna:

Subject: Leeward District Sanitary Landfill Environmental Impact
Statement Preparation Notice - (STP 8-8973)

We appreciate your valuable comments and offer the following responses
to your comments.

Comment:

"We do not anticipate your projects significantly affecting our
State highway programs in the area. Please be advised, however, that
any construction work within the State highway right-of-way will require
a permit from our Highways Division. Section 10 of your document,
Approvals, should be amended to include this requirement."

Response:

The information regarding the project's impact on State highway programs
is noted. The civil engineer will coordinate the project with the High-
ways Division and all applicable permits will be obtained.


Section 10 of the Environmental Impact Statement will include the re-
quirement for a construction permit with the State highway right-of-way.

Dr. Ryokichi Higashimura
June 23, 1983
Page 2

Your letter will be incorporated into the Environmental Impact Statement and a copy will be sent to you for review and comment.

Please contact John Lee at 527-3366 if there are any questions.

Very truly yours,


MICHAEL J. CRAIN
Director and Chief Engineer

12-20



University of Hawaii at Manoa

Water Resources Research Center
Holmes Hall 203 • 2540 Dole Street
Honolulu, Hawaii 96822

4 May 1983

83-03510
Refuse

Dr. Michael J. Chun
Director and Chief Engineer
Department of Public Works
City & County of Honolulu
650 South King Street
Honolulu, Hawaii 96813

Dear Dr. Chun:

Subject: Environmental Impact Statement Preparation Notice Leeward District Sanitary Landfill, Waimanalo Gulch (TRK 9-2-03 For. 13, 2, 40) and Ohikilolo Site (TRK 8-3-01), March 1983

We have reviewed the subject EISPM and offer the following comments. What (or where) is the source of the imported material? And what will be the environmental impact of doing this?

Thank you for the opportunity to comment. This material was reviewed by WRRC personnel.

Sincerely,

Edwin T. Murebayashi
Edwin T. Murebayashi
EIS Coordinator

ETH:jm

AN EQUAL OPPORTUNITY EMPLOYER

DEPARTMENT OF PUBLIC WORKS
CITY AND COUNTY OF HONOLULU
430 SOUTH KING STREET
HONOLULU, HAWAII 96813



SILEEN R. ANDERSON
MAYOR

MICHAEL J. CHUN, Ph.D.
DIRECTOR AND CHIEF ENGINEER
MAURICES M. HATA
DEPUTY DIRECTOR

R 83-434

June 15, 1983

Mr. Edwin T. Murebayashi
EIS Coordinator
University of Hawaii
Water Resources Research Center
Holmes Hall
2530 Dole Street
Honolulu, Hawaii 96822

Dear Mr. Murebayashi:

Subject: Leeward District Sanitary Landfill Environmental Impact Statement Preparation Notice

We appreciate your valuable comments and offer the following responses.

Comment:

"We have reviewed the subject EISPM and offer the following comments. What (or where) is the source of the imported material? And what will be the environmental impact of doing this?"

Response:

Material will be from construction projects (excess material).

Your letter will be incorporated into the Environmental Impact Statement and a copy will be sent to you for review and comment.

Please contact John Lee at 527-5366 if there are any questions.

Very truly yours,

Michael J. Chun

MICHAEL J. CHUN
Director and Chief Engineer

BUILDING DEPARTMENT
CITY AND COUNTY OF HONOLULU
83-01568
HONOLULU MUNICIPAL BUILDING
150 SOUTH KING STREET
HONOLULU, HAWAII 96813



SILVER R. ANDERSON
MAYOR

ROY H. TANJI
DIRECTOR AND BUILDING SUPERINTENDENT
WILLIAM F. REMULAR
CHIEF ENGINEER

PB 83-229

March 24, 1983

Ryan

TO: MR. MICHAEL J. CHUN, DIRECTOR AND CHIEF ENGINEER
DEPARTMENT OF PUBLIC WORKS

FROM: ROY H. TANJI
DIRECTOR AND BUILDING SUPERINTENDENT

SUBJECT: EIS PREPARATION NOTICE
PROPOSED LEeward SANITARY LANDFILL
WAIMANALO GULCH SITE (TMK: 9-2-03:POR. 13, 2 & 40)
AND OHIKILOLO SITE (TMK: 8-3-01)

12-22

We have reviewed the EIS Preparation Notice for the proposed Leeward Sanitary Landfill at the Waimanalo Gulch and Ohikilolo sites and have no comments.

Thank you for the opportunity to review the notice.

Roy H. Tanji
ROY H. TANJI
Director and Building Superintendent

cc: J. Harada

TO: _____
MAR 28 9 39 AM '83
RECEIVED
DEPT OF PUBLIC WORKS

DEPARTMENT OF PUBLIC WORKS
CITY AND COUNTY OF HONOLULU
150 SOUTH KING STREET
HONOLULU, HAWAII 96813



SILVER R. ANDERSON
MAYOR

MICHAEL J. CHUN, Ph.D.
DIRECTOR AND CHIEF ENGINEER
MAURICE W. RAYA
DEPUTY DIRECTOR

R 83-419

June 9, 1983

MEMORANDUM

TO: MR. ROY H. TANJI, DIRECTOR AND BUILDING SUPERINTENDENT
BUILDING DEPARTMENT

FROM: MICHAEL J. CHUN, DIRECTOR AND CHIEF ENGINEER
DEPARTMENT OF PUBLIC WORKS

SUBJECT: LEeward DISTRICT SANITARY LANDFILL
ENVIRONMENTAL IMPACT STATEMENT

We appreciate your review of the document. Your letter will be incorporated into the environmental impact statement.

A copy of the Environmental Impact Statement will be sent to you for review and comment.

Please contact John Lee at 577-5366 if there are any questions.

Michael J. Chun
FOR MICHAEL J. CHUN
Director and Chief Engineer

cc: EISC
DLU

DEPARTMENT OF GENERAL PLANNING
CITY AND COUNTY OF HONOLULU

630 SOUTH KING STREET
HONOLULU, HAWAII 96813



EILEEN R. ANDERSON
MAYOR

WILLARD T. CHOW
CHIEF PLANNING OFFICER

RALPH KAWAHOTO
DEPUTY CHIEF PLANNING OFFICER

DGP3/83-5673

MEMORANDUM

TO: Dr. Michael J. Chun
Director and Chief Engineer
Department of Public Works

VIA: Mr. Andrew I. T. Chang, Managing Director

SUBJECT: Environmental Impact Statement Preparation Notice for
the Proposed Leeward Sanitary Landfill, Waimanalo
Culch Site and Ohikilolo Site

12-23

Dr. Michael J. Chun
Page 2

4. The traffic and environmental conditions on Farrington Highway section along the Waianae Coast will very likely be impacted. Pertinent discussion would need to include the service areas for collection and disposal of refuse at both landfill sites, number of refuse and soil transport trucks likely to be using the roadway at peak/off-peak periods, hours of facility operation, as well as estimates of truck emissions of air pollutants and truck related noise and interference with the locality's vehicular traffic. It appears that because of the northwest Ohikilolo location, traffic and environmental impacts along the Waianae Coast communities may be of special concern.

Ralph Kawahoto
RALPH KAWAHOTO
Planner

APPROVED:

Willard T. Chow
WILLARD T. CHOW

In addition to the areas of concern outlined in the preparation notice, items of interest to us are as follows:

1. Additional information on the group of residential units located adjacent to the Waimanalo project site, i.e., its proximity and location relative to the landfill, prevailing wind direction in the immediate vicinity of the landfill, and other data which are likely to produce adverse effects on nearby residents in terms of noise, dust, pests, odor, litter, etc., generally associated with landfill operations. Measures to mitigate the adverse impacts also need to be resolved.
2. Similar assessment may be needed at the Ohikilolo project with regard to the Paniolo Country Ohikilolo Hakua Ranch, First Hawaiian Bank's Recreation Center, and the three residences located on or near the project site.
3. Since both the Waimanalo and Ohikilolo proposed locations have little onsite cover material available, information on the amount and source of soil material to be imported may need to be discussed. This discussion should include an estimate of the number and frequency of trucks to be used for the transporting operations and evaluation of soil displacements at their sources.

DEPARTMENT OF PUBLIC WORKS
CITY AND COUNTY OF HONOLULU
650 SOUTH KING STREET
HONOLULU, HAWAII 96813



EILEEN R. ANDERSON
MAI

MICHAEL J. CHOW, Ph.D.
DIRECTOR AND CHIEF ENGINEER
MAURICE H. DAVIS
SENIOR ENGINEER

R 83-434

June 15, 1983

MEMORANDUM

TO: MR. WILLARD T. CHOW, CHIEF PLANNING OFFICER
DEPARTMENT OF GENERAL PLANNING

FROM: MICHAEL J. CHOW, DIRECTOR AND CHIEF ENGINEER
DEPARTMENT OF PUBLIC WORKS

SUBJECT: LEIARD DISTRICT SANITARY LANDFILL (DCP/83-5673)
ENVIRONMENTAL IMPACT STATEMENT PREPARATION NOTICE

12-24

Mr. Willard T. Chow, Chief Planning Officer
June 15, 1983
Page 2

Response: Continued:

The landfilling support facilities (weigh station, office/locker rooms, maintenance and storage areas) are separated by a 400 foot buffer area from the nearest residential area. The operating face of the landfill will be located approximately 800 to 1,000 feet from the residential area.

A properly designed, operated and maintained sanitary landfill will not create adverse environmental impacts. This department will design the landfill to prevent adverse environmental impacts from occurring, this will function as the most effective mitigative measure.

Comment:

"2. Similar assessment may be needed at the Ohikilolo project with regard to the Paniolo Country Ohikilolo Makua Ranch, First Hawaiian Bank's Recreation Center, and the three residences located on or near the project site."

Response:

The three residences located across Farrington Highway will be separated from the landfill by the highway and a 200-foot buffer zone. The First Hawaiian Bank's Recreation Center is located approximately 1,500 feet south of the landfill. This distance combined with the landfill access road (20 feet) and the 200-foot buffer zone will provide a buffer area between the landfill and the recreational facility.

The Paniolo Country Ohikilolo Makua Ranch is located within the proposed landfill site. The area used for the ranch and pasture will be displaced by the landfilling activities. This action will constitute an adverse environmental impact.

A properly designed and operated landfill will not create adverse environmental impacts. There will be visual and noise impacts during the operation of the landfill. These impacts will be minimized by the buffer area fronting the landfill site.

Comment:

"3. Since both the Waimanalo and Ohikilolo proposed locations have little onsite cover material available, information on the amount and source of soil material to be imported may need to be discussed. This discussion should include an estimate of the number and frequency of trucks to be used for the transporting operations and evaluation of soil displacements at their sources."

We appreciate your review of the document and offer the following responses to your comment.

Comment:

"1. Additional information on the group of residential units located adjacent to the Waimanalo project site, i.e., its proximity and location relative to the landfill, prevailing wind direction in the immediate vicinity of the landfill, and other data which are likely to produce adverse effects on nearby residents in terms of noise, dust, pests, odor, litter, etc., generally associated with landfill operations. Measures to mitigate the adverse impacts also need to be resolved."

Response:

The nearest single story wooden residential unit in good condition is located approximately 400 feet north-west from the proposed access road to the sanitary landfill. The afternoon and late night wind directions will be from the direction of the ocean (west) toward the mouth of the gulch (east). The wind direction and buffer area of 400 feet should prevent significant adverse environmental impacts (dust, blowing litter, odor and noise) to the nearby homes.

Mr. Willard T. Chow, Chief Planning Officer
June 15, 1983
Page 3

Response:

The traffic impacts will be evaluated by a traffic engineer and the results of the analysis and recommendations will be included in the EIS.

Material will come from construction projects (excess material).

Comment:

"4. The traffic and environmental conditions on Farrington Highway section along the Waianae Coast will very likely be impacted. Pertinent discussion would need to include the service areas for collection and disposal of refuse at both landfill sites, number of refuse and soil transport trucks likely to be using the roadway at peak/off-peak periods, hours of facility operation, as well as estimates of truck emissions of air pollutants and truck related noise and interference with the locality's vehicular traffic. It appears that because of the northwest Ohikilolo location, traffic and environmental impacts along the Waianae Coast communities may be of special concern."

Response:

The traffic impact through Waianae will be evaluated by a traffic engineer and the results will be included in the EIS.

Michael J. Chun

MICHAEL J. CHUN
Director and Chief Engineer

DEPARTMENT OF LAND UTILIZATION
CITY AND COUNTY OF HONOLULU 83-0093
 630 SOUTH KING STREET
 HONOLULU, HAWAII 96813-0048



ENV
Refuse

MICHAEL M. MCELROY
 DIRECTOR

ROBERT S. JONES
 SENIOR ENGINEER

LU3/83-1184(JDN)

April 22, 1983

MEMORANDUM

TO : DR. MICHAEL J. CHUN, DIRECTOR & CHIEF ENGINEER
 DEPARTMENT OF PUBLIC WORKS

FROM : MICHAEL M. MCELROY, DIRECTOR

SUBJECT : ENVIRONMENTAL IMPACT STATEMENT PREPARATION NOTICE (EISP/N)
 FOR THE PROPOSED LEONARD SANITARY LANDFILLS;
 WAIMANALO GULCH SITE (TAX MAP KEY 9-2-03; POR. 2, 13 & 40
 AND OHIKILOLO SITE (TAX MAP KEY 8-3-01)

12-26

We have reviewed the subject EISP/N and have the following comments:

1. Special Management Area (SMA)
 Portions of both the Waimanalo Gulch site and the Ohikilolo site are within the SMA. Therefore, an SMA Use Permit (SMP) will be required to implement the landfills and their corresponding site improvements and support facilities. The SMP application is to be filed with DLU.
2. Comprehensive Zoning Code (CZC) Requirements
 The City and County zoning for both sites is AG-1 Restricted Agricultural District. Public sanitary landfills are permitted principal uses in AG-1 districts. However, "offices or storage or maintenance facilities shall be permitted only as conditional uses" - CZC, Section 21.4.2(a)(9). Therefore, conditional use approval will be required for the site improvements and support facilities. (Re: Page 1-20)

10
 APR 22 9 07 AM '83
 HONOLULU, HAWAII

MEMO TO DR. MICHAEL J. CHUN, DIRECTOR & CHIEF ENGINEER
 Page 2

3. City and County Land Use Designations

Reference to the Development Plans and Public Facilities Maps should be made. For your information (as of this writing), the proposed Waianae Development Plan designates the Ohikilolo site as Agricultural. The corresponding Public Facilities Map shows that a solid waste facility is planned for future (7 years beyond). The Ewa Development Plan designates the Waimanalo Gulch site as Agricultural. The corresponding Public Facilities Map shows that a solid waste facility is planned and has a status of "proposed funding (2-6 years)". Therefore, the proposed landfills are consistent with City and County land use designations.

4. Flood Hazard Districts

The Waimanalo Gulch site is not within a CZC Flood Hazard District. The Federal Flood Insurance Rate Map (FIRM) designation is Zone D. These are described as areas of undetermined, but possible, flood hazard. A major portion of the Ohikilolo site is also designated as FIRM Zone D and therefore, not within a Flood Hazard District. However, a small portion of the site fronting Farrington Highway is within a Flood Hazard District. It has a FIRM zone designation of AA with a base flood elevation of 14-feet.

5. Water Quality

The EISP/N addresses the problem of leachate contamination of ground and surface water. However, the potential problem of leachate contamination of ocean water should also be investigated due to the close proximity of the landfills to the ocean.

6. Project Implementation

Timetables for implementation of the landfills and development of the site improvements should be included in the EIS. According to the EISP/N, the Waimanalo Gulch site is indicated to open first. However, there is no indication of phasing the Ohikilolo site. Will both sites be operated simultaneously?

DEPARTMENT OF PUBLIC WORKS
CITY AND COUNTY OF HONOLULU
630 SOUTH KING STREET
HONOLULU, HAWAII 96813



SILEEN B. ANDERSON
MAYOR

MICHAEL J. CHUN, PH. D.
DIRECTOR AND CHIEF ENGINEER

MAURICE H. RAYA
DEPUTY DIRECTOR

R 83-471

June 23, 1983

MEMO TO DR. MICHAEL J. CHUN, DIRECTOR & CHIEF ENGINEER
Page 3

7. Mitigation of Visual Impacts

Re: Section 4. VI. Measures to mitigate visual impacts during operation and after completion of the landfills should be discussed in greater detail.

8. Other Concerns

- A. Displacement: Re: Section 2. III. D. 6, Page 2-12.
Displacement of residents and how it will be handled should be discussed further.
- B. Traffic: Re: Section 2 - II. D. 7 & III. D. 7, Pages 2-5 & 2-12.
If the anticipated increase in traffic is significant, mitigation measures should be investigated.
- C. Public Objections: Re: Section 2 - II. D. 9 & III. D. 9-10, Pages 2-6 and 2-12.
Public objections and concerns should be addressed in the EIS.
- D. Phasing Out and Closing
Plans for phasing out and closing the landfills should be detailed, i.e., landscaping and site reclamation plans.

Please contact John Nakagawa of our staff at 527-5038 if there are any questions.

Very truly yours,

MICHAEL H. McELROY
Director of Land Utilization

MHH:s1

MEMORANDUM

TO: MR. MICHAEL H. McELROY, DIRECTOR
DEPARTMENT OF LAND UTILIZATION

FROM: MICHAEL J. CHUN, DIRECTOR AND CHIEF ENGINEER
DEPARTMENT OF PUBLIC WORKS

SUBJECT: LEIWARD DISTRICT SANITARY LANDFILL (LU3/83-114(JDWS))
ENVIRONMENTAL IMPACT STATEMENT PREPARATION NOTICE

We appreciate your review of the document and your valuable comments. The following responses are provided to your comments.

Comment:

"1. Special Management Area (SMA)"

"Portions of both the Waimanalo Gulch site and the Ohikilolo site are within the SMA. Therefore, an SMA Use Permit (SMP) will be required to implement the landfills and their corresponding site improvements and support facilities. The SMP application is to be filed with OLU."

Response:

A SMA Use Permit will be filed with your department for the landfill and support facilities when the final engineering plans are completed.

Comment:

"2. Comprehensive Zoning Code (CZC) Requirements"

"The City and County zoning for both sites is AG-1 Restricted Agricultural District. Public sanitary landfills are permitted principal uses in AG-1 districts. However, "offices or storage

Mr. Michael M. McElroy, Director
June 23, 1983
Page 2

Comment: Continued

Maintenance facilities shall be permitted only as conditional uses" - CZC, Section 21.4.2.(a)(9). Therefore, conditional use approval will be required for the site improvements and support facilities. (Re: Page 1-20)"

Response:

Conditional use approval for the site improvements (offices, storage, maintenance facilities, scales, etc.) will be sought after the engineering plans are completed.

Comment:

"3. City and County Land Use Designations"

"Reference to the Development Plans and Public Facilities Maps should be made. For your information (as of this writing), the proposed Waianalo Development Plan designates the Ohikilolo site as Agricultural. The corresponding Public Facilities Map shows that a solid waste facility is, "planned for future (7 years - beyond)." The Ewa Development Plan designates the Waianalo Gulch site as Agricultural. The corresponding Public Facilities Map shows that a solid waste facility is planned and has a status of "proposed funding (2-6 years)." Therefore, the proposed landfills are consistent with City and County land use designations."

Response:

We appreciate your analysis, and reference to the Development Plans and Public Facilities Maps will be made in the Environmental Impact Statement.

Comment:

"4. Flood Hazard Districts"

"The Waianalo Gulch site is not within a CZC Flood Hazard District. The Federal Flood Insurance Rate Map (FIRM) designation is Zone D. These are described as areas of undetermined, but possible, flood hazard. A major portion of the Ohikilolo site is also designated as FIRM Zone D and therefore, not within a Flood Hazard District. However, a small portion of the site fronting Farrington Highway is within a Flood Hazard District. It has FIRM zone designation of A4 with a base flood elevation of 14-feet."

Mr. Michael M. McElroy, Director
June 23, 1983
Page 3

Response:

This information will be passed on to the engineering consultant, and the area designated A4 fronting the Ohikilolo site will be evaluated for flooding.

Comment:

"5. Water Quality"

"The EISPM addresses the problem of leachate contamination of ground and surface water. However, the potential problem of leachate contamination of ocean water should also be investigated due to the close proximity of the landfills to the ocean."

Response:

Leachate is formed when landfills are located in areas having annual rainfall in excess of 30 inches. In areas having less than 30 inches of rainfall per year, the probability of leachate formation is minimal. Studies conducted on the formation of leachate show that no leachate is being produced in the Kapas Sanitary landfill.

It is not anticipated that leachate will be produced at the Leeward landfills because of the low rainfall. Also, if it is determined that precautionary measures, including the installation of leachate interceptor trenches and monitoring wells are required, they will be installed.

Comment:

"6. Project Implementation"

"Timetables for implementation of the landfills and development of the site improvements should be included in the EIS. According to the EISPM, the Waianalo Gulch site is indicated to open first. Will both sites be operated simultaneously?"

Response:

Waianalo Gulch will be opened first by 1985 and used continuously until it reaches capacity in approximately seven years. Ohikilolo will then be opened to serve as the sole public landfill site in the Leeward district after Waianalo Gulch is closed.

Mr. Michael M. McElroy, Director
June 23, 1983
Page 4

Comment:

"7. Mitigation of Visual Impacts"

"As: Section 4, VI. Measures to mitigate visual impacts during operation and after completion of the landfills should be discussed in greater detail."

Response:

Measures to mitigate visual impacts during and after completion of the landfills will be discussed in the EIS.

Comment:

"8. Other Concerns"

"A. Displacement: Re: Section 2. III. D. 6, Page 2-12."

"Displacement of residents and how it will be handled should be discussed further."

Response:

The relocation of affected individuals and facilities will be handled by the Land Division. The exact method and/or means will be worked out by the City and County with the affected parties.

"B. Traffic: Re: Section 2 - II. D. 7 & III. D. 7, Pages 2-5 & 2-12."

"If the anticipated increase in traffic is significant, mitigation measures should be investigated."

Response:

The traffic impacts will be studied and if there should be adverse impacts, mitigative measures will be evaluated.

"C. Public Objections: Re: Section 2 - II. D. 9 & III. D. 9-10, Pages 2-6 and 2-12."

"Public objections and concerns should be addressed in the EIS."

Mr. Michael M. McElroy, Director
June 25, 1983
Page 5

Response:

Public objections and concerns will be included and addressed in the EIS.

"D. Phasing Out and Closing"

"Plans for phasing out and closing the landfills should be detailed, i.e., landscaping and site reclamation plans."

Response:

Plans for phasing and closing of the landfill will be detailed in the final engineering plans.

Your letter will be incorporated into the Environmental Impact Statement and a copy will be sent to you.

Please contact John Lee at 527-5366 if there are any questions.

Michael J. Crum

MICHAEL J. CRUM
Director and Chief Engineer

DEPARTMENT OF PUBLIC WORKS
CITY AND COUNTY OF HONOLULU
 630 SOUTH KING STREET
 HONOLULU, HAWAII 96813



MICHAEL J. CHUN, Ph.D.
 DIRECTOR AND CHIEF ENGINEER
 MAURICE H. KATA
 DEPUTY DIRECTOR
 R 83-419

SILEEN M. ANDERSON
 DEPUTY

June 9, 1983

MEMORANDUM

TO: MRS. EMIKO I. KUDO, DIRECTOR
 DEPARTMENT OF PARKS AND RECREATION

FROM: MICHAEL J. CHUN, DIRECTOR AND CHIEF ENGINEER
 DEPARTMENT OF PUBLIC WORKS

SUBJECT: LEONARD DISTRICT SANITARY LANDFILL
ENVIRONMENTAL IMPACT STATEMENT

We appreciate your review of the document. Your letter will be incorporated into the environmental impact statement.

A copy of the Environmental Impact Statement will be sent to you for review and comment.

Please contact John Lee at 527-5366 if there are any questions.

John Lee
 FOR MICHAEL J. CHUN
 Director and Chief Engineer

cc: EISC
 DLU

DEPARTMENT OF PARKS AND RECREATION
CITY AND COUNTY OF HONOLULU 83-01602
 630 SOUTH KING STREET
 HONOLULU, HAWAII 96813



EMIKO I. KUDO
 DIRECTOR
 SAM L. GEAR
 DEPUTY DIRECTOR
 FOSCAR M. ASANUMA
 ASSISTANT DIRECTOR

*ENV ill
 Report*

March 24, 1983

RECEIVED
 DEPT OF PUBLIC WORKS
 MAR 29 9 01 AM '83

TO: MICHAEL J. CHUN, DIRECTOR AND CHIEF ENGINEER
 DEPARTMENT OF PUBLIC WORKS

FROM: EMIKO I. KUDO

SUBJECT: ENVIRONMENTAL IMPACT STATEMENT PREPARATION NOTICE
 FOR THE LEONARD DISTRICT SANITARY LANDFILLS

The proposed landfills will not have any detrimental impact on recreation facilities in proximity to the project sites.

Thank you for the opportunity to review the EIS Preparation Notice.

Emiko I. Kudo
 (Mrs.) EMIKO I. KUDO, Director

EIK:vc

DEPARTMENT OF TRANSPORTATION SERVICES
CITY AND COUNTY OF HONOLULU
 HONOLULU MUNICIPAL BUILDING
 430 SOUTH KING STREET
 HONOLULU, HAWAII 96813



William A. Bonnet
 DIRECTOR
 DEPARTMENT OF TRANSPORTATION SERVICES

SILEEN M. ANDERSON
 DEPUTY DIRECTOR

April 25, 1983 TE 3/83-1113

MEMORANDUM

TO: MICHAEL J. CHUM, DIRECTOR AND CHIEF ENGINEER
 DEPARTMENT OF PUBLIC WORKS

FROM: WILLIAM A. BONNET, DIRECTOR

SUBJECT: ENVIRONMENTAL IMPACT STATEMENT PREPARATION NOTICE
 FOR THE PROPOSED LEONARD SANITARY LANDFILL,
 HAIKHALO GULCH SITE (TMK: 9-2-03; POR. 13, 2 AND 40)
 AND OHIKILOLO SITE (TMK: 8-3-01)

The preparation notice (page 4-1) recognizes that there will be an impact from daily traffic from municipal compactor trucks, transfer trailers, commercial vehicles, and public self/haul vehicles associated with the operations of a sanitary landfill. An estimate of the total traffic that will be generated from this project will be helpful to us in the review phase.

If you have any questions, please contact Kenneth Hirata at 527-5031.

William A. Bonnet
 WILLIAM A. BONNET

DEPARTMENT OF PUBLIC WORKS
CITY AND COUNTY OF HONOLULU
 430 SOUTH KING STREET
 HONOLULU, HAWAII 96813



Michael J. Chum, Ph.D.
 DIRECTOR AND CHIEF ENGINEER
 DEPARTMENT OF PUBLIC WORKS

R 83-434

June 15, 1983

MEMORANDUM

TO: MR. WILLIAM A. BONNET, DIRECTOR
 DEPARTMENT OF TRANSPORTATION SERVICES

FROM: MICHAEL J. CHUM, DIRECTOR AND CHIEF ENGINEER
 DEPARTMENT OF PUBLIC WORKS

SUBJECT: LEONARD DISTRICT SANITARY LANDFILL (TE 3/83-1113)
ENVIRONMENTAL IMPACT STATEMENT PREPARATION NOTICE

We appreciate your review of the document and offer the following response to your comment.

Comment:

"The preparation notice (page 4-1) recognizes that there will be an impact from daily traffic from municipal compactor trucks, transfer trailers, commercial vehicles, and public self/haul vehicles associated with the operations of a sanitary landfill. An estimate of the total traffic that will be generated from this project will be helpful to us in the review phase."

Response:

The total estimated traffic to be generated from the landfills will be contained in a traffic report being prepared by our consultant, which will be included in the EIS.

Please contact John Lee at 327-5366 if there are any questions.

Michael J. Chum
 MICHAEL J. CHUM
 Director and Chief Engineer

FIRE DEPARTMENT
CITY AND COUNTY OF HONOLULU

1433 S. MCGREGOR STREET, ROOM 303
HONOLULU, HAWAII 96814



EILEEN M. ANDERSON
SECRETARY

M. M. NONAKA
CHIEF

Page Two
April 5, 1983

Although the companies from Maianae Station will be well within the required response time to the proposed project, only minimal fire-fighting effectiveness is available. These companies are only capable of extinguishing small fires and/or possibly preventing the extension of fires to other structures.

Existing fire protection for this proposed project is poor. An approved water supply capable of supplying the required fire flow is needed.

April 5, 1983

TO: MICHAEL J. CHAN, DIRECTOR AND CHIEF ENGINEER
DEPARTMENT OF PUBLIC WORKS

FROM: MELVIN M. NONAKA, FIRE CHIEF

SUBJECT: EIS PREPARATION NOTICE FOR THE PROPOSED LEONARD SANITARY
LANDFILL, WAIMANALO GULCH SITE (TMK 9-2-03: POR. 13,
2 and 40) and OHIKILOLO SITE (TMK 8-3-01)

12-33

Melvin M. Nonaka,
Fire Chief

MNN:ct/NSOW

We have no objections to the proposed Waimanalo Gulch site and the Ohikilolo Site landfill projects.

WAIMANALO GULCH SITE

The Nanakuli Fire Station is located approximately 3 miles from the proposed project with a response time of approximately 4 minutes. Supportive services will be provided by the Makakilo and the Maianae Fire Stations with response times of approximately 7-10 minutes and 12-14 minutes, respectively.

Fire protection for the proposed project is adequate.

OHIKILOLO SITE

The Maianae Fire Station is located approximately 5.5 miles from the proposed project with a response time of approximately 7 minutes. Also available are water tankers from the Maianae and the Nanakuli Fire Stations with response times of approximately 7 minutes and 18 minutes, respectively.

According to the guidelines from the National Fire Protection Association, the initial responding company for rural areas should reach the scene within 10 minutes of the alarm.

POLICE DEPARTMENT
CITY AND COUNTY OF HONOLULU
1430 SOUTH BERTANHA STREET,
HONOLULU, HAWAII 96811



GILEEN R. ANDERSON
MAYOR

FRANCIS KEALA
CHIEF
HAROLD FALK
DEPUTY CHIEF

OUR REFERENCE CS-ES

R 83-195

March 29, 1983

RECEIVED
DEPT OF PUBLIC WORKS
MAR 31 1 55 PM '83

12-35

MEMORANDUM

TO: MICHAEL J. CHUN, DIRECTOR AND CHIEF ENGINEER
DEPARTMENT OF PUBLIC WORKS

FROM: FRANCIS KEALA, CHIEF OF POLICE
HONOLULU POLICE DEPARTMENT

SUBJECT: ENVIRONMENTAL IMPACT STATEMENT PREPARATION NOTICE FOR THE PROPOSED
LEeward SANITARY LANDFILL, WAIMANALO GULCH SITE (TIMK: 9-2-03;
POR. 13, 2, AND 40) AND OHIKILOLO SITE (TIMK: 8-3-01)

We have reviewed the Environmental Assessment and EIS Preparation Notice for the proposed Leeward Sanitary Landfills at Waimanalo Gulch and Ohikilo. We would like to mention that traffic safety should continue to be considered, especially at the points of ingress and egress on Farrington Highway for both sites during the site improvement and operational stages of the project.

We find nothing objectionable regarding the proposed project. We may have further comment when more detailed plans become available.

Francis Keala
FRANCIS KEALA
Chief of Police

DEPARTMENT OF PUBLIC WORKS
CITY AND COUNTY OF HONOLULU
430 SOUTH KING STREET
HONOLULU, HAWAII 96813



GILEEN R. ANDERSON
MAYOR

MICHAEL J. CHUN, Ph.D.
DIRECTOR AND CHIEF ENGINEER
MAURICE M. KATA
DEPUTY DIRECTOR

R 83-419

June 9, 1983

MEMORANDUM

TO: MR. HAROLD FALK, ACTING CHIEF OF POLICE
HONOLULU POLICE DEPARTMENT

FROM: MICHAEL J. CHUN, DIRECTOR AND CHIEF ENGINEER
DEPARTMENT OF PUBLIC WORKS

SUBJECT: LEeward DISTRICT SANITARY LANDFILL
ENVIRONMENTAL IMPACT STATEMENT

We appreciate your review of the document. Your letter will be incorporated into the environmental impact statement.

A copy of the Environmental Impact Statement will be sent to you for review and comment.

Please contact John Lee at 527-5366 if there are any questions.

Michael J. Chun
FOR MICHAEL J. CHUN
Director and Chief Engineer

cc: EISC
DLU

THE ESTATE OF JAMES CAMPBELL

April 20, 1983

Mr. Michael Chun
Director of Chief Engineer
Department of Public Works
City & County of Honolulu
650 S. King Street
Honolulu, Hawaii 96813

Dear Mr. Chun:

Leeward District Sanitary Landfill
Environmental Impact Statement
Notice of Preparation

We have reviewed the study for the landfill proposed for Waimanalo Gulch. We appreciate the opportunity to offer our comments. There are a few items that we would like to clarify:

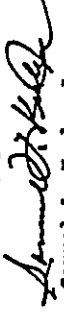
1. The proposed life of the project is for 4 1/2 years. Does the City propose acquiring the property by condemnation or lease?
2. If the City plans to occupy the area on a lease basis, does the City have plans to continue occupancy of the area beyond the life of the landfill?
3. Part of the proposed landfill area is encumbered by a lease to Tonggy Ranch. How does the City plan to handle this?
4. To what extent will the site be fenced, i.e. just the landfill area or beyond?
5. There is not much cover material on the lands of the Campbell Estate. Where is the city's source of cover material for use in the landfill operation?
6. The report calls for a major drainage system which we assume is to intercept and prevent waters from going into the landfill area. Where will the surface runoff waters be discharged? Is it the intent of the City to discharge it directly into the ocean?

Mr. Michael Chun
April 20, 1983
Page 2

If the Waimanalo Gulch site is selected as the landfill, we would appreciate receiving a copy of the development plan showing the landfill design, the method which will be used to control gas migration, and plans for restoration of the landfill.

If there are any questions, do not hesitate to call.

Very truly yours,


Samuel L. Keala, Jr.
Manager, Engineering/
Construction Services

98:H207n

DEPARTMENT OF PUBLIC WORKS
CITY AND COUNTY OF HONOLULU
500 SOUTH KING STREET
HONOLULU, HAWAII 96813



GILLEN M. ANDERSON
MAYOR

MICHAEL J. CHOW, Ph.D.
DIRECTOR AND CHIEF ENGINEER

MAURICE W. HAYA
DEPUTY DIRECTOR

R 83-465

June 22, 1983

Mr. Samuel L. Keala, Jr.
Manager, Engineering/
Construction Services
The Campbell Building
828 Fort St. Mail Suite 500
Honolulu, Hawaii 96813

Dear Mr. Keala:

Subject: Leeward Sanitary Landfill Environmental Impact Statement
Preparation Notice - Letter dated 20 April 1983

We appreciate your review of the document and offer the following responses to your comments on the Waimanalo Gulch site.

Comment:

"1. The proposed life of the project is for 4 1/2 years. Does the City propose acquiring the property by condemnation or lease?"

Response:

It is the City's intention to lease the property from the landowners. The exact time period for the lease will be negotiated. The revised life of the landfill is now estimated at 7 years.

Comment:

"2. If the City plans to occupy the area on a lease basis, does the City have plans to continue occupancy of the area beyond the life of the landfill?"

Response:

The City has no plans, at the present time, to continue occupancy beyond the life of the landfill. We will be in a position to clarify this matter after negotiation for the use of the land has been completed.

Mr. Samuel L. Keala, Jr.
June 15, 1983
Page 2

Comment:

"3. Part of the proposed landfill area is encumbered by a lease to Tongg Ranch. How does the City plan to handle this?"

Response:

The City's Land Division will be working with the owners of land to determine the best and most equitable means of dealing with the land-owners and lease to Tongg Ranch.

Comment:

"4. To what extent will the site be fenced, i.e. just the landfill area or beyond?"

Response:

Only the portion used for landfilling will be fenced, the exact location of the fencing and type of fence will be worked out during the preliminary engineering phase of the project.

Comment:

"5. There is not much cover material on the lands of the Campbell Estate. Where is the City's source of cover material for use in the landfill operation?"

Response:

The cover material to be used for landfilling will be procured through a bidding process from construction projects.

Comment:

"6. The report calls for a major drainage system which we assume is to intercept and prevent waters from going into the landfill area. Where will the surface runoff waters be discharged? Is it the intent of the City to discharge it directly into the ocean?"

Response:

The normal storm water will be diverted around the landfill and directed toward existing culverts located within the highway. There are no plans to modify the existing conditions with the exception of the installation of a siltation basin and energy dissipater to prevent siltation.

Mr. Samuel L. Keala, Jr.
June 15, 1983
Page 3

Comment:

"If the Waimanalo Gulch site is selected as the landfill, we would appreciate receiving a copy of the development plan showing the landfill design, the method which will be used to control gas migration, and plans for restoration of the landfill."

Response:

A copy of the preliminary development plan will be sent to you.

Your letter will be incorporated into the Environmental Impact Statement and a copy will be sent to you.

Please contact John Lee at 527-5366 if there are any questions.

I would personally like to thank you for your cooperation and for taking the time to meet with our environmental and engineering consultants.

Very truly yours,



MICHAEL J. CHUN
Director and Chief Engineer

First Hawaiian Bank

Mr. Michael J. Chun
April 20, 1983
Page Two

site will be visible from Farrington Highway and that increased traffic, especially refuse trucks, on the narrow two lane highway fronting the entrance to our facility poses a serious hazard.

The Environmental Impact Statement Preparation Notice states that a sanitary landfill is an environmentally acceptable method for the disposal of solid waste. The report states that during the operation of the landfill, the City and County will rigidly adhere to the proposed system of covering the refuse daily, watering the site to control dust and will keep the area clean to prevent odor and control pests. However, examination of other landfill sites has shown that this has not been done in practice and there is a considerable amount of noise, dust and debris associated with existing landfills. Therefore, we do not believe that the proposed landfill is a compatible use if located adjacent to our Recreation Center.

First Hawaiian's Recreation Center was opened for our employees and their families and guests ten years ago. The facility is operated year round and was designed to provide our employees with an opportunity to relax and enjoy the serene quiet and beauty that the area provides. The facility is also used for training new employees, bank meetings and for functions to improve customer relations. To these ends, considerable time and money was expended for off-site and on-site improvements.

Our recreation center has a swimming pool, a wading pool, tennis courts, volleyball courts, a baseball field, seven cabins equipped with cooking and sleeping accommodations, lounges, a community kitchen, game rooms, barbeque and picnic areas and a central hall for large meetings and other bank functions. Over one thousand employees and their guests use this facility each month.

We are understandably quite proud of our facility and its incalculable value to our organization and employees. We believe our facility is the finest multi-purpose center



First Hawaiian Bank
P.O. Box 2200
Honolulu, Hawaii 96847

April 20, 1983

Mr. Michael J. Chun
Director and Chief Engineer
Department of Public Works
City and County of Honolulu
650 South King Street
Honolulu, Hawaii 96813

Dear Mr. Chun:

Thank you for giving us an opportunity to review the Environmental Assessment and Environmental Impact Statement Preparation Notice for the proposed Leeward Sanitary Landfill. Our comments are confined to that part of the statement which proposes a site at Ohikilolo, TMK: 0-3-01.

We are writing to advise you that First Hawaiian Bank strongly opposes the proposed location of a sanitary landfill adjacent to our recreational center. We find that the site's south boundary is less than one-half mile away from our facility and the proposed buffer zone as shown in the statement is not large enough to minimize what we believe to be both short and long-term adverse impacts on our facility.

The short-term impact would be noise and fugitive dust generated during the construction phase of the project over what we estimate to be a one and one-half year period. These effects and the disruption and hazard of increased traffic are of major concern to us.

The long-term impacts include noise, dust, pests and odor on our facility throughout the life of the landfill, estimated to be eleven and one-half years. Other impacts include, the alteration of the terrain such as removal of existing vegetation and its impact on drainage in the area. We are also very concerned about the fact that the

DEPARTMENT OF PUBLIC WORKS
CITY AND COUNTY OF HONOLULU
430 SOUTH KING STREET
HONOLULU, HAWAII 96813



GILLEN R. ANDERSON
DATE

MICHAEL J. CHUN, Ph.D.
MAYOR AND CHIEF EXECUTIVE
OFFICER

SAUNCEE M. KANA
DEPUTY DIRECTOR
R 83-528

July 20, 1983

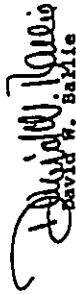
First Hawaiian Bank
Mr. Michael J. Chun
April 20, 1983
Page Three

of its kind in Hawaii and we sincerely believe that the location of the proposed landfill adjacent to our facility will cause irreparable harm to the quality of the environment which we have attempted to create.

Thank you again for affording us the opportunity to review and comment on your report and for any future assistance you can give us on this important subject. Please keep us informed on the status of this project.

If there are any questions regarding our comments, please call me at 525-7095.

Very truly yours,


David W. Ballie
Vice President
Bank Properties Department

DWB/bc

Mr. David W. Ballie
Vice President
Bank Properties Department
First Hawaiian Bank
P. O. Box 3200
Honolulu, Hawaii 96847

Dear Mr. Ballie:

Subject: Leeward Sanitary Landfill Environmental Impact Statement
Preparation Notice - Letter dated 20 April 1983

We appreciate your review of the document and offer the following responses to your comments on the Ohikilolo site.

Comment:

"We are writing to advise you that First Hawaiian Bank strongly opposes the proposed location of a sanitary landfill adjacent to our recreational center. We find that the site's south boundary is less than one-half mile away from our facility and the proposed buffer zone as shown in the statement is not large enough to minimize what we believe to be both short and long-term adverse impacts on our facility."

Response:

The opposition of First Hawaiian Bank to the Ohikilolo site as a sanitary landfill is noted.

Comment:

"The short-term impact would be noise and fugitive dust generated during the construction phase of the project over what we estimate to be a one and one-half year period. These effects and the disruption and hazard of increased traffic are of major concern to us."

Mr. David W. Bellie
July 20, 1983
Page 2

Response:

The short term construction-related environmental impacts of dust and noise will not adversely affect the bank's facilities. Fugitive dust will be controlled, for there are numerous methods by which it can be kept confined to the project site.

Noise will not be a significant adverse impact because of the distance separating the recreational facility from the landfill. The noise levels at the recreational facility will be in conformance to applicable State standards.

Comment:

"The long-term impacts include noise, dust, pests and odor on our facility throughout the life of the landfill, estimated to be eleven and one-half years. Other impacts include, the alteration of the terrain such as removal of existing vegetation and its impact on drainage in the area. We are also very concerned about the fact that the site will be visible from Farrington Highway and that increased traffic, especially refuse trucks, on the narrow two lane highway fronting the entrance to our facility poses a serious hazard."

Response:

The long term adverse impacts, noise, dust, pests, odor, traffic and safety you have mentioned are of concern to us. If these adverse impacts were to occur, we would be in violation of not only our own regulations and operating procedures, but the State permit which we would be operating under. Rest assured, that this department will not be in violation of applicable regulations and that to insure that no violations occur, the landfill will be properly designed and operated.

The landfill will not be visible from your recreational facility and should your employees proceed toward the Makua Keana State Park located about 2 miles north of your facility, the 200-foot landscaped buffer zone fronting the project will screen mauka views of the landfill.

The concern for potential hazardous traffic conditions at your entrance will be evaluated by a traffic engineer. We are also concerned about the impacts to other facilities (Keana Beach Park) and the state park (Keana Point State Park) located within two miles of the proposed landfill project.

Comment:

"The Environmental Impact Statement Preparation Notice states that a sanitary landfill is an environmentally acceptable method for the

Mr. David W. Bellie
July 20, 1983
Page 3

Comment: Continued

disposal of solid waste. The report states that during the operation of the landfill, the City and County will rigidly adhere to the proposed system of covering the refuse daily, watering the site to control dust and will keep the area clean to prevent odor and control pests. However, examination of other landfill sites has shown that this has not been done in practice and there is a considerable amount of noise, dust and debris associated with existing landfills. Therefore, we do not believe that the proposed landfill is a compatible use if located adjacent to our Recreation Center."

Response:

We venture to point out that none of the City and County operated landfills are in violation of our permits. Nor have we recently been cited by the enforcing agency, the State Department of Health for any violations.

Comment:

"First Hawaiian's Recreation Center was opened for our employees and their families and guests ten years ago. The facility is operated year round and was designed to provide our employees with an opportunity to relax and enjoy the serene quiet and beauty that the area provides. The facility is also used for training new employees, bank meetings and for functions to improve customer relations. To these ends, considerable time and money was expended for off-site and on-site improvements."

"Our recreation center has a swimming pool, a wading pool, tennis courts, volleyball courts, a baseball field, seven cabins equipped with cooking and sleeping accommodations, lounges, a community kitchen, game room, barbeque and picnic areas and a central hall for large meetings and other bank functions. Over one thousand employees and their guests use this facility each month."

"We are understandably quite proud of our facility and its invaluable value to our organization and employees. We believe our facility is the finest multi-purpose center of its kind in Hawaii and we sincerely believe that the location of the proposed landfill adjacent to our facility will cause irreparable harm to the quality of the environment which we have attempted to create."

Mr. David W. Bellie
July 20, 1983
Page 4

Response:

The information provided to us on the recreational facilities is useful and will be included in the Environmental Impact Statement.

In addition to your private recreational facility, there are public recreational areas located near the project site. We do not anticipate significant adverse environmental impacts to your facility or to the public facilities.

The disposal of solid waste is important from a health and safety aspect and this is a serious problem confronting our community. No one wants a solid waste disposal facility next door, but the fact of the matter is that we must have a solid waste disposal facility, in this case a sanitary landfill.

Your letter will be incorporated into the Environmental Impact Statement and a copy will be sent to you.

Your continued cooperation and efforts to meet this community-wide problem are appreciated.

Please contact John Lee at 527-5366 if there are any questions.

I would personally like to thank you for your cooperation and for taking the time to meet with our environmental consultant.

Very truly yours,



MICHAEL J. CHUM
Director and Chief Engineer

DEPARTMENT OF PUBLIC WORKS
CITY AND COUNTY OF HONOLULU
830 SOUTH KING STREET
HONOLULU, HAWAII 96813

MICHAEL J. CHUM, Ph.D.
DIRECTOR AND CHIEF ENGINEER
MAURICE H. KATA
DEPUTY DIRECTOR



X 83-598

SILVER H. ANDERSON
MAYOR

August 22, 1983

Mrs. Patricia Lau
Chairperson
Waianae Coast Neighborhood
Board No. 24
c/o V-CAP
85-555 Farrington Highway
Waianae, Hawaii 96792

Dear Mrs. Lau:
Subject: Leeward District Sanitary Landfill Environmental Impact
Statement Preparation Notice

We appreciate your review of the document and offer the following responses to your comments.

Comment:

"We would like to know the impact on Farrington Highway which the state has already allowed to deteriorate to a deplorable state."

Response:

The Highway is used by numerous vehicles and to determine the deterioration of the highway from refuse vehicles is difficult.

Comment:

"What percentage of Oahu's refuse will be sent to Ohikilolo?"

Response:

The City's objective is to send fifty-percent of Oahu's refuse to the Leeward District Sanitary Landfill and fifty-percent to the Windward Landfill, if no resource-recovery-facility is constructed.

WAIANAE COAST NEIGHBORHOOD BOARD NO. 24
85-555 FARRINGTON HIGHWAY
WAIANAE, HAWAII 96792

RECEIVED

MAY 16 10 54 AM '83

DIVISION OF PUBLIC UTILITIES & DISPOSAL



DEPT OF PUBLIC WORKS

MAY 13 3 43 PM '83

TO _____

May 13, 1983

Michael Chum
Chief Engineer
Department of Public Works
650 S. King Street
Honolulu, Hawaii 96813

Dear Mr. Chum:

The Waianae Coast Neighborhood Board has opposed the use of Ohikilolo as a landfill for many years. We have a great many concerns about the use of Ohikilolo which we would like addressed in the E.I.S. We would like to know the impact on Farrington Highway which the state has already allowed to deteriorate to a deplorable state. What percentage of Oahu's refuse will be sent to Ohikilolo? How many trucks will that be daily? How much will a loaded truck weigh? What effect will it have on our roads that are in such poor condition? At what rate will the speed at which our roads deteriorate be increased with this added weight?

We are concerned about the property itself and the effect a landfill will have on it and the surrounding area. Since Waianae already has a landfill, we are aware of some of the problems associated with landfills. No matter what steps are taken, fires occur. There are no city waterlines on the property. All water is obtained from 5 private wells. How will fires be controlled? What will happen to the water on the property. There are five wells and the area is also a natural catchment. It seems impossible to prevent contamination of the ground water. How will this be prevented? There are also a number of heiaus on the property - including one identified by Bishop Museum. What will happen to them? What will the cost be to the city to transport rubbish to about the furthest point possible from Honolulu proper?

We feel the city, in light of the limited amount of land suitable for a landfill, should reassess their list of sites and make more effort to find a location closer to Honolulu.

Sincerely,

Patricia Lau

Patricia Lau, Chairperson
Waianae Coast Neighborhood
Board No. 24

Mrs. Patricia Lau
August 22, 1983
Page 2

Comment:

"How many trucks will that be daily?"

Response:

The traffic projections are being evaluated and will be documented in the EIS.

Comment:

"How much will a loaded truck weigh?"

Response:

The loaded truck will vary in weight, depending on the type of refuse, the compaction and type of truck. A transfer trailer will weigh between 15 to 16 tons; a packer truck up to 5 tons; front-end loaders and roll-on-roll-off trucks between 10 to 20 tons.

Comment:

"What effect will it have on our roads that are in such poor condition? At what rate will the speed at which our roads deteriorate be increased with this added weight?"

Response:

The highway is used by numerous vehicles and to determine the deterioration of the highway from refuse vehicles is difficult. All vehicles will be in the weight range specification for the highway and will conform to applicable state and county requirements.

Comments:

"There are no city waterlines on the property. All water is obtained from 5 private wells. How will fires be controlled?"

Response:

In the event a fire occurs, our landfill operators are trained to immediately isolate the fire area by removing it away from other refuse. Dirt or other cover material is used to extinguish the fire.

With proper compaction of the refuse and the application of cover material the occurrence of a fire is remote. At our Kapas Landfill we experience less than one outbreak per year.

Mrs. Patricia Lau
August 22, 1983
Page 3

Comment:

"There are five wells and the area is also a natural catchment. It seems impossible to prevent contamination of the ground water. How will this be prevented?"

Response:

The water source for the five wells is from rainfall along the upper ridges of the valley. The rain water flows underground through the valley and eventually into the ocean. The landfill will not affect the water source area but it will affect the wells below the 200-foot contour. Those wells which will conflict with the landfilling operation will be sealed and abandoned.

The basal groundwater found beneath the landfill is located outside of the Underground Injection Control Line (UIC) and not considered suitable for potable water source for municipal use (low yield and high chloride content).

Leachate is formed when landfills are located in areas having annual rainfall in excess of 30 inches. In areas having less than 30 inches of rainfall per year, the probability of leachate formation is minimal.

It is not anticipated that leachate will be produced at the Leeward Landfills because of the low rainfall. However, as a precautionary measure, a leachate collection system and monitoring wells will be installed.

Also prior to landfilling, the bottom of the landfill will be sloped and compacted which will minimize infiltration of water into the ground and facilitate the collection of leachate.

Comment:

"There are also a number of basins on the property - including one identified by Bishop Museum. What will happen to them?"

Response:

An archaeological surface reconnaissance of the project site has been conducted. The archaeological report will be included in the Environmental Impact Statement.

Comment:

"What will the cost be to the city to transport rubbish to about the furthest point possible from Honolulu proper?"

Mrs. Patricia Lau
August 22, 1983
Page 4

Response:

Transporting and operating the Ohikilolo Sanitary Landfill will be costly because of the distance. The cost for transporting refuse from the Shafter Flats Transfer Station to Ohikilolo is \$10.00/ton and to Waimanalo Gulch is \$8.90/ton (estimate for 1987).

Comment:

"We feel the city, in light of the limited amount of land suitable for a landfill, should reassess their list of sites and make more effort to find a location closer to Honolulu."

Response:

The selection of a site for landfilling closer to the Honolulu area has been an ongoing project for the last fifteen years. There are several difficulties in selecting and developing landfill sites on Oahu:

1. Restriction of landfills from areas located over potential supplies of municipal water - these areas cover most of the island of Oahu.
2. The Federal government also prohibits landfilling in wetland areas.
3. Other areas are either near residential communities or owned by the State or Federal governments and used for other purposes.

Your continued input in the selection of a sanitary landfill for the Leeward area is appreciated.

Your letter will be incorporated in the Environmental Impact Statement and a copy will be sent to you.

Please contact John Lee at 527-5366 if there are any questions.

Very truly yours,



MICHAEL J. CHUN
Director and Chief Engineer

HAWAIIAN ELECTRIC COMPANY, INC.

Box 2750 / Honolulu, Hawaii / 96840

hjs

RICHARD L. O'CONNELL, P.E.
MANAGER, ENVIRONMENTAL DEPARTMENT
1988 10-1-88

April 26, 1983

ENV 2-1
RV/G

Dr. Michael J. Chun
Director and Chief Engineer
Department of Public Works
City and County of Honolulu
650 South King Street
Honolulu, Hawaii 96813

Dear Dr. Chun:

Subject: Environmental Impact Statement Preparation Notice
for the Proposed Leeward Sanitary Landfill,
Waimanalo Gulch Site (TMK: 9-2-03: Por. 13, 2,
and 40) and Ohikilo Site (TMK: 9-3-01)

We have reviewed the above Preparation Notice and offer the following comments regarding the Waimanalo site:

1. Section 2-II-A-4: HECO property, THK 9-2-03:40, is within the proposed landfill site as delineated by the heavy lines at Waimanalo Gulch. Presently, we have a Passive Repeater located on that property. The overall plan of the proposed landfill site may have an effect on HECO's equipment.
2. Figures 1-2 and 2-1 should be revised to show the Kahe-CEIP easements (see attached sketch).
3. Section 2-II-B-7: The last sentence should be reworded as follows: "HECO power lines cross the middle and upper portions of the site."
4. Section 2-II-E-3: Concerning relocation, any proposed realignment of HECO power lines and associated relocation costs should be identified and coordinated prior to any on site work. Further, minimum conductor to ground clearances should be observed during the landfiling operations in accordance with the State of Hawaii General Order No. 6.
5. It appears that no HECO electrical distribution facilities will be affected by either project.

12-46

HAWAIIAN ELECTRIC COMPANY, INC.

Dr. Michael J. Chun
Director and Chief Engineer
Department of Public Works
April 25, 1983
Page 2

6. It should also be noted that the rough vehicular trail that now starts at the foot of Waimanalo Gulch and winds its way to the top of the ridgeline behind and above HECO's Kahe Valley is used for maintenance of HECO's poles and other facilities cited above. We now have right-of-way access over this trail. It or an adequate substitute must remain open for HECO's use for emergencies and maintenance at all times.

7. If more than 55 mw of net generating capacity are installed at the Kahe site, the existing Kahe-CEIP line will have to be extended to Halawa. If this cannot be done, an additional right-of-way out of Kahe will be required for the additional lines to Halawa. The decrease from the 75 mw used previously to 55 mw is due to the uprating of the Kahe units in January, 1982.

Thank you for the opportunity to comment on this Environmental Impact Statement Preparation Notice.

Sincerely,

R. L. O'Connell

Richard L. O'Connell
Manager, Environmental Department

JMP:cal
Enclosure

DEPARTMENT OF PUBLIC WORKS
CITY AND COUNTY OF HONOLULU
150 SOUTH KING STREET
HONOLULU, HAWAII 96813



GILBERT R. ANDERSON
MANAGER

MICHAEL J. CHUNG, Ph.D.
DIRECTOR AND CHIEF ENGINEER
MAURICE W. HAY
DEPUTY DIRECTOR
R 83-471

June 23, 1983

Mr. Richard L. O'Connell, P. E.
Manager, Environmental Department
Hawaiian Electric Company, Inc.
Box 2750
Honolulu, Hawaii 96840

Dear Mr. O'Connell:

Subject: Leeward Sanitary Landfill Environmental Impact Statement
Preparation Notice - Letter dated 26 April 1983

We appreciate your review of the document and offer the following responses to your comments.

Comment:

"1. Section 2-11-A-4: HECO property, TMK 9-2-03:40, is within the proposed landfill site as delineated by the heavy lines at Waimanalo Gulch. Presently, we have a Passive Repeater located on that property. The overall plan of the proposed landfill site may have an effect on HECO's equipment."

Response:

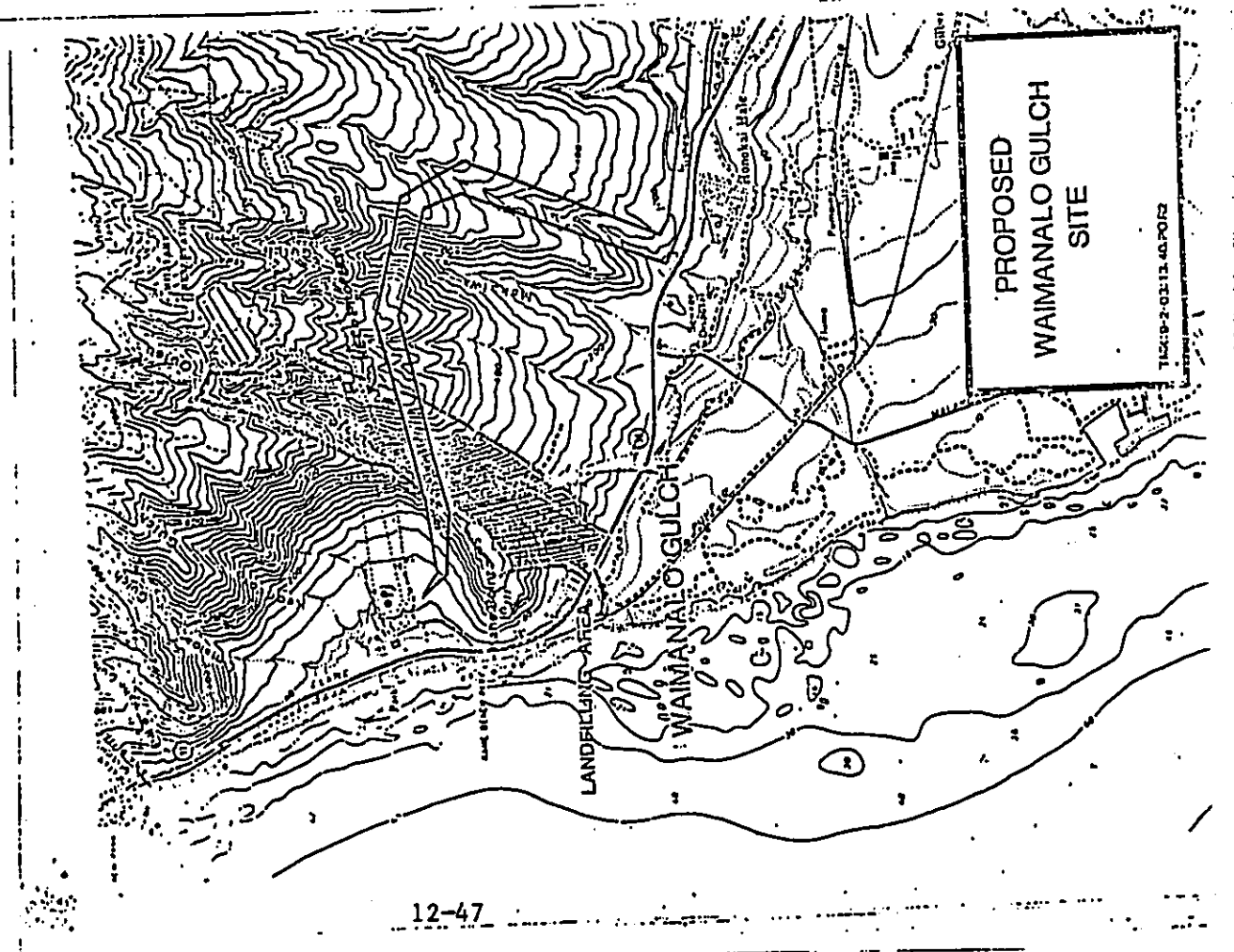
The impact of the landfill on the passive repeater will be evaluated by the consulting engineer and your company's representative.

Comment:

"2. Figures 1-2 and 2-1 should be revised to show the Kahe-CZEP easements (see attached sketch)."

Response:

The Figures 1-2 and 2-1 will be revised to show the easements.



Mr. Richard L. O'Connell
June 23, 1983
Page 3

Comment:

"7. If more than 55 mw of net generating capacity are installed at the Kaha site, the existing Kaha-CRIP line will have to be extended to Halawa. If this cannot be done, an additional right-of-way out of Kaha will be required for the additional lines to Halawa. The decrease from the 75 mw used previously to 55 mw is due to the updating of the Kaha units in January, 1982."

Response:

The consulting engineer will meet with HECO staff to further clarify the need for additional right-of-way for electrical transmission lines from the Kaha site.

Your letter will be incorporated into the Environmental Impact Statement and a copy will be sent to you.

Please contact John Lee at 527-5366 if there are any questions.

Very truly yours,



MICHAEL J. CRUM
Director and Chief Engineer

Mr. Richard L. O'Connell
June 23, 1983
Page 2

Comment:

"3. Section 2-II-B-7: The last sentence should be reworded as follows: "HECO power lines cross the middle and upper portions of the site."

Response:

Information on the location of the power line transverseing the middle and upper portions of the Waimanalo Gulch site will be included in the Environmental Impact Statement.

Comment:

"4. Section 2-II-E-3: Concerning relocation, any proposed realignment of HECO power lines and associated relocation costs should be identified and coordinated prior to any on site work. Further, minimum conductor to ground clearances should be observed during the landfilling operations in accordance with the State of Hawaii General Order No. 6."

Response:

The consulting engineer will be in contact with HECO to determine the minimum conductor to ground clearances during landfilling. If required, this department and the consulting engineer will coordinate any plans for the relocation of HECO power lines.

Comment:

"5. It appears that no HECO electrical distribution facilities will be affected by either project."

Response:

None required.

Comment:

"6. It should also be noted that the rough vehicular trail that now starts at the foot of Waimanalo Gulch and winds its way to the top of the ridge line behind and above HECO's Kaha Valley is used for maintenance of HECO's poles and other facilities cited above. We now have right-of-way access over this trail. It or an adequate substitute must remain open for HECO's use for emergencies and maintenance at all times."

Response:

This information will be passed on to the consulting engineer and provisions for access to the poles and other facilities will be provided.



Michael J. Chun
 Director and Chief Engineer
 Department of Public Works
 City and County of Honolulu
 650 South King Street
 Honolulu, Hawaii 96813

April 6, 1983

Subject: EIS Preparation Notice for the Leeward District Sanitary Landfill

Life of the Land would like to be a consulted party. Please send us a copy of the Draft EIS and Revised EIS when they become available.

We would appreciate it if the Draft EIS addressed the following points in plain english with adequate graphics:

1. the location of the BVS no-pass line and the proposed DOH injection well control line in relation to the two project sites;
2. geology and ground water bodies beneath the project sites;
3. the location, ground elevation, and static heads of wells in the project vicinity;
4. estimated total soil runoff from each of the project sites during their lifetime and analysis of where soil runoff will end up; and
5. relocation payments and services to be provided to persons and businesses who will be displaced by City actions.

Yours,

M. J. Chun
 Arthur Mori
 President

cc: DEQC
 cc: EISC

12-49

DEPARTMENT OF PUBLIC WORKS
CITY AND COUNTY OF HONOLULU
 650 SOUTH KING STREET
 HONOLULU, HAWAII 96813



SILEEN M. ANDERSON
 Mayor

MICHAEL J. CHUN, Ph.D.
 DIRECTOR AND CHIEF ENGINEER
 MAURICE M. HATA
 DEPUTY DIRECTOR

R 83-445

June 22, 1983

Mr. Arthur Mori
 President
 Life of the Land
 240 S. Hotel St., Rm 211
 Honolulu, Hawaii 96813

Dear Mr. Mori:

Subject: Leeward Sanitary Landfill Environmental Impact Statement
 Preparation Notice - Letter dated 6 April 1983

We appreciate your review of the document and offer the following responses.

Comment:

"1. the location of the BVS no-pass line and the proposed DOH injection well control line in relation to the two project sites;"

Response:

The BVS no-pass line and proposed DOH injection well control line do not encompass the landfilling area of the two sites.

Comment:

"2. geology and ground water bodies beneath the project sites;"
 "3. the location, ground elevation, and static heads of wells in the project vicinity;"

Response:

The geological characteristics and the ground water bodies beneath the sites will be described in the EIS using available information.

Comment:

"4. estimated total soil runoff from each of the project sites during their lifetime and analysis of where soil runoff will end up; and"



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B I S H O P M U S E U M
1515 BERNICE STREET • P.O. BOX 9000-A • HONOLULU, HAWAII 96819 • (808) 847-3511

18 April 1983

Mr. Michael J. Chun
Director and Chief Engineer
Department of Public Works
City and County of Honolulu
650 South King Street
Honolulu, HI 96813

Dear Mr. Chun:

RE: EIS Preparation Notice for the Proposed Leeward
Sanitary Landfill

We have reviewed the notice of preparation for the proposed landfill and wish to be consulted party on the Environmental Impact Statement. Our principle areas of concern at this stage are fire hazards, rare native plants and animals found in the area, and potential groundwater contamination. The following staff members in the natural sciences have contributed to the preparation of these comments: Drs. Carl Christensen, Wayne Gagne, Frank Howarth, and Frank Radovsky. Additional comments may be coming to you separately from other areas of the Museum.

The potential floristic and faunistic values of the area are not addressed at all in the Notice of Preparation. This lacuna is not supported by available evidence, and we strongly urge that a floristic survey at least be conducted at the Ohikilolo site before this area is committed to landfill use. Several rare Hawaiian plants are making their last stand on Ohikilolo Ridge and neighboring areas. For example, the following plant species are listed in DLMR's book "Rare Endemic Plants of the Hawaiian Islands" (1981, edited by C. Corn, DLMR) and are known to occur in Ohikilolo or in similar habitats nearby: Achyrantes rotundata (Hbd), Acaelia koala (Hbd), Achyranthes tomentosa (Cham), Muhlenbergia celastroides var. kaenana (Sherff), Gouania (St. John & Fred.), Cyanea superba (Cham), Euphorbia celastroides var. kaenana (Sherff), modioliana (St. John), Hibiscus brackenridgei var. modioliana (St. John), Lobelia nifhaluensis (Gray), Lobelia nifhaluensis (Mann), Lipochaeta tenuifolia (Gray), Mezoseuiron kavaense (Mann) var. meridiana (St. John), Mezoseuiron kavaense (Mann), Schleidea kaialae var. kaialae (Wawra), Tetramolopium filiforme (Sherff), and T. leidotum var. leidotum (Less).

page 2

In addition, an officially protected endangered species of tree snail, Achatinella mustelina, occurs on the upper ridges above the proposed project area and is vulnerable to fire should any spread from the site.

Given the biotic values of the site and their vulnerability to fires, provisions should be made in the design and construction of the landfill to prevent fires from spreading from the project area boundary, i.e. adequate fire breaks should be constructed and maintained.

Thank you for the opportunity to comment.

Sincerely yours,

E. Gratz
Director

DEPARTMENT OF PUBLIC WORKS
CITY AND COUNTY OF HONOLULU
650 SOUTH KING STREET
HONOLULU, HAWAII 96813



EILEEN G. ANDERSON
DIRECTOR

MICHAEL J. CHUN, Ph.D.
DIRECTOR AND CHIEF ENGINEER
BALANCE N. HAYA
SENIOR DIRECTOR

R 83-445

June 22, 1983

12-52
Mr. E. Creutz
Director
Bishop Museum
1525 Bernice St.
P. O. Box 19000-A
Honolulu, Hawaii 96819

Dear Mr. Creutz:

Subject: Leeward Sanitary Landfill Environmental Impact Statement
PREPARATION NOTICE - Letter dated 18 April 1983

We appreciate your review of the document and the valuable information your staff has provided.

The following response is provided to your comment regarding the need for fire protection and containment for the Ohikilolo site. This concern was also raised by City and County Fire Department, the U. S. Fish and Wildlife Service and the State DNR.

The project engineer has been advised to provide a 30 to 50-foot wide fire break around the landfill site. We will also specify in our operations manual that the fire break be maintained as part of the operation and maintenance of the landfill.

The area which will be used for landfilling at the Ohikilolo site will not exceed the 200-foot elevation. The flora and fauna located at the higher elevations will not be adversely affected by the landfilling activities.

Your letter will be incorporated into the Environmental Impact Statement and a copy will be sent to you.

Please contact John Lee at 527-5366 if there are any questions.

Very truly yours,

MICHAEL J. CHUN
Director and Chief Engineer

Mr. Michael Chun
Page 2
April 21, 1983

April 21, 1983

Mr. Michael J. Chun
Director & Chief Engineer
Department of Land Utilization
City and County of Honolulu
650 S. King Street
Honolulu, Hawaii 96813

Dear Mr. Chun:

This is in response to plans being developed to include Ohikilolo Valley (Leeward Oahu - TRK 8-3-01) on a Sanitary Landfill (ref. Leeward District Sanitary Landfill - Environmental Impact Statement, March 14, 1983). We are affected because we are residents of Ohikilolo Valley, 2) because we conduct a business (agricultural - cattle, ranch, and farming) on the proposed site and 3) because of the adverse effects of the landfill on the Waianae Coast. These include:

- 1) Archaeological Impact
There are historical sites of value located in Ohikilolo Valley.
- 2) Impact on traffic on Farrington Highway
Conditions are already adversely affecting the Waianae Coast community, the proposal would increase traffic congestion on already inadequate road.
- 3) The effects on distance to the cost
The proposed site would increase costs to the City and County.
- 4) The Impact of the Landfill on shoreline and Ground Water
Seepage and silt will adversely affect the shoreline, the marine life and the livelihood of many local fishermen.
The impact of silt on Ground Water is not adequately studied (2 wells exist on the site at sea level).
- 5) Hazardous Materials
The only access from Honolulu to the site is through the most congested and populated center of the Waianae Coast.

The EIS Preparation Notice submitted is inadequate and misleading due to the adverse effects of the Ohikilolo site. Because of the conditions of the impact on my family, we would like to provide comments, be consulted and be informed of any further actions concerning the use of Ohikilolo.

The use of additional landfills is more a short term solution to the City's need and there should be the development of a more comprehensive approach to the City's needs of waste management. We encourage the Department of Public Works to consider alternatives other than landfill.

Sincerely,



Albert & Theola Silva
P. O. Box 311
Waianae, HI 96792
Phone: 696-7910 (home)
696-4261 (bus.)

RECEIVED
DEPT OF PUBLIC WORKS
APR 25 2 14 PM '83

DEPARTMENT OF PUBLIC WORKS
CITY AND COUNTY OF HONOLULU
650 SOUTH KING STREET
HONOLULU, HAWAII 96813



EILEEN R. ANDERSON
MAYOR

MICHAEL J. CHAM, PH.D.
DIRECTOR AND CHIEF ENGINEER
MAURICE M. KATA
SENIOR ENGINEER
R 83-510

July 12, 1983

Mr. and Mrs. Albert Silva
P. O. Box
Waianae, Hawaii 96792
Dear Mr. & Mrs. Silva:

Subject: Leeward Sanitary Landfill Environmental Impact Statement
Preparation Notice - Letter dated 21 April 1983

We appreciate your review of the document and offer the following responses to your comments.

Comment:

"We are affected 1) because we are residents of Ohikilolo Valley, 2) because we conduct a business (agricultural - cattle, ranch, and farming) on the proposed site and 3) because of the adverse effects of the landfill on the Waianae Coast. These include."

Response:

We are aware of the fact that you are residents of Ohikilolo Valley and that you and your business activity will be adversely affected by the proposed action.

We have instructed our consultants, Environment Impact Study Corp. and Shimaburo and Associates to meet with you and to independently evaluate the impact of this project on you and your activities.

Their evaluation will be presented in the Environmental Impact Statement and a copy will be sent to you.

We request that you cooperate with our consultants in order that an objective determination of the potential impacts to you can be presented to this department.

Mr. and Mrs. Silva
July 12, 1983
Page 2

Comment:

"1. Archaeological Impact
There are historical sites of value located in Ohikilolo Valley."

Response:

The impacts of the landfill on historical sites will be evaluated and documented in the report after an archaeological surface reconnaissance is conducted of the area to be used for landfilling.

Comment:

"2) Impact on traffic on Farrington Highway
Conditions are already adversely affecting the Waianae Coast community, the proposal would increase traffic congestion on already inadequate road."

Response:

The impact of traffic on the Waianae Coast community will be evaluated by a traffic engineer. The results will be presented in the EIS.

Comment:

"3) The effects on distance to the coast
The proposed site would increase costs to the City and County."

Response:

We concur that there will be an increased cost for hauling the refuse to the Ohikilolo site.

Comment:

"4. The Impact of the Landfill on shoreline and Ground-Water"
Seepage and silt will adversely affect the shoreline, the marine life and the livelihood of many local fishermen.
The impact of silt on Ground Water is not adequately studied (2 wells exist on the site at sea level)."

Response:

There will not be an adverse environmental impact to the near shore waters from silt and other pollutants. The landfill will be designed to prevent siltation of the near shore waters by providing a siltation basin.

Mr. and Mrs. Silva
July 12, 1983
Page 3

The possibility of the production of leachate at both sites is minimized by the low annual average rainfall. Leachate is generally produced in areas having average rainfall in excess of 30 inches. This is not the case for the leeward coast. We do not anticipate the production of leachate which will result in adverse long-term impacts to the basal groundwater and coastal water quality.

Comment:

"5. Hazardous Materials
The only access from Honolulu to the site is through the most congested and populated center of the Waianae Coast."

Response:

No hazardous materials are accepted at the landfills and therefore precludes adverse impacts to the Waianae coast.

Comment:

"The EIS Preparation Notice submitted is inadequate and misleading due to the adverse effects of the Ohikilolo site. Because of the conditions of the impact on my family, we would like to provide comments, be consulted and be informed of any further actions concerning the use of Ohikilolo."

Response:

The Environmental Impact Statement Preparation Notice is one of the three documents required by law. Your comments will be incorporated into the Environmental Impact Statement and a copy of the statement will be sent to you.

We have instructed our consultants to meet with you to further discuss the impacts of the landfill on your family and activities.

You will be a consulted party and be informed of any further actions.

Comment:

"The use of additional landfills is more a short term solution to the City's need and there should be the development of a more comprehensive approach to the City's needs of waste management. We encourage the Department of Public Works to consider alternatives other than landfill."

Mr. and Mrs. Silva
July 12, 1983
Page 4

Response:

A sanitary landfill is the only method for the final disposal of solid waste. We have and will continue to explore means by which solid waste volume can be reduced, such as, incineration and resource recovery. The fact of the matter is that sanitary landfills will be required for the disposal of the ash and non-combustible material (dirt rocks, demolition waste).

