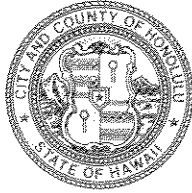


DEPARTMENT OF PLANNING AND PERMITTING  
**CITY AND COUNTY OF HONOLULU**

650 SOUTH KING STREET • HONOLULU, HAWAII 96813  
TELEPHONE: (808) 523-4414 • FAX: (808) 527-6743 • INTERNET: www.co.honolulu.hi.us/planning

JEREMY HARRIS  
MAYOR



RECEIVED

RANDALL K. FUJIKI, AIA  
DIRECTOR

'00 JUL 20 P3:35

LORETTA K.C. CHEE  
DEPUTY DIRECTOR

TH 2000/CLOG-960  
OFFICE OF ENVIRONMENTAL  
QUALITY CONTROL

July 12, 2000

Ms. Genevieve Salmonson, Director  
Office of Environmental Quality Control  
State of Hawaii  
235 South Beretania Street, Room 702  
Honolulu, Hawaii 96813

Dear Ms. Salmonson:

Acceptance Notice for the Final Environmental Impact Statement (FEIS)  
for the Proposed Kailua-Kaneohe-Kahaluu Facilities Plan, Koolaupoko,  
Oahu, Hawaii, TMK: Portions of 4-2, 4-3, 4-4, 4-5, 4-6, 4-7, 4-8 and 4-9

We are notifying you of our acceptance of the subject FEIS for the proposed Kailua-Kaneohe, Kahaluu Facilities Plan project. The Department of Planning and Permitting has determined that the subject FEIS is acceptable under the procedures established in Chapter 343 of the Hawaii Revised Statutes.

Pursuant to procedures contained in Section 11-200-23(c), Chapter 200, Title 11 (Environmental Impact Statement Rules), Department of Health Administrative Rules, we request that this acceptance notice be published in the August 8, 2000 Environmental Notice.

Attached is a copy of our acceptance report. Should you have any questions, please contact Tim Hata of our staff at 527-6070.

Sincerely yours,

A handwritten signature in cursive script, appearing to read "Randall K. Fujiki".

RANDALL K. FUJIKI, AIA  
Director of Planning & Permitting

RKF:js

Attachment

cc: Department of Design and Construction (Attn: Mr. Carl Arakaki)  
Department of Environmental Services  
Wilson Okamoto & Associates, Inc. (Attn: Mr. Rodney Funakoshi)

2000 - Oahu - FEIS -

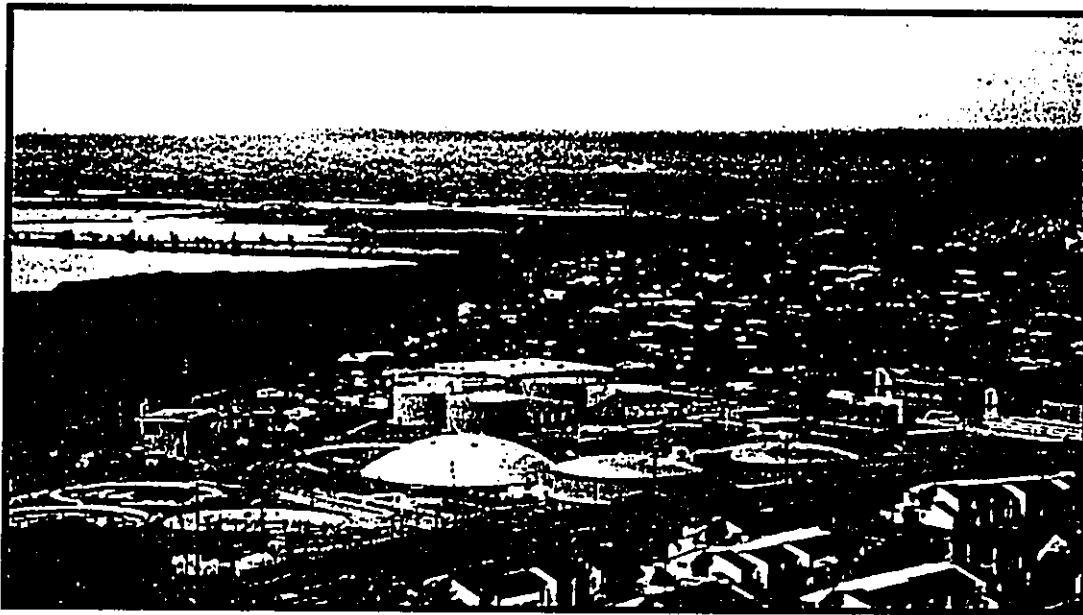
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**FILE COPY**

**Kailua - Kaneohe - Kahaluu Wastewater  
Final**

**Environmental Impact Statement  
for the  
Kailua-Kaneohe-Kahaluu  
Facilities Plan**

**Koolaupoko, Oahu, Hawaii**



Prepared for:  
**City & County of Honolulu**  
**Department of Design and Construction**  
and  
**Department of Environmental Services**

Prepared by:  
**Wilson Okamoto & Associates, Inc.**

February 2000

**FINAL  
ENVIRONMENTAL IMPACT STATEMENT  
FOR THE  
KAILUA-KANEOHE-KAHALUU FACILITIES PLAN**

**Koolaupoko, Oahu, Hawaii**

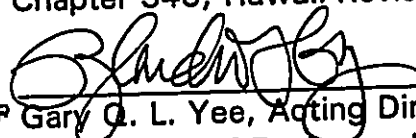
**PROPOSING AGENCY:** City and County of Honolulu  
Department of Design and Construction  
650 South King Street  
Honolulu, Hawaii 96813

and

City and County of Honolulu  
Department of Environmental Services  
650 South King Street  
Honolulu, HI 96813

**ACCEPTING AUTHORITY:** Department of Planning and Permitting  
City and County of Honolulu

**RESPONSIBLE OFFICIAL:** This document has been prepared under my  
direction pursuant to the requirements of  
Chapter 343, Hawaii Revised Statutes

  
FOR Gary Q. L. Yee, Acting Director      02/09/00  
Date  
Department of Design and Construction  
City and County of Honolulu

**PREPARED BY:** Wilson Okamoto & Associates, Inc.  
1907 South Beretania Street, Suite 400  
Honolulu, Hawaii 96826

February 2000

**TABLE OF CONTENTS**

Page

PREFACE ..... i

SUMMARY ..... iii

1. INTRODUCTION ..... 1-1

    1.1 Introduction ..... 1-1

    1.2 Background..... 1-1

        1.2.1 Preparation of the Facilities Plan Update..... 1-4

    1.3 Project Location ..... 1-7

    1.4 Project Need ..... 1-8

        1.4.1 Consent Decree..... 1-8

        1.4.2 Projected Flows..... 1-8

2. PROJECT DESCRIPTION..... 2-1

    2.1 Proposed Action..... 2-1

        2.1.1 Treatment and Disposal System ..... 2-1

            2.1.1.1 Kailua Regional WWTP ..... 2-2

            2.1.1.2 Kaneohe WWPTF..... 2-7

            2.1.1.3 Ahuimanu WWPTF ..... 2-7

        2.1.2 Collection System Improvements..... 2-10

            2.1.2.1 Kailua Basin Flow Equalization  
                    Facilities Alternatives ..... 2-10

            2.1.2.2 Collection System Basin Rehabilitation ... 2-17

            2.1.2.3 Collection System Lines ..... 2-18

            2.1.2.4 Pump Station Modifications ..... 2-20

            2.1.2.5 Sewer Improvement Districts ..... 2-22

    2.2 Use of Public Funds and Lands..... 2-24

        2.2.1 Public Funds ..... 2-24

        2.2.2 Public Lands ..... 2-30

    2.3 Phasing and Timing of Action..... 2-31

**TABLE OF CONTENTS (CONT'D)**

	<u>Page</u>
<b>3. DESCRIPTION OF THE EXISTING ENVIRONMENT</b> .....	<b>3-1</b>
<b>3.1 CLIMATE</b> .....	<b>3-1</b>
<b>3.2 PHYSIOGRAPHY</b> .....	<b>3-2</b>
<b>3.2.1 Geology and Topography</b> .....	<b>3-2</b>
<b>3.2.1.1 Geology</b> .....	<b>3-2</b>
<b>3.2.1.2 Topography</b> .....	<b>3-4</b>
<b>3.2.2 Soils</b> .....	<b>3-5</b>
<b>3.3 HYDROLOGY AND WATER QUALITY</b> .....	<b>3-15</b>
<b>3.3.1 Surface Water</b> .....	<b>3-15</b>
<b>3.3.1.1 Physical and Chemical</b> <b>Water Quality of Streams</b> .....	<b>3-18</b>
<b>3.3.1.2 Bacteriological</b> <b>Water Quality of Streams</b> .....	<b>3-19</b>
<b>3.3.2 Groundwater</b> .....	<b>3-25</b>
<b>3.3.3 Coastal Waters</b> .....	<b>3-29</b>
<b>3.3.4 Flood Zones and Tsunami Hazards</b> .....	<b>3-34</b>
<b>3.3.5 Earthquake/Seismic Hazards</b> .....	<b>3-36</b>
<b>3.4 NATURAL ENVIRONMENT</b> .....	<b>3-38</b>
<b>3.4.1 Flora</b> .....	<b>3-38</b>
<b>3.4.2 Fauna</b> .....	<b>3-39</b>
<b>3.4.3 Aquatic Resources</b> .....	<b>3-39</b>
<b>3.4.4 Wetlands</b> .....	<b>3-41</b>
<b>3.4.5 Historic Sites and Archaeological/Cultural Sites</b> .....	<b>3-45</b>
<b>3.5 SOCIO-ECONOMIC CHARACTERISTICS</b> .....	<b>3-49</b>
<b>3.5.1 Kailua</b> .....	<b>3-50</b>
<b>3.5.2 Kaneohe</b> .....	<b>3-50</b>
<b>3.5.3 MCBH-Kaneohe Bay</b> .....	<b>3-50</b>
<b>3.5.4 Kahaluu</b> .....	<b>3-51</b>
<b>3.6 AIR QUALITY</b> .....	<b>3-52</b>
<b>3.6.1 Regulated Air Emissions</b> .....	<b>3-53</b>
<b>3.7 NOISE</b> .....	<b>3-54</b>
<b>3.7.1 Noise Standards and Guidelines</b> .....	<b>3-56</b>

**TABLE OF CONTENTS**

	<u>Page</u>
PREFACE .....	i
SUMMARY .....	iii
1. INTRODUCTION .....	1-1
1.1 Introduction .....	1-1
1.2 Background.....	1-1
1.2.1 Preparation of the Facilities Plan Update.....	1-4
1.3 Project Location .....	1-7
1.4 Project Need .....	1-8
1.4.1 Consent Decree.....	1-8
1.4.2 Projected Flows.....	1-8
2. PROJECT DESCRIPTION.....	2-1
2.1 Proposed Action.....	2-1
2.1.1 Treatment and Disposal System .....	2-1
2.1.1.1 Kailua Regional WWTP .....	2-2
2.1.1.2 Kaneohe WWPTF.....	2-7
2.1.1.3 Ahuimanu WWPTF .....	2-7
2.1.2 Collection System Improvements.....	2-10
2.1.2.1 Kailua Basin Flow Equalization Facilities Alternatives .....	2-10
2.1.2.2 Collection System Basin Rehabilitation ...	2-17
2.1.2.3 Collection System Lines .....	2-18
2.1.2.4 Pump Station Modifications .....	2-20
2.1.2.5 Sewer Improvement Districts .....	2-22
2.2 Use of Public Funds and Lands.....	2-24
2.2.1 Public Funds .....	2-24
2.2.2 Public Lands .....	2-30
2.3 Phasing and Timing of Action.....	2-31

## TABLE OF CONTENTS (CONT'D)

	<u>Page</u>
3.7.2 Existing Noise Environment.....	3-56
3.8 TRAFFIC.....	3-60
3.9 AESTHETICS .....	3-61
3.10 SOLID WASTE .....	3-62
3.11 INFRASTRUCTURE AND UTILITIES.....	3-62
3.11.1 Water System.....	3-62
3.11.2 Wastewater System .....	3-63
3.11.2.1 Collection System.....	3-63
3.11.2.2 Treatment and Disposal System .....	3-71
3.11.2.3 Sanitary Sewer Overflows .....	3-74
3.11.2.4 Effluent Reuse Potential.....	3-74
3.11.3 Drainage System.....	3-79
3.11.4 Electrical System.....	3-80
3.11.5 Communications System.....	3-80
3.11.6 Gas System.....	3-81
3.12 RECREATION RESOURCES .....	3-81
4. IMPACTS AND MITIGATION MEASURES .....	4-1
4.1 Physiography .....	4-1
4.1.1 Geology and Topography.....	4-1
4.1.2 Soils .....	4-2
4.2 Hydrology and Water Quality .....	4-5
4.2.1 Surface Water.....	4-6
4.2.2 Groundwater.....	4-10
4.2.3 Coastal Waters .....	4-12
4.2.3.1 Flood Zones and Tsunami Hazards.....	4-14
4.2.4 Earthquake/Seismic Hazards .....	4-21
4.3 Natural Environment .....	4-22
4.3.1 Flora .....	4-22
4.3.2 Fauna .....	4-23
4.3.3 Aquatic Resources.....	4-24
4.3.4 Wetlands.....	4-27

**TABLE OF CONTENTS (CONT'D)**

	<u>Page</u>
4.3.5 Historic Sites and Archaeological/Cultural Sites.....	4-29
4.4 Socio-Economic.....	4-31
4.5 Air Quality .....	4-34
4.5.1 Short-Term Construction Impacts .....	4-34
4.5.2 Odor Impacts from Wastewater Treatment Facilities .....	4-35
4.5.3 Mitigation of Odor Problems .....	4-36
4.5.3.1 Short-Term Odor Mitigation Measures ....	4-37
4.5.3.2 Intermediate- and Long-Term Odor Mitigation .....	4-38
4.6 Noise .....	4-42
4.6.1 Short-Term Construction Impacts .....	4-42
4.6.2 Potential Noise Impacts from Operation of Wastewater Facilities .....	4-43
4.6.3 Recommended Noise Mitigation .....	4-44
4.7 Traffic.....	4-45
4.8 Aesthetics .....	4-48
4.9 Solid Waste .....	4-51
4.10 Infrastructure and Utilities.....	4-52
4.10.1 Water System.....	4-52
4.10.2 Drainage System.....	4-53
4.10.3 Electrical System.....	4-55
4.10.4 Communications System.....	4-56
4.10.5 Gas System.....	4-57
4.11 Recreation Resources.....	4-58
5. RELATIONSHIP TO PLANS, POLICIES AND CONTROLS .....	5-1
5.1 Hawaii State Plan .....	5-1
5.2 State Functional Plans.....	5-4
5.3 State Land Use District .....	5-5
5.4 State Coastal Zone Management Program .....	5-6
5.5 City and County of Honolulu General Plan .....	5-10



**TABLE OF CONTENTS (CONT'D)**

	<u>Page</u>
5.6	City and County of Honolulu Development Plan..... 5-13
5.6.1	Development Plan Land Use Map ..... 5-15
5.6.2	Development Plan Public Facilities Map ..... 5-18
5.6.3	Koolaupoko Sustainable Communities Plan ..... 5-22
	5.6.3.1 Public Infrastructure Map..... 5.25
5.7	City and County of Honolulu Land Use Ordinance and Zoning ..... 5-26
5.8	City and County of Honolulu Special Management Area ..... 5-27
5.9	Permits and Approvals ..... 5-27
6.	ALTERNATIVES TO THE PROPOSED ACTION..... 6-1
6.1	Project Alternatives..... 6-1
6.1.1	No Action Alternative ..... 6-3
6.1.2	Resumption of Secondary Treatment at Kaneohe and Ahuimanu Treatment Plants..... 6-5
6.1.3	Blending Secondary With Primary Treatment and Flow Equalization ..... 6-7
6.1.4	Maximize Flow Equalization at Kaneohe WWPTF and Rehabilitate Selected Collection Basins..... 6-12
6.1.5	Relocation of Kailua Regional WWTP to Kapaa Industrial Park ..... 6-14
6.2	Kailua Basin Equalization Alternatives..... 6-19
6.2.1	Kailua Road WWPS-Mid Pacific Country Club..... 6-20
6.2.2	Oneawa Street-Mokapu Boulevard-Kailua Road Pipe Storage ..... 6-21
6.2.3	Puu O Ehu Tunnel Storage..... 6-22
6.2.4	Kailua District Park Equalization Basin ..... 6-23
7.	RELATIONSHIP BETWEEN LOCAL AND SHORT-TERM USES OF HUMANITY'S ENVIRONMENT AND THE MAINTENANCE OF LONG- TERM PRODUCTIVITY ..... 7-1
7.1	Short-Term Uses ..... 7-1

**TABLE OF CONTENTS (CONT'D)**

	<u>Page</u>
7.2 Long-Term Productivity .....	7-1
8. IRRETRIEVABLE AND IRREVERSIBLE COMMITMENTS OF RESOURCES .....	8-1
9. PROBABLE ADVERSE ENVIRONMENTAL EFFECTS WHICH CANNOT BE AVOIDED .....	9-1
9.1 Short-Term Effects .....	9-1
9.2 Long-Term Effects .....	9-2
10. SUMMARY OF UNRESOLVED ISSUES.....	10-1
11. REFERENCES .....	11-1
12. PREPARERS OF THE EIS.....	12-1
12.1 Proposing Agency.....	12-1
12.2 EIS Consultant .....	12-1
12.3 EIS Technical Studies/Support.....	12-1
13. CONSULTATION .....	13-1
13.1 Pre-Assessment Consultation .....	13-1
13.2 EIS Preparation Notice Consultation .....	13-4
13.3 <i>Draft EIS Consultation</i> .....	13-43
13.4 <i>Draft EIS Public Hearing</i> .....	13-99

## LIST OF FIGURES

	<u>Page</u>
Figure 1-1	Kailua-Kaneohe-Kahaluu Planning Area..... 1-2
Figure 1-2	Regional Wastewater System ..... 1-5
Figure 2-1	Proposed Wastewater System Improvements ..... 2-3
Figure 2-2	Kailua Regional Wastewater Treatment Plant Recommended Site Plan..... 2-4
Figure 2-3	Kaneohe Wastewater Preliminary Treatment Facility Recommended Site Plan..... 2-8
Figure 2-4	Ahuimanu Wastewater Preliminary Treatment Facility Recommended Site Plan..... 2-9
Figure 2-5	Kailua Equalization Basin Alternatives ..... 2-11
Figure 2-6	MCBH Kaneohe Bay Flow Equalization Site ..... 2-15
Figure 3-1	Rainfall ..... 3-3
Figure 3-2	Topographic Map ..... 3-6
Figure 3-3	Soils ..... 3-7
Figure 3-4	Agricultural Lands of Importance to the State of Hawaii ..... 3-14
Figure 3-5	Streams ..... 3-17
Figure 3-6	Water Quality Monitoring and Sampling Stations..... 3-20
Figure 3-7	Aquifer Sectors and Systems..... 3-26
Figure 3-8	Tsunami Inundation Map ..... 3-37
Figure 3-9	Wetlands ..... 3-42
Figure 3-10	Eligible and Registered Historic Places ..... 3-47
Figure 3-11	Air Quality Monitoring Stations at Kailua Regional Wastewater Treatment Plant ..... 3-55
Figure 3-12	Community Noise Measurement Locations ..... 3-58
Figure 3-13	Potable Water Sources..... 3-64
Figure 3-14	Kahaluu Sewer Improvement Areas ..... 3-68
Figure 3-15	Kaneohe Sewer Improvement Areas ..... 3-69
Figure 3-16	Kailua/Kaneohe Sewer Improvement Areas..... 3-70
Figure 3-17	Historic Overflows ..... 3-75

## LIST OF FIGURES (CONT'D)

	<u>Page</u>
Figure 4-1	Flood Zones ..... 4-15
Figure 4-2	Flood Zone Map - Vicinity of Kaneohe WWTP..... 4-16
Figure 4-3	Flood Zone Map - Vicinity of Ahuimanu WWPTF..... 4-17
Figure 4-4	View of Kailua Road EQ Site from Kailua Road ..... 4-50
Figure 5-1	State Land Use Districts..... 5-7
Figure 5-2	Development Plan Land Use Map ..... 5-16
Figure 5-3	Development Plan Public Facilities Map..... 5-21
Figure 5-4	Zoning ..... 5-28
Figure 5-5	Special Management Area (SMA)..... 5-29
Figure 6-1	Land Acquisition Area..... 6-9

## LIST OF TABLES

	<u>Page</u>
Table 1-1	Modeled Wastewater Flows Kailua-Kaneohe-Kahaluu 1995 and 2020 (in mgd) ..... 1-11
Table 2-1	Kailua-Kaneohe-Kahaluu Final Facilities Plan, Kailua Flow Equalization Scenarios and Recommendations ..... 2-12
Table 2-2	Pump Station Modifications ..... 2-20
Table 2-3	Sewer Improvement Districts..... 2-23
Table-2-4	Proposed Facilities Plan: Flow Equalization in Kailua and Kaneohe; Rehabilitate Basins Generalized Cost Estimates (April 1998 Dollars) ..... 2-25
Table 2-5	Land Ownership, Existing and Proposed Wastewater Facilities..... 2-30
Table 2-6	Kailua-Kaneohe-Kahaluu Facilities Plan Phasing Plan ..... 2-32
Table 3-1	Soil Types in Planning Region ..... 3-8
Table 3-2	Maunawili Stream and Kawai Nui Marsh Mean Physical/Chemical Data Summary..... 3-21

## LIST OF TABLES (CONT'D)

	<u>Page</u>
Table 3-3	Kaneohe Area Streams Mean Physical/Chemical Data Summary ..... 3-22
Table 3-4	Kaneohe Area Streams Mean Bacteriological and Dissolved Heavy Solids Data Summary ..... 3-23
Table 3-5	Geometric Mean of Fecal Indicators Obtained from Samples Taken at Kailua Streams, Expressed in Colony Forming Units (CFU)/100mL..... 3-25
Table 3-6	Coastal Water Quality Mean Physical/Chemical Data Summary ..... 3-31
Table 3-7	Kaneohe Bay Coastal Water Mean Bacteriological Data Summary ..... 3-33
Table 3-8	Kailua Bay Monthly Geometric Mean Enterococcus Values (cfs/100ml) Exceeding the State Recreational Waters Standard ..... 3-35
Table 3-9	Eligible and Registered Historical and Archaeological Sites in the Planning Area ..... 3-48
Table 3-10	Socio-Economic Characteristics of the Kailua-Kaneohe-Kahaluu Planning Region..... 3-51
Table 3-11	Property Line and In-Plant Hydrogen Sulfide (H <sub>2</sub> S) Monitoring Station Results in Parts Per Billion (ppb) at Kailua Regional Wastewater Treatment Plant, 1998 ..... 3-54
Table 3-12	Maximum Permissible Sound Levels ..... 3-57
Table 3-13	Sound Level Measurement Results in Nearby Residential Areas ..... 3-59
Table 3-14	Inventory of Sewer Pipes Kailua-Kaneohe-Kahaluu Service Area ..... 3-66
Table 3-15	<i>Windward Oahu Non-Potable Water Demand</i> ..... 3-77
Table 3-16	<i>Measured EC and Estimated TDS and Cl</i> ..... 3-79
Table 3-15 3-17	Existing Recreational and Open Space Resources in the Kailua-Kaneohe-Kahaluu Planning Region..... 3-82

LIST OF TABLES (CONT'D)

	<u>Page</u>
Table 4-1	Flood Zone and Tsunami Hazard Designations at Wastewater Facility Sites..... 4-18
Table 5-1	Development Plan Land Use Map, Zoning and Special Management Area Designations, Existing and Proposed Wastewater Facilities..... 5-17
Table 6-1	Assessed Values by TMK Plat Area (lots within 1,000 feet of Kailua Regional WWTP)..... 6-10
Table 6-2	<i>Relocation of Kailua Regional WWTP to Kapaa Industrial Park, Generalized Cost Estimates, (June 1996 Dollars)..... 6-17</i>

APPENDICES

Appendix A:	Botanical Survey (Botanical Consultants)
Appendix B:	Noise Assessment (D.L. Adams Associates, Ltd. dba Darby & Associates)

**PREFACE**

This Final Environmental Impact Statement (EIS) is prepared pursuant to Chapter 343, Hawaii Revised Statutes, and Title 11, Chapter 200, Administrative Rules, Department of Health, State of Hawaii. The City and County of Honolulu's Department of Design and Construction and Department of Environmental Services propose to undertake various improvements to the wastewater collection, treatment and disposal system, and the establishment of Sewer Improvement Districts for unsewered areas in the Kailua-Kaneohe-Kahaluu wastewater service area, Koolaupoko District, Island of Oahu. The City's Department of Design and Construction and Department of Environmental Services, the proposing agency, have determined that the proposed action requires the preparation of an Environmental Impact Statement.

The proposed projects described in this Final EIS are based on the Kailua-Kaneohe-Kahaluu Facilities Plan which was finalized and approved by the City in September 1998.

This Final EIS incorporates responses to comments received during the 45-day comment period following the publication of the Draft EIS, and testimony given at the public hearing of December 9, 1999. In this Final EIS text, deletions are indicated by a line through the text, and additions are in italics.

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**SUMMARY**

**Proposing Agency:** City and County of Honolulu  
Department of Design and Construction  
650 South King Street  
Honolulu, Hawaii 96813

City and County of Honolulu  
Department of Environmental Services  
650 South King Street  
Honolulu, Hawaii 96813

**Accepting Authority:** City and County of Honolulu  
Department of Planning and Permitting  
650 South King Street  
Honolulu, Hawaii 96813

**Location:** Koolaupoko District, Oahu, Hawaii

**Tax Map Keys:** 4-2-15: portions 6 and 8; 4-2-16: portion 2; 4-4-08:  
portion 1; 4-4-11: 81; 4-5-30: 36; 4-7-04: 6; and  
various other TMKs in 4-2, 4-3, 4-4, 4-5, 4-6, 4-7,  
4-8, and 4-9

**PROPOSED ACTION:**

The proposed action involves the implementation of the City's Facilities Plan for the Kailua-Kaneohe-Kahaluu region, consisting of various improvements to the wastewater collection, treatment and disposal system, and the establishment of Sewer Improvement Districts for much of the unsewered areas. Proposed major improvements include the following:

Kailua Regional Wastewater Treatment Plant (WWTP): Modifications to the WWTP's existing treatment facilities will provide secondary treatment capacity of 35.6 mgd. Improvements include modifications to the existing influent pump station, headworks, primary clarifiers, secondary clarifiers, dewatering building and centrifuge. Other improvements include odor and noise control and construction of a new ultraviolet disinfection facility. The treatment plant is currently limited to a secondary treatment capacity of 28 mgd.

Kaneohe Wastewater Preliminary Treatment Facility (WWPTF): 6.4 MG flow equalization (EQ) basin, odor control system modifications, and Kaneohe-Kailua force main replacement.

Ahuimanu WWPTF: New preliminary treatment system, 0.6 MG flow equalization basin, odor control system modifications, and Ahuimanu effluent force main replacement.

Kailua Basin Flow Equalization Facilities Alternatives: In-pipe storage along Kalaheo Avenue (0.5 MG) and along Wanaao and Kailua Roads (0.95 MG) based on a 2-year storm and expected reduction of infiltration/inflow (I/I) from collection system rehabilitation projects. Other options include existing storage at the Kailua Regional WWTP, and storage at the Marine Corps Base Hawaii (MCBH) Kaneohe Bay, adjacent to the Kailua Road WWPS, and at Kapaa Industrial Park.

Collection System Basin Rehabilitation: Rehabilitation of up to seven (7) collection system basins to reduce infiltration/inflow to the collection system during heavy storms: Kailua (Basins 2B01, 2B03.3 and 2B04), Kaneohe (Basins 9C01B, 9C01D and 9D01A), and Kahaluu (Basin 9A01).

Collection System Lines: Construction of relief lines consisting of approximately 1,890 feet of 8- to 36-inch lines in Kaneohe/Kahaluu and approximately 8,190 feet of 8- to 36-inch lines in Kailua to increase the collection system's capacity. Rehabilitation/replacement of approximately 4,500 feet of 27- and 30-inch lines in Kaneohe/Kahaluu, and approximately 34,600 feet of 12- to 66-inch lines in Kailua.

Other WWPS Improvements: Modifications to 22 WWPSs, including increasing pumping station capacities, and pump station and force main replacement and/or rehabilitation. Construction of up to three (3) new pump stations to service Sewer Improvement Districts in Kahaluu.

Sewer Improvement Districts: Implementation of nine (9) Sewer Improvement Districts serving 764 lots in the region.

**SIGNIFICANT BENEFICIAL AND ADVERSE IMPACTS AND PROPOSED MITIGATION MEASURES:**

Surface and Coastal Waters: The proposed wastewater facility improvements will have beneficial long-term water quality impacts on surface and coastal receiving waters. The provision of flow equalization facilities (for temporary wastewater storage during heavy storms) and collection system improvements to reduce infiltration and inflow will reduce the probability of spills and bypasses to the surface and coastal waters during periods of heavy rainfall. The improved facilities would enable flows that would otherwise potentially be overflows to be treated to a secondary level and eventually discharged through the Mokapu Outfall. The proposed Sewer Improvement Districts will reduce the probability of spills and overflows from failing individual wastewater systems to surface and coastal waters, and further contribute to the beneficial impact on water quality.

Wetlands: If the MCBH Kaneohe Bay flow equalization facility option is pursued, construction of the facility will have an impact on existing wetlands. The MCBH site is located north of Nuupia Ponds and includes wetland areas that would need to be taken into consideration in the siting and development of the facility. Potential impacts to faunal and aquatic resources due to wastewater spills from the proposed MCBH Kaneohe Bay EQ basin or leakage or accidental breakage in the transmission line crossing Nuupia Ponds and the wetlands will need to be mitigated by proper design, construction and operation of the facility. If the MCBH Kaneohe Bay EQ facility alternative is pursued, environmental permitting requirements, including a wetlands mitigation plan, would need to be addressed in coordination with environmental managers at the MCBH Kaneohe Bay, the U.S. Army Corps of Engineers and the U.S. Fish and Wildlife Service to mitigate the associated impacts.

Socio-Economic: The long-term economic impacts of the proposed wastewater facility improvements are significant. The total estimated capital cost for the proposed facility improvements is approximately \$386.1 million (April 1998 dollars). The estimated annual operating cost is approximately \$30.6 million (April 1998 dollars). For determination of sewer rates, all of the facilities operated by the City are considered to be a single system and the costs of the system are therefore distributed among all its customers. There will be a need for increased sewer rates resulting from the planned construction of the proposed improvements in the Facilities Plan.

Residents currently served by individual wastewater systems that are proposed to be serviced by the municipal sewer system under the proposed action would be required to pay for the cost of construction of the sewer lateral within their property and the demolition of the existing individual sewer system. This cost is estimated at approximately \$4,000. The homeowners would also be responsible for paying the City's one-time Sewer Improvement District assessment fee and monthly sewer user service charge.

Short-Term Noise, Air Quality and Traffic Impacts: Construction activities associated with the proposed project will create some adverse impacts such as unavoidable noise impacts in the vicinity of the project sites, air pollution emissions from soil excavation and construction vehicle equipment and movement, and temporary disruption of traffic and on-street parking. The properties which are anticipated to be most affected by construction activity impacts are those residences and businesses located adjacent to and along the proposed wastewater facility improvements. Unavoidable construction noise impacts on nearby land uses in the immediate vicinity of the proposed facility improvements will be mitigated to some degree by complying with the provisions of the State Department of Health Administrative Rules, Title 11, Chapter 46, Community Noise Control. Construction work which may be performed 24 hours a day, 7 days a week will require a Community Noise Variance permit from the DOH. Potential air quality impacts during construction of the proposed project will be mitigated by complying with the State DOH Administrative Rules, Title 11, Chapter 60, Air Pollution Control. Construction contractors will be required to mitigate potential vehicular and pedestrian traffic impacts through appropriate traffic control measures and safety devices. The degree of impact resulting from construction activities along major roadways will be mitigated by phasing sewer line projects into zones, thereby minimizing noise, air, and traffic impacts to residents and businesses at any given time. Emerging "trenchless" technologies such as microtunneling (use of a subsurface boring machine for pipe installation) may also be used to minimize disruption to residences and businesses.

Long-Term Air Quality Impacts: Existing odor problems from the Kailua Regional WWTP have been a primary area of concern expressed by residents in the nearby community. As expressed by nearby residents, air emissions from the WWTP raise the concern of potential health impacts on residents in the immediate vicinity and students and faculty of the nearby Aikahi Elementary School, as well as facility workers. Nearby residents have also expressed concern regarding the impact of odors from the WWTP which may

not present a health hazard, but are considered by many to reduce the quality of life in the community.

The City is undertaking short-, intermediate- and long-term odor mitigation measures to reduce the ~~presence of all sources of noxious air emissions~~ *emission of air pollutants*. These measures include maintenance and operation activities, chemical treatment to reduce entry level of odorous compounds into treatment processes, and odor reduction systems installed to handle off-gases from unit processes.

Long-Term Noise Impacts: ~~Noxious Nuisance~~ noise levels emanating from the Kailua Regional WWTP are a concern to nearby residents as expressed in public meetings held for the Facilities Plan. Although the proposed improvements to the plant would mostly entail modifications within existing facilities and are not expected to contribute to higher levels of noise, consideration should be given to further reducing noise emanating from the plant due to noise complaints from nearby residents.

Noise mitigation measures are recommended to further reduce noise emanating from the WWTP's primary and secondary noise sources, namely the Odor Control Fans, Effluent Pumps and the Administration Building's exterior air-conditioning unit.

#### **ALTERNATIVES CONSIDERED:**

**Project Alternatives:** Major alternatives to the proposed action include the following:

- No Action Alternative
- Resumption of Secondary Treatment at Kaneohe and Ahuimanu Treatment Plants
- Blending Secondary with Primary Treatment and Flow Equalization
- Maximize Flow Equalization at Kaneohe WWPTF and Rehabilitate Selected Collection Basins
- Relocation of Kailua Regional WWTP to Kapaa Industrial Park

**Kailua Basin Equalization Alternatives:** The following sub-alternatives were evaluated to provide flow equalization facilities for the Kailua Basin:

- Kailua Road WWPS-Mid Pacific Country Club
- Oneawa Street-Mokapu Boulevard-Kailua Road Pipe Storage
- Puu O Ehu Tunnel Storage
- Kailua District Park Equalization Basin

**UNRESOLVED ISSUES:**

Kailua Basin Flow Equalization Facilities Alternatives and Extent of Rehabilitation of the Collection System Lines: Presently, major uncertainties exist in the selection of a Kailua Basin equalization alternative.

At the time of the Final Facilities Plan, it was undecided whether the 2-year storm or the 5-year storm would be pursued as the basis for determining design peak flows. However, the City has since established a policy to use the 2-year, 6-hour storm event *with pending* the concurrence of the Environmental Protection Agency.

The other uncertainty in the selection of a Kailua Basin equalization alternative is the extent of reduction in infiltration and inflow to the sewer system that would be achieved by rehabilitation projects. The City proposes to rehabilitate up to seven (7) collection system basins in the Kailua-Kaneohe-Kahaluu region, having begun with the pilot project for basins in the Enchanted Lake area. The extent of reduction in infiltration/inflow achieved by the rehabilitation of lines is expected to be approximately 35 to 38 percent, based on experiences elsewhere as well as results from the pilot project rehabilitation of main lines in a basin in the Enchanted Lake area.

With the City's decision to pursue the 2-year storm as the basis for planning and design, the 5-year alternatives could be eliminated. However, they are retained for consideration since these options could be found to be more favorable upon further engineering analysis.

Project Plans and Design: The conceptual plans and detailed design features of the proposed individual wastewater projects remain to be finalized. The method of construction deemed most appropriate for the individual projects will be determined during the planning and design phases for each project. As the individual projects progress toward the design and construction

phases, preliminary engineering studies and environmental review will be undertaken for each project on an as-needed basis.

Funding of Improvements: The funds required for construction of the proposed individual wastewater projects may vary depending on the final design of each project, bidding conditions, and other factors. Also, the actual cost to be assessed per wastewater system ratepayer for the proposed facility improvements remains to be determined.

Necessary Permits and Approvals: Land use and environmental permits and approvals will be required prior to construction of the proposed projects, and are identified in Section 5.9. The required permits and approvals will be determined during the more detailed planning and design phase for each project.

Phasing of Improvements: The actual phasing of construction of the majority of the proposed individual wastewater projects is unresolved as it will be largely dependent on the availability of funding for the improvements, as well as Honolulu City Council approval. Any future changes to the City's land use plans and policies affecting build-out capacity which cannot be anticipated may impact both the need for and timing of wastewater projects proposed to increase future capacity.

Odor Mitigation: In addition to short-term odor mitigation measures being undertaken by the City at the Kailua Regional WWTP, the City is also pursuing intermediate- and long-term odor mitigation at the plant. This includes consideration of various odor reduction systems, as well as newer technologies recommended in the Facilities Plan for inclusion in engineering studies for future upgrades and replacement of existing systems. Design of future facilities will need to incorporate both the latest technologies, as well as well-defined operation and maintenance procedures to assure reduction of *noxious nuisance* air emissions from the collection system, storage facilities and treatment sites.

Islandwide, the Odor Control Assessment Program scheduled to start in FY 2000 will involve the preparation of a study to address the effectiveness of all City-owned and operated existing odor control units, as well as address future odor control requirements. The study will provide a master plan to control odors from the collection system, pump stations and treatment plants.

Facilities in Flood Hazard Districts: The Kaneohe and Ahuimanu WWPTFs, Coconut Grove WWPS and proposed Kaalaea WWPS are all located within the respective flood hazard districts. Development of the proposed wastewater facility improvements within the flood hazard districts will be in accordance with regulations set forth in Section 21-9.10 Flood Hazard Districts of the City's Land Use Ordinance (LUO), and subject to the preparation of flood studies pursuant to the Section, as may be required.

MCBH Kaneohe Bay EQ Basin Alternative: If the MCBH Kaneohe Bay EQ alternative is pursued, environmental permitting requirements, including a wetlands mitigation plan, would need to be addressed in coordination with environmental managers at the MCBH Kaneohe Bay, the U.S. Army Corps of Engineers and the U.S. Fish and Wildlife Service to mitigate the associated impacts. Additional environmental investigations and mitigation, such as the enhancement of wetland habitat elsewhere on the Base, may be required.

**COMPATIBILITY WITH LAND USE PLANS AND POLICIES:**

The proposed project will generally conform with the various land use plans, policies and regulatory controls, including, but not limited to, the Hawaii State Plan, State Recreation Functional Plan, State Coastal Zone Management Program, and the City and County of Honolulu's General Plan, Development Plan (DP), proposed Koolaupoko *Sustainable* Communities Plan, and Land Use Ordinance.

The proposed wastewater facility improvements are consistent with the respective State Urban, Agricultural and Conservation District classifications. Proposed improvements to the Kailua Road WWPS and installation of sewer lines within the Conservation District would be subject to a Conservation District Use Application (CDUA) pursuant to the State Department of Land and Natural Resources Administrative Rules, Title 13, Chapter 5 for lands designated in the Conservation District.

The proposed project improvements are consistent with the respective underlying City DP Land Use Map designations. The existing DP for the Koolaupoko area is currently undergoing revision by the City's Department of Planning and Permitting (DPP). The plan for this region has been titled "Koolaupoko *Sustainable* Communities Plan" which sets forth general policies and principles for public facilities and infrastructure in the region. Until the proposed Koolaupoko *Sustainable* Communities Plan is adopted, the



Koolaupoko DP Public Facilities Map would need to be amended to reflect the proposed wastewater facility improvements designated as major planned public facilities.

According to the City DPP, wastewater facilities are permitted uses in all zoning districts; however, if the proposed facility exceeds the affected district's development standards (i.e., height, setbacks, etc.), a Waiver of Requirements would need to be obtained from the City DPP. A number of proposed wastewater facility improvements are located within the Special Management Area (SMA). The proposed facility improvements which would entail "development" within the SMA will require a SMA Use Permit.

**REQUIRED PERMITS AND APPROVALS:**

The following is a list of permits and approvals which may be required prior to construction and operation of the proposed improvements:

Federal

U.S. Army Corps of Engineers

- Department of the Army

State of Hawaii

Department of Health

- National Pollutant Discharge Elimination System (NPDES) General Permit for Storm Water Associated with Construction Activity
- NPDES General Permit for Discharges Associated with Construction Activity Dewatering
- Section 401 Water Quality Certification
- Noise Permits
- Air Quality Permits
- *Disability and Communication Access Board (Review pursuant to Americans with Disabilities Act Accessibility Guidelines (ADAAG))*

Department of Land and Natural Resources Land Division

- Conservation District Use Application

Department of Land and Natural Resources Historic Preservation Division

- Chapter 6E, HRS Historic Preservation

State of Hawaii (continued)

Office of Planning

- Coastal Zone Management (CZM) Program Consistency Review

Department of Transportation

- Permit to Perform Work Within State Highways

City and County of Honolulu

Department of Planning and Permitting

- Environmental Impact Statement
- Special Management Area (SMA) Use Permit
- Development Plan Public Facilities Map Amendment
- Flood Hazard Development Approval
- Waiver of Requirements
- Building Permit
- Construction Dewatering Permit
- Demolition Permit
- Electrical Permit
- Plumbing Permit
- Sidewalk/Driveway Work Permit
- Street Usage Permit
- Grading and Drainage Permits
- Permit to Excavate Public Right-of-Way
- Grubbing Permit
- Drainage Plan Approval

Board of Water Supply

- Water and Water System Requirements
- Water Connection Approval

Other

Utility Companies

- Utility Service Requirements
- Permit Regarding Work on Utility Lines

**1. INTRODUCTION**

**1.1 Introduction**

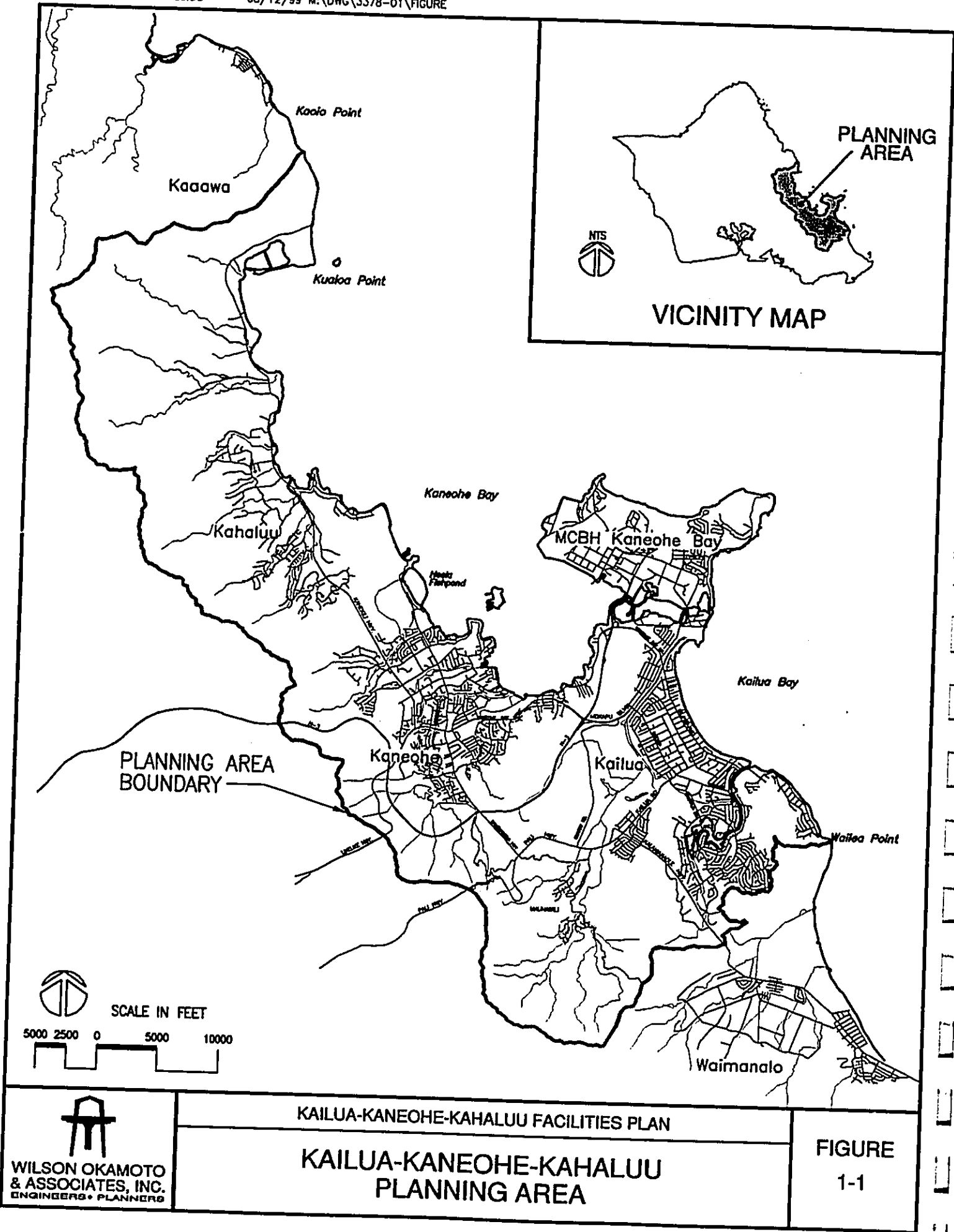
The City and County of Honolulu's Department of Design and Construction (DDC) and Department of Environmental Services (ENV) completed an update of the wastewater facilities plan for the Kailua-Kaneohe-Kahaluu wastewater service area in September 1998. The approved Facilities Plan is a 20-year plan which identifies the future wastewater needs for the Kailua-Kaneohe-Kahaluu wastewater service area and required improvements to the Kailua Regional Wastewater Treatment Plant (WWTP), preliminary treatment facilities, pump stations, and collection and disposal system.

Preparation of an Environmental Impact Statement (EIS) is required pursuant to Chapter 343, *Hawaii Revised Statutes*, and Chapter 200, Title 11, State of Hawaii Department of Health Administrative Rules, based on the use of County and State lands and County funds. As the individual wastewater projects progress toward the design and construction phase, preliminary engineering studies and environmental review will be undertaken for each project on an as-needed basis.

Separate Facilities Plans for the Kaneohe-Kailua area and Kahaluu area were originally prepared by the City in 1984 and 1980, respectively. Accompanying EISs for these Facilities Plans include the *Revised Environmental Impact Statement for Kaneohe-Kailua Wastewater Facilities* prepared by GMP Associates, Inc. for the City and County of Honolulu Department of Public Works in March 1984, and the *Revised Environmental Impact Statement for the Kahaluu Wastewater Treatment and Disposal System* prepared by R. M. Towill Corporation for the City and County of Honolulu Department of Public Works in March 1980.

**1.2 Background**

The Kailua-Kaneohe-Kahaluu wastewater service area is in the Koolaupoko District on the windward side of the Island of Oahu (see Figure 1-1). The



  
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KAILUA-KANEOHE-KAHALUU FACILITIES PLAN

KAILUA-KANEOHE-KAHALUU  
PLANNING AREA

FIGURE  
1-1

service area boundaries extend from Kaoio Point and Waikane Valley to the north, to Wailea Point and Lanikai/Keolu Hills to the south, and inland along the ridgeline of the Koolau Mountain Range. The area encompasses approximately 36,500 acres, or 57 square miles, and includes the suburban communities of Kailua and Kaneohe and the rural-agricultural communities of Kahaluu, Waiahole-Waikane and Kualoa.

The Kailua-Kaneohe-Kahaluu area is served by the Kailua Regional WWTP (see Figure 1-2). Prior to 1994, the planning region was served by three wastewater treatment plants. These included the Kailua WWTP constructed in 1964, the Kaneohe WWTP constructed in 1962, and the Ahuimanu WWTP constructed in 1967. In late 1994, the former secondary treatment plants at Kaneohe and Ahuimanu were converted to preliminary treatment facilities (WWPTF) and the Kailua WWTP was expanded to accommodate the screened wastewater flows from these areas and renamed the Kailua Regional WWTP. Wastewater flows conveyed to the Kailua Regional WWTP receive secondary treatment and are discharged to the receiving waters east of the Mokapu Peninsula through the Mokapu Outfall, which extends approximately 5,000 feet offshore at a depth of about 110 feet.

The Kailua Regional WWTP is designed to treat an average daily flow of 15.25 million gallons per day (mgd). In 1998, the facility processed an average of approximately 12.52 mgd.

The existing collection system consists of approximately 200 miles of gravity lines and force mains ranging in diameter from 6 to 66 inches, and 23 wastewater pump stations (WWPS), excluding the pump stations at the Kaneohe and Ahuimanu WWPTFs. The three major basins in the region are the Kailua Basin, Kaneohe Basin and Ahuimanu Basin. From the Kailua Basin, wastewater is collected primarily through gravity lines and conveyed to the Kailua Regional WWTP. From the Kaneohe and Ahuimanu Basins, wastewater is collected at the respective preliminary treatment facilities and conveyed via force main to the Kailua Regional WWTP. Major problems that plague the system and contribute to hydraulic overloads are groundwater infiltration and storm water inflow. Systems in low-lying areas along the coast are also subject to seawater and root intrusion to the collection system.

There are an estimated 2,119 lots that are unsewered in the Kailua-Kaneohe-Kahaluu region, with over half located in the Kahaluu area. Kahaluu has 1,333 unsewered lots, Kaneohe has 456 unsewered lots, and Kailua has 330 unsewered lots.

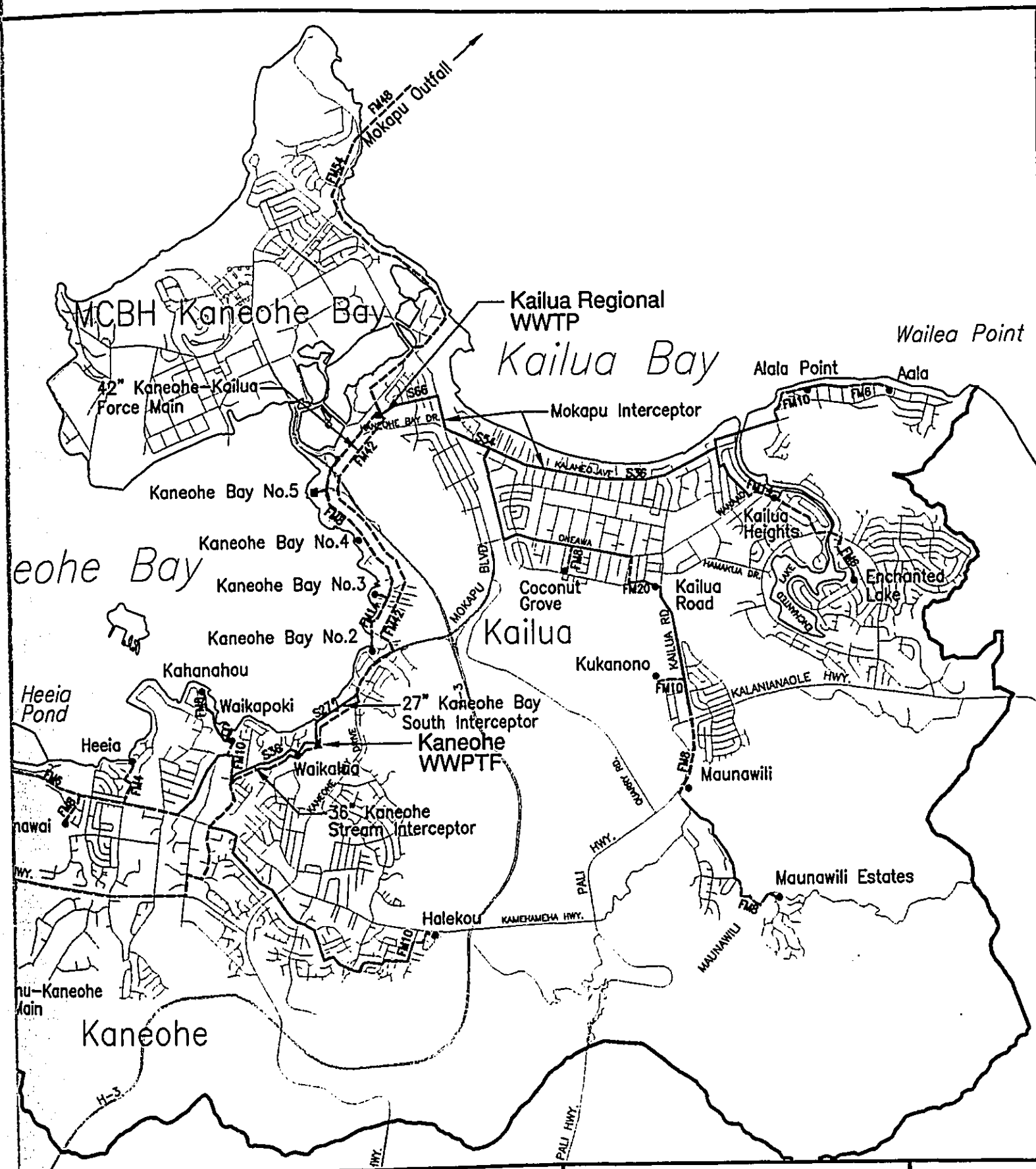
A more detailed description of the existing wastewater system for the Kailua-Kaneohe-Kahaluu service area is included in Section 3.11.2.

### **1.2.1 Preparation of the Facilities Plan Update**

Preparation of the update of the Kailua-Kaneohe-Kahaluu Facilities Plan was initiated in mid-1995 and finalized and approved by the City in September 1998. The Facilities Plan was prepared in accordance with various Federal, State and City and County of Honolulu regulations and programs. These include the Federal Clean Water Act, Environmental Protection Agency (EPA) facilities planning regulations, City and County of Honolulu's 208 Water Quality Management Plan, National Pollutant Discharge Elimination System, and Hawaii Administrative Rules, Title 11-23 relating to Underground Injection Control Program and Title 11-62 relating to Wastewater Systems.

Preparation of the Facilities Plan update was triggered by a Consent Decree (Save Our Bays and Beaches, Hawaii's Thousand Friends, Sierra Club, and Surfrider Foundation vs. City and County of Honolulu, Civil No. 92-00263 DAE) executed in August 1995. The Consent Decree required the plaintiff's participation through a special consultant in the preparation of the Facilities Plan. Dr. Bruce Bell was designated as the Special Consultant to review and provide input to the Plan's preparation. Dr. Bell concluded his review with the finding that "the Plan has been prepared in a manner consistent with good engineering practice and that the recommended alternatives are reasonable alternatives." Further discussion of the Consent Decree is provided in Section 1.4.1.

The following objectives were developed to guide the preparation of the Kailua-Kaneohe-Kahaluu Facilities Plan:



PLAN  
SYSTEM

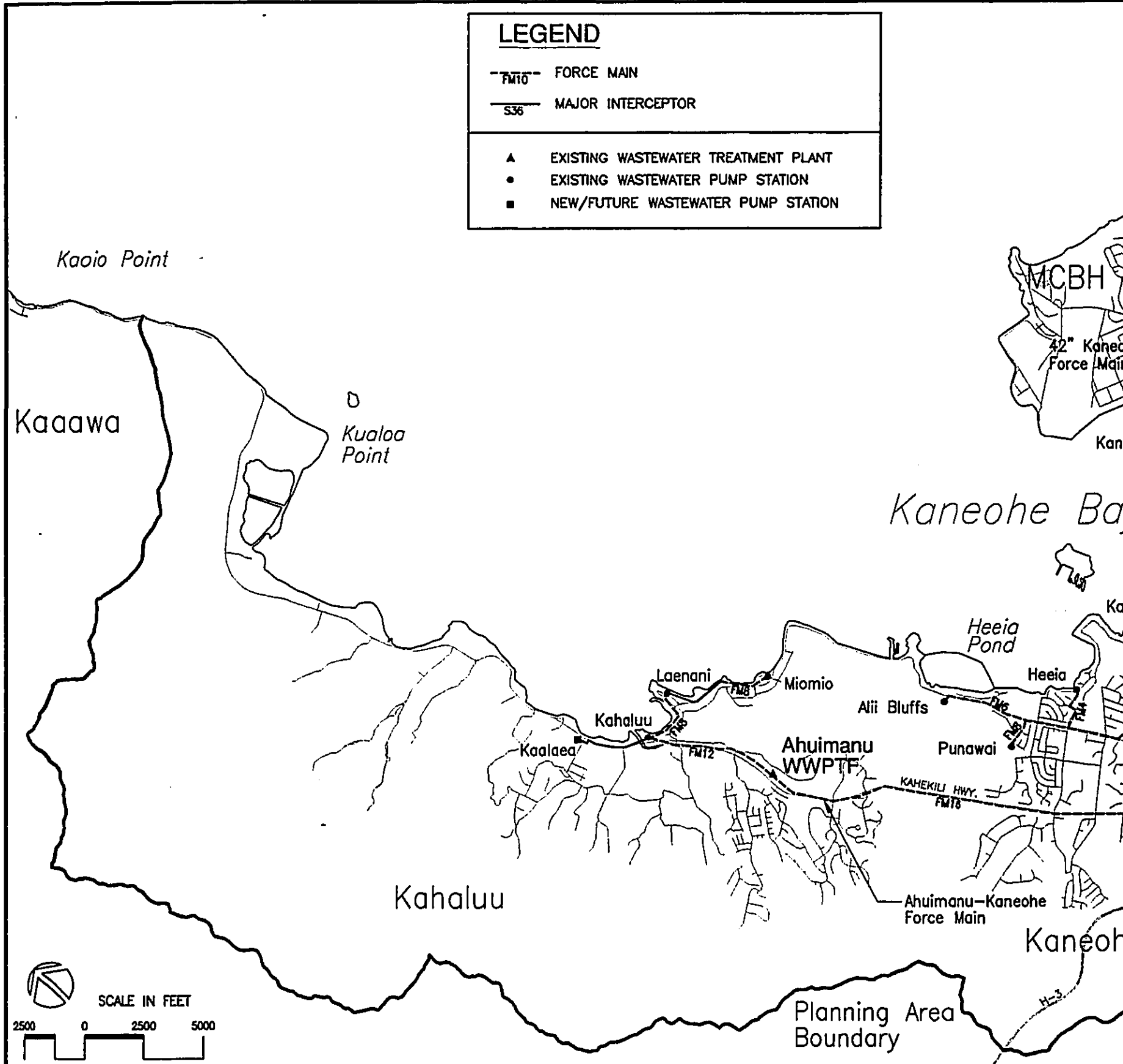
REGIONAL WASTEWATER  
SYSTEM

FIGURE  
1-2

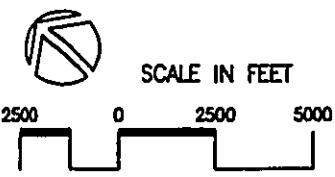
**LEGEND**

— FM10 — FORCE MAIN  
 — S36 — MAJOR INTERCEPTOR

- ▲ EXISTING WASTEWATER TREATMENT PLANT
- EXISTING WASTEWATER PUMP STATION
- NEW/FUTURE WASTEWATER PUMP STATION



01/06/99 M:\DWG\3378-01\FIGURE  
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 NW-SYSTEM.DWG



  
**WILSON OKAMOTO & ASSOCIATES, INC.**  
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KAILUA-KAEOHE-KAHALUU FACILITIES PLAN  
**REGIONAL WASTEWATER SYSTEM**



***Facilities Plan Objectives***

- *Prevent sewage spills and overflows.*
- *Improve sewer service to Windward Oahu.*
- *Extend service to residential areas not served by the public sewer system.*
- *Plan for future improvements that:*
  - *Reduce odor and noise impacts;*
  - *Protect public health; and*
  - *Protect water resources and the environment.*
- *Inform and seek public input in facilities planning.*

The Final Facilities Plan report was prepared in several phases, including the Conceptual Plan (September 1996), Preliminary Plan (February 1997), Interim Plan (February 1998), and Pre-Final Plan (July 1998). During the course of the Facilities Plan preparation, four public informational meetings, one community meeting and one public hearing were conducted in which a total of 15 alternatives and 11 sub-alternatives were developed and presented based on public feedback. A community steering committee was also established to specifically address odor and noise at the Kailua Regional WWTP. Public informational meetings held in March and April 1997 following publication of the Preliminary Plan led to the consideration and evaluation of supplemental alternatives designed to address community concerns regarding wastewater operations and their impacts to the surrounding community. A public informational meeting held in March 1998 for the Interim Plan and a community meeting held at Iana Street in June 1998 led to the development of supplemental alternatives and sub-alternatives to address residents' concerns and opposition to any expansion of facilities at the Kailua Regional WWTP until existing odor and noise problems at the treatment plant are resolved.

Based on the evaluation criteria established to assess all alternatives, including compliance with water quality requirements, cost-effectiveness, community compatibility, and general environmental impacts, the recommended Facilities

Plan consisting of the proposed action described herein was developed. In August 1998, a public informational meeting on the Pre-Final Plan was held in which the recommended Facilities Plan was presented. A public hearing on the Final Plan was held in September 1998.

The Final Plan for the Kailua-Kaneohe-Kahaluu Facilities Plan was approved by the City and County of Honolulu Department of Environmental Services on September 30, 1998.

### **1.3 Project Location**

Kailua Regional WWTP: The Kailua Regional WWTP is located in Aikahi on an approximately 25-acre site (Tax Map Key: 4-4-11: 81) owned by the City and County of Honolulu. The site is bounded by Nuupia Ponds and the Marine Corps Base Hawaii (MCBH) Kaneohe Bay facility to the north and west, Kaneohe Bay Drive and the Aikahi Gardens townhouse complex to the southwest, Aikahi Park and Aikahi Elementary School to the southeast, and Aikahi Park residences to the east.

Kaneohe WWPTF: The Kaneohe WWPTF is located on an approximately 15.9-acre parcel (TMK: 4-5-30: 36) in the Puohala area and is owned by the City and County of Honolulu. Surrounding land uses include the Bay View Golf Course to the west, Kawa Stream and the Bay View Golf Course to the south, open areas and Waikalua Fish Pond to the east, and Kaneohe Stream and residences to the north.