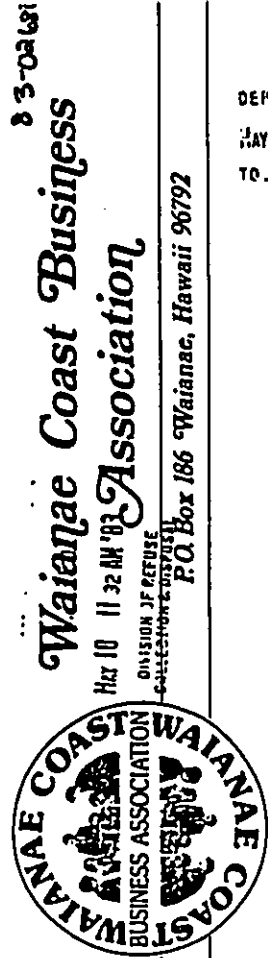
Your letter will be incorporated into the Environmental Impact Statement and a copy will be sent to you.

Please contact John Lee at 527-5366 if there are any questions.

Very truly yours,



MICHAEL J. CHIU
Director and Chief Engineer



8 3-0261
Waiānae Coast Business Association
 MAY 10 11 32 AM '83
 DIVISION OF REFUSE COLLECTION SERVICES
 P.O. Box 186 Waiānae, Hawaii 96792

RECEIVED
 DEPT OF PUBLIC WORKS
 MAY 17 2 48 PM '83
 TO

May 15, 1983
 Mr. Michael J. Chun, Director and Chief Engineer
 Dept. of Public Works
 650 South King-11th Floor
 Honolulu, Hawaii 96813

Dear Mr. Chun,

I am writing you on behalf of the membership of the Waiānae Coast Business Association. After lengthy discussions at several meetings, we have come to an agreement regarding the matter of a sanitary landfill on the Waiānae Coast.

We realize that, within the next year, there will be a desperate need for additional landfill sites on Oahu, and, we know that Waiānae, being primarily a rural area, is a good location for such a project.

We would like to endorse the Waimanalo Gulch site for such a landfill as opposed to the Ohikilolo Ranch site in Makua Valley. The reasons for taking this position are as follows:

1. The traffic along Farrington Highway is already very heavy and we do not want to see the addition of large trucks traveling through our communities day and night.
2. We would like to keep all problems associated with a landfill (birds, flies, fire, noise, dust etc.) away from any populated area on the Waiānae Coast itself.
3. We do not want to see the open spaces of the Ohikilolo Ranch disturbed by placing a landfill there. The Ranch has tremendous historical and spiritual significance to all residents on the Waiānae Coast, and we feel it would serve no positive purpose to destroy an area that so many residents identify with.

Thank you for your attention to this letter, and, if you have any questions regarding this matter, please do not hesitate to call me at my home (695-8790) or at my business (696-2396 The Red Baron).

Sincerely yours,
Lyman Davis
 Lyman Davis, President

DEPARTMENT OF PUBLIC WORKS
CITY AND COUNTY OF HONOLULU
 850 SOUTH KING STREET
 HONOLULU, HAWAII 96813



MICHAEL J. CHUN, Ph.D.
 DIRECTOR AND CHIEF ENGINEER
 MAURICE H. HAY,
 DEPUTY DIRECTOR
 R 83-510

July 12, 1983

Ms. Lynn Davis
 President
 Waiānae Coast Business Association
 P. O. Box 186
 Waiānae, Hawaii 96792

Dear Ms. Davis:

Subject: Leeward District Sanitary Landfill Environmental Impact Statement Preparation Notice

We appreciate your review of the document and offer the following responses to your comments.

There is a need for a landfill in the leeward district, and the current proposal is for two sites, Ohikilolo and Waimanalo Gulch. The two sites will constitute the Leeward District Sanitary Landfill and both are needed.

The landfill at the Ohikilolo Valley will have a significant adverse impact on the tenants of the valley. As to the significance of the ranch to the community from spiritual and historical aspects, we recognize your organization's point of view.

We are appreciative of your organization's support of the Waimanalo Gulch site for a landfill.

Your letter will be incorporated into the Environmental Impact Statement and a copy will be sent to you.

Please contact John Lee at 577-5366 if there are any questions.

Very truly yours,

Michael J. Chun
 MICHAEL J. CHUN
 Director and Chief Engineer



THE OFFICE OF DONALD WOLBRINK PLANNING LANDSCAPE ARCHITECTS, INC. 25
 DEPT. OF LAND UTILIZATION
 CITY & COUNTY OF HONOLULU

FISC 20433-2261

May 13, 1983

Department of Land Utilization
 City and County of Honolulu
 650 South King Street
 Honolulu, Hawaii 96813

Re: Environmental Impact Statement Preparation
 Notice for Proposed Leeward Sanitary Landfill
 Waimanalo Gulch Site, TMK 9-2-03: por 13, 2,
 and 40. to Ohikilolo Site. TMK 8-3-01

Gentlemen:

The undersigned has been engaged by the owners of the Ohikilolo Property, consisting of family and descendants of L. L. McCandless, for the purpose of responding to the subject Environmental Impact Statement Preparation Notice.

In preparing this response, it has been noted that the "Inventory Study of Potential Sanitary and Demolition Landfill Sites" prepared for the City and County of Honolulu, Department of Public Works, Division of Refuse Collection and Disposal, by Stanley S. Shimabukuro and Associates in August, 1977, on Page C-47 with reference to the Ohikilolo Landfill Site says the following. "This site is not recommended for landfill development".

ENVIRONMENTAL IMPACTS

The environmental impact statement should address the impact of the possible sanitary landfill use of Ohikilolo in the following areas of concern:

- (1) Offshore water quality. The coastal waters off Ohikilolo are of high quality and the impact of the proposal on both near shore and off shore water quality should be addressed.
- (2) Social impacts. Impacts of sanitary landfill on people using the

Department of Land Utilization
 Page 2
 May 13, 1983

area, the adjacent beach, and the Makua-Kaena State Park should be determined.

(3) Preservation Land. Part of the land is in a preservation district and the negative impact on preservation land, whether under the landfill or adjacent to it, should be measured.

(4) Potable water quality. While the Notice of Preparation states that only that portion of the site which is outside the "USDW" area will be used, infiltration from the landfill can spread into potable water reserve areas.

(5) Historical or archaeological significance. Although the Notice of Preparation says that there are no sites known to exist which are of historical or archaeological significance, no historical or archaeological survey has been made that we know about. The Waianaa Coast at one time had a large Hawaiian population. Historical or archaeological significance should be determined.

(6) Future uses. The entire valley is handsome, and both the public interest and the private interest deserves protection from a desecrating use such as a sanitary landfill.

(7) Agricultural land. The land is now used for ranching purposes, and its removal from this use is a significant negative economic impact on the community and on the owner.

(8) Traffic. It does seem foolhardy to burden the public highways all the way to Ohikilolo with solid waste trucks.

ALTERNATIVES

At least the following alternatives should be investigated.

(1) Waipio Peninsula Excess Navy Lands. The Naval Magazine CIP final program of August, 1982, WESTLOCH Branch, indicates that approximately 78-plus acres of Navy land now fall outside the ESQD Arcs imposed on the area and are in the process of being reported as excess to the needs of the Navy.

(2) Sites within the ESQD Arc on Waipio Peninsula. Extensive land areas are within the blast zones for protective purposes and joint use of portions of such lands for waste disposal deserve attention.



EILEEN B. ANDERSON
MAYOR

MICHAEL J. CHUN, Ph.D.
DIRECTOR AND CHIEF ENGINEER

MAURICE W. ROY
DEPUTY DIRECTOR

R 83-565

August 2, 1983

Mr. Donald Wolbrink
1164 Bishop Street
Suite 903
Honolulu, Hawaii 96813

Dear Mr. Wolbrink:

Subject: Leeward District Sanitary Landfill Environmental Impact
Statement Preparation Notice - Letter dated May 13, 1983

We appreciate your review of the document and offer the following responses to your comments. The responses will be in the order of your comments.

Response: Page 1

The 1977 study prepared by Stanley S. Shisaburo and Associates for the City and County evaluated numerous sites for landfilling in the Leeward District. One of the sites was Ohikilolo, and the conclusion in 1977 was that Ohikilolo was not recommended for landfill development because there were other more suitable sites for landfilling. Presently, there are no "other" sites available for landfilling. There are several difficulties in selecting and developing landfill sites on Oahu:

1. Restriction of landfills from areas located over potential supplies of municipal water - these areas cover most of the island of Oahu.
2. The Federal Government also prohibits landfilling in wetland areas.
3. Other areas are either near residential communities or owned by the State or Federal Governments and used for other purposes.

Therefore, the Ohikilolo site is being considered for landfilling.

Response: "ENVIRONMENTAL IMPACTS"

"(1) Offshore water quality"

The proposed project will be designed to minimize the adverse environmental impacts to the offshore water quality. The installation of siltation basins will prevent significant adverse impacts to the near-shore water quality and there should be insignificant, if any impacts to the off shore water quality.

"(2) Social impacts"

The impacts to the people using the shore areas fronting the landfill site will be visual, noise and aesthetic. The landfill will be visible from the road and not visible from the beach because of the difference in elevation. The noise from the trucks will be audible from the road and beach.

The aesthetic quality of the valley will be altered from its present state to that of a landfill. This will constitute a negative environmental impact.

"(3) Preservation Land"

The land designated 'preservation' will not be used for landfilling.

"(4) Potable water quality"

There are no major potable water supplies within the project area. A leachate collection system will be installed to minimize any impact on ground-water.

"(5) Historical or archaeological significance"

An archaeological surface reconnaissance of the landfilling has been conducted. The report will be included in the Environmental Impact Statement.

"(6) Future uses"

The valley is aesthetically pleasing and the existing ranching activities have not significantly detracted from the natural quality. The landfilling activities will, during the clearing and operation phases, be visually obtrusive. However, after the landfilling activities have been terminated, much or all of the area can be revegetated.

Mr. Donald Wolbrink
August 2, 1983
Page 3

Response: "ENVIRONMENTAL IMPACTS" - Continued

"(7) Agricultural land"

The removal of the land from ranching will be a significant impact on the existing tenants. However, removal of ranch land is not anticipated to cause a significant adverse impact on the State's ranching activities.

"(8) Traffic"

The traffic impacts will be evaluated and discussed in the Environmental Impact Statement.

"Alternatives"

The alternative sites listed under numbers 1 through 6 were evaluated and pursued by the City but were rejected for one or a combination of reasons cited in our first response. At present, there are no additional lands available for the expansion of Waiwase Landfill. The Hakua site contains live ammunition (duds) and is still being used by the military as a practice range. Although the Maili site is an attractive one from a technical standpoint its proximity to residential areas preclude it from being considered for development as a landfill.

Your letter will be incorporated in the Environmental Impact Statement, and a copy will be sent to you.

Please contact John Lee at 527-5366 if there are any questions.

Very truly yours,



MICHAEL J. CHUN
Director and Chief Engineer

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100

Dr. Michael Chun
Page 2
May 20, 1983

be their impact on the condition of the highway? Is the roadbed for the approximately 11 miles of 2 lane highway in Makaha and beyond adequate to withstand this traffic? Have highway maintenance costs been figured into the costs of using these sites and are there agreements with the State Department of Transportation to provide highways able to sustain this traffic? (Highways in this area are currently in deplorable condition and no re-surfacing is currently scheduled prior to the projected opening of Waimanalo Gulch). What are the statistical projections for increased traffic accidents with this magnitude of increased traffic? Note: Ohikilolo is farther than 3 miles beyond Makaha Valley (p. 2-13).

4. The noise pollution at Nanaikapono School is already very high. What would be the impact of these additional vehicles? Would noise levels remain within tolerable limits or would some of the classrooms have to be suffered against noise or vacated? What would the cost be?

5. What are the operational costs to the City (fuel, shortened life of trucks, man-hours to drive these distances) of selecting Waimanalo Gulch and Ohikilolo over other possible sites?

6. What effect will surface run-off and or ground water seepage into the ocean have on adjacent reefs and on the ocean? Will the marine ecosystem be disturbed in any way? What effect might it have on the fishing and gathering that presently are carried on at the shorelines?

7. Ohikilolo has archeological sites of importance to the community. How would they be protected and how would continued public access accured?

8. Where will the cover materials for these sites be imported from? Will they be trucked in? If so, traffic questions should include these additional trucks. What will be the effect on the area from which the ground cover material will be removed? What is the increase in operational costs of importing ground cover materials and how does it compare to other sites?

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DEPT OF PUBLIC WORKS

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WAIANAE LAND USE CONCERNS COMMITTEE
85-555 Farrington Highway
Waianae, Hawaii 96792

May 20, 1983

Dr. Michael Chun
Director and Chief Engineer
Department of Public Works
City and County of Honolulu
650 South King Street
Honolulu, Hawaii 96813

Dear Dr. Chun:

We have received the Notice of Preparation for the Environmental Impact Statement for the Leeward District Landfill and we wish to offer the following comments:

1. The inventory studies done in 1977 and 1979 were inadequate. Many of the areas most intensively studied were eliminated by subsequent Federal regulations on ground water protection. More effort needs to be spent on surveying areas not excluded by those regulations, particularly the Ewa Plain. The City is saying why it wishes to select certain parcels; it is not saying why many other parcels were eliminated (including many not even considered in the 1977 or 1979 studies).

2. There is inadequate exploration of alternatives to land-filling. One example of an alternative is "up front" recovery. Some cities are recovering up to 60% of waste by separating out certain metals, glass, paper and materials suitable for composting. Another example is adoption of statutes that would require producers to package for minimum waste and to provide cash incentives for returning certain containers.

3. Both land fills would have massive impacts on traffic on the Waianae Coast. Specifically, how many trucks per hour will arrive at Waimanalo Gulch? During what hours? How many trucks per hour will pass through Waianae Coast communities? During what hours? How much do these trucks and their cargo weigh and what will

Mr. Billie J. Hauge
August 2, 1983
Page 2

The landfill inventory study conducted in the seventies considered areas located in the Ewa Plains. Many of the sites were rejected because of potential adverse impacts to agriculture and land conflicts with designated blast zones.

Comment:

"There is inadequate exploration of alternatives to land-filling. One example of an alternative is "up front" recovery. Some cities are recovering up to 60% of waste by separating out certain metals, glass, paper and materials suitable for composting. Another example is adoption of statutes that would require producers to package for minimum waste and to provide cash incentives for returning certain containers."

Response:

Various alternatives to landfilling have been explored over the years, including waste separation, composting and resource recovery. The present efforts by the City to develop a resource to energy project is an example of the effort being undertaken to solve the refuse problem.

Sanitary landfills will be needed even if resource recovery is implemented by the City. Even with the maximum use of resource recovery, sanitary landfilling will continue to be an important means of solid waste disposal because landfills will be used to dispose of the ash and residue produced by the resource recovery system and the unprocessable waste such as bulky items, demolition material, rock and soil. The landfills are also needed to serve as emergency backup facilities during shut down of the resource recovery facility.

Comment:

"Both land fills would have massive impacts on traffic on the Waianae Coast. Specifically, how many trucks per hour will arrive at Waianalo Gulch? During what hours? How many trucks per hour will pass through Waianae Coast communities? During what hours? How much do these trucks and their cargo weigh and what will be their impact on the condition of the highway? Is the roadbed for the approximately 11 miles of 2 lane highway in Makaha and beyond adequate to withstand this traffic? Have highway maintenance costs been figured into the costs of using these sites and are there agreements with the State Department of Transportation to provide highways able to sustain this traffic? (Highways in this area are currently in deplorable condition and no re-surfacing is currently scheduled prior to the projected opening of Waianalo Gulch). What are the statistical projections for increased traffic accidents with this magnitude of increased traffic? Note: Ohikilolo is farther than 3 miles beyond Makaha Valley (p. 2-13)."

Mr. Billie J. Hauge
August 2, 1983
Page 3

Response:

The traffic impacts will be described in the Environmental Impact Statement. A traffic study is presently being conducted by a traffic engineer.

Comment:

"The noise pollution at Manaiakopou School is already very high. What would be the impact of these additional vehicles? Would noise levels remain within tolerable limits or would some of the classrooms have to suffer against noise or vacated? What would the cost be?"

Response:

The existing traffic patterns and vehicles using Farrington Highway fronting Manaiakopou School are already impacting the school. The noise impact will not be cumulative nor should it exceed the present noise levels.

Comment:

"What are the operational costs to the City (fuel, shortened life of trucks, man-hours to drive these distances) of selecting Waianalo Gulch, and Ohikilolo over other possible sites?"

Response:

The operational costs to the City will be higher than if landfill sites were closer to the urban center of Honolulu.

Comment:

"What effect will surface run-off and or ground water seepage into the ocean have on adjacent reefs and on the ocean? Will the marine ecosystem be disturbed in any way? What effect might it have on the fishing and gathering that presently are carried on at the shorelines?"

Response:

The landfill activities should not have a significant adverse environmental impact on the groundwater or the nearshore waters. Energy dissipators and basins will be installed at both of the sites to minimize adverse impacts to the coastal waters from silt.

Mr. Billie J. Hauge
August 2, 1983
Page 5

have been rejected because they are either over municipal groundwater supplies or the Federal Government is currently using them for other purposes and is unwilling to relinquish them for landfill sites.

Your letter will be incorporated in the Environmental Impact Statement, and a copy will be sent to you.

Please contact John Lee at 527-5366 if there are any questions.

Very truly yours,


MICHAEL J. CHINN
Director and Chief Engineer

Mr. Billie J. Hauge
August 2, 1983
Page 4

Leachate is formed when landfills are located in areas having annual rainfall in excess of 30 inches. In areas having less than 30 inches of rainfall per year, the probability of leachate formation is minimum.

It is not anticipated that leachate will be produced at the Leeward landfills because of the low rainfall. Also, if it is determined that precautionary measures, including the installation of leachate intercepter trenches and monitoring wells are required, they will be installed.

Comment:

"Ohikilolo has archeological sites of importance to the community. How would they be protected and how would continued public access be secured?"

Response:

The significant archeological sites, if present, will be protected and public access provided. An archeological surface reconnaissance has been conducted. The results will be included in the Environment Impact Statement.

Comment:

"Where will the cover materials for these sites be imported from? Will they be trucked in? If so, traffic questions should include these additional trucks. What will be the effect on the area from which the ground cover material will be removed? What is the increase in operational costs of importing ground cover materials and how does it compare to other sites?"

Response:

Cover material for our present landfills is purchased from various sources, including construction projects, housing developments, agricultural operations and quarry operations. This practice is expected to continue with our future landfills.

Comment:

"Have serious efforts been made to negotiate use of Federal lands?"

Response:

Serious efforts have been made to negotiate the use of Federal lands at Waipio Peninsula, Honouliuli, Eva No. 2, and Makua. These sites

DEPARTMENT OF LAND UTILIZATION
CITY AND COUNTY OF HONOLULU
850 SOUTH KING STREET
HONOLULU, HAWAII 96813

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DEPARTMENT OF LAND UTILIZATION
COLLECTION & DISPOSAL

MICHAEL M. MCCELROY
DIRECTOR
ROBERT D. JONES
SPUTTY BRISTON

April 21, 1983

LU4/83-1681 (JDN)

12-66

Mr. Michael A. Gibson
Ashford & Ariston
Attorneys at Law
P.O. Box 131
Honolulu, Hawaii 96810

Dear Mr. Gibson:

Environmental Impact Statement Preparation Notice (EISPN)
For the Proposed Leeward Sanitary Landfill;
Maianalo Gulch Site--Tax Map Key 9-2-03; Portion 13, 2 & 40
Ohikilo Site--Tax Map Key 8-3-01

Your request for an extension of time to review and comment on the subject EISPN is acceptable to both the Department of Land Utilization and the Department of Public Works. You are granted until and including May 17, 1983, as requested, to respond.

If you have any questions, please contact John Hakagawa of our staff at 527-5038.

Very truly yours,

Jonette Chae
MICHAEL M. MCCELROY
Director of Land Utilization

MMH:s1

cc: DPA Attn: John Lee

12 11 10 09 08 07 06 05 04 03 02 01

PETITION

We, the undersigned are opposed to using OHIKILOLO for the Leeward Sanitary landfill as proposed by the City and County of Honolulu.

NAME	ADDRESS
Joseph S. Lee	P.O. Box 495 Wai'anae
George P. P.	94-5200 Kamehameha Hwy, Pahaia
Randy - Tam	94-940 Kaula'auha Rd
Steven J. Lee	84-132 Wideman St
Ronnie E. Lee	84-1310 Nideena Rd St.
David Condon-Johnson	84-636 Dickerson St.
Charles (Abe) D.	527 B Judd St
Gregory Lee	587-B Judd St
Edna Lee	60 Keimani Ln.
John Lee	84-1072 Kalaheo St
U. E. Lee	" "
Paul Lee	89 1/2 Wai'anae St (Suburban)
Norm Lee	84-734 Honolulu St. Maesala
Archie Lee	87-319 Makinwe St. Ahuaiki
Conrad Lee	84-744 Honolulu St. Makaha
Norm Lee	84-744 Honolulu St. Makaha
Bob Lee	87-288 Heleka St - NAWANAWA
John Lee	85-901 Puna Puna Pt.
Alan Lee	87-196 Heleka St. Makahaiki
Tom Lee	87-167 Kimo St. Makaha
Robert Lee	87-220 A 112010 Aze.
Arthur Lee	8406 Makaha Pt. 59
John Lee	87-235 Puna Pt. Makaha
Melvin Lee	87-035 Puna Pt. Makaha
John Lee	80-1578 Kalaheo St. Makaha
John Lee	85-521 Wai'anae Hwy. Pahaia
John Lee	85-521 Wai'anae Hwy. Pahaia
John Lee	Railway St.

PETITION

We, the undersigned are opposed to using OHIKILOLO for the Leeward Sanitary landfill as proposed by the City and County of Honolulu.

NAME	ADDRESS
Joseph Lee	504 Lana St. Kaima, HI
Joe Lee	84-504 Fricks St
Joseph Lee	968 Maunawili Rd
John Lee	508 Maunawili Rd
John Lee	968 Maunawili Rd. Kaima, HI 96134
John Lee	P.O. Box 997, Wai'anae, HI 96792
John Lee	P.O. Box 793 Wai'anae, HI 96792
John Lee	P.O. Box 311 Wai'anae, HI
John Lee	89-065 Helekahele Ave. Maesala
John Lee	89-065 Helekahele Ave. Maesala
John Lee	P.O. Box 1221 Wai'anae 96792
John Lee	P.O. Box 1221 Wai'anae 96792
John Lee	" " " "
John Lee	" " " "
John Lee	25-039 Army St.
John Lee	P.O. Box 121 Wai'anae 96792
John Lee	85-175 Wai'anae Hwy C-227
John Lee	85-109 Kapaeha Pt. Wai'anae 96792
John Lee	" " " "
John Lee	" " " "
John Lee	2439 + Homua Pt. N. I. K. Pahaia
John Lee	P.O. Box 1171 Wai'anae 96792
John Lee	P.O. Box 1171 Wai'anae 96792
John Lee	87-111 Kapaeha Pt. Wai'anae 96792
John Lee	" " " "
John Lee	88098 Pahaia Pt. Wai'anae 96792
John Lee	" " " "
John Lee	" " " "
John Lee	50. Solutana St. Pahaia
John Lee	Kamehameha Hwy - Box 25-A, Pahaia 96817
John Lee	85-801 Pahaia Pt.

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We, the undersigned are opposed to using OHIKILOLO for the Leeward Sanitary landfill as proposed by the City and County of Honolulu.

NAME	ADDRESS
W. D. ...	911 ...
...	2390 ...
...	35227 ...
...	85-1491 ...
...	2615 ...
...	81-557 ...
...	87-151 ...
...	84-246 ...
...	" " "
...	2012 ...
...	85-109 ...
...	84-201 ...
...	85-300 ...
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...	87-216 ...
...	81-1315 ...
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...	45-122 ...
...	4623 ...
...	4471323 ...
...	4011323 ...
...	401712 ...
...	82-588 ...
...	82-665 ...
...	87-665 ...
...	37-216 ...
...	81-511 ...

We, the undersigned are opposed to using OHIKILOLO for the Leeward Sanitary landfill as proposed by the City and County of Honolulu.

NAME	ADDRESS
...	P.O. Box 138 ...
...	3009 A. I. ...
...	78-614 ...
...	85-323 ...
...	85-149 ...
...	98-599 ...
...	415-1114 ...
...	1280 ...
...	2202 ...
...	82-203 ...
...	92-655 ...
...	92-250 ...
...	95-145 ...
...	94-639 ...
...	57-1351 ...
...	1210 ...
...	81-121 ...
...	83-135 ...
...	155 ...
...	53 ...
...	53 ...
...	2155 ...
...	350 ...
...	P.O. Box 433 ...
...	1158 ...

PETITION

We, the undersigned are opposed to using OHIKILOLO for the Leeward Sanitary landfill as proposed by the City and County of Honolulu.

NAME	ADDRESS
Arthur K. Mendenhall	85-709 - C Palihua Pl
AUO SENEY	84-1042 B# Fair Hwy
Bruce K. Scales	86-012-c Palahi Bay St.
Eugene and Ruth	86-012-c Palahi Bay St.
Kathy M. Johnson	84-524-D Fair Hwy
Chris Sauer	84-740 Fricke St
JAC to Sauer	A Sauer
John L. Borod	87-583 MANUMULU SHEET
Walter M. Bolte	" " "
John Sauer	2044 1/2 Palahua Pl. Manumulu 96795
Stephen R. Bruck	87-2186 Fair Hwy 96792
Richard Chous	87-147 Palahua St.
Richard Wallace	85-576 Palahua St. to Leeward
David K...	3371 Kaimali Dr. 96717
John L. Helms	85-629 NEAK ST. Ewa Beach 96796
Charles K. ...	91-1095 Kaimali ST. Ewa Beach 96796
Mrs. Mataline	85223 MAHELE ST. EWA BEACH 96792
Olderby	1271 Neak Ave. #200 Ewa Beach 96796
Openehe	85-225 Palahua St. Ewa Beach 96796
Shenka	85 225 Palahua St. Ewa Beach 96796
Lorna Arise	86-042 Alton St. Ewa Beach 96792
Wynette K. For	85-1291 KAIMALI DR. EWA BEACH
Carl Perry	2105 Ahihewa St. Ewa Beach 96792
A. M. ...	95255 Wai. Kalan. Wahiawa
Margaret Viner	96329 Palahua St. Ewa Beach
Laura ...	89-417 Palahua St. Ewa Beach
Mrs. ...	89-105 Palahua St. Ewa Beach
Pauline ...	87-456 Fair Hwy. Ewa Beach
Herman ...	87-156 Fair Hwy. Ewa Beach

PETITION

We, the undersigned are opposed to using OHIKILOLO for the Leeward Sanitary landfill as proposed by the City and County of Honolulu.

NAME	ADDRESS
K.A. SMITH	81-610 KAIMALI DR.
Stanley ...	610 ...
Rebecca ...	87-123 Makona St. 96792
Virvan P. ...	84-1029 Noholo Rd. 96792
Pearlene ...	84-1050 Fair Hwy. 96792
Brenda ...	87-285 Palahua St. 96792
Peter H. ...	85-749 Palahua St. 96792
Roy ...	87-123 Makona St. 96792
Richard ...	1100
Robert ...	1100
Adeline ...	85-1048 Kaimali St. 96792
Ann ...	85-119A Kaimali St. 96792
Maria ...	83-500 Fair Hwy
Elizabeth ...	89-436 KAIMALI AVE. 96792
Howard ...	85-249 Oala Okana Ave
Judith ...	85-249 Oala Okana Ave
Lynn ...	87-207 Palahua St. 96792
Constance ...	" " " " " " " " " " " "
Lynn ...	" " " " " " " " " " " "
Carole ...	" " " " " " " " " " " "
Frank ...	" " " " " " " " " " " "
Phyllis ...	" " " " " " " " " " " "
Wilma ...	" " " " " " " " " " " "
Henry ...	89-436 KAIMALI AVE. 96792

12-74

PETITION

He, the undersigned are opposed to using OHIKIILOLO for the Leeward Sanitary Landfill as proposed by the City and County of Honolulu.

NAME	ADDRESS
William Williams	105R Kamaoiake Kaula, Hawaii
Walter Phillips	1052 Kaulaiake St. Kaula, HI 96734
Richard E. Brown	551 Kaulaiake St. Kaula, HI 96734
Colman E. Marshall	2136 Alueloa St. Honolulu, HI 96821
Mary K. Mandy	236 Alueloa St. Honolulu, HI 96821
Amia L. Johnston	1077 Kaulaiake Kaula, Hawaii 96734
Nicholas Johnston	1077 Kaulaiake Kaula, Hawaii 96734
Awa M. Kekuanui	1035 Opa Koa Blvd. Honolulu, HI 96817
Donna O. Kekuanui	105 Kaula St. Honolulu, HI 96817
Richard E. Brown	105 Kaula St. Honolulu, HI 96817
Richard E. Brown	91-1043 Kaula St. Honolulu, HI 96734
William K. Doering	551 Kaulaiake St. Kaula, HI 96734
Githen Lee	89-371 Mokuiake St.
Gay F. Fernald	131 Mokuiake Place Honolulu, HI 96817
Mr. Ma Haba-staka	84-744 FAY HAY 96792
Mike Pradny	98-154 KALIKE PL 96701
Shelia Pele	86-042 Haha St. 96-788
Edward S. Tom	99-146 Kaulaiake Dr. 96707
Christina V. Chelle	85-035B Auahi Street 96792
Wanda A. Butler	85-035B Auahi Street 96792
Prudence Chong	45-1113 Mokuiake Place Honolulu, HI 96792
William C. Rice	89-200 Holt St. Manoa, HI 96792
Samuel Rice	84-210 Holt St. Manoa
William C. Rice III	84-260 Holt St. Manoa
James St. Rice	80-042 HAWAII ST. PAHIANA
James St. Rice	84-1006 Leleke St. Manoa
John A. Marston	84-1006 Leleke St. Manoa
Charles L. Marston	701 KE FINE Manoa
John A. Marston	66-517 Kaulaiake, Kaula, HI

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EIS Responses and Comments

SECTION 13

ORGANIZATIONS AND PERSONS
CONSULTED IN THE PREPARATION OF THE EIS

The following list includes those agencies and organizations to whom the Environmental Impact Statements were sent or from whom comments were received during the EIS review period. Those with an asterisk sent in written comments, and the comments and corresponding responses are presented on the indicated pages.*

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DEPARTMENT OF THE ARMY
PACIFIC OCEAN DIVISION, CORPS OF ENGINEERS
FT. SHAFTER, HAWAII 96858

September 27, 1983

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R*

Dr. Michael Chun, Director
Department of Public Works
City and County of Honolulu
630 South King Street, 11th Floor
Honolulu, Hawaii 96813

Dear Dr. Chun:

Thank you for the opportunity to review and comment on the environmental impact statement for Leeward Sanitary Landfill. Comments in our April 11, 1983 letter has been acknowledged and we have no further comments.

Sincerely,

Michael J. Chun
Michael J. Chun
Chief, Engineering Division



DEPARTMENT OF PUBLIC WORKS
CITY AND COUNTY OF HONOLULU
630 SOUTH KING STREET
HONOLULU, HAWAII 96813

ELLEN M. ANDERSON
SECRETARY

MICHAEL J. CHUN, Ph.D.
DIRECTOR AND CHIEF ENGINEER
"LAUNCELOT" HALL
DEPARTMENT OF PUBLIC WORKS
CITY AND COUNTY OF HONOLULU

R 83-750

October 31, 1983

Mr. Kiauk Cheung
Chief, Engineering Division
Department of the Army
Pacific Ocean Division
Corps of Engineers
Ft. Shafter, Hawaii 96858

Dear Mr. Cheung:

Subject: Leeward District Sanitary Landfill
Environmental Impact Statement

We appreciate your review of the document. Your letter will be incorporated into the revised environmental impact statement.

Michael J. Chun

MICHAEL J. CHUN
Director and Chief Engineer

cc: EISC
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OCT 5 1983



United States
Department of
Agriculture

Soil
Conservation
Service

P.O. Box 50004
Honolulu, Hawaii
96850

October 28, 1983

Mr. Michael McElroy, Director
Department of Land Utilization
City & County of Honolulu
650 South King Street, 7th Floor
Honolulu, Hawaii 96813

Dear Mr. McElroy:

Subject: EIS for the Leeward District Sanitary Landfill, Waimanalo
Guich and Ohikilo, Oahu

We reviewed the subject environmental impact statement and have no
comments to make.

Thank you for the opportunity to review this document.

Sincerely,

Francis C.H. Lum
FRANCIS C.H. LUM
State Conservationist

cc:

Dr. Michael Chun, Director
Department of Public Works
City and County of Honolulu
650 South King Street, 11th Floor
Honolulu, Hawaii 96813

Environment Impact Study Corp.
2850 Pan Street, Suite 202
Honolulu, Hawaii 96819

13-4

The Soil Conservation Service
is an agency of the
Department of Agriculture

RECEIVED
NOV. 03 1983
EISC

DEPARTMENT OF PUBLIC WORKS
CITY AND COUNTY OF HONOLULU
590 SOUTH KING STREET
HONOLULU, HAWAII 96813



SILENCE ADDRESS
MAILING

MICHAEL J. CHUN, Ph.D.
DIRECTOR AND CHIEF ENGINEER
MAURICE W. BATA
SUPPORT OFFICER

R 84-12

January 9, 1984

Mr. Francis C. H. Lum
State Conservationist
Soil Conservation Service
P. O. Box 50004
Honolulu, Hawaii 96850

Dear Mr. Lum:

SUBJECT: Leeward District Sanitary Landfill Environmental Impact Statement

We appreciate your review of the document. Your letter will be incorporated into the revised environmental impact statement.

Very truly yours,

Michael J. Chun

MICHAEL J. CHUN
Director and Chief Engineer

cc: DLU
EISC ✓

1 2 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31



United States Department of the Interior

FISH AND WILDLIFE SERVICE
300 ALA MOANA BOULEVARD
P. O. BOX 50187
HONOLULU, HAWAII 96850

83-05283

MAILING LABEL 101
ES
ROOM 6307

SEP 21 1983

ENU(4)
Refuse

Mr. Michael McElroy
Director, Department of Land
Utilization, C & C of Honolulu
650 South King St., 7th Floor
Honolulu, HI 96813

Re: Leeward District Sanitary
Landfill EIS

Dear Mr. McElroy:

The Service has reviewed the subject EIS and finds that it is not complete. Specifically, the discussions of the biological characteristics of (p. 2-38) and potential impacts to (p. 4-21) Ohikilolo Valley have not included information provided by the Service in our letter of March 30, 1983, nor have they addressed the concerns of the Bishop Museum (letter of April 18, 1983). Provision of a 30 to 50 foot-wide fire break as the sole means to prevent fires from spreading to the adjacent ridge line appears inadequate. Full disclosure of the fire risk to candidate endangered plants on the west ridge should be made in the EIS. In addition to maintenance of a fire break, the Service further recommends that some fire fighting capabilities be maintained continuously at the landfill.

Sincerely yours,

1/

William F. Kramer
Acting Project Leader
Office of Environmental Services

cc: NMFS - WPPD
HDF-11
EDMR
EPA, San Francisco
Dr. Michael Chun, Director, C&C Public Works
Environmental Impact Study Corp.
Office of Environmental Quality Control

SEP 22 1983
5:56 PM
SEP 28 1983
EISC

DEPARTMENT OF PUBLIC WORKS
CITY AND COUNTY OF HONOLULU

830 SOUTH KING STREET
HONOLULU, HAWAII 96813



EILEEN M. ANDERSON
Mayor

MICHAEL J. CHUM, Ph.D.
DIRECTOR AND CHIEF ENGINEER

MAURICE N. KAYA
DEPUTY DIRECTOR

R 84-67

January 30, 1984

Mr. William R. Kramer
Acting Project Leader
Office of Environmental Services
U. S. Department of the Interior
Fish and Wildlife Service
P. O. Box 50167
Honolulu, Hawaii 96850

Dear Mr. Kramer:

SUBJECT: Leeward District Sanitary Landfill Environmental Impact Statement

We appreciate your valuable comments and offer the following responses.

Comment:

"The Service has received the subject EIS and finds that it is not complete. Specifically, the discussions of the biological characteristics of (p. 2-38) and potential impacts to (p. 4-21) Ohikilolo Valley have not included information provided by the Service in our letter of March 30, 1983, nor have they addressed the concerns of the Bishop Museum (letter of April 18, 1983). Provision of a 30 to 50 foot-wide fire break as the sole means to prevent fires from spreading to the adjacent ridge line appears inadequate. Full disclosure of the fire risk to candidate endangered plants on the west ridge should be made in the EIS. In addition to maintenance of a fire break, the Service further recommends that some fire fighting capabilities be maintained continuously at the landfill."

Response:

The letters from your agency and Bishop Museum were reproduced in their entirety and are found in Section 12 of the EIS, pages 12-7 and 12-52, respectively. Following the recommendations from Bishop Museum, our

Mr. William R. Kramer
Page 2
January 30, 1984

consultant contacted the State Department of Land and Natural Resources and your agency to verbally discuss the anticipated impact to the vegetation if the project were to be implemented.

The conclusion for Ohikilolo Valley was that as long as the landfilling activities are limited to the 200-foot contour and a 30-50 foot wide fire break is created around the landfill site, the potential adverse impacts from fire and ground clearing activities would not affect the vegetation located along the ridges. The vegetation in the area to be used for landfilling has already been altered by the ranching activities. We are in agreement that in the remote event that a fire were to start in the landfill, immediate extinguishing of the fire would be required. For this reason, all equipment used in the landfilling operations will be equipped with fire extinguishers, the operators will be trained to extinguish fires using a combination of extinguishers and water for small fires and containment and smothering procedures for larger fires. The fire break will be continuously maintained around the perimeter of the landfill.

13-6

A fire break is provided mainly to prevent fires from entering the landfill, not from leaving it. Fires which start in a landfill are inhibited from spreading by combustible material which has been densely compacted and which has a relatively high moisture content. Furthermore, these fires occur only at the working face (which is more than 50, 70, or 140 feet away from the perimeter of the landfill) because all other areas are covered with soil. Brush fires, on the other hand, spread quickly as they feed on dry, highly combustible vegetation, and it is these fires which pose the real danger. Such an intense fire can ignite the refuse in a landfill, as one recently did at Kawaihoa Sanitary Landfill in Haleiwa.

Your letter will be incorporated into the Revised Environmental Impact Statement.

Very truly yours,



FOR MICHAEL J. CHUN
Director and Chief Engineer

cc: DLW
S. Shimabukuro
EISC

4 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100



United States Department of the Interior

GEOLOGICAL SURVEY
Water Resources Division
P.O. Box 50166
Honolulu, Hawaii 96850

83-05347

September 23, 1983

RECEIVED
DEPT OF PUBLIC WORKS
SEP 26 10 18 AM '83

ENVM
Esque

Mr. Michael McElroy, Director
Department of Land Utilization,
City and County of Honolulu
650 South King Street, 7th floor
Honolulu, Hawaii 96813

Dear Mr. McElroy:

SUBJECT: Environmental Impact Statement:
Leeward District Sanitary Landfill

Our staff members have reviewed the subject EIS, and have no additional comments. Thank you for the opportunity to participate in the EIS process.

As requested, we are returning the document to the Environmental Quality Commission.

Sincerely,

Santos Valenciano
Acting District Chief

cc: Dr. Michael Chun
Environment Impact Study Corp.

DEPARTMENT OF PUBLIC WORKS
CITY AND COUNTY OF HONOLULU
650 SOUTH KING STREET
HONOLULU, HAWAII 96813



SILEEN R. ANDERSON
MAILER

MICHAEL J. CHUN, P.E.
DIRECTOR AND CHIEF ENGINEER
MAURICE M. KATA
DEPUTY DIRECTOR
R 83-750

October 31, 1983

Mr. Santos Valenciano
Acting District Chief
U. S. Department of the Interior
Water Resources Division
P. O. Box 50166
Honolulu, Hawaii 96850

Dear Mr. Valenciano:

Subject: Leeward District Sanitary Landfill
Environmental Impact Statement

We appreciate your review of the document. Your letter will be incorporated into the revised environmental impact statement.

Michael J. Chun

MICHAEL J. CHUN
Director and Chief Engineer

cc: EISC
DLW

RECEIVED
SEP 20 1983
EISC



HEADQUARTERS
NAVAL BASE PEARL HARBOR
BOX 110
PEARL HARBOR, HAWAII 96860

DEPARTMENT OF PUBLIC WORKS
CITY AND COUNTY OF HONOLULU
650 SOUTH KING STREET
HONOLULU, HAWAII 96813



MICHAEL J. CHUN, Ph.D.
DIRECTOR AND CHIEF ENGINEER
MAURICE M. BATA
DEPUTY DIRECTOR

R 83-750

SILEEN M. ANDERSON
SECRETARY

October 31, 1983

PLEASE REFER TO:
002B:MKL:jam
Ser 2034
2.1 SEP 1983

Mr. Michael McElroy, Director
Department of Land Utilization
City and County of Honolulu
650 South King Street, 7th Floor
Honolulu, Hawaii 96813

Dear Mr. McElroy:

Environmental Impact Statement (EIS)
Leeward District Sanitary Landfill

The EIS for the Leeward District Sanitary Landfill has been reviewed
and the Navy has no comments to offer.

Thank you for the opportunity to review the EIS.

Sincerely,

M. M. Dallam
M. M. DALLAM
CAPTAIN, CEC, U. S. NAVY
FACILITIES ENGINEER
BY DIRECTION OF THE COMMANDER

Captain M. M. Dallam
CEC, U. S. Navy
Facilities Engineer
Box 110
Pearl Harbor, Hawaii 96860

Dear Captain Dallam:

Subject: Leeward District Sanitary Landfill
Environmental Impact Statement

We appreciate your review of the document. Your letter will be incorporated into the revised environmental impact statement.

Michael J. Chun
MICHAEL J. CHUN
Director and Chief Engineer

cc: EISC
DLU

Enclosure

Copy to:
Dr. Michael Chun, Director
Department of Public Works, CEC of Hnl.
Environmental Impact Study Corp.
Environmental Quality Commission

RECEIVED
SEP 22 1983
EISC

02 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31



DEPARTMENT OF THE AIR FORCE
HEADQUARTERS 15TH AIR BASE WING (PACAF)
HICKAM AIR FORCE BASE, HAWAII 96813

REPLY TO DEEV (Mr Yamada, 449-1831)
ATTN: DEEV

SUBJECT: Environmental Impact Statement for the Leeward District Sanitary Landfill

TO: Ms Letita N. Uyehara, Interim Director
Office of Environmental Quality Control
550 Halekauwila Street, Room 301
Honolulu, HI 96813

1. This office has reviewed the subject EIS and has no comment relative to the proposed project.
2. We greatly appreciate your cooperative efforts in keeping the Air Force apprised of your project and thank you for the opportunity to review the document. The EIS is returned for your file.

13-9

Robert M. Oyaxi
ROBERT M. OYAXI
Chief, Engrg & Envmtl Png Div
Directorate of Civil Engineering

1 Atch
EIS

cc: Mr Michael McElroy, Director
City and County of Honolulu
Department of Land Utilization
650 South King Street, 7th Floor
Honolulu, HI 96813

Dr Michael J. Chun, Director
City and County of Honolulu
Department of Public Works
650 South King Street, 11th Floor
Honolulu, HI 96813

Environmental Impact Study Corp
2850 Paa Street, Suite 202
Honolulu, HI 96819

DEPARTMENT OF PUBLIC WORKS
CITY AND COUNTY OF HONOLULU
650 SOUTH KING STREET
HONOLULU, HAWAII 96813



EILEEN R. ANDERSON
MAYOR

MICHAEL J. CHUN, Ph.D.
DIRECTOR AND CHIEF ENGINEER
MICHAEL J. CHUN
DEPUTY DIRECTOR
R 83-750

October 31, 1983

Mr. Robert M. Okazaki
Chief, Engineering &
Environmental Planning Division
Department of the Air Force
Headquarters 15th Air Base Wing (PACAF)
Hickam Air Force Base, Hawaii 96813

Dear Mr. Okazaki:

Subject: Leeward District Sanitary Landfill
Environmental Impact Statement

We appreciate your review of the document. Your letter will be incorporated into the revised environmental impact statement.

Michael J. Chun

MICHAEL J. CHUN
Director and Chief Engineer

cc: EISC
DLU

US Department
of Transportation
United States
Coast Guard



Commander
Fourteenth Coast Guard District
(Op1)

Prince Kahanui
Federal Building
300 Ala Moana Blvd.
Honolulu, Hawaii 96850
Phone: 546-2861

11000

Serial 586

9 September 1983

Mr. Michael McElroy, Director
Department of Land Utilization, C&C of Hnl.
650 South King Street, 7th Floor
Honolulu, Hawaii 96813

Dear Mr. McElroy:

The Fourteenth Coast Guard District has reviewed the Draft Environmental Impact Statement (EIS) for the Leeward District Sanitary Landfill and has no objection or constructive comments to offer at the present time.

13-10

Sincerely,

J. E. SCHWARTZ
Commander, U. S. Coast Guard
District Planning Officer
By direction of

Commander, Fourteenth Coast Guard District

Copy: Department of Public Works, C&C of Hnl.
✓Environment Impact Study Corp.

DEPARTMENT OF PUBLIC WORKS
CITY AND COUNTY OF HONOLULU
650 SOUTH KING STREET
HONOLULU, HAWAII 96813



EILEEN R. ANDERSON
MAIL ROOM

MICHAEL J. CHUN, Ph.D.
DIRECTOR AND CHIEF ENGINEER

MAURICE M. HATA
DEPUTY DIRECTOR

R 83-750

October 31, 1983

Commander J. E. Schwartz
District Planning Officer
Fourteenth Coast Guard District
U. S. Department of Transportation
300 Ala Moana Boulevard
Honolulu, Hawaii 96850

Dear Commander Schwartz:

Subject: Leeward District Sanitary Landfill
Environmental Impact Statement

We appreciate your review of the document. Your letter will be incorporated into the revised environmental impact statement.

MICHAEL J. CHUN
Director and Chief Engineer

cc: EISC
DLU

DEPARTMENT OF PUBLIC WORKS
CITY AND COUNTY OF HONOLULU
430 SOUTH KING STREET
HONOLULU, HAWAII 96813



MICHAEL J. CHUN, Ph.D.
DIRECTOR AND CHIEF ENGINEER
MAURICE H. KAYA
DEPUTY DIRECTOR

R 84-28

January 13, 1984

FILED IN ADDRESS
MAIL ROOM

JACK K. SUMA
CHAIRMAN, BOARD OF AGRICULTURE
SUZANNE D. PETERSON
DEPUTY TO THE CHAIRMAN



State of Hawaii
DEPARTMENT OF AGRICULTURE
1428 So. King Street
Honolulu, Hawaii 96814

September 19, 1983

GEORGE B. ABIYOSHI
GOVERNOR

MEMORANDUM

To: Mr. Michael H. McElroy, Director
Department of Land Utilization
City and County of Honolulu

Subject: Environmental Impact Statement (EIS) for
Leeward District Sanitary Landfill
Waimanalo Gulch Site (TRK: 9-2-03: por. 13, 2, and 40) and
Ohikilolo Site (TRK: 8-3-01)

The Department of Agriculture is extremely concerned about the impact of the proposed landfill on the Paniolo Country Ohikilolo Makua Ranch and related activities.

In 1982, the cattle industry was the second most important diversified agricultural activity, in the State by value of production (Statistics of Hawaiian Agriculture, 1982, page 11). We estimate the Ohikilolo Ranch to be of mid-size relative to other ranching operations on Oahu and in the State.

The EIS states on page 4-52 that "The loss of the ranch activities would mean the loss of the cattle operation (about 500 head), loss of the grass hay production, loss of the goat herd, loss of the kiawe charcoal operation, loss of the donkey herd (sold to the Honolulu Zoo for meat) ...". Taken in its entirety, this is a relatively large agricultural operation.

We understand from the EIS that "... relocation payments and method or relocation of persons and/or businesses will be handled during the negotiation for the acquisition of the land" (EIS, page 12-51). The EIS should make clear what provisions will be made to relocate the ranch and what compensation will be paid for damages incurred.

Thank you for the opportunity to comment.

JACK K. SUMA
SEP 21 1983

JACK K. SUMA
Chairman, Board of Agriculture

cc: Dept. of Public Works, CSC of Honolulu
/ Environmental Impact Study Corp.

"Support Hawaiian Agricultural Products"

Mr. Jack K. Suwa
Chairman, Board of Agriculture
State of Hawaii
Department of Agriculture
1428 So. King Street
Honolulu, Hawaii 96814

Dear Mr. Suwa:

SUBJECT: Leeward District Sanitary Landfill Environmental Impact Statement
We appreciate your valuable comments and offer the following responses.

Comment:

"The Department of Agriculture is extremely concerned about the impact of the proposed landfill on the Paniolo Country Ohikilolo Makua Ranch and related activities."

"In 1982, the cattle industry was the second most important diversified agricultural activity, in the State by value of production (Statistics of Hawaiian Agriculture, 1982, page 11). We estimate the Ohikilolo Ranch to be of mid-size relative to other ranching operations on Oahu and in the State."

"The EIS states on page 4-52 that 'The loss of the ranch activities would mean the loss of the cattle operation (about 500 head), loss of the grass hay production, loss of the goat herd, loss of the kiawe charcoal operation, loss of the donkey herd (sold to the Honolulu Zoo for meat)...'. Taken in its entirety, this is a relatively large agricultural operation."

Response:

Your evaluation of the Ohikilolo Ranch to be a mid-size operation and that when the other activities are considered, this is a relatively large agricultural operation is noted. We have stated throughout

Mr. Jack K. Suwa
Page 2
January 13, 1984

the environmental impact statement that the proposed project at Ohikilolo Valley will have a significant adverse impact to the ranch and its activities.

There is a possibility that there can be joint use of the land during the landfill operation. Also, the land can revert back into agricultural use, including ranching when the landfilling operations have been terminated. This can be explored during the preliminary engineering phase of the project.

Comment:

"We understand from the EIS that "...relocation payments and method of relocation of persons and/or businesses will be handled during the negotiation for the acquisition of the land" (EIS, page 12-51). The EIS should make clear what provisions will be made to relocate the ranch and what compensation will be paid for damages incurred."

Response:

The policy of the City and County of Honolulu is that families and individuals to be displaced by governmental action will have full opportunity to occupy standard housing that is within their financial means and adequate to their needs. Also, businesses to be displaced will be provided maximum assistance to aid in their satisfactory re-establishment with a minimum of delay and loss of earnings. Since negotiations will take place just prior to land acquisition, the precise extent of such assistance and compensation cannot be detailed in the EIS.

Your letter will be incorporated into the Revised Environmental Impact Statement.

Very truly yours,

Michael J. Chun

MICHAEL J. CHUN
Director and Chief Engineer

cc: DLW
S. Shimabukuro
EISC ✓

DEPARTMENT OF PUBLIC WORKS
CITY AND COUNTY OF HONOLULU
630 SOUTH KING STREET
HONOLULU, HAWAII 96813



MICHAEL J. CHUN, Ph.D.
DIRECTOR AND CHIEF ENGINEER
MAURICE M. BATA
DEPUTY DIRECTOR
R 83-750

October 31, 1983

GILLEN R. ANDERSON
DIRECTOR

CHARLES S. CLARE
DIRECTOR OF HEALTH

IN REPLY, PLEASE REFER TO
EPHS-88



STATE OF HAWAII
DEPARTMENT OF HEALTH
P. O. BOX 3478
HONOLULU, HAWAII 96801

September 26, 1983

GEORGE B. ANDERSON
DIRECTOR OF HEALTH

MEMORANDUM

To: Mr. Michael McElroy, Director, Department of Land Utilization
City & County of Honolulu

From: Deputy Director for Environmental Health

Subject: Environmental Impact Statement (EIS) for Leeward District Sanitary Landfill, Kaimanalo Gulch and Ohikiloa, Oahu

13-13

Thank you for allowing us to review and comment on the subject EIS. On the basis that the project will comply with all applicable Administrative Rules, please be informed that we do not have any objections to this project.

We realize that the statements are general in nature due to preliminary plans being the sole source of discussion. We, therefore, reserve the right to impose future environmental restrictions on the project at the time final plans are submitted to this office for review.

cc: DEQC
Dr. Michael Chun
Environmental Impact Study Corp.

Melvin K. Koizumi
MELVIN K. KOIZUMI

Mr. Melvin K. Koizumi
Deputy Director for Environmental Health
State of Hawaii
Department of Health
P. O. Box 3378
Honolulu, Hawaii 96801

Dear Mr. Koizumi:

Subject: Leeward District Sanitary Landfill
Environmental Impact Statement

We appreciate your review of the document. Your letter will be incorporated into the revised environmental impact statement.

Michael J. Chun
MICHAEL J. CHUN
Director and Chief Engineer

cc: EISC
DLU

RECEIVED
SEP 28 1983
EISC

To: Eugene

DEPARTMENT OF PUBLIC WORKS
CITY AND COUNTY OF HONOLULU
850 SOUTH KING STREET
HONOLULU, HAWAII 96813



GILLEN R. ANDERSON
Mayor

MICHAEL J. CHOI, Ph.D.
DIRECTOR AND CHIEF ENGINEER

MAURICE M. WATA
DEPUTY DIRECTOR

ENV 83-344

38
DW. CHOI
Asst. Chief
Engr. Div.
Sept 30, 1983
[Handwritten initials and dates]

September 30, 1983

Mr. Brian Choy
Department of Health
State of Hawaii
P. O. Box 3378
Honolulu, Hawaii 96801

Dear Mr. Choy:

Re: UIC Alignment in the Ewa DP Area

A question was raised concerning the alignment of the UIC Line as it crosses the ridges at Waimanalo and Makaiwa Gulches in the Ewa DP area. All of the maps, including the original worksheet, show the mauka boundary to be located on the 800-foot contour. The report of the Honolulu Technical Advisory Committee on Underground Injection Control states that it is along the 400-foot contour. This is a typographical error and should be revised as follows on page 21 of the report: "Thereafter, the line crosses the ridge into Waimanalo and Makaiwa Gulches along the 800-foot contour and returns back to Farrington Highway opposite Awaawaha Place on the ridge line."

If you have any questions, please call me at 523-4150.

Very truly yours,

Brian Choy
BRIAN CHOY
Environmental Engineer

7
bcc: Roy Takara

RECEIVED
OCT 4 1983
EISC

DEPARTMENT OF HEALTH
STATE OF HAWAII
P. O. BOX 3378
HONOLULU, HAWAII 96813
OCT 17 10 52 AM '83
CHARLES S. CLINE
DIRECTOR OF HEALTH
[Handwritten initials]

October 14, 1983

Mr. Chew Lun Lau
Department of Public Works
City & County of Honolulu
650 S. King Street
Honolulu, Hawaii 96813

Dear Mr. Lau:

Thank you for clarifying the question regarding which elevation contour is the correct one in the vicinity of Waimanalo Gulch. It is acknowledged that the TAC report should be corrected to coincide with the graphic depiction of the 800-foot contour as the one which the UIC Line follows.

Sincerely yours,

Mattie E. Heber
MATTIE E. HEBER
for Brian J. Choy
Environmental Planner

RECEIVED
OCT 20 1983
EISC

RL
OCT 20 1983
EISC

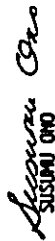
Hon. M. M. McElroy, DLU
EIS Ieeward sanitary fill
Page Two
SEP 2 8 1983

SEP 2 8 1983

If at all possible, the Ohikilolo study area should be deleted from the list of possible landfill sites because of its archaeological significance.

If the Ohikilolo study area is chosen as a landfill site, it is recommended that an intensive archaeological survey be conducted in the project area. The survey should include detailed mapping of the area and all the sites in it, test excavations, and historical research. Using the results of the survey to guide fieldwork plans, sufficient scientific excavations should be conducted on the proposed Ohikilolo landfill area to mitigate the removal of these sites from the archaeological record. It should be noted that the sites in the Ohikilolo study area have public use potential in addition to their research value. Preservation and park development should be considered in future planning efforts.

Sincerely,


SUSAN O'NEIL

Chairperson
Board of Land and Natural Resources
and
State Historic Preservation Officer

cc: Dept. of Public Works,
CAC Honolulu
✓ EIS Corp.

Honorable Michael M. McElroy
Director
Department of Land Utilization
City and County of Honolulu
650 So. King Street
Honolulu, Hawaii 96813

Dear Mr. McElroy:

We have reviewed the environmental impact statement (EIS) regarding the Ieeward sanitary fill and have a number of concerns to express.

Wildlife

The EIS briefly addresses the wildlife in the immediate areas. Although these sites are not endangered wildlife sensitive areas, exotic birds and the endemic Hawaiian Owl (Pueo) use areas such as these as feeding and nesting grounds. Probable impacts on these species should be taken into account.

The EIS lists the Indian grey francolin (*Francolinus pondicerianus*) as probably occurring at both sites. However, the occurrence of the Erckel's francolin (*Francolinus erckelii*) would be more likely, since it is known that the Erckel's francolin is found along the Waianae range.

Fire

The Ieeward area of Oahu is a high fire hazard area. The EIS addresses adequately the fire breaks to keep fires from entering and exiting the landfill.

Historic Sites

We concur with recommendations made pertaining to archaeological sites.

No further archaeological study is warranted in the Waipanae gulch study area. Management of the area should include the requirement that our historic sites office be notified at 548-7460 whenever previously unidentified sites, artifacts, and human bones are discovered in the project area.

DEPARTMENT OF PUBLIC WORKS
CITY AND COUNTY OF HONOLULU
650 SOUTH KING STREET
HONOLULU, HAWAII 96813



GILEEN M. ANDERSON
MAYOR

MICHAEL J. CHUN, JR. D.
PROCTOR AND CHIEF ENGINEER
MAURICE H. RAYA
DEPUTY ENGINEER

January 13, 1984

R 84-28

Mr. Susumu Ono
Chairperson
Board of Land and Natural Resources
and State Historic Preservation Officer
P. O. Box 621
Honolulu, Hawaii 96809

Dear Mr. Ono:

SUBJECT: Leeward District Sanitary Landfill Environmental Impact Statement

We appreciate your review of the document and offer the following responses to your comments.

Comment:

"Wildlife"

"The EIS briefly addresses the wildlife in the immediate areas. Although these sites are not endangered wildlife sensitive areas, exotic birds and the endemic Hawaiian owl (Pueo) use areas such as these as feeding and nesting grounds. Probable impacts on these species should be taken into account."

"The EIS lists the Indian grey francolin (*Francolinus pondicerianus*) as probably occurring at both sites. However, the occurrence of the Erckel's francolin (*Francolinus erckelii*) would be more likely, since it is known that the Erckel's francolin is found along the Waianae range."

Response:

We agree that exotic birds and the endemic Hawaiian owl (Pueo) use the sites for feeding and nesting. The EIS will be corrected to reflect your concerns.

Mr. Susumu Ono
Page 2
January 13, 1984

Comment:

"Fire"

"The leeward area of Oahu is a high fire hazard area. The EIS addresses adequately the fire breaks to keep fires from entering the landfill."

Response:

Your evaluation that the fire breaks described in the EIS is adequate is appreciated. We will continue to work with your agency during the preliminary engineering phase of the project. The fire breaks will be designed to contain all fires within the project site and prevent the fires from leaving the landfill.

Comment:

"Historic Sites"

"We concur with recommendations made pertaining to archaeological sites."

"No further archeological study is warranted in the Waianae gulch study area. Management of the area should include the requirement that our historic sites office be notified at 548-7460 whenever previously unidentified sites, artifacts, and human bones are discovered in the project area."

Response:

Your confirmation that no additional archaeological work is required for the Waianae Gulch site is noted. We will notify your department if previously unidentified sites, artifacts, and human bones are discovered.

Comment:

"If at all possible, the Ohikilolo study area should be deleted from the list of possible landfill sites because of its archaeological significance."

Response:

The problem of solid waste disposal on Oahu, combined with the need for additional landfills and the lack of viable landfill sites, dictate that Ohikilolo remain as a potential site until alternative sites can be found or it is determined through the EIS process that Ohikilolo is not a viable site.

Mr. Susumu Ono
Page 3
January 13, 1984

Comment:

"If the Ohikilolo study area is chosen as a landfill site, it is recommended that an intensive archaeological survey be conducted in the project area. The survey should include detailed mapping of the area and all the sites in it, test excavations, and historical research. Using the results of the survey to guide fieldwork plans, sufficient scientific excavations should be conducted on the proposed Ohikilolo landfill area to mitigate the removal of these sites from the archaeological record. It should be noted that the sites in the Ohikilolo study area have public use potential in addition to their research value. Preservation and park development should be considered in future planning efforts."

Response:

We will follow your recommendations for the Ohikilolo site and will work closely with your department.

Very truly yours,



MICHAEL J. CHAN
Director and Chief Engineer

cc: DLU
S. Shimabukuro
EISC ✓

GEORGE A. JAYNES
GOVERNOR

1983 OCT -7 PM 1:59
DEPT. OF LAND UTILIZATION
CITY & COUNTY OF HONOLULU

201-1-83-5139

RYOKICHI HIGASHIYAMA, Ph.D.
DIRECTOR

DEPUTY DIRECTORS
WAYNE J. YAMAGUCHI
JONATHAN K. SHIMADA, Ph.D.
CHERYL D. SOON

WALTER WEAVER, TO
STP 8.9411



STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
869 PUNCHBOWL STREET
HONOLULU, HAWAII 96813

October 4, 1983

Mr. Michael McElroy, Director
Department of Land Utilization
City and County of Honolulu
650 South King Street
Honolulu, Hawaii 96813

Dear Mr. McElroy:

Environmental Impact Statement
Leeward District Sanitary Landfill
Waimanalo Gulch and Ohikilolo, Oahu

Thank you for the opportunity to comment on the subject document.

Our concerns are adequately addressed in the statement and thus we have no further comments to add which would improve the document.

Very truly yours,

Ryokichi Higashiyama
Ryokichi Higashiyama
Director of Transportation

ftl.
OCT 14 1983
Et.

DEPARTMENT OF PUBLIC WORKS
CITY AND COUNTY OF HONOLULU
850 SOUTH KING STREET
HONOLULU, HAWAII 96813



SILVEEN N. ANDERSON
MANAGER

MICHAEL J. CHUM, Ph.D.
DIRECTOR AND CHIEF ENGINEER
MANAGEMENT IN PRACTICE
OFFICE DIRECTOR

R 83-750

October 31, 1983

Dr. Ryokichi Higashiyama
Director of Transportation
State of Hawaii
Department of Transportation
869 Punchbowl Street
Honolulu, Hawaii 96813

Dear Dr. Higashiyama:

Subject: Leeward District Sanitary Landfill
Environmental Impact Statement

We appreciate your review of the document. Your letter will be incorporated into the revised environmental impact statement.

Michael J. Chum

MICHAEL J. CHUM
Director and Chief Engineer

cc: EISC
DLU

DEPARTMENT OF PUBLIC WORKS
CITY AND COUNTY OF HONOLULU
650 SOUTH KING STREET
HONOLULU, HAWAII 96813



MICHAEL J. CHUN, Ph.D.
DIRECTOR AND CHIEF ENGINEER
MAURICE H. KAYA
DEPUTY DIRECTOR
R 83-750

EILEEN M. ANDERSON
UNIT 5

October 31, 1983

ALLEN T. LANE
MAJOR, HAWAII
CONTR & ENGR OFFICER
DANIEL K. C. LIU
CONTR & ENGR OFFICER
DEPT. OF PUBLIC WORKS

12 SEP 1983



STATE OF HAWAII
DEPARTMENT OF DEFENSE
OFFICE OF THE ADJUTANT GENERAL
2845 BUNNING ROAD, HONOLULU, HAWAII 96819

GEORGE S. JARROLD
UNIT 5

HIENG

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Mr. Michael McElroy, Director
Dept of Land Utilization
City and County of Honolulu
650 South King Street, 7th Floor
Honolulu, Hawaii 96813

Dear Mr. McElroy:

Thank you for providing us the opportunity to review the proposed project,
"Leeward District Sanitary Landfill" Environmental Impact Statement.

We have completed our review and have no comments to offer at this time.

Yours truly,

Jerry M. Matsuda
JERRY M. MATSUDA
Major, HAWAII
Contr & Engr Officer

cc: Depy of Public Works/CAC Hon
ATTN: Dr. Michael Chun
Environmental Impact Study Corp.
Environmental Quality Commission w/EIS

Major Jerry M. Matsuda
HAWAII, Control and Engineer Officer
State of Hawaii
Department of Defense
3949 Diamond Head Road
Honolulu, Hawaii 96816

Dear Major Matsuda:

Subject: Leeward District Sanitary Landfill
Environmental Impact Statement

We appreciate your review of the document. Your letter will be incorporated into the revised environmental impact statement.

cc: EISC
DLU

Michael J. Chun
MICHAEL J. CHUN
Director and Chief Engineer

CRONCE A. JARVIS
DIRECTOR



STATE OF HAWAII
ENVIRONMENTAL QUALITY COMMISSION
200 WALKAPUNA ST.
ROOM 200
HONOLULU, HAWAII 96813

September 2, 1983

POSTAL TELEPHONE

TELEPHONE NO.
985-1440

DEPARTMENT OF PUBLIC WORKS
CITY AND COUNTY OF HONOLULU
650 SOUTH KING STREET
HONOLULU, HAWAII 96813



SILVER A. ANDERSON
MAYOR

MICHAEL J. CHUN, Ph.D.
DIRECTOR AND CHIEF ENGINEER

MAURICE W. HATA
DEPUTY DIRECTOR

R 83-750

October 31, 1983

Dear Reviewer:

Attached for your review is an Environmental Impact Statement (EIS) that was prepared pursuant to Chapter 313, Hawaii Revised Statutes and the Rules and Regulations of the Environmental Quality Commission:

Title: Leeward District-Sanitary Landfill

Location: Waimanalo Gulch and Ohikilolo, Oahu

Classification: Agency Action

Your comments or acknowledgement of no comments on the EIS are welcomed. Please submit your reply to the accepting authority or approving agency:

Mr. Michael McElroy, Director

Department of Land Utilization, C&C of Hnl.

650 South King Street, 7th Floor

Honolulu, Hawaii 96813

Please send a copy of your reply to the proposing party:

Dr. Michael Chun, Director AND Environment Impact Study Corp.

Department of Public Works, C&C of Hnl. 2850 Pae Street, Suite 202

650 South King Street, 11th Floor Honolulu, Hawaii 96819

Honolulu, Hawaii 96813

Your comments must be received or postmarked by: October 8, 1983.

If you have no further use for this EIS, please return it to the Commission.

Thank you for your participation in the EIS process.

We have no comments at this time. Thank you for the opportunity to review

REC... this report.

No comments.

OCT 3 1983

EISC

Takeshi Yoshihara
Energy Program Administrator
Division of Energy

Mr. Takeshi Yoshihara
Energy Program Administrator
Division of Energy
State of Hawaii
335 Merchant Street, Room 110
Honolulu, Hawaii 96813

Dear Mr. Yoshihara:

Subject: Leeward District Sanitary Landfill
Environmental Impact Statement

We appreciate your review of the document. Your letter will be incorporated into the revised environmental impact statement.

Michael J. Chun
MICHAEL J. CHUN
Director and Chief Engineer

cc: EISC
DLU

DEPARTMENT OF PUBLIC WORKS
CITY AND COUNTY OF HONOLULU
430 SOUTH KING STREET
HONOLULU, HAWAII 96813



MICHAEL J. CHUN, Ph.D.
DIRECTOR AND CHIEF ENGINEER
MAURICE M. WATA
DEPUTY DIRECTOR
R 83-750

EILEEN M. ANDERSON
SECRETARY

October 31, 1983

Mr. Hideo Murakami
State Comptroller
Department of Accounting and
General Services
P. O. Box 119
Honolulu, Hawaii 96810

Dear Mr. Murakami:

Subject: Leeward District Sanitary Landfill
Environmental Impact Statement

We appreciate your review of the document. Your letter will be incorporated into the revised environmental impact statement.

Michael J. Chun
MICHAEL J. CHUN
Director and Chief Engineer

cc: EISC
DIJ

83-05141

ENV (w)

Refuse (P) 3744.3

SEP 15 1983

Mr. Michael McElroy
Director
Department of Land Utilization
City and County of Honolulu
Honolulu, Hawaii

Dear Mr. McElroy:

Subject: Leeward District Sanitary Landfill
Environmental Impact Statement

We have reviewed the subject environmental impact statement and have no comments to offer.

Thank you for the opportunity to review the environmental impact statement.

Very truly yours,

HIDEO MURAKAMI
State Comptroller

RM:j
cc: /Dr. Michael Chun
Environment Impact Study Corp.

RECEIVED
SEP 26 1983
EJC



University of Hawaii at Manoa

Environmental Center
Crawford 317 • 2550 Campus Road
Honolulu, Hawaii 96822
Telephone (808) 949-7561

RECEIVED
OCT 14 1983
EISC

October 7, 1983
RE:0387

Mr. Michael McElroy, Director
Department of Land Utilization
City and County of Honolulu
850 South King Street
Honolulu, Hawaii 96813

Dear Mr. McElroy:

Draft Environmental Impact Statement
Leeward District Sanitary Landfill
Waimanalo Gulch Site and Ohikilolo Site
Waianae, Oahu

Thank you for the opportunity to review the above cited document. The Environmental Center review has been prepared with the assistance of Paul Ekern, Agronomy and Soils; Matthew Spriggs, Anthropology; and Jacquelin Miller and Pamela Rahusen, Environmental Center.

Our reviewers have identified two major areas within the DEIS which should be expanded and/or corrected to describe more adequately the impacts that will occur with the proposed Leeward Sanitary Landfill.

General Comments

The draft EIS addresses the need and objectives of the Department of Public Works to construct a (emphasis added) new landfill in Leeward Oahu to service the rapidly expanding Leeward area and a portion of the Iiionolu District. We note the use of the singular tense here as well as in the title of the document "Leeward District Sanitary Landfill." The DEIS does not address a single sanitary landfill. This project proposes two landfill sites, both of which will impact the Leeward communities.

Archaeology

We are pleased to note that historical documentation has been included in Appendix C of this DEIS of the archaeological and cultural significance of the sites. Unfortunately, however, no synthesis of the documents is presented or any interpretation offered in the form of a concluding discussion or summary of the history of the immediate area. We suggest that, in future EIS's, both the historical documentation and synthesis of that information will be included.

Mr. Michael McElroy

-2-

October 7, 1983

Ohikilolo Site

It is evident from the archaeological survey and historical documentation that Makaha Valley has great archaeological and cultural significance which will be significantly impacted (destroyed) if this site is used for the proposed landfill. It is stated on page 2-42 that, "A preliminary surface archaeological reconnaissance revealed the presence of a significant number of archaeological site complexes (emphasis added)." We note, further, that there is no specific discussion on what will happen to these known archaeological sites located within the proposed Ohikilolo Landfill site. Page 4-50 of the DEIS states that, "Considerable amount of work will have to be undertaken before any construction activities could occur on the project site." This last statement needs to be expanded in the revised EIS. Would the archaeological sites be destroyed or left as isolates in the middle of the landfill? Would the known archaeological sites be preserved? Would a major salvage program occur before the proposed Ohikilolo Landfill is constructed? The various mitigating options should be fully explored and addressed in the revised EIS. We further suggest that a professionally drafted map indicating the relationships between the known archaeological sites and the proposed Ohikilolo Landfill be included in the revised EIS. The rough field sketch map on page C-33 is difficult to interpret and should be redrawn and re-labelled for clarity.

The archaeological importance of the proposed Ohikilolo site is so great that we question the appropriateness of its use for a landfill.

Water Quality

There appears to be no discussion of the eventual method for disposal of the waters; for maintenance of the diversions and flumes for conveyance to the lower levels; nor the action of the silt basins (sediment traps) subsequent to the completion of the fill. We suggest that these points be fully discussed in the revised EIS.

Leachate

We note on pages 4-8 and 4-18 that leachate is not expected to be produced because the major portion of the rainfall water is expected to runoff. If this is the case, we suggest that the possible impacts of the water runoff from the sites and into the surrounding environments should be addressed. Our reviewers do not share the conclusion that leachate is unlikely to occur. With no evapotranspiration (no vegetative cover), infiltration will add to the water content of the wastes and even the high initial moisture-holding capacity of the waste is likely to be exceeded even with a relatively impermeable cover.

Drainage

We suggest clarification of the figures provided on pages 2-2 and 2-27, namely, "the drainage area is 680+ acres; the Q is 3,000 CFS" (Waimanalo Gulch); the drainage area is 638+ acres, the Q is 2,800+ CFS (Ohikilolo). Does 'Q' refer to the mean discharge, maximum discharge or some other unit?



University of Hawaii at Manoa

Environmental Center
Crawford 317 - 2550 Campus Road
Honolulu, Hawaii 96822
Telephone (808) 946-7281

October 20, 1983

Mr. Michael McElroy, Director
Department of Land Utilization
City and County of Honolulu
650 South King Street
Honolulu, Hawaii 96813

Dea Mr. McElroy:

Draft Environmental Impact Statement
Leeward District Sanitary Landfill
Waimanalo Gulch and Ohikiloio Sites
Waianae, Oahu

It has come to our attention that there is an error on page 2 of the Environmental
Center's review dated October 7, 1983 regarding the above noted DEIS. The first sentence
should read as follows:

It is evident from the archaeological survey and historical
documentation that Ohikiloio Valley has great archaeological and
cultural significance which will be significantly impacted
(destroyed) if this site is used for the proposed landfill.

Enclose is the corrected page 2 for insertion. We apologize for any inconvenience
that this may have caused to you and your staff.

Yours truly,

Doak C. Cox
Director

Enclosure

cc: OEQC
Department of Public Works
Environment Impact Study Corp.
Paul Ekern
Matthew Spriggs
Jacquelin Miller
Pamela Bahusen

REC...
OCT 25 1983
ECC

AN EQUAL OPPORTUNITY EMPLOYER

October 7, 1983

-3-

Mr. Michael McElroy

On pages 4-21 and 4-49 we note that, "the final use of the landfill has not been
determined." We suggest that this section be expanded to include possible limitations
of its future use in accord with the methods of formation of the fill and the disposal of
the flood flows diverted from the former gulches.

Comments submitted by the Corps of Engineers at the preparation stage (page 12-3)
indicate that parts of the project areas lie in possible flood-hazard areas and as such
they conclude that "The proposed landfill site should be located outside any identified
flood plain areas...." We would add "unless the landfill is adequately protected against
flood erosion and so designed as not to increase flood heights elsewhere."

Resource Recovery Facility

The statement is made (page 9-1) that, "Environmental considerations make ocean
disposal undesirable, moreover, it is presently prohibited by EPA regulations." Time
did not permit us to address this point in detail. However, we are familiar with some
types of waste disposal in the ocean that are environmentally acceptable and may even
enhance certain desirable environmental qualities. Most notable is the enrichment of
nutrient deficient tropical waters by properly treated sewage disposal, or the discharge
of non-toxic dredged materials into deep waters. Given the potential environmental
impacts and social-cultural concerns for the continued development of sanitary landfill
sites, particularly when the only options seem so destructive to the archaeological resources,
perhaps ocean disposal of the residue from incinerated wastes and the residue of the
resource recovery facility should at least be examined. We hasten to add, and emphasize,
we are not "recommending" ocean disposal, but only that the actual environmental impacts
of this option should be examined before it is totally dismissed.

We also suggest that the relationship between the Resource Recovery Facility,
to be located at Campbell Industrial Park, and the Leeward Sanitary Landfill be addressed.