Ahuimanu WWPTF: The Ahuimanu WWPTF is located on an approximately 4.6-acre parcel (TMK: 4-7-04: 6) owned by the City and County of Honolulu. The site is bounded by Kahekili Highway to the west, Ahuimanu Stream to the east, and open areas to the south and north.

There are 23 wastewater pump stations located in the vicinity of residential areas throughout the planning region (see Figure 1-2).

#### **1.4 Project Need**

##### **1.4.1 Consent Decree**

The current update of the Kailua-Kaneohe-Kahaluu Facilities Plan was triggered by a Consent Decree (Save Our Bays and Beaches, Hawaii's Thousand Friends, Sierra Club, and the Surfrider Foundation vs. City and County of Honolulu, Civil No. 92-00263 DAE) executed in August 1995. The suit was filed for alleged violations of the Federal Water Pollution Control Act (Clean Water Act) and the terms and conditions of the National Pollutant Discharge Elimination System (NPDES) permits issued by the State Department of Health (DOH) to the City for discharges at the Kailua and Kaneohe Wastewater Treatment Plants. The Consent Decree was executed in U.S. District Court to resolve the Plaintiff's claim against the City for civil penalties and injunctive relief for all alleged violations that have occurred at the Plants from August 1989 to May 1992.

The Consent Decree provides for the following remedies to address the issues raised by this litigation: a) Plaintiff's participation in the preparation of the Facilities Plan for the Kailua and Kaneohe service areas through a special consultant; b) construction and operation of an ultraviolet light disinfection facility at the Kailua Regional WWTP to disinfect effluent prior to discharge; and, c) monitoring and improvement of the water quality of the Kailua/Kaneohe/Waimanalo watershed areas through the appointed Kailua Bay Advisory Council.

##### **1.4.2 Projected Flows**

The Facilities Plan assesses wastewater system needs and requirements in the service area and how best to provide the improvements to meet those needs. The main determinant of these needs is the amount of wastewater flows which must be accommodated by the collection, treatment and disposal systems. In the Kailua-Kaneohe-Kahaluu region, although limited population growth (approximately 3 percent increase) is expected over the next 20 years, flows are substantially influenced by infiltration and inflow to the collection system. This occurs when storm water enters the collection system as direct

inflow through illegally connected downspouts, area drains, catch basins, or flooded manholes, or as indirect infiltration through defective joints, cracks or other defects in sewer lines.

Groundwater infiltration and storm water inflow into the sanitary sewer systems are two of the major problems creating hydraulic overloads through the pipes, pump stations and treatment plant during heavy rainfall periods. Systems in low lying areas along the coast are also subject to seawater and root intrusion to the collection system.

An assessment of physical conditions and problem areas in the gravity lines was compiled with the assistance of the City and County of Honolulu, Division of Collection System Maintenance as well as from the Second Year Infiltration/Inflow (I/I) study completed by Fukunaga and Associates in December 1995 and updated in August 1997 (Third Year I/I). The I/I study assessed the physical condition of Oahu's sewage collection system. These problems relate primarily to root intrusion, seawater, hydrogen sulfide corrosion, and sagging pipes. The major problem areas in the Kailua-Kaneohe-Kahaluu region are as follows:

- Aikahi-Kailua Town Area in Kailua: Visual and TV inspection indicate extreme deterioration in the existing pipes. Hydraulic analysis indicates inadequacy problems. Most of the problem lines are in the Kalaheo Avenue area and are a result of root intrusion.
- Enchanted Lake-Lanikai Area in Kailua: Investigations of the sewer lines along Hamakua Drive and Kailua Road indicate extensive hydrogen sulfide corrosion. Additionally, the areas along Keolu Drive from Hamakua Drive to Akiohala Street show signs of sagging and ground movement.
- Maunawili-Pohakupu Area in Kailua: Assessment of sewer lines reveals primarily root intrusion problems, mostly in the Maunawili area.

- Kokokahi/Waikalua/Haiku/Lilipuna Areas in Kaneohe: Investigations of the sewer lines in these areas indicate inadequate lines, sagging, root intrusion, and infiltration problems.
- Kahaluu Area: Assessment indicates hydraulic inadequacy problems in sewer lines in the Ahuimanu area.

Existing and projected wastewater flows for the Kailua-Kaneohe-Kahaluu region incorporate population and land use considerations as provided by the City and County of Honolulu Department of Planning and Permitting (formerly Planning Department). By the year 2020, the population of the Kailua-Kaneohe-Kahaluu region is projected to increase 3.2 percent from 105,819 in 1995 to 109,236. Kailua is expected to grow by 4 percent and Kahaluu by 18 percent, while Kaneohe is expected to have a 1 percent decrease in population.

The City has recently established a policy to use the 2-year, 6-hour storm event to determine design peak flows for new projects. This is based on a detailed analysis of 1-year, 2-year, 5-year, and 10-year storm events which was done as part of the Infiltration/Inflow Minimization Study. The analysis of rainfall patterns over a 28-year period showed that the 2-year design storm being used for modeling equates to a flow with a probability of occurrence once every 4 to 6 years. Designing for the 2-year storm would reduce sanitary sewer overflows by 77 percent, while designing for the 5-year storm would reduce overflows by 87 percent. The marginal increase in protection, however, would have substantially higher costs. As a result, the City has decided to use the 2-year storm as the basis for determining peak flows for facilities planning. ~~The EPA has indicated their concurrence with~~ *Concurrence by the EPA is pending regarding* the approach used for this determination.

It is noted that the 5-year storm was used through most of the Facilities Planning process in the development of alternatives and preliminary recommendations. However, the 2-year storm was also considered and assessed relative to planning options and associated costs. This EIS presents the recommendations and costs relative to the 2-year storm given

the City's current policy, but retains for future consideration the recommended options developed for the 5-year storm.

Wastewater flows were projected using the City's Sewer Flow Analysis System (SFAS) model, assuming the 2-year 6-hour storm (approximately 4 inches of rainfall) with the full conveyance of peak flows. Predicted daily average flows and peak hour wastewater flow rates for the Kailua-Kaneohe-Kahaluu region are shown in Table 1-1.

<b>Table 1-1                      Modeled Wastewater Flows                      Kailua-Kaneohe-Kahaluu                      1995 and 2020 (in mgd)</b>					
<b>Facility/Basin</b>	<b>Existing Capacity</b>	<b>1995</b>		<b>2020</b>	
		<b>Ave.</b>	<b>Peak</b>	<b>Ave.</b>	<b>Peak</b>
Ahuimanu WWPTF	3.3	0.9	3.1	1.6	5.9
Kaneohe WWPTF	10.0	5.6	42.6	6.0	43.9
Kailua Basin		5.9	37.2	6.2	38.1
Kailua Regional WWTP	28.0	12.4	80.1	13.9	85.5

The SFAS model data on which the Facilities Plan is based shows that full conveyance of flows from the 2-year storm would require a treatment capacity of 80.1 mgd to handle 1995 peak flows at the Kailua Regional WWTP, and 85.5 mgd by the year 2020. The transport, processing and disposal of these flows would require substantial expansion and modification of the existing treatment facilities and collection system. To reduce the peak flows that need to be processed by the Kailua Regional WWTP, the use of flow equalization facilities are proposed in Kailua, Kaneohe and Ahuimanu to temporarily store wastewater during peak storm periods (see Sections 2.1.1 and 2.1.2.1).

An assessment of the pump station capacities and flow requirements for meeting the 2-year peak storm flows indicated the need to upgrade the hydraulic capacities at a number of pump stations throughout the region to accommodate projected peak flows.

The collection system would need to be substantially improved to convey the peak storm flows. Relief or replacement lines are required to convey the peak flows where inadequate capacity exists. An assessment of the physical conditions and problem areas in the gravity lines throughout the planning region indicates problems related primarily to root intrusion, seawater, hydrogen sulfide corrosion, and sagging pipes. An extensive program of collection system line rehabilitation is proposed to reduce infiltration and inflow during heavy storms (see Sections 2.1.2.2 and 2.1.2.3).

## **2. PROJECT DESCRIPTION**

### **2.1 Proposed Action**

The proposed action involves the implementation of the City's Facilities Plan for the Kailua-Kaneohe-Kahaluu region, consisting of various improvements to the wastewater collection, treatment and disposal system, and the establishment of Sewer Improvement Districts for much of the unsewered areas (see Figure 2-1).

#### **2.1.1 Treatment and Disposal System**

Proposed major improvements to the treatment and disposal system include facility improvements at the Kailua Regional WWTP and Kaneohe and Ahuimanu WWPTFs.

Proposed major improvements are listed here and described in the following sections:

##### Kailua Regional WWTP:

- Modifications within existing plant facilities, including the influent pump station, headworks, primary and secondary clarifiers, dewatering building, and centrifuge
- Ultraviolet (UV) Disinfection Facility (under construction)
- Odor and Noise Control Improvements

##### Kaneohe WWPTF:

- 6.4 MG Flow Equalization (EQ) Basin
- Odor Control System Modifications
- Kaneohe-Kailua Force Main Replacement



Ahuimanu WWPTF:

- New Preliminary Treatment System
- 0.6 MG Flow Equalization Basin
- Odor Control System Modifications
- Ahuimanu Effluent Force Main Replacement

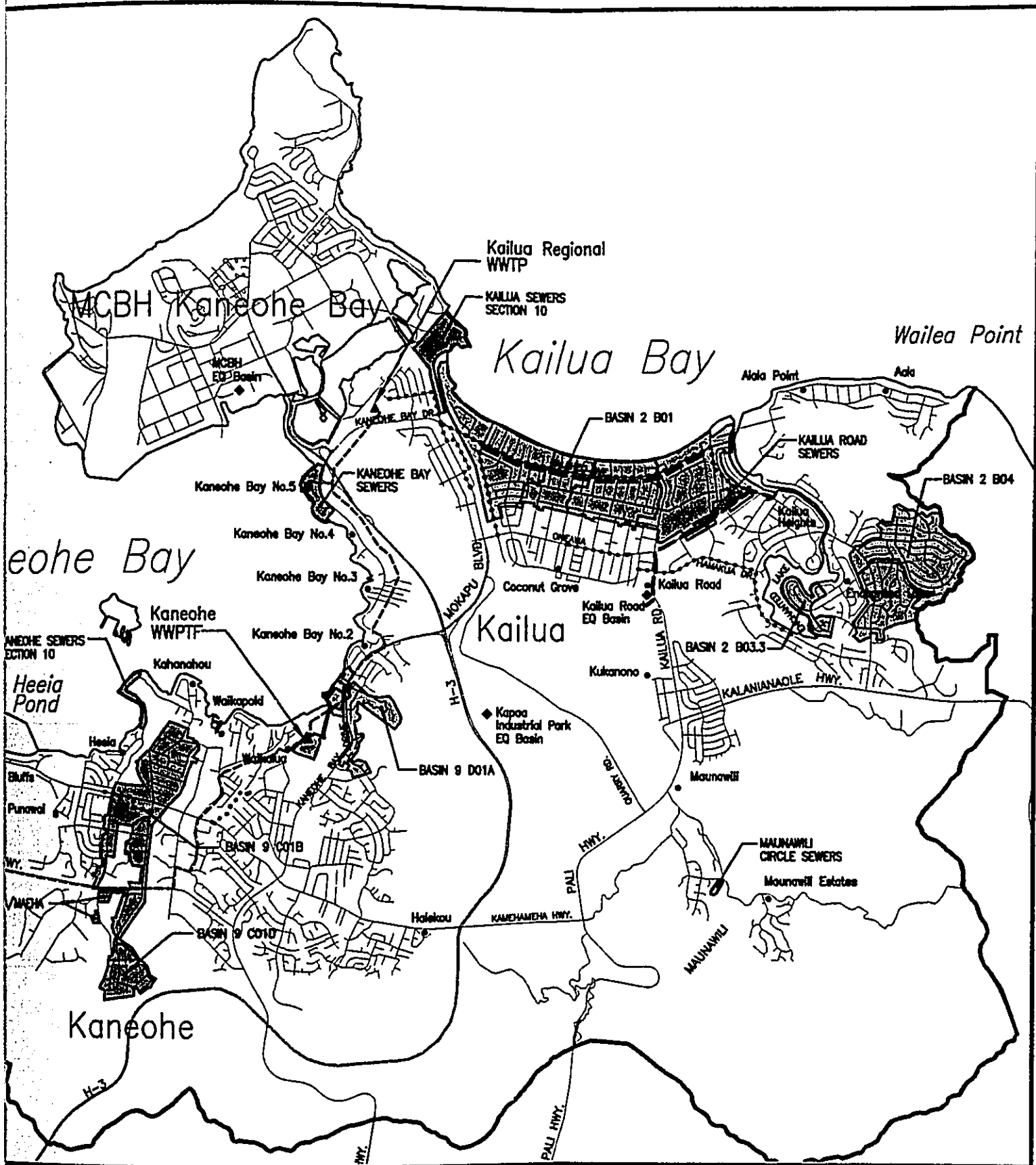
**2.1.1.1 Kailua Regional WWTP**

The Kailua Regional WWTP would be modified to handle secondary treatment from 28 mgd to 35.6 mgd by using existing treatment facilities (see Figure 2-2). *The increased capacity is intended to accommodate peak flows from a 2-year, 6-hour storm event, and is not due to any anticipated or substantial future growth and development in the region.* In lieu of facilities expansion at the plant, up to 1.5 MG of flow equalization facilities would be provided within the Kailua Basin (see Section 2.1.2.1). Additionally, up to 7.0 MG of storage/equalization facilities would be provided at the Kaneohe and Ahuimanu WWPTFs (see Sections 2.1.1.2 and 2.1.1.3).

In order to handle storm conditions, hydraulic improvements are needed to prevent loss of biological solids during the high flow event. Although biochemical oxygen demand (BOD<sub>5</sub>) and solids loading will not increase during the high flow event, certain unit processes will need to be modified to handle the larger flows. The hydraulic capacity-related improvements to the treatment facilities are described below.

**Capacity-Related Improvements:** Proposed improvements include the following:

**Influent Pump Station:** Additional pumping capacity would be added to the existing pump station to meet hydraulic needs during storms. This could include replacement of pump impellers and pump motors to increase flow or installation of a submersible pump in the wet-well. Work would be confined to the inside of the building and will require temporary piping and pumping equipment for a period of time to make the necessary connections. The total capacity would be increased from 18 mgd to 24 mgd.












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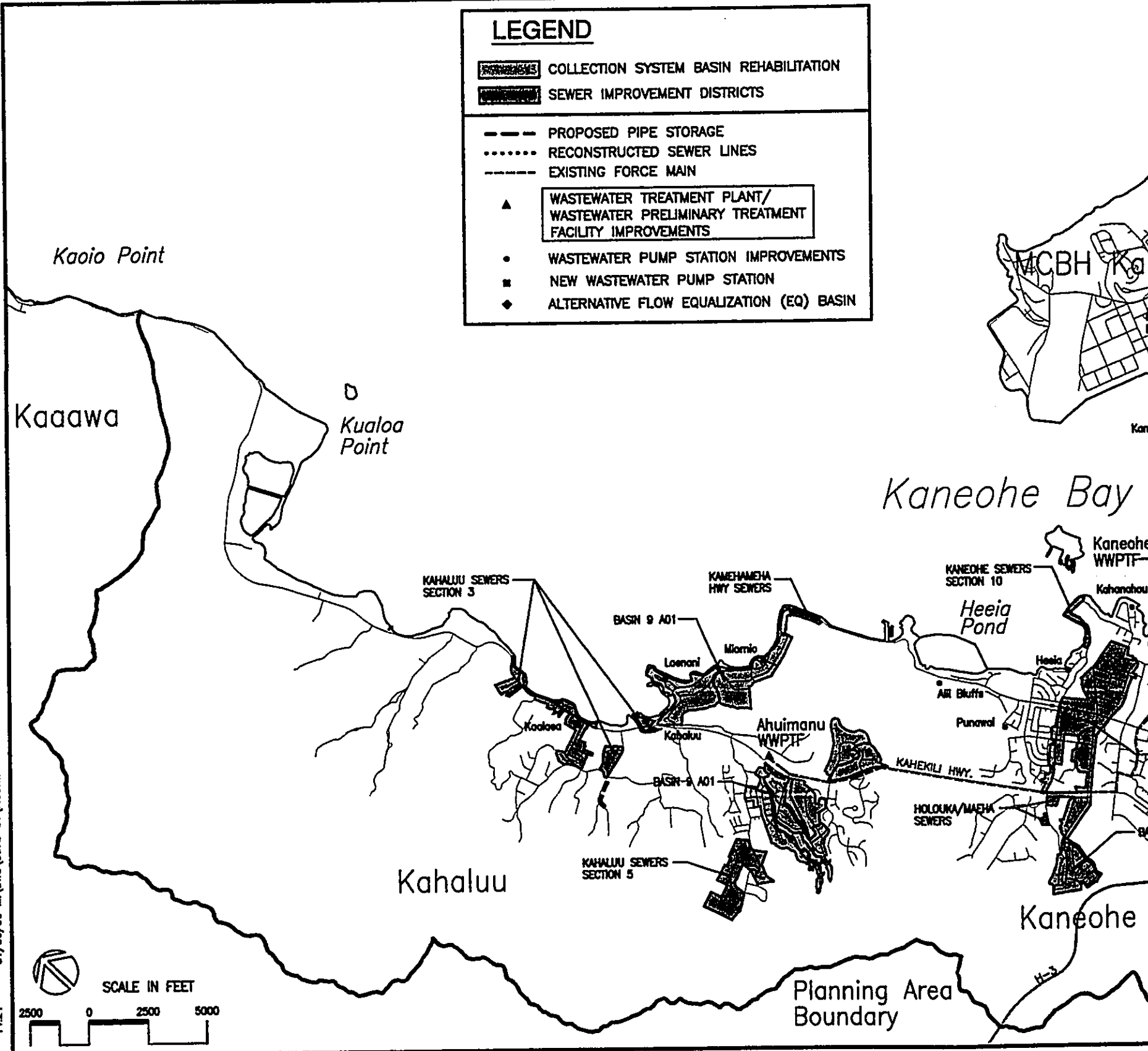
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PROPOSED WASTEWATER  
SYSTEM IMPROVEMENTS

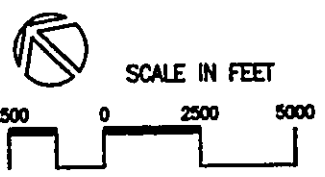
FIGURE  
2-1

### LEGEND

-  COLLECTION SYSTEM BASIN REHABILITATION
-  SEWER IMPROVEMENT DISTRICTS
-  PROPOSED PIPE STORAGE
-  RECONSTRUCTED SEWER LINES
-  EXISTING FORCE MAIN
-  WASTEWATER TREATMENT PLANT/  
WASTEWATER PRELIMINARY TREATMENT  
FACILITY IMPROVEMENTS
-  WASTEWATER PUMP STATION IMPROVEMENTS
-  NEW WASTEWATER PUMP STATION
-  ALTERNATIVE FLOW EQUALIZATION (EQ) BASIN



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 14-24  
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**KAILUA-KANEOHE-KAHALUU FACILITIES PLAN**

**PROPOSED WASTEWATER  
SYSTEM IMPROVEMENTS**

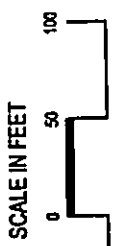
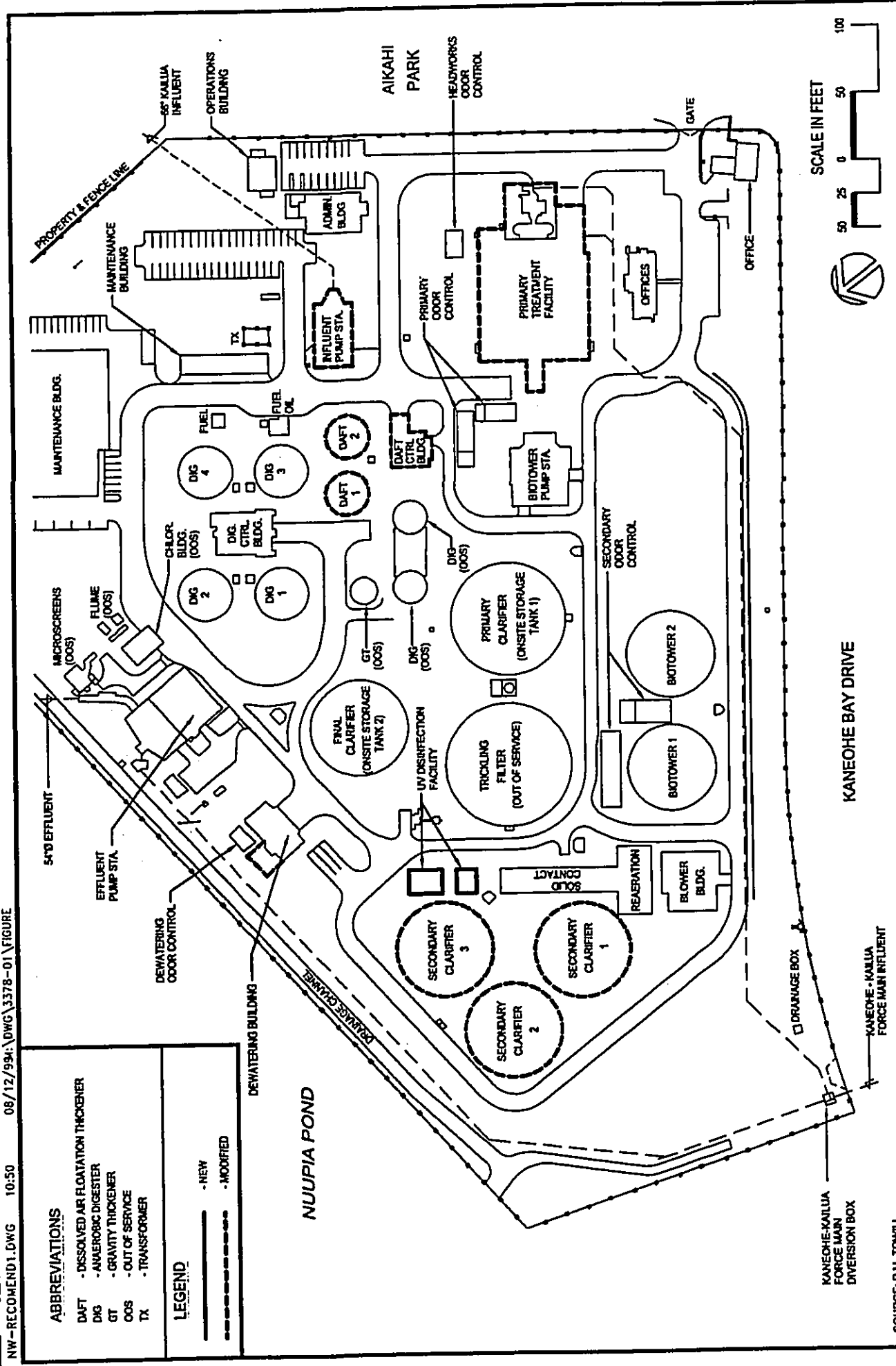
NW-RECOMMEND1.DWG 10:50 08/12/99A:DWG 3378-01 FIGURE

**ABBREVIATIONS**

- DAFT - DISSOLVED AIR FLOTATION THICKENER
- DIG - ANAEROBIC DIGESTER
- GT - GRAVITY THICKENER
- OOS - OUT OF SERVICE
- TX - TRANSFORMER

**LEGEND**

- NEW
- - - - MODIFIED



**FIGURE 2-2**

**KAILUA-KANEOHE-KAHALUU FACILITIES PLAN**  
**KAILUA REGIONAL WASTEWATER TREATMENT PLANT**  
**RECOMMENDED SITE PLAN**

**WILSON OKAMOTO & ASSOCIATES, INC.**  
ENGINEERS • PLANNERS

SOURCE: R.M. TOWILL

**Headworks:** The hydraulic capacity of the grit and screening equipment will be examined and necessary modifications made to handle a peak flow of 24 mgd with sufficient redundancy. It is anticipated that any necessary equipment would be accommodated in the existing structures.

**Primary Clarifiers:** Currently, two problems are associated with the scum troughs' location and accessibility. The first is related to hydraulics during high flows, causing water to pass to the scum troughs during high tank levels. The second is the release of odors to the atmosphere during normal skimming and maintenance activities. The existing trough location would be modified to prevent overflows during the anticipated peak conditions. The existing sludge pump system would be examined to determine if more efficient and trouble-free pumping can be accomplished.

**Secondary Clarifiers:** The existing structures of the three secondary clarifier tanks would remain unchanged. Under normal flow conditions, the tanks deliver a quality effluent. Two major components of each tank would be modified to improve solids capture during peak flow conditions:

- Outlet effluent launders
- Return sludge pickup system.

**Ultraviolet Disinfection:** Construction has commenced on an UV disinfection facility to be comprised of a modular ultraviolet light array that will treat up to 30 mgd of effluent to the highest level of disinfection and will be capable of passing up to 45 mgd hydraulically. Addition of a new flow meter is expected to have a range of 10 to 45 mgd and will be used to control the ultraviolet disinfection system. The UV disinfection facility was previously assessed in the *Final Environmental Assessment for the Disinfection Facility, Kailua Regional Wastewater Treatment Plant* prepared by M&E Pacific, Inc. for the City and County of Honolulu Department of Wastewater Management in September 1996.

**Dewatering Building:** Proposed improvements include modification of the building to accommodate entrance of larger trucks and an upgraded building ventilation system.

**Centrifuge:** One additional centrifuge will be required within the existing dewatering building.

**Other Improvements:** Installation of these capacity improvements will require ancillary piping and support equipment. These will be detailed in the respective preliminary engineering phase for each improvement project.

**Non-Capacity-Related Improvements:** Proposed improvements include the following:

**Odor and Noise Control Improvements:** In an effort to resolve odor and noise concerns associated with the Kailua Regional WWTP, the City Department of Environmental Services is establishing measures to mitigate *noxious nuisance* air emissions and noise at the plant.

**Odor Control Improvements:** *The City is undertaking short-, intermediate- and long-term odor mitigation measures to reduce the presence of all sources of noxious air emissions emission of air pollutants.* These measures include maintenance and operation activities, chemical treatment to reduce entry level of odorous components into treatment processes, and odor reduction systems installed to handle off-gases from unit processes. A detailed discussion of air quality impacts and mitigation measures is included in Section 4.5.

**Noise Control Improvements:** Recommended noise mitigation measures at the plant include construction of 10-foot high noise barrier walls for the Headworks and Primary Odor Control Fans; installation of a limp-mass barrier material with fiberglass insulation to be hung from the eave of the roof over the Effluent Pumps; and, construction of a three-sided, open-top noise enclosure around the air-cooled condensing unit of the Administration Building. A detailed discussion of noise impacts and mitigation measures is included in Section 4.6.

**Landscaping:** Landscape improvements for aesthetic purposes have recently been completed, including the planting of a row of trees along the Aikahi Park (southeast) boundary of the treatment plant to screen the facility from the Park, Aikahi Elementary School and nearby residential area, and infilling of the existing hedge near the plant's entrance along Kaneohe Bay Drive. Additional

trees, shrubs and flowering plants would be planted as necessary during other phases of capacity, odor and noise control improvements.

**2.1.1.2 Kaneohe WWPTF**

Proposed improvements include the following (see Figure 2-3):

**Flow Equalization Basin:** The 6.4 MG flow equalization basin with associated pumps would regulate peak flows to a maximum flow of 10.5 mgd to the influent pump station, screening process, and grit removal process. Planned improvements also include modifications to the influent pump station, including upgrading of the pumps and degritting. The equalization basin and other improvements would be consolidated to the eastern side of the site to enable coexistence with development of a proposed public park on a portion of the Kaneohe WWPTF site.

**Odor Control System Modifications:** An analysis will be performed in the preliminary engineering phase ~~defining the approach~~ to *review options or approaches in defining* odor control improvements to determine if the existing odor control system can be expanded or modified for the new equalization basin, or if a new system is needed.

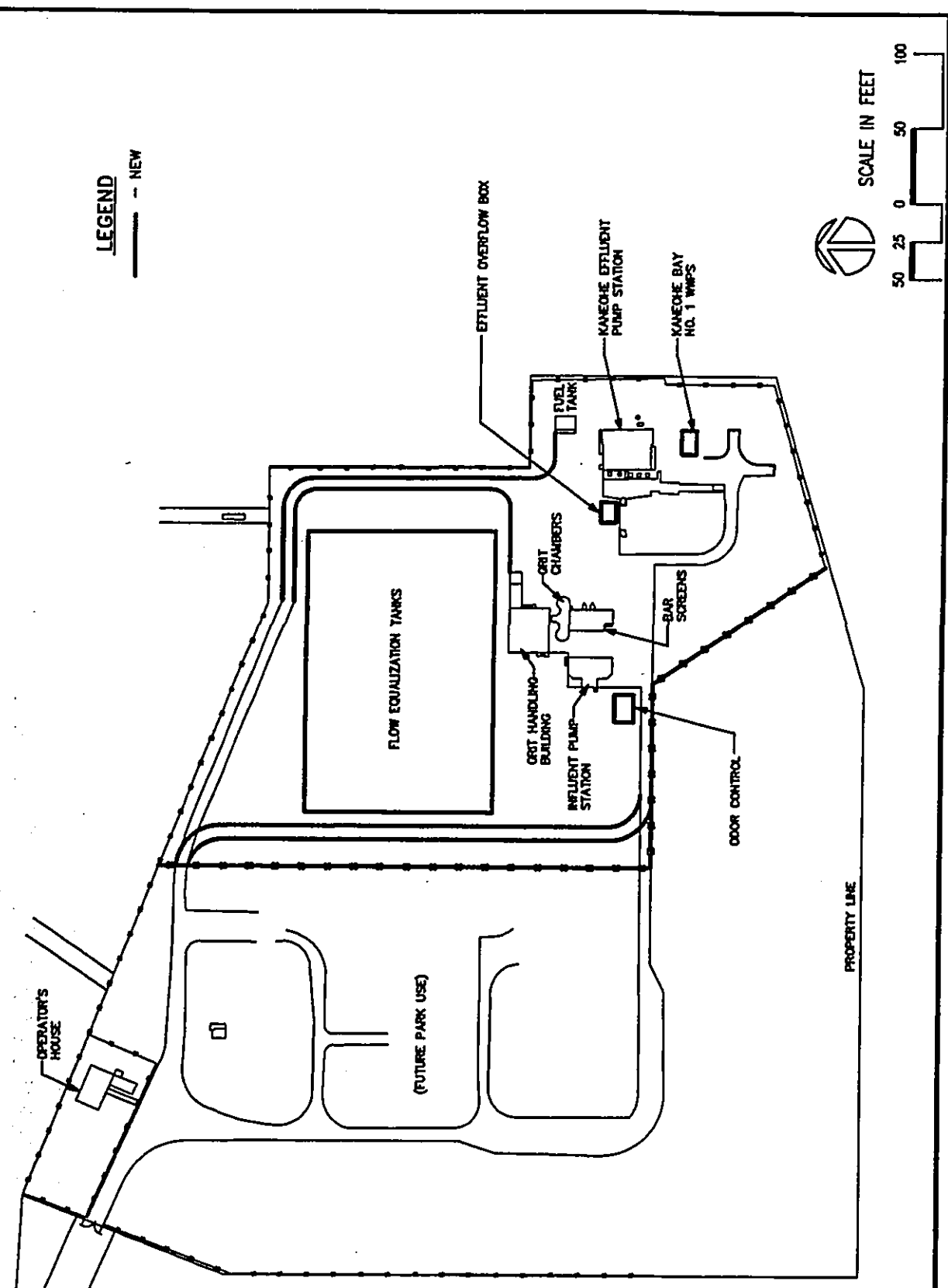
**Kaneohe-Kailua Effluent Force Main:** It is expected that the Kaneohe-Kailua effluent force main will reach the end of its service life within the planning period and will require replacement.