We appreciate the opportunity to comment on this DEIS and hope you will find our
comments useful in the preparation of the revised document.

Sincerely,

Doak C. Cox
Director

cc: OEQC
Department of Public Works
Environment Impact Study Corp.
Paul Ekern
Matthew Spriggs
Jacquelin Miller
Pamela Bahusen

(corrected)

Mr. Michael McElroy

-2-

October 7, 1983

Ohikilolo Site

It is evident from the archaeological survey and historical documentation that Ohikilolo Valley has great archaeological and cultural significance which will be significantly impacted (destroyed) if this site is used for the proposed landfill. It is stated on page 2-42 that, "A preliminary surface archaeological reconnaissance revealed the presence of a significant number of archaeological site complexes (emphasis added)." We note, further, that there is no specific discussion on what will happen to these known archaeological sites located within the proposed Ohikilolo Landfill site. Page 4-50 of the DEIS states that, "Considerable amount of work will have to be undertaken before any construction activities could occur on the project site." This last statement needs to be expanded in the revised EIS. Would the archaeological sites be destroyed or left as isolated in the middle of the landfill? Would the known archaeological sites be preserved? Would a major salvage program occur before the proposed Ohikilolo Landfill is constructed? The various mitigating options should be fully explored and addressed in the revised EIS. We further suggest that a professionally drafted map indicating the relationships between the known archaeological sites and the proposed Ohikilolo Landfill be included in the revised EIS. The rough field sketch map on page C-33 is difficult to interpret and should be redrawn and re-labelled for clarity.

13-24

The archaeological importance of the proposed Ohikilolo site is so great that we question the appropriateness of its use for a landfill.

Water Quality

There appears to be no discussion of the eventual method for disposal of the waters; for maintenance of the diversions and flumes for conveyance to the lower levels; nor the action of the siltling basins (sediment traps) subsequent to the completion of the fill. We suggest that these points be fully discussed in the revised EIS.

Leachate

We note on pages 4-8 and 4-38 that leachate is not expected to be produced because the major portion of the rainfall water is expected to runoff. If this is the case, we suggest that the possible impacts of the water runoff from the sites and into the surrounding environments should be addressed. Our reviewers do not share the conclusion that leachate is unlikely to occur. With no evapotranspiration (no vegetative cover), infiltration will add to the water content of the wastes and even the high initial moisture-holding capacity of the waste is likely to be exceeded even with a relatively impermeable cover.

Drainage

We suggest clarification of the figures provided on pages 2-2 and 2-27, namely, "the drainage area is 680+ acres; the Q is 3,000 CFS" (Waimanalo Gulch); the drainage area is 638+ acres, the Q is 2,800+ CFS (Ohikilolo). Does 'Q' refer to the mean discharge, maximum discharge or some other unit?

DEPARTMENT OF PUBLIC WORKS
CITY AND COUNTY OF HONOLULU
450 SOUTH KING STREET
HONOLULU, HAWAII 96813



EILEEN R. ANDERSON
MAYOR

MICHAEL J. COX, Ph.D.
DIRECTOR AND CHIEF ENGINEER
MAURICE M. HATA
DEPUTY DIRECTOR

R 84-67

January 30, 1984

Dr. Doak C. Cox, Director
Environmental Center
University of Hawaii
Crawford 317
2550 Campus Road
Honolulu, Hawaii 96822

Dear Dr. Cox:

SUBJECT: Leeward District Sanitary Landfill Environmental Impact Statement

We appreciate your valuable comments and offer the following responses to your comments.

Comment:

"General Comments"

"The draft EIS addresses the need and objectives of the Department of Public Works 'to construct a (emphasis added) new landfill in Leeward Oahu to service the rapidly expanding Leeward area and a portion of the Honolulu District.' We note the use of the singular tense here as well as in the title of the document 'Leeward District Sanitary Landfill.' The DEIS does not address a single sanitary landfill. This project proposes two landfill sites, both of which will impact the Leeward communities."

Response:

It is true that two separate sites are being sought by the City for the Leeward District Sanitary Landfill. However, only one site at a time will be developed and operated as a landfill. The first site to be used will be the Waimanalo Gulch site followed by the Ohikilolo site once Waimanalo Gulch has been filled and closed. We agree that both sites will have an impact on the leeward community and have addressed the impacts of both in the impact statement.

Mr. Doak C. Cox
Page 3
January 30, 1984

Response:

You may be correct in your assumption that "...the proposed site is so great that we question the appropriateness of its use for a landfill." However, until studies and evaluations are concluded, we cannot support your statement.

Comment:

"Water Quality"
"There appears to be no discussion of the eventual method for disposal of the waters; for maintenance of the diversions and flumes for conveyance to the lower levels; nor the action of the silting basins (sediment traps) subsequent to the completion of the fill. We suggest that these points be fully discussed in the revised EIS."

Response:

The specific details on the size of the siltation basins, perimeter intercept drains and internal drains will be determined during the preliminary engineering phase of the design. Sufficient reviews by applicable governmental agencies will insure that all regulations are met and that there will not be a significant adverse impact to the adjacent areas.

Comment:

"Leachate"
"We note on pages 4-8 and 4-38 that leachate is not expected to be produced because the major portion of the rainfall water is expected to runoff. If this is the case, we suggest that the possible impacts of the water runoff from the sites and into the surrounding environments should be addressed. Our reviewers do not share the conclusion that leachate is unlikely to occur. With no evapotranspiration (no vegetative cover), infiltration will add to the water content of the waste and even the high initial moisture-holding capacity of the waste is likely to be exceeded even with a relatively impermeable cover."

Response:

The specific details on the size of the siltation basins, etc. will be determined during the preliminary engineering phase of the project after the completion of the EIS. The naturally occurring storm water flows will only be diverted around the landfill and the landfill itself will not contribute a significant amount of additional runoff to what is naturally occurring.

Some evapotranspiration will be provided by the vegetation which will be planted on the landfill as each section is completed.

Mr. Doak C. Cox
Page 2
January 30, 1984

Comment:

"Archaeology"
"We are pleased to note that historical documentation has been included in Appendix C of this DEIS of the archaeological and cultural significance of the sites. Unfortunately, however, no synthesis of the documents is presented or any interpretation offered in the form of a concluding discussion or summary of the history of the immediate area. We suggest that, in future EIS's, both the historical documentation and synthesis of that information will be included."

"It is evident from the archaeological survey and historical documentation that Ohikilolo Valley has great archaeological and cultural significance which will be significantly impacted (destroyed) if this site is used for the proposed landfill. It is stated on page 2-42 that, 'A preliminary surface archaeological reconnaissance revealed the presence of a significant number of archaeological site complexes (emphasis added)'. We note, further, that there is no specific discussion on what will happen to these known archaeological sites located within the proposed Ohikilolo Landfill site. Page 4-50 of the DEIS states that, 'Considerable amount of work will have to be undertaken before any construction activities could occur on the project site. This last statement needs to be expanded or left as isolates in the middle of the archaeological sites be destroyed or left as isolates in the middle of the landfill? Would the known archaeological sites be preserved? Would a major salvage program occur before the proposed Ohikilolo Landfill is constructed? The various mitigating options should be fully explored and addressed in the revised EIS. We further suggest that a professionally drafted map indicating the relationships between the known archaeological sites and the proposed Ohikilolo Landfill be included in the revised EIS. The rough field sketch map on page C-33 is difficult to interpret and should be redrawn and re-labelled for clarity."

Response:

We have consulted the State Historic Preservation Officer on the Ohikilolo site and will follow his recommendations on required future archaeological work. We will conduct an intensive archaeological survey, including detailed mapping of the area and all of the sites in it, test excavations and historical research. The survey will then be used as a guide for additional field work plans and excavations. All of this must be accomplished before mitigative plans can be formulated.

Comment:

"The archaeological importance of the proposed Ohikilolo site is so great that we question the appropriateness of its use for a landfill."

Mr. Doak C. Cox
Page 4
January 30, 1984

There is no indication from actual observations of existing landfill operations on Oahu that leachate will be produced at the proposed landfill sites.

Comment:

"Drainage"

"We suggest clarification of the figures provided on pages 2-2 and 2-27, namely the drainage area is 680+ acres; the Q is 3,000 CFS (Maimalo Gulch); the drainage area is 638+ acres, the Q is 2,800+ CFS (Ohikilolo). Does 'Q' refer to the mean discharge, maximum discharge or some other unit?"

Response:

The "Q" for the sites has been determined by using accepted standards used by all engineering firms on Oahu and conforms to the requirements established by City. The unit is cubic feet per second (cfs) and is the maximum discharge for the given design conditions.

Comment:

"On pages 4-21 and 4-49 we note that, 'the final use of the landfill has not been determined.' We suggest that this section be expanded to include possible limitations of its future use in accord with the methods of formation of the fill and the disposal of the flood flows diverted from the former gulches."

Response:

This section cannot be expanded until the preliminary and final engineering plans have been developed. This phase of the work will commence after the completion of the EIS.

Comment:

"Comments submitted by the Corps of Engineers at the preparation stage (page 12-3) indicate that parts of the project areas lie in possible flood-hazard areas and as such they conclude that 'The proposed landfill site should be located outside any identified flood plain areas....' We would add 'unless the landfill is adequately protected against flood erosion and so designed as not to increase flood heights elsewhere.'"

Response:

The preliminary and final engineering plans will be developed to conform to all applicable regulations and standards for flood erosion.

Mr. Doak C. Cox
Page 5
January 30, 1984

Comment:

"Resource Recovery Facility"

"The statement is made (page 9-1) that, 'Environmental considerations make ocean disposal undesirable, moreover, it is presently prohibited by EPA regulations.' Time did not permit us to address this point in detail. However, we are familiar with some types of waste disposal in the ocean that are environmentally acceptable and may even enhance certain desirable environmental qualities. Most notable is the enrichment of nutrient deficient tropical waters by properly treated sewage disposal, or the discharge of non-toxic dredged materials into deep waters. Given the potential environmental impacts and social-cultural concerns for the continued development of sanitary landfill sites, particularly when the only options seem so destructive to the archaeological resources, perhaps ocean disposal of the residue from incinerated wastes and the residue of the resource recovery facility should at least be examined. We hasten to add, and emphasize, we are not 'recommending' ocean disposal, but only that the actual environmental impacts of this option should be examined before it is totally dismissed."

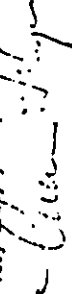
"We also suggest that the relationship between the Resource Recovery Facility to be located at Campbell Industrial Park, and the Leeward Sanitary Landfill be addressed."

Response:

We are in complete agreement that ocean dumping of residue from incinerators and resource recovery facilities is not feasible, however, a study of the potential environmental impacts must first be conducted. There is however, the problem of time. A landfill is needed immediately, and we do not have the luxury of waiting a few years until a study and the necessary permits have been obtained.

The Leeward Sanitary Landfill will accept ash and residue from the Resource Recovery Facility and the Waipahu Incinerator, and non-combustible material, and "overflow" raw refuse. It will also receive "diverted" refuse from the Resource Recovery facility and the Waipahu Incinerator during emergency and/or maintenance shutdowns.

Very truly yours,



MICHAEL J. CHUN
Director and Chief Engineer

cc: DLJ
S. Shimabukuro
EISC



University of Hawaii at Manoa

Water Resources Research Center
Holmes Hall 283 - 2540 Dole Street
Honolulu, Hawaii 96822

31 October 1983

NOV 10 1983

Dr. Michael Chun, Director
Department of Public Works
City & County of Honolulu
650 South King Street
Honolulu, Hawaii 96813

Dear Dr. Chun:

SUBJECT: Environmental Impact Statement for Leeward Sanitary Landfill
at Waimanalo Gulch Site and Ohikilo Site, Oahu, August 1983

We have reviewed the subject EIS and offer the following comments:

1. P. 2-32, D. Climate. "Tropical" storm occurrences are very rare, especially in winter. Perhaps the reference is to "subtropical" storms usually called "kona storms" locally.
2. P. 2-10. The source for the wind map is not given. Source: Noguchi, Y. (1977).
3. P. 4-8, 4-38. If as stated, the major portion of the rainfall is expected to be runoff such that leachate is not a problem, then the conveyance and disposal of the runoff must be addressed. This has not been adequately covered.
The EIS should cover the design, construction and maintenance of runoff conveyances to the lower levels, stilling basins (sediment traps) during and subsequent to completion of the fill.
4. P. 4-21. Statements on ultimate use of the area might well be enlarged to suggest some limitations on the use in accord with the methods of filling and the disposal of flood flows diverted from the former gulch.

Thank you for the opportunity to comment. This material was reviewed by WRRRC and affiliate personnel.

Sincerely,
Edwin T. Murebayashi
Edwin T. Murebayashi
EIS Coordinator

ETH:jm
cc: Env. Impact Study Corp.
Michael McElroy, DLU, C&C of Honolulu

AN EQUAL OPPORTUNITY EMPLOYER

DEPARTMENT OF PUBLIC WORKS
CITY AND COUNTY OF HONOLULU
650 SOUTH KING STREET
HONOLULU, HAWAII 96813



EILEEN M. ANDERSON
DIRECTOR

March 15, 1984

R 84-153

Mr. Edwin T. Murebayashi
EIS Coordinator
University of Hawaii at Manoa
Water Resources Research Center
Holmes Hall 283
2540 Dole Street
Honolulu, Hawaii 96822

Dear Mr. Murebayashi:

SUBJECT: Leeward District Sanitary Landfill Environmental Impact Statement

We appreciate your valuable comments and offer the following responses.

Comment:

"1. P. 2-32, D. Climate. 'Tropical' storm occurrences are very rare, especially in winter. Perhaps the reference is to 'subtropical' storms usually called 'kona storms' locally."

Response:

The correction will be made.

Comment:

"2. P. 2-10. The source for the wind map is not given. Source: Noguchi, Y. (1977)."

Response:

The source will be cited.

Comment:

"3. P. 4-8, 4-38. If as stated, the major portion of the rainfall is expected to be runoff such that leachate is not a problem, then the conveyance and disposal of the runoff must be addressed. This has not been adequately covered."

Mr. Murabayashi
Page 2
March 15, 1984

The EIS should cover the design, construction and maintenance of runoff conveyances to the lower levels, stilling basins (sediment traps) during and subsequent to completion of the fill."

Response:

The design, construction and maintenance of runoff conveyances to the lower level, sediment traps, etc. will be developed during the engineering phase of the project, after the completion of the Environmental Impact Statement. The storm drainages system will be sized and designed in accordance with City standards.

Comment:

"4. P. 4-21. Statements on ultimate use of the area might well be enlarged to suggest some limitations on the use in accord with the methods of filling and the disposal of flood flows diverted from the former gulch."

Response:

We agree that the ultimate use of the land after landfilling activities have been terminated may be limited by the methods of filling and the design of the storm drainage system.

Your letter will be incorporated in the Revised Environmental Impact Statement.

Very truly yours,



MICHAEL J. CHUN
Director and Chief Engineer

cc: DLU
Shimabukuro
EISC

DEPARTMENT OF PUBLIC WORKS
CITY AND COUNTY OF HONOLULU
630 SOUTH KING STREET
HONOLULU, HAWAII 96813



MICHAEL J. CHUN, P.E.
REGISTERED PROFESSIONAL ENGINEER
LAURENCE H. HATA
REGISTERED PROFESSIONAL ENGINEER
R 83-750

EILEEN H. ANDERSON
SECRETARY

October 31, 1983

83-05017
ENV (7)
Rymer

RS 63-722

September 21, 1983

TO: MR. MICHAEL McGRATH, DIRECTOR
DEPARTMENT OF LAND UTILIZATION

FROM: ROY H. TANJI
DIRECTOR AND BUILDING SUPERINTENDENT

SUBJECT: EIS FOR LEeward DISTRICT SANITARY LANDFILL
WAIHELEVA GULCH AND OHIKILOLO, OAHU

MEMORANDUM

TO: MR. ROY H. TANJI, DIRECTOR AND BUILDING SUPERINTENDENT
BUILDING DEPARTMENT

FROM: MICHAEL J. CHUN, DIRECTOR AND CHIEF ENGINEER
DEPARTMENT OF PUBLIC WORKS

SUBJECT: LEeward DISTRICT SANITARY LANDFILL
ENVIRONMENTAL IMPACT STATEMENT

We have reviewed the EIS for the Leeward District Sanitary Landfill and have no comments.

Thank you for the opportunity to review the EIS.

We appreciate your review of the document. Your letter will be incorporated into the revised environmental impact statement.

ROY H. TANJI
Director and Building Superintendent

Michael J. Chun
MICHAEL J. CHUN
Director and Chief Engineer

TH:lo
cc: Dept. of Pub. Works
Environment Impact Study Corp.
J. Harada

cc: EISC
DLU

SEP 29 1983
EISC

SEP 29 1983
EISC

DEPARTMENT OF GENERAL PLANNING
CITY AND COUNTY OF HONOLULU
630 SOUTH KING STREET
HONOLULU, HAWAII 96813



EILEEN W. ANDERSON
Director

WILLARD T. CHOW
Chief Planning Officer
RALPH KAWAMOTO
Senior Chief Planning Officer

October 6, 1983

DGP9/83-8418

DEPARTMENT OF PUBLIC WORKS
CITY AND COUNTY OF HONOLULU
630 SOUTH KING STREET
HONOLULU, HAWAII 96813



EILEEN W. ANDERSON
Director

MICHAEL J. CHUN
Chief Engineer
SAUNICE M. HATA
Senior Engineer

R 83-750

October 31, 1983

13-30

MEMORANDUM

TO: Mr. Michael H. McElroy, Director
Department of Land Utilization

VIA: Mr. Andrew I. T. Chang, Managing Director *for*

SUBJECT: Leeward District Sanitary Landfill
Environmental Impact Statement

MEMORANDUM

TO: MR. WILLARD T. CHOW, CHIEF PLANNING OFFICER
DEPARTMENT OF GENERAL PLANNING

ATTENTION: MR. RALPH KAWAMOTO, PLANNER

FROM: MICHAEL J. CHUN, DIRECTOR AND CHIEF ENGINEER
DEPARTMENT OF PUBLIC WORKS

SUBJECT: LEEWARD DISTRICT SANITARY LANDFILL
ENVIRONMENTAL IMPACT STATEMENT

We have no further comments on the subject environmental impact statement. Our earlier comments have been acknowledged by the applicant and are discussed in the EIS.

We appreciate your review of the document. Your letter will be incorporated into the revised environmental impact statement.

APPROVED:

W.T. Chow

WILLARD T. CHOW

Ralph Kawamoto
RALPH KAWAMOTO
Planner

Michael J. Chun
MICHAEL J. CHUN
Director and Chief Engineer

cc: EISC
DLU

cc: Department of Public Works
Environment Impact Study Corp.

107 11 1983

DEPARTMENT OF LAND UTILIZATION
CITY AND COUNTY OF HONOLULU
 580 SOUTH KING STREET
 HONOLULU, HAWAII 96813



EILEEN M. ANDERSON
 MAYOR

MICHAEL H. MCELROY
 DIRECTOR
 ROBERT B. JONES
 DEPUTY DIRECTOR

October 6, 1983

LU9/93-5771(JDM)

MEMORANDUM

TO : DR. MICHAEL J. CHUN, DIRECTOR & CHIEF ENGINEER
 DEPARTMENT OF PUBLIC WORKS

FROM : MICHAEL H. MCELROY, DIRECTOR

SUBJECT : DRAFT ENVIRONMENTAL IMPACT STATEMENT (EIS)
 FOR LEEWARD DISTRICT SANITARY LANDFILL --
 VAINAMALO GULCH SITE (TAX MAP KEY 9-2-3; PORTION 2, 13
 AND 40) AND OHIKILOLO SITE (TAX MAP KEY 8-3-1)

We have reviewed the subject Draft EIS and find that it adequately addresses our concerns.

There is one correction which should be made regarding Development Plan designations. The applicable Development Plan designations are reported in Section 3 of the Draft EIS. However, in the Summary (page S-2 and Page S-5), reference to General Plan designations are inappropriate and should be changed accordingly. For your information, both the Hahaione and Ewa Development Plans designate the subject sites as Agricultural.

If there are any questions, please contact John Hakagawa of our staff at 527-5035.

Michael H. McElroy
 MICHAEL H. MCELROY
 Director of Land Utilization

MMH:st
 cc: Environment Impact Study Corp.
 REC-...
 OCT 11 1983

DEPARTMENT OF PUBLIC WORKS
CITY AND COUNTY OF HONOLULU
 580 SOUTH KING STREET
 HONOLULU, HAWAII 96813



EILEEN M. ANDERSON
 MAYOR

MICHAEL J. CHUN, Ph.D.
 DIRECTOR AND CHIEF ENGINEER
 MAURICE W. EWA
 DEPUTY DIRECTOR

R 84-12

January 9, 1984

MEMORANDUM

TO : MR. MICHAEL H. MCELROY, DIRECTOR
 DEPARTMENT OF LAND UTILIZATION

FROM : MICHAEL J. CHUN, DIRECTOR AND CHIEF ENGINEER
 DEPARTMENT OF PUBLIC WORKS

SUBJECT : LEEWARD DISTRICT SANITARY LANDFILL
 ENVIRONMENTAL IMPACT STATEMENT

We appreciate your review of the document and offer the following responses to your comments.

Comment:
 "We have reviewed the subject Draft EIS and find that it adequately addresses our concerns."

"There is one correction which should be made regarding Development Plan designations. The applicable Development Plan designations are reported in Section 3 of the Draft EIS. However, in the Summary (page S-2 and Page S-6), reference to General Plan designations are inappropriate and should be changed accordingly. For your information, both the Hahaione and Ewa Development Plans designate the subject sites as Agricultural."

Response:
 The corrections will be made to the summary pages.

Michael J. Chun
 MICHAEL J. CHUN
 Director and Chief Engineer

cc: S. Shimabukuro
 EISC

Mr. Zaiko I. Kudo
Page 2
January 9, 1984

Response:

The annual increase of \$5,000.00 in providing horsefeed and hay for the Honolulu Zoo animals is noted. We will coordinate our plans with you to minimize adverse impacts to the major food supplier and to the zoo.

Michael J. Chih

MICHAEL J. CHIH
Director and Chief Engineer

DEPARTMENT OF PUBLIC WORKS
CITY AND COUNTY OF HONOLULU
450 SOUTH KING STREET
HONOLULU, HAWAII 96813



MICHAEL J. CHUH, Ph.D.
DIRECTOR AND CHIEF ENGINEER
HAURICE M. KATA
DEPUTY DIRECTOR
R 83-750

EILEEN M. ANDERSON
MAILER

October 31, 1983

TE 9/83-3583
PL 3034-83

October 3, 1983

13-34

MEMORANDUM

TO: MR. WILLIAM A. BONNET, DIRECTOR
DEPARTMENT OF TRANSPORTATION SERVICES

FROM: MICHAEL J. CHUH, DIRECTOR AND CHIEF ENGINEER
DEPARTMENT OF PUBLIC WORKS

SUBJECT: LEWARD DISTRICT SANITARY LANDFILL
ENVIRONMENTAL IMPACT STATEMENT

MEMORANDUM

TO: MICHAEL M. McELROY, DIRECTOR
DEPARTMENT OF LAND UTILIZATION

FROM: WILLIAM A. BONNET, DIRECTOR

SUBJECT: LEWARD DISTRICT SANITARY LANDFILL-EIS

We appreciate your review of the document. Your letter will be incorporated into the revised environmental impact statement.

We have reviewed the Environmental Impact Statement for the subject project and have no comments.

Michael J. Chuh

MICHAEL J. CHUH
Director and Chief Engineer

cc: EISC
DLU

William A. Bonnet
WILLIAM A. BONNET

cc: Environment Impact
Study Corp.

BOARD OF WATER SUPPLY
CITY AND COUNTY OF HONOLULU

83-05306
COPY

DEPARTMENT OF PUBLIC WORKS
CITY AND COUNTY OF HONOLULU
650 SOUTH KING STREET
HONOLULU, HAWAII 96813



EILEEN R. ANDERSON
MANAGER

MICHAEL J. CHUN, Ph.D.
DIRECTOR AND CHIEF ENGINEER
MAURICE W. BARR
DEPUTY DIRECTOR
R 83-750

September 12, 1983

RECEIVED
DEPARTMENT OF PUBLIC WORKS
SEP 15 1983
10 54 AM '83

MICHAEL H. MCELROY, DIRECTOR
DEPARTMENT OF LAND UTILIZATION
KAZU HAYASHIDA
BOARD OF WATER SUPPLY

SUBJECT: ENVIRONMENTAL IMPACT STATEMENT FOR LEEWARD DISTRICT SANITARY LANDFILL AT WAIHANALO GULCH AND OHINILOLO SITES

We have no objections to the proposed sanitary landfill sites and anticipate no adverse effects to potable groundwater resources.

If you have any questions, please call Lawrence Whang at 527-6138.

Kazu Hayashida
KAZU HAYASHIDA
Manager and Chief Engineer

cc: Dr. Michael Chun (DFW)
Environment Impact Study Corp.

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SEP 28 1983
EISC

October 31, 1983

MEMORANDUM

**TO: MR. KAZU HAYASHIDA, MANAGER AND CHIEF ENGINEER
BOARD OF WATER SUPPLY**

**FROM: MICHAEL J. CHUN, DIRECTOR AND CHIEF ENGINEER
DEPARTMENT OF PUBLIC WORKS**

**SUBJECT: LEEWARD DISTRICT SANITARY LANDFILL
ENVIRONMENTAL IMPACT STATEMENT**

We appreciate your review of the document. Your letter will be incorporated into the revised environmental impact statement.

Michael J. Chun
MICHAEL J. CHUN
Director and Chief Engineer

cc: EISC
DLU

209/83-5362

FIRE DEPARTMENT
CITY AND COUNTY OF HONOLULU
1435 S. BERTANHA STREET, ROOM 303
HONOLULU, HAWAII 96814



1983 SEP 19 10:44-9-05
SILEEN M. ANDERSON
DEPT. OF LAND UTILIZATION
CITY & COUNTY OF HONOLULU

September 15, 1983

TO: Mr. Michael M. McElroy, Director
Department of Land Utilization

FROM: Melvin M. Nonaka, Fire Chief

SUBJECT: Waimanalo Gulch Site and
Ohikilolo Site Landfill

13-1-36

We have no objection to the proposed Waimanalo Gulch site and the Ohikilolo site landfill as indicated in our response to you dated April 05, 1983 in the EIS Preparation notice.

Also, we are in agreement with your plans to provide a fire break 50 - 70 feet wide within the boundaries of the sites and become part of your maintenance and operations program of the land site.

The EIS is being returned to you.

Melvin M. Nonaka
MELVIN M. NONAKA,
Fire Chief

MHN:ct/NSKM
Enc.

To: Dr. Michael Chun, Director
Department of Public Works
Environmental Impact Study Corp.

SEP 26 1983
EISC

DEPARTMENT OF PUBLIC WORKS
CITY AND COUNTY OF HONOLULU
630 SOUTH KING STREET
HONOLULU, HAWAII 96813



SILEEN M. ANDERSON
MAILING

M. M. NONAKA
CHIEF

MICHAEL J. CHUN, Ph.D.
DIRECTOR AND CHIEF ENGINEER
MELVIN M. NONAKA
DEPUTY DIRECTOR
R 83-750

October 31, 1983

MEMORANDUM

TO: MR. MELVIN M. NONAKA, FIRE CHIEF
HONOLULU FIRE DEPARTMENT

FROM: MICHAEL J. CHUN, DIRECTOR AND CHIEF ENGINEER
DEPARTMENT OF PUBLIC WORKS

SUBJECT: LEIARD DISTRICT SANITARY LANDFILL
ENVIRONMENTAL IMPACT STATEMENT

We appreciate your review of the document. Your letter will be incorporated into the revised environmental impact statement.

Michael J. Chun
MICHAEL J. CHUN
Director and Chief Engineer

cc: EISC
DLU

DEPARTMENT OF PUBLIC WORKS
CITY AND COUNTY OF HONOLULU
530 SOUTH KING STREET
HONOLULU, HAWAII 96813



EILEEN R. ANDERSON
MAYOR

MICHAEL J. CHUN, P.E. D.
DIRECTOR AND CHIEF ENGINEER

MAURICE W. BAY
DEPUTY DIRECTOR

R 83-750

October 31, 1983

MEMORANDUM

TO: MR. DOUGLAS G. GIBB, POLICE CHIEF
HONOLULU POLICE DEPARTMENT

FROM: MICHAEL J. CHUN, DIRECTOR AND CHIEF ENGINEER
DEPARTMENT OF PUBLIC WORKS

SUBJECT: LEeward DISTRICT SANITARY LANDFILL
ENVIRONMENTAL IMPACT STATEMENT

We appreciate your review of the document. Your letter will be incorporated into the revised environmental impact statement.

Michael J. Chun

MICHAEL J. CHUN
Director and Chief Engineer

cc: EISC
DLW

CS-JS

September 14, 1983

Mr. Michael McElroy, Director
Department of Land Utilization
City and County of Honolulu
550 South King Street, 7th Floor
Honolulu, Hawaii 96813

Dear Mr. McElroy:

Subject: Leeward Sanitary Landfill at Waianalo Gulch and
Ohikilolo

Thank you for the opportunity to review the Environmental Impact Statement for the Leeward District Sanitary Landfill. Our concern in this project has and will be with the impact it will have on traffic in the area. If this stage of development, we are satisfied that our traffic concerns have been addressed and have no further comment to offer at this time.

Douglas G. Gibb

DOUGLAS G. GIBB
Chief of Police

cc: Dr. Michael Chun, Director
Department of Public Works
550 South King Street, 11th Floor
Honolulu, Hawaii 96813

✓ Environment Impact Study Corp.
2050 Koa Street, Suite 202
Honolulu, Hawaii 96819



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CITY COUNCIL
 CITY AND COUNTY OF HONOLULU
 HONOLULU, HAWAII 96813 / TELEPHONE 523-4000

D.F.Pink
C.Wal
Refuse

PAULEY T. MARK

Mr. Michael McElroy
 Director, Department of Land Utilization
 City and County of Honolulu
 650 South King Street, 7th Floor
 Honolulu, Hawaii 96813

Re: Environmental Impact Statement for the Proposed Leeward
 District Sanitary Landfill at Waipamalo Gulch and Ohiki-
 lolo Valley

Dear Mr. McElroy:

I have reviewed the above referenced E.I.S. and strongly feel
 that it should not be accepted until it is revised to address
 more completely several significant areas. These areas are as
 follows:

1. Threats to Endangered Flora and Fauna; Disregard of
 Federal Endangered Species Laws.

The U.S. Department of Interior, Fish and Wildlife
 Service, Office of Environmental Services, in its
 letter to the proposing agency (E.I.S. p. 12-7),
 noted that the Ohikilolo Valley west ridge is the
 habitat for five separate plant species which are
 Candidate Endangered Species. The letter noted that
 fire control at the site is of critical importance.

The Bishop Museum, in its letter to the proposing
 agency (E.I.S. p. 12-57), noted that an officially
 protected endangered species of the tree snail
 occurs on the upper ridges and is vulnerable to
 fire, should any spread from the site.

The E.I.S. notes the potential fire problem (p. 1-18 -19),
 including the anticipated need for fire department
 assistance (1-18). At E.I.S. p. 12-45, the proposing
 agency notes that almost one outbreak of fire per
 year occurs at the City's Kapaa landfill. The City
 Fire Chief, Melvin M. Nonaka, wrote that "(e)xisting
 fire protection for this proposed project is poor"
 (E.I.S. p. 12-34).

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 OCT 13 1983

EISC

upper ridges of Ohikilolo will not be used for
 landfilling and the potential impact by fires
 will be prevented by the installation of fire-
 breaks. Elsewhere in the E.I.S. it is noted that
 the fire breaks will be from 30 to 50 feet wide
 (E.I.S. pp. 12-7, 12-35).

The federal Office of Environmental Services has
 informed both your office and the proposing agency,
 however, that the proposed firebreak is "inadequate"
 (letter from William Kramer, Acting Project Leader, Office
 of Environmental Services, Fish and Wildlife Service,
 Department of the Interior, to Mr. Michael McElroy,
 dated September 21, 1983). In view of this, the E.I.S.
 as presently written is seriously deficient in its
 handling of the endangered species issue.

As I am sure you are aware, the federal Endangered
 Species Act (16 U.S.C. Sections 1531 et. seq.) re-
 quires a "Section 7 consultation" with the U.S.
 Fish and Wildlife Service if there are any endangered
 species noted which might be affected by the pro-
 ject. If the Service makes a determination that the
 project is likely to jeopardize the continued existence
 of the species, the project may be in violation of
 the Act. The Fish and Wildlife Service has already
 indicated, in its September 21 letter, that this may
 well be the case with this project, yet there is
 no significant discussion of this serious impact
 in the E.I.S.

This is a serious deficiency in the E.I.S. Regardless
 of the fact that all funds for the project are to
 come from the City, the fact that a federal environ-
 mental statute could well be violated by the project
 is a clear indication that the subject of endangered
 species and the project's impact on them should be
 addressed in depth in the E.I.S.

I strongly suggest, therefore, that a section dealing
 with this issue be added, before the E.I.S. is deemed
 acceptable.

2. Impact on Endangered Species; Disregard of the State of
 Hawaii Endangered Species Act.

I am informed by Mrs. Silva that, contrary to the
 survey reported in the E.I.S., the Hawaiian
 short-eared owl (*Nyctaleus sandwichensis*),
 or puco, is very commonly seen on the project site,
 to the extent that it is not unusual for a puco
 to crash into the windshield of a ranch vehicle
 which is driving on the ranch at night. They are
 often seen perched on the ranch fences, also. The
 puco, being an owl, is naturally nocturnal; is it
 possible that the survey was taken only during the

day? The pueo is listed by the State as an endangered species on Oahu. See "Rules Regulating the Management and Protection of Indigenous Wildlife..." published by the State Department of Land and Natural Resources, pursuant to H.R.S. Chapter 195D.

In spite of the above, the E.I.S. baldly states, at page 2-38, that "the birds and animals found on the (Ohikilolo) project site are not rare or endangered species."

I strongly suggest, therefore, that the E.I.S. be revised to note the presence of the pueo, to note that the pueo is considered an endangered species by the State, and to thoroughly address the impact of the project on this important species, which occurs naturally nowhere else in the world but Hawaii.

3. Impact on Water Quality: Leachate

The identical sections on leachates (E.I.S. 4-8 to 4-11; 4-36 to 4-39) recite a collection of conclusions without supportive evidence or appropriate analysis. There is no citation of scientific data to justify the conclusion that there will be no leachate production so long as rainfall is less than 30" per year; there is no supportive evidence that there will be no adverse long-term impacts on basal groundwater and coastal water quality.

I suggest that the E.I.S. be revised to include the supportive data, evidence and analysis.

4. Impact on Unique archeological sites

The section of the E.I.S. which deals, in the body of the report, with archeological sites in Ohikilolo Valley (E.I.S. 4-50) seems to downplay the significance of the sites. The sites are referred to as "atypical" and "different". Reference is made to Appendix C of the E.I.S., as containing the "results of the survey".

This is misleading. Appendix C actually contains a report on the survey which extolls the unique historical/archeological significance of the Ohikilolo Valley.

The body of the E.I.S. should be revised to include, at page 4-50, the following sentence from the report contained in the Appendix: "Ohikilolo appears to offer an unrivaled example of a dryland agricultural/aquacultural system." The report in Appendix C contains the following conclusory recommendation: "It is recommended that

if at all possible, this area be deleted from the list of possible landfill sites under county consideration." The facts leading to this recommendation, which are found in Appendix C, should be set forth in the body of the E.I.S. report.

Thank you for the opportunity to comment on the E.I.S. prior to the consideration of the project by the Council.

Sincerely yours,

Betsy T. Mink

BETSY T. MINK
CHAIR
CITY COUNCIL

cc. Dr. Michael Chun, Director, C&C Public Works

PTH:ave

DEPARTMENT OF PUBLIC WORKS
CITY AND COUNTY OF HONOLULU
650 SOUTH KING STREET
HONOLULU, HAWAII 96813



EILEEN R. ANDERSON
Chair

MICHAEL J. CHUN, Ph.D.
DIRECTOR AND CHIEF ENGINEER
MARJORIE M. BARRA
SENIOR ENGINEER

May 4, 1984

Honorable Patsy T. Mink, Chair
City Council
City and County of Honolulu
Honolulu, Hawaii 96813

Dear Madam Chair:

Subject: Leeward District Sanitary Landfill Environmental Impact Statement

Thank you for your interest and concern regarding the proposed siting of a sanitary landfill at Ohikilolo. As you are aware, the Department of General Planning has communicated to the City Council the withdrawal of administration support for the proposed Auloa and Ohikilolo landfills. The withdrawal of support was due to the acceptance of the Pricing Proposal submitted by Honolulu Resource Recovery Venture (CE/Amfac) for a resource recovery project which should reduce future sanitary landfill requirements. For your information, the Department of Public Works intends to complete the Environmental Impact Statement for Ohikilolo. Withdrawal of support for the proposed Ohikilolo landfill was based on acceptance of the Pricing Proposal for a resource recovery facility and is not related to the acceptability of the Environmental Impact Statement for Ohikilolo.

We appreciate your valuable comments and offer the following responses.

Comment:

"I have reviewed the above referenced EIS and strongly feel that it should not be accepted until it is revised to address more completely several significant areas. These areas are as follows:

1. Threats to Endangered Flora and Fauna; Disregard of Federal Endangered Species Laws.

The U. S. Department of Interior, Fish and Wildlife Service, Officer of Environmental Services, in its letter to proposing agency (EIS P. 12-7), noted that the Ohikilolo Valley west ridge is the habitat for five separate plant species which are Candidate Endangered Species. The letter noted that fire control at the site is of critical importance."

Honorable Patsy T. Mink, Chair
May 4, 1984
Page 2

Response:

While we recognize that there are endangered species of plants located along the west ridge of Ohikilolo Valley, we have pointed out to both the U. S. Department of Interior, Fish and Wildlife Service, and the Bishop Museum that the landfill will be limited to areas below the 200-foot elevation and will not affect the upper ridge line. Fire breaks to prevent any fires from spreading beyond the landfill will be constructed and maintained around the site. The width of the fire break has been determined in consultation with the Department of Land and Natural Resources.

Comment:

"The Bishop Museum, in its letter to proposing agency (EIS, p. 12-57), noted that an officially protected endangered species of the tree snail occurs on the upper ridges and is vulnerable to fire, should any spread from the site."

Response:

The combination of proper landfill/refuse management practices, fire breaks, and other necessary precautions to contain any potential fires within the boundary of the landfill will also be adequate to protect the endangered species of snails inhabiting the upper ridgelines of Ohikilolo Valley. Please note that the purposes of the fire break are to contain any fires within the boundary of the landfill, as well as to prevent fires from entering the landfill.

Comment:

"The EIS notes the potential fire problem (pages 1-18 - 19), including the anticipated need for fire department assistance (1-18). At EIS pages 12-45, the proposing agency notes that almost one outbreak of fire per year occurs at the City's Kapaa landfill. The City Fire Chief, Melvin M. Nonaka, wrote the '(e)xisting fire protection for this proposed project is poor' (EIS, pages 12-34)."

Response:

It should be generally recognized that there is always a potential for fires at a landfill because of spontaneous combustion or the inadvertent delivery of "hot wastes." However, we believe that the combination of proper landfill design, our existing program of closely monitoring all waste brought to the landfill, and the generally low combustible characteristics of the refuse will minimize the potential for fires at Ohikilolo. The training our landfill personnel receive further reduces the potential that any fire will extend beyond the confines of the landfill because of the proficiency developed in our personnel for quickly identifying and extinguishing small fires.

Honorable Patsy T. Mink, Chair
May 4, 1984
Page 3

Experience has generally shown that landfill fires, less than one per year at the existing Kopaa Sanitary Landfill, are small and quickly extinguished by the landfill operators. We recognize that the fire protection for the Ohikilolo Valley landfill site is primarily intended to extinguish small fires and to protect the surrounding environment by containing fires within the landfill itself. We anticipate that the small fires which may be encountered at the landfill can be contained by standard operating procedures, the landfill design and the perimeter fire break. These physical and operational features will serve to contain any fires to the operating face of the landfill.

Although the perimeter fire break around a landfill is a necessary precaution to contain any potential fires, sound landfill management requires that fire prevention receive the greatest emphasis by ensuring that refuse is properly compacted and covered with a daily layer of soil designated to prevent ignition of the refuse, limit the spread of any fires, and provide vector control. Furthermore, compaction of the refuse by landfill machinery prevents ready combustion of the refuse by decreasing its surface area and the relatively high moisture content of the refuse also decrease the probability of ignition.

Comment:

"The body of the EIS ignores the comments of the federal Office of Environmental Services and the Bishop Museum concerning the endangered species. These concerns are only addressed in Appendix B, at B-12, and are there dismissed with the statement 'the upper ridges of Ohikilolo will not be used for landfilling and the potential impact by fires will be prevented by the installation of fire-breaks. Elsewhere in the EIS it is noted that the fire breaks will be from 30 to 50 feet wide (EIS, pp. 12-7, 12-35)."

"The federal Office of Environmental Services has informed both your office and the proposing agency, however, that the proposed fire-break is 'inadequate' (letter from William Kramer, Acting Project Leader, Office of Environmental Services, Fish and Wildlife Service, Department of the Interior, to Mr. Michael McElroy, dated September 21, 1983). In view of this, the EIS as presently written is seriously deficient in its handling of the endangered species issue."

"As I am sure you are aware, the federal Endangered Species Act (16 U.S.C. Sections 1531 et. seq.) requires a 'Section 7 consultation' with the U.S. Fish and Wildlife Service if there are any endangered species noted which might be affected by the project. If the Service makes a determination that the project is likely to jeopardize the continued existence of the species, the project may be in violation of the Act. The Fish and Wildlife Service has already indicated, in its September 21 letter, that this may well be the case with this project, yet there is no significant discussion of this serious impact in the EIS."

Honorable Patsy T. Mink, Chair
May 4, 1984
Page 4

Response:

Because the upper ridgeline of Ohikilolo Valley is a sensitive habitat, the proposed landfill project will be confined to below the 200-foot elevation and will not adversely impact the upper ridgeline. In order to provide readers with adequate information to critically review environmental concerns, the entire contents of the letters submitted and our responses to them have been included in the EIS. We have responded to the concerns which were brought to our attention and firmly believe that our proposed actions will not adversely affect the rare and endangered species of plants or habitat of the upper ridgeline.

We believe that the necessary operating precautions, design criteria and standard operating procedures have been identified to contain any and all fires within the immediate boundary of the landfill. Please note that the perimeter width of the fire break was determined in consultation with the State.

Comment:

"This is a serious deficiency in the EIS. Regardless of the fact that all funds for the project are to come from the City, the fact that a federal environmental statute could well be violated by the project is a clear indication that the subject of endangered species and the project's impact on them should be addressed in depth in the EIS."

I strongly suggest, therefore, that a section dealing with this issue be added, before the EIS is deemed acceptable."

Response:

Your concerns are sincerely appreciated and duly noted. However, the Environmental Impact Statement does not appear seriously deficient regarding the issue of fires and endangered species. We believe that the proposed project will be in conformance with all applicable Federal Statutes.

Comment:

"2. Impact on Endangered Species; Disregard of the State of Hawaii Endangered Species Act.

I am informed by Mrs. Silva that, contrary to the survey reported in the EIS, the Hawaiian short-eared owl (*Asio flammeus sandwichensis*), or pueo, is very commonly seen on the project site, to the extent that it is not unusual for a pueo to crash into windshield of a ranch vehicle which is driving on the ranch at night. They are often seen perched on the ranch fences, also. The pueo, being an owl, is naturally nocturnal; is it possible that

the survey was taken only during the day? The puco is listed by the State as an endangered species on Oahu. See 'Rules Regulating the Management and Protection of Indigenous Wildlife...' published by the State Department of Land and Natural Resources, pursuant to HRS, Chapter 195D.

In spite of the above, the EIS baldly states, at pages 2-38, that the birds and animal found on the (Ohikilolo) project site are not rare endangered species.

I strongly suggest, therefore, that the EIS be revised to note the presence of the puco, to note that the puco is considered an endangered species by the State, and to thoroughly address the impact of the project on this important species, which occurs naturally nowhere else in the world but Hawaii."

Response:

The presence of the Puco was noted in Appendix B (B-17) and was listed as endemic (E) and found within the project site. The presence of the Puco in such large numbers and reports of these owls crashing into the windshields of the ranch vehicles is noted and will be included in the Revised Environmental Impact Statement.

The Puco is found on other islands and in other locations on the island of Oahu. It is not anticipated that the landfill project will have a significant adverse impact on the species. While the landfill may reduce the existing vegetation in the immediate-area of the landfill, it is conceivable that an increase in the Puco's food supply may be associated with the landfill.

Comment:

"3. Impact on Water Quality: Leachate

The identical sections on leachates (EIS 4-8 to 4-11; 4-36 to 4-39) recite a collection of conclusions without supportive evidence or appropriate analysis. There is no citation of scientific data to justify the conclusion that there will be no leachate production so long as rainfall is less than 30" per year; there is not supportive evidence that there will be no adverse long-term impacts on basal ground-water and coastal quality.

I suggest that the EIS be revised to include the supportive data, evidence and analysis."

Response:

A leachate study was conducted by EMCON and Associates for the City and County of Honolulu, (p. 4-55), footnotes [4.2 and 4.13]. The conclusions and findings are contained in the report regarding the production of leachate versus the rainfall.

Comment:

"4. Impact on Unique archaeological sites

The section of the EIS which deals in the body of the report, with archaeological sites in Ohikilolo Valley (EIS, p. 4-50) seems to downplay the significance of the sites. The sites are referred to as 'atypical' and 'different'. Reference is made to Appendix C of the EIS, as containing the 'results of the survey'.

This is misleading. Appendix C actually contains a report on the survey which extolls the unique historical/archaeological significance of the Chikilolo Valley."

Response:

The use of the terms "atypical" and "different" to describe the archaeological sites found by the survey is not intended to downplay the significance of the sites. Rather, the terms used to describe the sites should be read as indicating the importance of these sites. Because they are atypical, the sites are archaeologically significant.

The archaeological report was included in its entirety in the Environmental Impact Statement referenced on page 4-50. This was done to provide the reviewer with the necessary unedited documentation for the independent assessment of environmental concerns. We do not believe that there is anything misleading in the Environmental Impact Statement or the archaeological report.

Comment:

"The body of the EIS should be revised to include, at page 4-50, the following sentence from the report contained in the Appendix: 'Ohikilolo appears to offer an unrivaled example of a dryland agricultural/aquacultural system'. The report in Appendix C contains the following conclusory recommendation: 'It is recommended that if at all possible, this area be deleted from the list of possible landfill sites under the county consideration.' The facts leading to this recommendation, which are found in Appendix C, should be set forth in the body of the EIS report."

Honorable Patsy T. Mink, Chair
May 4, 1988
Page 7

Thank you for the opportunity to comment on the EIS prior to the consideration of the project by the Council.

Response:

We believe the inclusion of the unedited archaeological report and the reference and wording used on pages 4-50 (VIII, A.) sufficiently indicate the importance of the archaeological sites found by the City's survey.

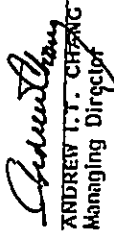
Your letter will be incorporated into the Revised Environmental Impact Statement.

Very truly yours,



MICHAEL J. CHIU
Director and Chief Engineer

CONCUR:



ANDREW T.T. CHANG
Managing Director

cc: Department of Land Utilization
S. Shimabukuro
EISC

13-43

83-05491

DEPARTMENT OF HOUSING AND COMMUNITY DEVELOPMENT
CITY AND COUNTY OF HONOLULU

450 SOUTH KING STREET
HONOLULU, HAWAII 96813
PHONE 83-5001



SILEEN B. ANDERSON
MAYOR

JOSEPH K. CONANT
DIRECTOR

CHARLES R. TORRES
DEPUTY DIRECTOR

ENV 24
Request

September 29, 1983

MEMORANDUM

TO: Michael J. Chun, Director
Department of Public Works

FROM: Joseph K. Conant

SUBJECT: Environmental Impact Statement
Leeward District Sanitary Landfill
Tax Map Key: 9-2-03: Portion of 13, 2, 40
8-3-01

Area: Approximately 182 Acres
Location: Maianae, Oahu

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We appreciate the opportunity to review and comment on the EIS for the Leeward District Sanitary Landfill project.

We have no objections to the general concept of sanitary landfills, and the Maianae site appears to be an appropriate location for such facilities.

We note that even with maximum use of resource recovery facilities, sanitary landfilling will continue to be an important means of solid waste disposal because landfills will be used to dispose of the ash and residue produced by the resource recovery system.

Given the short life expectancy (21 years) of the proposed landfill and the anticipated problems in obtaining remaining potential landfill sites, a delay in acquiring sites would lead to serious public safety and health hazards.

The Pantolo Country Ohikiko Makua Ranch and about five residences will require displacement. It is the policy of the City and County of Honolulu that families and individuals to be displaced by governmental action will have full opportunity to occupy standard housing that is within their financial means and adequate to their needs. Additionally, businesses to be displaced will be provided maximum assistance to aid in their satisfactory re-establishment with a minimum of delay and loss of earnings.

Memorandum to Michael J. Chun
September 29, 1983
Page 2

We will retain the EIS for our files.

cc: Environmental Impact Study
Corporation
2850 Paa Street, Suite 202
Honolulu, Hawaii 96819

OCT 4 1983

EISC

DEPARTMENT OF PUBLIC WORKS
CITY AND COUNTY OF HONOLULU
650 SOUTH KING STREET
HONOLULU, HAWAII 96813



GILLEN M. ANDERSON
DIRECTOR

MICHAEL J. CHUN, Ph.D.
DIRECTOR AND CHIEF ENGINEER
MAURICE M. KAYA
DEPUTY DIRECTOR

January 9, 1984

R 84-12

MEMORANDUM

TO: MR. JOSEPH K. CONANT
DEPARTMENT OF HOUSING AND COMMUNITY DEVELOPMENT

FROM: MICHAEL J. CHUN, DIRECTOR AND CHIEF ENGINEER
DEPARTMENT OF PUBLIC WORKS

SUBJECT: LEIWARD DISTRICT SANITARY LANDFILL
ENVIRONMENTAL IMPACT STATEMENT

We appreciate your review of the document and offer the following responses to your valuable comments.

Comment:

"We have no objections to the general concept of sanitary landfills, and the Wai'anae site appears to be an appropriate location for such facilities."

Response:

Your evaluation regarding the landfill and its location is noted.

Comment:

"We note that even with maximum use of resource recovery facilities, sanitary landfilling will continue to be an important means of solid waste disposal because landfills will be used to dispose of the ash and residue produced by the resource recovery system."

Response:

Your evaluation that a landfill will be needed for the disposal of the ash from the resource recovery facility and other noncombustible waste (demolition waste, soil and etc.) is correct.

Mr. Joseph K. Conant
Page 2,
January 9, 1984

Comment:

"Given the short life expectancy (21 years) of the proposed landfill and the anticipated problems in obtaining remaining potential landfill sites, a delay in acquiring sites would lead to serious public safety and health hazards."

Response:

Your conclusion that a delay in acquiring landfills will create serious public health and safety problems is correct.

Comment:

"The Penitoto Country Ohikiloto Makua Ranch and about five residences will require displacement. It is the policy of the City and County of Honolulu that families and individuals to be displaced by governmental action will have full opportunity to occupy standard housing that is within their financial means and adequate to their needs. Additionally, businesses to be displaced will be provided maximum assistance to aid in their satisfactory re-establishment with a minimum of delay and loss of earnings."

Response:

Thank you for your clarification on the City's policy on the relocation of residences and businesses.

Michael J. Chun
MICHAEL J. CHUN
Director and Chief Engineer

cc: DLJ
S. Shimabukuro
EISC

LU 113-5779

EWA NEIGHBORHOOD BOARD NO. 23
91-784 Makule Road
Ewa Beach, Hawaii 96706



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DEPT. OF LAND UTILIZATION
CITY & COUNTY OF HONOLULU

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DEPARTMENT OF PUBLIC WORKS
CITY AND COUNTY OF HONOLULU
630 SOUTH KING STREET
HONOLULU, HAWAII 96813



MICHAEL J. CHUN, Ph.D.
DIRECTOR AND CHIEF ENGINEER
MAURICE W. HATA
DEPUTY DIRECTOR
R 84-12

October 19, 1983

January 9, 1984

Department of Land Utilization
City and County of Honolulu
630 South King Street, 7th Floor
Honolulu, Hawaii 96813

Mr. Paul T. Oshiro
Chairman
Ewa Neighborhood Board #23
91-784 Makule Road
Ewa Beach, Hawaii 96706

Gentlemen:

Dear Mr. Oshiro:

Re: Environmental Impact Statement for the Proposed
Leeward District Sanitary Landfill at Waimanalo
Gulch Site and Ohikilo Site

SUBJECT: Leeward District Sanitary Landfill Environmental Impact Statement
We appreciate your review of the document. Your letter will be incorporated into the revised environmental impact statement.

At the October 13, 1983 meeting of the Ewa Neighborhood Board #23, the Environmental Impact Statement for the proposed Leeward District Sanitary Landfill was thoroughly discussed. The Board unanimously agreed to submit no comments until a full assessment of the proposed dual water system planned for the Ewa area is addressed.

Very truly yours,

We thank you for allowing us the opportunity to offer our comments.

Michael J. Chun
MICHAEL J. CHUN
Director and Chief Engineer

Very truly yours,
Paul T. Oshiro
Paul T. Oshiro
Chairman
Ewa Neighborhood Board #23

cc: DLU
EISC

PTO:bn
cc: Neighborhood Commission

EISC

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October 20, 1983

Mr. Michael J. Chun, Director
Department of Public Works
City and County of Honolulu
650 South King Street
Honolulu, Hawaii 96813

Dear Mr. Chun:

The Waianae Coast Neighborhood Board No. 24 has reviewed the Environmental Impact Statement for the Leeward District Sanitary Landfill and has a number of concerns that we feel have not been addressed adequately.

1. The City has not put forth an adequate effort to evaluate all possible alternate sites. The justification for the Waianae Coast sites comes from a study (Inventory Study of Potential Sanitary and Demolition Landfill Sites) which was made prior to the federal restrictions on locating landfills over groundwater supply areas. As a result, the study did not focus on acceptable sites, particularly those which might be found on the Ewa Plain.

2. The criteria for selection of sites in the aforementioned study were arbitrary and biased. They were weighted to come up with the recommendations that the City wanted to achieve.

3. We feel that the EIS failed to compute the cost-benefit of one site over another. In fact, none of our specific questions about the operating costs of landfills located on the Waianae Coast were answered. The failure to provide cost-benefit information will lead to flawed decision-making.

4. The traffic questions raised by the Neighborhood Board were inadequately answered. The tone of the answers which are given would imply that the traffic effects will be negligible--a conclusion that is unwarranted by your own data. Rubbish-carrying vehicles passing along the Waianae Coast at the rate of 38 per hour will have a very noticeable impact on those of us who live here. It means an additional vehicle every 90 seconds along the entire stretch of the Coast.

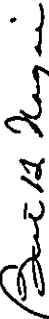
5. We remain deeply concerned about the conclusion that it will be acceptable to sacrifice a significant, relatively undisturbed archeological site once it is surveyed. The

Mr. Michael J. Chun
Page 2
October 20, 1983

Waianae community will NEVER agree that to survey and then to destroy is an acceptable course of action. We feel a deep need to preserve the remaining physical evidence of the cultural heritage of Waianae.

We feel that the City should resurvey the potential areas for landfill and do an in-depth analysis of costs associated with each choice. The present EIS is so flawed that it cannot be considered adequate for decision-making.

Sincerely,



Bert Nagai, Chairman
Waianae Coast Neighborhood Board No. 24

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DEPARTMENT OF PUBLIC WORKS
CITY AND COUNTY OF HONOLULU
450 SOUTH KING STREET
HONOLULU, HAWAII 96813



SILEEN M. ANDERSON
DIRECTOR

MICHAEL J. CHUNG, Ph.D.
DIRECTOR AND CHIEF ENGINEER
MAURICE H. KATA
SENIOR DIRECTOR

R 84-153

March 15, 1984

Mr. Bert Nagai, Chairman
Waianae Coast Neighborhood Board No. 24
85-855 Farrington Highway
Waianae, Hawaii 96792

Dear Mr. Nagai:

SUBJECT: Leeward District Sanitary Landfill Environmental Impact Statement

We appreciate your valuable comments and offer the following responses.

Comment:

"1. The City has not put forth an adequate effort to evaluate all possible alternative sites. The justification for the Waianae Coast sites comes from a study (Inventory Study of Potential Sanitary and Demolition Landfill Sites) which was made prior to the Federal restrictions on locating landfills over groundwater supply areas. As a result, the study did not focus on acceptable sites, particularly those which might be found on the Ewa Plain."

Response:

The potential problem of pollution of underground aquifers was one of the major reasons the City did not locate landfills over existing or future underground water supply areas. We are, therefore, limited in locating future landfill sites on Ewa or other parts of the Leeward area.

Comment:

"2. The criteria for selection of sites in the aforementioned study were arbitrary and biased. They were weighted to come up with the recommendations that the City wanted to achieve."

Response:

The site selection criteria were compiled by an independent engineering consultant hired by the City to perform the study. These criteria were

Mr. Bert Nagai
Page 2
March 15, 1984

modified following meetings held with the Neighborhood Boards and other interested members of the community. The City makes no attempt to influence the results of such studies. Indeed, a consultant would quickly lose his professional credibility if he allowed himself to be swayed by the wishes of his clients.

Comment:

"3. We feel that the EIS failed to compute the cost-benefit of one site over another. In fact, none of our specific questions about the operating costs of landfills located on the Waianae Coast were answered. The failure to provide cost-benefit information will lead to flawed decision-making."

Response:

Estimated costs for planning purposes have been provided in Table 1-5, P. 1-22. Transportation costs were given in our previous reply to your organization dated August 22, 1983. We believe that these preliminary cost estimates are sufficient bases for sound decision-making.

Comment:

"4. The traffic questions raised by the Neighborhood Board were inadequately answered. The tone of the answers which are given would imply that the traffic effects will be negligible -- a conclusion that is unwarranted by your own data. Bubbish-carrying vehicles passing along the Waianae Coast at the rate of 38 per hour will have a very noticeable impact on those of us who live here. It means an additional vehicle every 90 seconds along the entire stretch of the Coast."

Response:

The traffic study was prepared by a qualified traffic engineer and the unaltered results of the study are contained in the EIS. We believe that the study was adequate to answer the questions raised by your organization.

Comment:

"5. We remain deeply concerned about the conclusion that it will be acceptable to sacrifice a significant, relatively undisturbed archeological site once it is surveyed. The Waianae community will NEVER agree that to survey and then to destroy is an acceptable course of action. We feel a deep need to preserve the remaining physical evidence of the cultural heritage of Waianae."

Mr. Bert Nagai
Page 3
March 15, 1984

Response:

Your organization's concern and objections are noted. All requirements for the archaeological survey and appropriate actions will be in conformance with the recommendations of the State Historic Preservation Officer.

Comment:

"6. We feel that the City should resurvey the potential areas for landfill and do an in-depth analysis of costs associated with each choice. The present EIS is so flawed that it cannot be considered adequate for decision-making."

Response:

We believe that there is adequate information for the policy makers to render a decision on the proposed project. The search for landfill sites and alternate disposal methods is an ongoing program, and we will continue to evaluate additional landfill sites and disposal methods to meet the growing need for refuse disposal on Oahu.

Your letter will be incorporated into the Revised Environmental Impact Statement.

Very truly yours,



MICHAEL J. CHUN
Director and Chief Engineer

cc: DLU
S. Shimabukuro
EISC

Mr. O. K. Stender
Page 2
January 9, 1984

plans for our review and further comment. As you know, we are seriously exploring a landfill operation at Makiwa Gulch (which is our preferred site) and would appreciate your consideration of this site also in your evaluation of the Waimanalo Gulch."

Response:

A copy of the detailed engineering and development plan will be sent to you. We are aware that you are seriously exploring the development of a private landfill operation at Makiwa Gulch. The City explored Makiwa as a possible site for a landfill, but it was rejected because of strenuous opposition from the residents of Honokai Hale. We generally support the development of properly-planned and operated landfills and wish you well in your endeavor to develop a landfill at the Makiwa site.

Your letter will be incorporated into the Revised Environmental Impact Statement.

Very truly yours,

Michael J. Chun

MICHAEL J. CHUN
Director and Chief Engineer

10/10/83. 5753



First Hawaiian Bank
P.O. Box 3200
Honolulu, Hawaii 96847

DEPARTMENT OF PUBLIC WORKS
CITY AND COUNTY OF HONOLULU
650 SOUTH KING STREET
HONOLULU, HAWAII 96813



EILEEN R. ANDERSON
MAYOR

MICHAEL J. CHUN, Ph.D.
DIRECTOR AND CHIEF ENGINEER
MAURICE W. KATA
DEPUTY DIRECTOR

R 84-12

October 7, 1983

January 9, 1984

Department of Land Utilization
City and County of Honolulu
650 South King Street, 7th Floor
Honolulu, Hawaii 96813

Gentlemen:

Subject: Environmental Impact Statement for Proposed
Leeward District Sanitary Landfill at Waimanalo
Gulch Site and Ohikilolo Site

We acknowledge receipt of EIS, Leeward District Sanitary
Landfill and we do not have further comments at this
time. This does not in any way constitute our approval
of the project at the above mentioned sites.

We have no further use for the EIS, and we are returning
it at this time. Thank you for sending us a copy for
perusal.

Very truly yours,

David W. Ballie
David W. Ballie
Vice President

DWB/den

1983 OCT 11 AM 9 05
DEPT. OF LAND UTILIZATION
CITY & COUNTY OF HONOLULU

Mr. David W. Ballie
Vice President
First Hawaiian Bank
P. O. Box 3200
Honolulu, Hawaii 96847

Dear Mr. Ballie:

SUBJECT: Leeward District Sanitary Landfill Environmental Impact Statement

We appreciate your review of the document. Your letter will be incor-
porated into the revised environmental impact statement.

Very truly yours,

Michael J. Chun

MICHAEL J. CHUN
Director and Chief Engineer

cc: DLU
✓EISC

HAWAIIAN ELECTRIC COMPANY, INC.
Box 2750 / Honolulu, Hawaii / 96840

November 22, 1983
ENV 2-1
HV/G

RICHARD L. O'CONNELL, P.E.
MANAGER, ENVIRONMENTAL DEPARTMENT
DOB: 10-18-48

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Mr. Michael McElroy, Director
Department of Land Utilization
City and County of Honolulu
650 South King Street, 7th Floor
Honolulu, Hawaii 96813

Dear Mr. McElroy:

Subject: Leeward District Sanitary Landfill Environmental Impact Statement

We have reviewed the above subject Environmental Impact Statement and offer the following comments:

1. All figures showing the Waimanalo Gulch site have not been revised to show the Kahe-CEIP 138 kv OH lines.
2. Concerning relocation, the City will coordinate any plans for the relocation of HECO's power lines. HECO advises the City that for any proposed realignment of power lines the associated relocation costs should be identified prior to any site work.
3. The existing right-of-way in Waimanalo Gulch must remain open for HECO's use for emergencies and maintenance at all times.

Sincerely,

R. O'Connell
Richard L. O'Connell
Manager, Environmental Department

SLC:cal

cc: Dr. Michael Chun, Director
Dept of Public Works, C&C

Environment Impact Study Corp.

DEPARTMENT OF PUBLIC WORKS
CITY AND COUNTY OF HONOLULU
650 SOUTH KING STREET
HONOLULU, HAWAII 96813



SILEEN R. ANDERSON
SECRETARY

March 15, 1984

Mr. Richard L. O'Connell
Manager, Environmental Department
Hawaiian Electric Company, Inc.
Box 2750
Honolulu, Hawaii 96840

Dear Mr. O'Connell:

SUBJECT: Leeward District Sanitary Landfill Environmental Impact Statement

We appreciate your valuable comments and offer the following responses.

Comment:

"1. All figures showing the Waimanalo Gulch site have not been revised to show the Kahe-CEIP 138 kv OH lines."

Response:

We will revise some of the figures in the Revised Environmental Impact Statement to show the Kahe-CEIP 138 kv OH lines. The detailed engineering drawings will better reflect the details of the Kahe-CEIP kv OH lines.

Comment:

"2. Concerning relocation, the City will coordinate any plans for the relocation of HECO's power lines. HECO advises the City that for any proposed realignment of power lines the associated relocation costs should be identified prior to any site work."

Response:

The City will coordinate all plans for the relocation of HECO's power line and the relocation costs will be identified prior to any site work.

MICHAEL J. CHUN, P.E.
DIRECTOR OF PUBLIC WORKS
HAIRICE M. HARRIS
DEPUTY DIRECTOR

R 84-153

Lu 10/23 - 5964

October 19, 1983

To: Department of Land Utilization
City and County of Honolulu
650 South King Street, 7th Floor
Honolulu, Hawaii 96813

Re:

OCT 31 1983

Copy To: Michael J. Chun
Director and Chief Engineer
Department of Public Works
City and County of Honolulu
650 South King Street
Honolulu, Hawaii 96813

Subject: Environmental Impact Statement for the Proposed Leeward
District Sanitary Landfill at Waimanalo Gulch Site
(THK: 9-2-03; 2, 13; 40) and Ohikilolo Site,
(THK: 8-3-01)

Ref: Letter, dated September 6, 1983; DPM/C&C Honolulu-
R 83-613, with attachments.

Letter, dated October 5, 1983; Communication M-1178,
From Robert H.K. Au. (attached)

Oahu Solid Waste Management Plan, May 1983,
GWP Associates, Inc.

Inventory of Potential Sanitary and Demolition Sites
on the Island of Oahu, August 1977, S.S. Shimabukuro &
Associates, Inc., Honolulu.

"Presenting HOK-Kahe Mai Homes" an Executive Summary,
2 May, 1983; DW3 Honolulu.

True costs of landfilling - present as well as future -
may not always be recognized. Factors to be considered if
accurate values are to be recognized, include the rising values
of land and the added expense of conforming to new environmental
regulations. However, possibly most important of the "hidden"
landfill costs are the costs of not using the space for homes,
housing and commerce, all of which bring income, jobs and
personal satisfaction to a community.

An agreement has been reached between ourselves and an
independent local firm which projects desirable usage of our
property. In essence it details a proposed development of
affordable homes combined with complimentary commercial uses. We
recognize that re-zoning of the subject land is necessary.
However, residential usage of the property will be consistent
with the Hawaii State Plan; the Oahu General Plan and the Ewa
Development Plan, and fully supportive of our City's West Beach
Secondary Urban Center Concept.

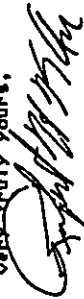
In addition to the established high land values
associated with Waimanalo Gulch there are other factors of
consequence which cause the site to be prohibitively expensive
for use as a sanitary landfill. Among these are:

1. Capacity - This is a low capacity site relative to
costs and needs.
2. Cover Material - Is not available on site and must
be hauled in at great expense.
3. Pollution of Ground Water - Leachate abatement
measures are required. We request that you ask the Technical
Review Committee for Underground Injection Control to confirm the
validity of the UIC line in the Waimanalo Gulch area.
4. Drainage - Gullies with large drainage basins
behind them present major drainage problems and cost. As
indicated in the Archaeological Reconnaissance, the upper section
of the valley is prone to violent flooding, with very
intermittent stream flows which tend to occur with tremendous
force. Adequate drainage engineering will be expensive while
significantly reducing the land-fill-volume available.
5. Traffic - The Traffic Impact Report prepared by
Austin, Tsutsumi and Associates, Inc., describes extensive highway
construction needed to enable Honolulu bound vehicles exiting
from the site to safely cross the Farrington Highway. It
concludes that a traffic signal may become warranted. The State
of Hawaii Dept. of Transportation reply to the EISPN indicates
that they do not expect significant impact upon the State Highway
programs in this area from the landfill project. Questions: Will
traffic signals be allowed to impede the flow of traffic in this
important corridor, with results similar to those experienced
currently by motorists using the Kalaheo Highway in East
Oahu?
6. Alternatives - We concur with the response to the
EISPN by Mr. Donald Wolbrink for the owners of the Ohikilolo site
regarding the existence of other possible sites. The Waimanalo
Gulch site was also among those sites not recommended for
landfill development in the 1977 Inventory Study prepared by
Shimabukuro and Associates.

We believe the City's need for so much landfill acreage remains an open question, deserving of further investigation.

Therefore, we request that the subject property, known as Waimanalo Gulch be withdrawn from consideration as a possible Landfill site by the City and County of Honolulu.

Very truly yours,



Robert H.K. Au, et al
1911 Keaumoku Street
Honolulu, Hawaii 96822

Attach.
cc: DMU/Honolulu

6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100

DEPARTMENT OF PUBLIC WORKS
CITY AND COUNTY OF HONOLULU
650 SOUTH KING STREET
HONOLULU, HAWAII 96813



SILEEN M. ANDERSON
DIRECTOR

MICHAEL J. CHUNG, Ph.D.
DIRECTOR AND CHIEF ENGINEER
MAURICE M. HAYES
DEPUTY DIRECTOR

R 84-67

January 30, 1984

Mr. Robert H. K. Au, et al
1911 Keaumoku Street
Honolulu, Hawaii 96822

Dear Mr. Au:

SUBJECT: Leeward District Sanitary Landfill Environmental Impact Statement

We appreciate your review of the document and offer the following responses to your comments.

Comment:

"True costs of landfilling - present as well as future - may not always be recognized. Factors to be considered if accurate values are to be recognized, include the rising values of land and the added expense of conforming to new environmental regulations. However, possibly most important of the 'hidden' landfill costs are the costs of not using the space for homes, housing and commerce, all of which bring income, jobs and personal satisfaction to a community."

"An agreement has been reached between ourselves and an independent local firm which projects desirable usage of our property. In essence it details a proposed development of affordable homes combined with complimentary commercial uses. We recognize that re-zoning of the subject land is necessary. However, residential usage of the property will be consistent with the Hawaii State Plan, the Oahu General Plan and the Ewa Development Plan, and fully supportive of our City's West Beach Secondary Urban Center Concept."

Response:

We appreciate the information on the proposed project to develop housing and commercial uses on your property. You are correct in stating that a land use boundary amendment and other requirements such as rezoning will be required of you prior to development of housing and other commercial activities.

Mr. Robert H. K. Au
Page 2
January 30, 1984

As for the "hidden" costs you mentioned, these costs will be estimated during the negotiation for the land, based upon its highest and best use, and will be included in the compensation paid to you for the property rights.

Comment:

"1. Capacity - This is a low capacity site relative to costs and needs."

Response:

The capacity of the landfill is adequate to meet immediate needs and we believe that the cost of the landfill is justified in the light of the pressing disposal requirements of our community.

Comment:

"2. Cover Material - Is not available on site and must be hauled in at great expense."

Response:

We agree that cover material is not available on site. However, cover material is readily available from other sources and at a reasonable price.

Comment:

"3. Polution of Ground Water - Leachate abatement measures are required. We request that you ask the Technical Review Committee for Underground Injection Control to confirm the validity of the UIC line in the Waimanalo Gulch area."

Response:

We have been working closely with the Technical Review Committee and have confirmed the location of the UIC line for the Waimanalo Gulch area. Leachate monitoring and abatement measures will be incorporated in the design of the landfill.

Comment:

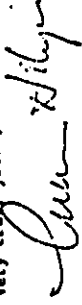
"4. Drainage - Gullies with large drainage basins behind them present major drainage problems and cost. As indicated in the Archeological Reconnaissance, the upper section of the valley is prone to violent flooding, with very intermittent stream flows which tend to occur with tremendous force. Adequate drainage engineering will be expensive while significantly reducing the land-fill-volume available."

Mr. Robert H. K. Au
Page 4
January 30, 1984

We therefore cannot comply with your request that Waimanalo Gulch be withdrawn from consideration as a site for a landfill.

Your letter will be incorporated into the Revised Environmental Impact Statement and a copy will be sent to you.

Very truly yours,



MICHAEL J. CHUM
FOR Director and Chief Engineer

cc: DLU
EISC

Mr. Robert H. K. Au
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Response:

The design and cost estimates for the drainage system to divert storm water will be finalized during the engineering phase of the project. Preliminary studies indicate that the storm waters can be easily directed around the landfill. The drainage system for the landfill is a necessary cost we have anticipated in the development of the landfill.

Comment:

"5. Traffic - The Traffic Impact Report prepared by Austin, Teutsumi and Associates, Inc., describes extensive highway construction needed to enable Honolulu bound vehicles exiting from the site to safely cross the Farrington Highway. It concludes that a traffic signal may become warranted. The State of Hawaii Dept. of Transportation reply to the EISP indicates that they do not expect significant impact upon the State Highway program in this area from the landfill project. Question: Will traffic signals be allowed to impede the flow of traffic in this important corridor, with results similar to those experienced currently by motorists using the Kalamianole Highway in East Oahu?"

Response:

The need for a traffic signal at the intersection will be evaluated at a later date by the State. The comparison between the traffic at the project site and Kalamianole Highway may not be entirely valid because the traffic volume along Kalamianole Highway is considerably greater. We do not anticipate that there will be a significant impedance of traffic fronting the project site, even with the installation of traffic signals.

Comment:

"6. Alternatives - We concur with the response to the EISP by Mr. Donald Wolbrink for the owners of the Ohikilolo site regarding the existence of other possible sites. The Waimanalo Gulch site was also among those sites not recommended for landfill development in the 1977 Inventory Study prepared by Shimabukuro and Associates."

Response:

The search for landfill sites has been an ongoing priority item for the City. There is no doubt that opposition to landfills will continue. However, the fact remains that there is an urgent need for a landfill on the leeward side of the island. There are presently only two viable locations under consideration as described in the EIS.

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estimates. With increased cuts in programs, budgets, etc., no economic impact study was conducted. The following costs should be considered and evaluated:

- a) cost of acquisition of land
- b) cost to develop landfill site
- c) distance cost from refuse generating center
- e) cost of improvements required to make landfill environmentally acceptable
- f) cost of operation
- g) cost of maintenance
- h) staffing cost
- i) cost of distance
- j) traveling distance (time)
- k) wear & tear on equipment - trucks, heavy equipment
- l) cost of highway maintenance
- m) fuel cost

These costs are astronomical not only to the City and County but also to the taxpayers.

- 4) Impact of Sanitary Landfill on the shoreline and ground water
The whole question of the adverse effects of seepage and silt on the shoreline and off shore areas have not been adequately addressed. What will be the adverse environment impact to a high quality fishing area? The impact on shoreline reef life and vegetation (limu) which is gathered by the community, has not been addressed. With high unemployment in the area many residents depend on shoreline and off shore fishing. The impact of silt and infiltration from the landfill can spread into the portable water reserve area and must be taken into consideration. The question of water is essential to Ohikilolo Ahupua'a (Valley). Presently the whole valley is sustained by wells. The lower level wells are used for irrigation and the well at about the 240 foot level is used to supply water to all of the residences on the ranch and the

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October 19, 1983

Mr. Michael Chum, Director
Department of Public Works
City & County of Honolulu
650 South King Street
Honolulu, Hawaii 96813

Dear Mr. Chum:

In reviewing the EIS for the Leeward Sanitary Landfill it is obvious that there has been insufficient research conducted for the EIS on Ohikilolo. In addition to our earlier comments to the EIS Preparation Notice which is included in the EIS dated August 25, 1983, we offer these further comments:

- 1) Archaeological Impact
There are historical sites of value located in Ohikilolo Valley. The Archaeological Reconnaissance conducted just touched on surface information, yet it recommends that if at all possible Ohikilolo be deleted from the list of possible landfill sites. Ohikilolo's uniqueness is a vast open air classroom of historical information that needs a full-scale archaeological survey that is not just limited to the boundaries of the sanitary landfill project. Since the Wai'anae Coast has had the largest Hawaiian population, historical and archaeological significance should be determined.
- 2) Impact on traffic on Farrington Highway
Increasingly heavy traffic conditions are already adversely affecting the Wai'anae Coast community. The landfill proposal would increase traffic congestion on already inadequate roads. The traffic impact report is inadequate and certainly needs more in depth studies conducted. Collection trucks, transfer trailers, private or commercial refuse trucks, trucks transporting cover materials, homeowners going through Nānākūli, Hāli, Wai'anae and Mākahe before getting to Ohikilolo will certainly have a traffic impact not to mention the fact that the added traffic will have to pass Nanaikapono Elementary, Wai'anae Intermediate and Wai'anae High School along Farrington Highway.
- 3) The cost effect on distance
The proposed site would increase costs to the City and County of Honolulu. There have been no cost effect

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contianers, hospital or clinical garbage used on the farms or in industry be disposed of? Who will check garbage for hazardous material and if they are not accepted at the landfill will they be discarded on the roadsides? What about the seepage of hazardous materials into the water?

8) Flora and Fuana
There is a major error in the written copy of page 2-38 under section "III Biological Characteristics of Ohikilolo Valley (Landfilling Area), B. Animals (Fauna)." The copy clearly states the site is not a sensitive wildlife habitat and that the birds found are not rare or endangered. But Appendix B on page 8-17 lists the pueo, the Hawaiian owl, which has been designated on Oahu by the administrative rules of the State Division of Forestry and Wildlife, as endangered.

9) Social/Historical/Cultural Impact on the Community
The EIS does not address the social, historical or cultural impact on the community. Makua Ranch is widely used by Wai'anae Coast residents as a recreation site. It is a matter of community pride on the Wai'anae Coast that the Ranch is owned and run by people of Hawaiian ancestry. Concerts and large family gatherings are held free of charge at the Ranch and people from all over attend. In addition to concerts and large gatherings, the Ranch is open to hikers and horseback riders who are especially grateful for access to Ohikilolo Valley since the neighboring Makaha Valley is completely closed to hikers and horseback riders. The Ranch has tremendous historical and spiritual significance to all the residents on the Wai'anae Coast. Ohikilolo is said to be the last connection to the very beginning of ranching history on the Island of Oahu. The very dry rugged terrain produced lots of cattle, good horses and cowboys that were tough as the terrain. This is where many of the stock families of Wai'anae identify with the Ranch. Many of their grandfathers, fathers, uncles, brothers were once cowboys or worked on the Ranch full-time, part-time or went out to help on the weekends. The historical events of Hawaii go back to Ohikilolo and the historical events of Rancher and Congressmen to the United States. L.L. McCandless. The vast historical events of World War II, the lost of half of the ranch and the U.S. Supreme Court's decision for payment of damages and the leasing of Makua Valley to U.S. Government. A history many Elementary and High School students have come to learn.

adjoining property. A wind mill pumps water out of the lower well for irrigation to the grass fields. To cap the wells on the flats and expect the seepage not to reach the portable water reserve is a ridiculous assumption. If anything, we have to preserve all ground water. In this instance you have productive agricultural land with built-in water reserve not tapping into the main line. Interestingly the land at Ohikilolo has never before been so productive. Residents have commented on the fact that the land in relation to the elements in the past 2 years--when the Coast was dry there was rainfall more than usual at Ohikilolo. As a result it has almost been green year around. It has rained there when everywhere else on the Coast is dry.

5) Well and portable water supply
The existing well located above the 200 feet contour line that provides water for all of the occupants of Ohikilolo and all of the animals is not minimal. The well depth is 126 feet and approximately 118 feet to the top of the water. Why wouldn't there be seepage into portable water? Water supply is so essential to our island that there definitely needs to be more studies and informational data collected before destroying natural water supply for the present and future use. More studies need to be conducted in this area.

6) Agricultural Lands
EIS quoted SDAG letter dated April 6, 1983 "The majority of the 95 acres would be prime if irrigation were provided". Water from the lower well is provided for irrigation only when there is no rain. For the past 2 years we have experienced more rainfall than usual. Yields of grass from those lands proposed for Leeward Sanitary Landfill feed zoo animals and beef livestock and replacement calves for local milk industry. Agricultural potential of the completed landfill site will be limited. That should certainly classify those AG lands as prime. The cost of importing both beef and animal feed into our state show how important all ag lands are. More data is needed.

7) Hazardous Materials
The only access from Honolulu to the site is through the most congested and populated center of the Wai'anae Coast. No studies or statistics on the hazardous materials are mentioned in EIS. The response to hazardous materials are accepted at the landfills and therefore no adverse impact to the Wai'anae Coast is unacceptable. Where will or how will the chemical

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The untouched beauty of the Ohikilolo has also attracted the budding movie, television and commercial industry. Hawaii 5-0, Magnum PI and a number of Japanese film and Commercial companies have used the ranch for location shootings. Use of the ranch grounds and facilities by the community has opened another recreational facility on the Coast. Family luau, concerts, community fairs, link the community into feeling an ownership. The Annual Branding and Luau at the Ranch bring friends and neighbors from all over the world together once a year. Cowboys from the outside island ranches and skilled ropers on the Waianae Coast come together to rope and brand calves and cattle to the amazement of bright-eyed youngsters. Many, many people contribute time and talents to the Annual Luau. Farmers bring bags of vegetables, fisherman bring fish, limu and squid, people bring plants. People come ready to help prepare foods. Musicians call to volunteer their fine talents. Its really the Wai'anae Coast community's Pa'ina. We have just provide the opportunity. The Annual May Thanks-giving Luau has become a Waianae Coast tradition. The beach and ocean front is open to fishermen both on and off shore. Families and community groups who want to camp at the cove make arrangements to pick up the keys for the weekend. Boy Scouts and school groups have hiked in the mountains and later sat by the open fire to hear stories and legends of Ohikilolo and Makua by community elders. The Wai'anae Astronomy Club had several star parties where youngsters have learned about the universe and stars, their names and locations. Nowhere else on the Waianae Coast can the stars be visible through a telescope or with the naked eye because of the complete darkness of the area (no street lights, etc.) Some afternoons you can pass the Ranch and you will see several cars or truck loads of children sitting and watching the cows, calves, donkeys and goats grazing in the grass fields. It serves no purpose to destroy so beautiful an area that so many residents identify with. Is there any wonder a community should show pride, ownership and a personal association to Ohikilolo. Ohikilolo is one of the last places on Oahu where charcoal is produced. Charcoal is used in many of the hotel restaurants in Waikiki. You can find it in many of the local food chain stores with the picture of the kiawe tree.

- 10) Alternative Sites re-evaluate and look for other The City needs to alternative sites like the hills and valleys that are below the Federal water lines. The Ewa Plains need to be re-evaluated.

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- 11) Land Use after Landfill use after the landfill. EIS does not address land use after the landfill. No study was made on the impact of large amount of acreage or the use of the entire valley during landfill and land use after landfill.

The EIS submitted an inadequate and misleading report. It escaped the adverse effects on the residents of Ohikilolo, the Wai'anae Coast community and all of the historical and future impacts. We would like to provide future comments, be consulted and be informed of any further action concerning the use of Ohikilolo. The use of additional landfills is again a short term solution. The City should consider development of a more comprehensive approach to the City's needs to waste management. We encourage the Department of Public Works to consider alternatives other than Landfill.

Enclosed are more petitions against the Leeward Sanitary Landfill proposed at Ohikilolo. Please include these with our previous petitions.

Sincerely,

Albert & Theola Silva

Albert & Theola Silva
P. O. Box 311
Waianae, Hawaii 96792
Phone: 696-7910 (home)
696-4261 (bus.)

Enclosures

PETITION

WE, THE RESIDENTS OF THE CITY AND COUNTY OF HONOLULU AND WAIANAE DISTRICT, SUPPORT CITY COUNCIL CHAIR PATSY MINK'S REQUEST TO WILLARD T. CHOH, CHIEF PLANNING OFFICER OF THE DEPARTMENT OF GENERAL PLANNING, TO HAVE THE "OHIKILOLO" SITE REMOVED FROM THE PUBLIC FACILITIES MAP WHICH SAID REQUEST IS IN THE CURRENT ANNUAL REVIEW PROCESS.

PRINT NAME	SIGNATURE	ADDRESS
① Sandra Brangolista	<i>Sandra Brangolista</i>	84557 Mademans Rd
② W. Weerasingha	<i>W. Weerasingha</i>	P.O. Box 55-1100 Kalahele Pl. Honolulu
③ Helmut D. Kellner	<i>Helmut D. Kellner</i>	1115 Kalahele Pl. Honolulu
④ Willie M. Pua	<i>Willie M. Pua</i>	85-1108 Kapaeha Ave
⑤ Mrs. + Mrs. Kenny Pua	<i>Mrs. + Mrs. Kenny Pua</i>	85-1108 Kapaeha Ave
⑥ Irene K. Maynard	<i>Irene K. Maynard</i>	127 Kapaeha Ave
⑦ LINDY REECE	<i>Lindy Reece</i>	8121 Kalahele Pl. Honolulu
⑧ Helen Kellner	<i>Helen Kellner</i>	3697 Kalahele Pl. Honolulu
⑨ EVELYN FARRIS	<i>Evelyn Farris</i>	480-S Kalahele Pl. Honolulu
⑩ Katherine Kahihikolo	<i>Katherine Kahihikolo</i>	41-246 Hui St Honolulu
⑪ LINDY REECE	<i>Lindy Reece</i>	8121 Kalahele Pl. Honolulu
⑫ Horace K. Malone	<i>Horace K. Malone</i>	71-246 - Kalahele Pl. Honolulu
⑬ TOMMY PATEPATE	<i>Tommy Patepate</i>	94-185 Paha St Honolulu
⑭ SALLIE CHUNG	<i>Sallie Chung</i>	94-185 Paha St Honolulu
⑮ Mrs. + Mrs. Pua	<i>Mrs. + Mrs. Pua</i>	85-1108 Kapaeha Ave
⑯ MICKELLE K. FREEMAN	<i>Mickelle K. Freeman</i>	87-157 Kalahele Pl. Honolulu
⑰ KALUA MILITANTE	<i>Kalua Militante</i>	87-157 Kalahele Pl. Honolulu
⑱ Kelly K. Wood	<i>Kelly K. Wood</i>	87-157 Kalahele Pl. Honolulu
⑳ Mike Siskak	<i>Mike Siskak</i>	88-157 Kalahele Pl. Honolulu
㉑ Jack Foss	<i>Jack Foss</i>	501 Kalahele Pl. Honolulu
㉒ Mervin L. Knight	<i>Mervin L. Knight</i>	89-137 Kalahele Pl. Honolulu
㉓ Joe Weight	<i>Joe Weight</i>	1709 Kalahele Pl. Honolulu
㉔ Kathy Fowler	<i>Kathy Fowler</i>	2147 Kalahele Pl. Honolulu
㉕ KANDI FOXMAN	<i>Kandi Foxman</i>	74 Kalahele Pl. Honolulu
㉖ Pat Kapaeha	<i>Pat Kapaeha</i>	345 Kalahele Pl. Honolulu
㉗ Sheila A. Pua	<i>Sheila A. Pua</i>	86-042 Kapaeha St. Honolulu

PETITION

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PRINT NAME	SIGNATURE	ADDRESS
① Gregory Rice	<i>Gregory Rice</i>	86-042 Kapaeha St. Honolulu
② Don S. Seal	<i>Don S. Seal</i>	1115 Kalahele Pl. Honolulu
③ Bernice Mizoguchi	<i>Bernice Mizoguchi</i>	96-120 Kapaeha St. Honolulu
④ Peter N. ...	<i>Peter N. ...</i>	59-198 C1 Kapaeha St. Honolulu
⑤ Phillis Freitas	<i>Phillis Freitas</i>	419 A Kalahele Pl. Honolulu
⑥ ...	<i>...</i>	18-1114 Kapaeha St. Honolulu
⑦ ...	<i>...</i>	3049 Kapaeha St. Honolulu
⑧ ...	<i>...</i>	87-127 Kapaeha St. Honolulu
⑨ ...	<i>...</i>	94-179 Kapaeha St. Honolulu
⑩ ...	<i>...</i>	94-097 Kapaeha St. Honolulu
⑪ ...	<i>...</i>	97-557 Kapaeha St. Honolulu
⑫ ...	<i>...</i>	4190 Kapaeha St. Honolulu
⑬ ...	<i>...</i>	504 Kapaeha St. Honolulu
⑭ ...	<i>...</i>	2924 Kapaeha St. Honolulu
⑮ ...	<i>...</i>	2144 Kapaeha St. Honolulu
⑯ ...	<i>...</i>	204 Kapaeha St. Honolulu
⑰ ...	<i>...</i>	244 Kapaeha St. Honolulu
⑱ ...	<i>...</i>	85-244 A Kapaeha St. Honolulu
⑲ ...	<i>...</i>	86-021 Kapaeha St. Honolulu
⑳ ...	<i>...</i>	P.O. Box 8141 Kapaeha St. Honolulu
㉑ ...	<i>...</i>	93-500 Kapaeha St. Honolulu
㉒ ...	<i>...</i>	83-500 Kapaeha St. Honolulu
㉓ ...	<i>...</i>	84-013 Kapaeha St. Honolulu
㉔ ...	<i>...</i>	P.O. Box 1010 Kapaeha St. Honolulu
㉕ ...	<i>...</i>	81-111 Kapaeha St. Honolulu

WE, THE RESIDENTS OF THE CITY AND COUNTY OF HONOLULU AND WAIANAE DISTRICT, SUPPORT CITY COUNCIL CHAIR PATSY HINK'S REQUEST TO HILLARD T. CHOW, CHIEF PLANNING OFFICER OF THE DEPARTMENT OF GENERAL PLANNING, TO HAVE THE "OHIKILOLO" SITE REMOVED FROM THE PUBLIC FACILITIES MAP WHICH SAID REQUEST IS IN THE CURRENT ANNUAL REVIEW PROCESS.

PRINT NAME	SIGNATURE	ADDRESS
Robert L. Macdonald	[Signature]	1012 Kamehameha Blvd
Carol J. Rodriguez	[Signature]	81201 Kapiolani Blvd
Termy S. Owe	[Signature]	85-105 A Ala Akai St
Melanie Brown	[Signature]	81-410 Kapiolani St
Sam Leo	[Signature]	80-988 Farrington Hwy
Straight Young	[Signature]	Waiwae Falls, Kamehameha
Bob F. BUCK	[Signature]	86-120 Kapiolani Hwy
Yung KAWASAKI	[Signature]	96-120 Farrington Hwy, Waiwae
Hanna Borg	[Signature]	86-120 Farrington Hwy
Clayton Lim	[Signature]	95-725 Kapiolani Pl
Clayton S. Kim	[Signature]	86-136 Kapiolani St, Waiwae
Maryjo Magallanes	[Signature]	85-1252 Kapiolani Hwy, Waiwae
Leslie Kaohilani	[Signature]	87-1647 Waiwae Rd
Sharon L. Sidel	[Signature]	86-120 Farrington Hwy, Waiwae
Sharon Young	[Signature]	87-231 Waiwae St
1111 Kapiolani	[Signature]	85-1330 Kapiolani St
ANGELINE L. YOUNG	[Signature]	86-130 Kapiolani St
Theresa Carter	[Signature]	86-120 Farrington Hwy
Alan M. M. M. M.	[Signature]	89-036 Farrington Hwy
Debra V. Egan	[Signature]	86-120 Farrington Hwy
Debra V. Egan	[Signature]	325 Kapiolani Ave, Waiwae
Shirley Chan	[Signature]	86-166 Kapiolani St, Waiwae
Gracie Gomez	[Signature]	86-232 Alamiki St, Waiwae
Gene Ahrens	[Signature]	86-120 Farrington Hwy, Waiwae
M. Silvestre	[Signature]	86-120 Farrington Hwy, Waiwae
Vivian Dale Sotero	[Signature]	86-120 Farrington Hwy, Waiwae
Ruth N. Aiko	[Signature]	87-216 Kapiolani St, Waiwae
Melvin N. Aiko	[Signature]	86-855 Kapiolani St, Waiwae
Tom Bradley	[Signature]	8446 Kapiolani St, Waiwae

WE, THE RESIDENTS OF THE CITY AND COUNTY OF HONOLULU AND WAIANAE DISTRICT, SUPPORT CITY COUNCIL CHAIR PATSY HINK'S REQUEST TO HILLARD T. CHOW, CHIEF PLANNING OFFICER OF THE DEPARTMENT OF GENERAL PLANNING, TO HAVE THE "OHIKILOLO" SITE REMOVED FROM THE PUBLIC FACILITIES MAP WHICH SAID REQUEST IS IN THE CURRENT ANNUAL REVIEW PROCESS.

PRINT NAME	SIGNATURE	ADDRESS
JEFF RAMONSON	[Signature]	85-945 NIMANU ST, WAIANAE
MARQUELINE LINDEE	[Signature]	1300 Liliuokalani Dr, Waiwae
BRETT A. SPRINGER	[Signature]	1581-H Kamehameha St, Waiwae
TERESA J. BOSS	[Signature]	1551-H Kamehameha St, Waiwae
Peter H. Tsunaga	[Signature]	1523 Iwaleke Pl, Waiwae
Lisa D. MARTIN	[Signature]	2311 Apopua St, Waiwae
Sauligo Mckenzie	[Signature]	5277A St, Kailua
HELENE J. BERGHAUS	[Signature]	87-230 FARRINGTON HWY
Adela Lopez	[Signature]	2897-A OLIKI HWY
MARY ANITA LYDDAN	[Signature]	86 Kapiolani Dr, Waiwae
Termy Young	[Signature]	87-147 B. Akawa Rd
Marlene Lovick	[Signature]	87-1552 Liliuokalani St
Madeline Zilly	[Signature]	85-1108 Kapiolani St
JOHN J. O'BRIEN	[Signature]	908 627 Waiwae St
STEVEN E. O'BRIEN	[Signature]	87-1552 Liliuokalani St
WALTER E. NATHAN	[Signature]	85-1108 Kapiolani St
LEE BANISLOS	[Signature]	85-1108 Kapiolani St
LEE NATIONAL SERVICES	[Signature]	85-1108 Kapiolani St
Henry Snel	[Signature]	85-1108 Kapiolani St
Bernadette Downey	[Signature]	85-1108 Kapiolani St
THOMAS DOWNY	[Signature]	85-1108 Kapiolani St
Danette Rayford	[Signature]	85-1108 Kapiolani St

PETITION

WE, THE RESIDENTS OF THE CITY AND COUNTY OF HONOLULU AND WAIANA DISTRICT, SUPPORT CITY COUNCIL CHAIR PATSY HINK'S REQUEST TO WILLARD T. CHOW, CHIEF PLANNING OFFICER OF THE DEPARTMENT OF GENERAL PLANNING, TO HAVE THE "OHIKILOLO" SITE REMOVED FROM THE PUBLIC FACILITIES MAP WHICH SAID REQUEST IS IN THE CURRENT ANNUAL REVIEW PROCESS.

PRINT NAME	SIGNATURE	ADDRESS
Charlene A. Vroman	Charlene A. Vroman	84011 Makou St. Waiana
Marcia C. Gago	Marcia C. Gago	97-558 S. Farrington Hwy
Timothy A. Shipe	Timothy A. Shipe	87-164 Dili Pkwy St
JAMES HILTON	JAMES HILTON	Box 418 WAIANA
Dorothy R. News	Dorothy R. News	85-186 McArthur St. Waiana
Nalani Noleke	Nalani Noleke	87-101C Ilii Rd Waiana
Laura DeLyestiro	Laura DeLyestiro	229 Kilan Rd. Waiana
Margaret Wilkins	Margaret Wilkins	84-748 R. Farrington Hwy
Blana A. McKeon	Blana A. McKeon	85-778 Farrington Hwy Waiana
John L. LaKuch	John L. LaKuch	84-241 Farrington St. Makaha
Jane Gustman	Jane Gustman	85-1373 Waiana Rd
Patricia L. Loh	Patricia L. Loh	84-253 Puukohala Waiana
David T. Phillips	David T. Phillips	84-253 Puukohala Waiana
Jayce Stearns	Jayce Stearns	84-520 Farrington Hwy Waiana
Donna Lynch	Donna Lynch	P.O. Box 1210 Waiana
Mildred Silva	Mildred Silva	85-1428 Kamalehua St
M. G. Hugo	M. G. Hugo	P.O. Box 1954 Waiana 96792
Marvin Chan	Marvin Chan	84-122 Kapa Pl. 96792
Francis K. Kame	Francis K. Kame	85-497 Waiana Hwy Rd
Bence ELMY	Bence ELMY	92-655 Waiana Rd
KATHLEEN M. BAJEMA	KATHLEEN M. BAJEMA	16-538 Pukou Loop 96792
Changshui L. Bngun	Changshui L. Bngun	85-794 P. Farrington H.
David Maki	David Maki	84-252 Kamalehua Ave
John J. J. J.	John J. J. J.	85-700 Waiana Hwy Waiana
Sharon Y. Y. Y.	Sharon Y. Y. Y.	84-1072 Kaula Waiana Rd
Sharon Hanks	Sharon Hanks	84-102 Waiana Pl
Elizabeth K. K.	Elizabeth K. K.	84-256 Waiana
PAM Hallahan	PAM Hallahan	84-256 Waiana
GLYN DANK	GLYN DANK	252 Waiana St.

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PRINT NAME	SIGNATURE	ADDRESS
Helene Javarez	Helene Javarez	74-368 Kewalo Lk
Clifford Rosa	Clifford Rosa	45-177 ALB
Ellen Krissner	Ellen Krissner	1923 ENCLAW 96713
Johai M. Eriane	Johai M. Eriane	92-771 Waiana Rd
Zelma L. Kamehau	Zelma L. Kamehau	87-144 C Waiana
Kyra N. Wells	Kyra N. Wells	87-144 B I. Waiana
Shawn Koa	Shawn Koa	87-144 A I. Waiana
Manuela Brune	Manuela Brune	84-120 Kapa St.
David Kalanika	David Kalanika	66-142-2 Kapa St. Waiana
Eileen Tolman	Eileen Tolman	87-144 B I. Waiana
Clayton S. Ling	Clayton S. Ling	84-1054 Farrington Hwy
John A. Brown	John A. Brown	44-227 Waiana Rd
E. F. Tilton	E. F. Tilton	3341 KAOHINANI DR
David T. Tilton	David T. Tilton	3341 KAOHINANI DR
Henry S. S.	Henry S. S.	817 B 356 Waiana
FRED Berman	FRED Berman	98-4098 Hokonui St
Walter M. M.	Walter M. M.	44-891 KAOHINANI DR
Claine K. K.	Claine K. K.	84-846 Waiana
Georgette Militate	Georgette Militate	P.O. Box 11451 Waiana 96716
Michael S. S.	Michael S. S.	84-1001 HAWA St. 96792
Kenneth K.	Kenneth K.	84-1054 Farrington Hwy
Patricia N.	Patricia N.	2205 Waiana Rd. HI 96724
Alfred M.	Alfred M.	45-59 PUA ANA WAIANA
Joseph K.	Joseph K.	2010 15th Street Waiana
Donald J.	Donald J.	84-239 HAWA ST.
Christine C.	Christine C.	85-0358 GUARD ST.
Wayne C.	Wayne C.	85-0358 GUARD ST.
David S.	David S.	KAOHINA

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PETITION

WE, THE RESIDENTS OF THE CITY AND COUNTY OF HONOLULU AND WAIANAE DISTRICT, SUPPORT CITY COUNCIL CHAIR PATSY HINK'S REQUEST TO HILLARD T. CHOW, CHIEF PLANNING OFFICER OF THE DEPARTMENT OF GENERAL PLANNING, TO HAVE THE "OHIKILOLO" SITE REMOVED FROM THE PUBLIC FACILITIES MAP WHICH SAID REQUEST IS IN THE CURRENT ANNUAL REVIEW PROCESS.

PRINT NAME	SIGNATURE	ADDRESS
Wallace McCreary	<i>Wallace McCreary</i>	85-1907 Ala. Hana St
BRENDA VESSEN	<i>BRENDA VESSEN</i>	BOX 1249
ANDREY A. SUE	<i>ANDREY A. SUE</i>	84-962 A-1 Hana St.
Georgette A. Casey	<i>Georgette A. Casey</i>	84-06 Kiepa Pl.
Gwendolyn Areshtes	<i>Gwendolyn Areshtes</i>	86-1314 Kaniela Pl.
MARY G. DELANEY	<i>MARY G. DELANEY</i>	84-465 FAERLINGTON
Charles HANISH	<i>Charles HANISH</i>	84 964 HANA MAKAHA
Bernice H. Keegan	<i>Bernice H. Keegan</i>	87-216 HOLENA 70412
Alberta. Tavohe	<i>Alberta. Tavohe</i>	87-217 HANA MAKAHA 86-291
Thomas H. Dales	<i>Thomas H. Dales</i>	85-272 FAERLINGTON HWY
Stanford & Whosone	<i>Stanford & Whosone</i>	86-125 Analepe Place
CA Amstutz	<i>CA Amstutz</i>	86-207 Waiwae
Vedat E. Enad	<i>Vedat E. Enad</i>	87-916 FAERLINGTON HWY
GREEN FUJIMURA	<i>GREEN FUJIMURA</i>	85-936 JIM. ROAD ST.
Diana McTEGROVE	<i>Diana McTEGROVE</i>	85-118 H Ala. HANA ST.
Manuel Pajamillo	<i>Manuel Pajamillo</i>	87-626 Manoa ST.
Richard Davidson	<i>Richard Davidson</i>	84-1050 Lahi Lahi St.
PEIK BOPTZBOZ	<i>PEIK BOPTZBOZ</i>	87-673 manunui ST.
Denise Lapilo	<i>Denise Lapilo</i>	87-147 ALIANA ST.
Mona Ames	<i>Mona Ames</i>	85-309 Imiponopi 9672
Scott Casey	<i>Scott Casey</i>	84-124 Kiepa Place
Yuse Luque	<i>Yuse Luque</i>	85-143 Ala. HANA ST.
Alexandria Pavao	<i>Alexandria Pavao</i>	84-850 D. FAERLINGTON
Faron Martin	<i>Faron Martin</i>	85-145 Ala. HANA ST.
MARU BUENA	<i>MARU BUENA</i>	84-949 HANA ST. A.
TRUDY CHAVEZ	<i>TRUDY CHAVEZ</i>	87-151 PALAKALANA ST.
Dorene Vantula	<i>Dorene Vantula</i>	85-118 C. Ala. HANA ST.
Allen P. S. S.	<i>Allen P. S. S.</i>	85-133A-CHALMERS ST.
Jethin Andille	<i>Jethin Andille</i>	85-415 A HANA ST. HANA

PETITION

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PRINT NAME	SIGNATURE	ADDRESS
Joseph Bonafant	<i>Joseph Bonafant</i>	1199 HANA
London Landin	<i>London Landin</i>	87-190 Fair Hwy
PATRICIA SOFA	<i>PATRICIA SOFA</i>	85-2700 Ala. HANA ST
Carolyn DeWitt	<i>Carolyn DeWitt</i>	84-280 HANA ST.
JAMES SA	<i>JAMES SA</i>	84-224 HANA ST.
Denny Davidson	<i>Denny Davidson</i>	84-555 HANA ST.
Robert H. Davidson	<i>Robert H. Davidson</i>	84-553 HANA ST.
Dennis M. D. Smith	<i>Dennis M. D. Smith</i>	85-018 HANA ST. HANA
Wesley L. Smith	<i>Wesley L. Smith</i>	84-265 HANA ST. HANA
Frances Grant	<i>Frances Grant</i>	84-265 HANA ST. HANA
Mrs. Miriam K. Smith	<i>Mrs. Miriam K. Smith</i>	87-236 HANA ST. HANA
Robert Padalen	<i>Robert Padalen</i>	87-137 A-GILMAN ST.
Virginia STEPHAN	<i>Virginia STEPHAN</i>	639 HANA ST. HANA
LIONEL STEPHAN	<i>LIONEL STEPHAN</i>	639 HANA ST. HANA
R.D. RAVEY	<i>R.D. RAVEY</i>	1533 HANA ST. HANA
ANNE RAYE	<i>ANNE RAYE</i>	1533 HANA ST. HANA
BARBARA K. FERREIRA	<i>BARBARA K. FERREIRA</i>	91-993 HANA ST. HANA
FRAN BUSTAMANTE	<i>FRAN BUSTAMANTE</i>	87-150 HANA ST. HANA
Cherry H. H. H.	<i>Cherry H. H. H.</i>	87-575 HANA ST. HANA
Beth Rose Resentes	<i>Beth Rose Resentes</i>	87-148 HANA ST. HANA
Robert C. Baker	<i>Robert C. Baker</i>	87-148 HANA ST. HANA
Elena K.P. Tagudin	<i>Elena K.P. Tagudin</i>	87-148 HANA ST. HANA
LeRoy H. Wobula Jr.	<i>LeRoy H. Wobula Jr.</i>	87-148 HANA ST. HANA
CAELIC E. Cunha	<i>CAELIC E. Cunha</i>	87-148 HANA ST. HANA
PETER W. BAKER	<i>PETER W. BAKER</i>	84-231 HANA ST.
Priscilla Gilmer	<i>Priscilla Gilmer</i>	85-175 HANA ST.
Lyah Kivira	<i>Lyah Kivira</i>	85-175 HANA ST.
GARETT LUTTRELL	<i>GARETT LUTTRELL</i>	84-962 HANA ST.
Judy HORNBER	<i>Judy HORNBER</i>	84-962 HANA ST.

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PRINT NAME	SIGNATURE	ADDRESS
CHARLES YUNG	<i>Charles Yung</i>	86-115 Oahu Ave. #1
Clayton Young	<i>Clayton Young</i>	86-115 Oahu Ave. #1
Mike Stouff	<i>Mike Stouff</i>	85-731 Puuiki Pl. #A1
REENA PUNA	<i>Reena Puna</i>	85-225 F Ala Ala St.
HANNIHO SOMILDAN	<i>Hanniho Somildan</i>	15-360A Mahinaua Rd.
Wendy Dahi	<i>Wendy Dahi</i>	PO BOX 721 WAIANA'E
DAVID M KEMO III	<i>David M Kemo III</i>	85-127 MAHINAUA ST.
Emily Lopez	<i>Emily Lopez</i>	85-229 L. Hue St.
Richard Tomason	<i>Richard Tomason</i>	84-664 4th MAHINAUA ST.
Donald W. Mladek	<i>Donald W. Mladek</i>	87-1676 Kelaia St.
RICHARD L. SOWERS	<i>Richard L. Sowers</i>	530 Mahala Uky Twa
Sabrina Rivera	<i>Sabrina Rivera</i>	88-229 Kelaia St. Waiana'e
David A. Kaimanaka	<i>David A. Kaimanaka</i>	87-171 Mahala St. Waiana'e
Merritt Tomason	<i>Merritt Tomason</i>	85-170 Kelaia St.
ABBIE H. KAISA	<i>Abbie H. Kaisa</i>	P.O. Box 853 Waiana'e HI 96792
Ann M. Okada	<i>Ann M. Okada</i>	87-143 Mahala St.
Russell Y. Hirata	<i>Russell Y. Hirata</i>	84-627 Mahala St. HI 96792
VINCENT A. SAURA	<i>Vincent A. Saura</i>	87-114 Mahala St. Waiana'e HI 96792
MARTHA A. BENNINGTON	<i>Martha A. Bennington</i>	1131 Mahala St. Waiana'e HI 96792
HEVER I. CASSETT	<i>Hever I. Cassett</i>	710 Kelaia St. Waiana'e HI 96792
LINDA GALLAGHER	<i>Linda Gallagher</i>	85-1111 MAHALA ST. WAIANA'E HI 96792
Carole Quinn	<i>Carole Quinn</i>	" " " "
FETERED HAYASHI	<i>Fetered Hayashi</i>	PO Box 784 Waiana'e HI
LARRY RICHMAN	<i>Larry Richman</i>	84-050 FARR. HWY
DARREN DAVISO	<i>Darren Daviso</i>	48-1035 AUMAHU ST.
ANTHONY L. BAIRD	<i>Anthony L. Baird</i>	PO Box 784 Waiana'e HI
William Lim	<i>William Lim</i>	PO Box 277 Waiana'e
Paul Lee	<i>Paul Lee</i>	85-142 Kelaia St.
Sherrice Hayashi	<i>Sherrice Hayashi</i>	P.O. Box 784 Waiana'e

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PRINT NAME	SIGNATURE	ADDRESS
PLO MEYER	<i>PLO Meyer</i>	87-228 Hologoro St.
Georgina Pora	<i>Georgina Pora</i>	87-699 Mahana St.
Regina V. Vincent	<i>Regina V. Vincent</i>	6827-111th St Ewa Beach
Athina Estillone	<i>Athina Estillone</i>	94-208 Aliipono St.
Boby Kouka	<i>Boby Kouka</i>	P.O. Box 87 Waiana'e
Dorothy Padesco	<i>Dorothy Padesco</i>	88-557 Kelaia St.
Earl F. Baker	<i>Earl F. Baker</i>	87-126 Kelaia Ave.
Kathy Tunica	<i>Kathy Tunica</i>	85-1009 Maui St.
FARREZ EKAM	<i>Farrez Ekam</i>	25-080 MAHALA PL.
Willis Vankiwire	<i>Willis Vankiwire</i>	88-059 ANALIHO ST.
Rachel K. Paack	<i>Rachel K. Paack</i>	8-1111 Hahaione St.
Bertie L. Umbaki	<i>Bertie L. Umbaki</i>	85-155 Mahala St.
LYLITE FARGENTHAK	<i>Lylite Fargenthak</i>	87-150th Kelaia St. Waiana'e HI 96792
Sue Teoban	<i>Sue Teoban</i>	87-2131-2 Kelaia Place
Anna O'Brien	<i>Anna O'Brien</i>	88-171 Kelaia Ave.
Rita M. Rose H	<i>Rita M. Rose H</i>	88-920 Ewa St. Waiana'e HI 96792
Elizabeth P. Padesco	<i>Elizabeth P. Padesco</i>	87-150th Kelaia St. Waiana'e HI 96792
Phyllis Kengpa	<i>Phyllis Kengpa</i>	86-225 Kelaia St. Waiana'e HI 96792
Dora Shofa	<i>Dora Shofa</i>	P.O. Box 612 Waiana'e HI 96792
Lloyd Reinhardt	<i>Lloyd Reinhardt</i>	88-525 Mahala St. Waiana'e HI 96792
Joseph Carrera	<i>Joseph Carrera</i>	85-1111 MAHALA ST. WAIANA'E HI 96792
ANITA G. LUKUA	<i>Anita G. Lukua</i>	84-102 Kelaia St. Waiana'e HI 96792
Gidget J.C. Rita	<i>Gidget J.C. Rita</i>	86-266 Kelaia St. Waiana'e HI 96792
Linda Meyer	<i>Linda Meyer</i>	84-950 Kelaia St. HI 96792
Bret Foster	<i>Bret Foster</i>	85-148 E ALA WALUA ST. HI 96792
Marie Ann Pichb	<i>Marie Ann Pichb</i>	87-227 Hologoro St. HI 96792
Pamela Akana	<i>Pamela Akana</i>	87-1512 Kelaia St. HI 96792
Bartha Taniolo	<i>Bartha Taniolo</i>	84-645th Kelaia St. HI 96792
Tom Teikere	<i>Tom Teikere</i>	86-904 Kelaia St. HI 96792

DEPARTMENT OF PUBLIC WORKS
CITY AND COUNTY OF HONOLULU
610 SOUTH KING STREET
HONOLULU, HAWAII 96813



SILEEN R. ANDERSON
Mayor

MICHAEL J. CHAN, PH.D.
DIRECTOR AND CHIEF ENGINEER

MAURICE H. RAY
DEPUTY DIRECTOR

R 84-153

March 15, 1984

Mr. Albert & Mrs. Theola Silva
P. O. Box 311
Waimae, Hawaii 96792

Dear Mr. and Mrs. Silva:

SUBJECT: Leeward District Sanitary Landfill Environmental Impact Statement

We appreciate your valuable comments and offer the following responses.

Comment:

"In reviewing the EIS for the Leeward Sanitary Landfill it is obvious that there has been insufficient research conducted for the EIS on Ohikilolo. In addition to our earlier comments to the EIS Preparation Notice which is included in the EIS dated August 25, 1983, we offer these further comments:"

"1) Archaeological Impact"

"There are historical sites of value located in Ohikilolo Valley. The Archaeological Reconnaissance conducted just touched on surface information, yet it recommends that if at all possible Ohikilolo be deleted from the list of possible landfill sites. Ohikilolo's uniqueness is a vast open air classroom of historical information that needs a full-scale archaeological survey that is not just limited to the boundaries of the sanitary landfill project. Since the Wai'anae Coast has had the largest Hawaiian population, historical and archaeological significance should be determined."

Response:

We believe that sufficient research and documentation have been conducted in the preparation of the EIS to allow policy makers to render an informed decision regarding the project. We agree that additional archaeological

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work will be required for Ohikilolo Valley if it is to be developed as a landfill. We have and will continue to work with the State Historic Preservation Officer and follow all of his recommendations.

Comment:

"2) Impact on traffic on Farrington Highway"
"Increasingly heavy traffic conditions are already adversely affecting the Wai'anae Coast community. The landfill proposal would increase traffic congestion on already inadequate roads. The traffic impact report is inadequate and certainly needs more in depth studies conducted. Collection trucks, transfer trailers, private or commercial refuse trucks, trucks transporting cover materials, homeowners going through Manakuli, Meili, Wai'anae and Makaha before getting to Ohikilolo will certainly have a traffic impact not to mention the fact that the added traffic will have to pass Manakapo Elementary, Wai'anae Intermediate and Wai'anae High School along Farrington Highway."
These costs are astronomical not only to the City and County but also to the taxpayers."

Response:

We can understand your concern about potential traffic impact on the Wai'anae Coast Community. Because of this concern the City requested an independent traffic study be conducted by a qualified traffic engineer to evaluate the potential traffic impact from the proposed project. The unedited results of the traffic study were included in the Environmental Impact Statement. The traffic study projected the worst possible traffic conditions and the resulting impacts. The conclusion was that the traffic from the proposed project should not significantly increase the total traffic volume on Farrington Highway because the project generates relatively low traffic volumes.

Comment:

"3. The cost effect on distance"
"The proposed site would increase costs to the City and County of Honolulu. There have been no cost effect estimates. With increased cuts in programs, budgets, etc., no economic impact study was conducted. The following costs should be considered and evaluated:

- a) cost of acquisition of land
- b) cost to develop landfill site
- c) distance cost from refuse generating center
- e) cost of improvements required to made landfill environmentally acceptable
- f) cost of operation

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- g) cost of maintenance
- h) staffing cost
- i) cost of distance
- j) traveling distance (time)
- k) wear & tear on equipment - trucks, heavy equipment
- l) cost of highway maintenance
- m) fuel cost

These costs are astronomical not only to the City and County but also to the taxpayers."

Response:

The estimated project cost is presented in Table 1-5 (p. 1-22) of the Environmental Impact Statement. The projected cost for hauling to Ohikilolo Valley is \$10.60/ton for 1987 (p. S-14). We agree that the hauling cost, site preparation cost, archaeological cost, and relocation cost will be considerable. Also, many of the costs you mention will be the same regardless of the location of the landfill.

The exact cost for the acquisition of the land, operation and maintenance costs, site preparation, etc. have not been determined. These costs can only be determined after negotiation for the land has been completed and the plans for the landfill finalized during the engineering phase of the project. All of the above actions will be undertaken after the finalization of the Environmental Impact Statement.

Comment:

"4. Impact of Sanitary Landfill on the shoreline and ground water" on the shoreline and off shore areas have not been adequately addressed. What will be the adverse environment impact to a high quality fishing area? The impact on shoreline reef life and vegetation (fish) which is gathered by the community, has not been addressed. With high unemployment in the area many residents depend on shoreline and off shore fishing. The impact of silt and infiltration from the landfill can spread into the portable water reserve area and must be taken into consideration. The question of water is essential to Ohikilolo Ahupua'a (Valley). Presently the whole valley is sustained by wells. The lower level wells are used for irrigation and the well at about the 200-foot level is used to supply water to all of the residences on the ranch and the adjoining property. A wind mill pumps water out of the lower well for irrigation to the grass fields. To cap the wells on the flats and expect the seepage not to reach the portable water reserve is a ridiculous assumption. If anything,

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we have to preserve all ground water. In this instance you have productive agricultural land with built-in water reserve not tapping into the main line. Interestingly the land at Ohikilolo has never before been so productive. Residents have commented on the fact that the land in relation to the elements in the past 2 years--when the Coast was dry there was rainfall more than usual at Ohikilolo. As a result it has almost been green year around. It has rained there when everywhere else on the Coast is dry."

Response:

The question of potential impacts to the nearshore waters from siltation and leachate has been presented in the Environmental Impact Statement [p. 4-36 to 4-39]. We believe that the landfill can be designed with the necessary safeguards to prevent significant adverse environmental impacts to the nearshore waters.

Comment:

"5. Well and portable water supply"
The existing well located above the 200 feet contour line that provides water for all of the occupants of Ohikilolo and all of the animals is not minimal. The well depth is 126 feet and approximately 118 feet to the top of the water. Why wouldn't there be seepage into portable water? Water supply is so essential to our island that there definitely needs to be more studies and informational data collected before destroying natural water supply for the present and future use. More studies need to be conducted in this area."

Response:

The landfilling activities will be located below the 200-foot elevation and below the portable water well. The formation of significant quantities of leachate and the potential contamination of water below the landfill is not expected to be a significant adverse impact. The reasons, as stated in the EIS are: low rainfall of the project area, the capacity of refuse to absorb moisture, compaction of the landfill subgrade to reduce its permeability, the covering of the refuse to prevent infiltration of rain into the refuse, the installation of perimeter drainage system and siltation basins to divert storm waters around the landfill, the installation of a leachate collection system and monitoring wells.

Comment:

"6) Agricultural Lands"
"EIS quoted SD Ag. letter dated April 6, 1983 'The majority of the 95 acres would be prime if irrigation were provided.'"

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Water from the lower well is provided for irrigation only when there is no rain. For the past 2 years we have experienced more rainfall than usual. Yields of grass from those lands proposed for Leeward Sanitary Landfill feed zoo animals and beef livestock and replacement calves for local milk industry. Agricultural potential of the completed landfill site will be limited. That should certainly classify those Ag lands as prime. The cost of importing both beef and animal feed into our state show how important all ag lands are. More data is needed."

Response:

We agree that there may be some question in the classification of agricultural land of Ohikilolo. For the purposes of ranching, and grass hay production in the flat portion of the valley, the area could be considered "prime" agricultural lands.

We recognize that irrigation of the grass hay fields has not been required because of the higher than normal rainfall in Ohikilolo Valley and that irrigation is possible using the existing wells during periods of low rainfall. We also recognize that there is sufficient water located on the project site to meet the existing needs of the ranch and that the availability of the inexpensive water, land and the multiple land uses (charcoal production, goat, donkey, cattle and beef production) make the ranching activities productive.

The decision to use this productive agricultural land for a landfill must be decided by the policy and decision makers. They must weigh the loss of the agricultural land versus the need for a landfill to meet the growing need for refuse disposal.

Comment:

"7) Hazardous Materials"

"The only access from Honolulu to the site is through the most congested and populated center of the Waianae Coast. No studies or statistics on the hazardous materials are mentioned in ZIS. The response no hazardous materials are accepted at the landfill and therefore no adverse impact to the Waianae Coast is unacceptable. Where will or how will the chemical containers, hospital or clinical garbage used the farms, etc., or in industry be disposed of? Who will check garbage for hazardous material and if they are not accepted at the landfill will they be discarded on the roadides? What about the seepage of hazardous materials into the water?"

Response:

The disposal of hazardous waste is a complex problem and properly handled by the State and Federal government. The City's position is that no

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hazardous wastes are accepted at the City operated sanitary landfills and each commercial carrier must disclose to the City the type and quantity of refuse.

Comment:

"8) Flora and Fauna"

"There is a major error in the written copy of page 7-38 under section, 'III Biological Characteristics of Ohikilolo Valley (Landfilling Area), B. Animals (Fauna)'. The copy clearly states the site is not a sensitive wildlife habitat and that the birds found are not rare or endangered. But Appendix B on page B-17 lists the pueo, the Hawaiian owl, which has been designated on Oahu by the administrative rules of the State Division of Forestry and Wildlife, as endangered."

Response:

There is no error or conflict in the determination that the lower portion of the project site is not a sensitive wildlife habitat, even though the Pueo is located on or near the project site and apparently feeds on mice and rats inhabiting the hay fields. Because the habitat has been altered by the ranching activities, including the harvesting of kiawe trees for charcoal production, the valley cannot be considered a significant or sensitive wildlife habitat. There is no protection offered to the pueo and no land area is specifically designated as a habitat for the pueo nor is the land managed as a wildlife habitat.

Comment:

"9) Social/Historical/Cultural Impact on the Community"

"The ZIS does not address the social, historical or cultural impact on the community. Hakua Ranch is widely used by Waianae Coast residents as a recreation site. It is a matter of community pride on the Waianae Coast that the Ranch is owned and run by people of Hawaiian ancestry. Concerts and large family gatherings are held free of charge at the Ranch and people from all over attend. In addition to concerts and large gatherings, the Ranch is open to hikers and horseback riders who are especially grateful for access to Ohikilolo Valley since the neighboring Hakaha Valley is completely closed to hikers and horseback riders. The Ranch has tremendous historical and spiritual significance to all the residents on the Waianae Coast. Ohikilolo is said to be the last connection to the very beginning of ranching history on the Island of Oahu. The very dry rugged terrain produced lots of cattle, good horses and cowboys that were tough as the terrain. This is where many of the stock families of Waianae identify with the Ranch. Many of their grandfathers, fathers, uncles, brothers were once cowboys or worked on the Ranch full-time, part-

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time or went out to help on the weekends. The historical events of Hawaii go back to Ohikilolo and L. L. McCandless, Rancher and Congressman to the United States.

The vast historical events of World War II, the loss of half of the ranch and the U.S. Supreme Court's decision for payment of damages and the leasing of Makua Valley to U.S. Government. A history many Elementary and High School students have come to learn. The untouched beauty of the Ohikilolo has also attracted the budding movie, television and commercial industry. Hawaii 5-0, Magnum PI and a number of Japanese Film and Commercial companies have used the ranch for location shootings. Use of the ranch grounds and facilities by the community has opened another recreational facility on the Coast. Family luau, concerts, community fairs, link the community into feeling an ownership. The Annual Branding and Luau at the Ranch bring friends and neighbors from all over the world together once a year. Cowboys from the outside island ranches and skilled ropers on the Waianae Coast come together to rope and brand calves and cattle to the amazement of bright-eyed youngsters. Many, many people contribute time and talents to the Annual Luau. Farmers bring bags of vegetables, fisherman bring fish, limu and squid, people bring plants. People come ready to help prepare foods. Musicians call to volunteer their fine talents. It's really the Waianae Coast community's Pains. We have just provide the opportunity. The Annual May Thankgiving Luau has become a Waianae Coast tradition. The beach and ocean front is open to fishermen both on and off shore. Families and community groups who want to camp at the cove make arrangements to pick up the keys for the weekend. Boy Scouts and school groups have hiked in the mountains and later sat by the open fire to hear stories and legends of Ohikilolo and Makua by community elders. The Waianae Astronomy Club has had several star parties where youngsters have learned about the universe and stars, their names and locations. Nowhere else on the Waianae Coast can the stars be visible through a telescope or with the naked eye because of the complete darkness of the area (no street lights, etc.). Some afternoons you can pass the ranch and you will see several cars or truck loads of children sitting and watching the cows, calves, donkeys and goats grazing in the grass fields. It serves no purpose to destroy so beautiful an area that so many residents identify with. Is there any wonder a community should show pride, ownership and a personal association to Ohikilolo. Ohikilolo is one of the last places on Oahu where charcoal is produced. Charcoal is used in many of the local food chain stores in Waikiki. You can find it in many of the local food chain stores with the picture of the kiawe tree.

Response:

We believe that the Environmental Impact Statement does address the social, historical and cultural impact of the project on the community.

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Specifically, a historical and archaeological survey was conducted by our consultants to determine the significance of Ohikilolo Valley. The studies did reveal the presence of significant archaeological sites which were not previously recorded for the Ohikilolo Valley. The unedited reports were included in the Environment Impact Statement.

As for the cultural significance of the valley, we have relied on community input and specifically your input on the significance of the valley to the community and to the Silva family. We have not challenged nor attempted to conceal any of the impressions, feelings or cultural significance of the valley to the community. As such, we have included all of the letters, unedited, in the Environmental Impact Statement.

Comment:

"10) Alternative Sites"

"The City needs to re-evaluate and look for other alternative sites like the hills and valleys that are below the Federal water lines. The Eva Plains need to be re-evaluated."

Response:

The search for suitable lands for landfills is an ongoing process. Presently, there are only two viable leeward sites under consideration, Waimanalo Gulch and Ohikilolo Valley. The Waimanalo Gulch site will be developed first and then Ohikilolo. The Waimanalo Gulch has a life expectancy of 7 years, which can easily be doubled if the resource recovery project is implemented.

Comment:

"12) Land Use after Landfill"

"EIS does not address land use after the landfill. No study was made on the impact of large amount of acreage or the use of the entire valley during landfill and land use after landfill."

Response:

The specific use of the land after landfilling is an unresolved issue, other than to say that the completed landfill will be suitable for some type of open space use. Plans for eventual use can be developed during the preliminary engineering phase of the project, which will commence after the Environmental Impact Statement has been completed.

Comment:

"The EIS submitted an inadequate and misleading report. It escaped the adverse effects on the residents of Ohikilolo, the Waianae Coast

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community and all of the historical and future impacts. We would like to provide future comments, be consulted and be informed of any further action concerning the use of Ohikilolo."

Response:

We believe that the RIS completely and accurately describes the anticipated effects a landfill will have on the Ohikilolo environment. There is sufficient information presented to provide an objective and factual document upon which the policy makers can base a decision.

Comment:

"The use of additional landfills is again a short term solution. The City should consider development of a more comprehensive approach to the City's needs to waste management. We encourage the Department of Public Works to consider alternatives other than Landfill."

Response:

Landfills will always be required for the disposal of non-combustible material, demolition wastes and ash from incinerators. We have and will continue to pursue other means of refuse disposal.

Comment:

"Enclosed are more petitions against the Leeward Sanitary Landfill proposed at Ohikilolo. Please include these with our previous petitions."

Response:

The petitions and your letter will be incorporated into the Revised Environmental Impact Statement and a copy will be sent to you.

We appreciate your input and the time you have taken to provide us with the necessary information required to properly evaluate our action and its impact on you and the community.

Very truly yours,



MICHAEL J. CHUN
Director and Chief Engineer

Attachment: Copy of Petition

cc: DLJ
S. Shimabukuro
EISC

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100

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THE OFFICE OF DONALD WOLBRINK PLANNING, LANDSCAPE ARCHITECTURE

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20 OCTOBER 1983

Mr. Michael McElroy, Director
Department of Land Utilization
City and County of Honolulu
650 South King St., 7th Floor
Honolulu, HI 96813

Dear Mr. McElroy:

SUBJECT: ENVIRONMENTAL IMPACT STATEMENT FOR THE PROPOSED
LEEMARD DISTRICT SANITARY LANDFILL AT MAIWAHALO CULCH
SITE
(TK: 9-2-03:2, 13, 40) & OHUKILOLO SITE (TK: 8-3-01)

The Director and Chief Engineer of the City & County Department of Public Works has kindly forwarded to me a copy of the subject EIS, welcoming my review and comments. I have been retained by the McCandless heirs as their advisor and thus my involvement in this project is limited to those aspects related to their property at Ohukilo.

The comments contained in this letter should be considered as coming from the McCandless heirs as their positions on these matters. Thus, the McCandless heirs, and not Donald Wolbrink, should be identified as commenting on the EIS. Page 12-2 of the EIS should also be corrected to indicate that the McCandless heirs provided written comments to the NOP.

The McCandless heirs do not believe that the EIS, as drafted, fulfills the content requirements set forth in the EIS regulations, Sub-part E, 1:42. Comments prepared by me follow:

ALTERNATIVES TO THE PROPOSED ACTION

A. General Inadequacy of The Section

The Alternatives Section (Section 6) is grossly inadequate. As stated in Sub-part E, Section 1:42(g) of the EIS regulations, the EIS must include:

"Any known alternatives for the action which could feasibly attain the objectives of the action - even though more costly - shall be described and explained as to why they were rejected."

"For agency actions, this discussion must include where relevant, those alternatives not within the existing authority of the agency."

"A rigorous exploration and objective evaluation of the environmental impacts of all reasonable alternative actions, particularly those that might enhance environmental quality or avoid or reduce some or all of the adverse environmental benefits, costs, and risks shall be included in the agency review process in order not to prematurely foreclose options which might enhance environmental quality or have less detrimental effects... In each case, the analysis shall be sufficiently detailed to allow the comparative evaluation of the environmental benefits, costs, and risks of the proposed action and each reasonable alternative."

The alternatives section does not provide sufficient information to enable the reviewer to make any judgments or conclusions about alternative sites. This is not because of lack of information on the subject. There are several reports and studies that describe viable alternatives to the use of Ohukilo, and without exception, point out the shortcomings of Ohukilo in relation to other sites.

The Alternatives Section of the subject EIS consists of one and a quarter pages of text and a table listing potential sites. Because the narrative descriptions in the text are so brief, the table is meaningless.

The sites listed in the table were evaluated by Shimabukuro & Associates in 1977 and 1979. Although the 1977 report is available at the Municipal Reference and Records Center, the 1979 document, which describes and evaluates sites 27 to 36 in Table 6-1 of the EIS, is not available in any public reference location. Upon inquiry at the Division of Refuse Collection and Disposal, it was learned that the report had never been finished and that the draft copies were being used by the Division only for reference purposes. An unfinished, publicly unavailable document can hardly be incorporated into an EIS by reference, particularly in the important area of alternatives.

Alternatives analysis, and in fact site selection itself, is not necessarily a "black & white" matter. Creative ways to use a site, such as proposing joint use by those with common needs or by anticipating a means of revenue generation for a landowner or community, as well as a program of community participation and information, backed up by a splendid operation record, all can have a major influence on site determination for sanitary and demolition landfills. (As an example, I have observed sanitary landfill operations in Los Angeles in their final stages surrounded by single family homes in the \$150,000 class, a circumstance reflecting total acceptance of the landfill operation.) This type of analysis should be included in any

complete alternatives' section. In fact, the EIS regulations (1.42(g)) mandate agencies to include discussions of alternatives not within the existing authority of the agency, if these are relevant. We believe that in the case of the subject EIS, such a discussion is warranted.

B. Criteria and Evaluation

The 1977 report entitled Inventory Study of Potential Sanitary and Demolition Landfill Sites, prepared for the City and County of Honolulu by Stanley S. Shimabukuro and Associates, Inc., lists nineteen criteria for selecting a landfill (Appendix A).

The report further notes that although the tabulation lists nineteen items as the criteria, each site was only required to have four essential characteristics before being considered for further evaluation as a potential landfill (p. A-3). These essential basic characteristics are:

1. Adequate capacity.
2. Adequate protection of our ground water supply.
3. No apparent significant environmental damage to the land, air, ocean or population.
4. Apparent economic feasibility.

Unless all four criteria were met, potential sites were not considered for further evaluation.

Ohikilolo did not meet these basic requirements. Out of 26 potential sites considered for further evaluation it was ranked 25th. The Shimabukuro Report describes the Ohikilolo Landfill Site as follows (page C-47):

"The Ohikilolo Landfill Site is located north of Makaha Valley. It is remote from refuse generation centers and hauling costs would be high..."

"This site is not recommended for landfill development."

The report was prepared in 1977. A supplement to this report prepared by Shimabukuro in August, 1979, (the unfinished draft previously referred to) also recommends against the Ohikilolo site. This supplemental report was commissioned by the City to develop new site selection criteria, reevaluate the leeward sites contained in the 1977 report, and look at additional sites. Twenty leeward sites were reviewed. Nine of these were rejected for various reasons. Of the remaining eleven, Ohikilolo ranked eighth and we question whether those ranked lower are not in fact more suitable than Ohikilolo for sanitary landfill purposes. The report notes (page IV-9):

"The Ohikilolo site is far removed from the Keahi transfer station (36 miles). The upper areas are over the BMS groundwater zone. First Hawaiian Bank has a substantial rest and recreation facility at the site. Also, three residences may be displaced. Unstable and rising fuel prices make this site unattractive."

"This site is not recommended for landfill development."

Another report written in 1983 confirms the unsuitability of the site, in the context of this being a proposed site under active consideration by the City, despite its obvious shortcomings. This report is the environmental impact statement for the City's proposed Solid Waste Processing Resource Recovery Facility, prepared by Belt, Collins and Associates. Unlike the environmental impact statement under discussion, it includes a concise but complete discussion of alternatives to the proposed facility. In Table V-2, Potential Landfill Sites Currently Under Consideration by the City and County, page V-4, under Comments, it is noted that Ohikilolo "will increase highway traffic. High transportation costs for hauling refuse from urban areas."

Ohikilolo did not meet the criteria in 1977 and it does not meet them now. There have been no changes in the facts relative to Ohikilolo. The only reason it is even being considered is because of the political problems that have arisen around other sites. However, we believe that the fact that there are difficulties in connection with or opposition to other sites does not make Ohikilolo a good site now.

The fact that Ohikilolo ranked next to last on a list that covered not just the leeward side but all the potential sites on Oahu indicates the inadequacy of the discussion on alternatives. Section 6, Alternatives To The Proposed Action should be expanded to include a thorough discussion of the genuine and real alternative sites that are not only feasible, but also are better alternatives than using Ohikilolo.

C. Sites Which Have Been Rejected

The following points apply to many of the potential landfill sites that have been summarily dismissed in the Alternatives section:

1. The City has not done a good job in selling landfills to the community for two major reasons:
 - a. The City's operations have not been as good as they should be, and it therefore lacks credibility when it tells citizens that sanitary landfills are clean operations and can be compatible neighbors. People naturally respond based on what their own observations

tell them - that the City consistently does not allocate sufficient resources to the Division of Refuse Collection and Disposal and that the so-called sanitary landfill will actually be a dump. This does not have to be this way. In other communities, notably Los Angeles, sanitary landfills are run so well that they are accepted in wealthy neighborhoods. There the people believe that the operation will be well-run and know that they will eventually have a new park because the governmental track record is consistently good.

The Shimabukuro report states in its Conclusions, page I-11, that:

"The City can improve its landfilling operations. Landfill personnel need continual training. Detailed landfill plans should show operational phases and incremental development."

In its section entitled General Recommendations, page I-13, the report recommends that:

"The City should upgrade the appearance of the existing Kapaa, Kawaihoa, and Waianae sites by landscaping completed areas as soon as practicable and not wait until the entire site is filled before beginning landscaping operations. Landfill personnel should receive formal training. The whole concept of a sanitary landfill and the Department of Health regulations covering landfill operations should be explained to all landfill personnel."

"Secondary beneficial uses, such as parks, golf courses, farmlands, ranches or open space, should be determined prior to the land being used as a landfill site and plans for implementation of such uses should be prepared at least one year before the completion of the landfills."

The City also has not allocated sufficient resources to selling its programs to the community, particularly its refuse disposal projects. An excellent example is the history of resource recovery projects. Despite repeated setbacks, the City has not been willing to make the necessary commitment to this most important matter. As a result, uneconomic and least desirable sites are now having to be considered.

The Shimabukuro report also comments on this deficiency in both its Conclusions and General Recommendations sections. Under Conclusions, page I-11, it is stated that:

"There is a need for a public relations effort to educate the general public in solid waste disposal technology. Through education, most citizens can become supporters of the City's solid waste disposal program."

Under General Recommendations, page I-13, it is suggested that:

"The City should expand its public relations effort regarding sanitary landfills to gain public support. The prevailing open dump idea type of operation now in the minds of the public should be dispelled once and for all. The need for landfills should be explained..."

On June 30, 1983, in a speech to the Honolulu Chamber of Commerce, Mayor Eileen Anderson expressed her great concern about the problem of community opposition to needed major facilities, and the increase in the "not in my backyard" attitudes that have hampered important municipal activities. She noted that:

"...The immediate problem is that we are giving to certain residents - sometimes not more than a handful - a veto power over what is a community decision..."

"A solution to the Not In My Backyard syndrome will not come quickly or easily. But I think we should accept the fact that it must be found if we are to continue the progress of our City in the years ahead...as well meaning as they may be, we cannot allow small groups of individuals, purporting to represent certain neighborhoods, a veto power over decisions having island-wide implications. We cannot capitulate to a few phone calls, letters or demonstrations..."

It is clear that the only reasons an uneconomic site such as Ohikilolo is even being considered is because community opposition, real or only apparent, has caused the Department of Public Works to drop more suitable sites from consideration. There are not only many alternative sites available, they are all superior to Ohikilolo, and they should be discussed at length in the section on alternatives.

The City has rejected the pursuit of alternative sites on military lands with insufficient reasons. While it is true that there has been a lack of enthusiasm for joint use of federal properties, particularly military bases, in the past, new policies have been adopted by the present administration that may alter the situation.

2.

3. Other sites have been rejected as alternatives because there are problems connected with using the entire area. Certain sites have been considered by the city and rejected because the entire area planned for was not available. However, the alternative of using only part of the proposed site has not been explored.

D. Specific Sites to be Reconsidered

In our written comments to the Notice of Preparation (NOP), we requested that nine specific alternative sites be evaluated and assessed in the EIS. Much to our surprise (and dismay) our request was ignored and the sites were summarily dismissed without adequate documentation or, to our knowledge, valid reasons for rejection. Again, we request that the following sites be reevaluated and a rigorous and objective evaluation of the environmental impacts of these sites and comparative costs be incorporated into the EIS. The EIS regulations mandate that this be done even though some of the sites (such as those on military lands) are not within the existing authority of the agency.

1. Hanalei

Hanalei A, a former quarry, is listed as "close to a community." It is an abandoned quarry. An alternate which would leave a major buffer between the fill site and the community could leave as much as 100 acres available for sanitary landfill. A smaller buffer at Hanalei B could add another 100 acres, perhaps enough area for 15 to 20 years of landfill activity. Citizen opposition should not be the primary criterion for rejecting the site. The city should give something to the community in return, such as the regional park described in the 1978 EIS for this site.

2. Hailii

Table 6-1 says that this is an active quarry and "it is not contemplated that the owners will allow the city to develop a landfill at this site." This is a 200-acre site. It may be possible for quarrying to take place in certain parts of the site, with landfill concurrently in other parts - all to the significant financial benefit of the quarry owner who could receive premiums or royalties from the city in lieu of land acquisition. Also, the use of an active quarry for a sanitary landfill may provide substantial cost savings due to the fact that sufficient cover material is available on site. In addition, based on data presented in the 1977 Shimabukuro report, which states that quarry operations are expected to continue for 25 years, the active life of this quarry will be reduced by approximately 50% by the time the site is needed for landfill purposes.

3. Maipilo Landfill Site (areas within the NAWPAG WEST LDCB Branch ESOB Area.)

These areas are drawn representing distances from West Loch ammunition docks. The Naval Magazine, Lualualei, Hawaii Capital Improvements Plan - 1982 recommends that "the land area inside the ESOB area should be retained to construct ordinance magazines for all services including current rollback requirements." It is recognized that sanitary landfill and ordinance storage do not mix due to methane gas formation, however, even a minor flexibility in the acreage to be reserved for ordinance storage could benefit both the Navy and the City.

4. Kalanee Landfill Expansion

Some of the reasons this site was not recommended for expansion as a major regional landfill development in the 1979 Shimabukuro report were because: (a) the access road would have to be improved; (b) some homes might be located too close to access routes and require relocation; (c) the atmosphere of the rural type roadway or the country style living would be severely disrupted; and (d) the distance from the Keen Transfer Station (30 miles) could become a major economic factor. With the exception of improving the access road, all of these limitations apply to Ohikilolo and, in addition, Ohikilolo is 6 miles farther away from the transfer station. As this is an expansion of an existing landfill, this alternative requires reevaluation as a landfill site.

5. Kahe

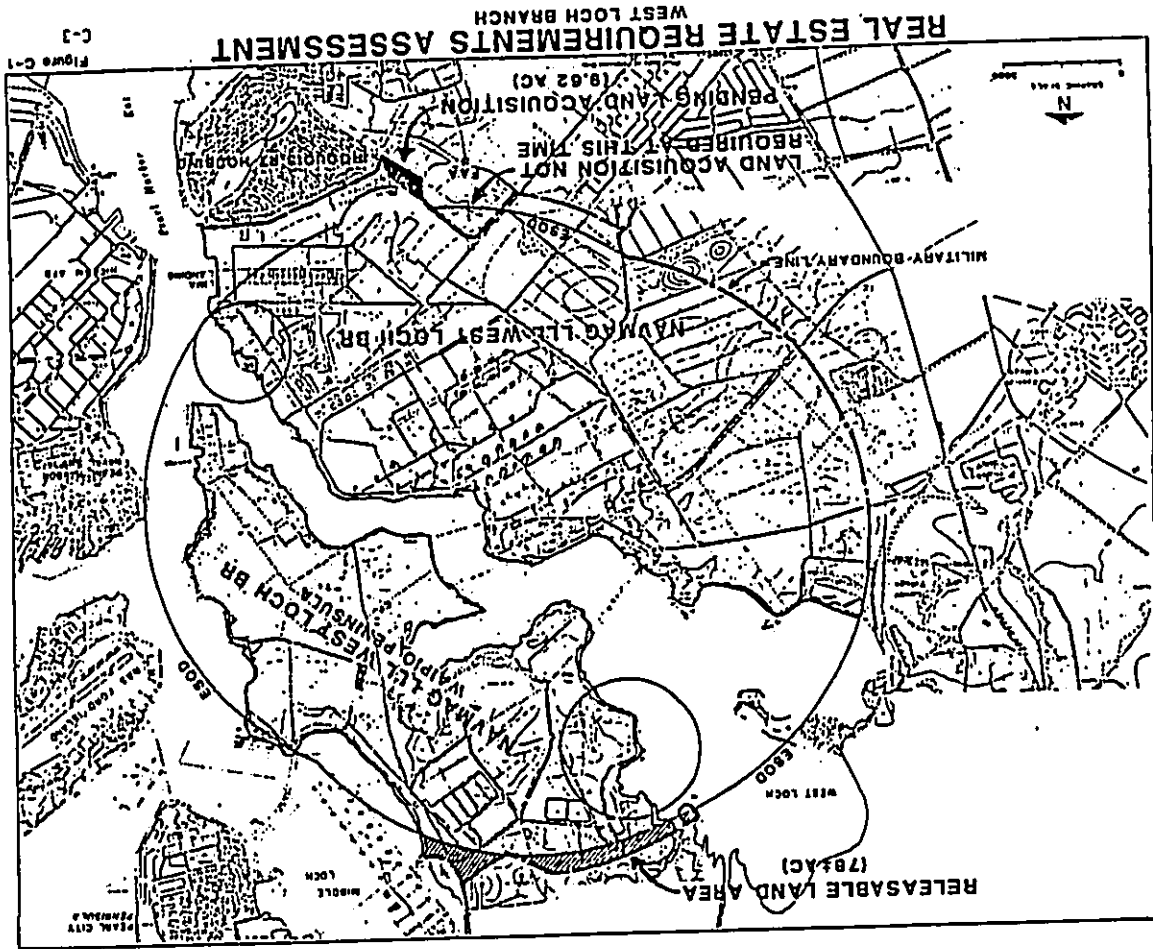
Has Hawaiian Electric been contacted recently as to their current plans for the area? Perhaps their expansion plans are less ambitious at the present time.

6. Ewa I and II

The 1979 Shimabukuro report states that these sites are outside the BMS groundwater zone. Table 6-1 states they are within groundwater supply area - who is right? At least one of these sites should be reconsidered as they ranked 1 and 2 in the 1979 Shimabukuro report.

7. Honouliuli Expanded to 52 Acres

This site was recommended in the 1979 Shimabukuro report. This report also stated that the site was outside the BMS groundwater zone.



8. Koko Crater

Although it is obvious that strong opposition to this site will be forthcoming, it should not be dismissed without thorough investigation and a public relations effort. We recognize that traffic impact on Kalaheo Highway presents a potential problem, however, hours of operation could be adjusted so that trucks will not be on the road during peak periods. The economics of the situation requires that this site receive further study.

9. Several Sites

Among the various potential sites investigated, it would seem that an approach of using several sites at once could be considered, i.e. a small site in Waianae for sanitary and demolition landfill material originating only in Waianae, the Barbers Point site for demolition material only, and one or more sites in central Oahu for material from Honolulu.

E. Sites Not Previously Considered

1. Navy Surplus Land at Waipio

In our comments to the NCP we noted that the Navy owns ± 78 acres of releasable land at their Northern Waipio peninsula NAWPAC boundary (a map showing this area is attached). In the narrative section of the 1982 Capital Improvement Plan for Naval Magazine Lualualei which accompanies the map, the Navy states:

"A possible long range land use on Waipio Peninsula including the 78 acres of releasable land is for a Navy sanitary landfill in the event the Palalaia landfill site is closed or if the city's H-power project is not constructed. The ordinance storage potential capacity for the West Loch Branch will probably be affected contingent on the landfill "operational" requirements. The same 78 acres has also been considered in the Pearl Harbor Master Plan as a potential site for additional POL storage."

The possibilities of obtaining this and/or other military surplus property should be investigated and evaluated in the Revised EIS. Both the Navy and the City have significant sanitary landfill needs on this island. A jointly developed program for mutual benefit would seem warranted.

2. Pearl City Peninsula-Waipio

There are options available for landfiling on the Pearl City Peninsula locale, they are:

discussed. It is our understanding that the City's arrangement at Palalai allows them use of the facility at nominal cost. Comparisons of costs to the City (Capital and Operational) for private versus municipal landfills should be analyzed.

OTHER COMMENTS ON THE EIS
(In order that they appear in the document)

A. Page 1-9 & 1-10, Table 1-2 & 1-3: On what basis was the assumption made that no additional private or military sanitary landfill sites would be in operation after 1987? Please document your sources as such landfills could reduce the tonnage estimated for City-owned landfills.

B. Page 1-19: What has the city been doing to exploit the methane gas resource resulting from its landfill operations?

C. Page 1-22, Table 1-3: Please break down the administrative operation and maintenance and supply costs by cost item and by site. Are land costs included in development costs? If we read Table 1 in the 1979 Shimaburo report correctly, hauling costs to Ohikilolo will be \$12,600 per day (1000 lbs./day, 1979 dollars). This is \$3.9 million per year or approximately \$82 million (1979 dollars) in hauling costs alone for a six day per week operation for 21 years. A less remote site with a comparable life could represent 10's of millions of savings in hauling costs. For comparative purposes, hauling costs for life of operation should be stated in the revised EIS for sites to be reconsidered.

Have increased labor costs necessitated by the remoteness of the site been factored into the cost estimate? How do these figures compare with those of other alternative sites not considered in the EIS?

D. Page 2-22A: From what point of reference is the estimate of 36 miles from Honolulu taken? Downtown Honolulu? Keel transfer station? Where?

E. Page 2-23-2: Have the costs of buying and hauling cover material been considered in evaluating the suitability (or unsuitability) of the site?

F. Page 2-37-D: Much of the total annual rainfall may accumulate from several storms during the winter months. How would this affect the operation? Averages can be very misleading.

G. Page 2-37-E: There appear to be contradictions concerning the availability of water on the site. On page 2-35 it is said that some water is available on site from one well, whereas Figure 2-8 (without a legend) seems to show several wells on the site. Later, on page 4-51, it is stated that "The Board of Water Supply's water main will need to be extended to the project site to provide water for drinking and irrigation."

a. I have met with the Navy and they informed me that some years ago the Navy and the City worked out an arrangement whereby the Navy would furnish the City with title to approximately 95 acres of land for a new Ted Wakalena golf course. (We understand from the Navy that this offer has never been rescinded.) This 95-acre site could be incorporated with the 28 acre City-owned and now closed Pearl City sewage treatment plant site, making a total of 123 City-owned acres. One possible plan for these 123 acres is to first use them for a sanitary landfill. When the site is at capacity for that purpose, a golf course could be created on the fill.

b. The present Ted Wakalena course on Waipio Peninsula could be used for landfilling when the 123 acres described above are full. A second golf course could be constructed when landfill operations are completed. It should be noted that saltwater intrusion is said to be a serious maintenance problem at the very popular present course, due to its low elevation. Filling would enhance the recreational attributes of the site by solving the maintenance problem.

Implementation of one or both of these alternatives could not only provide the City with sufficient landfill capacity for the foreseeable future but also could ultimately result in doubling the number of golfing facilities in the area. For these reasons, we believe that the City should seriously consider these options and provide a rigorous evaluation of their environmental impacts, including cost comparisons with other alternative sites, in the Revised EIS.

F. Other Deficiencies in Alternatives Section

1. Alternative Processing Methods

Another deficiency of the section on Alternatives to the Proposed Action is the discussion on alternative processing methods. This discussion consists of a three-line paragraph. Even if the conclusion that the only two viable methods to reduce the volume of solid waste are incineration and energy recovery is accepted as valid, there should be at least some discussion on why this is true and why other alternatives are not being proposed. A good example of such a discussion can be found in the EIS for Solid Waste Processing Resource Recovery Facility by Belt, Collins & Associates.

2. Private Landfill Operations

A detailed discussion of providing incentives to the private sector to develop commercial landfills should be

The Department of Health has developed an inventory of both drinking water wells and injection wells as part of the underground injection control development. Please identify what wells on the property will be closed and how this will affect the on-site water supply. In addition, please clarify the actual availability of on-site water for landfill operations. If water must be brought to the site, what is the length and cost of the proposed water main extension? Has this cost been included as a development cost?

H. Page 2-39 - A1: How much water will the landfill operation require? How will this affect supply?

I. Page 2-39 - B2: Potential fires are a serious threat in an arid valley. What provisions are being made for fire flow? Again, provision of water to the site should be described and clarified.

J. Page 2-40: Social and cultural values should be included in the description of the socio-economic characteristics section. Ohikilolo may be the only remaining valley on Oahu where a spirit and feeling of old Hawaii from pre-history to the present persists. This is not at all a matter of simply preserving a certain "lifestyle." It involves protecting an environment which successfully integrates the spirit of the past with the realities of present day living. Ohikilolo is a place, but even more so it is a total experience: historically, culturally, and aesthetically.

K. Page 3-1: The relationship of the proposed project to the goals and objectives of the General Plan of the City and County of Honolulu, the State Plan, the Agriculture Interim Guidelines Functional Plan, and the Coastal Zone Management Program should be described in the Revised EIS.