**2.1.1.3 Ahuimanu WWPTF**

Proposed improvements include the following (see Figure 2-4):

**New Preliminary Treatment System:** The preliminary treatment process would be upgraded to provide efficient screening and grit removal at capacities up to 5 mgd and would replace the existing preliminary treatment system.

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**LEGEND**  
—— NEW

SCALE IN FEET  
50 0 50 100

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KAILUA-KANEOHE-KAHALUU FACILITIES PLAN

**KANEOHE WASTEWATER PRELIMINARY TREATMENT FACILITY  
RECOMMENDED SITE PLAN**

**FIGURE  
2-3**



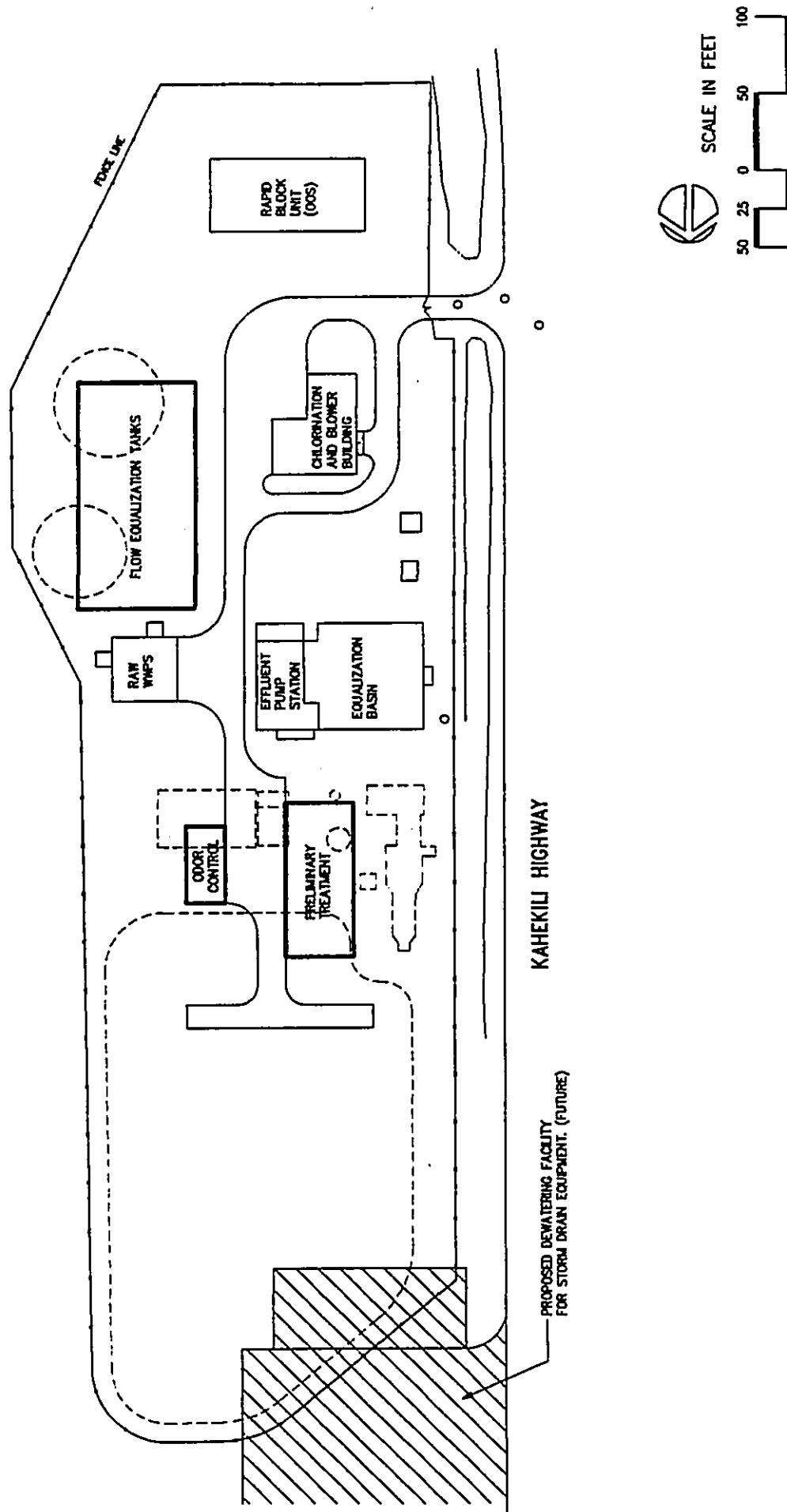
**ABBREVIATIONS:**

OOS OUT OF SERVICE

**LEGEND:**

— NEW OR MODIFIED PROCESS OR STRUCTURE

- - - STRUCTURES REMOVED



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KAILUA-KANEOHE-KAHALUU FACILITIES PLAN  
**AHUIMANU WASTEWATER PRELIMINARY TREATMENT FACILITY  
RECOMMENDED SITE PLAN**

**FIGURE**  
2-4

**Flow Equalization Basin:** The 0.6 MG flow equalization basin would regulate peak flows to a maximum flow of 1.1 mgd to the effluent pump station and force main.

**Odor Control System Modifications:** An analysis will be performed in the preliminary engineering design phase ~~defining the approach~~ to *review options or approaches in defining* odor control improvements to determine if the existing odor control system will be adequate for the new equalization basin, or if a new system is needed.

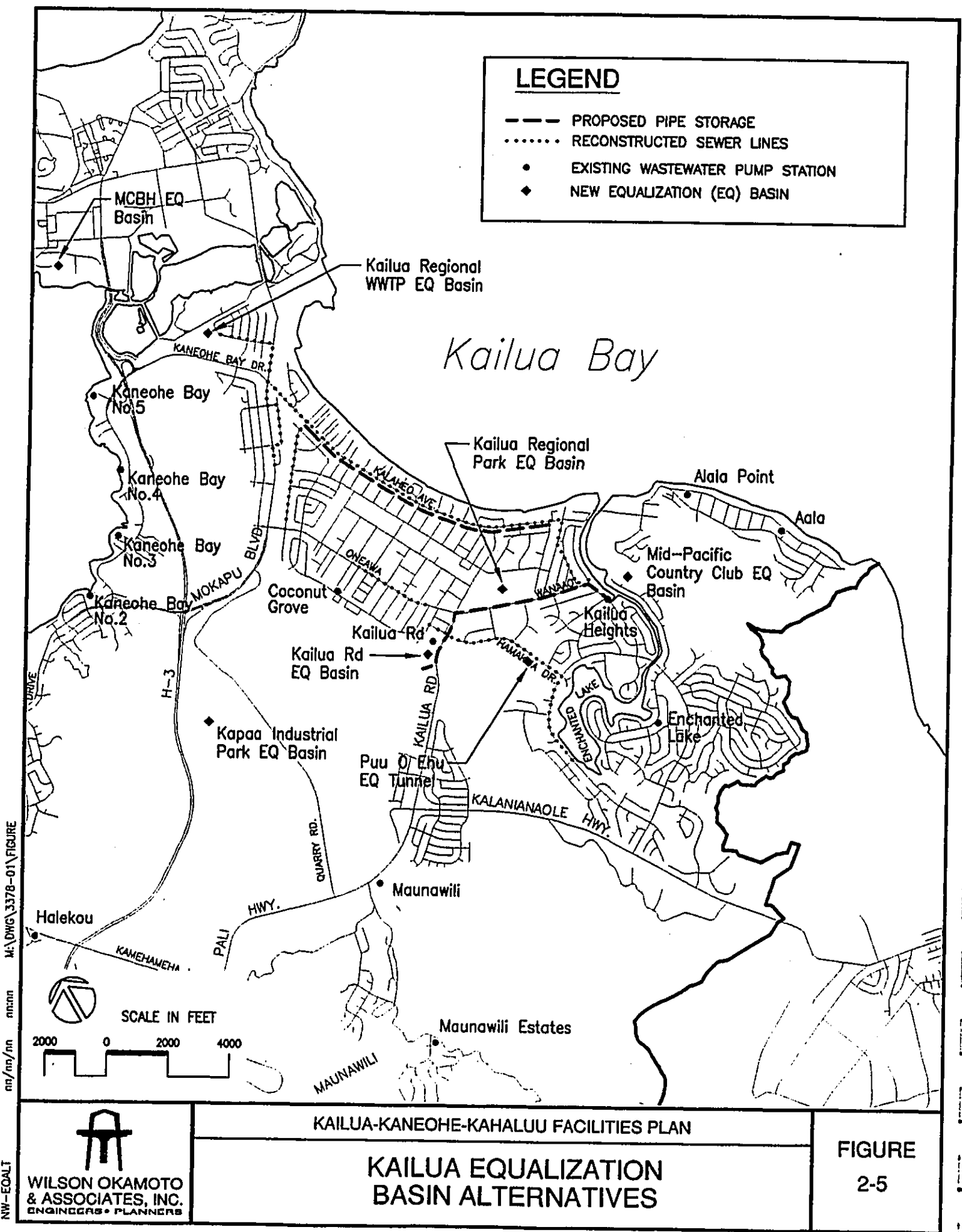
**Ahuimanu Effluent Force Main:** It is expected that the Ahuimanu effluent force main will reach the end of its service life within the planning period and will require replacement.

### **2.1.2 Collection System Improvements**

Proposed improvements to the collection system include the provision of flow equalization facilities for the Kailua Basin, the rehabilitation of up to seven (7) collection system basins, provision of relief lines and the rehabilitation/replacement of lines throughout the Kailua and Kaneohe Basins, pump station modifications, and the implementation of Sewer Improvement Districts in nine (9) areas.

#### **2.1.2.1 Kailua Basin Flow Equalization Facilities Alternatives**

A range of alternatives was considered for the provision of flow equalization facilities for the Kailua Basin (see Figure 2-5). This would allow for peak flows to be stored and then released back to the system at a reduced flow rate. The net effect of this equalization is a lower peak flow to the wastewater treatment plant than would have occurred if the storm peak flow were allowed to flow directly to the treatment plant for processing. The provision of flow equalization facilities for the Kailua Basin would reduce peak flows and eliminate the need to provide new and expanded treatment facilities.



The Facilities Plan recommended flow equalization for the Kailua Basin as depicted by scenarios in Table 2-1. At the time of the Final Facilities Plan, it was undecided whether the 2-year storm or the 5-year storm would be pursued as the basis for determining design peak flows. However, the City has since established a policy to use the 2-year, 6-hour storm event *with pending* the concurrence of the EPA (see Section 1.4.2).

<b>Table 2-1</b> <b>Kailua-Kaneohe-Kahaluu Final Facilities Plan</b> <b>Kailua Flow Equalization Scenarios and Recommendations</b>		
	<b>Previous I/I Reduction</b> <b>35%</b>	<b>Anticipated I/I Reduction</b> <b>40%+</b>
<b>2-Year Storm</b>	Kailua RWWTP (use existing storage) [1.5 MG]	Kalaheo-Wanaao (pipe storage) [0.5+0.95 MG]
<b>5-Year Storm</b>	MCBH K-Bay EQ Basin [2.75 MG] Or Kalaheo-Wanaao (pipe storage), Kailua Rd WWPS EQ Basin [0.5+0.75+1.5 MG]	Kailua RWWTP-Kalaheo Ave. [2.1+0.5 MG]
<b>Notes:</b> <ul style="list-style-type: none"> <li>▪ Storage volumes in brackets</li> <li>▪ Previous I/I Reduction: reduction conservatively expected</li> <li>▪ Anticipated I/I Reduction: reduction likely to be achieved</li> <li>▪ If I/I reduction not achieved (less than 30%) for 5-year storm, then pursue EQ basin at Kapaa Industrial Park</li> </ul>		

The other uncertainty in the selection of a Kailua Basin equalization alternative is the extent of reduction in infiltration and inflow (I/I) to the sewer system that would be achieved by rehabilitation projects. The City proposes to rehabilitate up to seven (7) collection system basins in the Kailua-Kaneohe-Kahaluu region, having begun with the pilot project for basins in the Enchanted Lake area (see Section 2.1.2.2). The extent of reduction in infiltration/inflow achieved by the rehabilitation of lines is expected to be approximately 35 to 38 percent, based on experiences elsewhere as well as results from the pilot project rehabilitation of main lines in a basin in the Enchanted Lake area.

With the City's decision to pursue the 2-year storm as the basis for planning and design, the 5-year alternatives could be eliminated. However, they are retained for consideration since these options could be found to be more favorable upon further engineering analysis.

**Kalaheo-Wanaao Pipe Storage:** The recommended option is the Kalaheo Avenue and Wanaao Road pipe storage (2-year storm, anticipated I/I reduction of 40 percent or more). The recommended alternative is to provide for 0.5 MG of in-pipe storage by rehabilitating portions of the existing 36-inch and 66-inch lines along Kalaheo Avenue which are to be replaced by separate lines this year, and providing 0.95 MG of in-pipe storage through a new 60-inch gravity line extending approximately 6,500 feet along Wanaao and Kailua Roads between the Kailua Heights and Kailua Road WWPSs.

**Kailua Regional WWTP Storage:** The alternative recommendation (if 35 percent or less reduction in I/I is attained) is to reuse the existing unused clarifier tanks at the Kailua Regional WWTP, using 1.5 MG of the 2.1 MG capacity of unused tanks. Rehabilitation improvements to the tanks would be required to provide storage. A pump diversion system at the Kailua Regional WWTP to the equalization basins would be provided. No expansion of treatment capacity would be made to the existing headworks/influent pump station; however, increased hydraulic capacity would be necessary to handle increased storm flows. Upgraded equipment would be designed to meet stringent noise mitigation requirements and would be housed in existing structures. New diversion and return pump structures would be placed below ground and submerged pumps would be used to mitigate noise. Odor control improvements would be provided.

Other options which could be considered (previously listed under 5-year storm heading but downsized to match the 2-year storm storage requirement) include:

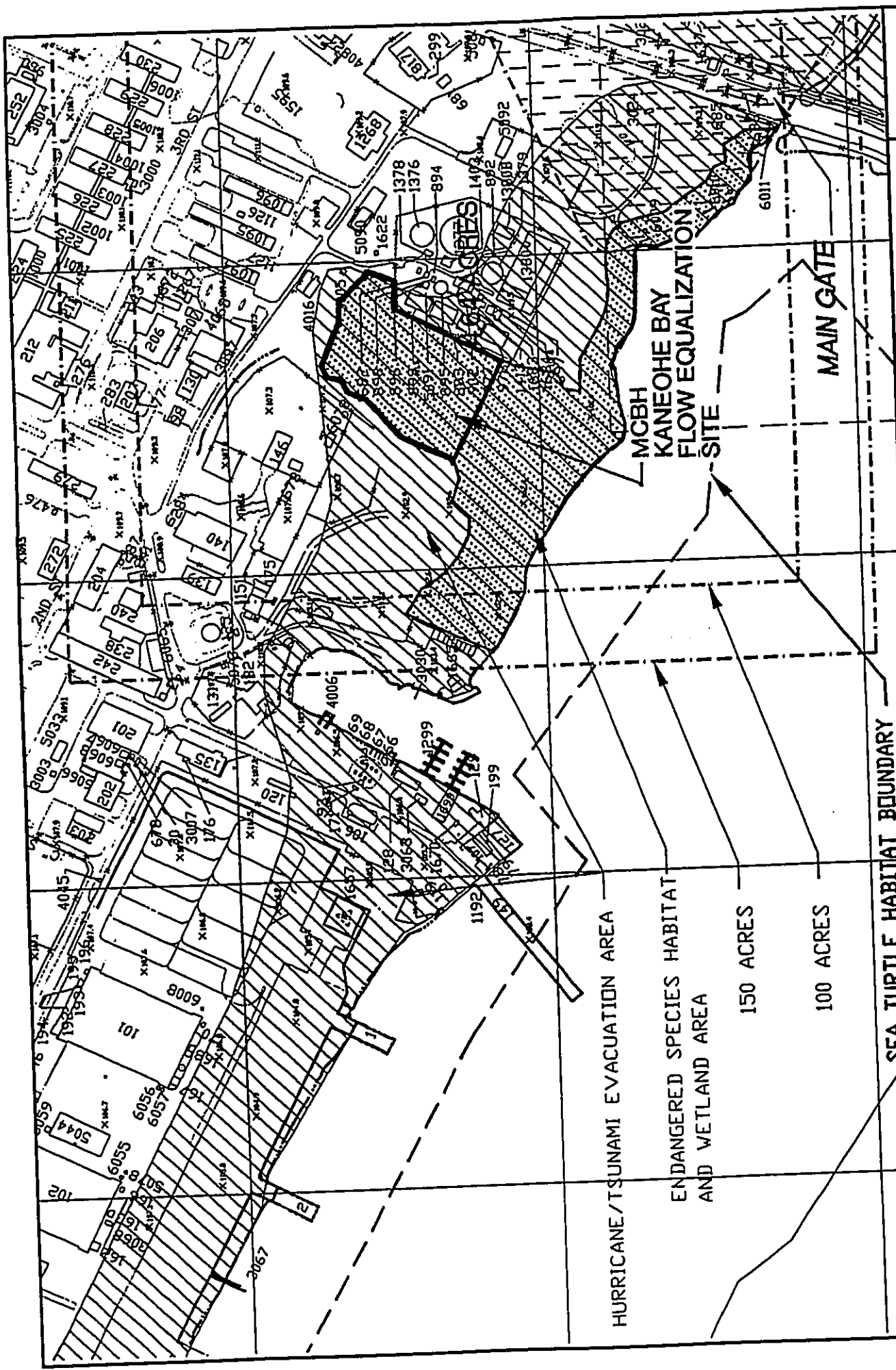
- **MCBH Kaneohe Bay EQ Basin:** In this alternative, a 1.5 MG equalization basin (above-ground) would be provided at the MCBH Kaneohe Bay located on Mokapu Peninsula north of the Kailua Regional WWTP. The equalization basin would be constructed on vacant land owned by the United States of America, Department of the Navy adjacent to and west

of the existing MCBH Kaneohe Bay wastewater treatment plant (TMK: 4-4-08: 1) (see Figure 2-6). The equalization basin site is located north of Nuupia Ponds and includes wetland areas which would need to be taken into consideration in the siting and development of the facility. Odor control improvements would be provided.

A new pump station and influent line at the Kailua Regional WWTP would be required, along with an approximately 5,500-foot, 24-inch transmission line between the pump station and the MCBH Kaneohe Bay. The secondary treatment facility at the MCBH Kaneohe Bay would be improved to process stored flows, then discharge directly to the Mokapu Outfall. The MCBH Kaneohe Bay wastewater treatment plant would also be upgraded to provide R-1 quality effluent for irrigation. Currently, about 0.5 mgd of reclaimed effluent from the MCBH Kaneohe Bay treatment plant is used for irrigation of the golf course located on Base. Additional solids contact, filtration, and ultraviolet disinfection processes would be added for the MCBH to produce R-1 quality effluent for irrigation. If this alternative is pursued, an environmental review process would be undertaken at that time, as may be required.

Additional coordination is being pursued with the Base Facilities and Environmental Compliance Departments of the MCBH Kaneohe Bay to determine if the site adjacent to the existing treatment plant could be used to develop the required wastewater facilities.

- **Kalaheo-Wanaao Pipe Storage and Kailua Road WWPS EQ Basin:** In this alternative, flow equalization would be provided through 0.5 MG of in-pipe storage obtained by rehabilitating portions of the 36-inch and 66-inch Kalaheo Avenue sewer lines to be replaced, and a 1.0 MG equalization basin adjacent to the Kailua Road WWPS. Improvements to the Kailua Road WWPS would include pump and wet-well capacity upgrades.




FIGURE

2-6

KAILUA-KANEOHE-KAHALUU FACILITIES PLAN

MCBH KANEOHE BAY FLOW EQUALIZATION SITE

  
 WILSON OKAMOTO  
 & ASSOCIATES, INC.  
 ENGINEERS - PLANNERS

HURRICANE/TSUNAMI EVACUATION AREA

ENDANGERED SPECIES HABITAT  
AND WETLAND AREA

150 ACRES

100 ACRES

SEA TURTLE HABITAT BOUNDARY

MAIN GATE

The 1.0 MG equalization basin would be located on an approximately 1.6-acre vacant site owned by the State of Hawaii (TMK: 4-2-16: 2). The site is bounded by Kailua Road to the south, the Kailua Road WWPS and landscaped area to the northeast and east, and Kawai Nui Marsh to the north and west. The equalization basin would be placed partially underground and a mini-park developed above to maintain aesthetic compatibility. Odor control improvements would be provided.

- **Kailua Regional WWTP-Kalaheo Avenue Pipe Storage:** This alternative is to provide for 2.1 MG of flow equalization at the existing Kailua Regional WWTP by modifying the existing unused primary and secondary clarifier tanks, and 0.5 MG of in-pipe storage by rehabilitating portions of the 36-inch and 66-inch Kalaheo Avenue sewer lines. Improvements to the primary clarifier, trickling filter and final clarifier tanks (rehabilitation and roof cover) would be required to provide storage. Other improvements would include odor control improvements for the equalization basins, a pump diversion system at the Kailua Regional WWTP to the equalization basins, and return pumps from the equalization basins to the headworks/influent pump station. Expansion of the treatment capacity to 24 mgd would be made to the existing headworks/influent pump station.
- **Kapaa Industrial Park EQ Basin:** This alternative is to provide for a 1.5 MG flow equalization basin (above-ground) at Kapaa Industrial Park located west of Kawai Nui Marsh and Kapaa Quarry Road. The Kapaa Industrial Park (TMK: 4-2-15: 8), owned by Castle Estate and leased to Ameron, Inc., encompasses industrial-zoned lands below the former Kapaa Landfill site. The site is bordered to the north by the H-3 Interstate Freeway and the Ameron Quarry is located to the west. The site is relatively flat and separated from residential areas by Kawai Nui Marsh. Most of the Industrial Park site has been developed as an industrial subdivision, with existing uses including warehouses and other light industrial and commercial businesses.

Associated improvements would include pump station improvements to the Kailua Heights WWPS (pump and wet-well capacity upgrades) and Kailua Road WWPS (new pumps/wet-well) to provide adequate pumping capacity to the Kapaa site. A 24-inch force main would extend approximately 6,600



feet from the Kailua Heights WWPS to the Kailua Road WWPS. From the Kailua Road WWPS, a 30-inch line would extend approximately 16,300 feet along Oneawa Street and Kapaa Quarry Road to Kapaa Industrial Park. A booster pump station along Kapaa Quarry Road would be required to convey flows from the Kailua Road WWPS to Kapaa.

#### **2.1.2.2 Collection System Basin Rehabilitation**

The rehabilitation of up to seven (7) collection system basins is proposed to reduce infiltration/inflow to the collection system during heavy storms (see Figure 2-1). Rehabilitation involves sealing sewer mains, manholes and lower laterals (i.e., the portions of the service laterals located in the public right-of-way with techniques such as Cured-in-Place Pipe and sliplining). Rehabilitation serves to reduce the peak flows at the plant since less rainwater gets into the sewer system. The seven (7) basins include three (3) basins in Kailua, three (3) basins in Kaneohe, and one (1) basin in Kahaluu.

**Kailua - Basin 2B01 (Kalaheo Avenue area) Rehabilitation:** Seal sewer mains, manholes and lower laterals to reduce infiltration and inflow during heavy storms.

**Kailua - Basins 2B03.3 and 2B04 (Enchanted Lake area) Rehabilitation:** Rehabilitate lower laterals to reduce infiltration/inflow during heavy storms.

**Kaneohe - Basins 9C01B (Lilipuna area), 9C01D (Haiku Village area) and 9D01A (Kokokahi and Waikalua areas) Rehabilitation:** Seal sewer mains, manholes and lower laterals to reduce infiltration and inflow during heavy storms.

**Kahaluu - Basin 9A01 (Kahaluu and Ahuimanu areas) Rehabilitation:** Seal sewer mains, manholes and lower laterals to reduce infiltration and inflow during heavy storms.

### 2.1.2.3 Collection System Lines

The provision of relief lines and the rehabilitation/replacement of lines throughout the Kailua and Kaneohe basins are proposed to increase the collection system's capacity. Relief involves the installation of a new line to provide additional hydraulic capacity to an existing line. Rehabilitation is the repair or restoration of an existing line. Replacement involves the installation of a new line due to hydraulic and/or structural deficiencies.

For Kaneohe/Kahaluu, approximately 1,890 lineal feet of 8- to 36-inch relief lines would be needed, while in Kailua, approximately 8,190 lineal feet of 8- to 36-inch relief lines would be needed. In Kaneohe/Kahaluu, approximately 4,500 lineal feet of 27- and 30-inch lines would need to be rehabilitated/replaced. In Kailua, approximately 34,600 lineal feet of 12- to 66-inch lines would need to be rehabilitated/replaced. In addition, structurally deteriorated sewers and lines throughout the region would need to be rehabilitated/replaced within the planning period.

The major collection system improvement projects which are planned in the region are shown in Figure 2-1 and described below:

**Kainehe Street, Hamakua Drive, Keolu Drive Reconstructed Sewer:** Rehabilitate approximately 1,100 feet of 12- and 36-inch lines which have cracks and extensive hydrogen sulfide corrosion. Provide approximately 7,300 feet of 18- and 30-inch relief lines along Hamakua Drive and Keolu Drive from Kailua Road to Kiukee Place to increase capacity. These proposed improvements were previously assessed in the *Final Environmental Assessment for the Kainehe Street, Hamakua Drive and Keolu Drive Reconstructed Sewer Project* prepared by Akinaka & Associates, Inc. for the City and County of Honolulu Department of Design and Construction in March 1999.

**Kainui Drive Trunk Sewer Reconstruction:** Rehabilitate approximately 3,000 feet of corrosive 48-inch lines. This proposed project was previously assessed in the *Final Environmental Assessment for Kainui Drive Trunk Sewer Reconstruction* prepared by Shimabukuro, Endo & Yoshizaki, Inc. for the City and County of Honolulu Department of Design and Construction in September 1999.

**Kalaheo Avenue Reconstructed Sewer:** Rehabilitate approximately 1,800 feet of the 54-inch line from the Kalaheo Avenue/Kainui Drive intersection to the Kalaheo Avenue/Mokapu Boulevard intersection to reduce further infiltration and corrosion, and replace approximately 12,000 feet of severely corroded 24- and 36-inch lines in Kalaheo Avenue and Wanaao, Aumoe and Kailua Roads. Also includes replacement of approximately 3,400 feet of the 66-inch line from the Mokapu Boulevard/Kalaheo Avenue intersection to the Kailua Regional WWTP. These proposed improvements were previously assessed in the *Revised Final Environmental Assessment for the Kalaheo Avenue Reconstructed Sewer* prepared by ParEn Inc., dba Park Engineering for the City and County of Honolulu Department of Design and Construction in April 1999.

**Oneawa Street Sewer Rehabilitation:** Rehabilitate/replace approximately 3,000 feet of corrosive 42-inch lines.

**Ilimalia Loop/Mokapu Boulevard Reconstructed Sewer:** Rehabilitate/replace approximately 3,000 feet of corrosive 24- and 27-inch lines.

**Kailua Relief Sewers:** Rehabilitate/replace approximately 8,190 feet of hydraulically inadequate 8- to 36-inch sewer relief lines.

**Kailua Rehabilitation/Replacement Sewers:** Rehabilitate/replace structurally deteriorated sewers and lines within the planning period.

**Kaneohe/Kamehameha Highway Reconstructed Sewer:** Rehabilitate/replace approximately 2,500 feet of corrosive 27-inch lines.

**Halemuku Place-Waikalua Reconstructed Sewer:** Rehabilitate/replace approximately 2,000 feet of corrosive 27- and 30-inch lines.

**Kaneohe Relief Sewers:** Rehabilitate/replace approximately 1,890 feet of hydraulically inadequate 8- to 36-inch sewer relief lines in Kaneohe and Kahaluu.

**Kaneohe-Kahaluu Rehabilitation/Replacement Sewers:** Rehabilitate/replace structurally deteriorated sewers and lines within the planning period.

**2.1.2.4 Pump Station Modifications**

Proposed pump station modifications include increasing pumping station capacities as required to convey peak flows and rehabilitation of the stations and force mains. Pump station replacement and force main replacement and/or rehabilitation are also programmed as needed due to the design life of these facilities (50 years) or pump station component systems (10 to 40 years) expiring during the planning period. The exact needs and improvements would be determined during the preliminary engineering phase of the project. Pump station modifications are proposed for 22 WWPSs as described in Table 2-2.

Table 2-2 Pump Station Modifications						
WWPS	Replace/ Upgrade Pumps	Rehab. Pump Station	Replace/ Rehab. Force Main	Emergency Pump	Emergency Generator	Gravity Overflow Pipe
Aala		✓	✓			
Alala Point		✓	✓	✓	✓	
Coconut Grove		✓	✓			✓
Enchanted Lake	✓	✓	✓		✓	
Kailua Heights	✓	✓	✓	✓	✓	✓
Kailua Road	✓	✓	✓		✓	
Kukanono		✓	✓	✓		✓
Maunawili		✓	✓	✓	✓	✓
Maunawili Estates		✓	✓		✓	✓

Table 2-2 (cont.) Pump Station Modifications						
WWPS	Replace/ Upgrade Pumps	Rehab. Pump Station	Replace/ Rehab. Force Main	Emergency Pump	Emergency Generator	Gravity Overflow Pipe
Miomio		✓	✓	✓		
Kahanahou		✓	✓	✓		
Waikalua	✓	✓	✓	✓		
Punawai		✓	✓			
Alii Bluffs		✓	✓			
Heeia		✓				✓
Waikapoki		✓	✓	✓		
Halekou		✓	✓	✓		✓
Kahaluu	✓	✓		✓	✓	
Laenani		✓	✓			✓
Kaneohe Bay No. 2		✓	✓	✓		
Kaneohe Bay No. 3		✓	✓			✓
Kaneohe Bay No. 4		✓	✓			

In addition to the proposed pump station modifications, construction of two new pump stations and associated force mains are proposed to service various Sewer Improvement Districts in Kahaluu. A low-pressure sewer system (LPSS) proposed to service the Kahaluu Sewers, Section 3 Improvement District is being considered as an alternative to the construction of a new pump station and associated force main. A new pump station and associated force main were recently constructed to service a Sewer Improvement District in Malae. These are described as follows:

**Kaneohe Bay No. 5 WWPS:** Construction was recently completed of a new 0.25 mgd pump station and approximately 1,200 feet of 8-inch force main to the Kailua Regional WWTP to service 67 lots in Malae. The pump station is located on an approximately 3,566 square-foot site off of Kaneohe Bay Drive and identified as TMKs: 4-4-07: 25 and 33. The site is owned by the City and County of Honolulu (parcel 25) and State of Hawaii (parcel 33). The pump station and force main were previously assessed in the *Final Environmental Assessment for the Kaneohe Bay South Wastewater Pump Station No. 5 and Force Main* prepared by GK &

Associates/SEY Engineers, Inc. for the City and County of Honolulu Department of Wastewater Management in November 1993.