L. Page 4-39 B: How much runoff can be expected? Quantities should be given.

M. Page 4-42: It should be emphasized in the noise impacts section that the noise created by refuse trucks will impact an area 36 miles in length. Although this noise may be intermittent rather than continuous, an evaluation of the number of residences, schools, churches and recreation facilities that will be affected by the project should be incorporated into the Revised EIS. The regional impacts (secondary) of the project should not be underestimated. It should also be noted that this impact (noise) will continue for the duration of the project - 21 years or longer, and should certainly be considered as a long-term secondary impact.

N. Page 4-47 V-A: Litter will be a problem unless proper operating and monitoring procedures are followed.

O. Page 4-49-51: Who decides what the final use of the land will be? Does the City have any plans to establish an outdoor recreation area in the valley? Final use is important in evaluating whether the compensation to be derived exceeds the inconvenience to the landowner which he must experience when giving up his land. In addition, the visual impact of a completed altered natural valley cannot be mitigated.

P. Page 4-49 VII-A: Will dust and gases produced from the landfill operation affect the rare flora on the ridge?

Q. Page 4-50 A and Appendix C: The conclusions and recommendations of the City's archaeological consultant should be incorporated into the impact section of the EIS. This well-done reconnaissance survey recommends that the area be deleted from the list of possible landfill sites. The archaeological consultant states that Ohikilolo appears to offer an unrivaled example of a dryland agricultural/aquacultural system. He concludes his study by stating "This valley offers an unrivaled opportunity for archaeological examination, and all efforts must be made to maximize the amount of information retrieved prior to use, if the landfill is deemed necessary." Has a time and cost estimate been made for such a survey?

R. It should be noted that when the site was evaluated by Shueburo it was thought that there were no archaeological features present. Now that potentially significant sites have been discovered on the property, it behooves the City to reevaluate its decision to desecrate the site.

S. Page 4-51 2: Because of the potential for serious fires which could affect not only the project site but the entire region, on-site fire flow should be provided. Due to the gusty winds, fire breaks are not always successful in containing fires. Water and other means should be readily available to quickly extinguish fires. Although response time from Maianae is theoretically less than 10 minutes, bumper to bumper weekend traffic on the narrow two-lane highway could lengthen this time considerably.

T. Page 4-52 XI: The economic impact section should present a table of costs which includes the additional costs that will be incurred to bring utilities, including water, to the site in order to truly reflect the effects that the remoteness of this site will have on total costs. In addition, an estimate of the revenues to the City which will be foregone if the project is implemented should also be given. A detailed cost analysis may indicate that, although sanitary landfills in general are the most cost effective method of refuse disposal, a landfill located in a remote site such as Ohikilolo may not be cost effective when compared to other means of disposal.

U. Page 4-52 XII: Please explain, "the land will probably revert back to the landowners." As a representative of the landowners, I feel that a clarification is warranted.

Y. Page 5-4 2. Water Quality: What are the impacts on water quality if most of the average rainfall comes in several large storms? Because the probability of this occurrence at Ohikilo is high, an analysis of storm related impacts should be incorporated into the Revised EIS.

Z. Page 5-4 3: The analysis of visual impacts is inadequate. The valley will be completely transformed and this fact should be emphasized. Graphics illustrating before and after elevations and sight lines should be incorporated into the Revised EIS in order to fully disclose to the public and the decision makers exactly what will happen.

AA. Page 5-5 5: More accurately, the statement should read "The landowners will be denied use of the land for a period of 21 to 63 years while the landfilling operations occur." This will have a severe adverse impact on the owners. What will the City offer in return for denying the use of private property for a lifetime? A specific evaluation of this impact and proposed mitigating measures should be incorporated into the Revised EIS.

Adverse economic impacts to the current residents and the zoo should be described in detail and quantified in the Revised EIS. What will happen to the displaced residents? What will happen to First Hawaiian Bank's facilities?

BB. Page 5-5 II - Secondary Impacts: The long-term adverse secondary impacts should also include vehicular noise from the leeward end of H-1 to the site. This fact should be emphasized in the Revised EIS. As stated previously, the single statement that the loss of the valley represents a lowering of the quality of life is an inadequate description of the loss of the valley. The section on secondary adverse long-term impacts should be expanded in the Revised EIS. Long-term adverse impacts to the adjacent State Park should also be addressed.

CC. Page 7-1 Para. 2: "A properly operated landfill is a safe method of waste disposal. ...is generally free of vector, odor, fire, leachate, soil erosion and aesthetic problems." What guarantee does the public have that the landfill will be properly operated?

DD. Page 8-1 last para.: The last sentence is a totally inadequate description of the irreversible and irretrievable commitment of resources. It should be expanded to incorporate our earlier comments on the subject. When the natural qualities of what may be the last valley of this kind on Oahu are gone, they can never be replaced.

EE. Page 11-1. Unresolved Issues: The final use of the land after landfilling should be determined and presented in the Revised EIS.

The Shimaburo 1979 study states that the residents and the First Hawaiian Bank facilities will be displaced. Where will they be displaced to? What type of relocation assistance will be given? Is the City prepared to assist in the relocation of a working ranch? Have relocation costs been factored into the cost estimates for the project? This is the only site that the City is actively considering which will both displace people and buildings.

The economic loss of the ranch activities should be quantified in the Revised EIS. In addition, the impacts on the Honolulu Zoo should be described in detail. What will be the effect of the loss of animal food produced in the valley on the already financially strapped zoo? What proportion of zoo food is produced in the valley? How will this be replaced? Since the zoo and the Refuse Department are both City agencies, have inter-agency discussions on this matter been held?

U. Page 4-53: "The landfill life can easily be tripled with the implementation of City's proposed 'Solid Waste Processing recovery facility.'" This means that the landowners could conceivably be deprived of the rights to their land for 63 years! Almost a lifetime.

V. Page 4-54 III: Long term secondary impacts should include the impact of the project on regional growth patterns if the water main is extended and roads are improved. In addition, noise along the corridor from the transfer station to the site should also be considered a long-term secondary impact.

In light of the fact that the landfill operation could continue for 63 years, the statement that the scarring of the land during operation of the landfill will be a short-term secondary impact is rather ridiculous. Also the term "temporarily" is a little ludicrous in light of the time-frame being considered, even if the time-frame is only 21 years. Long term impacts on the State's Kaena-Halea State Park should also be discussed in detail in the Revised EIS.

W. Page 5-3 IA: Construction vehicle traffic on Farrington Highway will be an adverse impact and should be noted as such in the Revised EIS.

X. Page 5-4 Para. 2: "The likely sources (of water) include the use of existing wells and extension of the Board of Water Supply's line to the project site." Again, a clarification is required to clear up the inconsistencies about water availability found throughout the report. What existing wells will be used? How far will the Board of Water Supply's line be extended? How much water will come from the Board of Water Supply?

Ff. Page 12-5. Response to Corps of Engineers NOP Letter: A map showing the flood zones with the project site overlaid should be incorporated into the Revised EIS.

Gg. Page 12-10. Response to the Department of Agriculture: "The evaluation that the majority of the 95 acres of the Ohikilolo site, if irrigated, would be prime is noted. However, there is no indication that sufficient water suitable for irrigation is readily available on the project site." What is the water situation? First you state that sprinkling and irrigation will be required for the landfill and then you state that there is insufficient water for irrigation for agricultural use. If the City can bring in water for this purpose, why can't others? What alternative crops could economically be grown on the property with and without irrigation?

Hh. Appendix D - Traffic Impact Report: It appears that there are several deficiencies in the Traffic Impact Study which should be corrected in the Revised EIS.

1. The report does not include a peak hour traffic analysis for Farrington Highway near the project site. Traffic counts should be taken. Conflicts with automobiles, particularly on Saturdays when recreation traffic is heavy, could be considerable. At least one day of counts therefore, should be Saturday.
2. If one assumes a fairly flat distribution of traffic throughout the day, the traffic figures given on page 6 should be doubled to reflect two-way trips appearing on the highway during the stated hours.
3. Noise impacts all along Farrington Highway will be considerable as will the visual effects.
4. The traffic impact study for Ohikilolo should be expanded to a regional context. The effects of this traffic will impact the entire leeward coast. Since Farrington Highway in the leeward area carries a significant number of recreation trips on weekends, Saturday counts and analyses should be included to present a true picture of traffic impact.
5. What improvements will be required on Farrington Highway to support the increased traffic load and weight resulting from the operation of the landfill? What is the actual number of heavy trucks currently using the Highway in the vicinity of Ohikilolo?
6. There is no indication that employee trips to/from the site were included in the traffic analysis. The traffic analysis should be redone to include all trips. Forecasts

for a minimum 20 years should also be included. The increased traffic generated by Kaena State Park should also be incorporated in the analysis to reflect a true picture of future traffic conditions with and without the project.

7. There are contradictory statements on page 3. Paragraph 2 states that Ohikilolo has a life expectancy of 21. years at a fill rate of 1,000 tons per day. In paragraph 8 it is stated that the loan factor would be 1,350 tons per day and higher. The analysis that follows is confusing and should be clarified based on either 1,000 tons per day or 1,350 tons per day as it will affect when the Ohikilolo site will be opened.

SUMMARY

In summary, the subject Environmental Impact Statement, which was signed by Michael J. Duan on August 25, 1983, is inadequate and incomplete in light of the content requirements specified in the Environmental Impact Statement Regulations. The adverse impacts of using a remote site such as Ohikilolo have been understated in the EIS and, as I have stated repeatedly in this letter, the discussion on alternatives is grossly inadequate. These deficiencies should be corrected before the EIS is accepted by your agency.

We thank you for the opportunity to comment on the EIS and we are looking forward to a detailed response to all of our comments.

Very truly yours,

Donald Wolbrink
Donald Wolbrink
For the McCarrollless Helms

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DEPARTMENT OF PUBLIC WORKS
CITY AND COUNTY OF HONOLULU
535 SOUTH KING STREET
HONOLULU, HAWAII 96813



MICHAEL J. CHUN, M.D.
MAYOR AND CHIEF EXECUTIVE OFFICER
MAURICE W. KATA
DEPUTY MAYOR

R 04-206

March 23, 1984

Department of Public Works
Planning Commission
ECC/DEQC
Department of General Planning
City Council Chair
State Historic Preservation Officer

cc:

Department of Public Works
Planning Commission
ECC/DEQC
Department of General Planning
City Council Chair
State Historic Preservation Officer

EILEEN A. ANDERSON
SALES

Mr. Donald Wolbrink
For the McCandless Heirs
1164 Bishop Street, Suite 903
Honolulu, Hawaii 96813

Dear Mr. Wolbrink:

SUBJECT: Leeward District Sanitary Landfill Environmental Impact Statement

We appreciate your review of the document and offer the following responses to your comments.

Comment:

"The Director and Chief Engineer of the City & County Department of Public Works has kindly forwarded to me a copy of the subject EIS, welcoming my review and comments. I have been retained by the McCandless heirs as their advisor and thus my involvement in this project is limited to those aspects related to their property at Ohikilolo."

"The comments contained in this letter should be considered as coming from the McCandless heirs as their positions on these matters. Thus, the McCandless heirs, and not Donald Wolbrink, should be identified as commenting to indicate that the McCandless heirs provided written comments to the NOP."

Response:

Your involvement in the project and the limitation of your comments to the property at Ohikilolo are noted.

Comment:

"The McCandless heirs do not believe that the EIS, as drafted, fulfills the content requirements set forth in the EIS regulations, Sub-part E, 1:62. Comments prepared by me follow:

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This is not the situation at the present time because these alternative sites are no longer available, as we have stated in Section 6 of the Environmental Impact Statement. The reasons for rejection of these sites, once considered for landfills, are: either the sites are over municipal groundwater supplies or the Federal Government is currently using the sites for other purposes and is unwilling to relinquish control of them.

Comment:

"The Alternatives Section of the subject EIS consists of one and a quarter pages of text and a table listing potential sites. Because the narrative descriptions in the text are so brief, the table is meaningless."

Response:

The information contained in Table 6-1 is accurate and describes the current situation and position of the City regarding landfill sites.

Comment:

"The sites listed in the table were evaluated by Shimabukuro & Associates in 1977 and 1979. Although the 1977 report is available at the Municipal Reference and Records Center, the 1979 document, which describes and evaluates sites 27 to 36 in Table 6-1 of the EIS, is not available in any public reference location. Upon inquiry at the Division of Refuse Collection and Disposal, it was learned that the report had never been finished and that the draft copies were being used by the Division only for reference purposes. An unfinished, publicly unavailable document can hardly be incorporated into an EIS by reference, particularly in the important area of alternatives."

Response:

The information is available to whomsoever requests it, and we see no reason not to use the reference material in the preparation of the Environmental Impact Statement.

Comment:

"Alternative analysis, and in fact site selection itself, is not necessarily a 'black & white' matter. Creative ways to use a site, such as proposing joint use by those with common needs or by anticipating a means of revenue generation for a landowner or community, as well as a program of community participation and information, backed up by a splendid operation record, all can have a major influence on site

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Comment:

"ALTERNATIVES TO THE PROPOSED ACTION"

"A. General Inadequacy of the Section"

"The Alternatives Section (Section 6) is grossly inadequate. As stated in Sub-part E, Section 1-62(g) of the EIS regulations, the EIS must include:

'Any known alternatives for the action which could feasibly attain the objectives of the action - even though more costly - shall be described and explained as to why they were rejected.'

'For agency actions, this discussion must include where relevant, those alternatives not within the existing authority of the agency.'

'A rigorous exploration and objective evaluation of the environmental impacts of all reasonable alternative actions, particularly those that might enhance environmental quality or avoid or reduce some or all of the adverse environmental benefits, costs, and risks shall be included in the agency review process in order not to prematurely foreclose options which might enhance environmental quality or have less detrimental effects...In each case, the analysis shall be sufficiently detailed to allow the comparative evaluation of the environmental benefits, costs, and risks of the proposed action and each reasonable alternative.'

Response:

We believe that the information contained in Section 6 of the Environmental Impact Statement is an accurate representation of the facts and situation regarding the status of landfill sites and the alternatives presently available to the City.

Comment:

"The alternatives section does not provide sufficient information to enable the reviewer to make any judgments or conclusions about alternative sites. This is not because of lack of information on the subject. There are several reports and studies that describe viable alternatives to the use of Ohikilolo, and without exception, point out the shortcomings of Ohikilolo in relation to other sites."

Response:

The alternatives section does provide sufficient information to make judgments and conclusions regarding alternative sites. We agree that the past reports you have cited describe alternatives to the use of Ohikilolo and the shortcomings of using the site as a landfill. However,

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determination for sanitary and demolition landfills. (As an example, I have observed sanitary landfill operations in Los Angeles in their final stages surrounded by single family homes in the \$150,000 class.) a circumstance reflecting total acceptance of the landfill operations.) This type of analysis should be included in any complete alternatives section. In fact, the EIS regulations (1:42(g)) mandate agencies to include discussions of alternatives not within the existing authority of the agency, if these are relevant. We believe that in the case of the subject EIS, such a discussion is warranted."

Response:

We will, during the preliminary engineering phase of the project, determine the final use of the landfill site and whether or not there is a possibility of joint use of the Ohikilolo site. At this time, we foresee no reason to exclude cattle grazing and ranching from the completed landfill.

Comment:

"B. Criteria and Evaluation"
"The 1977 report entitled Inventory Study of Potential Sanitary and Demolition Landfill Sites, prepared for the City and County of Honolulu by Stanley S. Shimabukuro and Associates, Inc., lists nineteen criteria for selecting a landfill (Appendix A)."

"The report further notes that although the tabulation lists nineteen items as the criteria, each site was only required to have four essential characteristics before being considered for further evaluation as a potential landfill (p. A-3). These essential basic characteristics are:

1. Adequate capacity.
2. Adequate protection of our ground water supply.
3. No apparent significant environmental damage to the land, air, ocean or population.
4. Apparent economic feasibility."

"Unless all four criteria were met, potential sites were not considered for further evaluation."

"Ohikilolo did not meet these basic requirements. Out of 26 potential sites considered for further evaluation it was ranked 25th. The Shimabukuro Report describes the Ohikilolo Landfill Site as follows (page C-47):

"The Ohikilolo Landfill Site is located north of Makaha Valley. It is remote from refuse generation centers and hauling costs would be high..."

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"This site is not recommended for landfill development."

"The report was prepared in 1977. A supplement to this report prepared by Shimabukuro in August, 1979, (the unfinished draft previously referred to) also recommends against the Ohikilolo site. This supplemental report was commissioned by the City to develop new site selection criteria, reevaluate the leeward sites contained in the 1977 report, and look at additional sites. Twenty leeward sites were reviewed. Nine of these were rejected for various reasons. Of the remaining eleven, Ohikilolo ranked eighth and we question whether those ranked lower are not in fact more suitable than Ohikilolo for sanitary land fill purposes. The report notes (page 19-9):

"The Ohikilolo site is far removed from the Keehi transfer station (36 miles). The upper areas are over the BWS groundwater zone. First Hawaiian Bank has a substantial rest and recreation facility at the site. Also, three residences may be displaced. Unstable and rising fuel prices make this site unattractive."

"This site is not recommended for landfill development."

Response:

The report Inventory Study of Potential Sanitary and Demolition Landfill Sites (Shimabukuro and Associates, Inc., 1977) did state that the Ohikilolo site is located away from refuse generation centers and hauling costs would be high and that the site is not recommended for landfill development. However, as we have stated, this was the situation in 1977 and is not the current condition. Many sites having more desirable characteristics as landfill sites were rejected over the years. The fact is that there are no other sites presently available for landfills.

Comment:

"Another report written in 1983 confirms the unsuitability of the site, in the context of this being a proposed site under active consideration by the City, despite its obvious shortcomings. This report is the environmental impact statement for the City's proposed Solid Waste Processing Resource Recovery Facility, prepared by Belt, Collins and Associates. Unlike the environmental impact statement under discussion, it includes a concise but complete discussion of alternatives to the proposed facility. In Table V-2, Potential Landfill Sites Currently Under Consideration by the City and County, page V-4, under Comments, it is noted that Ohikilolo "will increase highway traffic. High transportation costs for hauling refuse from urban areas."

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Response:

There is no denying that a landfill at Ohikilolo will increase traffic on Farrington Highway. However, a traffic study, included as Appendix D of the EIS, concludes that the increased traffic generated by the proposed landfill will not significantly affect overall operations on Farrington Highway.

We also agree that there will be increased costs for transporting refuse to the Ohikilolo site. The exact costs have not been worked out at this time, only preliminary estimates for planning purposes. Much of the data needed for calculating the costs are dependent on the future of the Resource Recovery Facility.

Comment:

"Ohikilolo did not meet the criteria in 1977 and it does not meet them now. There have been no changes in the facts relative to Ohikilolo. The only reason it is even being considered is because of the political problems that have arisen around other sites. However, we believe that the fact that there are difficulties in connection with or opposition to other sites does not make Ohikilolo a good site now."

Response:

As stated earlier, there are no other Leeward sites available for landfilling at the present time.

Comment:

"The fact that Ohikilolo ranked next to last on a list that covered not just the leeward side but all the potential sites on Oahu indicates the inadequacy of the discussion on alternatives. Section 6. Alternatives To The Proposed Action should be expanded to include a thorough discussion of the genuine and real alternative sites that are not only feasible, but also are better alternatives than using Ohikilolo."

Response:

The Ohikilolo site was not ranked by the Shimabukuro study. As shown on P. II-13 of that report, only the four most desirable Leeward sites, Makaiwa, Manakuli, Kaloi, and Honouliuli, were ranked; the others were numbered for convenience and listed in order.

The fact that the Ohikilolo site was considered undesirable because of its remoteness and other factors does not preclude its use as a landfill site. The fact remains that there are no alternative sites presently available. The information contained in Section 6 of the EIS is a true and accurate representation of the present situation, and we therefore believe that the discussion is adequate."

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Comment:

"C. Sites Which Have Been Rejected"

"The following points apply to many of the potential landfill sites that have been summarily dismissed in the Alternatives section:

"1. The City has not done a good job in selling landfills to the community for two major reasons:

"a. The City's operations have not been as good as they should be, and it therefore lacks credibility when it tells citizens that sanitary landfills are clean operations and can be compatible neighbors. People naturally respond based on what their own observations tell them - that the City consistently does not allocate sufficient resources to the Division of Refuse Collection and Disposal and that the so-called sanitary landfill will actually be a dump. This does not have to be this way. In other communities, notably Los Angeles, sanitary landfills are run so well that they are accepted in wealthy neighborhoods. There the people believe that the operation will be well-run and know that they will eventually have a new park because the governmental track record is consistently good."

Response:

The three existing City facilities at Kapaa, Kawaiho, and Waianae are being operated as sanitary landfills in accordance with Department of Health regulations and cannot, by any stretch of the imagination, be called "dumps." Despite fiscal constraints imposed by the soft economy we believe our facilities are well-run, and, indeed, we have received many positive comments from users and visitors to the landfills.

Comment:

"The Shimabukuro report states in its Conclusions, page I-11, that:

"The City can improve its landfilling operations. Landfill personnel need continual training. Detailed landfill plans should show operational phases and incremental development."

"In its section entitled General Recommendations, page I-13, the report recommends that:

"The City should upgrade the appearance of the existing Kapaa, Kawaiho, and Waianae sites by landscaping completed areas as soon as practicable and not wait until the entire site is filled before beginning landscaping operations. Landfill

personnel should receive formal training. The whole concept of a sanitary landfill and the Department of Health regulations covering landfill operations should be explained to all landfill personnel.

"Secondary beneficial uses, such as parks, golf courses, farmlands, ranches or open space, should be determined prior to the land being used as a landfill site and plans for implementation of such uses should be prepared at least one year before the completion of the landfills."

Response:

Detailed plans will show the operational phase and incremental development of the landfill, including the landscaping plans. The final land-use of the landfill sites will be determined at least one year before completion of the landfills. An abandonment plan is required and will be filled with the Department of Health prior to closure of the landfills. The landfill personnel receive continual formal training in operations, safety, and management, and the appearances of the existing Kapapa, Kawaihoa and Kananani sites have been improved.

Comment:

"b. The City also has not allocated sufficient resources to selling its programs to the community, particularly its refuse disposal projects. An excellent example is the history of resource recovery projects. Despite repeated setbacks, the City has not been willing to make the necessary commitment to this most important matter. As a result, uneconomic and least desirable sites are now having to be considered."

"The Shimabukuro report also comments on this deficiency in both its Conclusions, and General Recommendations sections. Under Conclusions, page 1-11, it is stated that:

"There is a need for a public relations effort to educate the general public in solid waste disposal technology. Through education, most citizens can become supporters of the City's solid waste disposal program."

"Under General Recommendations, page 1-13, it is suggested that:

"The City should expand its public relations effort regarding sanitary landfills to gain public support. The prevailing open dump idea type of operation now in the minds of the public should be dispelled once and for all. The need for landfills should be explained...."

"On June 30, 1983, in a speech to the Honolulu Chamber of Commerce, Mayor Eileen Anderson expressed her great concern that the problem of community opposition to needed major facilities, and the increase in the 'not in my backyard' attitudes that have hampered important municipal activities. She noted that:

"...The immediate problem is that we are giving in to certain residents - sometimes not more than a handful - a veto power over what is a community decision..."

"A solution to the Not in My Backyard syndrome will not come quickly or easily. But I think we should accept the fact that it must be found if we are to continue the progress of our City in the years ahead... as well meaning as they may be, we cannot allow small groups of individuals, purporting to represent certain neighborhoods, a veto power over decisions having island-wide implications. We cannot capitulate to a few phone calls, letters or demonstrations...."

"It is clear that the only reason an uneconomic site such as Ohikilolo is even being considered is because community opposition, real or only apparent, has caused the Department of Public Works to drop more suitable sites from consideration. There are not only many alternative sites available, they are all superior to Ohikilolo, and they should be discussed at length in the section on alternatives."

Response:

The City has fully committed its resources to pursuing a workable resource recovery project for Oahu. Despite drastic setbacks often unrelated to the practicality of such a project, we have just concluded the bidding phase of the second resource recovery procurement process. Subject to the outcome of pending litigation and availability of funds, we intend to see this much-needed project implemented.

We agree that more effort and funds should be directed toward educating the public on solid waste, including resource recovery, sanitary landfill, etc. However, there never seems to be sufficient funds to accomplish all that is desirable.

Most of the alternative leeward sites were rejected for the very sound reasons enumerated in Section 6. As much as we would like to ignore the Not-in-my-Backyard syndrome, it will always be a factor in the political decision-making process.

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Comment:

"2. The City has rejected the pursuit of alternative sites on military lands with insufficient reasons. While it is true that there has been a lack of enthusiasm for joint use of federal properties, particularly military bases, in the past, new policies have been adopted by the present administration that may alter the situation."

Response:

The City has over the years met with various branches of the military to explore joint use of land for landfilling. We would not be pursuing the Ohikilolo site if military land for landfilling were available.

Comment:

"3. Other sites have been rejected as alternatives because there are problems connected with using the entire area. Certain sites have been considered by the city and rejected because the entire area planned for was not available. However, the alternative of using only part of the proposed site has not been explored."

Response:

The alternative of using only portions of a site for landfilling is generally not a good practice because the cost and the level of effort required to maintain numerous small landfills are significantly greater than for operating one or two large centralized landfills. We do not believe that using small portions of land for landfilling is the best use of land.

Comment:

"D. Specific Sites to be Reconsidered"

"In our written comments to the Notice of Preparation (NOP), we requested that nine specific alternative sites be evaluated and assessed in the EIS. Much to our surprise (and dismay) our request was ignored and the sites were summarily dismissed without adequate documentation or, to our knowledge, valid reasons for rejection. We request that the following sites be reevaluated and a rigorous and objective evaluation of the environmental impacts of these sites and comparative costs be incorporated into the EIS. The EIS regulations mandate that this be done even though some of the sites (such as those on military lands) are not within the existing authority of the agency."

Response:

We realize that many of the objections which caused the City to reject the alternative Leeward sites can now be raised against Ohikilolo and Waimanalo Gulch. These objections may even apply to an equal or greater

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degree to the two sites currently under consideration than they do to the alternative sites. However, the process of elimination has not been an arbitrary or frivolous one (it included a complete EIS for three sites which were eventually rejected), and the City now finds itself with only two viable sites for the Leeward Sanitary Landfill. Despite the enormous environmental, sociological, engineering, and economic problems inherent in selecting and developing landfill sites, the City must create a large, centralized landfill for Leeward Oahu to meet the refuse disposal needs of Honolulu's expanding population and to relieve the pressure on our near-capacity, existing landfills.

The various reasons for rejecting the other Leeward sites have not changed significantly in the time since Shimabukuro performed the inventory study, and we will cite the primary ones for each of the alternative sites you mention. It is possible that, based on this EIS, a decision will be made to reject one or both current sites. The City will then be faced with the difficult and delicate task of reconsidering its past decisions to reject the alternative sites.

Comment:

"1. Manakuli"

"Manakuli A, a former quarry, is listed as 'close to a community.' It is an abandoned quarry. An alternative which would leave a major buffer between the fill site and the community could leave as much as 100 acres available for sanitary landfill. A similar buffer at Manakuli B could add another 100 acres, perhaps enough area for 15 to 20 years of landfill activity. Citizen opposition should not be the primary criterion for rejecting the site. The city should give something to the community in return, such as the regional park described in the 1978 EIS for this site."

Response:

These sites were evaluated in the previous Leeward Sanitary Landfill EIS (1978) and were rejected because they are close to a community which strenuously objects to their development as landfills.

"2. Maili"

"Table 6-1 says that this is an active quarry and 'it is not contemplated that the owners will allow the city to develop a landfill at this site.' This is a 200-acre site. It may be possible for quarrying to take place in certain parts of the site, with landfill concurrently in other parts - all to the significant financial benefit of the quarry owner who could receive premiums or royalties from the city in lieu of land acquisition. Also, the use of an active quarry

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thorough investigation and a public relations effort. We recognize that traffic impact on Kalamiaole Highway presents a potential problem, however, hours of operation could be adjusted so that trucks will not be on the road during peak periods. The economics of the situation requires that this site receive further study."

Response:

Community opposition and traffic impact would most certainly be problems. Also, the deed for the property specifies park-type uses only, and the unique botanical garden which currently occupies the crater would be difficult to relocate because of its dry-climate requirement. For these reasons, the City has decided not to pursue a landfill at the site.

Comment:

"9. Several Sites"

"Among the various potential sites investigated, it would seem that an approach of using several sites at once could be considered, i.e., a small site in Waianae for sanitary and demolition landfill material originating only in Waianae, the Barber's Point site for demolition material only, and one or more sites in central Oahu for material from Honolulu."

Response:

The levels of effort and cost required to maintain numerous small landfills are significantly greater than for operating one or two large centralized landfills. Also, the central Oahu area is within the UIC line and over municipal groundwater supplies.

Comment:

"E. Sites Not Previously Considered"

"1. Navy Surplus Land at Waipio"

"In our comments to the ROP we noted that the Navy shows + 78 acres of releasable land at their Northern Waipio Peninsula NAVMAG boundary (a map showing this area is attached). In the narrative section of the 1982 Capital Improvement Plan for Naval Magazine Lualualei which accompanies the map, the Navy states:

"A possible long range land use on Waipio Peninsula including the 78 acres of releasable land is for a Navy sanitary landfill in the event the Palisades landfill site is closed or if the city's H-power project is not constructed. The ordinance storage potential capacity for the West Loch Branch will probably be affected con-

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tingent on the landfill "operational" requirements. The same 78 acres has also been considered in the Pearl Harbor Master Plan as a potential site for additional POL storage."

"The possibilities of obtaining this and/or other military surplus property should be investigated and evaluated in the Revised EIS. Both the Navy and the City have significant sanitary landfill needs on this island. A jointly developed program for mutual benefit would seem warranted."

Response:

The 78 acres are contained in a long, thin area which, when proper buffer zones are subtracted, leaves little useable space for landfilling. The site is further limited because it is divided into two separate parcels, portions of which are in protected wetlands.

Comment:

"2. Pearl City Peninsula-Waipio"

"There are options available for landfilling on the Pearl City Peninsula locale, they are:

"a. I have met with the Navy and they informed me that some years ago the Navy and the City worked out an arrangement whereby the Navy would furnish the City with title to approximately 95 acres of land from a new Ted Makalena golf course. (We understand for the Navy that this offer has never been rescinded.) This 95-acre site could be incorporated with the 28 acre City-owned and now closed Pearl City sewage treatment plant site, making a total of 123 City-owned acres. One possible plan for these 123 acres is to first use them for a sanitary landfill. When the site is at capacity for that purpose, a golf course could be created on the fill."

"b. The present Ted Makalena course on Waipio Peninsula could be used for landfilling when the 123 acres described above are full. A second golf course could be constructed when landfill operations are completed. It should be noted that saltwater intrusion is said to be a serious maintenance problem at the very popular present course, due to its low elevation. Filling would enhance the recreational attributes of the site by solving the maintenance problem."

"Implementation of one or both of these alternatives could not only provide the City with sufficient landfill capacity for the foreseeable future but also could ultimately result in

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It is our understanding that the City's arrangement at Palalal allows them use of the facility at nominal cost. Comparisons of costs to the City (Capital and Operational) for private versus municipal landfills should be analyzed."

Response:

The City cannot provide direct incentives or subsidies to the private sector for the development of commercial landfills, but we do encourage such efforts. The preferential rate (it certainly is not "nominal") paid by the City at Palalal is the same one charged any other government agency, whether State or Federal.

Cost is not the only determining factor in deciding between municipal and private landfill disposal. A private landfill would have to be able to guarantee disposal of the tremendous volume of refuse collected by the City over a long contract period. There are no existing private landfills with sufficient capacity to make that guarantee.

Comment:

"OTHER COMMENTS ON THE EIS"
(in order that they appear in the document)

"A. Page 1-9 & 1-10, Table 1-2 & 1-3: On what basis was the assumption made that no additional private or military sanitary landfill sites would be in operation after 1986? Please document your sources as such landfills could reduce the tonnage estimated for City-owned landfills."

Response:

At the time the tables were compiled, there were no proposals for future private or military landfills. Since that time, two or three proposals have surfaced, although none of them are well enough defined to predict how they might impact City landfills. Regardless of such plans, the City will still have to dispose of the major portion of the refuse generated on Oahu, and the tables are valid for the "worst-case" situation.

Comment:

"B. Page 1-19: What has the city been doing to exploit the methane gas resource resulting from its landfill operations?"

Response:

The City is preparing a request for proposals (RFP) to install a methane gas recovery system at Kapaa on a competitive basis. Recovery systems for Kawaiiloa and Waianae would not be economical because current tech-

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doubling the number of golfing facilities in the area. For these reasons, we believe that the City should seriously consider these options and provide a rigorous evaluation of their environmental impacts, including cost comparisons with other alternative sites, in the Revised EIS."

Response:

The 28-acre City parcel is being used as a corporation yard. The Navy estimates that only 60 acres of the 95-acre parcel is useable for land-filling because the remainder is a bird sanctuary. The site is further limited because it was previously used as a landfill. A Navy soils consultant has recommended that no more than one additional lift (10 to 15 feet) be placed on the site so as to avoid slippage of the unstable subsoil. The Navy, which currently disposes of its solid waste at Palalal and Kapaa, intends to use this site when Palalal closes and if the City disposal system cannot accommodate its refuse. While the site may be adequate for the Navy's needs, it does not provide adequate capacity for an ecological municipal landfill.

An engineering consultant for the City is examining the feasibility of using ash from the Waipahu incinerator to build up portions of Ted Hakalena Golf Course. This would not only solve the saltwater intrusion problem, but it would provide a convenient and economical way to dispose of the ash.

Comment:

"F. Other Deficiencies In Alternatives Section"
"1. Alternative Processing Methods"

"Another deficiency of the section on Alternatives to the Proposed Action is the discussion on alternative processing methods. This discussion consists of a three-line paragraph. Even if the conclusion that the only two viable methods to reduce the volume of solid waste are incineration and energy recovery is accepted as valid, there should be at least some discussion on why this is true and why other alternatives are not being proposed. A good example of such a discussion can be found in the EIS for Solid Waste Processing Resource Recovery Facility by Belt, Collins & Associates."

Response:

Alternative disposal and processing methods for solid waste are discussed in Appendix E of the Environmental Impact Statement.

Comment:

"2. Private Landfill Operations"
"A detailed discussion of providing incentives to the private sector to develop commercial landfills should be dis-

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Comment:

"Z. Page 2-23-2: Have the costs of buying and hauling cover material been considered in evaluating the suitability (or unsuitability) of the site?"

Response:

The cost of buying and hauling cover material was not a significant factor in determining site suitability because most landfills do not have sufficient overburden to satisfy cover material requirements.

Comment:

"F. Page 2-32-D: Much of the total annual rainfall may accumulate from several storms during the winter months. How would this affect the operation? Averages can be very misleading."

Response:

The perimeter and onsite drainage systems will be designed to accommodate design storm conditions in accordance with City storm drainage standards.

Comment:

"G. Page 2-32-E: There appear to be contradictions concerning the availability of water on the site. On page 2-35 it is said that some water is available on site from one well, whereas Figure 2-8 (without a legend) seems to show several wells on the site. Later, on page 2-51, it is stated that, 'The Board of Water Supply's water main will need to be extended to the project site to provide water for drinking and irrigation.'"

"The Department of Health has developed an inventory of both drinking water wells and injection wells as part of the underground injection control development. Please identify what wells on the property will be closed, and how this will affect the on-site water supply. In addition, please clarify the actual availability of on-site water for landfill operations. If water must be brought to the site, what is the length and cost of the proposed water main extension? Has this cost been included as a development cost?"

Response:

The present occupants of the valley rely on one well for drinking water (at about the 200-foot elevation). There are other wells located at the 50 to 100 foot elevation which have been developed or will be developed by the ranch for irrigation of the hay fields.

Mr. Donald Wolbrink
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Response:

nology does not allow efficient recovery of gas from small landfills.

Comment:

"C. Page 1-22, Table 1-5: Please break down the administrative operation and maintenance and supply costs by cost item and by site. Are land costs included in development costs? If we read Table 1 in the 1979 Shimaburo report correctly, hauling costs to Ohikilolo will be \$12,600 per day (1000 lbs./day, 1979 dollars). This is \$3.9 million per year or approximately \$82 million (1979 dollars) in hauling costs alone for a six day per week operation for 21 years. A less remote site with a comparable life could represent 10% of millions of savings in hauling costs. For comparative purposes, hauling costs for life of operation should be stated in the revised EIS for sites to be reconsidered."

"Have increased labor costs necessitated by the remoteness of the site been factored into the cost estimate? How do these figures compare with those of other alternative sites not considered in the EIS?"

Response:

The administrative, operation, maintenance and supply costs are estimates based on existing sanitary landfill costs and are estimated at \$2 million per year for either site. Land costs are not included because negotiation for the land has not been initiated.

The detailed cost estimates for hauling have not been worked out. However, the estimate of \$2.0 to \$3.1 million, for planning purposes, is a reasonable estimate.

We agree with your analysis that a landfill site closer to the urban center of Honolulu would reduce hauling, transportation, and other costs. However, there are simply no other Leeward landfill sites presently being considered.

Comment:

"D. Page 2-22A: From what point of reference is the estimate of 36 miles from Honolulu taken? Downtown Honolulu? Keahi transfer station? Where?"

Response:

The distance is measured from the Keahi Transfer Station.

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When the landfill is operated, the water supply will be from Board of Water Supply sources. This will be accomplished by extending the water main. Although an allowance was made in the development cost estimate for a water supply system, the exact cost will be worked out during the preliminary engineering phase of the project. The wells located on the property will be sealed.

Comment:

"H. Page 2-39 - A1: How much water will the landfill operation require? How will this affect supply?"

Response:

We expect water demand to be similar to Kapaa Landfill, which uses approximately 14,000 gallons per day. This is not a significant amount when compared to the total demand for the Waianae area.

Comment:

"I. Page 2-39 - B2: Potential fires are a serious threat in an acid valley. What provisions are being made for fire flow? Again, provision of water to the site should be described and clarified."

Response:

The need for fire flow protection will be evaluated during the engineering phase of the project. There may be alternative means, such as fire ponds or reservoirs, to meet the needs for onsite fire flow protection. The exact details will be worked out with the Fire Department.

Comment:

"J. Page 2-40: Social and cultural values should be included in the description of the socio-economic characteristics section. Ohikilolo may be the only remaining valley on Oahu where a spirit and feeling of old Hawaii from pre-history to the present persists. This is not at all a matter of simply preserving a certain 'lifestyle.' It involves protecting an environment which successfully integrates the spirit of the past with the realities of present day living. Ohikilolo is a place, but even more so it is a total experience: historically, culturally, and aesthetically."

Response:

The social and cultural aspects of Ohikilolo Valley as you have described them will be included in the Comments and Responses section of the EIS.

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Many other commentors have also described in detail the importance of the valley's cultural, social and personal aspects. The section containing your letters and our responses is just as important a part of the EIS as any text reference.

Comment:

"K. Page 3-1: The relationship of the proposed project to the goals and objectives of the General Plan of the City and County of Honolulu, the State Plan, the Agriculture Interim Guidelines Functional Plan, and the Coastal Zone Management Program should be described in the Revised EIS."

Response:

The relationship of the proposed project to applicable land use regulations has been described in Section 3. We believe that the discussion is adequate.

Comment:

"L. Page 4-39 B: How much runoff can be expected? Quantities should be given."

Response:

The exact quantities of storm runoff will be determined during the engineering phase of the project, and the drainage systems will be sized accordingly.

Comment:

"M. Page 4-42: It should be emphasized in the noise impacts section that the noise created by refuse trucks will impact an area 36 miles in length. Although this noise may be intermittent rather than continuous, an evaluation of the number of residences, schools, churches and recreation facilities that will be affected by the project should be incorporated into the Revised EIS. The regional impacts (secondary) of the project should not be underestimated. It should also be noted that this impact (noise) will continue for the duration of the project - 21 years or longer, and should certainly be considered as a long-term secondary impact."

Response:

In our general discussion of noise impacts (page 4-42, EIS) we did mention that there are no effective means of reducing noise from refuse

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into the impact section of the EIS. This well-done reconnaissance survey recommends that the area be deleted from the list of possible landfill sites. The archaeological consultant states that Ohikilolo appears to offer an unrivaled example of a dryland agricultural/agricultural system. He concludes his study by stating "This valley offers an unrivaled opportunity for archaeological examination, and all efforts must be made to maximize the amount of information retrieved prior to use, if the landfill is deemed necessary. Has a time and cost estimate been made for such a survey?"

"It should be noted that when the site was evaluated by Shimabukuro it was thought that there were no archaeological features present. Now that potentially significant sites have been discovered on the property, it behooves the City to reevaluate its decision to desecrate the site."

Response:

The entire archaeological report has been included in the EIS as Appendix C. We believe that the inclusion of the entire report is sufficient to provide all of the necessary information. We have been in communication with the State Historic Preservation Officer and will follow all recommendations regarding the additional surveys and excavations which will be required. We are in the process of obtaining a cost estimate for the next step in the archaeological evaluation of Ohikilolo: mapping and excavation of test pits.

Comment:

"8. Page 4-51 2: Because of the potential for serious fires which could affect not only the project site but the entire region, on-site fire flow should be provided. Due to the gusty winds fire breaks are not always successful in containing fires. Water and other means should be readily available to quickly extinguish fires. Although response time from Waianae is theoretically less than 10 minutes, bumper to bumper weekend traffic on the narrow two-lane highway could lengthen this time considerably."

Response:

Landfill fires are infrequent because the majority of the refuse is compacted and has a high moisture content. Also, an open fire at a landfill only occurs at the working face of the exposed refuse since all other areas of the landfill are covered with soil. Furthermore, the working face of the landfill is more than 140 feet away from any vegetation.

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Response:

vehicles. However, the noise from the refuse vehicles should not be any greater than that of the buses and other commercial vehicles presently using Farrington Highway.

Comment:

"H. Page 4-47 V-A: Litter will be a problem unless proper operating and monitoring procedures are followed."

Response:

There are effective means of controlling litter problems at the operating face of the landfill should problems arise. The most effective means of litter control is the installation of portable litter fences adjacent to the operating face of the landfill.

Comment:

"O. Page 4-49-1: Who decides what the final use of the land will be? Does the City have any plans to establish an outdoor recreation area in the valley? Final use is important in evaluating whether the compensation to be derived exceeds the inconvenience to the landowner which he must experience when giving up his land. In addition, the visual impact of a completed altered natural valley cannot be mitigated."

Response:

The final use of the land after landfilling has not been determined, other than it must be some type of open space use. There is sufficient time to determine the final use of the land, and the landowners will be consulted prior to finalizing any plans.

Comment:

"P. Page 4-49 VII-A: Will dust and gases produced from the landfill operation affect the rare flora on the ridge?"

Response:

The operation of the landfill and dust and gases will not affect the rare flora along the ridge.

Comment:

"Q. Page 4-50, A and Appendix C: The conclusions and recommendations of the City's archaeological consultant should be incorporated

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Comment:

"5. Page 4-32.XI: The economic impact section should present a table of costs which includes the additional costs that will be incurred to bring utilities, including water, to the site in order to truly reflect the effects that the remoteness of this site will have on total costs. In addition, an estimate of the revenues to the City which will be foregone if the project is implemented should also be given. A detailed cost analysis may indicate that, although sanitary landfills in general are the most cost effective method of refuse disposal, a landfill located in a remote site such as Ohikilolo may not be cost effective when compared to other means of disposal."

Response:

Exact costs have not been calculated, only estimates have been developed for planning purposes. The detailed costs will be worked out during the preliminary engineering phase of the project, after the completion of the Environmental Impact Statement. Although costs will obviously be higher for a remote site like Ohikilolo, cost effectiveness is just one of many considerations in finding a solution to the City's critical solid waste disposal problem.

Comment:

"I. Page 4-32.XII: Please explain, 'the land will probably revert back to the landowners.' As a representative of the landowners, I feel that a clarification is warranted."

Response:

The means and conditions by which the land will be acquired have not been worked out. We anticipate leasing the land, but if lease terms cannot be agreed upon with the landowners, the City could acquire the land in fee or by condemnation.

Comment:

"The Shimabukuro 1979 study states that the residences and the First Hawaiian Bank facilities will be displaced. Where will they be displaced to? What type of relocation assistance will be given? Is the City prepared to assist in the relocation of a working ranch? Have relocation costs been factored into the cost estimates for the project? This is the only site that the City is actively considering which will both displace people and buildings."

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Response:

The First Hawaiian Bank's facilities will not be affected by the landfill. As for the relocation assistance for the individuals and businesses, the City will provide assistance. It is the policy of the City that businesses to be displaced will be provided maximum assistance to aid in their satisfactory reestablishment with a minimum of delay and loss of earnings; and for individuals to be displaced by governmental action, they will have full opportunity to occupy standard housing that is within their financial means and adequate to their needs.

Comment:

"The economic loss of the ranch activities should be quantified in the Revised EIS. In addition, the impacts on the Honolulu Zoo should be described in detail. What will be the effect of the loss of animal food produced in the valley on the already financially strapped zoo? What proportion of zoo food is produced in the valley? How will this be replaced? Since the zoo and the Refuse Department are both City agencies, have inter-agency discussions on this matter been held?"

Response:

Inter-agency discussions on the impact of the food loss have been undertaken. It is estimated that there could be an increase of \$5,000.00 per year to provide replacement meat and hay for the zoo.

Comment:

"U. Page 4-33: 'The landfill life can easily be tripled with the implementation of City's proposed 'Solid Waste Processing recovery facility.'" This means that the landowners could conceivably be deprived of the rights to their land for 63 years! Almost a lifetime."

Response:

The longevity of the site is what makes it so attractive from economic and operational standpoints. If the length of time is unacceptable to the landowners, they may elect to sell the land to the City.

Comment:

"V. Page 4-34.III: Long term secondary impacts should include the impact of project on regional growth patterns if the water main is extended and roads are improved. In addition, noise along the corridor from the transfer station to the site should also be considered a long-term secondary impact."

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Response:

The extension of the water line can be sized only to meet the minor water demand for the landfill operation. Therefore, secondary impacts from urban growth will not occur. We believe that the noise impact is a primary impact, and it was discussed as such.

Comment:

"In light of the fact that the landfill operation could continue for 63 years, the statement that the scarring of the land during operation of the landfill will be a short-term secondary impact is rather ridiculous. Also the term 'temporarily' is a little ludicrous in light of the time-frame being considered, even if the time-frame is only 21 years. Long term impacts on the State's Kaena-Makua State Park should also be discussed in detail in the Revised EIS."

Response:

The scarring of the land which will occur during site preparation and operation is considered a secondary impact because only portions of the land will be cleared incrementally. The land form alteration by landfilling was considered a primary impact and discussed as such. The landfill operation at Ohikilolo is not expected to have a significant environmental impact on the State Park.

Comment:

"W. Page 5-3 1A: Construction vehicle traffic on Farrington Highway will be an adverse impact and should be noted as such in the Revised EIS."

Response:

We believe that our discussion is adequate to describe the construction noise levels. We do not believe that the construction activities and vehicles using Farrington Highway will significantly increase the noise levels along the entire length of the Highway. Most of the noise will be limited to the project site during the initial clearing activities.

Comment:

"X. Page 5-4 Para. 2: 'The likely sources (of water) include the use of existing wells and extension of the Board of Water Supply's line to the project site.' Again, a clarification is required to clear up the inconsistencies about water availability found throughout the report. What existing wells will be used? How far will the Board of Water Supply's line be extended? How much water will come from the Board of Water Supply?'"

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Response:

Water for the landfill will be provided by extending the Board of Water Supply's existing line.

There are existing wells on the project site currently used for irrigation of the hay field, and one well which supplies water for household use. The wells located in the area of the landfill will be capped, and there is a possibility that the well located at the 200-foot elevation could be used for irrigation of the landscaped areas of the landfill. The exact water requirements and sources will be developed during the engineering phase of the project.

Comment:

"Y. Page 5-6. Water Quality: What are the impacts on water quality if most of the average rainfall comes in several large storms? Because the probability of this occurrence at Ohikilolo is high, an analysis of storm related impacts should be incorporated into the Revised EIS."

Response:

The size of the perimeter drain and siltation basins will be developed during the engineering phase of the project. The storm runoff can be handled without causing severe environmental impacts.

Comment:

"Z. Page 5-4, 3: The analysis of visual impacts is inadequate. The valley will be completely transformed and this fact should be emphasized. Graphics illustrating before and after elevations and sight lines should be incorporated into the Revised EIS in order to fully disclose to the public and the decision makers exactly what will happen."

Response:

The visual impacts are described in Section 4 of the EIS, and Section 5 (page 5-4) is a summary of the impacts. Graphic illustration of the landfill can only be developed after the preliminary engineering phase has described the height of the lifts and general contour of the land. After this phase has been completed, there will be detailed information and drawings for the development of landscape plans, which will represent the final appearance of the landfill.

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Response:

The guarantee provided to the public by the City is that the landfill will be properly operated in conformance with applicable regulations of the State Department of Health. Also, our internal operating instructions for the sanitary landfill and the specific plans developed for a landfill will insure the proper operation and maintenance by our personnel.

Comment:

"DD. Page 8-1 last para.: The last sentence is a totally inadequate description of the irretrievable and irretrievable commitment of resources. It should be expanded to incorporate our earlier comments on the subject. When the natural qualities of what may be the last valley of this kind on Oahu are gone, they can never be replaced."

Response:

We believe that this statement is a factual representation of the irretrievable and irretrievable commitments of resources. Throughout the impact statement, we have stated that there will be a significant adverse impact to the residents and users of Ohikilolo Valley. We have also included the entire contents of the archaeological report and all of the letters and petitions describing the current uses of the valley and the adverse impact the project will have on the people.

Comment:

"EE. Page 11-1, Unresolved Issues: The final use of the land after landfilling should be determined and presented in the Revised EIS."

Response:

The final use of the land has not been determined to allow the widest possible latitude to decision makers. We believe that allowing flexibility in the final land use will allow the City to meet the future needs of the residents.

Comment:

"FF. Page 12-51, Response to Corps of Engineers HOP Letter: A map showing the flood zone with the project site overlaid should be incorporated into the Revised EIS."

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Comment:

"AA. Page 5-5, 5: More accurately, the statement should read 'The landowners will be denied use of the land for a period of 21 to 63 years while the landfilling operations occur.' This will have a severe adverse impact on the owners. What will the City offer in return for denying the use of private property for a lifetime? A specific evaluation of this impact and proposed mitigating measures should be incorporated into the Revised EIS."

"Adverse economic impacts to the current residents and the zoo should be described in detail and quantified in the Revised EIS. What will happen to the displaced residents? What will happen to First Hawaiian Bank's facilities?"

Response:

We have previously responded to these comments.

Comment:

"BB. Page 5-5 11 - Secondary Impacts: The long-term adverse secondary impacts should also include vehicular noise from the leeward end of H-1 to the site. This fact should be emphasized in the Revised EIS. As stated previously, the single statement that the loss of the valley represents a lowering of the quality of life is an inadequate description of the loss of the valley. The section on secondary adverse long-term impacts should be expanded in the Revised EIS. Long-term adverse impacts to be adjacent State Park should also be addressed."

Response:

Section 5 is a summary of the adverse impacts. We have stated in Section 4 of the EIS that there will be an increase in the noise levels from the vehicles. However, we do not believe that the noise levels from the refuse vehicles will be any greater than that of other vehicles presently using the freeway and highway.

Comment:

"CC. Page 7-1 para. 2: 'A properly operated landfill is a safe method of waste disposal. ...is generally free of vector, odor, fire, leachate, soil erosion and aesthetic problems.' What guarantee does the public have that the landfill will be properly operated?"

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Response:

The engineer for the project has been informed of the information contained in the Corps of Engineers letter and will evaluate the recommendation. The flood areas will be properly scaled and drawn on the preliminary engineering plans.

Comment:

"CG. Page 12-10. Response to the Department of Agriculture: The evaluation that the majority of the 95 acres of the Ohikilolo site, if irrigated, would be prime is noted. However, there is no indication that sufficient water suitable for irrigation is readily available on the project site. What is the water situation? First you state that sprinkling and irrigation will be required for the landfill and then you state that there is insufficient water for irrigation for agricultural use. If the City can bring in water for this purpose, why can't others? What alternative crops could economically be grown on the property with and without irrigation?"

Response:

Extension of the water lines to the project site can be done by others. There are no restrictions in extending the water line. However, there may be problems in providing sufficient quantities for agricultural use. This is something which must be worked out between the Board of Water Supply and the prospective water user.

The amount of water which will be required for the landfilling operation will be minor and much less than for irrigation of agricultural crops.

Comment:

"HH. Appendix D - Traffic Impact Report: It appears that there are several deficiencies in the Traffic Impact Study which should be corrected in the Revised EIS."

"I. The report does not include a peak hour traffic analysis for Farrington Highway near the project site. Traffic counts should be taken. Conflicts with automobiles, particularly on Saturdays when recreation traffic is heavy, could be considered. At least one day of counts therefore, should be Saturday."

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Response:

The potential impact during peak hour traffic at the Ohikilolo site was evaluated by a traffic engineer. The conclusion is that the additional refuse vehicles will not alter the level of service, presently defined as "A".

Comment:

"2. If one assumes a fairly flat distribution of traffic throughout the day, the traffic figures given on page 6 should be doubled to reflect two-way trips appearing on the highway during the stated hours."

Response:

The data used in estimating the traffic impacts assumed two-way traffic patterns and also assumed the worst possible situation.

Comment:

"3. Noise impacts all along Farrington Highway will be considerable as will the visual effects."

Response:

The study dealt only with traffic impacts. The EIS has discussed the potential noise impacts from the landfill operation and the traffic it generates.

Comment:

"4. The traffic impact study for Ohikilolo should be expanded to a regional context. The effects of this traffic will impact the entire leeward coast. Since Farrington Highway in the leeward area carries a significant number of recreation trips on weekends, Saturday counts and analyses should be included to present a true picture of traffic impact."

Response:

The potential traffic impacts from the implementation of the project have been analyzed from a regional context. The peak hour traffic and weekend traffic have been considered in the analysis by the traffic engineer.

Comment:

"5. What improvements will be required on Farrington Highway to support the increased traffic load and weight resulting

Mr. Donald Wolbrink
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from the operation of the landfill? What is the actual number of heavy trucks currently using the Highway in the vicinity of Ohikilolo?"

Response:

No major improvements will be required on Farrington Highway to accommodate the refuse vehicles. An access road to the project site from Farrington Highway will be required, and the plans will be worked out during the engineering phase of the project.

The actual number of heavy trucks using Farrington Highway in the vicinity of Ohikilolo is not known. The closest estimate to the vicinity is 24 trucks, 6:00 AM to 6:00 PM [page 8 of Appendix H (EIS)].

Comment:

"6. There is no indication that employee trips to/from the site were included in the traffic analysis. The traffic analysis should be redone to include all trips. Forecasts for a minimum 20 years should also be included. The increased traffic generated by Kaena State Park should also be incorporated in the analysis to reflect a true picture of future traffic conditions with and without the project."

Response:

There is no indication of employee trips because the number of trips which will be generated by the employees will be minor, at the most, two round trips.

The forecast of 21 years was considered by the traffic engineer in the projection of the potential traffic impacts. The analysis also included the traffic generated by Kaena State Park over the 21 year period.

Comment:

"7. There are contradictory statements on page 3. Paragraph 2 states that Ohikilolo has a life expectancy of 21 years at a fill rate of 1,000 tons per day. In paragraph 8 it is stated that the load factor would be 1,350 tons per day and higher. The analysis that follows is confusing and should be clarified based on either 1,000 tons per day or 1,350 tons per day as it will affect when the Ohikilolo site will be opened."

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Response:

The fill rate of 1000 tons per day is the basis for a rough estimate of life expectancy. For the traffic analysis, we assumed the worst possible traffic conditions in assessing potential traffic impacts.

Comment:

"SUMMARY"

"In summary, the subject Environmental Impact Statement, which was signed by Michael J. Chun on August 25, 1983, is inadequate and incomplete in light of the content requirements specified in the Environmental Impact Statement Regulations. The adverse impacts of using a remote site such as Ohikilolo have been understated in the EIS and, as I have stated repeatedly in this letter, the discussion on alternatives is grossly inadequate. These deficiencies should be corrected before the EIS is accepted by your agency."

Response:

We believe the Environmental Impact Statement is adequate and presents factual information about the proposed project, its potential environmental impacts, and alternatives presently available.

Very truly yours,



MICHAEL J. CHUN
Director and Chief Engineer

cc: DLU
S. Shimabukuro
EISC

MAIANA LAND USE CONCERNS COMMITTEE
85-5355 FARRINGTON HIGHWAY
MAIANA, HAWAII 96792

83-05922

October 19, 1983

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Michael J. Chun, Director
Department of Public Works
City and County of Honolulu
Honolulu, Hawaii

Dear Mr. Chun:

The Maiana Land Use Concerns Committee has reviewed the Environmental Impact Statement for the Leeward District Sanitary Landfill and finds a number of major flaws in the document.

1. We do not find that the City made an adequate effort to explore the possibility of alternate sites. There is a great deal of reliance on a study (Inventory Study of Potential Sanitary and Desalination Landfill Sites) that was made prior to the Federal regulation prohibiting the location of landfill over groundwater supply areas. A majority of the sites were eliminated by the enforcement of this restriction. Had the study concentrated on non-restricted areas, more sites that had a possibility of being selected--particularly sites in the Ewa Plain--could have been considered. A subsequent detailed study of areas not over groundwater supplies should have been carried out when the Federal regulation under the Safe Drinking Water Act was promulgated.

2. We further find that the same study used inadequate criteria to determine which sites were most suitable. Two critical criteria that were not considered are "on-going operational costs" and "impact on historical and archeological sites". The practice of a City department--or a consultant for that City Department--coming up with weighted criteria in order to come to a determination about what is the best public policy is a suspect process. Not unexpectedly, the results are what the City department wanted in the first place.

3. Despite repeated requests in various responses to the Notice of Intent to Prepare the subject EIS, no cost analysis is provided. A cost-benefit analysis for all available sites should be provided. This analysis should include site

acquisition, site preparation and on-going operational costs and the data should be presented in a format that allows comparisons. None of the questions about specific operating costs in our letter of May 20, 1983, were answered. We feel that the answers to these questions are vital to an informed decision.

4. Ohikilolo would be classified as prime agricultural land if irrigation were provided. The assumption in the EIS is that water cannot become available. In fact, the Board of Water Supply currently projects production of more than two million gallons per day from Maiana Coast water sources in excess of current need. The community is quite clear that that water should remain in Maiana for agricultural uses and should not be exported to Honolulu for urban development.

5. We disagree with both the tone and substance of numerous conclusions drawn throughout the EIS that tend to down play the impact these landfills will have on the Maiana Coast. For example, we find the ten-fold increase of truck traffic past Makaha Beach a significant increase--one that will adversely affect traffic operations. The projection of one additional vehicle passing that location every minute and a half represents a great deal of traffic in this rural neighborhood. So nearly as we could tell from the narrative, this does not include the traffic generated by the importation of fill. Many of the specific questions about traffic in our letter of May 20, 1983, were not answered. We feel that answers to these questions are vital to an informed decision.

6. We also find the acceptance of the loss of significant, relatively undisturbed archeological sites at Ohikilolo an extremely serious decision--one that should not even be considered until such score is known about the sites.

We include a point of irritation to us--the document persists in describing the landfill as meeting the needs of "leeward" areas as though it is primarily needed to meet our needs. In fact, 50% of Dahu's rubbish will be sent to Maiana, serving an area that can be called leeward only if the island is divided into two parts--leeward and windward.

In summary, we feel that this process has been so flawed that it is essential that the City begin again and re-survey areas that might be acceptable for its landfill needs.

Sincerely,

Billie J. Hauge

Billie J. Hauge
Maiana Land Use Concerns Committee

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DEPARTMENT OF PUBLIC WORKS
CITY AND COUNTY OF HONOLULU
630 SOUTH KING STREET
HONOLULU, HAWAII 96813



GILBERT W. ANDERSON
MAYOR

MICHAEL J. CHUNG, Ph.D.
DIRECTOR AND CHIEF ENGINEER

MAURICE W. BATA
DEPUTY DIRECTOR

February 24, 1984

R 84-117

Ms. Billie J. Hauge
Waianae Land Use Concerns Committee
85-855 Farrington Highway
Waianae, Hawaii 96792

Dear Ms. Hauge:

SUBJECT: Leeward District Sanitary Landfill Environmental Impact Statement

We appreciate your valuable comments and offer the following responses.

Comment:

"1. We do not find that the City made an adequate effort to explore the possibility of alternate sites. There is a great deal of reliance on a study (Inventory Study of Potential Sanitary and Demolition Landfill Sites) that was made prior to the Federal regulation prohibiting the location of landfill over groundwater supply areas. A majority of the sites were eliminated by the enforcement of this restriction. Had the study concentrated on non-restricted areas, more sites that had a possibility of being selected -- particularly sites in the Eva Plain -- could have been considered. A subsequent detailed study of areas not over groundwater supplies should have been carried out when the Federal regulation under the Safe Drinking Water Act was promulgated."

Response:

We have carefully searched the Leeward area and, given the multitude of limiting factors, are unable to find other suitable, available sites for landfilling. However we are continuing our efforts in exploring alternate disposal methods and identifying other landfill sites to meet Oahu's needs.

Comment:

"2. We further find that the same study used inadequate criteria to determine which sites were most suitable. Two critical criteria that were not considered are 'on-going operational costs' and 'impact on historical and archeological sites.' The practice of a City department -- or a consultant for that City Department -- coming up with

Ms. Billie J. Hauge
Page 2
February 24, 1984

weighted criteria in order to come to a determination about what is the best public policy is a suspect process. Not unexpectedly, the results are what the City department wanted in the first place.

Response:

Operational costs do not vary greatly for landfills of similar size, and the use of these costs as a criterion for site selection would not have yielded any useful comparisons. Archeological and historical sites were considered in the 1977 study and based on existing information available at the time of the study. Field investigation of a particular site is the only sure way of determining the presence or absence of archeological artifacts or sites. This was done for both project sites for the current EIS, which revealed the presence of archeological sites in Ohikilolo Valley.

The site selection criteria were compiled by an independent engineering consultant hired by the City to perform the study. The City makes no attempt to influence the results of such studies. Indeed, a consultant would quickly lose his professional credibility if he allowed himself to be swayed by the wishes of his clients.

Comment:

"3. Despite repeated requests in various responses to the Notice of Intent to Prepare the subject EIS, no cost analysis is provided. A cost-benefit analysis for all available sites should be provided. This analysis should include site acquisition, site preparation and on-going operational costs and the data should be presented in a format that allows comparisons. None of the questions about specific operating costs in our letter of May 20, 1983, were answered. We feel that the answers to these questions are vital to an informed decision."

Response:

We believe that these preliminary cost estimates are sufficient bases for sound decision-making. Exact costs for acquisition, site preparation, and operation are not known at the present time. These costs can only be determined after negotiations for the land has been completed and the engineering phase of the project finalized. The preliminary cost estimates are presented in Table 1-5 (p. 1-22) and the hauling cost from Shafter Flats Transfer Station to Ohikilolo is \$10.00/ton and to Waianae Gulch \$8.90/ton (estimate for 1987).

Comment:

"4. Ohikilolo would be classified as prime agricultural land if irrigation were provided. The assumption in the EIS is that water cannot become available. In fact, the Board of Water Supply currently projects production of more than two million gallons per day from Waianae Coast water sources in excess of current need. The community is quite clear that that water should remain in Waianae for agricultural uses and should not be exported to Honolulu for urban development."

Ms. Billie J. Hauge
Page 3
February 24, 1984

Response:

Your objection to exporting water from the Waianae area is noted. However, the distribution of any water in excess of current needs is determined by the Board of Water Supply.

Comment:

"5. We disagree with both the tone and substance of numerous conclusions drawn throughout the GIS that tend to down play the impact these landfills will have on the Waianae Coast. For example, we find the ten-fold increase of truck traffic past Makaha Beach a significant increase--one that will adversely affect traffic operations. The projection of one additional vehicle passing that location every minute and a half represents a great deal of traffic in this rural neighborhood. So nearly as we could tell from the narrative, this does not include the traffic generated by the importation of fill. Many of the specific questions about traffic in our letter of May 20, 1983, were not answered. We feel that answers to these questions are vital to an informed decision."

Response:

We believe that the anticipated environmental impacts from the proposed project have been adequately and objectively described. The traffic study was prepared by a qualified traffic engineer, and the report is contained in the GIS. The traffic study was prepared based upon the worst possible traffic situation and did consider the transporting of fill material to the landfill site.

Comment:

"6. We also find the acceptance of the loss of significant, relatively undisturbed archeological sites at Ohikilolo an extremely serious decision -- one that should not even be considered until much more is known about the sites."

Response:

We are in complete agreement with you that the possible loss of the archeological sites in Ohikilolo Valley, recently found by our survey of the site is a serious decision and should only be made after careful study and evaluation. We will follow all of the archeological recommendations and requirements of the State Historic Preservation Officer.

Comment:

"7. We include a point of irritation to us -- the document persists in describing the landfill as meeting the needs of 'Leeward' area although it is primarily needed to meet our needs. In fact, 50% of Oahu's

Ms. Billie J. Hauge
Page 4
February 24, 1984

rubbish will be sent to Waianae, serving an area that can be called leeward only if the island is divided into two parts -- leeward and windward."

Response:

Our usage of the term "leeward" is the commonly accepted one which presumes the division of the island into two parts.

Comment:

"8. In summary, we feel that this process has been so flawed that it is essential that the City begin again and re-survey areas that might be acceptable for its landfill needs."

Response:

We believe that the entire process in the development of the landfill has been objective, and the documents prepared reflect the current situation regarding landfills on Oahu. There is sufficient information contained in the GIS for policy makers to render an objective decision regarding the future of this project.

Your letter will be incorporated into the Revised Environmental Impact Statement.

Very truly yours,



MICHAEL J. CHUN
Director and Chief Engineer

cc: DLJ
S. Shimabukuro
EISC

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Mr. Michael Chun
Page 2
October 20, 1983

trucked to Ohikilolo. Maybe the City should look at having a smaller landfill site in each community. It would certainly save money.

3) Costs
The EIS does not address the cost of the Leeward Sanitary Landfill sites or other sites for comparison.

4) Historical Sites
We are disturbed and find it unacceptable that the City would allow the destruction of an archeological site once you have surveyed it. It is important for our community to preserve the historical and cultural heritage of the Waianae Coast.

5) Eco-System
The EIS does not address the effects to the eco-system that the Landfill will have on the ocean at Ohikilolo. During the rainy season, there are lots of run off into the ocean in that area. How will it affect the reef life, fishing and gathering of limu?

6) Community Impact
Ohikilolo has a historical and spiritual meaning for many of our residents. It is a community resource rich with cultural and historical heritage of the Waianae Coast. Ohikilolo has offered our residents and community another open space recreational facility.

We consider the Environmental Impact Statement for the Leeward Sanitary Landfill inadequate and misleading for any decision-making. The City must look to other alternatives other than landfill.

Sincerely,

Peter A. S. ...
Peter A. S., Chairman
Waianae Coast District Council



DISTRICT OFFICES
CITY OF HONOLULU
415 Kalia Road
Honolulu, HI 96814
Phone: 535-1000

13-102

October 20, 1983

Mr. Michael Chun, Director
Department of Public Works
City & County of Honolulu
650 South King Street
Honolulu, Hawaii 96813

Dear Mr. Chun:

The Waianae Coast District Council has reviewed the Environmental Impact Statement for the Leeward Sanitary Landfill. We are against the Leeward Sanitary Landfill proposal at Ohikilolo. We feel there are some concerns that will adversely affect the Waianae Coast community that have not been adequately addressed.

1) Traffic Impact Study
The EIS states that the traffic generation to the proposed Sanitary Landfill at Ohikilolo will amount to approximately 2% of existing average daily traffic. Yet by your own data the rubbish-carrying vehicles passing along the Waianae Coast at the rate of 38 per hour and 266 or more trucks during the 8 hour work day and all of this not be noticed by residents or no increase in traffic is highly improbable. Working hours would also include school hours. There are 3 schools along Farrington Highway.

Many residents have already expressed their concern about the excessive speed limits into Nanakuli and the already deteriorating and deplorable roads and highways. The added heavy truck traffic would increase the probability of more accidents along our highways. We think the City should do a more comprehensive traffic study for this area.

2) Alternative Sites
The City has not looked at alternative sites. The EIS states approximately 50% of solid waste will be

DEPARTMENT OF PUBLIC WORKS
CITY AND COUNTY OF HONOLULU
630 SOUTH KING STREET
HONOLULU, HAWAII 96813



GILLEN R. ANDERSON
-41100

MICHAEL J. CHUN, Ph.D.
DIRECTOR AND CHIEF ENGINEER
MAURICE W. RAY
DEPUTY DIRECTOR

R 84-67

January 30, 1984

Mr. Peter Apo, Sr.

Chairman
Waianae Coast District Council
Honolulu Community Action Program
838 South Beretania Street, Suite 202
Honolulu, Hawaii 96813

Dear Mr. Apo:

SUBJECT: Leeward District Sanitary Landfill Environmental Impact Statement
We appreciate your review of the document and offer the following responses to your comments.

Comment:

"1) **Traffic Impact Study**
The EIS states that the traffic generation to the proposed Sanitary Landfill at Ohikilolo will amount to approximately 2% of existing average daily traffic. Yet by your own data the rubbish-carrying vehicles passing along the Waianae Coast at the rate of 30 per hour and 266 or more trucks during the 8 hour work day and all of this not be noticed by residents or no increase in traffic is highly improbable. Working hours would also include school hours. There are 3 schools along Farrington Highway."

"Many residents have already expressed their concern about the excessive speed limits into Hanalei and the already deteriorating and deplorable roads and highways. The added heavy truck traffic would increase the probability of more accidents along our highways. We think the City should do a more comprehensive traffic study for this area."

Response:

We do not believe that additional traffic studies would provide significant new data. Nor do we anticipate a significant adverse impact to communities along the route to Ohikilolo. The impact of landfill traffic

Mr. Peter Apo, Sr.
Page 2
January 30, 1984

on roadway conditions and maintenance will be evaluated by the State Department of Transportation prior to their approval or disapproval of the project. We will work with them to minimize adverse effects.

Comment:

"2) **Alternative Sites**
The City has not looked at alternative sites. The EIS states approximately 50% of solid waste will be trucked to Ohikilolo. Maybe the City should look at having a smaller landfill site in each community. It would certainly save money."

Response:

The search for landfill sites has been an ongoing priority item for many years. Numerous sites were studied and considered over the years. Many of the sites were rejected for one reason or another, and there are presently only two locations under consideration for landfilling in the Leeward District.

Your suggestion that every community have a landfill has merit. However, the cost of developing and operating small landfills for every community would be prohibitive. The cost of developing and operating centralized landfills is less expensive than developing and operating numerous small landfills, because there is no need to duplicate site improvements, facilities, staffing, and equipment. Also, there are many communities which do not have suitable land for landfilling. Because of widespread opposition, it is doubtful that enough small sites could be acquired to handle all of the wastes generated on Oahu.

Comment:

"3) **Costs**
The EIS does not address the cost of the Leeward Sanitary Landfill sites or other sites for comparison."

Response:

The estimated cost for the Leeward Sanitary Landfills are found in Table 1-5 on page 1-22 of the Environmental Impact Statement. (Costs for other Landfills were not presented because there are no alternative sites under consideration at the present time.)

Comment:

"4) **Historical Sites**
We are disturbed and find it unacceptable that the City would allow the destruction of an archeological site once you have surveyed it. It is important for our community to preserve the historical and cultural heritage of the Waianae Coast."

Mr. Peter Apo, Sr.
Page 4
January 30, 1984

We have pointed out in the impact statement, landfills will be required even with the implementation of the resource recovery facility.

Very truly yours,



FOR MICHAEL J. CHUN
Director and Chief Engineer

cc: DUD
EISC ✓

Mr. Peter Apo, Sr.
Page 3
January 30, 1984

Response:

We agree that it is important to preserve historical sites when possible. We have and will continue to conform to the suggestions and recommendations of the State Historic Preservation Officer.

Comment:

"5) Eco-System
The EIS does not address the effects to the eco-system that the Landfill will have on the ocean at Ohikilolo. During the rainy season, there are lots of run off into the ocean in that area. How will it affect the reef life, fishing and gathering of limu?"

Response:

The landfill's drainage system will be designed with siltation basins to prevent excessive siltation of the near-shore waters. It is not anticipated that the storm water runoff will be increased significantly from that which normally occurs and the storm water will not significantly degrade the water quality.

Comment:

"6) Community Impact
Ohikilolo has a historical and spiritual meaning for many of our residents. It is a community resource rich with cultural and historical heritage of the Waianae Coast. Ohikilolo has offered our residents and community another open space recreational facility."

Response:

The community resource of Ohikilolo Valley is noted.

Comment:

"We consider the Environmental Impact Statement for the Leeward Sanitary Landfill inadequate and misleading for any decision-making. The City must look to other alternatives other than landfill."

Response:

We believe that the Environmental Impact Statement is adequate for decision making purposes. The City is looking at resource recovery as an alternative means for disposal of the solid waste. However, as

Mr. Michael Chum
Page 2
October 21, 1983

Ohikilolo, to our community, is the only cattle ranch in our area. It has been open to all for community functions. For us it is a spiritual and very sacred place. The archaeological significance of Ohikilolo, the fish rock where fishermen put their hookupu after fishing, is still practiced today by several families. The surface archaeological survey has opened the past and perhaps the future to many on the Waianae Coast. To what purpose would someone want to destroy a community's heritage.

It should also be noted that winds in the area will carry garbage or what have you into the ocean especially into the Barking Sand area. The sand barks there because of the high velocity winds.

Thank you for considering our comments.

Sincerely,

Charles Lau
Charles Lau
Public Relations
Nanakuli Fishing Village
Enclosure

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REC'D
DEPT OF PUBLIC WORKS
OCT 23 2 30 PM '83

Nanakuli Fishing Village
85-555 Farrington Hwy.
Waianae, HI 96792

October 20, 1983

Mr. Michael Chum, Director
Department of Public Works
City & County of Honolulu
650 South King Street
Honolulu, Hawaii 96813

Dear Mr. Chum:

The Nanakuli Fishing Village has reviewed the Leeward Sanitary Landfill Environment Impact Statement. We are against any proposal to locate a landfill at Ohikilolo on the Waianae Coast.

We have not found in the EIS any studies on the adverse effects to fishing. The State of Hawaii recently built a beautiful boat harbor for fisherman and pleasure boats because of the bountiful fishing grounds on the Leeward Coast. Most fishermen look at the coastline as a big seafood deep freezer and many derive their survival through fishing in these hard times of high unemployment. What would be the adverse effects to our senior citizens and retired elderly who just want to shoreline fish or to those who pick the seaweed (limu) on the shores of Ohikilolo? The EIS states there will be no seepage or run off of silt or other pollutants by providing a siltation basin; however, it does not state how silt or other pollutants will be controlled during the rainy season. It also bothers us that the City is considering the landfill so close to the ocean that has a wealth of food supply yet untouched.

Additionally, heavy rubbish trucks to our already heavily burdened heavy traffic is insane. It only adds more traffic accidents. Three of our schools are right along Farrington Highway. We already have a traffic problem in Nanakuli coming off the freeway into a four lane highway--there is still speeding. We DO NOT want to have heavy loaded rubbish trucks going by all day.

OCT 31 1983
FISC

11
PETITION

We, the undersigned are opposed to using OHIKILOLO for the Leeward Sanitary landfill as proposed by the City and County of Honolulu.

NAME	ADDRESS
David Sunde	2614 Kona St. #6 Honolulu 96821
Ray Fakie	99-066 OHIAKI PL. AIEA 96701
Margaret J. Iwani	99-066 Ohiaiki Pl. Aiea HI 96701
Polina Tolani	99-066 Ohiaiki Pl. Aiea HI 96701
John J. O'Brien	8-274 Pelepa St. 96725
Regina V. Iwani	87-147 Palakona St. 96798
Daniel A. Iwani	85-289 Mahanui Rd. 96722
Arnold O'Brien	P.O. Box 2142 Haukapu, HI 96792
Miriam Iwani	84936 Kakaia St. Waianae HI 96792
Quincy K. Helemani	92-629 Neve St. Makakala 96706
John J. O'Brien	85-450 A. Iwani Ave. HI 96792
Bob Iwani	86-660 Waihanae Hwy. HI 96792
Michael Kakaia	" " " " " "
John Iwani	" " " " " "
John Iwani	2598 Alakala St. HI 96792
John Iwani	144 Kona Pl. HI 96792
John Iwani	85-109 Kapaemahu Pl.
Mrs. Nancy A. Kakaia	" " " " " "
Blossom Rowland	85-1150 Kanaile St.
Arnold O'Brien	7-8th Kakaia Street
Robert Iwani	85-109 Kapaemahu Pl.
John Iwani	7-8th Kakaia Street
John Iwani	23425 Apala Honolulu
John Iwani	22425 Apala Honolulu
John Iwani	P.O. Box 215 Ewa Beach HI 96706
John Iwani	P.O. Box 275 Ewa Beach HI 96706
John Iwani	1814 Kakaia St. HI 96792
John Iwani	904 The Cully Dr. HI 96792
John Iwani	2441 Kona Maui Is. HI

21
PETITION

We, the undersigned are opposed to using OHIKILOLO for the Leeward Sanitary landfill as proposed by the City and County of Honolulu.

Katherine Iwani	84-310 Ikuoana Pl.
John Iwani	220 Ikuoana Pl.
John Iwani	84-119 Maliana St.
John Iwani	41-68 Red St.
John Iwani	1012 Kakaia Pl. HI 96792
John Iwani	114 Kakaia Pl. HI 96792
John Iwani	85-833 Farrington Hwy.
John Iwani	85-706 Kapaemahu Pl. HI 96792
John Iwani	1657 Alderbrook St. HI 96792
John Iwani	84-111 ORANGE ST. HI 96792
John Iwani	1325 Kakaia Pl. HI 96792
John Iwani	84-111 Kakaia Pl. HI 96792
John Iwani	84-1072 Kakaia St. HI 96792
John Iwani	1327 Kakaia St. HI 96792
John Iwani	58 Ohiaiki Pl. HI 96792
John Iwani	58 Ohiaiki Pl. HI 96792
John Iwani	58 Ohiaiki Pl. HI 96792
John Iwani	1995 Kakaia Pl. HI 96792
John Iwani	1547 Kakaia Pl. HI 96792
John Iwani	5219 Kakaia Pl. HI 96792
John Iwani	1374 Kakaia Pl. HI 96792
John Iwani	53-007 Kakaia Pl. HI 96792
John Iwani	53-097 Kakaia Pl. HI 96792
John Iwani	53-097 Kakaia Pl. HI 96792
John Iwani	84-655 Waihanae Pl. HI 96792
John Iwani	87-936 Kakaia Pl. HI 96792
John Iwani	457 Kakaia Pl. HI 96792
John Iwani	225 Kakaia Pl. HI 96792
John Iwani	3128 Kakaia Pl. HI 96792

PETITION

We, the undersigned are opposed to using OHIKILOLO for the Leeward Sanitary landfill as proposed by the City and County of Honolulu.

NAME	ADDRESS
Bill Hesters	84-315 Ikuoae Pl.
Bim Chua	45-161 Konohe Bay Dr
MONA BURNS	44-919 HANA ST. #.
Quic H. W. Kuan	85-706 Kapauni Pl. Waimanalo HI 96792
Shawanao	P.O. Box 2315 Waimanalo, Hawaii
P. Lopez	28-110 Kookonaie, Hialeah
John Chikawa	430 Konohe Pl. Honolulu HI 96819
Bill Kama	85-497 Waimanalo Pl. Waimanalo HI 96792
Lee Ann Miller	PO Box 1374 HNL 96822
Emilia Sloan	225-425 Teia Puhalehale St

PETITION

We, the undersigned are opposed to using OHIKILOLO for the Leeward Sanitary landfill as proposed by the City and County of Honolulu.

NAME	ADDRESS
Leann Rodriguez	82-145 Hines St
Chilly Rodriguez	" " "
Rapato T. Estrada	82-307 Haama Pl.
Virginia Maldonado	" " "
Henny M. Kedes	86-307 Haama Pl.
Shelly Arslony	85-131 Kaulawale Rd.
Williams Lumbly	" " "
SR D. ...	24-484 Simms St. Waimanalo
...	" " "
Marilyn ...	4-906 Ahuenui Pl. Waimanalo HI 96794
Reg ...	47-475 Ahuenui Pl. Waimanalo HI 96794
...	94-1846 Aiea St., Waimanalo
...	87-214 Kaulahe Pl.
...	87-225 Okole St. Waimanalo HI 96792
...	87-123 Makana St
...	87-131 Puhalehale St 96792
...	86-523 Puhalehale St 96792
...	86-908 Waimanalo HI 96792
...	86-246 Kaulahe Pl. Waimanalo
...	24-879 Waimanalo St. Waimanalo
...	84-805 Fricker St.
...	84-805 Fricker St.
...	87-126 Auger Blvd Waimanalo
...	95-591 Waimanalo HI 96792
...	45-429 Waimanalo St
...	84-212 Waimanalo Pl. Waimanalo
...	85-775 Waimanalo Pl. Waimanalo
...	89-216 Waimanalo Pl.
...	94-1558 Waimanalo St.

WE, THE RESIDENTS OF THE CITY AND COUNTY OF HONOLULU AND WAIANAE DISTRICT, SUPPORT CITY COUNCIL CHAIR PATSY MIKI'S REQUEST TO WELLD T. CHOW, CHIEF PLANNING OFFICER OF THE DEPARTMENT OF GENERAL PLANNING, TO HAVE THE "OHIKILOLO" SITE REMOVED FROM THE PUBLIC FACILITIES MAP WHICH SAID REQUEST IS IN THE CURRENT ANNUAL REVIEW PROCESS. WE, THE UNDERSIGNED ARE OPPOSED TO USING "OHIKILOLO" FOR THE LEANARD SANITARY LANDFILL AS PROPOSED BY THE CITY AND COUNTY OF HONOLULU.

PRINT NAME	SIGNATURE	ADDRESS
KENESSEY KEANE	<i>[Signature]</i>	95-332 Farrer Hwy
Lolise Lalual	<i>[Signature]</i>	97-199 A Fair Hwy
Arnold Keane	<i>[Signature]</i>	95-328 Farrer Hwy
John Smith	<i>[Signature]</i>	89-509 Farrer Hwy
Vina Sunny	<i>[Signature]</i>	84-740 Trickett St
Clifford L. Ross	<i>[Signature]</i>	85-177 HIAS
Uluvaun Kakuina	<i>[Signature]</i>	959 Hobbins Rd

WE, THE RESIDENTS OF THE CITY AND COUNTY OF HONOLULU AND WAIANAE DISTRICT, SUPPORT CITY COUNCIL CHAIR PATSY MIKI'S REQUEST TO WELLD T. CHOW, CHIEF PLANNING OFFICER OF THE DEPARTMENT OF GENERAL PLANNING, TO HAVE THE "OHIKILOLO" SITE REMOVED FROM THE PUBLIC FACILITIES MAP WHICH SAID REQUEST IS IN THE CURRENT ANNUAL REVIEW PROCESS. WE, THE UNDERSIGNED ARE OPPOSED TO USING "OHIKILOLO" FOR THE LEANARD SANITARY LANDFILL AS PROPOSED BY THE CITY AND COUNTY OF HONOLULU.

PRINT NAME	SIGNATURE	ADDRESS
Diana MPTEGROVE	<i>[Signature]</i>	85-118 H. H. M. Ave
ERIC CAPTEGRAVE	<i>[Signature]</i>	85-118 H. H. M. Ave
Antonia M. Beline	<i>[Signature]</i>	14-761 Lohaina St
Tina Marshall	<i>[Signature]</i>	84-797 Lohaina St
Alexandro PANE	<i>[Signature]</i>	84-725 Lohaina St
Lolise Lalual	<i>[Signature]</i>	84-761 Lohaina St
David R. Walker	<i>[Signature]</i>	87-150 S. Keolu
Annella M. Diolty	<i>[Signature]</i>	87-119 Kinalakia
Christine Babin	<i>[Signature]</i>	84-999 Kinalakia
Gene Doyne	<i>[Signature]</i>	85-957 Bayview Dr.
Mathilda K. Davis	<i>[Signature]</i>	84-818 Trickett
Samuel Kapoi	<i>[Signature]</i>	85-257 Bayview
Paula Reed	<i>[Signature]</i>	86-247 Kinalakia
Frank Ch. Davis	<i>[Signature]</i>	85-945 Bayview
Charles L. Davis	<i>[Signature]</i>	85-945 Bayview
James K. Linn	<i>[Signature]</i>	85-945 Bayview
Rosario L. Linn	<i>[Signature]</i>	85-945 Bayview
Esther L. Linn	<i>[Signature]</i>	84-874 Hobbins St
Ernest A. Leone	<i>[Signature]</i>	86-199 Kinalakia
Shirley Lewis	<i>[Signature]</i>	14-761 Lohaina St
Paula Linn	<i>[Signature]</i>	86-141 Punahulu Rd
Mary K. Kahalawe	<i>[Signature]</i>	84-970 Lohaina St
Kenneth Kawasawa	<i>[Signature]</i>	86-970 Lohaina St
Maria S. Linn	<i>[Signature]</i>	84-968 Lohaina
Barbara Lohaina	<i>[Signature]</i>	84-818 Hobbins
Pete Linn	<i>[Signature]</i>	85-257 Bayview
C. Moran	<i>[Signature]</i>	P.O. Box 1215, Waianae
Joselyn K. Babin	<i>[Signature]</i>	84-761 Lohaina St

DEPARTMENT OF PUBLIC WORKS
CITY AND COUNTY OF HONOLULU
630 SOUTH KING STREET
HONOLULU, HAWAII 96813



WILEM H. ANDERSON
DIRECTOR

MICHAEL J. CHAM, Ph.D.
DIRECTOR AND CHIEF ENGINEER

MAURICE H. KAYA
DEPUTY DIRECTOR

R 84-12

January, 9 1984

Mr. Charles Lau
Public Relations
Manakuli Fishing Village
85-555 Farrington Highway
Waianae, Hawaii 96792

Dear Mr. Lau:

SUBJECT: Leeward District Sanitary Landfill Environmental Impact Statement

We appreciate your valuable comments and offer the following responses.

Comment:

"The Manakuli Fishing Village has reviewed the Leeward Sanitary Landfill Environment Impact Statement. We are against any proposal to locate a landfill at Ohikilolo on the Waianae Coast."

Response:

Your organization's opposition to the landfill at Ohikilolo is noted.

Comment:

"We have not found in the EIS any studies on the adverse effects to fishing. The State of Hawaii recently built a beautiful boat harbor for fisherman and pleasure boats because of the bountiful fishing grounds on the Leeward Coast. Most fishermen look at the coastline as a big seafood deep freezer and many derive their survival through fishing in these hard times of high unemployment. What would be the adverse effects to our senior citizens and retired elderly who just want to shoreline fish or to those who pick the seaweed (limu) on the shores of Ohikilolo? The EIS states there will be no seepage or run off of silt or other pollutants by providing a siltation basin; however, it does not state how silt or other pollutants will be controlled during

Mr. Charles Lau
Page 2
January 9, 1984

the rainy season. It also bothers us that the City is considering the landfill so close to the ocean that has a wealth of food supply yet untouched."

Response:

The siltation basin and drainage system will be designed to accommodate the storm water runoff during the rainy season. All applicable standards will be met and the design for the siltation basin and other pollution abatement structures and facilities will be reviewed by appropriate governmental agencies. We, too, would prefer locating landfills farther away from the ocean. Doing so, however, would place them over the aquifers which provide Oahu's drinking water, with the attendant possibilities of pollution.

Comment:

"Additionally, heavy rubbish trucks to our already heavily burdened heavy traffic is insane. It only adds more traffic accidents. Three of our schools are right along Farrington Highway. We already have a traffic problem in Manakuli coming off the freeway into a four lane highway -- there is still speeding. We DO NOT want to have heavy loaded rubbish trucks going by all day."

Response:

A traffic study was conducted and the results are contained in the EIS; please refer to Appendix D. We are also concerned about the traffic problems and will be working with the State Department of Transportation to insure that all precautions and requirements are met.

Comment:

"Ohikilolo, to our community, is the only cattle ranch in our area. It has been open to all for community functions. For us it is a spiritual and very sacred place. The archaeological significance of Ohikilolo, the fish rock where fishermen put their hookups after fishing, is still practiced today by several families. The surface archaeological survey has opened the past and perhaps the future to many on the Waianae Coast. To what purpose would someone want to destroy a community's heritage."

Response:

The Ohikilolo Valley's spiritual and sacred nature to some of the community is noted and will be taken into consideration in the final analysis of the site. All archaeological requirements for the study of the site will be worked out with the State Historic Preservation Officer.

Mr. Charles Lau
Page 3
January 9, 1984

Comment:

"It should also be noted that winds in the area will carry garbage or what have you into the ocean especially into the Backing Sand area. The sand banks there because of the high velocity winds."

Response:

The potential problem of winds carrying litter or other debris into the ocean will be evaluated during the preliminary engineering phase of the project. If necessary, litter barriers such as fences, shrubs, trees, etc., will be incorporated in the final design to ensure that no litter escapes into the ocean from the landfill.

Your letter and petition will be incorporated into the Revised Environmental Impact Statement.

Very truly yours,

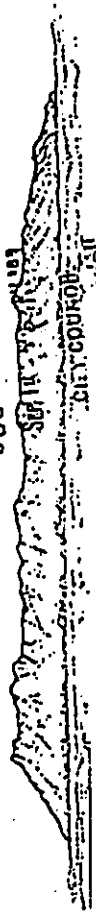


MICHAEL J. CHUN
Director and Chief Engineer

cc: DLJ
S. Shimabukuro

Waiānae Coast Rotary Club

P.O. Box 651 Waiānae, HI. 96792



Sept. 12th, 1983

Mrs Patsy Mink
City & County of Honolulu
Honolulu, Hawaii 96813

Dear Mrs Mink:

On behalf on all of the members of the Waiānae Coast Rotary Club we do not believe that the Ohikilolo Ranch should be for a new location of a refuge waste site. There are definitely more appropriate locations that would provide the necessary requirements needed and not create the problems that would occur in the future growth in the Waiānae Coast.

Whatever support you might offer would be greatly appreciated.

Mahalo, a nui loa,

J. Hildreth
H. Hildreth, Secy.

JHH:jh

September 28, 1983

Mr. J. H. Hildreth, Secretary
Waiānae Coast Rotary Club
P. O. Box 651
Waiānae, Hawaii 96792

Dear Mr. Hildreth:

Thank you for your letter of September 12, 1983, expressing your objection to the use of Ohikilolo as a sanitary landfill.

The City and County has studied numerous sites on the island as possible landfill sites. However, most of them are located within groundwater supply areas; are within close proximity to residential communities; or are located on lands owned by the Federal or State governments and are used for other purposes. Therefore, the City is concentrating its efforts on four sites: Ohikilolo and Waiānae Gulch in Leeward Oahu and Kāhiko and Bellows in Windward Oahu.

The City has recently completed and filed an Environmental Impact Statement for the Leeward sites. Each site has its advantages and disadvantages which will be carefully examined to insure the selection of a site which will do the most good for the most people. At this time, the Department of Public Works indicates that Waiānae Gulch is anticipated to be the first sanitary landfill to be developed. Your concern regarding Ohikilolo is appreciated and is being taken under consideration.

Thank you again for your interest and concern about this important issue.

Very truly yours,

Ellen R. Anderson

Ellen R. Anderson

HONOLULU

OCT 20 1983

EISC

bcc: Environment Impact Study Corp.

RECEIVED

OCT 20 1983

EISC

CITY COUNCIL
CITY AND COUNTY OF HONOLULU
HONOLULU, HAWAII 96813 / TELEPHONE 523-4000



PAISY T. MINK
Chair

September 26, 1983

To: Dr. Michael Chun
Director
Department of Public Works
City and County of Honolulu

From: Patsy T. Mink

I am forwarding for inclusion in the public comments regarding the location of a sanitary landfill at Ohikilolo, a letter I received from J. H. Hildreth Secretary of the Waianae Coast Rotary Club, P.O. Box 651, Waianae, Hawaii 96792, stating their opposition to the location of a landfill at Ohikilolo.

R 83-697

October 11, 1983

Honorable Patsy T. Mink, Chair
City Council
City and County of Honolulu
Honolulu, Hawaii 96813

Dear Madam Chair:

Thank you for forwarding the September 12, 1983 letter from the Waianae Coast Rotary Club. As you requested, the letter will be included in the public comments section of the Revised Environmental Impact Statement for the Leeward Landfill. The Mayor has already sent a response to an identical letter from the Rotary Club which was sent to her.

Very truly yours,

Michael J. Chun
MICHAEL J. CHUN
Director and Chief Engineer

Attach.
bcc: EISC -

APPROVED:

Andrew I. T. Chang
ANDREW I. T. CHANG
Managing Director

fa

OCT 20 1983
EISC

REC...
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West Beach Estates

2021 H. King Street • Honolulu, HI 96813 • Phone (808) 947-4261

83-05717

West Beach Estates

Dr. Michael Chun
October 6, 1983
Page 2

October 6, 1983

Dr. Michael Chun
Director and Chief Engineer
Department of Public Works
City and County of Honolulu
650 South King Street
Honolulu, Hawaii 96813

RECEIVED
OCT 14 1983
EISC

DEPT. OF PUBLIC WORKS
OCT 14 1983
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ENVIRONMENTAL
REFUSE

Subject: PROPOSED LEEMARD DISTRICT SANITARY LANDFILL AT WAIHANAALO GULCH
THK: 3-2-03: 2, 13 & 14

Dear Dr. Chun:

West Beach Estates has reviewed the draft Environmental Impact Statement with regard to possible impacts on the proposed West Beach resort. Generally, our concerns are more in the area of visual and aesthetic impacts since it is our understanding that this facility at Waihanaalo Gulch will be operated in a manner more consistent with current operating procedures as prescribed by REQA.

It should be noted that we have a general concern with dust, litter, vectors, and surface runoff and the cumulative effect of these on West Beach. However, in terms of specific concerns, we would like to see the following items addressed in the final Environmental Impact Statement:

1. **Traffic** - We anticipate the traffic going to and from the site from the Primary Urban Center will operate within the limits of applicable noise codes. The operating hours which will require the delivery of refuse and cover material to the site should be more clearly identified. Can we expect to see trucks coming earlier than normal operating hours, like residential pickup hours (0530 - 0730)? Also, will transfer trailers from Shafter Flats be moving refuse during the evening hours when traffic on H-1 and Farrington Highway is reduced? How will traffic from the proposed resource energy plant at Campbell Park move to the site? Finally, in the event of tenant or resident complaint on vehicular noise violations, how will DPM respond to these complaints?
2. **Visual/Aesthetic Impact** - We do not see any reference to a final grading plan which points out the final grading elevation of the site in terms of refuse placement. We have been told that due to the configuration of the Waihanaalo Gulch walls, the final grade elevations are not to exceed or go higher than the canyon walls. Is this basically true? If we look at the Palatal Landfill, it is apparent that the final grade elevation at that facility is exceeding the abandoned quarry that they started with in 1973. We would like to see a final grading plan that identifies the

closing height elevation that DPM plans to achieve during the lifetime of this project. Also, at the appropriate time, a refuse placement plan that shows how the lifts in the refuse placement area are to be achieved would be of great help. This would help us determine how refuse is being placed in relation to the development plan of West Beach, especially in reference to the low density parcels to be sited at the entry road of our project.

3. **Leachate Control** - On this subject, we are most concerned since the leachate generation of the Waihanaalo facility could prove extremely damaging to West Beach, especially to the shoreline with the lagoon system and marina. We would be interested in seeing how exactly the control of leachate is being proposed in the Waihanaalo Gulch and where the migration patterns are anticipated. Will DPM be considering a membrane lining or impervious liner on the bottom of the site with appropriate drainage controls to drain off the leachate into an enclosed system for removal and disposal? We are conversant with the techniques that will prevent leachate generation but fail to see any reference to these practices in the DEIS.

4. **Methane Gas** - This potential pollutant is also a vital concern to West Beach since the obvious odors that are emitted from a landfill operation that is not operating properly is offensive to both the operator and adjacent land users. There is also the potential hazard of explosion due to the emission of this highly volatile gas unless it is controlled through an initial design and implemented through daily operational control.

In conclusion, we understand your concerns regarding the necessity of landfill sites. However, if it must be located in Waihanaalo Gulch, we would expect that the City would make every effort to mitigate all potential adverse impacts to the West Beach project, realizing the value such a development will have on the Leeward and Central areas, as well as the economy of the entire Island of Oahu and State of Hawaii. In this connection, we would anticipate that the final Environmental Impact Statement would address and discuss the specific impacts to West Beach and their mitigation measures.

We will be pleased to continue working with your department and staff on this project, but must remain adamant on the position that West Beach must adopt to protect the integrity of that development.

Sincerely,

William V. Blaisdell
General Manager

WRB:CO

DEPARTMENT OF PUBLIC WORKS
CITY AND COUNTY OF HONOLULU
650 SOUTH KING STREET
HONOLULU, HAWAII 96813



EILEEN M. ANDERSON
19800

MICHAEL J. CHUN, Ph.D.
DIRECTOR AND CHIEF ENGINEER

MAURICE H. KAYA
SENIOR DIRECTOR

R 84-100

February 15, 1984

Mr. William W. Blaisdell
General Manager
West Beach Estates
2024 N. King Street
Honolulu, Hawaii 96819

Dear Mr. Blaisdell:

SUBJECT: Leeward District Sanitary Landfill Environmental Impact Statement

We appreciate your valuable comments and offer the following responses.

Comment:

"West Beach Estates has reviewed the draft Environmental Impact Statement with regard to possible impacts on the proposed West Beach resort. Generally, our concerns are more in the area of visual and aesthetic impacts since it is our understanding that this facility at Waimanalo Gulch will be operated in a manner more consistent with current operating procedures as prescribed by REQA."

Response:

We are in complete agreement that visual and aesthetic considerations must be considered in the development and operation of the landfill at Waimanalo Gulch. As such, the landfill will be designed to minimize the adverse visual impacts by providing a visual barrier at the mouth of the gulch. We will keep you informed of our plans during the engineering phase of the project.

The landfill will be designed and operated to prevent adverse impacts to the West Beach area.

Mr. William W. Blaisdell
Page 2
February 15, 1984

Comment:

"It should be noted that we have a general concern with dust, litter, vectors, and surface runoff and the cumulative effect of these on West Beach. However, in terms of specific concerns, we would like to see the following items addressed in the final Environmental Impact Statement:"

"1. Traffic - We anticipate the traffic going to and from the site from the Primary Urban Center will operate within the limits of applicable noise codes. The operating hours which will require the delivery of refuse and cover material to the site should be more clearly identified. Can we expect to see trucks coming earlier than normal operating hours, like residential pickup hours (0530 - 0730)? Also, will transfer trailers from Shafter Flats be moving refuse during the evening hours when traffic on H-1 and Farrington Highway is reduced? How will traffic from the proposed resource energy plant at Campbell Park move to the site? Finally, in the event of tenant or resident complaint on vehicular noise violations, how will DPH respond to these complaints?"

Response:

Refuse hauling vehicles will operate during normal hours from 7:00 AM to 5:00 PM daily and will comply with applicable noise regulations. We do not anticipate the movement of refuse from Shafter Flats beyond the working hours specified above. As for the movement of the vehicles from Campbell Park to the Waimanalo Gulch, they will follow existing roads and highways.

With regards to tenant or resident complaints on vehicular noise, this department will respond quickly to determine if there is a violation and, if so, will respond to correct the violation.

Comment:

"2. Visual/Aesthetic Impact - We do not see any reference to a final grading plan which points out the final grading elevation of the site in terms of refuse placement. We have been told that due to the configuration of the Waimanalo Gulch walls, the final grade elevations are not to exceed or go higher than the canyon walls. Is this basically true? If we look at the Paialal Landfill, it is apparent that the final grade elevation at that facility is exceeding the abandoned quarry that they started with in 1973. We would like to see a final grading plan that identifies the closing height elevation that DPW plans to achieve during the lifetime of this project. Also, at the appropriate time, a refuse placement plan that shows how the lifts in the refuse placement area are to be achieved would be of great help. This would help us determine how refuse is being placed in relation to the development plan of West Beach, especially in reference to the low density parcels to be sited at the entry road of our project."

Mr. William W. Blaisdell
Page 4
February 15, 1984

Comment:

"In conclusion, we understand your concerns regarding the necessity of landfill sites. However, if it must be located in Waimanalo Gulch, we would expect that the City would make every effort to mitigate all potential adverse impacts to the West Beach project, realizing the value such a development will have on the Leeward and Central areas, as well as the economy of the entire island of Oahu and State of Hawaii. In this connection, we would anticipate that the final Environmental Impact Statement would address and discuss the specific impacts to West Beach and their mitigation measures."

Response:

The City will make every effort to mitigate all potential adverse environmental impacts to the West Beach project. The specific engineering design for the mitigation of the potential adverse environmental impacts will be developed during the engineering phase of the project and you will be kept informed of our plans.

Comment:

"We will be pleased to continue working with your department and staff on this project, but must remain adamant on the position that West Beach must adopt to protect the integrity of that development."

Response:

Your position is understandable, and we will work with you to insure that the necessary protection of your project will be realized.

Your letter will be incorporated into the Revised Environmental Impact Statement.

Very truly yours,

MICHAEL J. CHEN
Director and Chief Engineer

cc: DLU
S. Shimabukuro
EISC

Mr. William W. Blaisdell
Page 3
February 15, 1984

Response:

The final grading plans, including landscaping plans and other required plans, will be prepared during the engineering phase of this development. As we have stated, you will be consulted during the engineering phase. The final grade of the landfill will not exceed the height of the gulch walls.

Comment:

"3. Leachate Control - On this subject, we are most concerned since the leachate generation of the Waimanalo facility could prove extremely damaging to West Beach, especially to the shoreline with the lagoon system and marina. We would be interested in seeing how exactly the control of leachate is being proposed in the Waimanalo Gulch and where the migration patterns are anticipated. Will DPW be considering a membrane lining or impervious liner on the bottom of the site with appropriate drainage controls to drain off the leachate into an enclosed system for removal and disposal? We are conversant with the techniques that will prevent leachate generation but fail to see any reference to these practices in the DEIS."

Response:

Your concern regarding possible contamination of the West Beach area from leachate is also our concern. We do not expect leachate to be generated because the landfill site is in an area of low annual rainfall. However, as safeguard measures, the landfill subgrade will be compacted to reduce its permeability, leachate interceptor trenches and monitoring wells will be installed, and the landfill will be designed to prevent the entrance of excessive moisture from storm runoff.

Comment:

"4. Methane Gas - This potential pollutant is also a vital concern to West Beach since the obvious odors that are emitted from a landfill operation that is not operating properly is offensive to both the operator and adjacent land users. There is also the potential hazard of explosion due to the emission of this highly volatile gas unless it is controlled through an initial design and implemented through daily operational control."

Response:

As with leachate control, gas venting and other means of gas control will be developed during the engineering phase of this project.





SIERRA CLUB, HAWAII CHAPTER
 P.O. BOX 22897 HONOLULU, HAWAII 96822
 (808) 946-8494

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September 30, 1983
 Michael J. Chun, Director and Chief Engineer,
 Department of Public Works, City and County of Honolulu
 650 South King Street, Honolulu, Hawaii 96813

Dear Mr. Chun:

Thank you for sending the EIS for the Proposed Leeward District Sanitary Landfill at Wai'anae Gulch Site (TKs 9-2-03; 2,13,40 and Ohikilo Site (TKs 8-3-01). We appreciate the opportunity to make constructive comments at early planning stages for projects with potential environmental effect. As chairman for the Conservation Committee of the Sierra Club, Hawaii Chapter, Honolulu Group, I would like to make two comments and recommendations for changes in your proposed project.

1. Both projects involve sites adjacent to access ridges to the vegetated uplands of the Wai'anae Range. Such ridges provide ready avenues for the spread of fires from the landfill sites to Preservation Zoned Conservation lands. On these lands are species of Hawaiian plants found nowhere else (not even on the other islands). These plants have been reduced to tiny remnant pockets of their at-one-time wider distributions in the Wai'anae Range. A single fire could eradicate these valuable pieces of Hawaiian heritage. You may document the locations of these plant species by consulting any of the following individuals:

- Wayne Gagne -- Bishop Museum Biologist 847-3311
- Kenneth Nagata -- Lyon Arboretum 988-3177

While the subject of landfill-induced fires is addressed in your EIS, I am not quite satisfied that the stated firebreak width will be adequate. During the dry season, on a particularly gusty day, fire would stand a good chance of spreading despite a 70 foot wide break. Since the Wai'anae and Nanakuli Fire Stations are capable of extinguishing "small fires and/or possibly preventing the extension of fires to other structures" (page 4-51 of the EIS), it seems that consideration of widespread detrimental impact to the Leeward Dry Forest Ecosystems was not considered seriously. I would recommend widening the required firebreak zone to twice the current planned maximum width (i.e., 140 feet wide), assuring that this zone remains clear of combustible weedy vegetation, and implementing a dry-season contingency plan for rapid containment of fires. Such a plan would presumably involve the Division of Forestry as well as the Wai'anae and Nanakuli fire control stations.

2. My second set of comments and recommendations acknowledge the presence of significant archeological sites in the proposed landfill areas. The EIS correctly points out the lack of adequate archeological work in the Leeward O'ahu area. I regret that the construction of either landfill project entails the destruction of archeological sites. It is a mistake to presume that any archeological study, no matter how meticulously performed, is capable of recording all of the rich information available at a given archeological site. I can only recommend that the archeological surveyors be given adequate time to perform their work, to the satisfaction of all the archeologists involved.

Thank you for the opportunity to make these comments and recommendations. The disposal for our wastes is a major and ubiquitous problem, but especially delicate in an island system such as ours. In addition to stop-gap projects such as landfills, we must continue to pursue the development of alternate processing systems that maximize recycling of resources and energy. The Sierra Club will continue to support viable methods to reduce the volume of our solid waste. Landfill projects will be tolerated only so long as such alternative methods are pending. Thank you for taking the time to read this. I hope it was informative.

Me na mana'o pumehana,

Samuel M. Gon III
 Conservation Chairman, Honolulu Group
 Sierra Club, Hawaii Chapter
 P. O. Box 22897
 Honolulu, Hawaii 96822

DEPARTMENT OF PUBLIC WORKS
CITY AND COUNTY OF HONOLULU
550 SOUTH KING STREET
HONOLULU, HAWAII 96813



EILEEN R. ANDERSON
MAIL ROOM

MICHAEL J. CHAM, Ph.D.
DIRECTOR AND CHIEF ENGINEER
MAURICE M. KAYA
DEPUTY DIRECTOR

R 84-67

January 30, 1984

Mr. Samuel M. Con III
Conservation Chairman, Honolulu Group
Sierra Club, Hawaii Chapter
P. O. Box 22897
Honolulu, Hawaii 96822

Dear Mr. Con:

SUBJECT: Leeward District Sanitary Landfill Environmental Impact Statement

We appreciate your valuable comments and offer the following responses.

Comment:

"1. Both projects involve sites adjacent to access ridges to the vegetated uplands of the Wai'anae Range. Such ridges provide ready avenues for the spread of fires from the landfill sites to Preservation Zoned Conservation lands. On these lands are species of Hawaiian plants found nowhere else (not even on the other islands). These plants have been reduced to tiny remnant pockets of their at-one-time wider distributions in the Wai'anae Range. A single fire could eradicate these valuable pieces of Hawaiian heritage. You may document the locations of these plant species by consulting any of the following individuals:

- Wayne Cagne -- Bishop Museum Biologist 847-3511
- Kenneth Nagata -- Lyon Arboretum 958-3177

"While the subject of landfill-induced fires is addressed in your EIS, I am not quite satisfied that the stated firebreak width will be adequate. During the dry season, on a particularly gusty day, fire would stand a good chance of spreading despite a 70 foot wide break. Since the Wai'anae and Manakuli Fire Stations are capable of extinguishing "small fires" and/or possibly preventing the extension of fires to other structures" (page 4-51 of the EIS), it seems that consideration of widespread detrimental impact to the Leeward Dry Forest Ecosystems

Mr. Samuel M. Con III
Page 2
January 30, 1984

was not considered seriously. I would recommend widening the required firebreak zone to twice the current planned maximum width (i.e., 140 feet wide), assuring that this zone remains clear of combustible weedy vegetation, and implementing a dry-season contingency plan for rapid containment of fires. Such a plan would presumably involve the Division of Forestry as well as the Wai'anae and Manakuli fire control stations."

Response:

We are aware of the plants located along the ridgeline of the Wai'anae Mountains and will continue to work with applicable governmental agencies to provide protection to the plants from fires. The size of the fire break was established by consultation with the Department of Land and Natural Resources (Forestry Division). As stated in the EIS, the landfilling operation will occur only in the lower regions of the project sites and will not impact the higher ridgelines.

A fire break is provided mainly to prevent fires from entering the landfill, not from leaving it. Fires which start in a landfill are inhibited from spreading by combustible material which has been densely compacted and which has a relatively high moisture content. Furthermore, these fires occur only at the working face (which is more than 30, 70, or 140 feet away from the perimeter of the landfill) because all other areas are covered with soil. Brush fires, on the other hand, spread quickly as they feed on dry, highly combustible vegetation, and it is these fires which pose the real danger. Such an intense fire can ignite the refuse in a landfill, as one recently did at Kawaiaoa Sanitary Landfill in Haleiwa.

Comment:

"2. My second set of comments and recommendations acknowledge the presence of significant archeological sites in the proposed landfill areas. The EIS correctly points out the lack of adequate archeological work in the Leeward O'ahu area. I regret that the construction of either landfill project entails the destruction of archeological sites. It is a mistake to presume that any archeological study, no matter how meticulously performed, is capable of recording all of the rich information available at a given archeological site. I can only recommend that the archeological surveys be given adequate time to perform their work, to the satisfaction of all the archeologists involved."

Response:

The construction of the landfill at the Waimanalo Gulch site will not adversely impact archeological sites; this has been confirmed by the State Historic Preservation Officer. As for the archeological sites in the Ohikilo Valley landfill site, we are and will continue to work with the State Historic Preservation Officer and will follow his recommendations. Every reasonable effort will be made to preserve and record the important archeological features in the valley.

Mr. Samuel M. Con III
Page 3
January 30, 1984

Comment:

"Thank you for the opportunity to make these comments and recommendations. The disposal for our wastes is a major and ubiquitous problem, but especially delicate in an island system such as ours. In addition to stop-gap projects such as landfills, we must continue to pursue the development of alternate processing systems that maximize recycling of resources and energy. The Sierra Club will continue to support viable methods to reduce the volume of our solid waste. Land-fill projects will be tolerated only so long as such alternative methods are pending. Thank you for taking the time to read this. I hope it was informative."

Response:

We appreciate your continued support in solving Oahu's solid waste disposal problem. We must point out that landfills will continue to be required for the disposal of noncombustible waste and residus from the resource recovery facility.

Your letter will be incorporated into the Revised Environmental Impact Statement.

Very truly yours,



MICHAEL J. CHUN
Director and Chief Engineer

cc: DLU
S. Shimabukuro
EISC

APPENDIX A
SITE SELECTION AND EVALUATION CRITERIA

In the Inventory Study of Potential Sanitary and Demolition Landfill Sites, prepared by Stanley S. Shimabukuro and Associates, Inc., for the City and County of Honolulu, the selection and evaluation of landfill sites were based primarily on the following criteria, not necessarily listed in order of importance: [A.1]

A. Capacity

Each potential site must have sufficient volume to make it worthwhile, since opening a new landfill involves major capital cost. Capacity is a very important factor in landfill development economics. Desirable minimum capacity should provide for approximately 5 years of life based on 500 tons/day of refuse.

B. Access to Adequate Roads

Any major landfill operation will attract additional traffic to the roadways in the area and an adequate, modern highway is needed to prevent excessive congestion and hazards. Site should be within 2,000 feet of an adequate main highway.

C. Availability to Utilities

All major landfill sites will need power, communication, sanitary and water systems for proper operation. The immediate availability of these utilities can be a major factor in the evaluation of the site.

D. Proximity to Incompatible Land Uses

A landfill operation is a nuisance type activity, similar to heavy construction work, and most land uses would conflict with it. Generally, a buffer area with landscaping is needed to isolate the landfill if its location is not in low land use areas or is not remote.

E. Pollution of Ground and Surface Water

A landfill can produce leachates and silt. Our potable ground water supply sources must be protected from leachates, and our surface water needs protection from siltation. The protection of our potable ground water supply is absolutely necessary.

F. Availability of Cover Material

Cover material is an important ingredient in a sanitary landfill. Without it, an ordinary dump exists. The economic availability of this cover material can be decisive. When cover material must be imported, the cost, depending on the location, of the landfill site can vary from \$1.50 to \$5.00 per ton.

G. Travel Distance

When conditions permit, landfill sites should be located close to the refuse generation centers. Hauling is an important factor in the economic operation of a landfill.

H. General Nuisance

A landfill operation will cause noise, dust, litter, odor and other nuisances. Unless these nuisances are properly provided for, the site should be remote. Wind direction is a factor. This item relates directly to D and G.

I. Existing Land Use

The existing land use of sites should be low or open so that use of the sites as landfills will not be objectionable to owners and interested groups.

J. Final Land Use of Landfill

The final land use after the landfill operation should be of equal or higher use than at present and should be compatible with the surrounding land uses. This item relates directly to item I.

K. Zoning, City General Plan and State Land Use District

An active landfill may operate for an extended time and could affect the overall growth plan of the island. This item relates directly to land acquisition cost, the overall general plan of the island and items I and J.

L. Geology

The geology of the site must be considered to protect the ground water supply and to determine the amount of cover material available. This item relates directly to items E and F. It must be studied in greater detail in the EIS stage.

M. Drainage

On- and off-site drainage systems are required to minimize the generation of leachates and silt and for protection against floods. Gullies with large drainage basins behind them present major drainage problems and costs.

N. Topography

The topography of the site determines the capacity and a substantial portion of the development cost. It also determines the visual impact of the site. Generally, gullies, swamps and low lying areas are desirable sites.

O. Objection by Landowners, Adjacent Landowners, Public and Community Organizations, etc.

This item can be an important factor, as the City's need for additional landfill space is becoming critical. Protests by owners or interested groups can cause major delays and produce a crisis situation, but should not be the major consideration in the landfill site selection process.

P. Destruction of Natural Resources

We must protect our natural resources from irreparable damages as much as possible, while providing suitable landfill sites for the general welfare.

Q. Other Environmental Factors, Including Displacement, Historical and Archaeological Sites, and Flora and Fauna

Historical and archaeological significance and flora and fauna of the sites must be studied. Also, visual pollution and displacement of persons and businesses must be considered. This item must be studied further in the EIS stage.

R. Safety

Sites must have safe access and must not present any hazard to the public or to property. Sites must be able to meet State Department of Health requirements, Public Health Regulations, Chapter 58 of Title 11, Administrative Rules on Solid Waste Management Control.

S. Major Development Costs

These costs are generally related to most of the items previously discussed. These costs can become prohibitive when:

1. Leachate abatement measures are required.
2. New access to site must be constructed to an adequate roadway.
3. Utilities are not available nearby and must be brought in from remote sources.
4. Cover material is not available on-site or nearby and must be hauled in from afar and stored.
5. Land is zoned for high uses such as residential or higher, or when land is in use.

Although this tabulation lists nineteen items as the criteria, each site was only required to have the following essential basic characteristics before being considered for further evaluation as a potential landfill site:

- Adequate capacity
- Adequate protection of our ground water supply
- No apparent significant environmental damage to the land, air, ocean or population
- Apparent economical feasibility

To rank the sites, a numerical value was placed on all of the nineteen criteria. Due to the fact that some of the criteria could not be quantified, weighted subjective values were placed on the criteria.

The criteria used by Stanley S. Shimabukuro and Associates, Inc. in selecting appropriate potential sanitary landfill sites includes those proposed by the Federal Register, "Landfill Disposal of Solid Waste." [A.2] Basically, the Federal Register recommends: "Site selection must be accomplished in consideration of: ground and surface water conditions; geology, soils and topographic features; solid waste types and quantities; social, geographic and economic factors, and aesthetic and environmental impacts." [A.3]

This issue of the Federal Register also emphasizes avoiding or giving low priority to "environmentally sensitive areas, including wetlands, 100-year floodplains, permafrost areas, critical habitats of endangered species, and recharge zones of sole source aquifers" [A.4] as potential sites for a sanitary landfill. In addition, the following criteria for site selection should be considered: [A.5]

"Zones of active faults and karst terrain should be avoided in locating landfill disposal facilities unless a site-specific evaluation demonstrates minimum potential for adverse effects, especially upon ground water."

"The cost effectiveness of a site's selection should be determined, if considered environmentally feasible. This cost analysis should include not only the economics of the disposal facility operation but also the impact of the planned future use of the site after completion of landfill operations."

"The possible incorporation of a site into a regional solid waste disposal system whether currently in existence or a future possibility, should be considered during environmental and economic evaluations. Furthermore, programs for the location, design and operation of solid waste facilities should be consistent with residual waste disposal programs developed pursuant to §208(b)(2)(J) of the Clean Water Act and §35.1519-6(f) of the Proposed Water Quality Management Regulations (43 FR 40752, September 12, 1978)."

"Sites traversed by pipes or conduits (for sewage, storm water, etc.) should be rejected unless their relocation or protection is feasible. Since such pipes may serve as pathways for gas and leachate, extreme caution must be observed and a plan for pipe maintenance and repair developed."

"Characteristics and availability of on-site soil should be evaluated with respect to their effects on site performance and site operations, such as, use of the soil for cover material and soil suitability for vehicle maneuverability."

"Sites located in the vicinity of airports, where birds attracted to the landfill disposal facility could pose a hazard to aircraft, should be avoided."

"Sites should be accessible to appropriate vehicles by all-weather roads leading from the public road system."

"The potential socio-economic effects of a site's selection should be determined. Topics to be addressed include aesthetic and safety considerations such as vehicular traffic, litter, noise and other possible nuisance conditions."

The criteria used by the City's consultant, Stanley S. Shimabukuro and Associates, Inc., therefore, has taken into consideration the conservative recommendations provided by the Federal government, as well as other environmental factors. Finding a potential sanitary landfill site that will be completely acceptable is extremely difficult on an island such as Oahu. The sites which are environmentally suitable are located in areas which are populated. This creates a situation where an optimum balance of all criteria is sought.

A summary of the criteria that were considered in evaluating and ranking potential sanitary and demolition landfill sites are listed below:

1. Approximate Capacity, in million cubic yards
2. Approximate Life as Sanitary Landfill, in years
3. Access to Adequate Roads
4. Availability of Utilities
5. Measures Required for Protection of Ground Water
6. Objection by Public, Community Groups, etc.
7. Objection by Landowner and Adjacent Landowners
8. Impact on Nearby Land Uses

9. Site Location
10. Measures Required for Protection of Surface Water
11. Availability of Fill Material
12. General Nuisance (Litter, Dust, Noise, Odor, Traffic, etc.)
13. Land Cost
14. Drainage Improvements On and Off Site
15. Topography
16. Hazard to Public Health and Safety

REFERENCES TO APPENDIX A

- [A.1] Department of Public Works, City and County of Honolulu.
August, 1977. Inventory of Potential Sanitary and De-
molition Landfill Sites on the Island of Oahu. Appendix
A. Prepared by Stanley S. Shimabukuro and Associates,
Inc., Honolulu, Hawaii.
- [A.2] Federal Register, Environmental Protection Agency. Monday,
March 26, 1979, Part II. Landfill Disposal of Solid
Waste, Proposed Guidelines. 40 CFR Part 241. Docket
No. 1008.1; FRL 1063-5.
- [A.3] Ibid. [A.2]. page 18142.
- [A.4] Ibid. [A.3].
- [A.5] Ibid. [A.3].

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APPENDIX B

APPENDIX B

TERRESTRIAL FLORA AND FAUNA BIOLOGICAL RECONNAISSANCE FOR
WAIMANALO GULCH (LANDFILLING AREA)

I. SURVEY METHODOLOGY

A biological field reconnaissance was conducted in April and July 1983 to inventory the flora and fauna of the project site.

Prior to conducting the field investigation, a literature search was conducted and aerial photographs studied to determine major vegetative zones.

The field reconnaissance consisted of walking and/or binocular transects from the mouth of the gulch along the floor and up to the height expected for the landfilling activities. The survey was conducted along a compass bearing to the highest elevation of the landfill with right-angle surveys along either side of the gulch floor. Refer to the checklist for plants and animals observed or believed to be present.

The field trip in July, 1983 was after the gulch was burnt. Most or all of the vegetation was burnt.

II. RESULTS

A. Flora

The plants observed or previously recorded in the gulch are listed in the checklist of plants.. The general observations are:

1. The plant community is largely made up of Kiawe forest overstory and grass understory. The plants found are mostly non-native species commonly found along the coastline.
2. The upper portion of the gulch contains a mixture of Klu (Acacia farnesiana), pili grass (Heteropogon contortus) and hialoa (Waltheria americana) and other grasses found include Chloris virgata, Setaria verticillata, Panicum maximum, and Trichachne insularis.

B. Fauna

1. Birds

The birds observed or previously recorded in the project area are listed in the check lists. The birds observed are

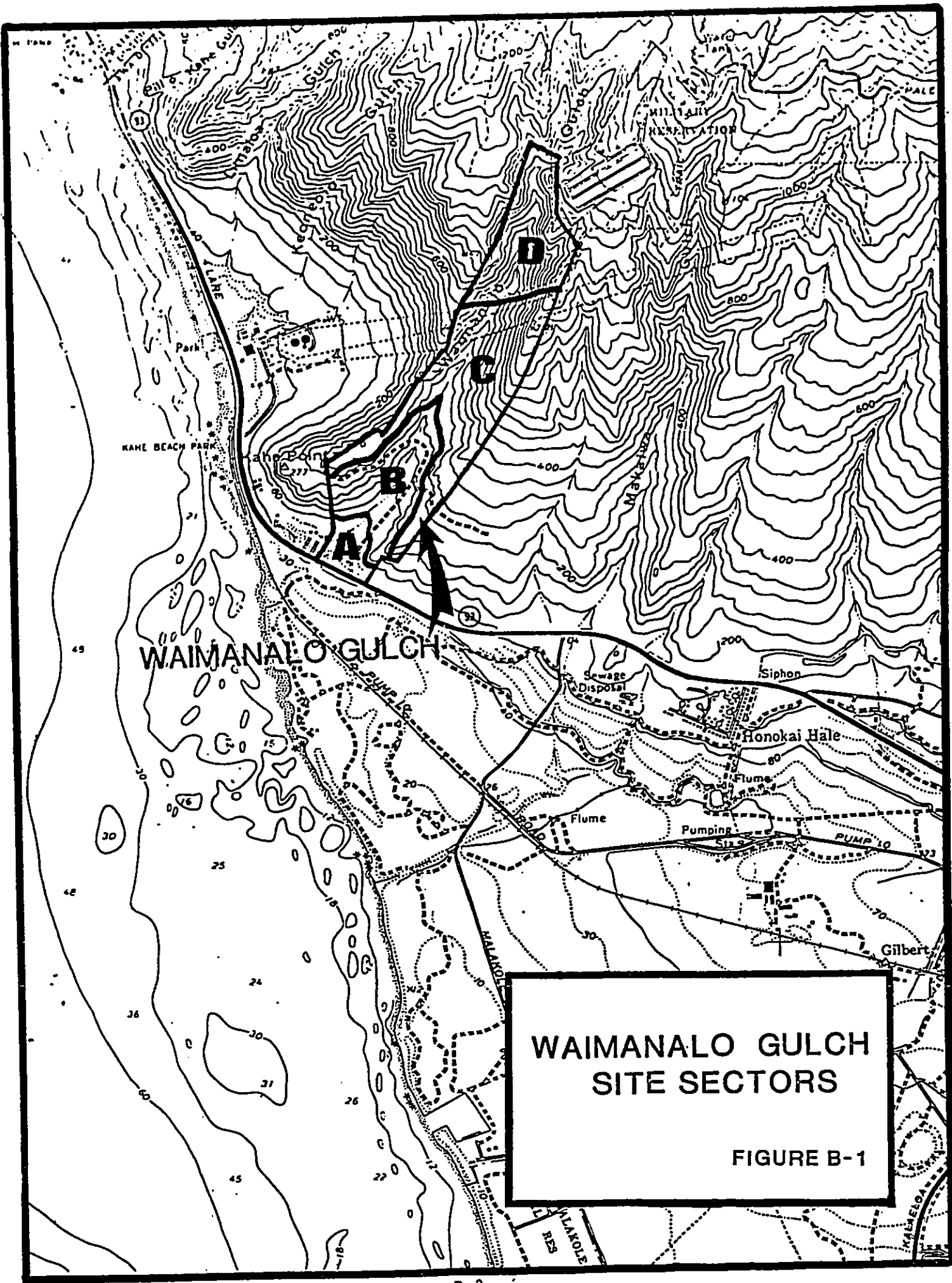
commonly found along the coastline. Some of the commonly observed birds include Barred dove, Japanese white-eye, Spotted dove, House finch, Cardinal, Common Myna, and American Golden Plover. Other birds which may also be found include Barn Owl, Ring-necked Pheasant, Skylark, Cattle Egret, Shama Thrush, Black-headed Mannikin.

2. Mammals

The observed mammals were dog, cat, mongoose and mice. Mammals previously observed or likely to be observed include rats, cattle, and mongoose.

III. CONCLUSION

No endangered species of plants or animals were observed. The gulch is not considered a sensitive habitat for wildlife. The project will alter the plants and vegetation of the gulch and may provide a different environment for the wildlife, especially the birds. The alteration of the habitat will provide a suitable feeding area for the Cattle Egret, doves and mynah birds.



APPENDIX B
FLORA CHECKLIST FOR PLANTS FOUND IN WAIMANALO PROJECT SITE

For each species, the following information is provided:

1. Family
2. Scientific name
3. Vernacular name
4. Status of the species. The following symbols are employed.
 - E endemic to the Hawaiian Islands, i.e., occurring naturally nowhere else in the world.
 - I indigenous, i.e., native to the Hawaiian Islands, but also occurring naturally (without the aid of man) elsewhere.
 - X exotic, i.e., species of accidental or deliberate introduction after the western discovery of the islands.
 - P Polynesian introduction; includes those species brought by the Polynesian immigrants previous to Captain Cook's discovery of the islands.
5. Relative abundance was determined for each species according to the following scale:
 - A ABUNDANT, generally the major or dominant species in a given area
 - C COMMON, generally distributed throughout a given area in large numbers
 - O OCCASIONAL, generally distributed through a major portion of a given area, but in small numbers
 - U UNCOMMON, observed uncommonly but more than 10 times in a given area
 - R RARE, observed 2 to 10 times in a given area
 - S SINGLE, only one specimen observed
 - L LOCAL, restricted to a confined area, although within that area it may occur in large numbers
6. Individual transects have been grouped into sectors.
7. Locality symbols used above each column represents the sectors (A, B and C).

CHECK LIST OF PLANTS
Waimanalo Gulch Project Site (Landfilling Area)

<u>SCIENTIFIC NAME</u>	<u>COMMON NAME</u>	<u>STATUS</u>	<u>SECTOR</u>			
			<u>A</u>	<u>B</u>	<u>C</u>	<u>D</u>
<u>MONOCOTYLEDONAE</u>						
<u>GRAMINEAE</u>						
<u>Agrostis alba</u> L.	Redtop	X	<u>U</u>	<u>U</u>	<u>C</u>	
<u>Chloris virgata</u>	Radiate fingergrass	X	<u>O</u>	<u>C</u>	<u>C</u>	<u>O</u>
<u>Digitaria pruriens</u>	Slender crabgrass	X	<u>U</u>	<u>U</u>	<u>U</u>	
<u>Panicum maximum</u> Jacq.	Guinea grass	X	<u>S</u>			
<u>Panicum maximum</u>		X				
<u>Setaria verticillata</u> (L.) Beauv.	Bristly foxtail	X	<u>C</u>			
<u>Genchrus echinatus</u> L.	Common Sandbar		<u>U</u>			
<u>Heteropogon contortus</u>	pili	E	<u>U</u>	<u>O</u>	<u>C</u>	<u>C</u>
<u>DICOTYLEDONAE</u>						
<u>AMARANTHACEAE</u>						
<u>Amaranthus spinosus</u> L.	Spiny amaranth	X	<u>C</u>			
<u>COMPOSITAE</u>						
<u>Verbesina encelioides</u> C (av.) B.&H. ex Grey	Golden crownbeard					
<u>Conyza bonariensis</u> L. Cronq.	Hairy horseweed	X	<u>S</u>			
<u>Emilia sonchifolia</u> (L.) DC.	Flora's paintbrush	X	<u>O</u>	<u>O</u>		
<u>Sonchus oleraceus</u> L.	Sow thistle	X	<u>S</u>			
<u>Bidens pilosa</u>	Spanish needle	X	<u>O</u>	<u>O</u>		
<u>CONVOLVULACEAE</u>						
<u>Ipomoea triloba</u> L.	Little bell	X	<u>S</u>			
<u>CUCURBITACEAE</u>						
<u>Momordica charrantia</u> var. <u>Pavel</u> Crantz.	Balsum apple	X	<u>S</u>			
<u>EUPHORBIACEAE</u>						
<u>Ricinus communis</u> L.	Castor bean; koli	X	<u>S</u>			
<u>Aleurites moluccana</u> (L.) Wild.	Kukui					
<u>LIBIATAE</u>						
<u>Leonotis nepetaefolia</u> (L.) Ait. f.	Lion's-ear	X	<u>O</u>			

CHECK LIST OF PLANTS CONT'D
Waimanalo Gulch Project Site (Landfilling Area)

<u>SCIENTIFIC NAME</u>	<u>COMMON NAME</u>	<u>STATUS</u>	<u>SECTOR</u>
			<u>A B C D</u>
<u>DICOTYLEDONAE</u>			
<u>LEGUMINOSAE</u>			
<u>Acacia farnesiana</u> (L.) Willd	Klu	X	<u>O O O</u> _
<u>Canavalia cathartica</u> Thouars.	Mauna-loa	X	_ _ _ _
<u>Cassia leschenaultiana</u> DC.	Japanese tea; lauki	X	<u>S</u> _ _ _
<u>Cassia occidentalis</u> L.	Coffee senna	X	_ _ _ _
<u>Crotalaria mucronata</u>	Smooth rattle-pod	X	<u>R</u> _ _ _
<u>Crotalaria spectabilis</u> Roth.	Rattle-pod	X	_ <u>O O O</u>
<u>Desmodium sandwicense</u>	Spanish clover	X	<u>O U</u> _ _
<u>Dolichos lablab</u>	Lablab bean; Hyacinth bean	X	_ _ _ _
<u>Erythrina sandwicensis</u> Deg. Wiliwilw	Wiliwili	E	_ _ <u>U U</u>
<u>Leucaena leucocephala</u> (Lam.) de Wit	Koa-haole	X	<u>A A A A</u>
<u>Prosopis pallida</u> (Humb. & Bonpl.) ex Willd, HBK	Algaroba, Kiawe	X	<u>A A A A</u>
<u>Desmanthus virgatus</u> (L.) Willd. A		X	_ <u>C</u> _ _
<u>MALVACEAE</u>			
<u>Abutilon molle</u>	Hairy abutilon	X	<u>O</u> _ _ _
<u>PASSIFLORACEAE</u>			
<u>Passiflora foetida</u> L.	Scarlet-fruited passion flower	X	<u>O</u> _ _ _
<u>PORTULACACEAE</u>			
<u>Portulaca oleracea</u> L.	Purslane; pigweed	X	<u>U</u> _ _ _
<u>STERCULIACEAE</u>			
<u>Waltheria americana</u> L.	Hi'aloa	I	<u>O O</u> _ _
<u>VERBENACEAE</u>			
<u>Lantana camara</u> L.	Lantana, latana	X	_ _ <u>R R</u>
<u>SOLANACEAE</u>			
<u>Nicandra physalodes</u> (L.) Gaetron	Apple of Peru	X	_ _ <u>R R</u>

CHECKLIST - FAUNA

Families are listed alphabetically under birds, mammals, amphibians and reptiles. Genera and species are arranged alphabetically. For each species, the following information is provided:

1. Scientific name
2. Vernacular name
3. Status of the species. The following symbols are employed:
 - E endemic to the Hawaiian Islands, i.e., occurring naturally nowhere else in the world.
 - I indigenous, i.e., native to the Hawaiian Islands, but also occurring naturally (without the aid of man) elsewhere.
 - X exotic, i.e., species of accidental or deliberate introduction after the western discovery of the islands.
 - P Polynesian introduction; it includes those species brought by the Polynesian immigrants previous to Captain Cook's discovery of the islands.
4. Relative Abundance:
 - Abundant - plentiful; seen with great frequency either within a single habitat or throughout the entire study area.
 - Common - general; seen frequently over a wide area but not in exceedingly large numbers.
 - Occasional - limited; seen infrequently in the study area or restricted to one habitat or a few habitats.
 - Rare - unusual; seldom seen, usually in very low numbers or merely passing through the study area.

A "p" is used to indicate species that could possibly frequent the study areas or through or over the area due to the close proximity of their habitat from the study area.
5. Locality symbols used above each column represent the sectors (A, B and C).

WAIMANOLO GULCH PROJECT SITE

CHECK LIST OF FAUNA

[Fauna observed, likely present, or which would possibly visit the site]

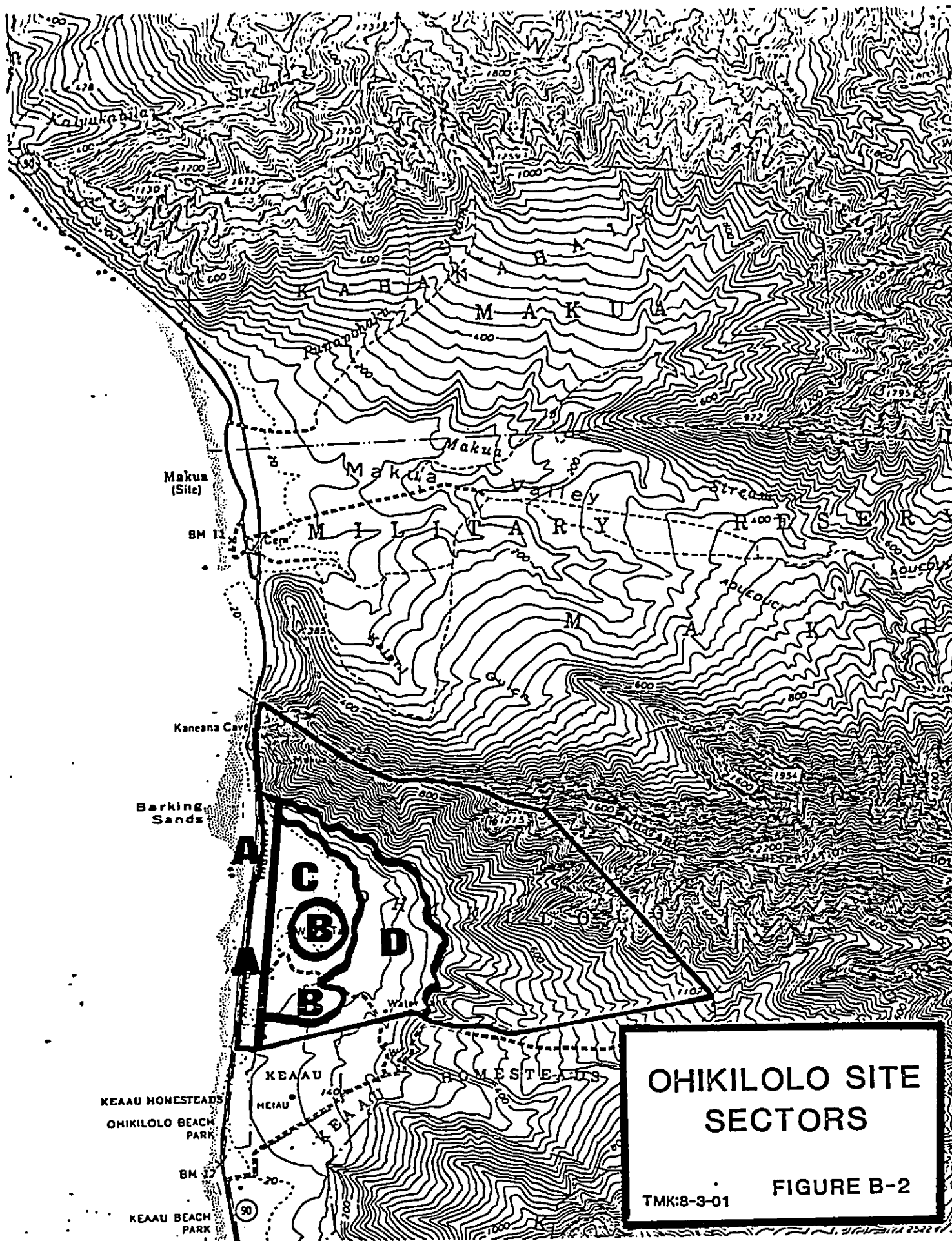
<u>SCIENTIFIC NAME</u>	<u>COMMON NAME</u>	<u>STATUS</u>	<u>SECTOR</u>			
			<u>A</u>	<u>B</u>	<u>C</u>	<u>D</u>
<u>CLASS AVES</u>						
<u>AROEIDAE</u>						
<u>Bubuleus ibis</u>	Cattle egret	X	<u>S</u>			
<u>COLUMBIDAE</u>						
<u>Geopelia striata</u>	Barred dove	X	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>
<u>Streptopelia chinensis</u>	Lace-necked dove	X				
<u>FRINGILLIDAE</u>						
<u>Carpodacus mexicanus frontalis</u>	House finch; linnet	X	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>
<u>Cardinalis</u>	Cardinal	X	<u>0</u>	<u>0</u>	<u>0</u>	
<u>MIMIDAE</u>						
<u>Mimus polyglottos</u>	Mockingbird	X	<u>P</u>	<u>P</u>	<u>P</u>	<u>P</u>
<u>PHASIANIDAE</u>						
<u>Francolinus pondicerianus</u>	Indian grey francolin	X	<u>P</u>	<u>P</u>		
<u>Phasianus colchicus torquatus</u>	Ring-necked pheasant	X	<u>P</u>	<u>P</u>	<u>P</u>	
<u>PLOCEIDAE</u>						
<u>Lnchura punctulata</u>	Spotted munia					<u>P</u>
<u>Lonchura malacca</u>	Black-headed mannikin	X				<u>P</u>
<u>Passer domesticus</u>	House sparrow	X	<u>0</u>	<u>0</u>	<u>0</u>	
<u>STRIGIDAE</u>						
<u>Asio flammeus sandwichensis</u>	Short-eared owl; pueo	E	<u>P</u>	<u>P</u>	<u>P</u>	<u>P</u>
<u>STURNIDAE</u>						
<u>Acridotheres tristis</u>	Common Mynah	X	<u>0</u>	<u>0</u>	<u>0</u>	
<u>ZOSTEROPIDAE</u>						
<u>Zosterops japonica</u>	Japanese white-eye	X	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>

WAIMANOLO GULCH PROJECT SITE

CHECK LIST OF FAUNA

[Fauna observed, likely present, or which would possibly visit the site]

<u>SCIENTIFIC NAME</u>	<u>COMMON NAME</u>	<u>STATUS</u>	<u>SECTOR</u>
			<u>A B C D</u>
<u>CLASS MAMMALIA</u>			
BOVIDAE			
<u>Bos taurus</u>	Cattle		<u> P P </u>
FELIDAE			
<u>Felis catus</u>	Feral Cat; Popoki	X	<u>R R R R</u>
MURIDAE			
<u>Mus musculus</u>	House mouse	X	
	Iole li'ili'i	X	<u>C C C C</u>
<u>Rattus exulans hawaiiensis</u>	Hawaiian rat; Iole	E	<u>P P P P</u>
<u>Rattus norvegicus</u>	Brown rat; Iole, Po'o-wai	X	<u>P P P P</u>
VIVERRIDAE			
<u>Herpestes auropunctatus</u>	Mongoose Iole-manakuku	X	<u>C C C C</u>
BUFONIDAE			
<u>Bufo marinus</u>	Giant neotropical toad, Bufo toad; Poloka	X	<u>P P P </u>
<u>CLASS REPTILIA</u>			
GEKKONIDAE			
<u>Hemidactylus garnotti</u>	Indo-pacific gecko; Fox gecko	P	<u>C C C P</u>
<u>Lepidodactylus lugubris</u>	Mourning gecko	P	<u>P C C P</u>



APPENDIX B

TERRESTRIAL FLORA AND FAUNA BIOLOGICAL RECONNAISSANCE FOR OHIKILOLO GULCH (LANDFILLING AREA)

I. SURVEY METHODOLOGY

A biological field reconnaissance was conducted in April and July 1983 to inventory the flora and fauna of the project site.

Prior to conducting the field investigation, a literature search was conducted and aerial photographs studied to determine major vegetative zones.

The field reconnaissance consisted of walking and/or binocular transects through the area to be used for landfilling. The survey was conducted along a compass bearing with right-angle transects.

II. RESULTS

The plants observed are listed in the checklist of plants. The general observations are:

1. The plant community of the landfilling area consists mostly of exotic vegetations. The flat area is primarily grass which is harvested by the ranch.
2. The trees along the stream bed consist primarily of kiawe and koa haole. A few wiliwili and kukui trees are found within dry stream beds.
3. The area around the dwellings contains coconut trees, mango and other plantings.

III. CONCLUSION

No endangered species of plants or animals were observed within the area to be used for landfilling. The area to be used for landfilling is not considered a sensitive wildlife habitat.

The eastern ridge top of Ohikilolo Valley contain several plants included in the Federal Register Notice of Review (45/FR/8247) as Category 1 candidate species for listing as Endangered (letter from U. S. Dept. of Interior, Fish & Wildlife Service March 20, 1983). The species

are Tetramolopium filiforme Sherff, Dubautia herbstrobatae Carr, Lobelia niihauensis var. meridiana St. John, Bonamia mensiesii Gray and Shiidea manii St. John.

There are other species of plants and an officially protected species of tree snail (Achatinella mustelina) found on the ridge top (letter from Bishop Museum dated 18 April 1983).

The upper ridges of Ohikilolo will not be used for landfilling and the potential impact by fires will be prevented by the installation of fire breaks.

APPENDIX B
FLORA CHECKLIST FOR PLANTS FOUND IN OHIKILOLO PROJECT SITE

For each species, the following information is provided:

1. Family
2. Scientific name
3. Vernacular name
4. Status of the species. The following symbols are employed.
 - E endemic to the Hawaiian Islands, i.e., occurring naturally nowhere else in the world.
 - I indigenous, i.e., native to the Hawaiian Islands, but also occurring naturally (without the aid of man) elsewhere.
 - X exotic, i.e., species of accidental or deliberate introduction after the western discovery of the islands.
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5. Relative abundance was determined for each species according to the following scale:
 - A ABUNDANT, generally the major or dominant species in a given area
 - C COMMON, generally distributed throughout a given area in large numbers
 - O OCCASIONAL, generally distributed through a major portion of a given area, but in small numbers
 - U UNCOMMON, observed uncommonly but more than 10 times in a given area
 - R RARE, observed 2 to 10 times in a given area
 - S SINGLE, only one specimen observed
 - L LOCAL, restricted to a confined area, although within that area it may occur in large numbers
6. Individual transects have been grouped into sectors.
7. Locality symbols used above each column represents the sectors (A, B and C).

CHECK LIST OF PLANTS
Ohikilolo Gulch Project Site (Landfilling Area)

<u>SCIENTIFIC NAME</u>	<u>COMMON NAME</u>	<u>STATUS</u>	<u>SECTOR</u>			
			<u>A</u>	<u>B</u>	<u>C</u>	<u>D</u>
<u>MONOCOTYLEDONAE</u>						
<u>GRAMINEAE</u>						
<u>Agrostis alba</u> L.	Redtop	X	<u>U</u>	---	---	---
<u>Chloris virgata</u>	Radiate fingergrass	X	<u>U</u>	---	---	---
<u>Digitaria pruriens</u>	Slender crabgrass	X	<u>U</u>	---	---	---
<u>Panicum maximum</u> Jacq.	Guinea grass	X	<u>C</u>	---	<u>C</u>	---
<u>Panicum maximum</u>		X	<u>C</u>	---	<u>C</u>	---
<u>Setaria verticillata</u> (L.) Beauv.	Bristly foxtail	X	<u>O</u>	<u>O</u>	---	---
<u>Cenchrus echinatus</u> L.	Common Sandbar	E	<u>U</u>	---	---	<u>O</u>
<u>Heteropogon contortus</u>	pili	E	---	---	---	<u>O</u>
<u>PALMAE</u>						
<u>Cocos nucifera</u>	Coconut	X	<u>S</u>	---	---	---
<u>DICOTYLEDONAE</u>						
<u>AMARANTHACEAE</u>						
<u>Amaranthus spinosus</u> L.	Spiny amaranth	X	<u>U</u>	<u>U</u>	---	---
<u>COMPOSITAE</u>						
<u>Verbesina encelioides</u> C (av.) B.&H. ex Grey	Golden crownbeard		<u>U</u>	---	---	---
<u>Conyza bonariensis</u> L. Cronq.	Hairy horseweed	X	---	<u>U</u>	<u>U</u>	---
<u>Emilia sonchifolia</u> (L.) DC.	Flora's paintbrush	X	<u>U</u>	---	---	---
<u>Sonchus oleraceus</u> L.	Sow thistle	X	---	<u>U</u>	<u>S</u>	---
<u>Bidens pilosa</u>	Spanish needle	X	<u>O</u>	---	---	---
<u>CONVOLVULACEAE</u>						
<u>Ipomoea triloba</u> L.	Little bell	X	---	<u>O</u>	<u>U</u>	---
<u>CUCURBITACEAE</u>						
<u>Momordica charantia</u> var. <u>Pavel</u> Crantz.	Balsum apple	X	---	<u>R</u>	<u>R</u>	---
<u>EUPHORBIACEAE</u>						
<u>Ricinus communis</u> L.	Castor bean; koli	X	<u>S</u>	---	---	---
<u>Aleurites moluccana</u> (L.) Wild.	Kukui		---	---	<u>U</u>	---
<u>LIBIATAE</u>						
<u>Leonotis nepetaefolia</u> (L.) Ait. f.	Lion's-ear	X	<u>O</u>	<u>O</u>	<u>O</u>	<u>O</u>

CHECK LIST OF PLANTS
Ohikilolo Gulch Project Site (Landfilling Area)

<u>SCIENTIFIC NAME</u>	<u>COMMON NAME</u>	<u>STATUS</u>	<u>SECTOR</u>			
			<u>A</u>	<u>B</u>	<u>C</u>	<u>D</u>
<u>DICOTYLEDONAE</u>						
<u>LEGUMINOSAE</u>						
<u>Acacia farnesiana</u> (L.) Willd	Klu	X	<u>R</u>	---	---	---
<u>Canavalia cathartica</u> Thouars.	Mauna-loa	X	---	---	---	---
<u>Cassia leschenaultiana</u> DC.	Japanese tea; lauki	X	<u>0</u>	---	---	---
<u>Cassia occidentalis</u> L.	Coffee senna	X	---	<u>0</u>	---	---
<u>Crotalaria mucronata</u>	Smooth rattle-pod	X	---	<u>0</u>	---	---
<u>Crotalaria spectabilis</u> Roth.	Rattle-pod	X	---	---	---	---
<u>Desmodium sandwicense</u>	Spanish clover	X	---	<u>0</u>	<u>0</u>	---
<u>Dolichos lablab</u>	Lablab bean; Hyacinth bean	X	---	---	<u>0</u>	<u>0</u>
<u>Erythrina sandwicensis</u>	Wiliwili	E	---	---	<u>0</u>	<u>0</u>
<u>Leucaena leucocephala</u> (Lam.) de Wit	Koa-haole	X	<u>C</u>	<u>C</u>	---	---
<u>Prosopis pallida</u> (Humb. & Bonpl.) ex Willd, HBK	Algaroba, Kiawe	X	<u>C</u>	<u>C</u>	<u>C</u>	<u>C</u>
<u>Desmanthus virgatus</u> (L.) Willd. A		X	---	---	---	---
<u>MALVACEAE</u>						
<u>Abutilon molle</u>	Hairy abutilon	X	---	<u>S</u>	---	---
<u>PASSIFLORACEAE</u>						
<u>Passiflora foetida</u> L.	Scarlet-fruited passion flower	X	---	---	---	---
<u>PORTULACACEAE</u>						
<u>Portulaca oleracea</u> L.	Purslane; pigweed	X	---	<u>R</u>	<u>R</u>	---
<u>STERCULIACEAE</u>						
<u>Waltheria americana</u> L.	Hi'aloa	I	<u>U</u>	---	---	---
<u>VERBENACEAE</u>						
<u>Lantana camara</u> L.	Lantana, latana	X	---	<u>0</u>	<u>0</u>	---
<u>SOLANACEAE</u>						
<u>Nicandra physalodes</u> (L.) Gaertn	Apple of Peru	X	---	<u>0</u>	<u>0</u>	<u>0</u>

CHECK LIST OF FAUNA
Ohikilolo Gulch Project Site (Landfilling Area)

Families are listed alphabetically under birds, mammals, amphibians and reptiles. Genera and species are arranged alphabetically. For each species, the following information is provided:

1. Scientific name
2. Vernacular name
3. Status of the species. The following symbols are employed:

E endemic to the Hawaiian Islands, i.e., occurring naturally nowhere else in the world.

I indigenous, i.e., native to the Hawaiian Islands, but also occurring naturally (without the aid of man) elsewhere.

X exotic, i.e., species of accidental or deliberate introduction after the western discovery of the islands.

P Polynesian introduction; it includes those species brought by the Polynesian immigrants previous to Captain Cook's discovery of the islands.

4. Relative Abundance:

Abundant - plentiful; seen with great frequency either within a single habitat or throughout the entire study area.

Common - general; seen frequently over a wide area but not in exceedingly large numbers.

Occasional - limited; seen infrequently in the study area or restricted to one habitat or a few habitats.