**Kahaluu Sewers Section 5 Improvement District WWPS:** Construct a new pump station to service 118 lots in Kahaluu. The location and capacity of the WWPS will be determined during the preliminary engineering phase.

**Kamehameha Highway Sewers Improvement District WWPS:** Construct a new pump station to service 37 lots along Kamehameha Highway. The location and capacity of the WWPS will be determined during the preliminary engineering phase.

**Kaalaea WWPS:** As an alternative to a proposed LPSS (see Section 2.1.2.5), construct a new 1.35 mgd pump station and approximately 5,000 feet of force main to the Kahaluu WWPS to service the Kahaluu Sewers Section 3 Improvement District. The station would be located on an approximately 15,760 square-foot parcel (TMK: 4-7-14: 35) on Wailehua Road owned by the City and County of Honolulu. The WWPS may not be needed if the LPSS is used. The pump station and force main were previously assessed in the *Final Environmental Assessment for the Kaalaea Wastewater Pump Station and Force Main* prepared by R.M. Towill Corporation for the City and County of Honolulu Department of Wastewater Management in October 1993.

#### **2.1.2.5 Sewer Improvement Districts**

To provide service to unsewered areas, implementation of nine (9) Sewer Improvement Districts serving 764 lots in the region are proposed. The proposed Improvement Districts are shown in Figure 2-1 and Table 2-3 and described below:

<b>Table 2-3 Sewer Improvement Districts</b>	
<b>Improvement District</b>	<b>No. Lots</b>
Kailua Sewers Section 10 ID	174
Kailua Road Sewers ID	16
Kaneohe Bay Sewers ID	67
Kaneohe Sewers Section 10 ID	28
Kahaluu Sewers Section 3 ID	287
Kahaluu Sewers Section 5 ID	118
Holouka/Maeha Sewers ID	27
Kamehameha Highway Sewers ID	37
Maunawili Circle Sewers ID	10
Total	764

**Kailua Sewers, Section 10 Improvement District:** Sewer district for 50 acres serving 174 lots with 8-inch lines (bounded by the end of Mokapu Boulevard, MCBH Kaneohe Bay boundary, and Kawai Nui Canal). A sewer lift station may be required.

**Kailua Road Sewers Improvement District:** Sewer district for nine (9) acres serving 16 lots along Kailua Road near Kailua District Park with 8-inch lines.

**Kaneohe Bay Sewers Improvement District:** Sewer district for 25 acres serving 67 lots with 8-inch lines (bounded by Kaneohe Bay Drive, Aina Moi Place and the MCBH Kaneohe Bay boundary). This Improvement District will be served by the new Kaneohe Bay No. 5 WWPS (see Section 2.1.2.4).

**Kaneohe Sewers, Section 10 Improvement District:** Sewer district for 13 acres serving 28 lots with 8- and 10-inch lines (fronting Lilipuna Street between Yacht Club Place and the end of Kaneohe Sewers, Section 3 Improvement District).

**Kahaluu Sewers, Section 3 Improvement District:** Sewer district for 85 acres serving approximately 287 lots (bounded by Kamehameha Highway, Waihee Road, Ahilama Road, and Kaimalolo Place). The system will include laterals and mains up to 6 inches in diameter to the Kahaluu WWPS. This Improvement District would be served by a LPSS. The LPSS is a low-pressure system serving individual lots wherein each lot has its own pump and a network of shallow force mains to discharge wastewater into the system. The LPSS may not be used if the alternative Kaalaea WWPS is implemented (see Section 2.1.2.4).

**Kahaluu Sewers, Section 5 Improvement District:** Sewer district for 60 acres serving 118 lots with 8-inch lines (between Hui lo Street and the end of Ahuimanu Road). A new pump station is proposed to service this Improvement District (see Section 2.1.2.4).

**Holouka/Maeha Sewers Improvement District:** Sewer district off of Haiku Road serving Holouka Place (12 lots within 2.3 acres) and Maeha Place (15 lots within 6.5 acres) with 8-inch lines.

**Kamehameha Highway Sewers Improvement District:** Sewer district for six (6) acres serving 37 lots along Kamehameha Highway with 8-inch lines. A new pump station is proposed to service this Improvement District (see Section 2.1.2.4).

**Maunawilii Circle Sewers Improvement District:** Sewer district for 4 acres serving 10 lots within Maunawili Circle with 8-inch lines.

## **2.2 Use of Public Funds and Lands**

### **2.2.1 Public Funds**

The total estimated capital cost for the proposed wastewater facility improvements is approximately \$386.1 million. This includes approved capital improvement projects. The cost estimates, including annual operating costs, are shown in Table 2-4.



**Table 2-4  
Proposed Facilities Plan:  
Flow Equalization in Kailua and Kaneohe; Rehabilitate Basins  
Generalized Cost Estimates (April 1998 Dollars)**

	Estimated Cost
<b>ESTIMATED CAPITAL COSTS</b>	
Treatment Plants & Preliminary Treatment Plants	
Kailua WWTP	
Increase Influent Pumping Station Capacity to 24.2 mgd Capacity	\$1,490,000
Replace Influent Pumping Station Screens	\$470,000
Increase Screening and Grit Removal Effective Capacity to 24 mgd	\$1,070,000
Primary Clarifier Improvements	\$110,000
Secondary Clarifier Improvements	\$40,000
Ultraviolet Disinfection	\$11,100,000
Additional Centrifuge	\$1,730,000
Odor Control Improvements	\$6,750,000
Noise Control Improvement	\$200,000
Piping	\$3,440,000
Electrical	\$1,840,000
Instrumentation	\$1,150,000
Site Preparation	\$1,150,000
Kailua EPS, FM, Outfall	
Upgrade Pumps	\$1,000,000
Kailua WWTP subtotal	\$31,540,000
Kaneohe WWPTF	
New Odor Control	\$3,000,000
6.4 MG Flow Equalization Tanks	\$29,500,000
Piping	\$3,250,000
Electrical	\$2,600,000
Instrumentation	\$1,630,000
Site Preparation	\$1,630,000
Kaneohe EPS, FM	
Replace Force Main	\$21,000,000
Kaneohe WWPTF subtotal	\$62,610,000

<b>Table 2-4 (cont.) Proposed Facilities Plan: Flow Equalization in Kailua and Kaneohe; Rehabilitate Basins Generalized Cost Estimates (April 1998 Dollars)</b>		<b>Estimated Cost</b>
<b>Ahuimanu WWPTF</b>		
New Preliminary Treatment Facility (Screening & Grit Removal)		\$530,000
New Odor Control		\$2,220,000
0.6 MG Flow Equalization Tank		\$1,570,000
Piping		\$430,000
Electrical		\$350,000
Instrumentation		\$220,000
Site Preparation		\$220,000
<b>Ahuimanu EPS, FM</b>		
New Force Main		\$10,600,000
Ahuimanu WWPTF subtotal		\$16,140,000
WWTP & WWPTF subtotal		\$110,290,000
<b>Collection System</b>		
<b>Windward District</b>		
Windward Area Baseyard		\$4,150,000
<b>Kailua</b>		
<b>Relief, Rehabilitation, Replacement</b>		
Kainehe Street, Hamakua & Keolu Drive Reconstructed Sewer*		**\$25,000,000
Kainui Drive Trunk Reconstructed Sewer*		**\$4,500,000
Kalaheo Avenue Reconstructed Sewer*		**\$42,000,000
Ilimalia Loop/Mokapu Boulevard Reconstructed Sewer*		\$6,245,000
Oneawa Street Sewer Rehabilitation		\$4,050,000
Kailuana Place Sewer Rehabilitation		\$297,000
Mokuloa Drive Sewer Relocation		\$285,000
Basin 2B01 Rehabilitation		\$8,970,000
Basin 2B03.3 Rehabilitation		\$1,833,000
Basin 2B04 Rehabilitation		\$8,684,000
Kailua Relief Sewers		\$6,939,000
Kailua Rehabilitation/Replacement Sewers		\$20,759,000
<b>Sewer Improvement District</b>		
Kailua Sewers Section 10 I.D.		\$5,256,000
Kailua Road Sewers I.D.		\$287,000
Maunawili Circle Sewers I.D.		\$333,000

**Table 2-4 (cont.)  
Proposed Facilities Plan:  
Flow Equalization in Kailua and Kaneohe; Rehabilitate Basins  
Generalized Cost Estimates (April 1998 Dollars)**

		Estimated Cost
<b>Kaneohe/Kahaluu</b>		
Relief, Rehabilitation, Replacement		
Kaneohe/Kamehameha Highway Reconstructed Sewer*		\$3,250,000
Kaneohe Bay Drive Reconstructed Sewer		\$670,000
Halemuku Place – Waikalua Reconstructed Sewer		\$1,656,000
Kanohuluwiwi Fish Pond Sewer Rehabilitation		\$158,000
Kaneohe Bay Drive Sewer Relocation		\$298,000
Kaneohe Bay Drive Manhole Relining		\$107,000
Basin 9C01B Rehabilitation		\$2,626,000
Basin 9C01D Rehabilitation		\$3,198,000
Basin 9D01A Rehabilitation		\$2,041,000
Basin 9A01 Rehabilitation		\$6,773,000
Kaneohe Relief Sewers		\$3,650,000
Kaneohe/Kahaluu Rehabilitation/Replacement Sewers		\$10,803,000
<b>Sewer Improvement District</b>		
Kaneohe Bay Sewers I.D.*		\$2,976,000
Kaneohe Sewers Section 10 I.D.		\$7,542,000
Kahaluu Sewers Section 3 I.D.*		\$10,450,000
Kahaluu Sewers Section 5 I.D.		\$5,566,000
Holouku/Maeha Sewers I.D.		\$262,000
Kamehameha Highway Sewers I.D.		\$4,271,000
Collection System subtotal	**\$205,885,000	
<b>Pump Stations</b>		
Windward District		
Force Main Modification for Air Relief Valves		\$822,000
Force Main Modification for Piggings Operations		\$1,316,000
<b>Kailua</b>		
Kailua Flow Equalization Storage		\$18,000,000
Aala WWPS Rehabilitation and FM Replacement/Rehabilitation		\$952,000
Alala Point WWPS Rehabilitation and FM Replacement/Rehabilitation		\$1,106,000
Coconut Grove WWPS Rehabilitation & FM Replacement/Rehabilitation		\$1,331,000
Enchanted Lake WWPS Modification/Rehabilitation		\$1,931,000
Kailua Heights WWPS Modification*/Rehabilitation		\$4,127,000
Kailua Road WWPS Modification/FM Replacement & WWPS Rehabilitation		\$3,532,000

<b>Table 2-4 (cont.) Proposed Facilities Plan: Flow Equalization in Kailua and Kaneohe; Rehabilitate Basins Generalized Cost Estimates (April 1998 Dollars)</b>	
	<b>Estimated Cost</b>
Kukanono WWPS Rehabilitation & FM Replacement/Rehabilitation	\$1,183,000
Maunawili WWPS Modification/FM Replacement & WWPS/FM Rehab.	\$2,249,000
Maunawili Ests WWPS Mod/FM Replacement & WWPS/FM Rehabilitation	\$1,473,000
<b>Kaneohe/Kahaluu</b>	
Kahaluu Housing WWPS	
Miomio WWPS Pump Replacement and WWPS Rehab/FM Replace/Rehab.	\$1,816,000
Kahanahou WWPS Pump Replacement and FM Rehabilitation/Replacement	\$1,620,000
Waikalua WWPS Modification and Rehabilitation	\$1,070,000
Punawai WWPS Pump Replacement; WWPS Rehab/FM Replace/Rehab.	\$2,438,000
Alii Bluffs WWPS Rehabilitation and FM Replacement/Rehabilitation	\$2,448,000
Heeia WWPS Emergency Power Upgrade and Rehabilitation	\$1,225,000
Waikapoki WWPS Modification/FM Replacement* and WWPS and FM	\$1,280,000
Halekou WWPS Rehabilitation/FM Replacement and FM Rehabilitation	\$1,537,000
Kahaluu WWPS Modification/FM Replacement and WWPS Rehabilitation	\$1,884,000
Laenani WWPS Rehabilitation/FM Replacement and FM Rehabilitation	\$1,418,000
Kaneohe Bay #2 WWPS Modification/FM Replacement; WWPS/FM Rehab.	\$1,727,000
Kaneohe Bay #3 WWPS Rehabilitation and FM Replacement/Rehabilitation	\$2,267,000
Kaneohe Bay #4 WWPS Rehabilitation and FM Replacement/Rehabilitation	\$730,000
Kaneohe Bay #5 WWPS	
Kaalaea WWPS and FM*	\$10,466,000
Pump Station subtotal	\$69,948,000
<b>Total Estimated Capital Cost</b>	<b>**\$386,123,000</b>
<b>ESTIMATED ANNUAL COSTS</b>	
Annualized Life Cycle Capital Costs	\$29,111,000
<b>Operation and Maintenance</b>	
<b>Treatment Plant and Preliminary Treatment Plants</b>	
<b>Kailua WWTP</b>	
Additional Influent Pumping Station Capacity	\$71,000
Additional Screening and Grit Removal Capacity	\$93,000
Ultraviolet Disinfection	\$336,000
Additional Centrifuge	\$131,000
Odor Control Improvements	\$273,000

**Table 2-4 (cont.)  
Proposed Facilities Plan:  
Flow Equalization in Kailua and Kaneohe; Rehabilitate Basins  
Generalized Cost Estimates (April 1998 Dollars)**

	Estimated Cost
<b>Kaneohe WWPTF</b>	
New Odor Control	\$273,000
New 6.4 MG Flow Equalization Tanks	\$59,000
<b>Kaneohe EPS, FM</b>	
Force Main	\$42,000
<b>Ahuimanu WWPTF</b>	
New Preliminary Treatment Facility	\$48,000
New Odor Control	\$105,000
0.6 MG Flow Equalization Tank	\$3,000
<b>Ahuimanu EPS, FM</b>	
New Force Main	\$21,000
<b>Collection System</b>	
Kailua	no increase
Kaneohe/Kahaluu	no increase
<b>Pump Stations</b>	
Windward District	
Kailua Flow Equalization Storage	\$13,000
Kailua WWPSs Operation and Maintenance	\$17,813
Kaneohe/Kahaluu WWPSs Operation and Maintenance	\$16,795
<b>Operation and Maintenance Cost Subtotal</b>	\$1,502,609
<b>Total Estimated Annual Cost</b>	\$30,614,000
*Current CIP project; cost is phases not started	
**Revised cost obtained subsequent to Kailua-Kaneohe-Kahaluu Facilities Plan, September 1998	

The capital costs of the proposed improvements at the Kailua Regional WWTP and Kaneohe/Ahuimanu WWPTFs are approximately \$31.5 and \$78.7 million, respectively. The proposed collection system improvements are estimated to cost \$205.9 million. The structural rehabilitation of all main collection system lines is assumed to be required over the planning period. Planned and proposed Sewer Improvement Districts are also incorporated in the cost estimates. Pump station modifications are estimated to cost \$70.0 million. Most of the pump stations are expected to be rehabilitated.

The estimated annual cost, including annualized life cycle capital costs and operation and maintenance costs, is \$30.6 million.

Funding for the proposed facility improvements would be from City and County of Honolulu wastewater revenue bonds. The City would be expected to fund all the capital and operating costs. Based on current City policy, the City's cost would be distributed among all of its wastewater system customers on Oahu.

**2.2.2 Public Lands**

The proposed wastewater facility improvements involve the use of mostly City and County of Honolulu-owned lands. The collection system's transmission lines and force mains are typically located within street right-of-ways that are under the jurisdiction of either the City or State. Land ownership of the existing and proposed wastewater facilities is shown in Table 2-5.

<b>Table 2-5 Land Ownership Existing and Proposed Wastewater Facilities</b>			
<b>Facility</b>	<b>Ownership</b>	<b>Land Area</b>	<b>Tax Map Key</b>
Kailua Regional WWTP	C&C of Honolulu	25.1 AC	4-4-11: 81
Kaneohe WWPTF	C&C of Honolulu	15.9 AC	4-5-30: 36
Ahuimanu WWPTF	C&C of Honolulu	4.6 AC	4-7-04: 6
<b>Pump Stations</b>			
<b>Kailua Basin:</b>			
Aala WWPS	C&C of Honolulu	11,250 SF	4-3-05: 1
Alala Point WWPS	C&C of Honolulu	13,560 SF	4-3-08: 27
Coconut Grove WWPS	C&C of Honolulu	6,000 SF	4-3-65: 36
Enchanted Lake WWPS	C&C of Honolulu	5,662 SF	4-2-50: 33
Kailua Heights WWPS	C&C of Honolulu	10,000 SF	4-2-75: 17
Kailua Road WWPS	C&C of Honolulu	9,635 SF	4-2-16: 4
Kukanono WWPS	C&C of Honolulu	16,160 SF	4-2-13: 39
Maunawili WWPS	C&C of Honolulu	63,075 SF	4-2-07: 31
Maunawili Estates WWPS	C&C of Honolulu	62,710 SF	4-2-67: 28

Table 2-5 (cont.) Land Ownership Existing and Proposed Wastewater Facilities			
Facility	Ownership	Land Area	Tax Map Key
<b>Kaneohe Basin:</b>			
Kahanahou WWPS	C&C of Honolulu	7,893 SF	4-5-47: 95
Waikalua WWPS	C&C of Honolulu	5,022 SF	4-5-07: 48
Punawai WWPS	Bishop Estate	546 SF	4-6-20: 66
Alii Bluffs WWPS	Bishop Estate – Fee; C&C of Honolulu-Lessee	4,519 SF	4-6-07: 92
Heeia WWPS	C&C of Honolulu	4,408 SF	4-6-23: 41
Waikapoki WWPS	C&C of Honolulu	8,101 SF	4-5-03: 10
Halekou WWPS	C&C of Honolulu	4,753 SF	4-5-54: 78
Kaneohe Bay #2 WWPS	C&C of Honolulu	4,125 SF	4-4-14: 49
Kaneohe Bay #3 WWPS	C&C of Honolulu	5,218 SF	4-4-37: 14
Kaneohe Bay #4 WWPS	C&C of Honolulu	8,175 SF	4-4-06: 16
Kaneohe Bay #5 WWPS	C&C of Honolulu (parcel 25) State of Hawaii (parcel 33)	3,566 SF	4-4-07: 25 & 33
<b>Ahuimanu Basin:</b>			
Kahaluu Housing WWPS	C&C of Honolulu (9,418 SF) State of Hawaii (67 SF)	9,485 SF	4-7-37: 24
Miomio WWPS	C&C of Honolulu	7,220 SF	4-7-30: 8
Kahaluu WWPS	C&C of Honolulu	8,778 SF	4-7-11: 16
Laenani WWPS	C&C of Honolulu	61,855 SF	4-7-10: 17
Kaalaea LPSS (Proposed)	C&C of Honolulu	9,191 SF	4-7-14: 35
<b>Alternative Flow Equalization Storage Facilities</b>			
Kailua Road EQ	State of Hawaii	1.6 AC	4-2-16: por. 2
Kapaa Industrial Park EQ	Castle Estate – Fee Ameron, Inc. – Lessee	5.0 AC	4-2-15: por. 8
MCBH Kaneohe Bay EQ	United States of America, Department of the Navy	4.6 AC	4-4-08: por. 1

### 2.3 Phasing and Timing of Action

Construction of the proposed wastewater facility improvements is anticipated to commence in 1999 with completion by year 2020. As depicted in Table 2-6, the phasing plan generally reflects the planning, design and construction timetable of the planned improvements.

The phasing plan gives priority to odor and noise control improvements and the rehabilitation/replacement of collection system lines which show severe corrosion or deterioration. The development of equalization facilities is expected to begin with the Kaneohe WWPTF site, then proceed with the Ahuimanu WWPTF site, and then the Kailua Basin flow equalization facility in the 2005 to 2010 time period.

Improvements to the Kailua Regional WWTP will be phased over several years. Because of the emphasis on both odor and noise control, short-term and long-term improvements are planned. Short-term improvements are anticipated to be completed by June 2000, and long-term improvements, particularly those that are capacity-related, will be phased to match event-driven projects in the collection system.

**Table 2-6  
Kailua-Kaneohe-Kahaluu Facilities Plan  
Phasing Plan**

Planned Improvements	Duration	Year																					
		99	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20
<b>Treatment Plants &amp; Preliminary Treatment Plants</b>																							
<b>Kailua WWTP</b>																							
Increase Influent Pumping Station Capacity	2002-2005																						
Replace Influent Pumping Station Screens	2002-2005																						
Increase Screening and Grit Removal Capacity	2002-2005																						
Primary Clarifier Modifications	2000-2003																						
Secondary Clarifier Modifications	2004-2007																						
Ultraviolet Disinfection	1999-2000																						
Additional Centrifuge	2000-2002																						
Odor Control Modifications (Existing)	1999-2001																						
Noise Control Modifications (Existing)	1999-2001																						
Odor Control Modifications (New)	2002-2005																						
Noise Control Modifications (New)	2002-2005																						
Site Preparation	2001-2002																						
<b>Kailua EPS, FM, Outfall</b>																							
No Change																							
<b>Kaneohe WWPTF</b>																							
New Odor Control	2005-2008																						
6.4 MG Flow Equalization Tanks	2004-2007																						
Site Preparation	2004-2007																						
<b>Kaneohe EPS, FM</b>																							
Replace Force Main	2005-2008																						



**Table 2-6 (cont.)  
Kailua-Kaneohe-Kahaluu Facilities Plan  
Phasing Plan**

Planned Improvements	Duration	Year																					
		99	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20
<b>Ahuimanu WWPTF</b>																							
New Prelim. Treatment Facility (Screening & Grit Removal)	2006-2009																						
New Odor Control	2006-2009																						
0.6 MG Flow Equalization Tanks	2007-2010																						
Site Preparation	2005-2006																						
<b>Ahuimanu EPS, FM</b>																							
New Force Main	2005-2008																						
<b>Collection System</b>																							
<b>Windward District</b>																							
Windward Area Baseyard	2003-2010																						
<b>Kailua</b>																							
<b>Relief, Rehabilitation, Replacement</b>																							
Kainehe St., Hamakua & Keolu Drive Reconstructed Sewer	1999-2003																						
Kainui Drive Trunk Reconstructed Sewer	1999-2003																						
Kalaheo Avenue Reconstructed Sewer	1999-2004																						
Ilimalia Loop/Mokapu Boulevard Reconstructed Sewer	1999-2001																						
Oneawa Street Sewer Rehabilitation	2000-2004																						
Kailuana Place Sewer Rehabilitation	1999-2001																						
Mokuloa Drive Sewer Relocation	1999-2001																						
Basin 2B01 Rehabilitation	2005-2008																						
Basin 2B03.3 Rehabilitation	2003-2006																						
Basin 2B04 Rehabilitation	2001-2004																						
Kailua Relief Sewers	2001-2020																						
Kailua Rehabilitation/Replacement Sewers	2004-2020																						
<b>Sewer Improvement District</b>																							
Kailua Sewers Section 10 I.D.	2002-2005																						
Kailua Road Sewers I.D.	2017-2020																						
Maunawili Circle Sewers I.D.	2017-2020																						
<b>Kaneohe/Kahaluu</b>																							
<b>Relief, Rehabilitation, Replacement</b>																							
Kaneohe/Kamehameha Highway Reconstructed Sewer	1999-2003																						
Kaneohe Bay Drive Reconstructed Sewer	2000-2004																						
Halemuku Place - Waikalua Reconstructed Sewer	2000-2004																						
Kanohuluwili Fish Pond Sewer Rehabilitation	1999-2001																						
Kaneohe Bay Drive Sewer Relocation	1999-2001																						
Kaneohe Bay Drive Manhole Relining	1999-2001																						
Basin 9C01B Rehabilitation	2003-2006																						
Basin 9C01D Rehabilitation	2005-2008																						
Basin 9D01A Rehabilitation	2005-2008																						
Basin 9A01 Rehabilitation	2007-2010																						
Kaneohe Relief Sewers	2001-2020																						
Kaneohe/Kahaluu Rehabilitation/Replacement Sewers	2004-2020																						

**Table 2-6 (cont.)  
Kailua-Kaneohe-Kahaluu Facilities Plan  
Phasing Plan**

Planned Improvements	Duration	Year																					
		99	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20
<b>Sewer Improvement District</b>																							
Kaneohe Bay Sewers I.D.	1999-2001	■	■	■																			
Kaneohe Sewers Section 10 I.D.	2017-2020																					■	■
Kahaluu Sewers Section 3 I.D.	1999-2000	■	■																				
Kahaluu Sewers Section 5 I.D.	2014-2017																					■	■
Holouku/Maeha Sewers I.D.	2010-2013																						
Kamehameha Highway Sewers I.D.	2006-2009																						
<b>Pump Stations</b>																							
<b>Windward District</b>																							
Force Main Modification for Air Relief Valves	2001-2004																						
Force Main Modification for Pigging Operations	2001-2020																						
<b>Kailua</b>																							
Kailua Flow Equalization Storage	2008-2011																						
Aala WWPS Rehabilitation and FM Replacement/Rehabilitation	2005-2012																						
Alala Point WWPS Mod/Rehab. and FM Replacement/Rehab.	2005-2013																						
Coconut Grove WWPS Rehab. & FM Replacement/Rehab.	2012-2020																						
Enchanted Lake WWPS Modification/Rehabilitation	2001-2017																						
Kailua Heights WWPS Modification/Rehabilitation	1999-2017																						
Kailua Road WWPS Mod/FM Replacement and WWPS Rehab.	2001-2016																						
Kukanono WWPS Rehab. & FM Replacement/Rehabilitation	2010-2018																						
Maunawili WWPS Mod/FM Replacement & WWPS/FM Rehab.	2003-2015																						
Maunawili Ests WWPS Mod/FM Replace & WWPS/FM Rehab.	2003-2015																						
<b>Kaneohe/Kahaluu</b>																							
Kahaluu Housing WWPS																							
Miomio WWPS Pump Replace; WWPS Rehab/FM Repl/Rehab.	2001-2020																						
Kahanahou WWPS Pump Replace & FM Rehab/Replacement	2001-2007																						
Waikalua WWPS Modification and Rehabilitation	2001-2014																						
Punawai WWPS Pump Repl; WWPS Rehab/FM Repl/Rehab.	2002-2020																						
Alii Bluffs WWPS Rehab. & FM Replacement/Rehabilitation	2015-2020																						
Heeia WWPS Emergency Power Upgrade and Rehabilitation	2008-2013																						
Waikapoki WWPS Mod/FM Replacement and WWPS & FM	1999-2007																						
Halekou WWPS Rehab/FM Replacement & FM Rehabilitation	2003-2011																						
Kahaluu WWPS Mod/FM Replacement and WWPS Rehab.	2002-2018																						
Laenani WWPS Rehab/FM Replacement & FM Rehabilitation	2013-2020																						
Kaneohe Bay #2 WWPS Mod/FM Replace; WWPS/FM Rehab.	2004-2015																						
Kaneohe Bay #3 WWPS Rehab. & FM Replace/Rehabilitation	2001-2008																						
Kaneohe Bay #4 WWPS Rehab. & FM Replace/Rehabilitation	2001-2008																						
Kaneohe Bay #5 WWPS																							
Kaalaea WWPS and FM	1999-2000																						

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

#### **3.1 Climate**

The climate in the planning region is characterized as mild subtropical. The planning region displays relatively uniform temperatures throughout the year with a mean annual temperature of 75° F (Fahrenheit). The average temperature dips to 68° F during the coolest month and rises to 81° F during the warmest month. Relative humidity ranges between 70 and 80 percent.

The lower elevations in the planning region have a lower average annual solar radiation intensity. The lower areas average approximately 150 watts per square meter ( $w/m^2$ ), while the upper reaches of the Koolau Mountains average approximately 200  $w/m^2$  (Juvik and Juvik, 1998).

The prevailing winds are the northeast trade winds which average approximately 20 miles per hour. In general, the trade winds are more persistent in summer (frequency average of 90 percent) than in winter (frequency average of 50 percent) and are stronger in the afternoon than at night. The effects of terrain on surface winds are varied and can have a significant effect on climate patterns.

Under trade wind conditions, the air is moist at elevations below the 6,000-foot temperature inversion layer. Vertical movement of air is restricted to this layer; thus clouds develop at a maximum of 6,000 feet. Clouds form chiefly along the mountains where the incoming trade wind air is crowded together as it is forced over the crest. Rainfall produced by this process, called orographic rainfall, is very consistent with Windward areas, leading to very high average rainfall totals. The perpendicular orientation of the Koolau Range enhances cloud formation and the associated rainfall pattern (Juvik and Juvik, 1998).

In general, this orographic effect produces the most intense rainfall in the planning region nearest the ridgeline summit. Median annual rainfall averages approximately 50 inches along the coastal areas and about 150 inches along the crest of the Koolau Range (see Figure 3-1). About 70 percent of the rainfall occurs between November and April. In general, the planning region experiences among the highest levels of rainfall on Oahu.

## **3.2 Physiography**

### **3.2.1 Geology and Topography**

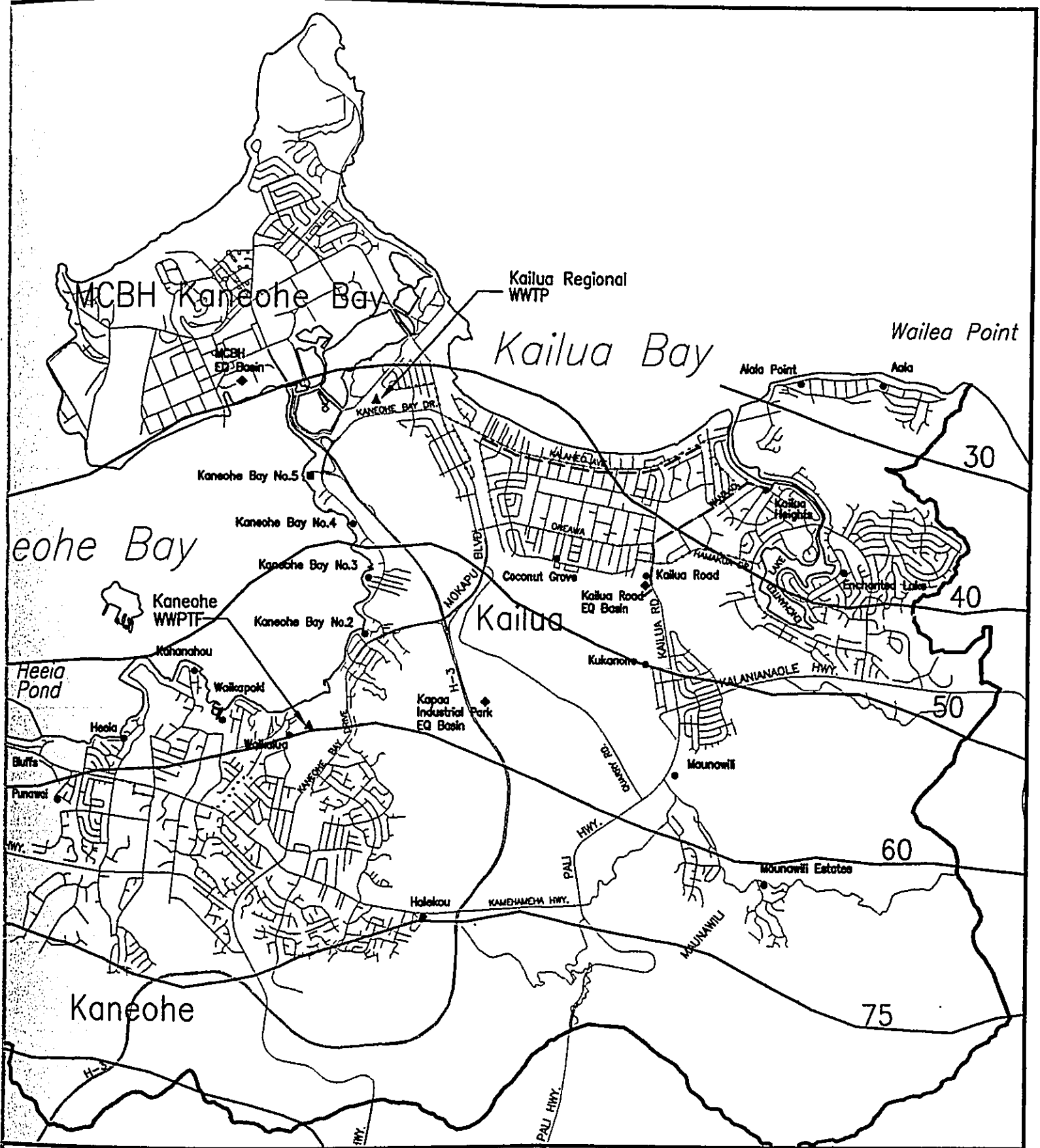
#### **3.2.1.1 Geology**

The physiography of Windward Oahu is dominated by the Koolau Range, the eroded remnants of a volcanic dome. The Koolau Range runs generally in a northwest to southeast direction and forms the western-southwestern boundary of the planning area. The Range is 37 miles long and is deeply eroded by streams. In places it has high sea cliffs along its shore. Precipitous fluted cliffs (palis) extend for 20 miles on the windward side of the Koolau Range, transitioning to a fringing coastal plain.

The planning region is characterized by deep amphitheater valleys carved by fluvial and marine erosion processes, separated by steep-sided basaltic ridges that project seaward from the Koolau Range. The Koolau rift zone along the Koolau Range is comprised of thin, narrow, basaltic lava flows piled one upon the other, with minor amounts of volcanic ash and numerous vertical, parallel dikes which store infiltrating rainfall and form a storage area for groundwater supply.

Along the base of the Koolau Range, the land is characterized by both older and younger alluvium. The older alluvium forms an apron at the base of projecting Koolau basaltic ridges and spurs. Its composition is predominantly silt and clay with lesser amounts of sand and gravel, and a few beds of poorly sorted gravel and cobbles. The younger alluvium, which extends up stream valleys, consists primarily of gravel, sand and silt. Colluvium, deposited at the base of the pali by erosion, smoothes the transition to stream deposited alluvium on the coastal plains. Much of the coastal plain in the Windward area is underlain by calcareous sedimentary material.

Seaward conditions include a layer of sand and beaches, which overlay a layer of limestone. Along the Kailua shoreline area are dune and beach deposits that are very permeable and capable of transmitting large amounts of water. Other shoreline areas in the planning area consist of layers of reef limestone alternating with beds of clay, tuff, and alluvium reaching to depths of 1,200 feet (Stearns, 1985).



S PLAN

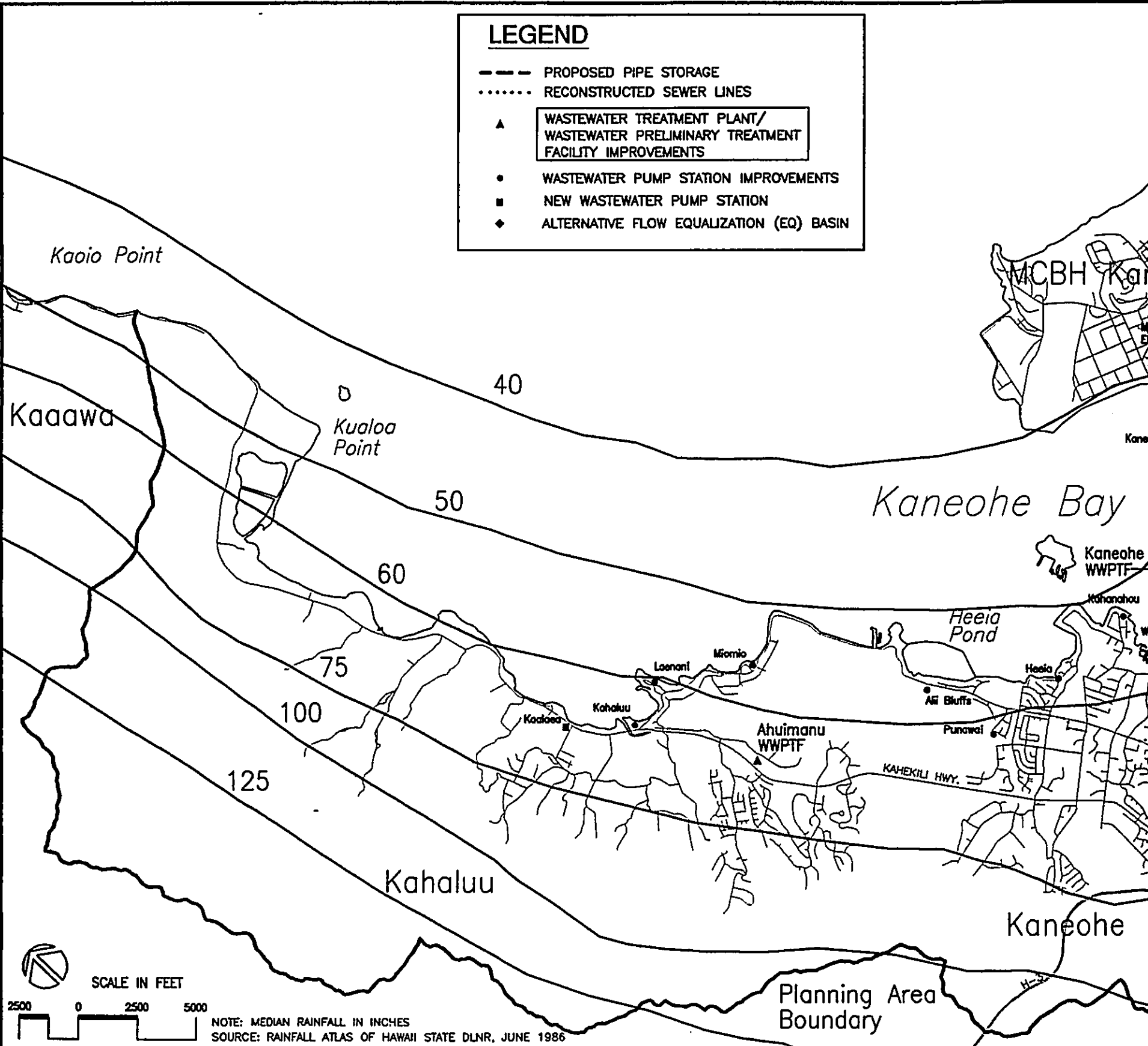
RAINFALL

FIGURE

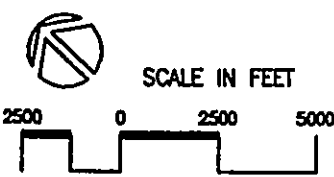
3-1

**LEGEND**

- PROPOSED PIPE STORAGE
- ..... RECONSTRUCTED SEWER LINES
- ▲ WASTEWATER TREATMENT PLANT/  
WASTEWATER PRELIMINARY TREATMENT  
FACILITY IMPROVEMENTS
- WASTEWATER PUMP STATION IMPROVEMENTS
- NEW WASTEWATER PUMP STATION
- ◆ ALTERNATIVE FLOW EQUALIZATION (EQ) BASIN



01/06/99 M:\DWG\3378-01\FIGURE 14:24



NOTE: MEDIAN RAINFALL IN INCHES  
SOURCE: RAINFALL ATLAS OF HAWAII STATE DLNR, JUNE 1986

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**KAILUA-KANEOHE-KAHALUU FACILITIES PLAN**

**RAINFALL**

In the Kailua area, the substrata generally consists of alluvium, dune sand, colluvium, mudflow deposits, and lagoonal deposits. Along the Kailua Bay coastline, coralline sand predominates for several thousand feet inland. Much of the Mokapu Peninsula was formed by late stage basaltic lava eruptions during Ulupau Crater's last period of activity.

### **3.2.1.2 Topography**

The topography of the planning area varies considerably, with elevations ranging from sea level to 3,000 feet above mean sea level (MSL) at the ridge of the Koolau Range (see Figure 3-2). Generally, the topography consists of gentle slopes extending from the shoreline to the back of valleys. At the back of valleys, steep to precipitous slopes extend to the crest of the Koolau Range.

The coastal plains rise at gentle slopes near the coast up to the 200-foot elevation level. This area generally encompasses most of the relatively flat and developable areas. In most of the Kaneohe and Kailua areas, moderate slopes of less than 10 percent prevail. In the Ahuimanu area and southern portion of Kailua, the terrain displays steep to moderately steep slopes near the sea. Steep to moderately steep ridges separate the Kailua and Kaneohe areas, and the Waimanalo area to the south.

All major wastewater facility project sites are relatively flat and contain no unique or unusual topographic features. The Kailua Regional WWTP is located at an elevation of approximately 4 feet MSL. The Kaneohe and Ahuimanu WWPTFs are both located at approximately 20 feet MSL elevation.

With regard to potential future wastewater facility sites, the Kailua Road equalization basin site (hereinafter referred to as the Kailua Road EQ site) is located at an elevation of approximately 14 feet MSL elevation. The elevation of the MCBH Kaneohe Bay equalization basin site (hereinafter referred to as the MCBH Kaneohe Bay EQ site) is approximately 1 foot MSL. The Kapaa Industrial Park equalization basin site (hereinafter referred to as the Kapaa Industrial Park EQ site) is located at approximately 86 feet MSL elevation.

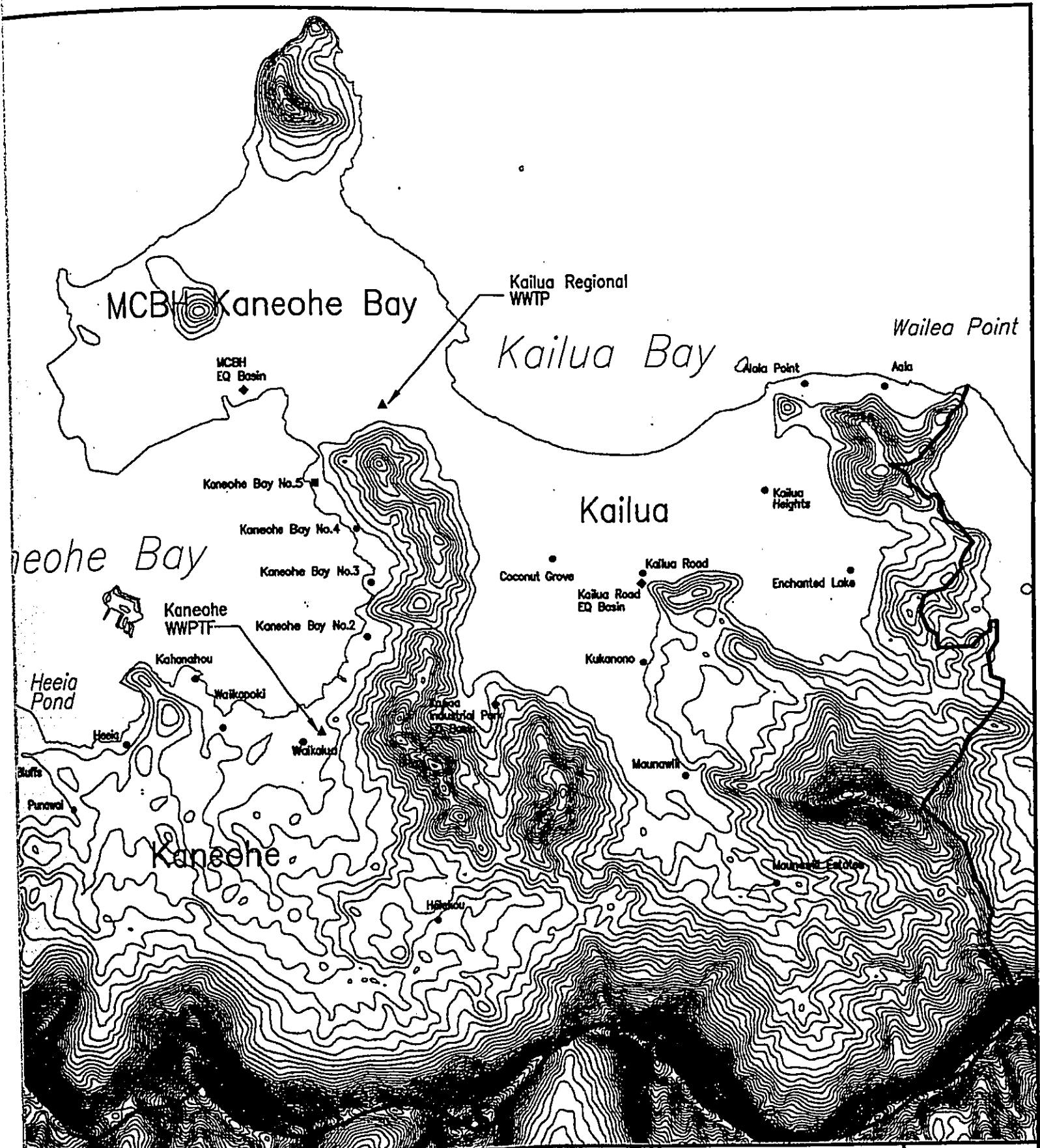
### 3.2.2 Soils

According to the U.S. Department of Agriculture, Natural Resources Conservation Service, the following three soil associations comprise the planning region (see Figure 3-3). A listing of soil types in the area is provided in Table 3-1.

**Kaena-Waialua Association** occurs along the eastern coastline of the planning area. Generally occurring in drainageways, on coastal plains, and on talus slopes, these soils are nearly level and gently sloping for the most part, in elevation ranges from sea level to 200 feet, but are steeper on talus slopes. They are formed in alluvium and vary widely in texture and drainage. Kaena and Waialua soils make up about 50 percent of the association. The remaining soils consist of Hanalei, Kawaihapai, Jaucas, Haleiwa, Kaloko, Keaau, Mokuleia, Pearl Harbor, Pulehu, Coral Outcrop, and Marsh. Kaena soils are poorly drained, dark-colored silty clays or clays underlain by alluvium. Waialua soils are moderately well-drained, dark reddish-brown silty clays or clays underlain by alluvium.

**Lolekaa-Waikane Association** consists of well-drained, fine textured and moderately fine textured soils on uplands, fans and terraces. This is the predominant soil association in the planning area and is found in areas between the Koolau Range and the eastern coastal plains. Formed in old alluvium and material weathered from basic igneous rock, these soils are nearly level to very steep, and can be found in elevations ranging from near sea level to 1,500 feet. Lolekaa soils comprise about 20 percent of the association and Waikane soils about 20 percent. The remaining soils consist of Paumalu, Kemoo, Leilehua, Alaeloa, Kaneohe, Paaloo, Pohakupu, and Manana. Lolekaa soils have a surface layer of dark-brown silty clay and a dominantly silty clay subsoil, with a substratum of gravelly alluvium. Waikane soils display a surface layer of dark-brown silty clay and a subsoil of dark reddish-brown silty clay. Their substratum is gravelly alluvium.





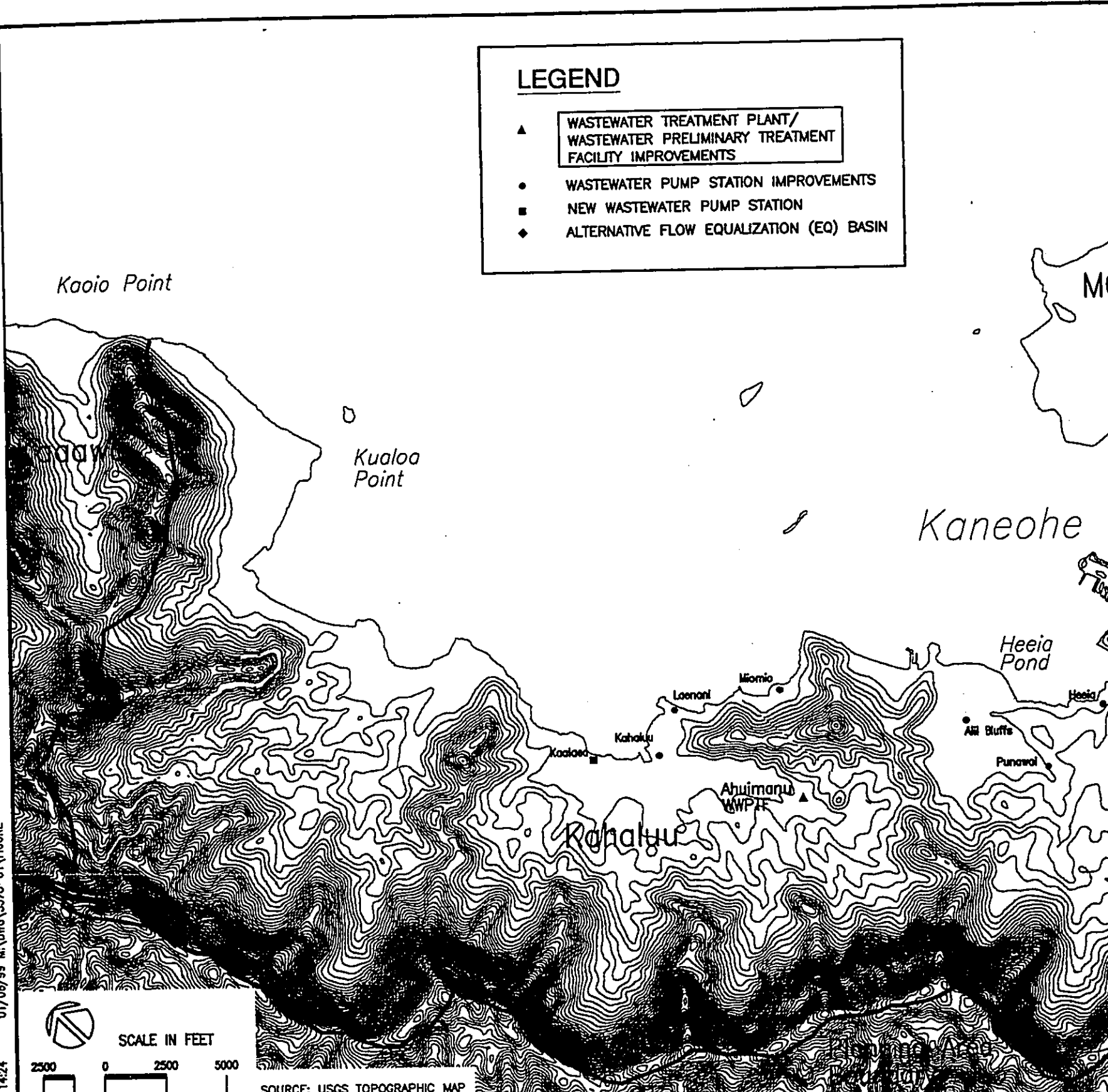
S PLAN

TOPOGRAPHIC  
MAP

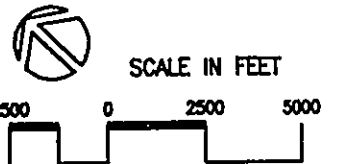
FIGURE  
3-2

# LEGEND

- ▲ WASTEWATER TREATMENT PLANT/  
WASTEWATER PRELIMINARY TREATMENT  
FACILITY IMPROVEMENTS
- WASTEWATER PUMP STATION IMPROVEMENTS
- NEW WASTEWATER PUMP STATION
- ◆ ALTERNATIVE FLOW EQUALIZATION (EQ) BASIN



01/06/99 M:\DWG\3378-01\FIGURE  
14:24  
NW-TOPO.DWG



SOURCE: USGS TOPOGRAPHIC MAP

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KAILUA-KANEOHE-KAHALUU FACILITIES PLAN

TOPOGRAPHIC MAP





**Rock Land-Stony Steep Land Association** consists of stony and rocky lands on steep to precipitous slopes along the Koolau Range. This soil is well-drained to excessively drained. Rock land comprises about 60 percent of the association, and Stony steep land about 15 percent. The remaining soils consist of Rock Outcrop, Stony Land, Lualualei, and Pulehu. Rock land is 25 to 90 percent rock outcrop, is very steep and occurs in gulches and on mountainsides. The soil material is very shallow. Stony steep land is characterized as a mass of boulders and stones deposited by water or gravity in valley bottoms or on side slopes of drainageways, with very steep slopes.

**Table 3-1  
Soil Types in Planning Region**

SYMBOL	SOIL TYPE	LOCATION	CHARACTERISTIC
<b>Kaena-Waiialua Association</b>			
<b>Coral Outcrop</b>			
CR	Coral Outcrop	Enchanted Lake area	Coral outcrop consists of coral or cemented calcareous sand. The coral reefs formed in shallow ocean water during the time the ocean stand was at a higher level. Small areas of coral outcrop are exposed on the ocean shore, coastal plains, and at the foot of the uplands.
<b>Hanalei Series</b>			
HnA	Hanalei silty clay, 0 to 2 percent slopes	Found throughout planning region near and in streams	These soils are somewhat poorly drained to poorly drained on bottom lands. These soils developed in alluvium derived from basic igneous rock. They are gently sloping in elevations ranging from sea level to 300 feet.
HnB	Hanalei silty clay, 0 to 6 percent slopes	Found throughout planning region near and in streams	
HoB	Hanalei stony silty clay, 2 to 6 percent slopes	Found throughout planning region near and in streams	
<b>Jaucas Series</b>			
JaC	Jaucas sand, 0 to 15 percent slopes	Mokapu Peninsula and coastal areas throughout the planning region	This series consists of excessively drained, calcareous soils that occur as narrow strips on coastal plains, adjacent to the ocean. They developed in wind and water deposited sand from coral and seashells. They are nearly level to strongly sloping, occurring in elevations from sea level to 100 feet.
JcC	Jaucas sand, saline, 0 to 12 percent slopes	Mokapu Peninsula and coastal areas throughout the planning region	
<b>Kawaihapai Series</b>			
KIB	Kawaihapai clay loam, 6 to 15 percent slopes	North of Kawai Nui Marsh along Mokapu Boulevard	This series consists of well-drained soils in drainageways and on alluvial fans on the coastal plains. These soils formed in alluvium derived from basic igneous rock in humid uplands. They are nearly level to moderately sloping at elevations from nearly sea level to 300 feet.
KIaB	Kawaihapai stony clay loam, 2 to 6 percent slopes	Keaalu, near Kaneohe Yacht Club	
KIbC	Kawaihapai very stony clay loam, 0 to 15 percent slopes	Keolu Hills	

**Table 3-1 (cont.)  
Soil Types in Planning Region**

SYMBOL	SOIL TYPE	LOCATION	CHARACTERISTIC
<b>Keaau Series</b>			
KmA	Keaau clay, 0 to 2 percent slopes	Mid-Pacific Country Club	This series consists of poorly drained soils on coastal plains. These soils developed in alluvium deposited over reef limestone or consolidated coral sand. They are nearly level to gently sloping from 5- to 40-foot elevations.
KmBA	Keaau clay, saline, 0 to 2 percent slopes	South of Nuupia Ponds	
<b>Marsh</b>			
Mz	Marsh	Kawai Nui and Heeia Marshes	Marshes consist of wet, periodically flooded areas covered dominantly with grasses and bulrushes or other herbaceous plants. It occurs as small low-lying areas along coastal plains. Water stands on the surface, but marsh vegetation thrives. The water is fresh or brackish depending on proximity to the ocean.
<b>Mokuleia Series</b>			
Ms	Mokuleia loam	Along Kamehameha Hwy east of Molii Pond	This series consists of well-drained soils along the coastal plains of the island. These soils formed in recent alluvium deposited over coral sand. They are shallow and nearly level at elevations ranging from nearly sea level to 100 feet.
Mt	Mokuleia clay loam	Point extending from Kahaluu Pond	
<b>Pearl Harbor Series</b>			
Ph	Pearl Harbor clay	North of Kawai Nui Marsh	This series consists of very poorly-drained soils on nearly level coastal plains. These soils developed in alluvium overlying organic material. They are found in elevations ranging from nearly sea level to 5 feet.
<b>Waialua Series</b>			
WIB	Waialua stony silty clay, 12 to 30 percent slopes	North of Molii Pond	This series consists of moderately well-drained soils on alluvial fans. These soils are developed in alluvium weathered from basic igneous rock. They are nearly level to steep at elevations ranging from 10 to 100 feet.
WIE	Waialua stony silty clay, 3 to 8 percent slopes	North of Molii Pond	
WkA	Waialua silty clay, 0 to 3 percent slopes	Mid-Pacific Country Club	
WmD	Waialua very stony silty clay, 12 to 20 percent slopes	North of Molii Pond, at the base of Puu Kanehualani	
<b>Lolekaa-Waikane Association</b>			
<b>Alaeloa Series</b>			
AeE	Alaeloa silty clay, 15 to 35 percent slopes	Enchanted Lake and Ahuimanu areas	These soils consist of well-drained soils on uplands and are developed in material weathered from basic igneous rock. They are gently sloping to steep and range from 100 to 1,500 feet.
ALF	Alaeloa silty clay, 40 to 70 percent slopes	Oneawa Hills and hills around Puu Maeliell	

**Table 3-1 (cont.)  
Soil Types in Planning Region**

SYMBOL	SOIL TYPE	LOCATION	CHARACTERISTIC
<b>Kaneohe Series</b>			
KgB	Kaneohe silty clay, 3 to 8 percent slopes	Kaneohe Town, Pali Golf Course	This series consists of well-drained soils on terraces and alluvial fans. These soils developed in alluvium and colluvium derived from basic igneous rock. The soils are gently sloping to very steep at elevations from 100 to 1,000 feet.
KgC	Kaneohe silty clay, 8 to 15 percent slopes	Kaneohe Town	
KHMC	Kaneohe silty clay loam, 5 to 15 percent slopes	Kaneohe Town	
KHME	Kaneohe silty clay loam, 15 to 30 percent slopes	Near Hawaiian Memorial Park	
KHMF	Kaneohe silty clay loam, 30 to 65 percent slopes	Near Hawaiian Memorial Park	
KHOF	Kaneohe silty clay, 30 to 65 percent slopes	Kaneohe Town, Koolau Golf Course	
<b>Lolekaa Series</b>			
LoB	Lolekaa silty clay, 3 to 8 percent slopes	Area between Kamehameha Hwy and Kahekii Hwy	This series consists of well-drained soils on fans and terraces. These soils developed in old, gravelly colluvium and alluvium. They are gently sloping to very steep at elevations from nearly sea level to 500 feet.
LoC	Lolekaa silty clay, 8 to 15 percent slopes	Various locations within the planning region	
LoD	Lolekaa silty clay, 15 to 25 percent slopes	Various locations near the base of the Koolau's	
LoE	Lolekaa silty clay, 25 to 40 percent slopes	Various locations near the base of the Koolau's	
LoF	Lolekaa silty clay, 40 to 70 percent slopes	Various locations near the base of the Koolau's	
<b>Pohakupu Series</b>			
PkB	Pohakupu silty clay loam, 0 to 8 percent slopes	Area surrounding Castle Medical Center	This series consists of well-drained soils in terraces and alluvial fans. These soils formed in old alluvium derived from basic igneous material. They are nearly level to moderately sloping at elevations ranging from 50 to 250 feet.
PKC	Pohakupu silty clay loam, 8 to 15 percent slopes	Slopes of Mount Olomana	
<b>Waikane Series</b>			
WpaE	Waikane stony silty clay, 15 to 30 percent slopes	Lands near hairpin turn on Pali Highway	This series consists of well-drained soils on alluvial fans and terraces. These soils developed in alluvium and colluvium derived from basic igneous rock. They are nearly level to very steep at elevations ranging from 200 to 1,000 feet.
WpB	Waikane silty clay, 3 to 8 percent slopes	Maunawili, Waikane Valley, and Waiahole area	
WpC	Waikane silty clay, 8 to 15 percent slopes	Maunawili, Waikane Valley, and Waiahole area	
WpE	Waikane silty clay, 25 to 40 percent slopes	Maunawili, Waikane Valley, and Waiahole area	
WpF	Waikane silty clay, 40 to 70 percent slopes	Maunawili, Waikane Valley, base of Koolau Range, and Waiahole area	
WpF2	Waikane silty clay, 40 to 70 percent slopes, eroded	Maunawili, Waikane Valley, base of Koolau Range, and Waiahole area	

**Table 3-1 (cont.)  
Soil Types in Planning Region**

SYMBOL	SOIL TYPE	LOCATION	CHARACTERISTIC
<b>Rock Land-Stony Steep Land Association</b>			
<b>Rock Land</b>			
rRK	Rock Land	Mount Olomana, range behind Waikane Valley	Rock land is made up of areas where exposed rock covers 25 to 90 percent of the surface. The rock outcrops (mainly basalt and andesite) and very shallow soils are the main characteristics. This land type is nearly level to very steep at elevations ranging from nearly level to 6,000 feet.
<b>Rock Outcrop</b>			
rRO	Rock Outcrop	Koolau Range	Rock outcrop consists of areas where exposed bedrock covers more than 90 percent of the surface. This land type is gently sloping to precipitous at elevations ranging from nearly sea level to 10,000 feet.
<b>Rough Mountainous Land</b>			
rRT	Rough Mountainous Land	Waikane Valley	This land type occurs in mountainous areas. It consists of very steep land broken by numerous intermittent drainage channels. In most places it is not stony and the soil mantle is very thin and overlies saprolite, which is relatively soft and permeable to roots and water. Elevations range from nearly sea level to more than 6,000 feet.
<b>Stony Steep Land</b>			
rSY	Stony Steep Land	Slopes above Kawai Nui Marsh, slopes of Puu Papaa	This type of land consists of a mass of boulders and stones deposited by water and gravity on side slopes of drainageways. The slope ranges from 40 to 70 percent at elevations ranging from 100 to 1,500 feet. Stones and boulders cover 50 to 90 percent of the surface with small patches of soil among the stones, which provides a foothold for plants.
<b>Lualualei Series</b>			
LPE	Lualualei extremely stony clay, 3 to 35 percent slopes	Keolu Drive	This series consists of well-drained soils on the coastal plains, alluvial fans, and on talus slopes. These soils developed in alluvium and colluvium and are nearly level to gently sloping, at elevations ranging from 10 to 125 feet.
<b>Other Soils</b>			
<b>Beaches</b>			
BS	Beaches	Beaches throughout the planning region	Beaches occur as sandy, gravelly, or cobby areas. They are washed by ocean waves, and consist mainly of light-colored sands derived from coral and seashells. A few beaches are dark colored because their sands are from basalt and andesite. These can be found on shorelines within the planning area.