Rare - unusual; seldom seen, usually in very low numbers or merely passing through the study area.

A "p" is used to indicate species that could possibly frequent the study areas or through or over the area due to the close proximity of their habitat from the study area.

5. Locality symbols used above each column represent the sectors (A, B and C).

Ohikilolo Gulch Project Site (Landfilling Area)

CHECK LIST OF FAUNA

[Fauna observed, likely present, or which would possibly visit the site]

<u>SCIENTIFIC NAME</u>	<u>COMMON NAME</u>	<u>STATUS</u>	<u>SECTOR</u>
			<u>A</u> <u>B</u> <u>C</u> <u>D</u>
<u>CLASS AVES</u>			
<u>AROEIDAE</u>			
<u>Bubuleus ibis</u>	Cattle egret	X	<u>P</u> <u>P</u> _ _
<u>COLUMBIDAE</u>			
<u>Geopelia striata</u>	Barred dove	X	<u>C</u> <u>C</u> <u>C</u> <u>C</u>
<u>Streptopelia chinensis</u>	Lace-necked dove	X	<u>C</u> <u>C</u> <u>C</u> <u>C</u>
<u>FRINGILLIDAE</u>			
<u>Carpodacus mexicanus</u>	House finch; linnet	X	<u>C</u> <u>C</u> <u>C</u> <u>C</u>
<u>frontalis</u>	Cardinal	X	<u>C</u> <u>C</u> <u>C</u> <u>C</u>
<u>Cardinalis</u>			
<u>MIMIDAE</u>			
<u>Mimus polyglottos</u>	Mockingbird	X	_ _ <u>P</u> <u>P</u>
<u>PHASIANIDAE</u>			
<u>Francolinus pondicerianus</u>	Indian grey francolin	X	_ _ _ <u>P</u>
<u>Phasianus colchicus torquatus</u>	Ring-necked pheasant	X	_ _ <u>P</u> <u>P</u>
<u>PLOCEIDAE</u>			
<u>Lnhura punctulata</u>	Spotted munia		_ _ _ <u>P</u>
<u>Lonchura malacca</u>	Black-headed mannikin	X	_ _ _ <u>P</u>
<u>Passer domesticus</u>	House sparrow	X	<u>P</u> _ _ _
<u>STRIGIDAE</u>			
<u>Asio flammeus</u>	Short-eared owl;		
<u>sandwichensis</u>	pueo	E	_ _ <u>R</u> <u>P</u>
<u>STURNIDAE</u>			
<u>Acridotheres tristis</u>	Common Mynah	X	<u>C</u> <u>C</u> <u>C</u> _
<u>ZOSTEROPIDAE</u>			
<u>Zosterops japonica</u>	Japanese white-eye	X	<u>C</u> <u>C</u> <u>C</u> _

Ohikilolo Gulch Project Site (Landfilling Area)

CHECK LIST OF FAUNA

[Fauna observed, likely present, or which would possibly visit the site]

<u>SCIENTIFIC NAME</u>	<u>COMMON NAME</u>	<u>STATUS</u>	<u>SECTOR</u>
			<u>A B C D</u>
<u>CLASS MAMMALIA</u>			
<u>EQUIDAE</u>			
<u>Equus asinus</u>	Donkey		-- -- <u>A</u>
<u>Equus caballus</u>	Horse		-- -- <u>A A</u>
<u>BOVIDAE</u>			
<u>Bos taurus</u>	Cattle		<u>A</u> -- -- <u>A</u>
<u>Capra hircus</u>	Goat		<u>A</u> -- --
<u>FELIDAE</u>			
<u>Felis catus</u>	Feral Cat; Popoki	X	<u>S S</u> -- <u>P</u>
<u>CANIDAE</u>			
<u>Canis familiaris</u>	Dog; Ilio	X	-- <u>S S S</u>
<u>MURIDAE</u>			
<u>Mus musculus</u>	House mouse	X	
	Iole li'ili'i	X	<u>C C C</u> --
<u>Rattus exulans hawaiiensis</u>	Hawaiian rat; Iole	E	<u>P P P P</u>
<u>Rattus norvegicus</u>	Brown rat; Iole, Po'o-wai	X	<u>P P P P</u>
<u>VIVERRIDAE</u>			
<u>Herpestes auropunctatus</u>	Mongoose Iole-manakuku	X	<u>C C C P</u>
<u>BUFONIDAE</u>			
<u>Bufo marinus</u>	Giant neotropical toad, Bufo toad; Poloka	X	<u>P P</u> -- --
<u>CLASS REPTILIA</u>			
<u>GEKKONIDAE</u>			
<u>Hemidactylus garnotti</u>	Indo-pacific gecko; Fox gecko	P	<u>O O O</u> --
<u>Lepidodactylus lugubris</u>	Mourning gecko	P	<u>O O O</u> --

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APPENDIX C

APPENDIX C

Archaeological Reconnaissance

And

Historical Documentation

FOR

Waimanalo Gulch

And

Ohikilolo Valley

Archaeologist:
Richard Bordner M.A.
Historian:
Carol Silva, M.A.

WAIMANALO GULCH

Archaeological Reconnaissance

And

Historical Documentation

WAIMANALO GULCH: ARCHAEOLOGICAL RECONNAISSANCE

I. Introduction:

The project study area encloses Waimanalo Gulch from the mauka side of the existing highway (H1) behind the existing houselots up the valley to the 430 foot elevation. The area is dry, with vegetation consisting mainly of Kiawe pasture, with koa haole on the slopes and scattered wiliwili in the streambed. Due to a recent fire throughout almost the entire study area, the vegetation was cleared and the rare opportunity to examine the actual land surface was provided. The only problem encountered with these conditions was the thick ash layer which made examination of the actual ground surface for possible midden largely impossible.

The study area section of the gulch is typified by a relatively narrow level valley floor dissected by deep erosional stream channels. A large amount of talus from the steep-sided slopes, combined with the intermittent flash-flooding, has removed most of the soil, leaving large amounts of talus debris scattered about.

A large amount of recent disturbance has occurred in the study area. Of interest is the fact that this was not the result of fire-fighting activities, as is often surmised. In fact the damage from the fire-fighting activities was very limited and localized, especially in areas where helicopter water-drops were used. The vast majority of the damage noted was (and is) the result of extensive rock-mining activities conducted in the lower portion of the study area. Large areas have been bulldozed and stripped of all loose material.

Several bulldozed trails lead up the valley, while a well-kept road leads up to the microwave relay station at the Kahe Point side of the valley. The nearby presence of the Nike missile site (located on the opposite ridge) and other associated facilities such as bunkers and training areas have disturbed sections of the valley and slopes, but the majority of the upper valley (above the road at 175 foot elevation) does not show any signs of recent modification or disturbance.

II. Historical Background

No information on possible sites of archaeological interest were noted in the sites of Oahu (Sterling and Summers 1978). From the historical documentation provided it appears that the main emphasis during the early historical period was on the lower, wetter sections of the valley now below the highway. The ambiguity of the locational name for the area covered by the study area can in part be seen as a possible indication of the relative value placed on different portions of Waimanalo Gulch. There was no indication in the historic literature of prior use of the upper portions of the valley.

The only obvious use of this valley section was during the 1950-60's use of the ridge for the missile site. Examination of the area below the existing microwave relay station uncovered a substantial pair of deep bunkers in the ridge, of probable post-World War II construction. It is likely that this portion of the military presence was a part of the Nike Missile complex.

III. Archaeological Reconnaissance (Refer to Historical Documentation for additional information)

The reconnaissance was conducted on July 7, 1983, by R. Bordner. The majority of the study area was covered on foot, in addition to visual examination through binoculars (a viable procedure due to clear terrain). Of interest were the problems that appeared in the use of the binoculars, in the false identification of caves in the side slopes. In every case the cave turned out to be merely a rock outcrop, or an area in shadow. The only cave located on foot was not noted by binoculars due to an intervening rock outcrop. This suggests that much care should be given to examination of slope sections and locating of cave sites by visual examination alone.

The lower section of the study area up to the 175 foot contour has been extensively disturbed, in major part from rock-mining operations. No indications of sites or other cultural materials were noted in this area.

The only site of definite human construction, with associated cultural debris, located during the entire survey was adjacent to the microwave trail at roughly the 175 foot mark. This site consists of a crushed basalt platform (possibly a carport) with a nearby shed. The shed had been totally consumed in the recent fire. In the immediate area of these features, covering upwards of 600 sq. meters, was a maze of single-layer stone alignments delineating roughly cleared rectangular areas and a series of cleared trails, the whole containing large amounts of historic debris.

These alignments appear to be of recent construction as there is no attempt at stacking, nor do the cleared areas contain soil or other indications of possible agricultural use. The midden was of recent (1950's+) date, as was the midden associated around the shed. The association of the shed/carport to the maze area is uncertain, but the maze area bears the appearance of a typical military bivouac area encampment. With the close association of numerous other military installations, it would appear that this site is a reflection of the 1950's period of military expansion into the valley, possibly during the Nike site construction.

In the upper section of the study area no definite sites with cultural materials were located. There was, however one probable cave shelter located at the 300 foot elevation on the Kahe Point side of the valley. The cave is difficult to reach, being on a steep rock outcrop approximately 35 feet above the valley floor. The shelter measures only 2m wide, 1m high and .8m deep, but the floor interior of the cave has apparently had the loose material removed and thrown casually to one side of the entrance. Upon examination of the interior no signs of cultural debris were noted, nor does there appear to be any substantial soil deposit within the cave.

It was surprising to note the total absence of cleared areas through-out the upper section of the valley. While this section is very narrow in width, and prone (from stream erosion) to violent flooding, other areas with similar conditions in other valleys have been utilized.

It had been expected that clearing for at least dry-land crops would be visible, but even with the excellent visibility no such areas were noted. The fact that there were no indications of prior agricultural use for the upper section of the valley was the main point of interest noted during this survey.

IV. Conclusions and Recommendations

From the historical and archaeological examination it appears that prior use of the present study area was ambiguous at best during the pre-contact and early historic periods. There would appear to be two major reasons behind this lack of land-use: 1) from the stream bank and alluvial debris it appears that the very intermittent stream flows tend occur with tremendous force, a function of the deeply dissected valley shape; 2) the apparent lack of a consistent stream flow, even a seasonal one, would mitigate against extended land use. It appears that this upper valley section of Waimanalo Gulch was not used extensively except for historic cattle grazing. It is possible that the area just mauka of the present highway, especially the area now inhabited, was an area of earlier house sites. The focus of interest in the lower reaches of the valley, as noted in the historic documentation, would have made this a likely location for habitation. But again recent disturbances in this area, both from present habitation, and more importantly from the rock-mining activities, has removed any indicators of prior use.

Based on these conclusions it is recommended that due to the negative findings of the historical research and the archaeological reconnaissance, that no further work need be done within the study area.

A SAMPLING OF HISTORICAL DOCUMENTATION RELATIVE TO
Waimanalo Gulch, Honouliuli, Ewa, Oahu

Early References

A traditional reference to the water-spirit guardian, Kanekua'ana, is found in the writings of Kamakau:

"Kanekua'ana was the 'kia'i' of 'Ewa, and the 'kama'aina' from Halawa to Honouliuli relied upon her. Not all of the people of 'Ewa were her descendants, but the blessings that came to her descendants were shared by all. When 'pilikia' came to the 'i'a' at 'Ewa, and their children were in distress because of the scarcity of 'i'a' /fish/, the descendants of Kanekua'ana erected 'waihau' heiaus for Kanekua'ana, and lighted the fires (for the cooking of offerings) to bring blessings upon the whole people. What blessings did they obtain? 'I'a' /Fish/...." (Kamakau 1964:83)

Another brief reference of general interest concerns Puu Kuua Heiau on Palikea Ridge in Honouliuli. In 1930, McAllister offers us the following description of it:

"Site 137. Puu Kuua heiau, Palikea, Honouliuli.

The heiau was located on the ridge overlooking Nanakuli, as well as Honouliuli, at the approximate height of 1800 feet. Most of the stones of the heiau were used for a cattle pen located on the sea side of the site. That portion of the heiau which has not been cleared for pineapples has been planted in ironwoods." (McAllister 1971:108)

The above citation is included for informational purposes only; it falls outside of the physical boundaries of this study and apparently little if anything of it yet remains.

A general comment relative to the environmental quality of the Ewa district is contributed by E. S. and E. G. Handy:

"...The length or depth of the valleys /of the central plain/ and the gradual slope of the ridges made the inhabited lowlands much more distant from the 'wao', or upland jungle, than was the case on the windward coast. Yet the 'wao' here was more extensive, giving greater opportunity to forage for wild foods in famine time.

"The people needed this resource because 'Ewa, particularly its western part, got very little rain in the summer months when the trade winds dropped their moisture in the interior. Stream water for irrigation, however, was always abundant. In the summer, compared with the windward coast, 'Ewa was considerably hotter in the daytime, and warmer at night, often rather windless....

"Climatically, lowland 'Ewa enjoyed only limited benefits from the northeast trade winds which blow during the spring, summer, and fall months. When 'kona', or cyclonic storms from the south, came during November through January, 'Ewa felt their full force. It was only moderately affected, in wind and rainfall, by other winter storms brought by north, northwest, and west winds. 'Tidal waves', or 'tsunami', such as afflict the windward coasts, originating as submarine earthquakes in northeast Asiatic and Aleutian waters, or in South American offshore coastal areas, were little felt along 'Ewa's seacoast." (Handy 1972:469-70)

Despite the above-mentioned disadvantages, Ewa proved to be quite a popular residence of the chiefs. They were enticed by the district's numerous fisheries at Puuloa, cultivated stream banks and shorelines, and uplands teeming

with bird life and lush vegetation. Battles were even fought here. It is unfortunate that much of the detail connected with the early history of the area has been lost.

A single specific reference to a chief residing on a particular site in Waimanalo follows:

"Koolina is in Waimanalo near the boundary of Ewa and Waianae. This was a vacationing place for chief Kakuhihewa and the priest Napuaikamao was the caretaker of the place. Remember Reader, this Koolina is not situated in the Waimanalo on the Koolau side of the island but the Waimanalo in Ewa. It is a lovely and delightful place and the chief, Kakuhihewa loved this home of his." (Sterling and Summers 1978:41)

In more recent historic times, John Papa Ii leaves us several descriptions of a native trail that passed through Waimanalo. From the shore of West Loch, the trail proceeded to the Honouliuli plains past Puu o Kapolei and Waimanalo and continued onward along the shore around the island. Ii noted:

"At Pueohulunui /in the vicinity of Middle Loch/ was the place where a trail branched off to go to Waialua and down to Honouliuli and on to Waianae. As mentioned before, there were three trails to Waianae, one by way of Puu o Kapolei, another by way of Pohakea, and the third by way of Kolekole." (Ii 1973:97)

"There were many houses at Makaha, where a fine circle of sand provided a landing place for fleets of fishing canoes. The trail which passed by this sandy bar was the one from Puu o Kapolei; which had joined the beach trail from Puuloa and from Waimanalo. It then went along the shore all around this island." (ibid. p.97)

"The trail led to Kaena and all the way to Waialua. From Waimanalo to Kaena traveling by noonday was very unpleasant because of the heat of the sun and the lack of wind over some stretches of sand on the trail. A chant was composed about the intense heat of the sun..." (ibid. p.98)

Ii's last extract is drawn from personal recollection and mentions a rather tragic situation:

"Ii was eight or nine years old when he was again seized by a desire to go to visit his aunt Kaneiakama, and he was given permission to do so. He had heard that his aunt was at Nanakuli, so he and his attendant departed by way of Puu o Kapolei to Waimanalo and on to Nanakuli. There he found his aunt and her husband who were in charge of the fishing....

"During their stay at Nanakuli they learned of the burning of the houses in Waimanalo. The overseer in charge of the burning told them that it was so ordered by the royal court because the people there had given shelter to the chiefess, Kuwahine, who ran away from her husband Kalanimoku after associating wrongfully with someone. Kuwahine was a daughter of the Kaikioewa who reared Kamehameha III in his infancy. She had run away because she had been beaten for her offense and for other reasons, too, perhaps. She had remained hidden for about four or five days before she was found. Here we see the sadness that befell the people through the fault of the chiefs. The punishment fell on others, though they were not to blame." (ibid. p.29)

Of the same time period as Ii's accounts are those written by a Scotsman named Archibald Campbell. He describes the land and the introduction of cattle

on Oahu (later a prominent factor in Waimanalo's development and use) in this fashion:

"Ten miles to the west of this /Pearl river/ is Barber's Point, (so called from the captain of a ship wrecked there,) the northwest extremity of the island. It is very low, and extends a considerable way into the sea.

"The tides upon this coast do not rise more than four feet at springs; it is high water about three at full and change of the moon. The force of the current is scarcely perceptible...." (Campbell 1967:115)

"At Owhyhee I was informed that there were many hundreds of cattle running wild, and several in a domestic state. The king had introduced the breed into Wahoo /Oahu/; and at the time I was there he had a herd of nine or ten upon the north side of the island....

"The cattle lately introduced are pastured upon the hills, and those parts of the country not under cultivation, the fences not being sufficient to confine them...." (ibid. p.117-8)

In July and August of 1826, Rev. Hiram Bingham accompanied Queen Kaahumanu on a tour of the island of Oahu. Aside from preaching and reading the Scriptures, Bingham was assigned the care and establishment of schools throughout the island. Of the Honouliuli district, he remarked:

"Kawaa, the head man of Honouliuli, in Ewa, on hearing that Kaahumanu had commenced this tour, built a large lanai, or airy and pleasant screen of green cocconut fronds or leaves interlaced, covering about 4,000 square feet, as a sort of temporary synagogue, which afforded accommodation for the queen's company and those who assembled there on her arrival and listened to the preaching of the Gospel and the addresses of the chiefs...." (Bingham 1981:297)

In January of 1828 a similar tour was conducted around the island for the purpose of examining the schools. Of his travels, Levi Chamberlain wrote:

"Having taken my leave of Boki, and his wife Liliha /at Waianae/, I set out at 3 o'clock and pursued my way along the sea shore with my attendants. We passed several 'kauhale' (clusters of houses) but found no schools, nor did we meet any persons who seemed to feel an interest in our object. As we thought it not likely that we should be welcome guests at any of the settlements in this district, or at least at any place where no school had been established, we quickened our pace in order to reach Waimanalo (a school district) before night. Our walk during the whole of the afternoon was over a barren country, in some places sandy, and in other places rocky; & the appearance of the people corresponded with that of the country. The food, by which the inhabitants are supplied, is cultivated in the vallies, which open among the mountains two or three miles from the shore.

"It was quite dark when we reached Waimanalo, and on arriving at the school house in which we expected to put up we were disappointed to find it deserted; and it was so infested with fleas that we feared we could not make ourselves comfortable in it. Some of the people of the place gathered around us, & we besought them to afford us accommodations in some one of their houses. One man whose house stood nearest us, and who was, I believe, the head man of the place, readily offered us his, and immediately began to put things in order for our accommodation; he did what he could to make us comfortable, and, as the house was small, vacated it entirely for our use.

"Saturday, Feb^y 9th. I enjoyed comfortable repose during the night and awoke refreshed. I arose and united with my attendants in singing a hymn, and offering a tribute of thanksgiving to God for his care & un-

ing kindness. After breakfast a few scholars assembled in front of the house. I examined them, and to one of them I gave a catechism and a sermon on the mount. Their teacher was absent, and I exhorted them not, on that account, to neglect instruction; but to give more attention to it - to assemble on the Sabbath, and learn the Catechism, and repeat passages from the word of God.

"At 10 minutes before 8 o'ck, after thanking our kind host for his attention to us, we set out for the next district. In consequence of the recent heavy rains the roads were very muddy, & the travelling very bad. We had met with nothing like it in any part of our previous travelling. After walking three hours & most of the time in mud we reached Honouliuli in the district of Ewa. A school of 22 scholars had assembled which I examined. The head man Kawa very kindly entertained me, caused a fowl to be cooked and some kalo to be nicely prepared; and furnished the natives with a liberal supply of fish and poi." (Chamberlain 1957:39)

The native historian Kamakau recorded that it was during the reign of Kamehameha III (1824-54) that the educational system flourished; he described it in terms of population thus:

"...At this time the country was filled with people, two or three times four hundred on each large estate, up to five times four hundred. Schools were built in the mountains and in the crowded settlements. Waipi'o had school houses near the coast and in the uplands. At Kahalepo'ai, Hauone, Kalakoa, Wahiawa, Halemano, and Kanewai there were large villages with teachers and schoolhouses; so at Lihu'e, Kalena, Maunauna, Kake, and Pu'uku'u. There were several school houses and teachers for each district. Honouliuli had over ten school houses with their teachers. The lowest number of pupils to each school was 50 up to 200 or more. Oahu was then thickly populated. It is sad to see how in so short a time whole villages have vanished leaving not a man...." (Kamakau 1961:424-5)

LAND RECORDS

It was during the reign of Kamehameha III that the Great Mahele was formulated to make available to the public, parcels of land in fee-simple. Prior to this device, all land within the kingdom was owned by the ruling monarch; personal ownership of real property was unknown.

During the Mahele, individuals were permitted to register claims only on the houselots they actually resided on and on the agricultural lands they had actively under cultivation. Each registered claim then had to be verified through the sworn testimony of one familiar with the boundaries and/or the acquisition of the parcel in question. If the claim was not contested by the district chief or perhaps, by another claimant for the same parcel, it was awarded and a small commutation fee was asked of the claimant.

Of the 13 major land divisions within the Ewa district, Honouliuli is second only to Waipio in the number of individual land claims registered and awarded outright during the Mahele. 99 separate claims for parcels of land were submitted to the Land Commission; all were uncontested and awarded.

The largest award was received by Chiefess M. Kekauonohi who obtained a deed

for all unclaimed land within the entire Honouliuli ahupuaa; her 43,250 acres excluded only those claims awarded to the other 98 land-owners. A quick statistical assessment of these 98 claims reveals that they range in size from 0.119 to 9.39 acres (6 parcels were between 6.06 and 5 acres in size, 49 parcels between 4.615 and 1 acre, and 42 parcels were less than an acre).

23 separate localities within Honouliuli were named in claims; Waimanalo was not included among them. In explanation of this, it is possible that the area currently referred to as Waimanalo may have been known in the past by different names now virtually lost - names perhaps which were assigned to smaller sub-divisions of land within Waimanalo. It is also equally probable that no specific claims were made for Waimanalo land, thus placing ownership for Waimanalo gulch and the plain extending seaward, with Chiefess Kekauonohi, owner of unclaimed lands in Honouliuli. (Indices 1929:343-7)

In an effort to document and monitor changes in land use and of land ownership, archival land records, reports, publications and news articles were reviewed. These sources have been summarized and ordered chronologically below and serve to outline some of the more major events of land history.

- undated "In royal patent issued to Mrs. A. Haalelea for the above ahupuaa /Honouliuli/. Boundaries of said Ahupuaa given but no patent number." Int. Dept. Doc. 312
- undated "In list of lands, showing that R.P. 6971, was issued to M. Kekauonohi, by name only on Land Claim No. 11216, on the above land /Honouliuli/ in Ewa, Oahu." Int. Dept. Doc. 314
- undated "List of lands of M. Kekauonohi, shows, (inter alia;) Honouliuli, Ahupuaa, Ewa, Oahu." Int. Dept. Doc. 387
- 8/5/1847 Messrs. Motteno and Stuppelbeen apply for a lease of the plain of Waimanalo in Ewa for the purpose of pasturing cattle. They make application to Keliiahonui, Kekauonohi's first husband (after his death she marries L. Haalelea) and they ask for a 10 year lease at \$200 per annum. The matter appears to be left unresolved due to Keliiahonui's title to the land "being doubtful." P.C.R. v.3:10 and P.C.R. v.4:39
- 1/21/1852 "In letter from T.H.S. Haalelea to Min. of Interior. That he is the owner of the above land /Honouliuli/, and that Anae is the tabu fish." Int. Dept.
- 3/13/1858 "Levi Haalelea vs. Daniel Montgomery re: ownership of Ahupuaa of Honouliuli purchased in 1849 by Issac Montgomery from M. Kekauonohi." The Polynesian p.358 c.3
- 7/15/1875 "In letter from Mrs. A.A. Haalelea to the Min. of Interior asking him to submit the question to the King in Cabinet Council, of including the fishing rights of the west lock /sic/ of the Pearl River Lagoon in the royal patent to be issued to her for the above ahupuaa /Honouliuli/.&c." Int. Dept.
- 3/13/1876 "In letter from A.F. Judd to the Min. of Interior protesting in behalf of Airine Haalou Ii against the granting by the Gov't. to Mrs. Haalelea or any one claiming the ownership of the above /Honouliuli/ & any fishing rights or sea pertaining

to same." Int. Dept.

3/22/1876

"In letter from Min. of Interior to Attorney General informing him that the owners of the above land bordering on the western side of the Lagoon commonly known as Pearl River have applied to this office for a Royal Patent for said land & the fishing right belonging to the land be included in the description, by meets & bounds of the real estate be patented.

"That A.F. Judd, one of the guardians of Airine Haalou Ii who owns the land on the opposite side of said land filed in this office on the 13th inst. a protest against the patenting of any fishing rights to the Owner or Owners of said Honouliuli as his ward also had rights in the same Loch as easement of the land of Waipio." Int. Dept.

undated

"In table of Konohiki lands, showing that the above land /Honouliuli/ was awarded to Campbell under Land Claim No. 1126 & that it has a sea coast frontage along the sea of 15.72 miles."

8/15/1885

An article in the Pacific Commercial Advertiser of this date describes a visit to James Campbell's Ranch:

"...The destination of the party was Mr. James Campbell's Honouliuli ranch on the eastern slope of the Waianae mountains. The party was well mounted, and made the hospitable home place of Mr. Campbell on the western lagoon or arm of Pearl harbor towards evening, where they were met and hospitably entertained by Mr. Cecil Brown in the old Coney place. This is the favorite country residence of Mr. Campbell.

"The Honouliuli ranch contains 42,000 acres, of which, speaking generally and judging by the eye, about 10,000 acres adapted for agriculture are between the foothills and the lower boundary line. There are also about 7,000 acres of level bottom land lying at the southeast end of the Waianae mountains, suitable for either cane or rice, if water can be put upon it in sufficient quantity, but which, in its present condition, is well adapted for mixed husbandry or grazing. The balance of the ranch is mountainous, or running out towards the harbor and coast line in a flat coral plain, covered with scant verdure, upon which, however, the stock get uncommonly fat. Indeed, this coral pasture, if it may be so termed, is the fattening paddock for the entire ranch, as well as for Mr. Campbell's Kahuku stock breeding ranch of 32,000 acres.

"The soil is a deep reddish loam up to the top of the highest peaks, and on the occasion of this visit it was well grassed everywhere. Indeed, although all the cattle were in prime condition there did not seem to be any lack of pasture, and if such a season as the present one could be counted on, Honouliuli ranch would easily carry double the present stock, which was stated to be 5,500 head of cattle, besides a band of horses and mules. There is also on the Kahuku ranch some 3,500 head of cattle, together with horse stock.

"The question of water is necessarily an important one, and conflicting opinions have been expressed regarding the availability of the water supply on Honouliuli ranch in a dry season. A careful examination of the sources of supply in the mountains, and the construction of dams or reservoirs at convenient points in the ravines, which could be made at trifling cost, owing to the formation of the country, would store abundance of water for all purposes, however dry the season; and, indeed, should

the project of a small farm settlement be inaugurated, this is one of those necessary works which must be undertaken. Springs appear to be abundant and there are several streams, while unmistakable evidence of underground water was visible to the experienced eye in various places. Wells have been sunk at various elevations to test the water reserve. One of these wells is at an elevation of about 400 feet above sea level. A windmill, by Byron Jackson, of California, imported by Mr. Dillingham, has been erected, and although the well is only fifty feet deep, and about thirty feet to water, this windmill pumps sufficient water for all the stock pasturing in the neighborhood. At an elevation of about 700 feet above sea level flowing well has been opened, the stream from which runs down to the Robinson ranch, several miles distant. On the flat, near the home- stead already spoken of, there is an artesian well which has had a steady flow of 2,400 gallons per hour for years past. Considering the immense watershed, and that the most of the drainage of the Waianae mountains from the divide along to the Waianae pali necessarily passes through the Honouliuli ranch, there should be no difficulty in procuring an abundant supply of water for all purposes of agriculture. The mountain summits are covered with rank grasses, and Spanish clover appeared in patches; but the sheltered slopes have a good deal of growing timber, and among it a few trees of sandal wood.

"There is evidence on all sides that this ranch was once the home of a considerable native population. Old tara /sic/ patches abound in the little valleys along the margin of streams, and large quantities of potatoes were raised on the dry land. Small-pox carried off the bulk of these people, according to an intelligent half-white who is employed as luna on the estate. There is no reason, therefore, why the same land should not, under different conditions, support a large resident white population.

"Honouliuli ranch was owned by Kekanonohi /sic/, a high chiefess, who died and devised it to her husband, Haalelea. On his death it went to his second wife, who sold it to Mr. J.H. Coney, from whom Mr. James Campbell bought it eight years ago for \$95,000. At that time the ranch was greatly overstocked, and it was imperative to give it a rest. Accordingly Mr. Campbell set about fencing the outer boundary where nature did not provide a sufficient barrier, as it does in the water frontage and the impassible precipice along the divide in the Waianae mountains, which forms the boundary line of the ranch upon that side. Thirty miles of fencing in all were built, of which twenty miles are of five feet 5-wire fence, and ten miles are of batten fence. When this work was finished, Mr. Campbell notified all owners of cattle to remove their stock. A careful record was kept of this mustering and removal of stock, and 32,347 head of branded cattle were driven off. The ranch was then left to recover for a year, and the year following a small herd was introduced from the Kahuku ranch, the numbers being gradually increased until its present condition. Mr. Campbell slaughters on an average six head of fat cattle per day, to supply the Honolulu market with beef. The price per carcass is from \$30 to \$35. As already explained, this meat output could be largely increased, as there is always the California market available, dressed meat being admitted duty free. Indeed, a large cattle owner in this city is said to have received an offer from the Coast for a regular monthly shipment of 250 carcasses of beef

and 1,000 sheep, but was unable to fill the order. Transportation in refrigerating chambers, however, will be available when a surplus beef product has been created for export.

"The ubiquitous Chinaman has taken hold of the rice lands in this neighborhood also, there being some 200 acres of rice at present, of which about 90 acres belong to Mr. Campbell, and are rented at \$15 per acre on short leases; \$25 an acre yearly has been agreed upon in one instance for a renewal of the lease, and all other leases are to be renewed on the same terms. The right of fishing in the western lagoon of Pearl harbor is also leased by the owner, Mr. Campbell; and a lime quarry pays a rent and royalty. It is needless to say that the property is economically administered, and with excellent results.

"The climate is delightful, and the view from many points on the sidehills is very fine. The pali on the western divide far excels Nuuanu pali in grandeur. Pearl harbor is accessible to vessels of light draft, but once inside the water is deep and bold up to the coral ledges, which form a continuous natural landing for many miles. Reference to a chart of the harbor will doubtless settle this point.

"To sum up all, without going into tedious details, Honouliuli ranch alone is calculated to provide homes for a large number of families engaged in agricultural and pastoral pursuits. The soil is rich, deep and fertile; the climate genial and enjoyable, and the possibilities encouraging. But it is now close held by one individual, and if it is to be segregated and put into the market as a small farm settlement, it must be by a company formed for that purpose. This is a business detail, however, which is not pertinent in this place. It is, however, to be hoped that not only will Honouliuli and Kahuku ranches be cut up onto small farms and thrown open to bona fide settlement, but that other large estates in this and the neighboring Islands may be similarly dealt with. Were this to happen the progress and development of the Kingdom would be assured."

1886

The following appeared in Thrum's Hawaiian Almanac and Annual for 1886:

"Honouliuli Ranch

"Contains (minus Puuloa, 2,300 acres) 43,250 acres in fee simple. This land is favorably situated, having direct communication with Honolulu by water, distance 10 miles, or by land by a good road, distance 17 miles, the latter offering singular facilities for an inexpensive railway track. The water route to Honouliuli is from Honolulu harbor skirting the reef to Pearl harbor, a magnificent inlet of the ocean protected by a reef or bar with 11 to 13 feet, but inside with from 20 fathoms to 3 fathoms of land-locked, protected anchorage, fit for all classes of coasters and yachts. On the west arm of this harbor Honouliuli has a frontage of no less than five miles, with from three to twenty fathoms in front of it. The whole fishing rights of this west arm are part of the property.

"Honouliuli Ranch is bounded by the sea and Pearl river on two sides, and extends in a westerly direction to the divide of the Waianae mountains which form a natural boundary so well defined and so difficult to pass as to render fencing on this line unnecessary. But where Honouliuli adjoins the neighbouring properties, it is securely fenced. There

are twenty miles of five wire fence with redwood posts, and ten miles batten fence, all in good order and erected within the last seven years.

"Stretching from Pearl harbor and skirting the base of Waianae mountains southward and eastward is a plain of about 7,000 acres of rich alluvial soil, eminently suitable - the upper portions for sugar and the lower for rice lands. Of these latter, from 3,000 to 4,000 acres may be irrigated by artesian wells, the elevation above high water mark being between 12 and 35 feet. A well sunk on this property in 1881, to a depth of 186 feet, has yielded unceasingly 2,400 gallons per hour since completion. Wells have been sunk at elevations from 400 to 700 feet about the sea level. Water was found at from 30 to 60 feet below the surface. One is a flowing well; on the other a windmill suffices to raise drinking water for surrounding herds. The ravines of the Waianae slope are narrow and readily lend themselves to favoring the construction of storage dams for purposes of irrigation. On the eastern slopes, among the foot hills of the Waianae mountains are over 10,000 acres of land, suitable for small farms, vineyards, orchards, &c. Several perennial springs flow through these valleys and ravines, and the extensive traces of taro culture show that in the hands of the old natives there was no lack of water. The Waianae mountains attract or precipitate sufficient rainfall in ordinary season for the maintenance of the present heavily-grassed condition of their slopes, and due attention to the forestry will enable them to carry more numerous heads of cattle than those which now fatten hock-deep on the Manienie or Bermuda grass. The lower and more open slopes are suitable for dairy, poultry or fruit raising. They are within easy reach of the main road to Honolulu, and people must soon invite the construction of a railway to the capital. The Sugar cane and Rice land of this property is valued at from \$100 to \$200 an acre, and may be taken up in large or small tracts at these figures; the grazing farm and fruit lands are valued at from \$10 to \$50 per acre. It is at present intended to offer some 10,000 acres of first-class agricultural land for sale, upon convenient terms, at \$50 an acre for colonization purposes, for resident and improving occupants. If the land is sold, the following plan suggests itself. To be offered in lots of not less than ten acres; nor more than one hundred acres, at \$50 per acre. Terms: The land to be fenced, and a house suitable for the holder to be built by him; and the land to be paid for on the installment plan during a term of ten years, in equal yearly installments, with interest at five per cent, per annum, net. The sale of the land to be made upon the following conditions: First. - Ten per cent of the purchase money to be paid upon signing the contract. Second - That improvements must be made within three months of date of contract, as follows: The land must be fenced with a good substantial fence, such as the Company shall designate; the material to be furnished at the expense of the Company, and the labor of construction and erection of the same to be performed by the purchaser, or at his expense. Third. - A dwelling house suited to the requirements of the purchaser to be erected within six months of date of contract or sale. Fourth. - That during and within a period of say two years, there must be fruit and other trees planted, in the proportion of say ten trees to each acre of

land bought. Fifth. - Should any purchaser fail to comply with any of the foregoing conditions, or should he fail to pay his regular yearly installment of purchase money, with interest, he shall forfeit all right and title to said land and improvements, subject however to the discretion of the Company." (Thrum 1886:74-5)

12/23/1887

"Min. of Interior To Cecil Brown. As Agent for above person /Mr. James Campbell/, inquiring as to whether permission can be obtained to erect a Light House at Barbers Point, at a proper locality for this purpose upon the lands of said person, &c." Int. Dept.

12/27/1887

"Min. of Interior To Cecil Brown. Acknowledging receipt of his favor of even date, informing that above person /Mr. Campbell/ will deed the Gov't. a piece of land (say one half acre) at Barbers Point for the purpose of erecting a Light House, on condition that he has the nomination & approval of the person who is to have charge of the same & also that the land so conveyed be used for Light House purposes only. Terms are accepted by the Gov't. &c." Int. Dept.

1889

Civil Engineers J.D. Schuyler and G.F. Allardt co-authored a report entitled "Report on Water Supply for Irrigation on the Honouliuli and Kahuku Ranchos" from which the following extracts have been taken:

"Our attention was first directed to the water supply that might be made available for irrigating the Honouliuli rancho. This great body of land is bounded on the west for some twelve miles by the summit crest of the Waianae Mountains, a range isolated from the Koolaupoko Mountains, or the main central range of the island. From the foothill slopes of the Waianae range a broad plain sweeps south and east to the eastern boundary of the rancho, to Pearl Harbor and the ocean. This plain at its northerly limit has an elevation of 1200 feet; that portion above an elevation of 150 feet is some nine miles long, one to two miles wide, and has an area of about 12,000 acres. Below an elevation of 20 feet is a broad extent of coral lands extending from Pearl Harbor along the ocean to Waimanalo, containing some 11,000 acres. The rancho, exclusive of Puuloa, has a frontage of nearly five miles on Pearl Harbor and eleven miles on the southerly sea coast of the island.

"The area of the arable and irrigable lands is about 17,000 acres, (not including coral lands), divided as follows:

(From surveys of C.H. Kluegel, C.E.)

	Acres.
Below 50 feet elevation	1,637
Between 50 and 100 feet elevation	2,276
Between 100 and 150 feet elevation	1,177
At Waimanalo (estimated)	600
Plains above 150 ft. elevation (as shown on map)	12,000
Total	17,690"

...

"As heretofore stated, exclusive of the 600 acres estimated as available for growing sugar cane at the Waimanalo end of the coral lands, there are 5,500 acres of good tillable land below the elevation of 150 feet, of which 79% or 4300 acres are below 100 feet altitude.

"The 600 acres at Waimanalo should be supplied by artesian wells, on account of their remoteness from the other sources

of supply. The greater portion of the tract is said to be below 50 feet altitude, consequently the cost of pumping would be comparatively moderate." (Schuyler, Allardt 1889:9-10;18-9)

Note: Schuyler and Allardt's map of the area which accompanied their report depicted Honouliuli's one quarry site in the Waimanalo section. A portion of this map has been appended to this text for reference.

1889-90

The Waimanalo Stone Quarry appears to provide some economic justification for the OR&L extension from Hoaeae to Waianae; the following excerpt is taken from an "Open Letter by B.F. Dillingham, and Report of Messrs. C.H. Kluegel and G.F. Allardt, Engineers of Oahu Railway and Land Company, to the Special Committee on Railways appointed by the Hawaiian Legislature of 1890.":

"...With sufficient support and encouragement from the Government, which the Company respectfully ask the present House of Legislature to authorize, the Oahu Railway and Land Company propose to build or extend their line in a westerly direction from Hoaeae, the terminus of the present contract, to Waianae, a distance of twenty (20) miles.

"If the line is so extended, it is proposed by Mr. E.B. Thomas and others in this country to form a company for the purpose of quarrying limestone, with a view to supplying our market with domestic lime.

"With suitable machinery there is little doubt that our sandstone can be placed on the market at a price to compete favorably with brick for building purposes. This will create in the country a new and valuable industry, and add considerably to the business of the proposed Waianae division of the Oahu Railway and Land Company.

"I have made a careful investigation of the business now existing and in immediate prospect, which would come to the Waianae Division, and submit the following as the result of such investigation.

"This line will be much less expensive to build than were the first fifteen miles, and will be undertaken for an amount not to exceed \$15,000 per mile, payable in Company's bonds bearing interest at 5 per cent. The interest to be guaranteed by the Hawaiian Government:

Hoaeae To Waianae.	
"Twenty miles, including equipment, at \$15,000	<u>\$300,000</u>
"Estimated present income:	
"Freight to and from Waianae	\$ 12,000
"Freight from Waimanalo Stone Quarry and wood lot	\$ 3,000
"Passenger traffic	\$ 5,000
"Annual subsidy from Government at \$500 per mile for the term of five years	\$ 10,000
	<u>\$ 30,000"</u>

"...The beneficial results which have already followed the completion of the Pearl River Division of the Oahu Railway, in the way of developing the resources of the country, in stimulating private enterprise, and in enhancing the value of landed property along the line, would seem to warrant the extension of the railway to more remote localities, and perhaps ultimately, its extension around the entire Island of Oahu.

"With this end in view, the undersigned /Kluegel and Allardt/, under your instructions, made a careful reconnoissance around the island for the purpose of determining the most feasible route, and arriving at an approximate estimate of its cost.

"We found the most practical route to be that along or near the coast, which route, at the same time, traverses by far the greater portion of the improved and unimproved arable lands on the island. The distance was found to be 132 miles, of which 15 miles are now completed and now in operation. The distance might be decreased about 18 miles by running the road across the divide between Ewa and Waialua; but this would cut off the important district of Waianae with its extensive sugar plantations; also, the large limestone quarries near Barber's Point...." (Kluegel, Allardt 1890:2-3;9)

1/19/1906

"Supt. of Public Instruction To Geo. F. Renton
"That the school lot at the Ewa Plantation, is in need of a much larger lot. Suggesting that an exchange be made by which the Dept. may acquire the necessary enlargement of the school premises referred to. Should the proposed exchange meet with his approval, there are about 2 acres of land covered by a Royal Patent in the above tract /Waimanalo/, Ewa, which would make a possible exchange, failing that, there are 2 small pieces of Gov't. land near Honouliuli, &c." Pub. Inst.

Note: In an effort to locate additional information on the specific parcel mentioned above, Public Instruction Correspondence files were examined. It was discovered that a land exchange was effected between the Government and the Jas. Campbell Estate. The actual parcel exchanged was situated in Niukee, Honouliuli. It is difficult to readily ascertain whether this Niukee parcel falls within or outside of the Waimanalo district. Additional research time should be devoted to this question for if Niukee is indeed within Waimanalo, then the 18 Land Commission Awards in Niukee would also demand immediate attention.

Brief References to Military Occupation in Honouliuli

Aside from Barber's Point Naval Air Station, a number of military posts have utilized Honouliuli lands. Thumb-nail descriptions of each follow:

MCAS Ewa

"The Marine Corps Air Station at Ewa - a great modern airfield - was developed from what had been for 15 years merely a dirigible mooring mast. As the headquarters base of Marine aviation in the Pacific, it served as the springboard into forward areas. Every Leatherneck air unit going to or returning from Pacific action went through Ewa." (Allen 1950:225)

Fort Weaver

"Located on the west side of the channel entrance to Pearl Harbor. It is a part of the Harbor Defenses of Pearl Harbor. Named in honor of Major General Erasmus Weaver, U.S.A. Reached by boat from Fort Kamehameha. May also be reached by automobile road. Distance from Honolulu by road is approximately 22 miles." (Bertiner 1947:21)

Fort Barrette

"Located west of Pearl Harbor; it is part of the Harbor Defenses of that designation. Named in honor of Brigadier General John D. Barrette, U.S.A." (Bertiner 1947:19)

Barber's Point Naval Air Station

"Located on the extreme south-western edge of the Island of Oahu, approximately 25 miles by highway. This station has been commissioned since December 7, 1941." (Bertiner 194?:19)

"NAS, Barber's Point, situated at the southwest corner of Oahu, was little more than a coral waste, covered in places with shallow-rooted brush, scrubby trees, and occasional cane pockets, when it was commissioned on April 15, 1942. It soon became an important air center, technical training school, and fortification manned by 12,000 sailors. The Army had a training area near Barber's Point with three sectors: a beach section, an area of pillboxes and wire entanglements, and a combined infantry-tank training ground." (Allen 1950:225)

Camp Malakole

"Located on the west shore of Oahu about three miles north of Barber's Point, this Coast Artillery post was first occupied by troops on November 12, 1940. There are 120 acres included in the military reservation." (Bertiner 194?:20)

"Beyond Barber's Point on the west, or leeward, shore of Oahu was Camp Malakole, officially established January 9, 1941. It was immediately dubbed 'Camp Melancholy' by the first occupants, who found it a lonely kiawe-covered waste 25 miles from Honolulu. Its original function was to maintain gun and firing positions for the coast artillery and anti-aircraft guns, but it later served also as a staging area. After the battle of Saipan emphasized the importance of anti-aircraft weapons in a field artillery role, it was enlarged to serve as an anti-aircraft training center. Under its supervision also were the near-by Waianae amphibious training center and the Kahe Point and Makua training areas." (Allen 1950:225-6)

The following article describes the purchase of Ewa lands by the military. Nearly 400 of a total of 537.278 acres was acquired from the James Campbell Estate in December of 1941:

"Under a petition filed in the U.S. district court for Hawaii yesterday, the federal government has taken possession of 537.278 acres of land in the Ewa district for military purposes. U.S. Judge Delbert E. Metzger signed the order giving the federal government possession of the land.

"At the same time of taking over the property, the government deposited with William F. Thompson, Jr., clerk of the federal court, a United States treasury warrant for \$135,287, as the government's appraisal of the property.

"Of the total area taken, 398.97 acres, valued at \$98,303, was owned by the James Campbell estate, and 126.04, valued at \$25,647, was owned by the Dowsett Co., Ltd. Small acreages were owned by J. Sakuma, Jorgen Jorgensen, Hilda Jorgensen, Orlando A. Schoening, Margaret P. Schoening, Ronald B. Wink, Otis F. Springer, Cora J. Springer and M. Maneki." (The Honolulu Advertiser 12/21/1941 p.1 c.1)

The acquisition of land on the Manawahua Ridge at the head of the Waimanalo Gulch for use as Nike-Hercules missile bases is mentioned and described in two news articles (dated 1959 and 1960):

"The Army in Washington yesterday disclosed five areas on Oahu which will provide sites for eight Nike-Hercules anti-aircraft missile bases on which construction is to start this summer.

"The areas are Ft. Shafter, Bellows Air Force Base in Waimanalo, Dil-

lingham Air Force Base near Mokuleia, Manawahua on the ridge behind Barber's Point Air Force Base in Ewa, and the Kaneohe Marine Corps Air Station.

"The disclosure was made in connection with approval by the House Armed Services Committee of Army plans to acquire the missile base sites. United Press International reported that privately-owned or Territorial land must be acquired by the Army for some of the proposed missile sites.

"The private lands are located in the mountains, the U.P.I. report said. The Army expects to swap land with the Campbell Estate to cut some of the costs of land acquisition. The report said the swap probably would involve excess Army land at Honouliuli military reservation (Camp Malakole).

"The committee has approved the Honouliuli land transfer. The Army land involved is near Barber's Point and includes some beach land. It was taken from the Campbell Estate during World War II for use as a staging area...." (The Honolulu Advertiser 5/6/1959 p.A-3 c.4-6)

"The Army today announced the locations of four of the six Nike-Hercules rocket batteries it will establish on Oahu.

"Two batteries will be situated at the southern tip of the Waianae mountain range north of Barber's Point....

"The Nike-Hercules batteries will be manned by Hawaii National Guard personnel who have received training on the Continent....

"Plans call for equipping each battery with nine launchers.

"Each battery, comprising at least 45 acres, will be equipped with a fire control area removed from the launching site....

"The first three Nike sites should be operational this year, he stated.

"Requests for bids on these three sites were sent out today....

"He said each Nike launcher will have 55 men on duty with 45 men on a stand-by status.

"He estimated the cost of construction, labor and equipment at the sites at \$7 to \$9 million, with a yearly payroll of \$1,200,000 for the men manning the missiles.

"The Ewa sites north of Barber's Point are on Campbell estate land." (The Honolulu Star-Bulletin 1/11/1960 p.1 c. 4-8)

Cartographic References and Miscellaneous Notes

Waimanalo is sketched in on a 1873 map of Honouliuli by W.D. Alexander. This appears to be the earliest map available of the district filed in the State Survey Division. Within Waimanalo two specific sites are plotted: Koolina (previously mentioned on page two of this report) and a little to the north along the coast a "Hamlet" is marked out. Further north along the coast and still within the Waimanalo boundary is what resembles an unmarked but fairly large-sized pond.

Reference to this coastal area in general was found in a recent publication by John Clark. He noted:

"Alice Kamokila Campbell was one of four daughters of the wealthy landowner James Campbell, whose estate was estimated to be worth \$100 million in 1945....

"In 1940 or 1941 Kamokila leased from the Campbell Estate about thirty-seven acres of beachfront property in the Waimanalo area of Honouliuli. This beach place, which she named 'Lanikuaka'a,' included a thatched Hawaiian house and three 'sacred pools' where Ka'ahumanu, a favorite wife of Kamehameha I, was supposed to have bathed and performed certain religious rites.

During the Second World War, this one of Kamokila's several homes was used as a recreation center by Army and Navy servicemen, who nicknamed it 'Camp Bell.' In later years Kamokila renamed her beachfront estate 'Lanikuhonua.'

"Probably it is Kamokila's 'Lanikuhonua' with its sacred pools that is referred to in Hawaiian history as Ko'olina, a lovely place in Waimanalo near the boundary of 'Ewa and Wai'anae. The caretaker of Ko'olina was Napua'ikamao, and the area was a favorite vacationing spot of the high chief Kakuhihewa.

"Before Kamokila leased Ko'olina, the pools were frequented by many teen-aged children from the neighboring camps of 'Ewa Plantation. In those days, convenient public transportation to 'Ewa Beach was not available, so the children caught the train to the pools. The former railway line passed just inland of the area. The westernmost pool was their favorite, and the kids called it 'D.P.D.'; the meaning of this name is now forgotten.

"The shoreline fronting Lanikuhonua is a shelf composed primarily of lava rock and raised coral reef. There is a small sand beach. The large saltwater pools are situated at the shore's edge, and each has a small sandy area in front of it. They are separated from the ocean by natural walls of reef over which the waves flow to fill the pools. The rocky shoreline is noted among fishermen as good moi grounds. There is no public access to the estate, which is now owned by a local real estate developer. He has renamed the area 'West Beach.'" (Clark 1977:76-7)

A map prepared in August of 1889 by Schuyler and Allardt (entitled "Map of Honouliuli and Vicinity, Oahu, H.I. Showing Irrigable Lands and Proposed Reservoir Sites, etc.") pin-points a quarry site in the Waimanalo district. This quarry is located in very close proximity to the unmarked pond, which is identical in contour and position to the pond drawn on Alexander's map.

Schuyler and Allardt's irrigation study helped to convince the legislature of the worth of Honouliuli and Waianae lands thus paving the way for the eventual extension of the O.R.&L. from Hoaeae to Kahuku.

The following translated extract described a sightseeing tour on the new railroad in July of 1895:

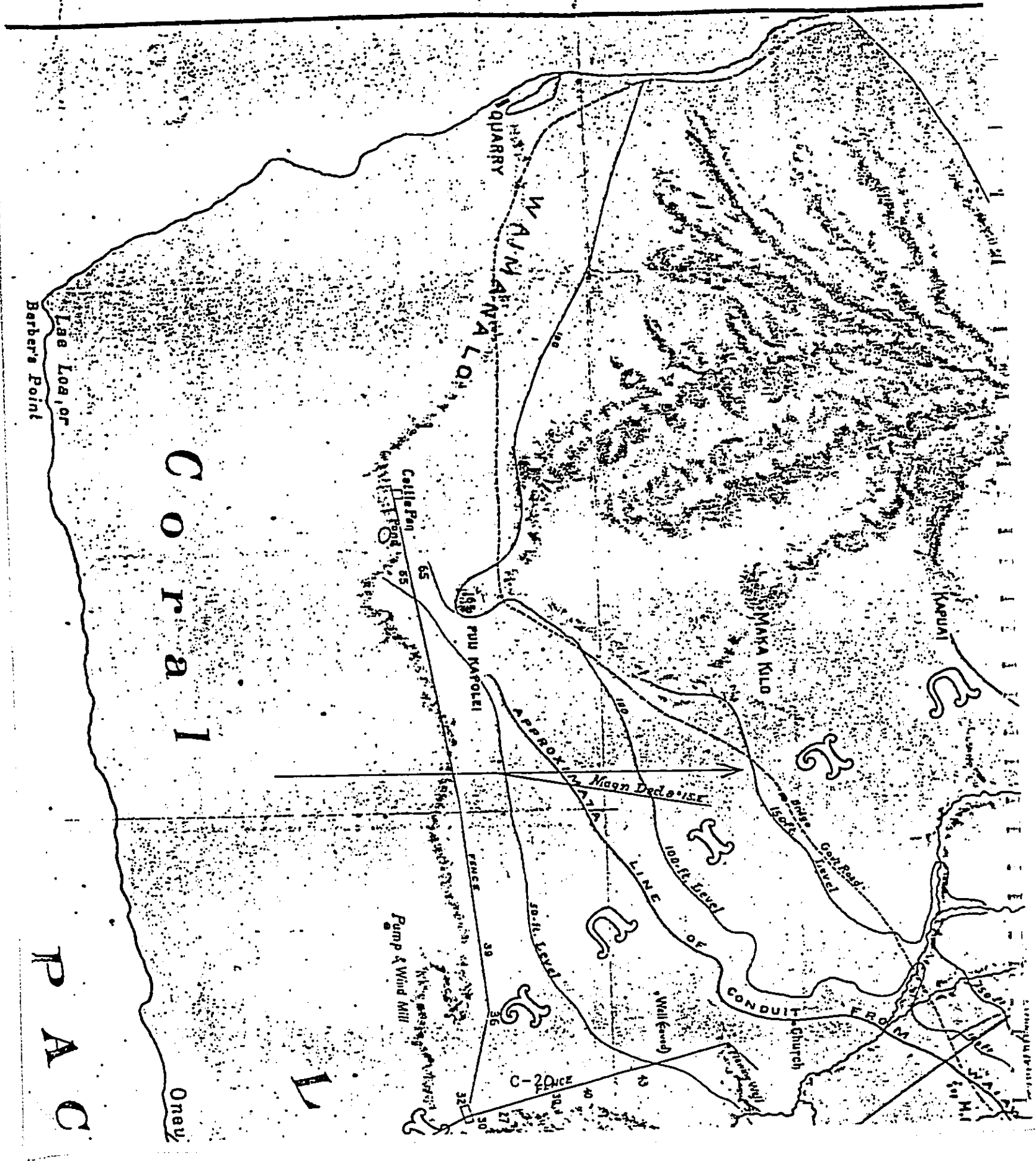
"...Entering Waimanalo there were kiawe growing here and there and it wasn't long before we approached the seashore presenting the open blue ocean, long and wide; it wasn't beautiful except in this place on the road. Then heading on to Piliokahi was an ancient stone-walled site; there said a resident, Ewa was protected from Waianae;.." (Johnson 1976:409)

Precisely where this "ancient stone-walled site" was located was not mentioned, though it is fairly safe to conclude that the site lay within the Ewa boundary.

A recent tour guide map of Oahu shows a road leading directly into the Waimanalo Gulch from the H1 Freeway. The road then forks into two distinct roads which skirt the lower elevations of the walls on both sides of the gulch. (Belknap 1971:46-7). This road was also verified by the U.S.G.S. map of the area; this map also plots "Browns Camp" makai of the mouth of Waimanalo Gulch.

A single graphic record of what appears to be the southeastern portion of Honouliuli also accompanies this report. (Bingham 1981:93).

Map of Honolulu and Vicinity
Jas. A. Schuyler & H. F. Allardt - August 26th, 1899





View of the southern side of Oahu from Ika. Page 93

*A Residence of Society - One year in the Sandwich Islands
by William Bingham p. 93*

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OHIKILOLO VALLEY

Archaeological Reconnaissance

And

Historical Documentation

OHIKILOLO VALLEY: ARCHAEOLOGICAL RECONNAISSANCE

I. Introduction

The study area consists of Ohikilolo Valley mauka from the existing highway (H-1) to approximately the 350 foot elevation. The valley is roughly bowl-shaped, with gentle slope till the 200 foot elevation, at which time slope angle increases dramatically. The area is generally dry, the flat frontal area in pasture, with the mauka portions in kiawe forest/pasture: kiawe and koa haole with scattered lower vegetation, and occasional clumps of mixed kukui and wiliwili along the tributary streams.

The area is under heavy present utilization by the Silva family. The frontal pasture area is grass fodder (commerical), while the mauka areas are utilized mainly for grazing of cattle, goats, horses and donkeys, with small areas being used for other agricultural products such as papaya.

The streams present are deep-cut and intermittent, suggesting that water is seasonal and in large quantities.

II. Historical Background (Refer to Historical Documentation for additional information)

The only two sites recorded for the Ohikilolo Valley are outside the present survey area. The first is Kaneana Cave, located on the ridge between Ohikilolo and Makua Valleys. As noted above, this cave is noted for it's legendary associations. The second is the 'barking' or 'sounding' sands on the beach at Ohikilolo. While both of these sites have obvious legendary and possible religious significance there is no indication of archaeological sites similar to those located during the reconnaissance in the earlier survey literature examined.

III. Archaeological Reconnaissance

The majority of sites located during the reconnaissance were found in the relatively flat areas from approximately 125 to 275 foot elevation.

The central area under pasture is unusually flat, with several spots exhibiting limited saltation. Informants noted that the lower flat area had formerly been a fishpond. Though the edges were examined there were no visible traces of fishpond walls, and the existing highway covers the seaward edge so complete verification was impossible. The area is unusually flat, and the soil is alluvium silt such as would be expected in a silted in fishpond.

The fishpond and immediate surrounding area have been extensively modified for pasture production, roads and habitation areas. Within this area, the extensive land modifications have destroyed archaeological sites.

The eastern portion of the study area was also barren of visible sites, again due to recent land modifications such as houses, corrals, and heavily used grazing areas.

Site 1: A water diversion feature located approximately 170' makai of the bisecting jeep road (see Map 1). This feature is located at the intersection of two small intermittent streams. It consists of an improved natural outcrop, apparently designed to limit and direct water flow at the intersection point, and extends for approximately 2m with a maximum height of .6m. In the immediate vicinity of the feature is a clump of mixed kukui and wiliwili trees.

Site 2: A stone wall and mound complex located makai of the jeep road (see Map 1). This complex consists of a large series of intersecting walls of stacked core-filled construction to a maximum of 1m high and .75m wide, with some wall intersecting at several locations and continuing for upwards of .20m. The enclosed areas formed by the intersections of the walls are not cleared and leveled, rather there are stone mounds usually around 1m square and .3m high, with smaller core-fill material in the center. The walls generally run on either a north-south or east-west bearing. It would appear that the mounding would serve for sweet potato planting areas, though there was no direct indication of use, as no cultural material was located in the area.

Site 3: A possible heiau and associated platform located just mauka of the jeep road (see Map 1). The heiau(?) is rectangular in shape, measuring approximately 4.5m x 6m, and consists of a thick-walled enclosure with 5 internal 'rooms' (see illust. I). The enclosure wall is core-filled up to .7m high and 1.3m wide, while the internal walls are .6m high and .5m wide. All internal walls are stacked, several containing 'cupboard' storage areas built into the lower sides. The internal rooms are cleared of large stone, and contain limited ili'ili paving. There is an entrance set in the front (west) wall of the enclosure, with steps made of large smooth slabs inset into the wall. At the northwest and southeast corners of the structure the corners have been built up to form small platforms approximately .7m wide and 1.5m wide which are even with the wall height and are built into the wall. The tops of these platforms have limited ili'ili paving. There was no midden or other cultural material indicating use located around this structure.

4m to the south of the heiau, there is an improved natural outcrop that has been developed into a small platform with faced stacked stone, .6m high, 1.5m long and .7m wide. The surrounding area is cleared of loose stone but there is no paving or indication of use.

Site 4: A complex of core-filled walls and leveled partly cleared areas bounded by the jeep road, the heiau (Site 3) the knoll and Site 5. This complex appears to be a continuation of the Site 2 complex - a maze of walls which intersect forming small enclosed areas. There is no indication of any form of water diversion throughout the complex. While in close proximity to Site 3 there are no walls which directly contact the main Site 3 heiau. The internal enclosed areas are cleared of most loose stone, and have been in some cases leveled and terraced. The walls are core-filled, from .2-.7m high and .6-1m wide. They do not appear to be related to historic grazing as the areas confined are too small to provide adequate food, nor are the walls high enough to keep livestock in or out. It would appear probable that this complex is actually in association with Site 2, but the jeep road bisects the

two sites and there is a distinct change in the internal enclosed areas, though Site 4 also appears to have served as some form of agricultural complex.

Site 5: A series of small C-shape shelters and stacked walls on the top of a large loose-rock outcrop, located against the knoll south of Site 4 (see Map 1). The outcrop is very unusual, consisting of a large mass of loose rock upwards of 4.5m high, 90m wide and over 30m long. On the top of this jumbled mass of stone are 3 C-shap shelters with connecting low walls. The C-shapes are formed of immediate loose rock cleared out to surround low pockets in the mass, with walls from .5-.8m high of single-stack construction. The connecting walls are poorly stacked single layer material, again loose stone up to .5m high. The C-shapes are small, generally with an interior diameter of 1-1.5m, with no indications of cultural use.

Site 6: A large enclosure with associated enclosed terraces and possible cattle walls, located northwest of Site 3 (see Map 1). This complex contains a large enclosure which measures approximately 4m x 5m with walls up to 1m high and .6m wide of core-fill construction. A further series of core-filled walls of the same dimensions extend in various directions, possibly forming an enlarged version of the Site 2 and 4 intersecting wall complex, though on a larger scale. Internal areas are largely cleared of loose material, with some stacking to from terraces, though in general the internal sections appear to have been merely cleared. It is near the main stream feeding this portion of the valley, though there is no indication of drainage or other indications of water transport. It would appear however, that this complex would serve as an agricultural complex.

Site 7: A habitation complex consisting of a large platform with associated enclosure, walls and cleared areas located south of Site 6 (see Map 1). The platform is of very well-stacked construction, 4m by 3m x 2m (front face). It is located next to a tributary stream which has had flow diverted by the platform and walls on the other side (see illust. II). The area immediately downslope of the platform has been

cleared of all loose material and is enclosed by a well-stacked wall 1.5m high, 1.5m wide at the base and .8m wide at the top (the angle is on the outside wall, the interior wall being vertical). The tributary, or possible au'wai, drains into the enclosed area, which contains several mounded areas similar to those found in Site 2 - 1.5m in diameter and .4m high, with smaller material in the center. The walls angling off from this complex are core-filled and in fair condition (from .8m high and .9m wide). They do not follow the same intersecting network as the walls in the other complexes, and appear from construction and location to be cattle walls.

Site 8: Historic gravesite. This site is located at the lower end of the pasture, near the main access road (see Map 1). From informants it was learned that the grave is that of Albert Silva's grandfather (on the mother's side). The area is fenced off and kept cleared and in good condition.

IV. Conclusions and Recommendations

Ohikilolo is unusual in several respects. First, the physical geography of the valley - the bowl shape and protected shore make it distinctive along the Waianae Coast, especially when combined with the relatively limited recent disturbance in the area. The shape means that a different system of land use could be expected than from the other dissected V-shaped valleys in the area. This is also amplified by the possible fishpond. While the idea of a direct ocean-access fishpond along the Waianae coast at this location did not at first seem likely due to common sea conditions in the area, especially high surf, the lack of damage sustained in the immediate fore-shore of Ohikilolo during the recent hurricane, compared with the extensive damage in the neighboring communities, suggests that certain off-shore formations, in fact, do protect the shore. This protection could in fact allow for a fishpond in this area.

Secondly, while the makai area has been recently cleared and thus destroyed possible surface structures, the mauka portion of the valley is largely intact. Damage in the mauka portion has been limited to

bulldozed trails and hooped traffic. While damage has resulted, especially from recent bulldozing, overall the back portions of the valley are in very good condition.

Third, there are the anomalies that this location seems to specialize in: the 'heiau' - a large structure, probably ceremonial but with a most unusual floor plan; the lack of any cultural material such as shell midden or early historic artifacts through the entire area, though the surface visibility during the reconnaissance was quite good (this being especially puzzling at sites 5 and 7, which appear to contain habitation features); and last, the very unusual boundary wall system, where enclosures are formed by the intersection of continuous walls which are too low to act as historic cattle deterrents, yet enclose areas in an apparently inefficient way for dry-land agricultural use.

This last anomaly is the most puzzling. While the heiau and midden 'mysteries' could be resolved fairly easily through closer examination and testing, the pattern of agricultural land use in this area is still a major puzzle. Unfortunately, the historic information available could shed no light on this problem. It would appear from the pattern of water distribution that the majority of the valley would be exposed only to intermittent rain or flowing water. There were no indications of au'wai or other water irrigation features for distributing water from existing streambeds, though logically the existing beds would be modified to suit needs (as per site 1). Thus it appears that the majority of the valley agriculture must have been dry-land crops such as dryland taro and sweet potato.

The mounding and terracing would suggest sweet potato as the major food source, but this does not solve the problem of the walls. While one would expect either small walled areas to keep destructive animals such as pigs enclosed, or large enclosed areas to keep pigs out, the multiple intersecting walls, enclosing relatively small planting areas fit neither of these conditions. If, as they appear, the walls served as boundary features then it would appear that agriculture was both intensive and divided between many groups or individuals, implying a very large population.

The lack of surface evidence of extensive habitation is a puzzle, as the areas which have been destroyed by recent work are the lower areas that would be logical planting areas - those locations most suitable for habitation (i.e., areas not suitable for agriculture) do not reflect the premise of an extensive population. The other alternatives are beach habitation or up-valley habitation, neither of which was checked during this reconnaissance.

This valley presents several tempting spots for future examination, but most of all it's mere existence - that of a largely intact dryland system - is it's most valuable asset. While dryland systems have been studied fairly extensively on Maui and Hawai'i, there has been almost no work on the O'ahu counterparts. Most of the suitable areas on O'ahu, such as portions of Ewa, Nanakuli, Makaha and elsewhere, have undergone extensive recent use for housing, agriculture and military pursuits. This recent destruction limits the areas available for study, with Ohikilolo being a prime candidate.

Ohikilolo appears to offer an unrivaled example of a dryland agricultural/aquacultural system. Due to it's relatively small size the valley would be manageable for study, though extensive work would be required. Modern disturbance is limited, and even in the disturbed makai portions information should still be available using sub-surface examination.

It is recommended that if at all possible, this area be deleted from the list of possible landfill sites under county consideration. However, if it is necessary to utilize this area then it is recommended that at minimum a full-scale archaeological survey be undertaken. Due to the peculiar situation at Ohikilolo, and the research opportunities it is recommended that this survey not be limited only to the artificial confines of the project boundaries, but also include the entire valley expanse - the ahupua'a. The survey should include detailed location mapping of all sites located, necessary test excavations and extensive historical research. It is suggested that the research focus of the work be oriented in two supporting directions: 1) resolve the

apparent anomalies noted in this report; 2) compare land-use and technology variation with similar environmental zones studied at other locations and compare with the specific intent of discussing island use variation (were there different techniques on different islands?)

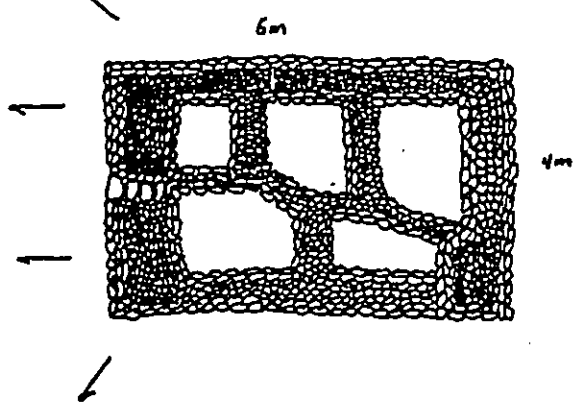
It is hoped that on the basis of a very exhaustive survey that some initial conclusions might be reached as to site significance, though it should be noted that final determinations of significance and thus necessary planning information may require intensive excavation. Thus, if Ohikilolo is to be utilized as a landfill site an extensive program of archaeological work must be undertaken, similar in size and intensity to that of Makaha Valley. This valley offers an unrivaled opportunity for archaeological examination, and all efforts must be made to maximize the amount of information retrieved prior to use, if the landfill is deemed necessary.



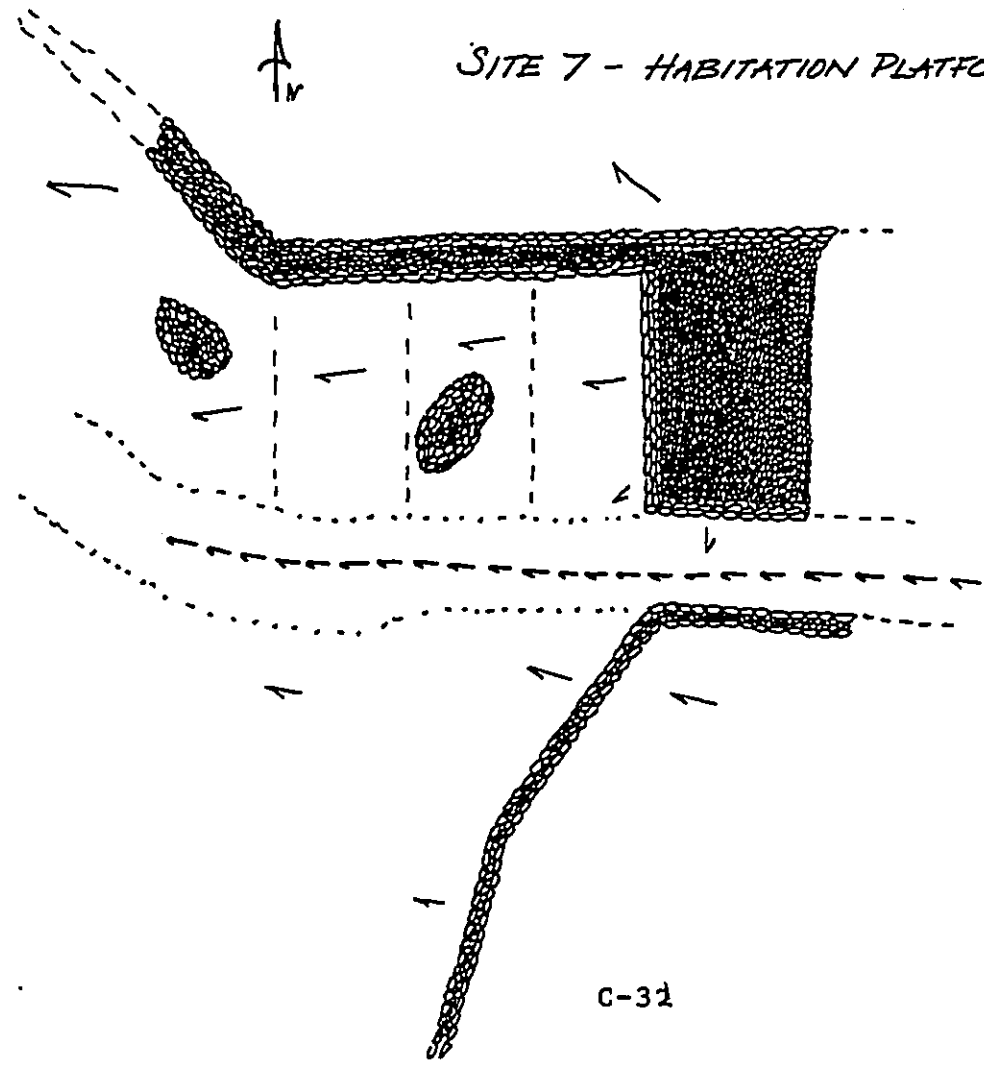
SITE 3 - HEIAU

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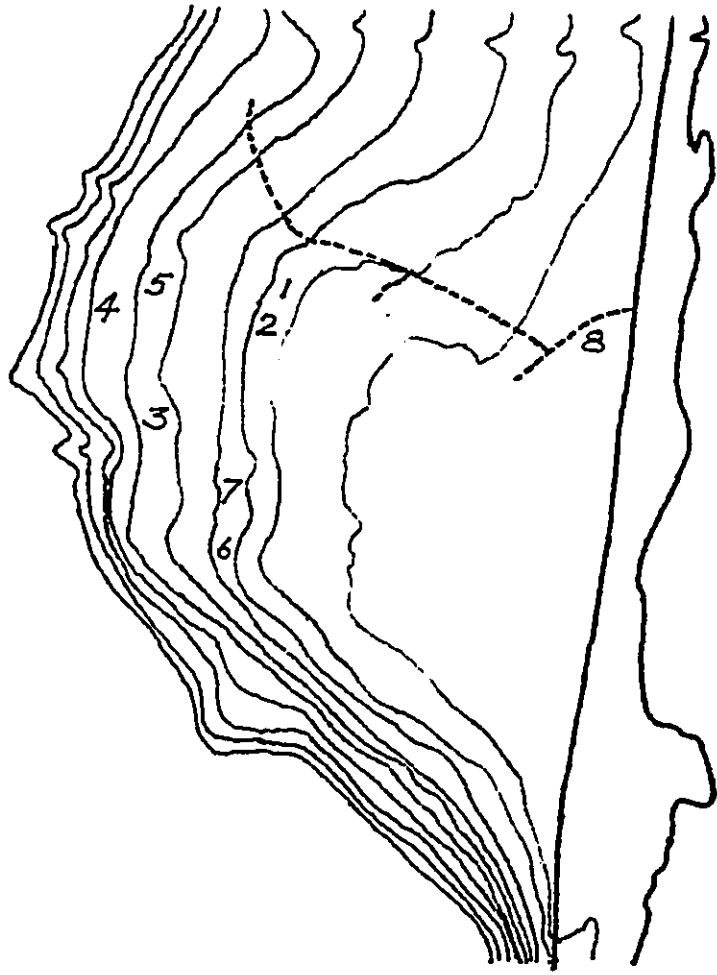
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SITE 7 - HABITATION PLATFORM.



C-31



MAP I

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A SAMPLING OF HISTORICAL DOCUMENTATION RELATIVE TO
Ohikilolo, Waianae, Oahu.

General Historical Background

Ohikilolo (Nahikilalo or Akilolo) has been described as "a district lying between Kepuhi and Makua, five or six miles beyond the end of the wagon road..." (Sterling and Summers 1978:81). In actuality, two districts are located between these landmarks: Keaau and Ohikilolo.

The same source who gave the above district description, continued:

"Ohikilolo means 'crazy crab' and the land section got its name from a species of crab, notable for erratic habit of locomotion and wild dances, which abound on the beach there." (Sterling and Summers 1978:81)

Within Ohikilolo are several physical (land) features which figure in Hawaiian mythology.

Kaneana Cave, located in the dividing ridge between Ohikilolo and Makua valleys is reported to be the home of a shark goddess who was able to assume both human and shark form. As a human, she was accustomed to entering the cave from the sea and dwelling therein. Regarding an inland entrance to this cave, archaeologist McAllister noted in 1930:

"...There is said to be an inland entrance, but an exploration of the cave failed to prove this contention. Every possible passage of the cave was examined by members of the Bernice P. Bishop Museum staff. The greatest distance in from the entrance is not more than a few hundred feet." (McAllister 1971:123)

It was also told that the cave once had considerable religious significance. It was sacred, being reserved as a site of certain ceremonial rituals:

"...Kaneana, as nearly as may be learned from living Hawaiians, means Cave of God, for ana, a cave, and Kane, supreme deity of the ancient Hawaiian pantheon. And according to legends of this great cavern near Makua it would appear to be relevant.