**Table 3-1 (cont.)  
Soil Types in Planning Region**

SYMBOL	SOIL TYPE	LOCATION	CHARACTERISTIC
<b>Ewa Series</b>			
EmA	Ewa silty clay loam, moderately shallow, 0 to 2 percent slopes	Near Mid-Pacific Country Club	This series consists of well-drained soils in basins and on alluvial fans. These soils are developed in alluvium derived from basic igneous rock. They are nearly level to moderately sloping at elevations ranging from near sea level to 150 feet.
<b>Fill Land</b>			
FL	Fill land, mixed	Enchanted Lake area, near Mid-Pacific Country Club, along Kaneohe Stream, and at MCBH Kaneohe Bay runways	This land type consists of areas filled with material from dredging, excavation from adjacent uplands, garbage, and slurry from sugar mills.
<b>Helemano Series</b>			
HLMG	Helemano silty clay, 30 to 90 percent slopes	Slopes of Mount Olomana, and in the area of Kapaa Quarry in Oneawa Hills	These are well-drained soils on alluvial fans and colluvial slopes on the sides of gulches. They developed in alluvium and colluvium derived from basic igneous rock. They are very steep and found in elevations of 500 to 1,200 feet.
<b>Honouliuli Series</b>			
HxB	Honouliuli clay, 2 to 6 percent slopes	Mokapu Peninsula	These soils consist of well-drained soils on coastal plains on Oahu. These soils developed in alluvium derived from igneous material. They are found in elevations ranging from 15 to 125 feet.
<b>Kokokahi Series</b>			
KtC	Kokokahi clay, 6 to 12 percent slopes	Lanikai, Kahaluu in the area of Puu Maelieli	This series consist of moderately well-drained soils on talus slopes and alluvial fans. These soils developed in colluvium and alluvium derived from basic igneous rock. They are moderately sloping to steep at elevations from nearly sea level to 125 feet.
KTKE	Kokokahi very stony clay, 0 to 35 percent slopes	Kaiwa Ridge in Lanikai	
<b>Lahalna Series</b>			
LaC	Lahalna silty clay, 7 to 15 percent slopes	North of Heeia Pond	This series consists of well-drained soils on uplands and are developed in material weathered from basic igneous rock. They are nearly level to moderately steep at elevations ranging from 10 to 1,000 feet.
<b>Makalapa Series</b>			
MdB	Makalapa clay, 2 to 6 percent slopes	Mokapu Peninsula	This series consists of well-drained soils on uplands. These soils formed in volcanic tuff and are nearly gently sloping to moderately steep, at elevations ranging from 20 to 200 feet.
MdC	Makalapa clay, 6 to 12 percent slopes	Mokapu Peninsula	
<b>Mamala Series</b>			
MnC	Mamala stony silty clay loam, 0 to 12 percent slopes	South of Nuupia Ponds, near the mouth of the Kawai Nui Canal	This series consists of shallow, well-drained soils along coastal plains. These soils formed in alluvium deposited over coral limestone and consolidated calcareous sand. They are nearly level to moderately sloping at elevations from nearly sea level to 100 feet.

**Table 3-1 (cont.)  
Soil Types in Planning Region**

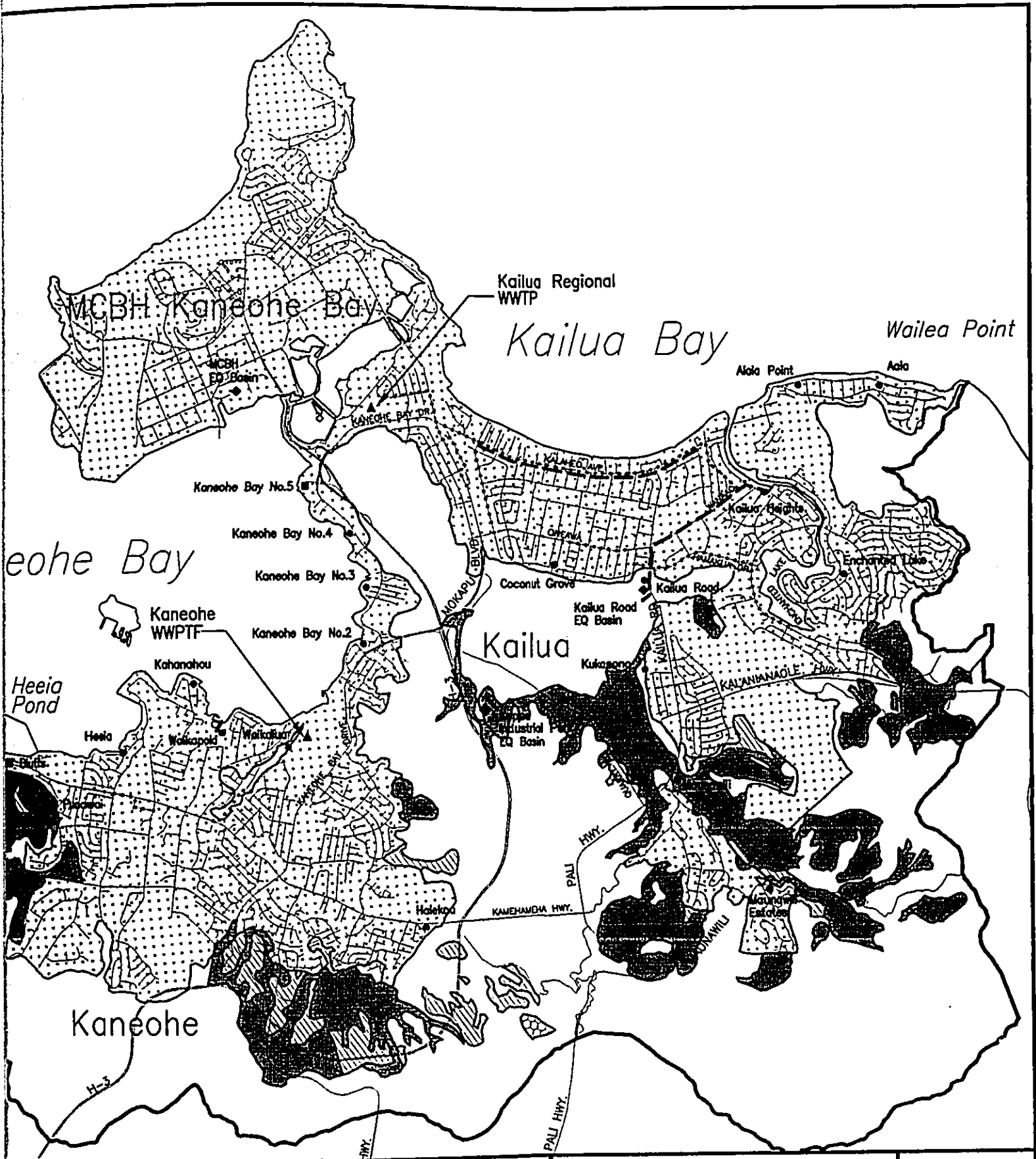
SYMBOL	SOIL TYPE	LOCATION	CHARACTERISTIC
<b>Molokai Series</b>			
MuC	Molokai silty clay loam, 7 to 15 percent slopes	Mokapu Peninsula	This series consists of well-drained soils on uplands. These soils formed in material weathered from basic igneous rock. They are nearly level to moderately steep at elevations ranging from sea level to 1,000 feet.
MuD	Molokai silty clay loam, 15 to 25 percent slopes	Mokapu Peninsula	
<b>Papaa Series</b>			
PYD	Papaa clay, 6 to 20 percent slopes	Keolu Hills	This series consists of well-drained soils on uplands. These soils formed in colluvium and residuum derived from basalt. They are moderately sloping to very steep at elevations ranging from nearly sea level to 500 feet.
PYE	Papaa clay, 20 to 35 percent slopes	Keolu Hills	
PYF	Papaa clay, 35 to 70 percent slopes	Keolu Hills	
<b>Tropaquepts</b>			
TR	Tropaquepts	Near Kahaluu Pond	These are poorly-drained soils that are periodically flooded by irrigation in order to grow crops that thrive in water. They occur as nearly level flood plains at elevations ranging from sea level to 200 feet.

Source: U.S. Department of Agriculture, Soil Conservation Service, 1972.

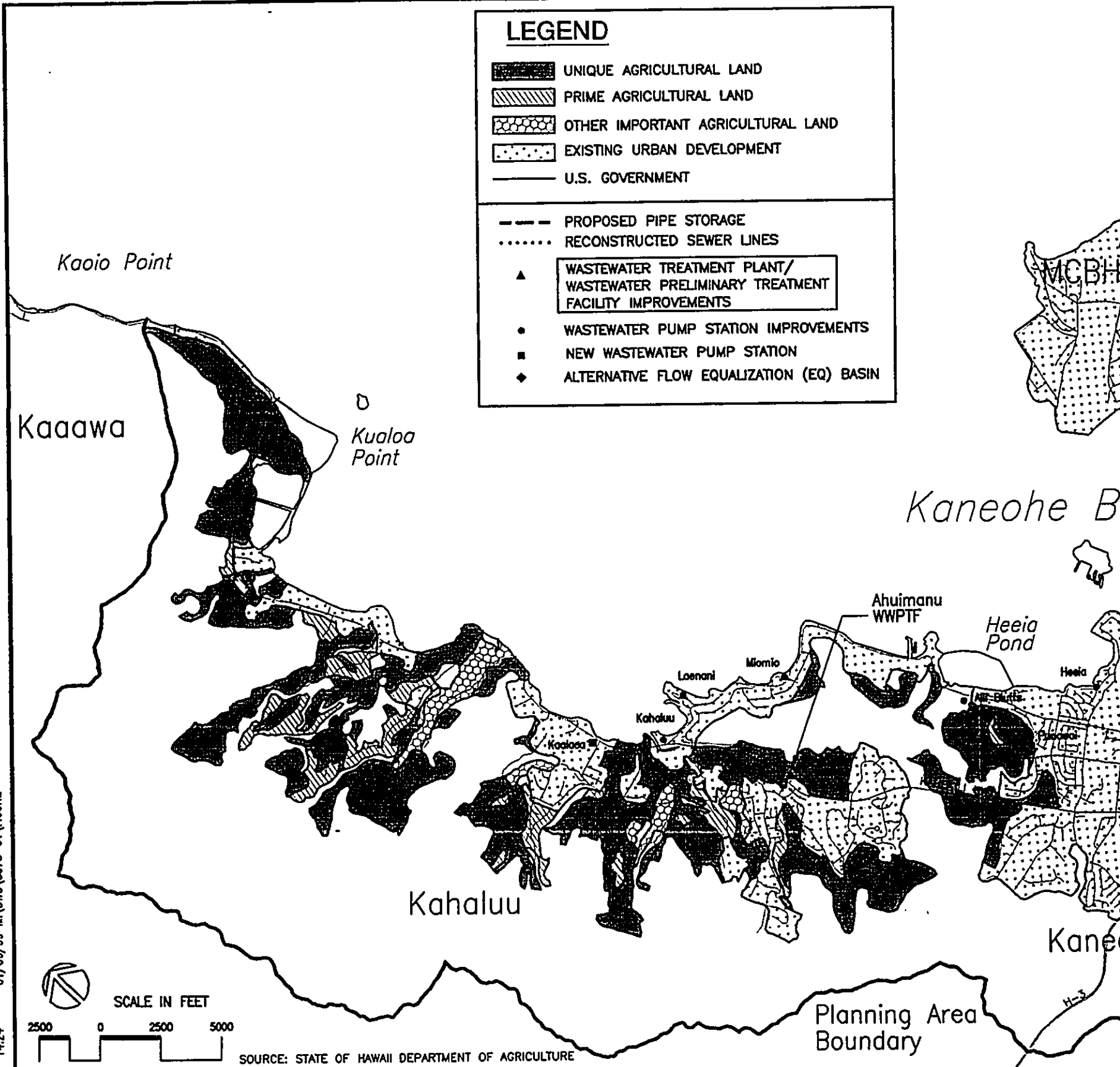
Within the planning region are Agricultural Lands of Importance to the State of Hawaii (see Figure 3-4). According to the U.S. Department of Agriculture, Natural Resources Conservation Service, and the University of Hawaii College of Tropical Agriculture, the following three agricultural lands designations comprise the planning region:

**Prime Agricultural Land** is land which has the soil quality, growing season, and moisture supply needed to produce sustained high yields of crops economically when treated and managed according to modern farming methods. The majority of these lands are located throughout various Kahaluu Valleys. These lands are also found in the area of Hoomaluhia Botanical Garden.

**Unique Agricultural Land** is 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. These agricultural lands are found throughout the planning region, mostly in valleys that lie inland of urban areas. These lands can also be found in the Maunawili and Kawai Nui Marsh areas of Kailua.



PLAN	AGRICULTURAL LANDS OF IMPORTANCE	FIGURE
ORTANCE All	TO THE STATE OF HAWAII	3-4

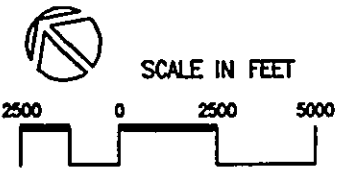


**LEGEND**

- UNIQUE AGRICULTURAL LAND
  - PRIME AGRICULTURAL LAND
  - OTHER IMPORTANT AGRICULTURAL LAND
  - EXISTING URBAN DEVELOPMENT
  - U.S. GOVERNMENT
- 
- PROPOSED PIPE STORAGE
  - RECONSTRUCTED SEWER LINES
- WASTEWATER TREATMENT PLANT/  
WASTEWATER PRELIMINARY TREATMENT  
FACILITY IMPROVEMENTS
  - WASTEWATER PUMP STATION IMPROVEMENTS
  - NEW WASTEWATER PUMP STATION
  - ALTERNATIVE FLOW EQUALIZATION (EQ) BASIN



01/06/99 M:\DWG\3378-01\FIGURE  
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SOURCE: STATE OF HAWAII DEPARTMENT OF AGRICULTURE

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**AGRICULTURAL LANDS OF IMPORTANCE TO THE STATE OF HAWAII**

**Other Important Agricultural Land** is land other than Prime or Unique Agricultural Land that is also of Statewide or local importance for agricultural use. These lands are not as plentiful, although small pockets can be found near Waiahole Stream, along the Kahaluu Stream system and in a small area near the Koolau Golf Course.

### **3.3 Hydrology and Water Quality**

#### **3.3.1 Surface Water**

The high rainfall on the Windward side of the Koolau Range supports numerous stream systems. Some flows of these perennial streams are affected by diversion and underground pumping as much as by rainfall. The streams in the planning region supply water for wetlands, fishponds, taro cultivation, and other agricultural uses and also drain the region of excess surface water. Streams within the planning region are shown in Figure 3-5 and include Hakipuu Stream, Waikane Stream, Waiahole Stream, Kaalaea Stream, Waihee Stream, Kahaluu Stream, Ahuimanu Stream, Heeia Stream, Keaahala Stream, Kaneohe Stream, Kawa Stream, Kawai Nui/Maunawili Stream, and Kaelepulu Canal (State Commission on Water Resource Management (CWRM), 1990).

The Waiahole, Waiana and Uwau Streams are part of the Waiahole Stream System. Beginning approximately 2.75 miles in Waiahole Valley, the stream system drains the slopes of the Koolau Range in the Waiahole Valley area and empties into Kaneohe Bay at the east end of Waiahole Beach Park. The Waiahole Stream System has a median flow of approximately 27.13 mgd. According to the Hawaii Stream Assessment, Waiahole Stream has *moderate* aquatic resources and *substantial* riparian, cultural and recreational resources.

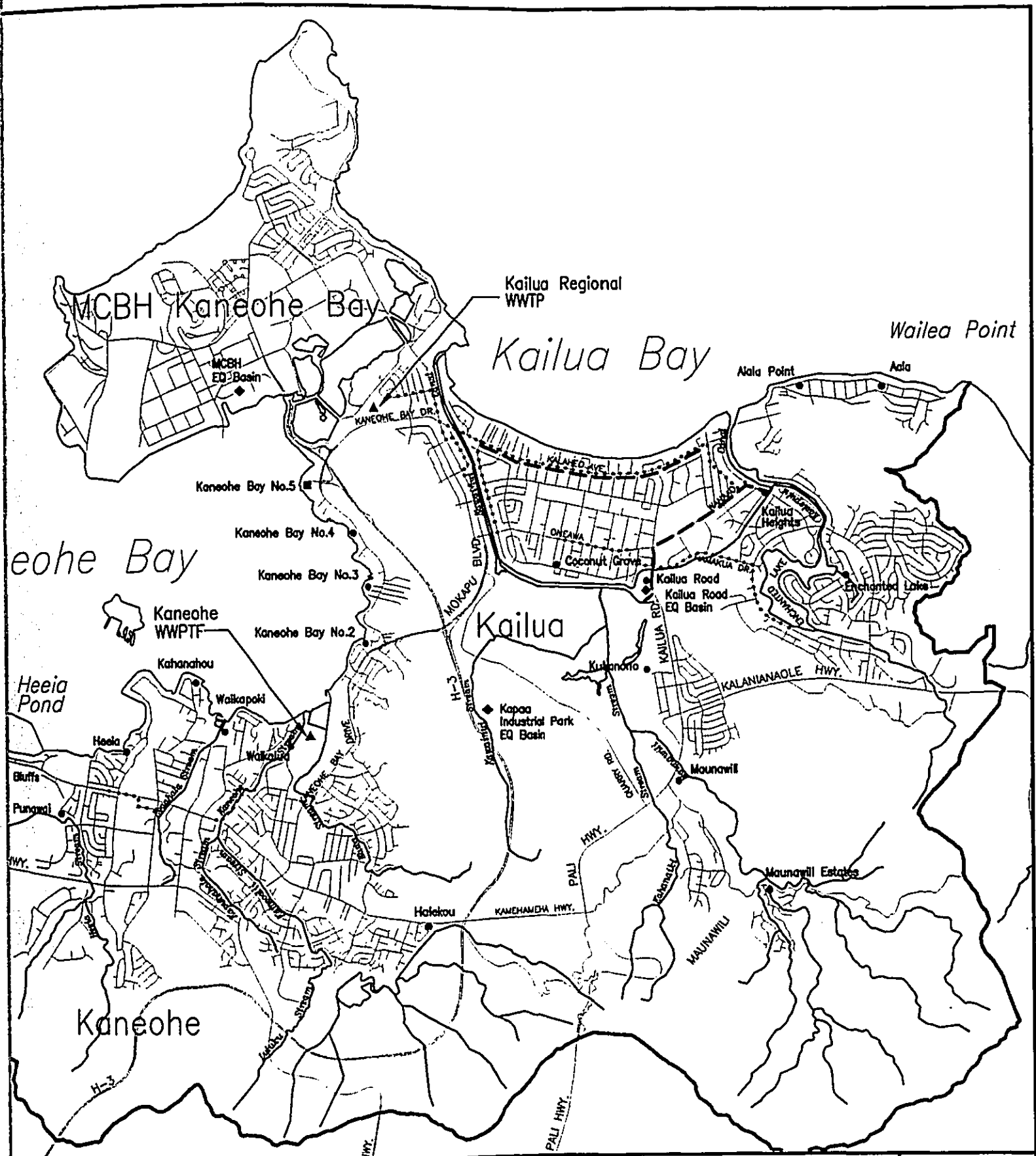
The Waihee, Kahaluu and Ahuimanu Streams are part of the Kahaluu Stream System which drains the slopes of the Koolau Range from Waihee to Ahuimanu, a drainage basin area of approximately five square miles. The stream system has a median flow of 11.95 mgd and empties into Kaneohe Bay near Kahaluu Fishpond. According to the Hawaii Stream Assessment, the Kahaluu Stream System has *moderate* aquatic resources and *substantial* cultural and recreational resources.

Heeia Stream, along with its tributary Lolekaa Stream, drains the slopes of Lolekaa and Haiku Valleys, a drainage basin area of approximately three square miles. The stream has a median flow of approximately 1.03 mgd. Heeia Stream empties into Heeia Marsh and Fishpond, supplying both wetland areas with fresh water. According to the Hawaii Stream Assessment, Heeia Stream has *moderate* aquatic resources, *outstanding* riparian resources and *substantial* recreational resources.

The Kaneohe Stream System begins at the base of the Koolau Range in Hoomaluhia Park, and about one-half mile to the southwest of Windward Community College. Together with its tributaries, Kamooalii, Luluku and Kapunahala Streams, it drains the entire Kaneohe area. The stream flows through Kaneohe Town and enters Kaneohe Bay near Kaneohe Beach Park. The median flow of Kaneohe Stream is approximately 6.3 mgd. According to the Hawaii Stream Assessment, the Kaneohe Stream System has *moderate* aquatic resources and *substantial* riparian and recreational resources.

The Kawainui/Maunawili, Kawailoa and Kawaiiki Streams are part of the Anahulu Stream System which drains the slopes of the Koolau Range in Maunawili Valley and Mount Olomana, a drainage basin area of approximately 10,394 acres. The stream flows north through Kawai Nui Marsh and into Kawai Nui Canal which empties into Kailua Bay. Maunawili Stream is rated as a "candidate stream for protection" by the CWRM due to outstanding cultural, riparian and recreational values. According to the Hawaii Stream Assessment, Kawainui/Maunawili Stream has *limited* aquatic resources, *outstanding* riparian and cultural resources and *substantial* recreation resources.

There are no designated wild or scenic rivers in the planning area as defined under the Federal Wild and Scenic Rivers Act.



S PLAN

STREAMS

FIGURE

3-5

**LEGEND**

- PROPOSED PIPE STORAGE
- ..... RECONSTRUCTED SEWER LINES
- ▲ WASTEWATER TREATMENT PLANT/  
WASTEWATER PRELIMINARY TREATMENT  
FACILITY IMPROVEMENTS
- WASTEWATER PUMP STATION IMPROVEMENTS
- NEW WASTEWATER PUMP STATION
- ◆ ALTERNATIVE FLOW EQUALIZATION (EQ) BASIN

Kaoio Point

Kaaawa

Kualoa Point

Kaneohe Bay

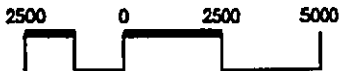
Kahaluu

Kaneohe

Planning Area Boundary



SCALE IN FEET



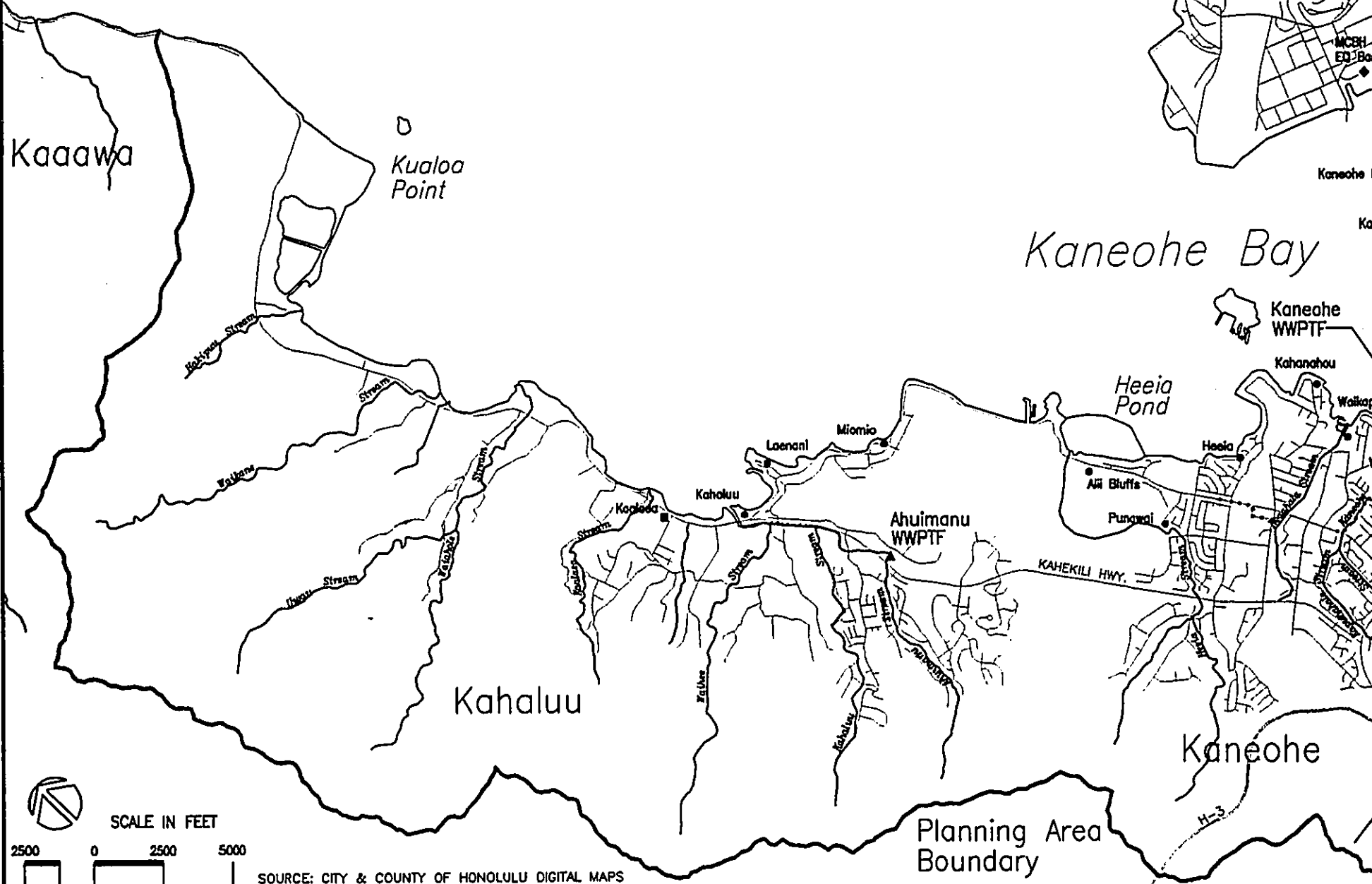
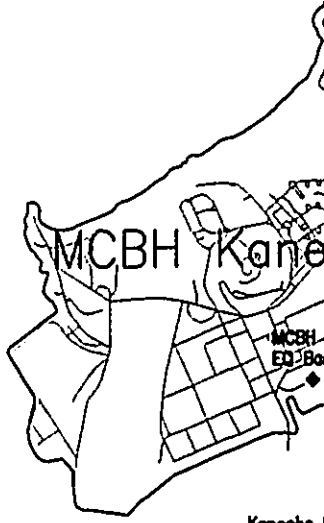
SOURCE: CITY & COUNTY OF HONOLULU DIGITAL MAPS

KAILUA-KANEOHE-KAHALUU FACILITIES PLAN

**STREAMS**

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NW-STREAM.DWG 14:24 01/06/99 M:\DWG\3378-01\FIGURE





### 3.3.1.1 Physical and Chemical Water Quality of Streams

Various field investigations of the physical and chemical parameters of the streams in the planning region have been performed at various times.

Data was obtained by the Kalaheo Stream Team at eight (8) sites on streams in Maunawili Valley and Kawai Nui Marsh. The Kalaheo Stream Team is part of an environmental studies project involving a water quality management system for the area from the Maunawili area streams through Kawai Nui Marsh to Kailua Bay. The water quality monitoring project began in the Fall of 1992 and continued through 1996 through Hawaii's legislative funding for water quality monitoring of Kailua Bay and Waimanalo Bay. The project was a collaboration and partnership with the University of Hawaii (Sea Grant), the City and County of Honolulu (Department of Public Works), State DOH, and the Kailua and Waimanalo communities. Of the eight (8) sites in which data was collected, four (4) were in Maunawili streams and four (4) in Kawai Nui Marsh. Sampling locations are shown in Figure 3-6. The monthly baseline data collected was for pH, dissolved oxygen, temperature, phosphates, nitrates, salinity, and characterization. The data was sent to the University of Hawaii (Sea Grant) which distributed the data to the State DOH and City.

The results of the investigations are presented in Table 3-2. Patterns in the study included higher water temperatures in sampling areas closer to the ocean and lower amounts of dissolved oxygen in samples at Kawai Nui Marsh and near the coastline compared to sampling done higher upstream.

The U.S. Geological Service also performed annual stream water quality sampling during the months of October 1996 through September 1997 on streams throughout Kaneohe. Data collected included pH levels, temperature (water and air), salinity, chemical data, bacteriological data, and heavy solids data. The sampling locations are shown in Figure 3-6 and results of the sampling are presented in Table 3-3. No discernible patterns were observed among area streams in the study.

The DOH classifies its water quality standards into a wet and dry season. As specified by Chapter 54, Hawaii Administrative Rules (HAR), the wet season runs from November through April, and the dry season runs from May through

October. Due to the mixing of data, it is difficult to define which season has a greater effect on the data.

Between the two different studies performed on streams throughout the planning region, neither showed a large exceedance of DOH water quality standards. As a whole, only water quality samples taken from the two stations at Kamooalii Stream showed exceedance of wet and dry season standards for nitrate and phosphorous levels. This may be due to these two sampling stations being located within highly urbanized areas.