"For this cave, only the antechamber or foyer of which is shown in the accompanying pen and ink drawing from a photograph taken recently, was kapu for religious ceremonials. Within its far depths beyond the inner entrance, where men are seen standing in the picture, is a chamber where kahunas conducted weird pagan rituals in the light of flaming kukui torches.

"According to an old Hawaiian who was born at Makua, the little village less than a mile distant, these ancient rites were performed as recently as 50 years ago. To the Hawaiians of that isolated region Kaneana is still kapu - a sacred place - and much persuasion to enter even so far as the mouth of the inner cave. (sic).

"Nevertheless, one youth, a native of Makua, who took lightly the beliefs of his elders, ventured to explore the sanctuary one day 30 years ago /≈1895/. He says that then there were upon the floor and walls images of various shapes, among which he recalls a canoe roughly carved of stone, axes, spears, and a sacrificial altar paved with the customary coral.

"He could not be induced to enter the inner cave again, but remarked that the entrance seemed smaller than when he was a boy, probably due, he said, to lepo, or silt, that had washed down from the big outer entrance since Kaneana was abandoned as a place of worship. He gave it as his opi-

nion that the silt had doubtless covered the floor of the inner chamber and perhaps buried the stone canoe and other relics. A suggestion that excavation be attempted brought to his face a quick shadow of superstitious fear. ...” (Sterling and Summers 1978:81)

Norah Stearns, in an article appearing in the Honolulu Star-Bulletin in September 1939, related the following details of the legend of Nanaue, the shark-man:

“At one time Nanaue lived near Makua cave. Through a subterranean channel he dragged his victim, it is said. Always at high tide. He placed the body on a certain slimy stone to await his leisure and appetite. Then at the turn of the tide he would disappear.

“That ‘certain slimy stone’ with several cupped spaces on its surface can still be seen in the cave, I am told. I had not remained in the cave long enough to verify the fact...” (Sterling and Summers 1978:82-3)

Stearns continued in her description of the cave noting that it was once a sea cave, eroded by centuries of wave action. She also added:

“Two other features of geological importance can be seen in the cave. On the north wall near the entrance and about 20 feet above the floor of the cave is a wave-rounded boulder deposit left by the sea on a ledge. Inside, beyond the first narrows is a series of smaller chambers about eight feet wide with two to six feet of partly hardened coral sand on their floors. In the sand are sea shells and smooth water worn lava coral pebbles. This sand is beach sand, and was left there by the sea, but its identity is concealed by a black coating of tufa deposited particle by particle throughout long ages by the slow dripping of water from the roof.” (ibid. p.82)

Aside from Kaneana Cave, another physical characteristic of the area is the sounding or barking sands. A brief description of these sands appeared in the Hawaiian-language newspaper, Kuokoa in November of 1899:

“Ohikilolo appeared before us, a place where sounding sands are found. They sound loud when forced together like the sounding sands of Nohili on Kauai.” (Sterling and Summers 1978:83)

Another source recorded the following account of an informant:

“The barking of the sand was not known until the time when the Makua Ranch was driving its cattle from the Keaaau side, when the cowboys ascended the sand hill and began to notice the humming which was peculiar to them. Then when Hon. Gov. S.B. Dole, then Governor for the Republic, visited Makua on a yacht with his followers, visited the sand hill, and were seated on the said sand hill in a row, and were drawn by a cowboy down the sand hill, when the sound was clearly understood to be the Barking Sand. It barks only during very dry weather, say July to September.” (ibid. p.83)

Some rather interesting historical details relative to the Ohikilolo shoreline were gathered and written-up by J. Clark thus:

“Ohikilolo is translated as ‘prying out brains,’ but the origin of the name for this small land division is now unknown. The single large lava point along the Ohikilolo shoreline was known as Kalaeopa’akai, the ‘salt point.’ The people from the surrounding villages came here to gather PA’AKAI, ‘hard sea,’ the crude Hawaiian salt. The black lava at the point has numerous shallow pockets which are filled with ocean water from spraying and splashing waves. The heat of the sun evaporates the water and the crys-

talized salt remains. Although the salt still forms in Kalaeopa'akai's pans, it is rarely gathered for use. The advances of civilization have touched even this remote point, and most of the depressions that catch the salt water are dirty and fouled with rubbish.

"The sand dunes that comprise most of the beach at the rear of Kalaeopa'akai are the once famous 'Barking Sands' of O'ahu. Barking Sands also are found near Mānā, Kaua'i, which Baldwin described in these terms:

"When thoroughly dry, this sand becomes resonant whenever its grains are set in motion. While they are called barking sands, they emit a great variety of sounds according to the method of friction. At times the sound will resemble subterranean thunder; again it will be a sighing or a faint groaning as of someone in pain; when the wind forms little cascades there is a resulting sound as from a lady's silk skirt; the act of sliding down the hills produce a sound having cadence periods; they were probably named for this.

"This phenomenon is a rare one, being common to only a few places in the world. It is said that there is a hill of barking sands at Mākua /'Ōhikilolo/, O'ahu." (from "A Footpath Journey," by Vaughan MacCaughey, in Mid Pacific Magazine, August 1917:188).

"The Barking Sands in 'Ōhikilolo have not been heard for many years. The once high sand dunes were mined and were leveled to accommodate railroad tracks. In addition the dunes are almost completely overgrown with brush. All these changes seem to have silenced the once resonant sands.

"The major attraction at 'Ōhikilolo is Kāneana, a large cave high above the shoreline that is situated just off Farrington Highway near the border of 'Ōhikilolo and Mākua. Once a gigantic sea cave, Kāneana, the 'cave of Kāne,' was created by wave action in a fault crack more than 150,000 years ago, when O'ahu's present coastline was underwater. It is also known as Ke'ana'ana, but most frequently is called Mākua Cave.

"The huge cavern, 450 feet long, was said to have been the home of Nanaue, a son of the shark god Kamahoali'i. Nanaue had a dual nature, being able to assume the form of a shark or of a man. He killed many people in the area and brought his victims into the cave through a secret ocean entrance. His altar was a white rock slab far back in one of the cave's smaller chambers. His reign of terror ended when he was put to death after his duality was discovered.

"Almost the entire shoreline of 'Ōhikilolo is rocky, and its waters are deep and often dangerous. The only safe place to swim is a small, secluded cove between Kalaeopa'akai and Kāneana. The shallow inshore pond is protected from the open ocean by a stretch of raised beach rock. There is no convenient public access to the greater part of 'Ōhikilolo Beach except by following the shoreline from below Kāneana Cave." (Clark 1977:95)

Fornander and Kamakau contradict one another in their accounts of a chief who was born in Ohikilolo:

"Hua Kalalai (Kama /child of/ Pau), born in Ohikilolo, Waianae, Oahu, died in Lanai, buried in Iao." (Fornander 1919:319)

"Pau was Hua's son. He was born at Ohikilolo in Wai'anae, a place belonging to his mother Hikimolulolea, and he ruled from Ohikilolo to Keawaula." (Sterling and Summers 1978:83)

In the epic of Pele and Hiiaka, Ohikilolo is mentioned in chant. Hiiaka returns with Lohiau from Kauai and upon reaching Waianae, Oahu she chants in part:

(Hawaiian text)

"Haoa ka La i na Makua;

(Emerson's translation)

Fierce glows the sun of Makua;

"Lili ka La i Ohiki-lolo;
 "Ha'a-hula le'a ke La i ke kula,
 "Ka Ha'a ana o ka La i Makaha;
 (Emerson 1915:157-8)

How it quivers at Ohiki-lele-
 'Tis the Sun-god's dance o'er the plain,
 A riot of dance at Makaha."

The native historian John Papa Ii left us fascinating information on Ohiki-lolo (or Nahikilalo, as he refers to the district):

"A place where robbers operated was located between Nahikilalo and Makaha. The robbers remained in a cave while their watchman kept a lookout from the top of the cliff. When he saw one or two travelers, he called, 'Malolo kai e (Low tide!).' When there was a large company, he called, 'Mui kai e! (High tide!)' Those who traveled alone or in pairs were robbed, but those who came in a large company went unmolested." (Ii 1973:97)

LAND RECORDS

A single land claim was registered and awarded for the ahupuaa of Ohikilolo during the Mahele. The claimant was William Harbottle who received 532.20 acres of land plus the fishing rights to the adjoining sea and the privilege of reserving one kind of fish from those waters. Both the register and the testimony of Harbottle's claim (L.C.A. 2937, R.P. 4540) state that the land was originally given to William Harbottle's father, John, by Kamehameha I. The senior Harbottle had served as a pilot and a captain under the first Kamehameha. Of Harbottle (also spelled Hairbottle) Archibald Campbell wrote in the early 1800's:

"Hairbottle had been fifteen years on the island, he was mate of the Jackall, which arrived about the end of 1794." (Campbell 1967:113)

Campbell also notes that "John Hairbottle" was known to the natives as "Keone o-opa" ("literally Lame John"). (ibid. p.187)

The elder Harbottle's name is also mentioned by John Papa Ii:

"...The Keoua was navigated by Captain J.M. Harbottle, and there were many other haole men who helped to handle the ship for the king. These men were all related to the king in some way and had received lands from him. They were like the people who were born in the islands, and each had a wife and children." (Ii 1973:105)

Copies of the register and testimony as well as the original Royal Patent survey and deed to the ahupuaa are appended to this report.

Only two archival land documents could be located relative to Ohikilolo:

undated "In table of Konohiki lands, showing that the above land /Ohikilolo/ was granted under Royal Patent No. 4540 & that it has a sea coast frontage along the sea of 0.95 miles." Int. Dept. Bk. 15 p. 106

11/26/1851 "Receipt showing the amount paid to Bishop for services rendered to surveying the above Ahupuaa /Ohikilolo/. Int. Dept.

Cartographic References

Aside from the original Royal Patent survey map which simply depicts land and ocean boundaries, two other maps were located in State Survey Division files.

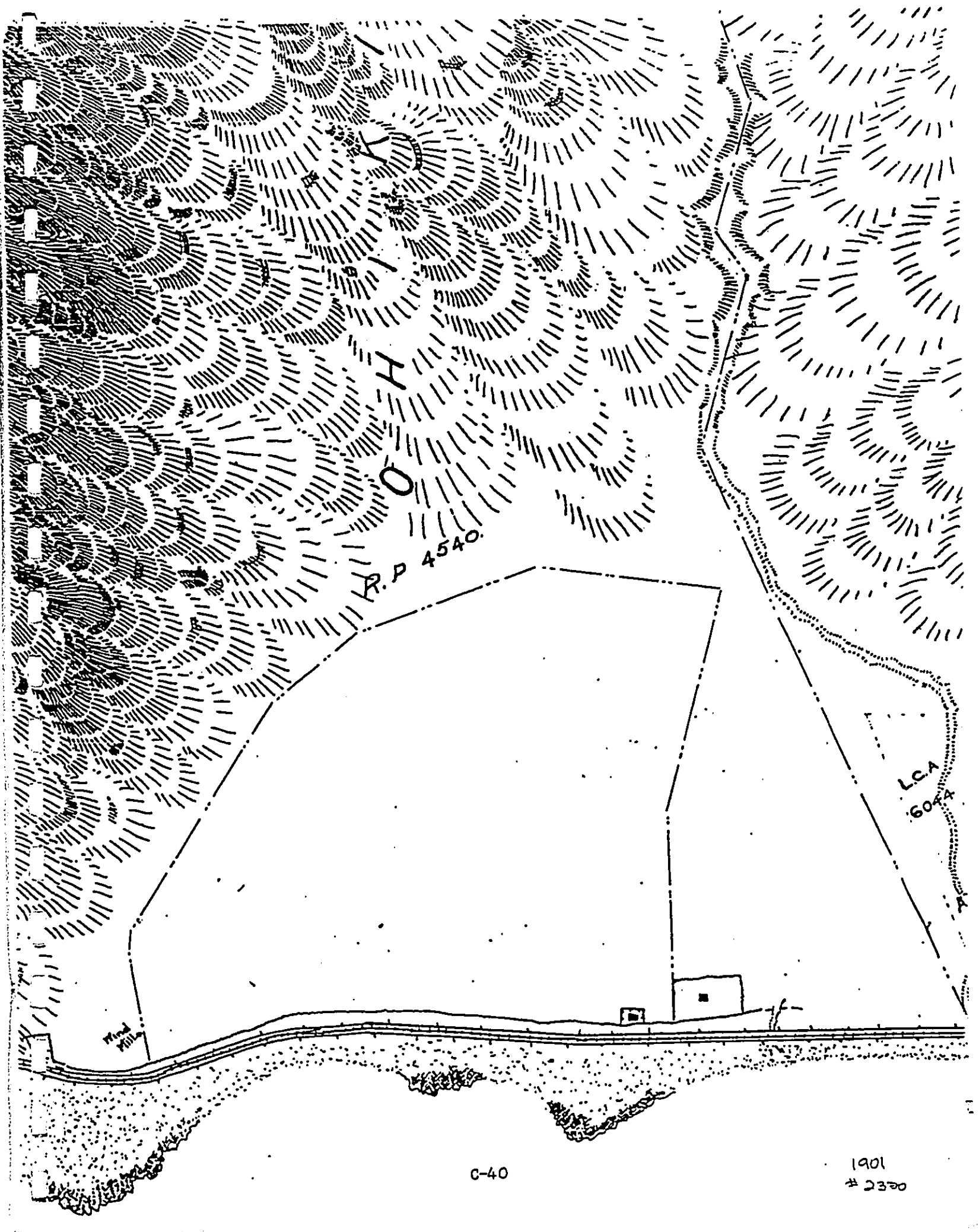
A 1901 tracing of the area by Jos. Iao (#2320) plots the site of a windmill mauka of the road. Running parrallel to the road (and railroad) is what appears to be a wall that nearly stretches the length of the valley mouth. Mauka of this wall are three enclosures, two of which seem to have structures within. The boundaries of R.P. 4540 are lined out; no other details are given.

The second map, a geological one prepared by the U.S. Army Corps of Engineers in 1918-19, shows the same wall (apparently of stone) running across the mouth of the valley, mauka of the road and railroad. Two windmills have been sketched-in. Three parcels of land have been delineated; two structures occupy the south-east corner of the largest parcel. One structure is centered in the parcel nearest Keaau and from this structure a pathway leads upland into Keaau where three other structures are situated. A single structure sits mid-valley beyond the three parcels on a slight slope of land.

An early but undated map of Oahu appearing in Meyen's A Botanist's Visit To Oahu In 1831 lists an "Akilolo" on the Waianae coast. This spelling may have resulted from a foreigner's transcription of rapid Hawaiian speech, and not much more.

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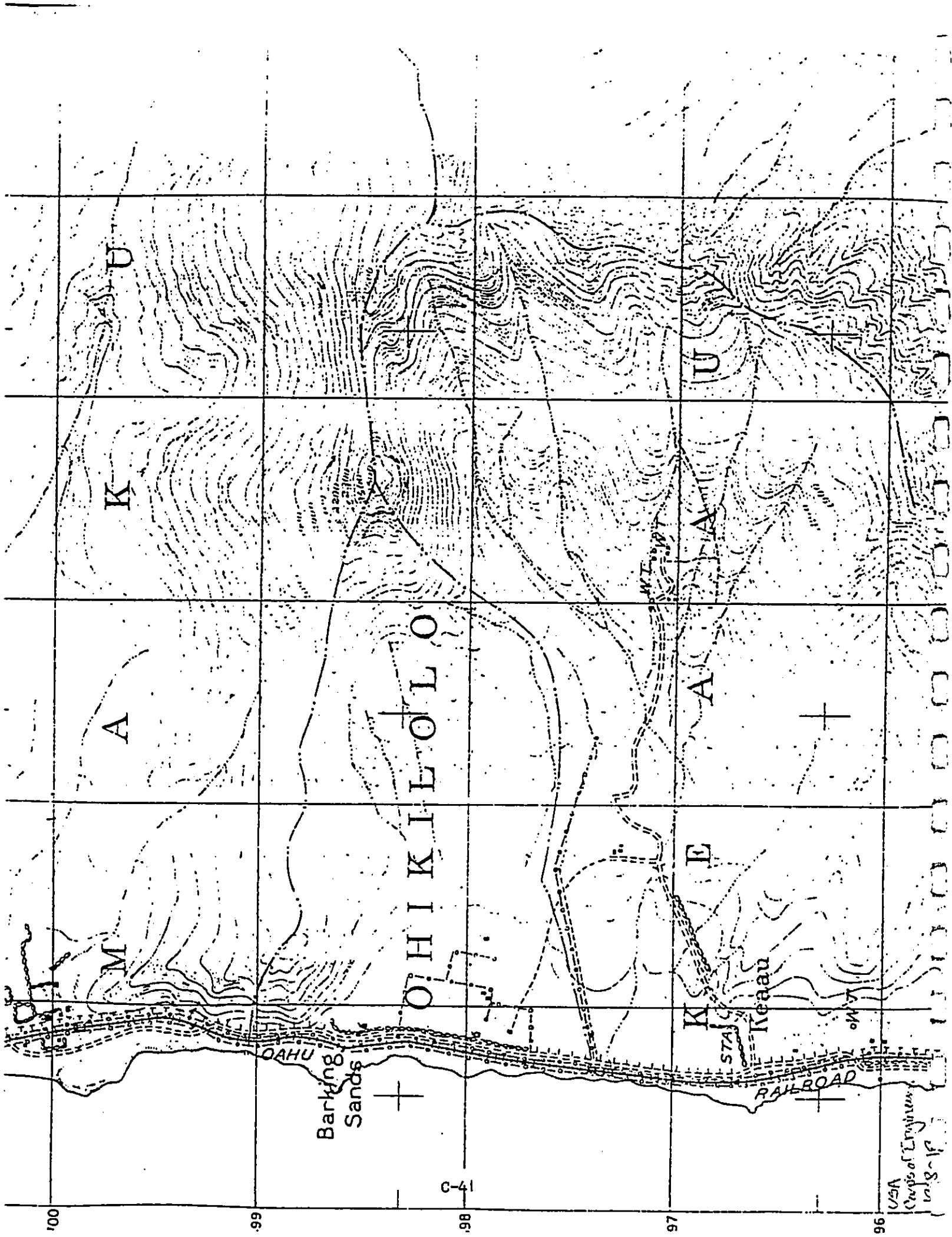
R.P. 4540.

LCA
6044

Wind
Pillar

C-40

1901
2300



U.S.A.
 Corps of Engineers
 1918-19

To the Land Commissioners of the Hawaiian Islands, Greetings: I hereby state my claim for my houselot in Honolulu, whose boundaries are: north, Nuuanu Street and Mr. Boyd's place, east, houselot of Keo Bu /George Booth/, south, lot of M. Peke /Beck?/, west, houselot of E. Dennis. Those are the boundaries -- those of these houselots. The original right to this claim was from John Harbottle, who had it from Kamehameha I, and another claim from Paki which is combined with this houselot where I am living, without dissent from any one.

Also, there are the lands of Kuipaakea in Kapalama /Oahu/, and Iloli on Molokai which were left to us, the keikis of John Harbottle, who had these lands from Kamehameha I.

Page 702

The lands which were taken by the Mo'i are: Ohikilolo, Waiape, on Oahu, Waipio District, Kumunui on Maui. These lands were for John Harbottle, who had them from Kamehameha I. Hanapouli on Oahu, is for Edward Harbottle, from the Mo'i, Kamehameha III. Keana, in Kaneohe, is mine, from Kamehameha III. I am, with thanks,

WILLIAM HARBOTTLE

To the President of the Land Commissioners to Quiet Land Titles whom the Mo'i has appointed to investigate the claims on the island of Oahu in the land of Honolulu, 'ili of Kalawahine. I hereby state I am a claimant of farm land in the vineyard, a place made by my kupunakane, who fenced it, and planted the plants. When he died it was inherited by my makuahine and on her death I inherited the occupancy of this claim. My representative will administer these claims of mine and to verify it it is proper for me to tell you, the Land Commissioners, as in your advertisement to the claimants to make their claims, of the truth of these claims. Farewell to you, the Land Commissioners.

I am, respectfully, your very humble servant.
Huanu, the claimant of a bequeathed mo'o in the 'ili in Kewalo, and of the trees which were planted, coconut, wi and some other plants, which are at Kaakaukukui uka. All these things planted by my kupunakane are claimed at this time, where I am living.

Page 703

/* a grandson of Marin/

HUANU *

To the Land Commissioners: I, a native-born old-timer, have a claim of right of occupancy from the time of Kamehameha I, by my makuas, and upon their death I, their keiki, inherited it. Furthermore, I have two mo'o. The number of lo'i in one mo'o at Kealapii is eight, the boundaries being: north, a houselot for Keawemuku, east, a mo'o for Kikookahi, south, a houselot for Kikookahi, west, Kahakuloa's mo'o. There are four lo'i in my other mo'o, bounded on the north by a muliwai, east, the houselot of Keawemuku, south, Kika's mo'o, west, Keawemuku's mo'o.

No. 2937 William Harbottle (section 4)

18 April 1851

Oili sworn he has seen his land named Ohikilolo, an ahupuaa in Waianae, Oahu. This is pasture land only. The boundaries are:

Mauka	Government land
Honolulu	M. Kekuanaoa's land
Makai	M. Kekuanaoa's land
Kaena	Government land

The father had received this land from Kam. I, he had lived peacefully all his life and upon his death had bequested this land to his children. They have it now, no disputes.

No. 2937 William Harbottle (section 5)

18 April 1851

Pahia sworn he has seen his ili land named Waiape, in Kaneohe, Koolaupoku, Oahu. The boundaries are:

Mauka	Kuaana's land of "Kaluaahuawa"
Koolauloa	Kuaana's land of "Kaluaahuawa"
Makai	Paul F. Marin's land of Punaluu
Kailua	The King's land

Land from Kam I to John Harbottle, William Harbottle's father. John Harbottle had lived peacefully and upon his death had bequested this land to his children, they have it at the present time, no disputes.

No. 2937 William Harbottle (section 7)

18 April 1851

Kanamū sworn he has seen his land named "Opana" in Hamakualoa, Maui, it is an ahupuaa.

Mauka	Lot Kamehameha's land
Wailuku	Haiku, Kaalaea, Ulumalu, Kaupakulua
Makai	Sea
Hana	Keaaula, Uaoa, Peahi ahupuaa's.

Pg. 3

Land from Kam I to John Harbottle, his (WM. Harbottle) father where on he had lived peacefully until his death. The children have inherited the land and are there at the present time.

Mahi sworn Both have known in the same way, no one has objected.

No. 2937 William Harbottle (section 8)

Kanamū sworn he has seen his land named "Hamakualoa" in Waipio ahupuaa. The boundaries are:

Mauka	Lot Kamehameha's land
Wailuku	Mokupapakua, Mokupapa-kanaka, Holowa ahupuaas
Makai	Sea
Hana	Waipio 2, Puolua, Huelo

Land to John Harbottle from Kam I, upon Harbottle's death, land was inherited by his children and they still have it today, no objections.

Mahi sworn both have known in the same way.

William Harbottle states, "There is in these lands mentioned above the interest of Kanaka, but it should be separated according to what is proper about their place."

No. 2937 William Harbottle (section 9)

William L. Lee has worked on this claim. No. 10893 William Harbottle: Work done by W. Lee (L.)

The undersigned, appointed to as-
sess the value of Tulecanas, and
determine the amount of the Govt.
claim therein, have examined No.
3937 of Wm Harbottle, in Ohikilalo
Waianae, Oahu, and estimate the
whole value at \$ 132.00
and the Govt. Amount " " 83.00

Honolulu
July 18. 1862.

J. A. Miller
J. W. Makabuni

NO. 4540

ROYAL PATENT

L.C. Award No. 2937

WILLIAM HARBOTTLE.

Ohikilolo, Waianae, Oahu

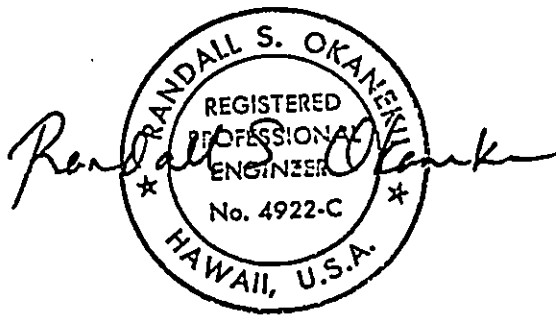
Plan & Description.

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APPENDIX D

TRAFFIC IMPACT REPORT
FOR THE
LEEWARD DISTRICT SANITARY LANDFILL

PREPARED FOR
STANLEY S. SHIMABUKURO & ASSOCIATES, INC.



BY
AUSTIN, TSUTSUMI & ASSOCIATES, INC.
ENGINEERS * SURVEYORS
HONOLULU, HAWAII

AUGUST 1983

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V. CONCLUSIONS AND RECOMMENDATIONS	10 - 12
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- A-1 AASHTO Vehicle Type Classification Chart
- A-2 Level of Service Definition

EXHIBITS

- 1 Location Map
- 2 Vicinity Map - Proposed Waimanalo Gulch Site
- 3 Vicinity Map - Proposed Ohikilolo Site
- 4 State Highway Count Locations
- 5 Geometric Improvements at Access Road to
the Proposed Waimanalo Gulch Site



DONALD S. AUSTIN, P.E.
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TED S. KAWAHIGASHI, P.E.
GEORGE M. NEUFFER, P.E.
KENNETH K. KUROKAWA, P.E.

TRAFFIC IMPACT REPORT FOR THE
LEEWARD DISTRICT SANITARY LANDFILL

I. INTRODUCTION

A. Purpose

The purpose of this study is to assess the impacts on traffic operations resulting from the proposed sanitary landfill operations at the Waimanalo Gulch and Ohikilolo sites, so as to provide the necessary input for the preparation of the Environmental Impact Statement for the Leeward District Sanitary Landfill.

B. Scope

The scope of this report includes: a brief description of the traffic-related operation of the proposed landfill sites; existing traffic conditions along Farrington Highway; impacts of traffic generated from the proposed landfill sites; mitigating measures to alleviate adverse impacts on traffic; and improvements to Farrington Highway at the proposed connections to the landfill access roads.

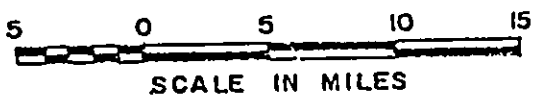
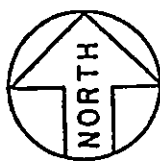
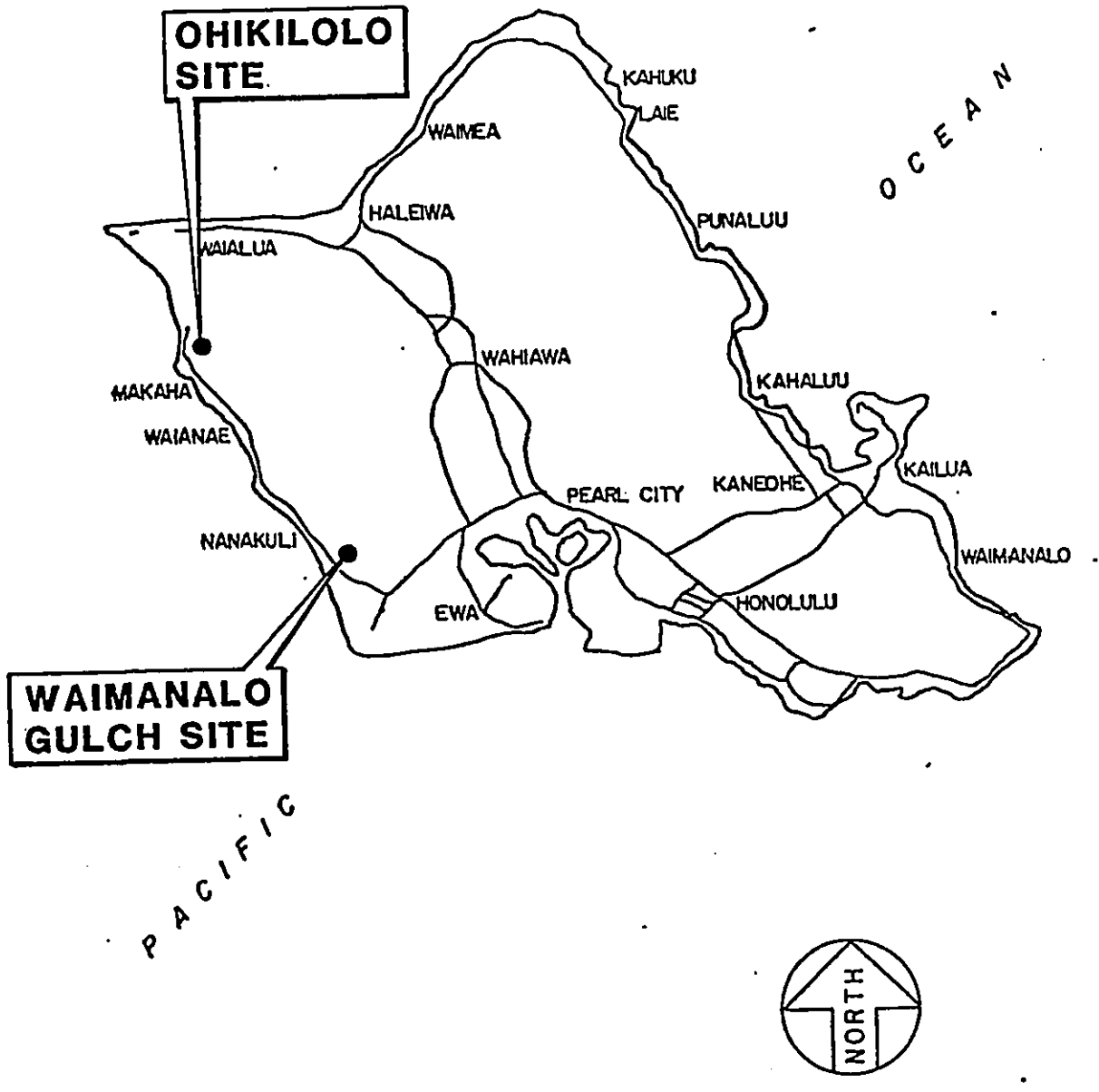
II. DESCRIPTION OF THE PROPOSED PROJECT

A. General

The Leeward District Sanitary Landfill consists of two sites to be developed consecutively, starting with the Waimanalo Gulch Site and followed by the Ohikilolo Site (see Exhibit 1).

REPLY TO:
SUITE 900, 745 FORT STREET MALL • HONOLULU, HAWAII 96813
PHONE 808/533-3646 • CABLE ADDRESS: "ATAHL" • TELEX: 723-8347 AT AHL HR

OFFICES IN:
HONOLULU, HAWAII
KAHULUI, MAUI • HILO, HAWAII



<p>STANLEY S. SHIMABUKURO & ASSOC., INC. TRAFFIC IMPACT REPORT FOR THE LEEWARD DISTRICT SANITARY LANDFILL EWA-WAIANAЕ, OAHU, HAWAII</p>	<p>ATA AUSTIN, TSUTSUMI, & ASSOC., INC. ENGINEERS, SURVEYORS • HAWAII, GUAM</p> <p>LOCATION MAP</p>	<p>EXHIBIT</p> <p>1</p>
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1. Waimanalo Gulch Site

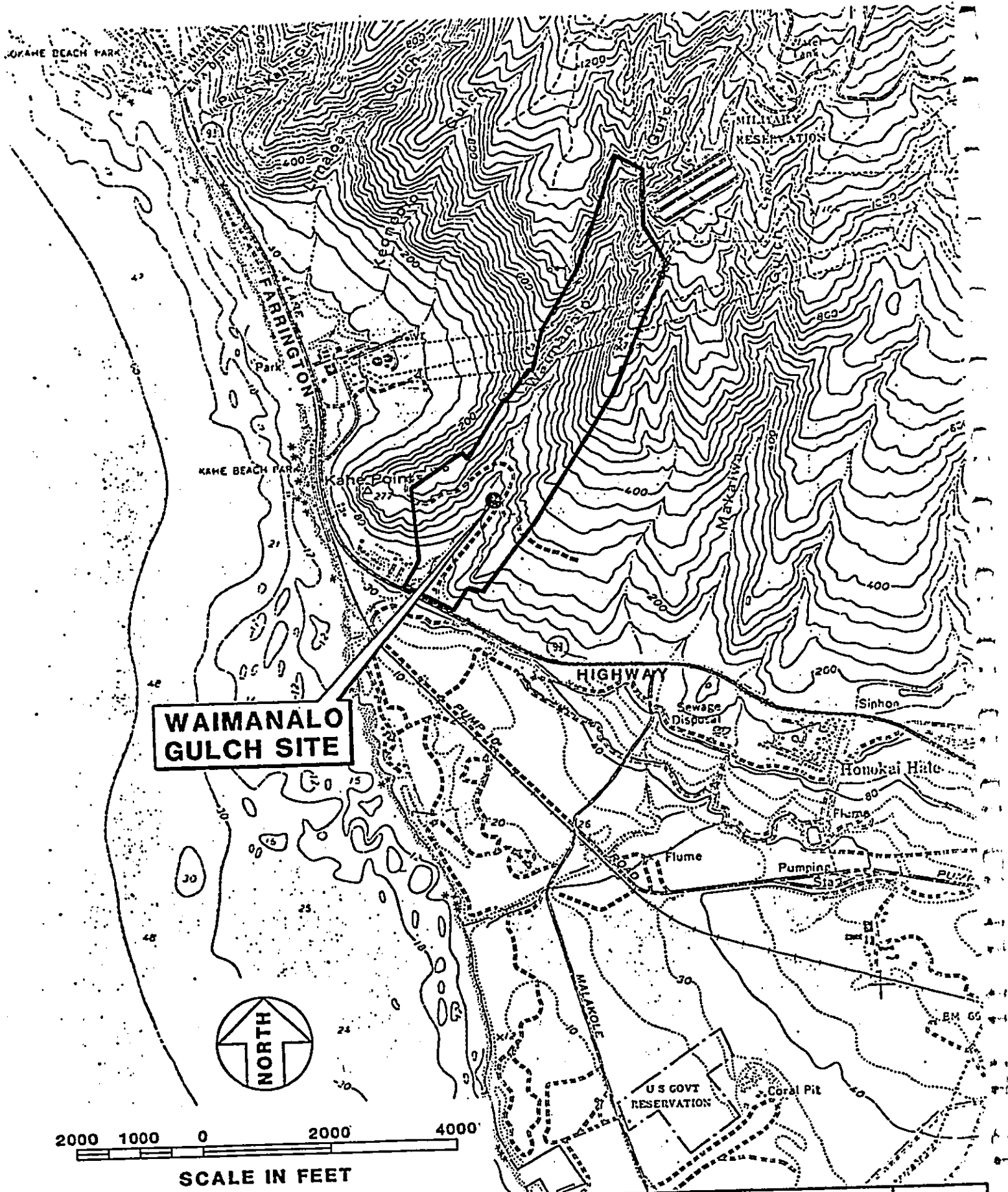
The Waimanalo Gulch Site, identified as Tax Map Key: 9-2-03:13 and 40, is located just east of Kahe Point on the mauka side of Farrington Highway (see Exhibit 2). The 57± acre site has a life expectancy of 7± years at a fill rate of 1000 tons per day.

2. Ohikilolo Site

The Ohikilolo Site, identified as Tax Map Key: 8-3-01, is located about 2 miles north of Makaha Beach Park on the mauka side of Farrington Highway (see Exhibit 3). The 182± acre site has a life expectancy of 21± years at a fill rate of 1000 tons per day.

B. Traffic Generation

The traffic generation potential for each site is nearly identical, since the operation at the initial site at Waimanalo Gulch will be transferred to Ohikilolo Site upon its completion. The landfill traffic is based upon the refuse load to be disposed of by the landfill method. Should a resource recovery operation be implemented, the expected load for the Leeward District would be 900 tons per day, consisting of 600 tons of ash from the resource recovery plant and 300 tons of non-combustible waste. Without a resource recovery system, the load can be expected to increase by 50% or higher to 1350 tons per day, and to increase by about 1 percent per year thereafter. For the purpose of this study, it is assumed that a resource recovery operation is not



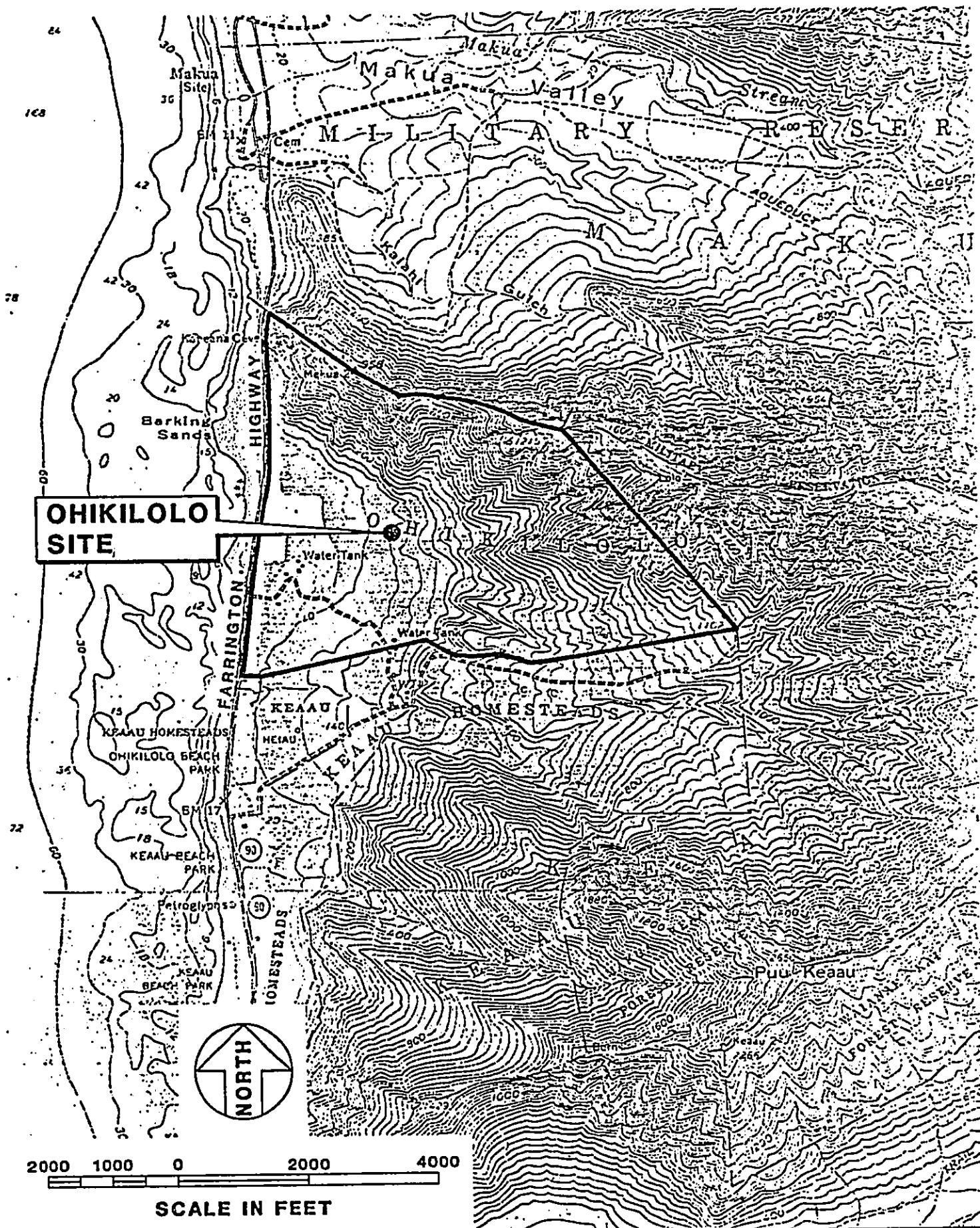
**WAIMANALO
GULCH SITE**

2000 1000 0 2000 4000
SCALE IN FEET

STANLEY S. SHIMABUKURO & ASSOC., INC.
TRAFFIC IMPACT REPORT FOR THE
LEEWARD DISTRICT SANITARY LANDFILL
EWA-WAIANA, OAHU, HAWAII

ATA AUSTIN, TSUTSUMI, & ASSOC., INC.
ENGINEERS SURVEYORS - HAWAII GUAM
VICINITY MAP
PROPOSED WAIMANALO
GULCH SITE

EXHIBIT
2



STANLEY S. SHIMABUKURO & ASSOC., INC.
**TRAFFIC IMPACT REPORT FOR THE
 LEEWARD DISTRICT SANITARY LANDFILL**
 EWA-WAIANA, OAHU, HAWAII

ATA AUSTIN, TSUTSUMI, & ASSOC., INC.
 ENGINEERS SURVEYORS - HAWAII - GUAM
**VICINITY MAP
 PROPOSED OHIKILOLO SITE**

EXHIBIT
3

implemented; therefore the 1350 tons per day load is used in the analysis.

Based upon this projected load, the following traffic generation characteristics were obtained from the Division of Refuse Collection and Disposal:

<u>Vehicle Type</u>	<u>Daily Traffic 7:00 AM - 5:00 PM</u>	<u>Peak Hour Traffic of Landfill Operation 9:00 AM - 10:00 AM</u>
City Refuse Collection Trucks	10	3
Transfer Trailers	47	6
Private or Commercial Refuse Trucks	107	15
Trucks Importing Cover Material	32	4
Home Owners	<u>50</u>	<u>10</u>
Totals	246	38

III. EXISTING CONDITIONS

A. Roadways

1. Waimanalo Gulch Site

Access to the proposed site will be provided by a new 2000 lineal foot roadway connecting to Farrington Highway. Farrington Highway, fronting the site, is a four lane divided highway consisting of two 24 foot wide roadbeds and a 24 foot wide grassed median, all within a right-of-way width of 135 feet. The posted speed limit is 45 miles per hour (MPH). Farrington Highway is the primary arterial highway serving the Waianae Coast.

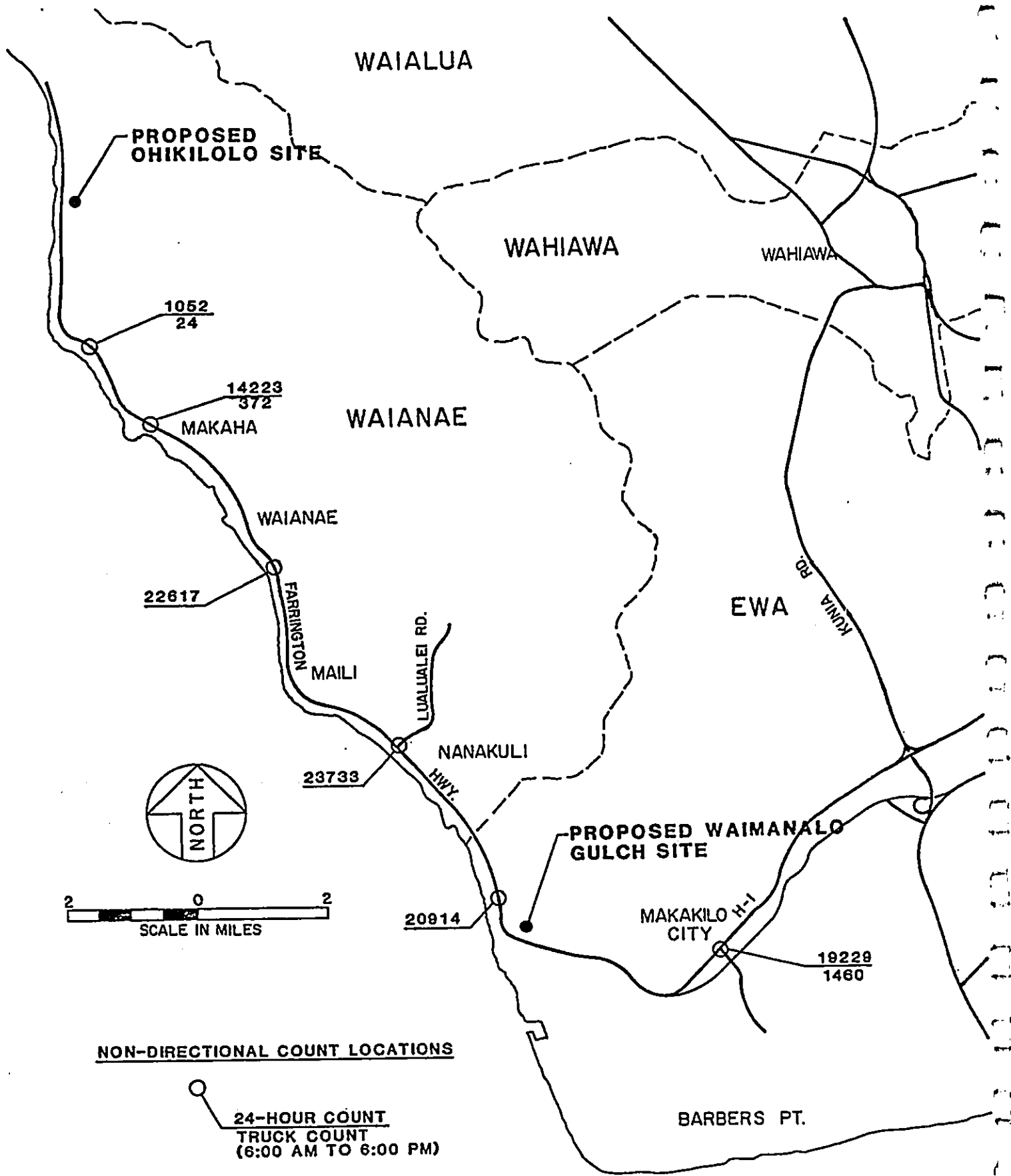
2. Ohikilolo Site

Access to the proposed site will be provided by a new 1000 lineal foot roadway connecting to Farrington Highway. Farrington Highway, fronting the site, is a two way, two lane highway with a 22 foot wide pavement. The posted speed limit is 45 MPH. Farrington Highway is the only access highway to the north Waianae Coast.

B. Traffic

Traffic counts were obtained from the State Department of Transportation (DOT), Highways Division and are shown in Exhibit 4. The 1982 24-hour total counts show: 19,229 vehicles per day (VPD) on the H-1 Freeway at the Makakilo Interchange; 20,914 VPD on Farrington Highway at Keananoio Bridge, just north of Kahe Point; 23,733 VPD on Farrington Highway at Lualualei Naval Road in Nanakuli; 22,617 VPD on Farrington Highway at Maililili Bridge between Maili and Waianae Town; 14,223 VPD on Farrington Highway through Makaha; and 1,052 VPD on Farrington Highway north of Makaha.

American Association of State Highway and Transportation Officials (AASHTO) vehicle type classification counts were also taken on Farrington Highway in Makaha and on H-1 Freeway at the Makakilo Interchange. For the purpose of this study, the truck counts included 2 axle, 4-tired trucks, other than panel or pick-up trucks, up through truck-trailer combinations (see Appendix A-1). On H-1 Freeway at Makakilo Interchange, 12-hour truck



<p>STANLEY S. SHIMABUKURO & ASSOC., INC.</p> <p>TRAFFIC IMPACT REPORT FOR THE LEEWARD DISTRICT SANITARY LANDFILL</p> <p>EWA-WAIANAE, OAHU, HAWAII</p>	<p>ATA AUSTIN, TSUTSUMI, & ASSOC., INC. ENGINEERS SURVEYORS - HAWAII, GUAM</p> <p>STATE HIGHWAY COUNT LOCATIONS</p>	<p>EXHIBIT</p> <p>4</p>
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count totals (6:00 AM to 6:00 PM) show 1,460 trucks. On Farrington Highway at Makaha Valley Road, truck count totals show 372 trucks between 6:00 AM and 6:00 PM. Similarly, Farrington Highway at Makaha Beach Park shows 24 trucks between 6:00 AM and 6:00 PM.

Based upon the peak hour traffic count data obtained from the State DOT, Farrington Highway operates at Level of Service "A" at both locations for the proposed sanitary landfill operations during the morning and afternoon peak periods and throughout the day. (See Appendix A-2 for Level of Service definitions.) Peak period traffic is a combination of the commuter, home-to-work traffic, and the recreational or tourist traffic.

IV. TRAFFIC IMPACTS OF THE PROPOSED PROJECT AND MITIGATING MEASURES TO ALLEVIATE THESE IMPACTS

The additional traffic generated by the proposed landfill sites amounts to about 2 percent of the existing average daily traffic through the developed areas. During the peak periods, the additional traffic imposed on the existing highway should not adversely affect existing operations which are at Levels of Service "A" at both locations. Through Makaha, the 246 vehicle increase in traffic to the Ohikilolo Site during the day may be significant in terms of its visual impact, however, the 38 vehicle per hour increase during the peak hour should not adversely affect traffic operations.

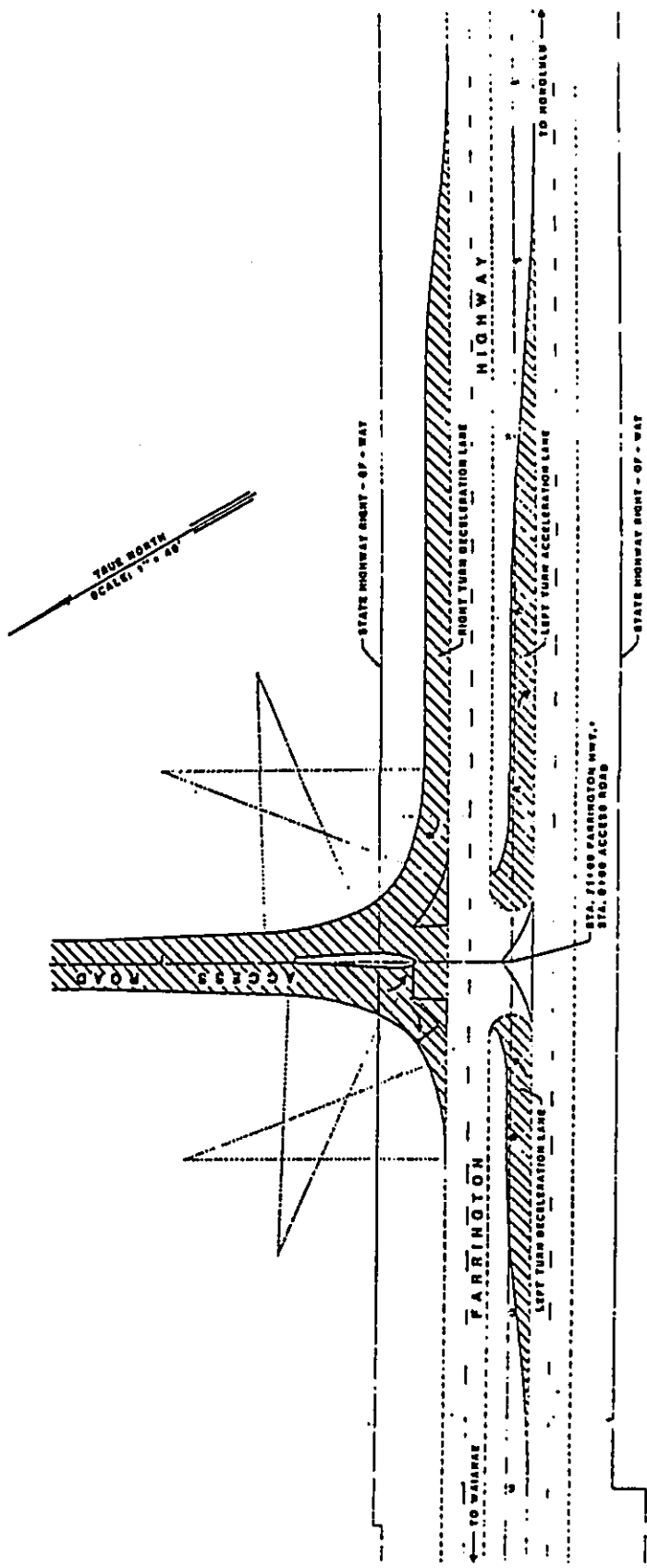
Vehicles leaving and entering the main highway to and from the landfill access road may create traffic safety problems at the intersections. The Ohikilolo Site is not anticipated to present any problems because of existing low traffic volumes and adequate sight distance on Farrington Highway. However, because of the heavier traffic and wide roadway at the Waimanalo Gulch Site, special channelization design consideration is required so that exiting vehicles, Honolulu-bound, can cross the Waianae-bound lanes and safely enter the Honolulu-bound lanes. The left turn acceleration lane, Honolulu-bound, reduces the time required for the driver to initiate his maneuver by focusing his attention on only one direction of traffic at a time. The left turn movement is broken down into two maneuvers; crossing the Waianae-bound lanes, then merging into the Honolulu-bound lanes. Exhibit 5 shows conceptual layout for a T-intersection with a right turn deceleration lane and a left turn acceleration lane. Should outbound landfill traffic experience excessive delay, a traffic signal may then be warranted.

V. CONCLUSIONS AND RECOMMENDATIONS

A. Conclusions

The projected traffic generated by the proposed landfill operations should not significantly affect overall operations on Farrington Highway at either site. The proposed Leeward District Sanitary Landfill sites generate relatively low traffic volumes. This is due to their remote locations from population centers, resulting in a small number of individual home owners delivering

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TRAFFIC IMPACT REPORT FOR THE
 GEOMETRIC IMPROVEMENT OF
 ACCESS ROADS TO THE PROPOSED
 WASHINGTON BUCKLE SITE
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their refuse to the landfill sites. Furthermore, the transfer trailers from the Keehi Transfer Station carry three times the load of the City's collection trucks. The transfer trailers will deliver about one-half the total refuse load to the Leeward District Sanitary Landfill Sites, thereby effectively reducing the landfill traffic volume by 30 percent. Should the Keehi Transfer Station increase its loading capacity, it could reduce the number of private collection truck trips generated by the proposed landfill. With implementation of a resource recovery system, the refuse load, limited to ash and non-combustible waste, and the resulting traffic demand would be further reduced.


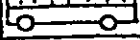
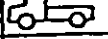
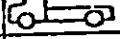

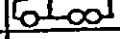




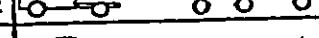
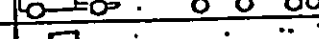
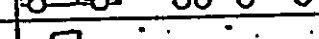
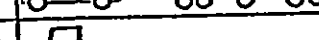
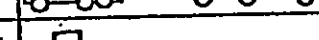
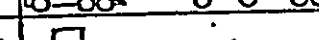
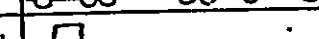

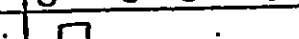


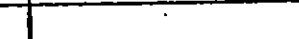
B. RECOMMENDATIONS

In general, the intersection improvements on Farrington Highway at the new landfill access road locations should be designed to facilitate safe access and egress so as not to disrupt mainline traffic. While the Ohikilolo Site needs minimal improvements on a two lane Farrington Highway, the Waimanalo Gulch Site requires exclusive turning lanes and speed-change lanes on the multi-lane configuration of Farrington Highway.

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APPENDIX

A-1
AASHTO VEHICLE TYPE CLASSIFICATION CHART

1	P	PASSENGER CARS	
2	B	BUSES	
3	2P	2 AXLE PANEL OR PICKUP LESS THAN 1 1/2 TON CAPACITY	
4	2S	2 AXLE FOUR TIRES OTHER THAN PANEL OR PICKUP	
5	2D	2 AXLE SIX TIRES	
6	3X	3 AXLE	
7	2-S-1	2 AXLE TRACTOR 1 AXLE SEMI-TRAILER	
8	2-S-2	2 AXLE TRACTOR 2 AXLE SEMI-TRAILER	
9	3-S-1	3 AXLE TRACTOR 1 AXLE SEMI-TRAILER	
10	3-S-2	3 AXLE TRACTOR 2 AXLE SEMI-TRAILER	
11	2-S-1-2	2 AXLE TRACTOR, 1 AXLE SEMI-TRAILER, 2 AXLE TRAILER	
12	2-S-1-3	2 AXLE TRACTOR, 1 AXLE SEMI- TRAILER, 3 AXLE TRAILER	
13	2-S-2-2	2 AXLE TRACTOR, 2 AXLE SEMI- TRAILER, 2 AXLE TRAILER	
14	2-S-2-3	2 AXLE TRACTOR, 2 AXLE SEMI- TRAILER, 3 AXLE TRAILER	
15	3-S-1-2	3 AXLE TRACTOR, 1 AXLE SEMI- TRAILER, 2 AXLE TRAILER	
16	3-S-1-3	3 AXLE TRACTOR, 1 AXLE SEMI- TRAILER, 3 AXLE TRAILER	
17	3-S-2-2	3 AXLE TRACTOR, 2 AXLE SEMI- TRAILER, 2 AXLE TRAILER	
18	3-S-2-3	3 AXLE TRACTOR, 2 AXLE SEMI- TRAILER, 3 AXLE TRAILER	
19	2-2	2 AXLE TRUCK, 2 AXLE TRAILER	
20	2-3	2 AXLE TRUCK 3 AXLE TRAILER	
21	3-2	3 AXLE TRUCK 2 AXLE TRAILER	
22	3-3	3 AXLE TRUCK 3 AXLE TRAILER	
23	OTHERS		

A-2. Level of Service Definition

The level of service concept defines various traffic flow conditions by 6 levels of service. These levels of service, designated A through F, from best to worst, cover the entire range of traffic operations that may occur.

In general, the various levels of service would have the following characteristics.

1. Level of Service A is defined as free flow, with low volumes and high speeds. Traffic density is low, with speeds controlled by driver desires, speed limits, and physical roadway conditions. There is little or no restriction in maneuverability due to presence of other vehicles, and drivers can maintain their desired speeds with little or no delay.
2. Level of Service B is in the zone of stable flow, with operating speeds beginning to be restricted somewhat by traffic conditions. Drivers still have reasonable freedom to select their speed and lane of travel. Reductions in speed are reasonable, with a low probability of traffic flow being temporarily restricted. The lower limit (lowest speed, highest volume) of this level of service has been associated with service volumes used in the design of rural highways.
3. Level of Service C is still in the zone of stable flow, but speeds and maneuverability are more closely controlled by the higher volumes. Most of the drivers are restricted in their freedom to select their own speed, change lanes, or pass. A relatively satisfactory operating speed is still obtainable with service volumes perhaps suitable for urban design practice.
4. Level of Service D approaches unstable flow, with tolerable operating speeds being maintained though considerably affected by changes in operating conditions. Fluctuations in volume and temporary restrictions to flow may cause substantial drops in operating speeds. Drivers have little freedom to maneuver, and comfort and convenience are low, but conditions can be tolerated for short periods of time.
5. Level of Service E cannot be described by speed alone, but represents operations at even lower operating speeds than in Level D, with volumes at or near the capacity of the highway. At capacity, speeds are typically, but not always, in the neighborhood of 30 mph. Flow is unstable, and stoppages of momentary duration can lead to a breakdown in traffic operations resulting in further speed reduction and vehicular queues.
6. Level of Service F describes forced flow operation at low speeds, where volumes are below capacity. These conditions usually result from queues of vehicles backing up from a restriction downstream. The section under study will be serving as a storage area. Speeds are reduced substantially and stoppages may occur for short or long periods of time because of the downstream congestion. In the extreme, traffic can come to a standstill.

Reference is made to the 1965 Highway Capacity Manual for a thorough discussion on the level of service concept. In addition, reference is also made to Transportation Research Board Circular Number 212, dated January 1980, and entitled Interim Materials on Highway Capacity.

APPENDIX E
ALTERNATIVE DISPOSAL/PROCESSING METHODS

Disposal of refuse can occur either on land or at sea. However, ocean disposal of solid waste is currently prohibited by the U. S. Environmental Protection Agency.

Methods to process waste include: 1) shredding, 2) incineration, 3) baling and 4) waste utilization, including composting, pyrolysis, recycling and steam and energy generation. These alternative processes, however, cannot totally dispose of solid waste; a landfill, therefore, is still required to dispose of waste that cannot be processed or to dispose of residues resulting from processing. Of the alternatives, incineration is the only method for which there is extensive data on operation, efficiency and cost.

The newest method of solid waste processing is resource recovery. Since success of any resource recovery program is dependent on market demand for products generated, the feasibility of these programs on Oahu is evaluated in this section in terms of existing or potential markets for recovered materials, soil conditioner and energy, as well as in terms of environmental impact.

I. SHREDDING [E.1]

Shredding reduces the volume of solid waste and turns it into a relatively homogeneous material. There are many basic types of size reduction equipment commercially available. The most common kind of size reduction used is the hammermill.

The size of the particles produced is quite important to the effectiveness of the step or steps following shredding (energy recovery, landfill disposal, or a combination of both). The shredding system must be capable of meeting the particular size requirements. Until recently, shredding was used to prepare solid waste for immediate disposal, but it is now considered a beneficial first step to other processing methods.

Advantages of Shredding:

- Reduces the volume of solid wastes significantly, with bulky waste being reduced around 90%.
- Shredded waste does not attract vectors, support combustion, have an objectionable odor, or lead to littering.
- When compacted in a landfill, shredded waste has fewer voids than unprocessed waste; the density is 25% to 60% greater depending on whether daily coverage is required.
- Shredding produces a more uniform fuel for incineration; the problem of agitation of the fuel to prevent uneven firebeds is minimized.
- Shredding is essential to process solid wastes for efficient mechanical separation.
- Shredding produces uniform material, so it is a common prerequisite for composting.
- Shredded waste is easily compacted and can extend the life of the landfill.
- Because shredding reduces the volume of bulky waste, it provides an advantage in hauling.
- Public acceptance to shredding facilities has been relatively good compared to acceptance of more conventional solid waste processing or disposal facilities.
- A large portion of the total solid waste load can be shredded.

Disadvantages of Shredding:

- Some waste cannot be put through a shredder because of size or density or because it is hazardous, has a high moisture content, or has other qualities that normally call for specialized handling in any system.
- Jamming of the shredder and uneven feeding can significantly reduce the output of the mill.
- Municipal solid waste has a high percentage of flammable materials which have caused, on occasion, fires in the shredder.

- There is a potential for explosion within a shredder due to explosive materials that may enter the facility.
- Shredders are noisy and produce dust, so the entire operation must be enclosed and dust collectors must be installed.

In deciding whether a shredding operation should be installed, it is necessary to consider the total benefits of shredding versus the cost of the operation. For projects in which the EPA has been involved, cost per ton ranged from \$8.60 up to \$10.60 in 1974 dollars, including hauling and disposal. One operation in Madison, Wisconsin (1974) reported \$8.60 TPD, based on a processing rate of 180 TPD, including hauling and disposal cost. Another operation in New York registered a cost of \$10.60 per ton including disposal, with an average annual output of 284 TPD. One county in Georgia has been shredding waste since 1973. Its two installations have shown lower operating costs, with one installation operating at a cost of \$4.80 per ton at 534 TPD and \$4.35 per ton for at 400 TPD facility. In the same year a facility in South Carolina estimated a \$4.10 per ton cost, including hauling and disposal. This facility processes 1,000 TPD.

During the design phase of the City and County of Honolulu's Keehi Transfer Station, the possibility of including a shredding operation was considered; however, a feasibility analysis indicated that the operation's capital and operating costs would be only partially offset by lower transportation costs and extended landfill life. In addition, as resource recovery was also being considered at that time, it was felt that shredding equipment should not be installed at a location separate from the resource recovery facility.

II. BALING [E.2]

Baling is a method used to reduce the volume of refuse, by forming raw solid waste into dense blocks of material. It potentially can achieve cost savings if transfer and long haul are necessary prior to disposal, and when land disposal space is at a premium. It also can potentially make waste easier to handle and transport. The decision to implement baling would have to be based in part upon the economic and environmental features of a given community.

The cost for establishing baling operations can range anywhere from about two-million dollars to four-million dollars. Baling projects with which the EPA has been involved range in cost from \$6.38 per ton for a 425 TPD processing facility to \$9.20 per ton for a 78 TPD processing facility.

Advantages of Baling:

- Baling nearly doubles the life of the land disposal site and reduces the number of times a city government must go through the difficult process of acquiring a new disposal site. Densities vary from 1,000 to more than 1,700 pounds per cubic yard, depending on the type of baler used.
- Balers can handle most types of wastes.
- While the cost is comparable to that of other forms of solid waste processing, bulk reduction makes long hauls more economical.
- Bales are easier to handle and transport than unprocessed waste; they are therefore more convenient for operations such as rail hauling.
- Baling should permit more immediate use of the disposal site upon completion, since minimal settling is anticipated.
- In shredding/baling operations, ferrous metal can be recovered from recycling via magnetic separation of the shredding. Also, corrugated containers and white goods can be hand-picked, baled separately and sold.

Disadvantages of Baling:

- Facilities which include baling involve a greater initial investment than conventional transfer stations handling the same tonnage.
- Baling precludes resource recovery once the bale is formed.
- There is incomplete knowledge about the economics of baling and effects of baling on decomposition in landfills, gas and leachate formation, and settling.
- Baling is not a final disposal process; bales must be disposed in a landfill situation.

III. WASTE UTILIZATION

A. Composting [E-2]

Composting is a volume-reducing process in which organic solid wastes, after separation from the inorganic fraction, are biochemically decomposed at a rapid rate (15-21 days) in open windrows or within confined tanks. The end product is a humus-like substance that primarily is used to condition soil.

In the United States, composting has not proven to be economically viable; its extremely high cost limits the number of markets for the compost materials. Consequently, composting as a processing method is slowly being phased out.

Advantages of Composting:

- Reduces volume and weight of refuse
- Can be used as soil conditioner to improve soil characteristics, thereby recycling solid wastes back to the soil
- Can prolong use of sanitary landfill

Disadvantages of Composting:

- Municipal refuse does not contain sufficient nitrogen to ensure proper digestion, so most compost media must be supplemented with additional nitrogen.
- Requires large land areas for processing
- Attracts flies and rodents
- Generates odor
- Requires separation of non-compostable material so does not account for total waste disposal
- High cost of application to land has made it uneconomical for large-scale use.
- Dependent on market conditions

The following is an excerpt from Handbook of Solid Waste Disposal [E.4]:

Despite considerable investment and technical knowhow, not one large-scale composting plant has operated economically long

enough in the United States to indicate that the process is feasible. As of 1972, there had been 18 attempts at composting in the United States and of those 18 only one or two were operating, and they existed under special circumstances. Composting has failed in the United States for four main reasons: (1) no steady market for the end product has been found, (2) initial investment and operating costs are generally high compared to other disposal methods, (3) a high quality end product usually cannot be derived from refuse in the United States without excessive expense, and (4) the separation of noncompostables requires a secondary method of disposal.

Many composting plants have been operated by private contractors who in turn charge the city an amount that defrays operating costs. Profits for the contractor are helped to be realized from the sale of the end product. Operators usually charge the city from \$1.00 to \$5.00 (1967) per ton, while the costs for composting refuse usually range from \$5.00 to \$10.00 per ton. The operators must make up the balance of the costs and any profits from the sale of the compost. To date this has not been possible.

B. Pyrolysis

Pyrolysis is the physical and chemical decomposition of organic materials in the absence and near-absence of oxygen at high temperatures. "The high temperature and the 'starved-air' situation causes a breakdown of the materials into three parts: (1) a gas consisting primarily of hydrogen, methane, and carbon monoxide; (2) a liquid fuel that includes organic chemicals such as acetic acid, acetone and methanol; (3) a char consisting of almost pure carbon, plus any glass, metal, or rock that may have been processed." [E.6] Pyrolysis processing is under development by many private and public organizations. The ultimate goal of this system is to convert solid waste into a storable, transportable fuel, either liquid or gas.

There are basically two types of pyrolysis processes: a gas pyrolysis process, and oil pyrolysis. There are different types of gas pyrolysis but the principle is essentially the same:

as refuse moves through the pyrolysis reactor, it is exposed to successively higher temperatures and is destructively distilled. In some processes, there is sufficient recovered fuel to be used as auxiliary fuel in fossil fuel boilers (medium Btu gas systems). In other systems the gas is of low Btu value and cannot be transported off-site; thus, it must be used as a fuel in a waste heat boiler to produce steam or electric power. Oil pyrolysis differs from gas pyrolysis in the temperatures to which the refuse is exposed.

According to a study by MITRE [E.8], cost estimates for a gas pyrolysis system range from \$33.90 per ton for a thousand TPD facility to \$25.44 per ton for a 2,000 TPD facility. MITRE's cost estimates for an oil pyrolysis system range from \$30.64 per ton for a 500 TPD facility to \$23.16 per ton for a 2,000 TPD facility [6.11].

Advantages of Pyrolysis:

- Reduces refuse volume and weight to facilitate solid waste handling
- Prolongs life of landfill site
- Processing is not affected by weather conditions
- Processing can produce fuel in the form of gas and oil

Disadvantages of Pyrolysis:

- Requires skilled operators
- Requires prior shredding and separating if fuels are to be produced efficiently
- Can produce operational impacts of noise, dust, thermal discharge into the atmosphere, and contaminated wastewater
- Cost for the process is high.

During the bidding for the HPOWER contract, no bidder proposing a pyrolytic system could guarantee a minimum of a year of trouble-free, full-scale operation as stipulated by the request for proposals.

C. Recycling [E.9]

Certain types of marketable materials can be recovered from solid waste, either before materials are placed in a collection vehicle, or later, from mixed municipal refuse.

Examples of materials that can be recovered from refuse through "source separation" are paper, glass and metal containers. These can be separated at their point of generation, be it at the home, office or other place of business. Once these materials have been separated out they can be transported to a secondary materials dealer or directly to a manufacturer.

Recovery of materials by source separation has been practiced only in a few instances prior to 1970. Since then this method has grown rapidly as a means of recovering paper, primarily newsprint and aluminum, from municipal refuse. Source separation has been used widely for recovery of waste paper. Recovery of glass and cans by this method has been used only in a few communities; the economic balance of these systems have been poor to date. The following table (Table E-1) gives a breakdown of the estimated percentages of paper, glass, ferrous metals, and other materials that compose total municipal solid refuse.

There are three basic approaches to implement the recovery of marketable materials from mixed municipal refuse. The first approach is to add shredding and ferrous metal recovery systems to landfill operations. Shredding can improve landfill operations and reduce requirements for landfill volume, and can also be an important first step in separating out various components. The second approach would be to recover non-combustible materials either before or after energy recovery takes place. The third approach is to recover as many of the components of the waste as is economically feasible.

Materials recovery offers several advantages: (1) conserving resources; (2) reducing of the quantity of refuse to be disposed, thus lengthening the life of a landfill; (3) lowering municipal disposal costs by the sale of recovered material; and (4) siting of resource recovery facilities would encounter less community opposition than conventional disposal facilities.

There are still many disadvantages and risks associated with recycling of materials. The degree of risk varies with the complexity of the system, but in general the methods used to recover

Table E-1
 COMPOSITION OF MUNICIPAL SOLID WASTE, AS DISCARDED,
 UNITED STATES, 1973^{1,2}

Component	Amount (millions of tons)	Percent of total
Paper	44.2	32.8
Newspaper	8.0	6.0
Corrugated	11.8	9.0
Office paper	5.4	4.0
Other	19.0	14.1
Glass	13.2	9.9
Ferrous metals	11.0	8.2
Nonferrous metals	1.4	1.0
Food waste	22.4	16.6
Yard waste	25.0	18.5
Other	17.2	12.8
Total	134.8	100.0

¹SMITH, F.A., U.S. Environmental Protection Agency.
 Unpublished data.

²Includes wastes generated in households, commercial and business establishments, and institutions (schools, hospitals, etc.); excluded are industrial process wastes, agricultural and animal wastes, construction and demolition wastes, mining wastes, abandoned automobiles, ashes, street sweepings, and sewage sludge. Wastes now being recycled are also excluded.

Source: E.1

marketable materials are still in the early stage of development. Therefore, cost and performance information on commercially available equipment is not well documented. Economic feasibility of recycling is primarily based on projected maintenance costs, the separation systems' recovery rate, and an assumed value for the product. There are also marketing considerations since the feasibility of a recovery system would depend upon the sale, at a reasonable price, of the extracted materials.

Even with full use of mechanical separating equipment and with full reuse of all separated materials, recycling can never utilize 100 percent of the solid waste. There will always be materials which must be disposed through other means because of contamination some materials and because of inefficiencies in the separation of others. For example, paper contaminated with grease or oil cannot be reprocessed into a new paper product and must be disposed of by incineration, or landfilling.

Market Conditions in Hawaii. Hawaii is not a major manufacturing center, so there is little local demand for secondary materials. Markets in the Orient and on the Mainland for recycled materials exist, but the cost of shipping added to the cost of separation has not made the recycling of most waste materials feasible here.

Ferrous Metals: The recovery of metal cans from solid waste appears to be promising, as there is a Mainland market for steel. Before metal cans can be used for their steel content, however, the tin in the metal must be removed. Detinning of cans from Hawaii presently occurs in Seattle. No detinning operations are planned for Oahu, and it is uncertain whether such an operation would be economically feasible here. The two major operators of detinning plants for the recovery of tin and ferrous metals in the United States are M & T Chemicals, and the Vulcan Materials Company. Both firms have expressed an interest in securing ferrous materials recovered in Hawaii from solid waste. There are, however, a number of restrictions imposed by both Vulcan Materials Company

and M & T Chemicals which must be considered prior to entering an agreement with either of these firms. Each of the firms requires the following:

- a. Metal shall be relatively free of trash, paper, plastics and other foreign contaminants.
- b. Iron content of the material is to be approximately 95 percent.
- c. Cans cannot be balled or nuggetized but must be shredded in a manner to provide maximum surface area.
- d. A price penalty will apply to scrap that has not been subject to air cleanup operation for removal of loose materials.

Locally, recycling of ferrous metals is accomplished by Flynn-Learner and by Hawaiian Western Steel. Neither of these firms accepts metal cans, because of their tin content.

The Dole Company bales old defective cans and sells them to mainland concerns as scrap. Any cans to be recycled are sent locally to the Recycling Group.

Aluminum: The Recycling Group, Inc. receives aluminum and pays \$0.17/pound. They take in about 60,000-70,000 pounds per month and send the aluminum to Reynolds Aluminum. There are also branches on Maui and on Kauai that ship aluminum to the Oahu office. This particular group also accepts metal cans (\$0.01/pound), compacts them and ships them to M and T Chemicals (Division of American Can Company). Primo and Schlitz bottles are accepted (\$0.60/case) and returned to the brewery. Newspaper (\$0.01/ pound) is shipped to the Far East at an average rate of 60-70 tons/week.

Rags: The demand for cotton rags on Oahu is substantial. The largest Hawaii distributor sells more than 16,000 pounds of rags a week, most of which are used for wiping purposes in various island industries. Cloth rags must be salvaged at the point of refuse generation (home), since there is no way of salvaging cloth after it has entered the waste stream.

REFERENCES TO APPENDIX E

- [E.1] Decision-Makers Guide in Solid Waste Management. 1976. Environmental Protection Agency.
- [E.2] Ibid.
- [E.3] Handbook of Solid Waste Disposal, 1975. Joseph L. Pavoni, et al.
- [E.4] Ibid.
- [E.5] Op. Cit. [E.1]
- [E.6] Op. Cit. [E.1]
- [E.7] Analysis of the Feasibility of Resource Recovery for Honolulu. April 1977. Prepared for the State of Hawaii by the MITRE Corporation.
- [E.8] Ibid.
- [E.9] Op. Cit. [E.1]