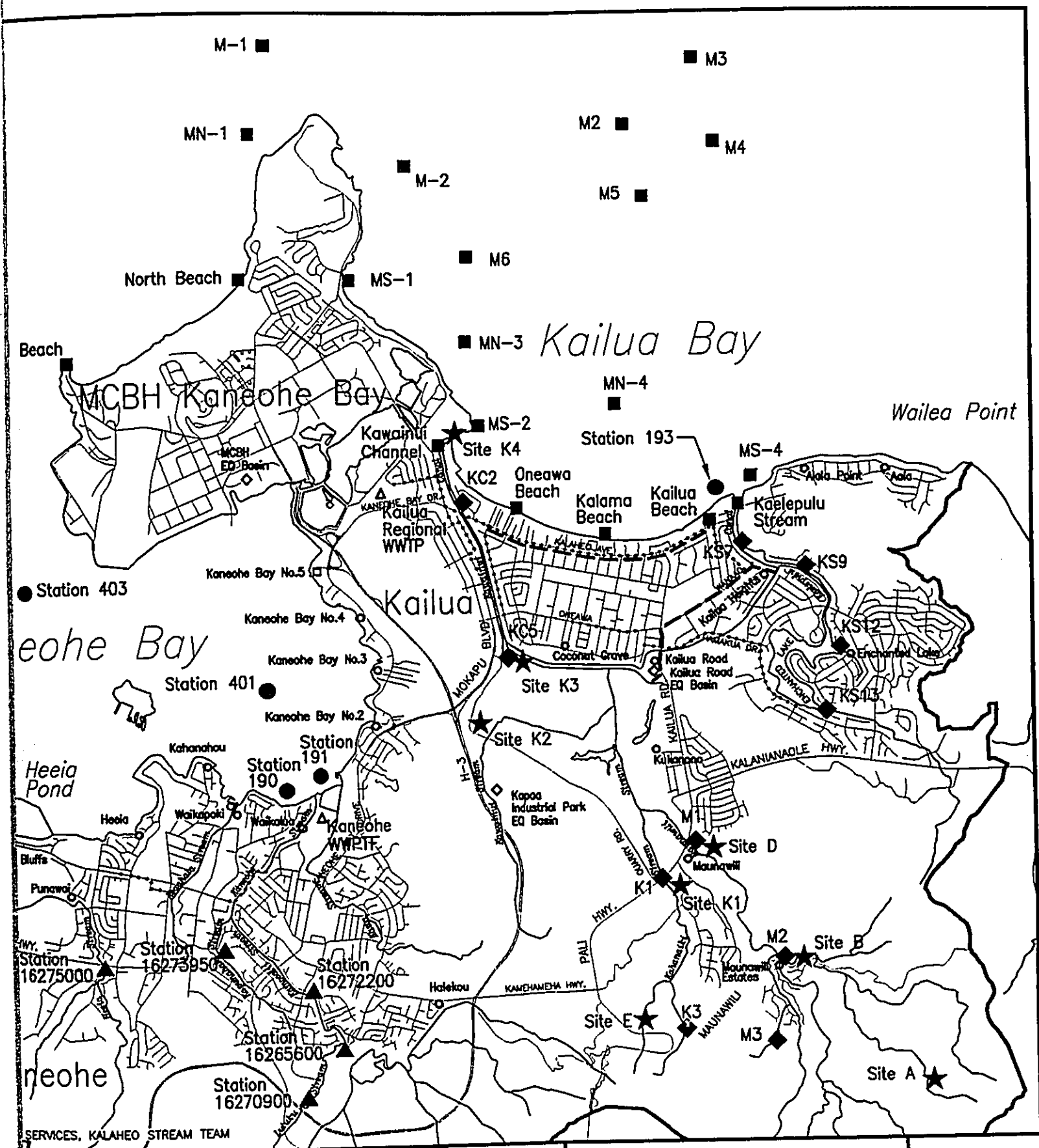
In the Kawai Nui Marsh environs, the DOH does not allow pH level deviation above 7.0 or below 4.5. Sampling of the two sites within Kawai Nui Marsh has shown that levels have exceeded the acceptable DOH levels. During the three year study, pH levels were rarely within DOH accepted levels. Nitrate and phosphate levels have never exceeded DOH levels of .20 mg/L and .025 mg/L, respectively, during the study period.

#### **3.3.1.2 Bacteriological Water Quality of Streams**

Few samplings of the baseline bacteriological water quality of streams in the Kahaluu and Kaneohe areas have been done. Data from the U.S. Geological Survey on bacteria levels in the planning area streams were limited to select Kaneohe streams and only included fecal coliform (see Table 3-4).

The results of the sampling are presented in the first column of Table 3-4. Sampling is restricted to five stations in the Kaneohe area. Of these five stations, only two met the State standards of 200 cfu/100 ml for fecal coliform. The only large exceedance was displayed at Kapunahala Stream, which exceeded water quality standards by 2000 cfu/100 ml. As with other sampling data, the further downstream, the greater the degradation of water quality levels.

Bacteriological sampling of streams in Kailua included Kaelepulu and Kawai Nui Canals. The data collected was obtained from two reports prepared by the University of Hawaii at Manoa Water Resources Research Center (UHM-WRRC) in October 1993. One report is entitled Impact of Kawainui Canal on the Recreational Water Quality of Kailua Bay (KB-4) prepared by Lina Ahuna



PLAN  
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WATER QUALITY MONITORING  
AND SAMPLING STATIONS

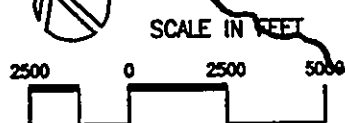
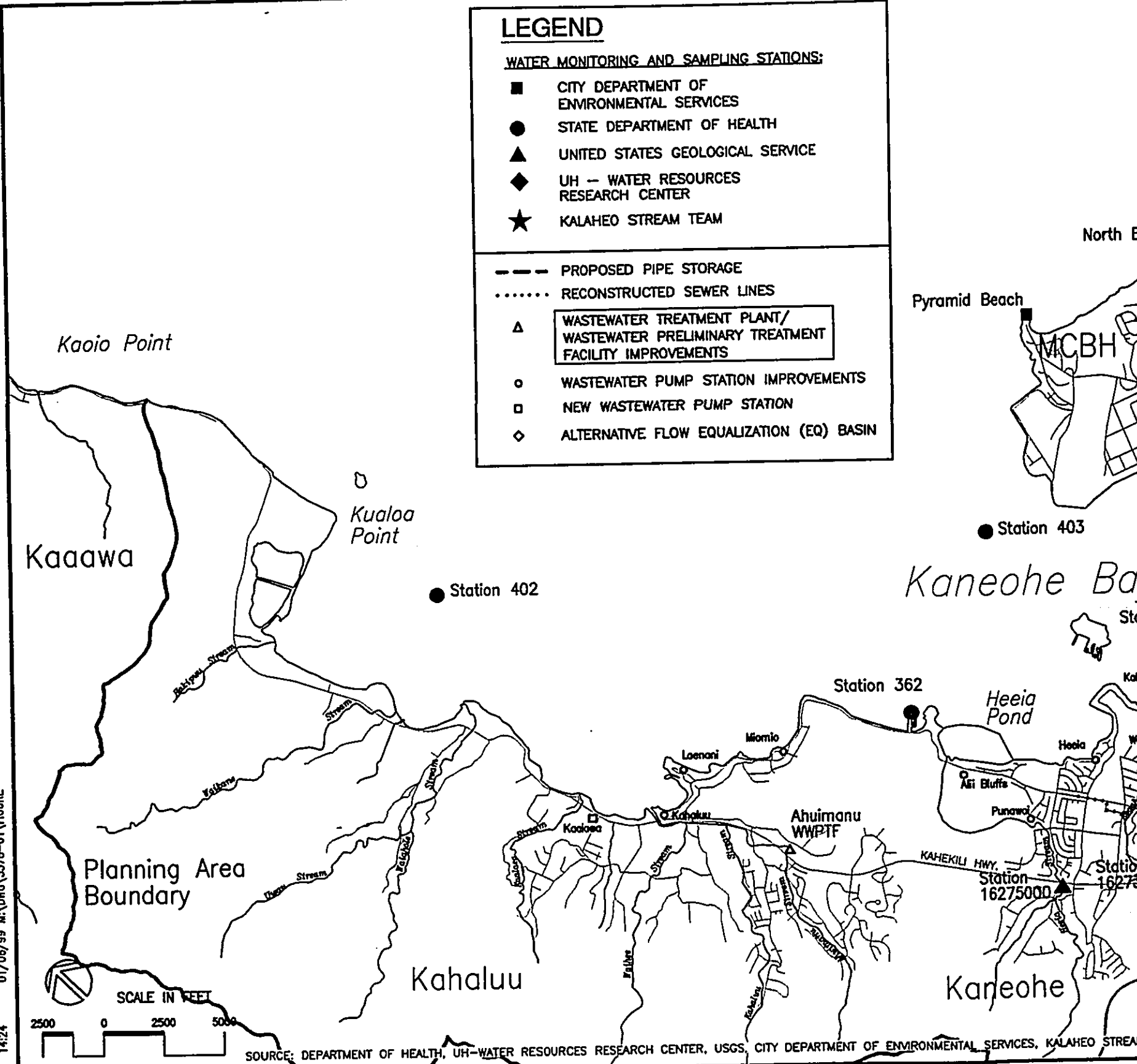
FIGURE  
3-6

# LEGEND

## WATER MONITORING AND SAMPLING STATIONS:

- CITY DEPARTMENT OF ENVIRONMENTAL SERVICES
- STATE DEPARTMENT OF HEALTH
- ▲ UNITED STATES GEOLOGICAL SERVICE
- ◆ UH - WATER RESOURCES RESEARCH CENTER
- ★ KALAHEO STREAM TEAM

- PROPOSED PIPE STORAGE
- ..... RECONSTRUCTED SEWER LINES
- △ WASTEWATER TREATMENT PLANT/  
WASTEWATER PRELIMINARY TREATMENT  
FACILITY IMPROVEMENTS
- WASTEWATER PUMP STATION IMPROVEMENTS
- NEW WASTEWATER PUMP STATION
- ◇ ALTERNATIVE FLOW EQUALIZATION (EQ) BASIN



SOURCE: DEPARTMENT OF HEALTH, UH-WATER RESOURCES RESEARCH CENTER, USGS, CITY DEPARTMENT OF ENVIRONMENTAL SERVICES, KALAHEO STREAM TEAM

## KAILUA-KANEOHE-KAHALUU FACILITIES PLAN

# WATER QUALITY MONITORING AND SAMPLING STATIONS

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**Table 3-2  
Maunawili Stream and Kawai Nui Marsh Mean Physical/Chemical Data Summary<sup>1</sup>**

Location	Dissolved Oxygen (% saturation) <sup>2</sup>				pH (units)				Nitrate (mg/l)				Phosphate (mg/l)				Temperature (°C)			
	No. of Samples	Mean	High	Low	No. of Samples	Mean	High	Low	No. of Samples	Mean	High	Low	No. of Samples	Mean	High	Low	No. of Samples	Mean	High	Low
State Standards (wet)	Not less than 80% saturation																			
State Standards (dry)	pH (units) shall not deviate more than 0.5 units from ambient conditions and shall be between 5.5 and 8.0																			
Site A (Ainoa Stream-Mauka)	15	104	120	90	16	7.83	8.45	7.50	14	0.06	0.20	0.00	14	0.26	0.46	0.10	15	21.59	24.00	18.50
Site B (Maunawili Stream-near Maunawili Road)	17	112	158	92	18	8.32	8.93	7.50	16	0.04	0.11	0.00	16	0.25	0.53	0.06	17	23.62	27.00	20.60
Site D (Maunawili Stream-by bridge at Pali Hwy.)	16	95	134	66	18	7.43	7.84	7.10	17	0.06	0.14	0.00	16	0.21	0.55	0.00	16	22.53	25.00	19.70
Site E (Kahana Iki Stream-upper reach, feeding into Kawai Nui Marsh)	13	97	115	79	13	7.49	7.96	7.28	11	0.02	0.13	0.00	11	0.14	0.30	0.00	12	21.20	23.00	19.20
Site K1 (Kahana Iki Stream, off Pali)	4	83	98	72	4	7.33	7.78	7.16	3	0.05	0.08	0.02	3	0.14	0.28	0.00	4	21.50	23.70	20.20
Site K2 (near Kapaa Quarry Road/Dump Road, off Mokapu Blvd.)	12	37	81	11	12	7.40	7.59	7.11	10	0.05	0.10	0.00	11	0.09	0.45	0.00	10	25.55	27.00	21.20
Site K3 (above Mokapu Canal by Dike Road)	13	52	90	30	13	7.25	8.00	6.77	11	0.02	0.10	0.00	12	0.24	0.55	0.00	11	24.85	28.00	21.00
Site K4 (Kailua Cove, end of Mokapu Canal)	6	81	70	102	6	7.89	8.09	7.53	n/a	n/a	n/a	n/a	5	0.10	0.22	0.00	5	26.08	27.40	23.70

Notes:  
1. Data is based on sample dates starting on 7/31/94 and ending on 7/27/96. Not all parameters sampled on all dates.  
2. Data was converted from mg/l using oxygen solubility tables provided by the U.S.G.S. Water Resources Division.  
Source: Kalaheo Stream Team sampling data. <http://ananke.advanced.org/2732/kst.html>

**Table 3-3  
Kaneohe Area Streams Mean Physical/Chemical Data Summary<sup>1</sup>**

Location	Dissolved Oxygen (% saturation) <sup>2</sup>				pH (units)				Nitrate (mg/l)				Phosphate (mg/l)				Temperature (°C)			
	No. of Samples	Mean	High	Low	No. of Samples	Mean	High	Low	No. of Samples	Mean	High	Low	No. of Samples	Mean	High	Low	No. of Samples	Mean	High	Low
	Not less than 80% saturation				pH (units) shall not deviate more than 0.5 units from ambient conditions and shall be between 5.5 and 8.0				0.25 0.18				0.05 0.03				Shall not vary more than one degree Celsius from ambient conditions			
State Standards (wet)																				
State Standards (dry)																				
Station 16265600-Right Branch, Kamooolii Stream	12	65	75	37	12	6.53	7.10	6.00	5	0.45	0.36	0.55	3	0.10	0.28	0.01	12	24.04	25.00	23.00
Station 16270900-Luluku Stream at 220 ft.	12	96	101	78	12	7.50	7.80	7.00	5	0.17	0.23	0.11	3	0.01	0.02	0.01	12	21.13	22.00	21.00
Station 16272200-Kamooolii Stream, below Luluku Stream	11	106	113	98	12	7.87	8.10	7.50	5	0.33	0.37	0.28	5	0.01	0.02	0.01	12	24.63	26.50	22.00
Station 16273950-South Fork Kapunahala Stream	11	99	102	94	12	7.81	8.10	6.80	5	0.08	0.13	<.05	5	0.03	0.04	0.02	12	22.83	25.00	21.00
Station 16275000-Haiku Stream, near Heeia	12	100	104	95	12	7.62	7.80	7.30	5	0.09	0.12	0.07	4	0.02	0.03	0.01	12	20.79	22.50	20.50

Notes:  
 1. Data is based on sample dates starting on 10/29/96 and ending on 9/9/97. Not all parameters sampled on all dates.  
 2. Data was converted from mg/l using oxygen solubility tables provided by the U.S.G.S. Water Resources Division.  
 Source: U.S. Geological Survey Water Data Report HI-97-1, 1997

**Table 3-4  
Kaneohe Area Streams Mean Bacteriological and Dissolved Heavy Solids Data Summary<sup>1</sup>**

Location	Fecal Coliform (cfu/100ml)				Arsenic (ppb)				Cadmium (ppb)				Lead (ppb)				Oil and Grease (mg/l)			
	No. of Samples	Mean	High	Low	No. of Samples	Mean	High	Low	No. of Samples	Mean	High	Low	No. of Samples	Mean	High	Low	No. of Samples	Mean	High	Low
Station 16265600-Right Branch, Kamooalii Stream	5	226	400	160	3	<1.00	1.00	<1.00	1	<0.30	n/a	n/a	1	<0.30	n/a	n/a	3	n/a	2.00	<1.00
Station 16270900-Luluku Stream at 220 ft.	5	220	270	170	3	<1.00	<1.00	<1.00	1	<0.30	n/a	n/a	1	<0.30	n/a	n/a	3	<1.00	<1.00	<1.00
Station 16272200-Kamooalii Stream, below Luluku Stream	3	171	270	82	3	<1.00	<1.00	<1.00	n/a	n/a	n/a	n/a	3	<1.00	<1.00	<1.00	3	<1.00	<1.00	<1.00
Station 16273950-South Fork Kapunahala Stream	5	2480	4100	1200	3	<1.00	<1.00	<1.00	n/a	n/a	n/a	n/a	3	<1.00	<1.00	<1.00	3	<1.00	<1.00	<1.00
Station 16275000-Haiku Stream, near Heeia	4	115	140	68	3	<1.00	<1.00	<1.00	n/a	n/a	n/a	n/a	3	<1.00	<1.00	<1.00	3	n/a	1.00	<1.00

**Notes:**

1. Data is based on sample dates starting on 10/29/96 and ending on 9/9/97. Not all parameters sampled on all dates.

Source: U.S. Geological Survey Water Data Report HI-97-1, 1997

and Roger Fujioka. The second report is entitled *Microbiological Assessment of Kaelepulu Stream and the Impact of Discharge in Kailua Bay (KB-3)* prepared by Bruce M. Roll and Roger S. Fujioka.

The objectives of the Kawai Nui Canal study were to determine the impact of discharges of freshwater from Kawai Nui Canal into Kailua Bay, and to determine the sources of the water quality indicator bacteria found in environmental waters. Samples were obtained at 17 sites within Maunawili, Kawai Nui Marsh/Canal and Kailua Bay. Representative sample site locations within the various areas of the study site are shown in Figure 3-6.

The objectives of the Kaelepulu Stream study were to determine the impact of Kaelepulu Stream on the microbiological quality of the waters in Kailua Bay and to determine the possible sources of indicator bacteria. Sampling was conducted at 11 sites that best represented the entire Kaelepulu Pond and Stream system. Representative sample site locations within the drainage system are depicted in Figure 3-6.

The results of the sampling for the Kawai Nui Canal and Kaelepulu Stream studies are presented in Table 3-5. The data indicates an exceedance of established recreational water quality standards. High levels of *Clostridium perfringens* (an indicator of fecal wastes) were not a product of sewage discharge, but most likely due to feces from ducks which concentrate in the area. Bacteria levels appear to be highest in areas where water enters the drainage systems. At all sites except one, enterococci levels were higher than State DOH standards of 33/100 mL. Most sites also displayed exceedance of State standards for levels of *E. coli* and fecal coliform, especially at sites below urban development. The source of most fecal bacteria was previously determined to come from the soil (Hardina and Fujioka, 1991).



**Table 3-5**  
**Geometric Mean of Fecal Indicators Obtained from Samples Taken at**  
**Kailua Streams, Expressed in Colony Forming Units (CFU)/100mL<sup>1</sup>**

Sample Site	Fecal Coliform	E. coli	Enterococci	C. Perfringens
KC2 <sup>1</sup>	281.0	195.0	184.0	18.0
KC5 <sup>1</sup>	316.0	169.0	153.0	8.0
K1 <sup>1</sup>	1126.0	906.0	752.0	38.0
K3 <sup>1</sup>	128.0	110.0	139.0	0.0
M1 <sup>1</sup>	906.0	759.0	566.0	12.0
M2 <sup>1</sup>	1074.0	918.0	891.0	6.0
M3 <sup>1</sup>	148.0	98.0	58.0	34.0
KS7 <sup>2</sup>	18.5	6.9	26.0	4.8
KS9 <sup>2</sup>	76.3	27.7	101.1	2.7
KS12 <sup>2</sup>	275.7	227.3	504.0	28.1
KS13 <sup>2</sup>	138.9	46.0	254.9	4.8

<sup>1</sup> - Data obtained from UHM-WRRC (Lina Ahuna and Roger Fujioka), *Impact of Kawainui Canal on the Recreational Water Quality of Kailua Bay (KB-4)*, Oct. 1993.

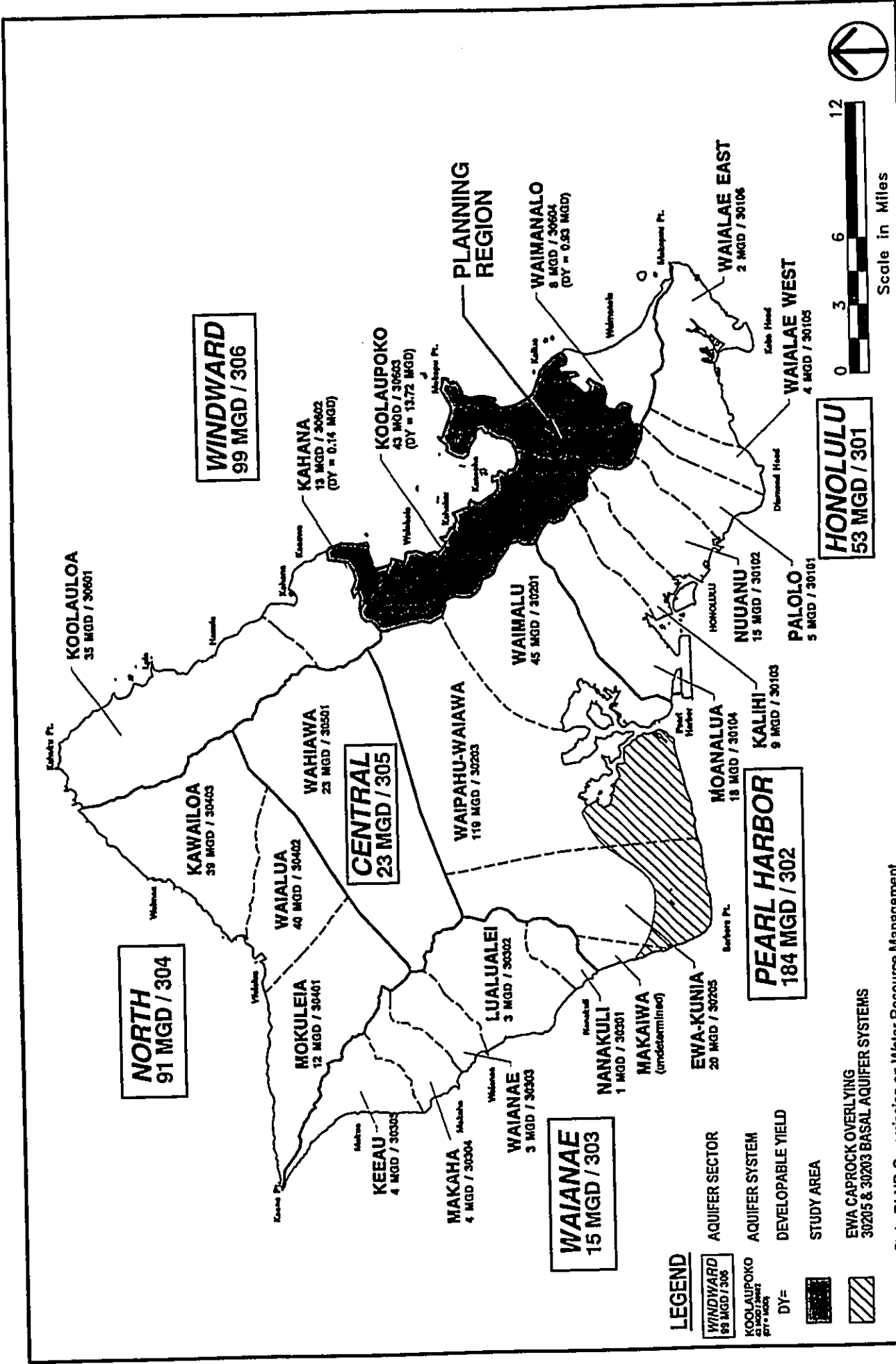
<sup>2</sup> - Data obtained from UHM-WRRC (Bruce M. Roll and Roger S. Fujioka), *Microbiological Assessment of Kaelepulu Stream and the Impact of Discharge in Kailua Bay (KB-3)*, Oct. 1993.

\* - USEPA freshwater standards for water quality compliance are as follows:  
 Fecal coliform = 200/100 mL, E. coli = 126/100 mL,  
 Enterococci = 33/100 mL, C. perfringens = 50/100 mL.

### 3.3.2 Groundwater

The planning area overlies the groundwater of the Waimanalo, Koolaupoko and Kahana Aquifer Systems within the Windward Aquifer Sector (see Figure 3-7).

An Aquifer Sector is a large aquifer unit that reflects broad hydrogeological similarities, yet maintains traditional hydrographic, topographic and historical boundaries, while an Aquifer System is more specifically defined by hydraulic continuity (CWRM, 1992). The Koolaupoko District, along with the Koolauloa District, receives the most rainfall on the island, with more than 100 inches annually. The abundance of rainfall, in combination with exposure of the rift zone and the caldera of the Koolau volcano, create hydrogeologic conditions where perennial flow is common in the upper reaches of valleys and supported by dike-confined water and high water tables. In the lower reaches, streams on the coastal plains or in reaches underlain by thick alluvium are perched and



Source: State DLNR Commission on Water Resource Management

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**AQUIFER SECTORS AND SYSTEMS**

FIGURE 3-7

do not impact groundwater flows, particularly where stream inverts are higher than the water table in the volcanics.

Aquifer types found within these systems include basal aquifers, high-level dike aquifers, and dike basal aquifers, which are a combination of the first two. Basal groundwater occurs at shallow depths and floats on the heavier seawater. The fresh water characteristically forms a lens-shaped body floating over the seawater. High-level dikes are dense, poorly permeable remnant conduits through which lava is extruded from the Koolau volcanic shield. Rainfall is retained within the cross-cut of the lava flows, acting as natural reservoirs for groundwater. Both the Waimanalo and Koolaupoko aquifer systems are considered by the State CWRM to have a direct relationship between surface water and groundwater conditions in the upper elevations. At mid-elevations, surface water may be hydraulically separated from the basal and dike basal aquifers by layers of thick sediments. Lower elevation stream flows may or may not be affected by basal groundwater withdrawals. It is evident that the impact of the pumping of groundwater upon stream flows is controlled by geology and local water tables relative to the stream channel. The following summarizes the hydrology of the Waimanalo, Koolaupoko and Kahana aquifer systems.

Waimanalo: The Waimanalo Aquifer System extends from Nuuanu Pali in Kailua to Makapuu Point, the easternmost point on Oahu. The system includes a dike complex, marginal dike zone, and the collapsed caldera of the original Koolau volcano. Three types of aquifers are present at Waimanalo: high-level unconfined dike, basal confined dike, and basal unconfined sedimentary. Groundwater flow within the aquifers is in a downward and eastern direction. Two drainage basins account for practically all stream flow. The largest is Maunawili, which empties into Kawai Nui Marsh, and the other is Waimanalo, which passes on to the limestone of the coastal plain at Bellows Field. There is limited developable groundwater in the marginal dike zone east of Maunawili in the Waimanalo drainage basin. Sustainable yield of the system is estimated at 8 mgd (CWRM, 1991).

Koolaupoko: Extending from Waikane Valley to the Nuuanu Pali, the Koolaupoko Aquifer System has portions of some streams which are sensitive to groundwater withdrawals such as Waihee Stream. The aquifer system consists of a dike complex and marginal dike zone, with nearly all of the

groundwater developed from the marginal dike zone (a narrow band generally less than one mile wide near the crest of the Koolaus between Waiahole and the Pali). Some of the groundwater in the system eventually drains to streams or emerges in wetlands. Groundwater also leaves by unseen underflow to the ocean and through caprock. Where the water table is at or higher than the streams, groundwater inflow contributes to the stream. The opposite may be true if the water table is below the stream level, particularly if the stream is perched on highly permeable alluvium. However, the lower reaches where the flow is perched on thick sediments are not affected by groundwater development. The 43 mgd estimated sustainable yield is basically the high-level groundwater that cannot leave the system as subsurface drainage. It also refers to high-level water exclusive of that removed by the Waiahole Tunnel (CWRM, 1991).

Kahana: The Kahana Aquifer System extends between the lower reach of Punaluu Valley and the topographic divide between Hakipuu and Waikane Valleys. All groundwater within this System is essentially dike-confined, from the crest of the Koolaus to nearly the coast. Groundwater occurrence in the Kahana System is mostly high-level, but small basal aquifers exist in the sector between lower Punaluu and Kahana Valleys, in lower Kahana Valley, and along the coast from Kahana into Kaaawa Valley. Much high-level groundwater seeps into the streams, but a significant fraction also drains into the narrow basal aquifers along the coast. The basal groundwater in turn leaks into the caprock sediments from where it finally passes into the sea.

The Kahana Stream acts as a drain on high-level dike-impounded groundwater; much of the groundwater above an elevation of 30 feet drains into the stream. A large part of the 13 mgd estimated sustainable yield consists of groundwater which accounts for the base flow of the stream (CWRM, 1991).

The CWRM has determined that groundwater withdrawals may have a direct relationship to stream flow in the Waimanalo and Koolaupoko Aquifer Systems. Accordingly, groundwater withdrawals are subject to provisions of the instream use protection program administered by CWRM as of April 19, 1989, the date of Administrative Rule adoption.

A discussion of the potable water wells and groundwater quality in the planning region is included in Section 3.11.1.

### **3.3.3 Coastal Waters**

**Kaneohe Bay:** Coastal waters in Kaneohe Bay, which extend from Kualoa Point in Waikane to Pyramid Rock in Mokapu Peninsula, are classified as Class AA waters. Class AA waters are high quality coastal waters classified by the DOH with the objective that "these waters remain in their natural pristine state as nearly as possible with an absolute minimum of pollution or alteration of water quality from any human-caused source or actions." (*Water Quality Standards, Title 11, Chapter 54, (HAR)*). Kaneohe Bay has a surface area of approximately 2 square miles with depths ranging from 50 feet to less than one foot. The Bay's watershed boundary consists of the drainage areas of Kaneohe, Kahaluu, Waiahole, and Waikane Streams. A shallow offshore barrier reef at the entrance to Kaneohe Bay separates the bay from the open ocean.

The DOH's monitoring of Kaneohe Bay has shown a dramatic decline in phosphorous and turbidity since 1979, when effluent discharge was terminated at two major outfalls in the Bay and diverted to the Mokapu Outfall. Effluent was diverted to Mokapu from the Ahuimanu WWTP in 1986 (0.51 mgd), from the Kaneohe WWTP in 1977 (3.57 mgd), and from the Kaneohe Marine Corps Air Station in 1978 (1.27 mgd) (*208 Water Quality Plan, 1990*). Sedimentation in Kaneohe Bay has occurred from both marine and terrigenous (land) sources. Since 1927, there has been an average shoaling of 3.3 feet within the lagoon of Kaneohe Bay. It has been estimated that 60 percent of the sediment is carbonate material from reefs, 13 percent from dredging soils and 27 percent from terrigenous sediments. Eighty-seven percent of the land-derived sedimentation occurs in the south bay. Urbanization in this area has increased the amount of sediment that stormwaters carry into the south portion of the bay.

**Kailua Bay:** Kailua Bay is an indentation in the coastline of Windward Oahu bounded by Mokapu Point at the north end and Wailea Point at the south end. The Bay is classified as Class A waters with the objective that "their use for recreational purposes and aesthetic enjoyment be protected. These waters

shall not act as receiving waters for any discharge which has not received the best degree of treatment or control compatible with the criteria established for this class." (*Water Quality Standards, Title 11, Chapter 54, HAR*). Kailua Bay does not fit the classical definition of an embayment because it has no restricted mouth, and, hence, is susceptible on the seaward side to open coastal transport conditions. The two ends of Kailua Bay are significantly different. The south end is a reef flat area contiguous with Waimanalo Bay, whereas the north end at Mokapu Peninsula has no adjacent reef flat but, instead, has deep water close to shore.

The Kailua Regional WWTP operates under NPDES Permit No. HI0021296, which authorizes the City Department of Environmental Services (formerly Department of Wastewater Management) to discharge secondary treated wastewater from the plant through the Mokapu Outfall. Discharges from the Kailua Regional WWTP through the Mokapu Outfall have not resulted in any violations of the nutrient levels in the State water quality standards during 1998 and since the current secondary discharge permit and monitoring program has been in place from late 1994. Presently, the City is in the process of renewing its NPDES permit, having submitted all applications and required information to the DOH.

Physical and Chemical Water Quality of the Coastal Waters: For Kailua Bay, the Department of Environmental Services is required by the NPDES permit to manage a program of regular water quality sampling. For Kaneohe Bay, the Clean Water Branch of the DOH manages a program of regular sampling and water quality testing. The locations of the sampling stations are indicated on Figure 3-6.

The data in Table 3-6 represents a summary of physical and chemical data from different locations in Kailua Bay and Kaneohe Bay. The sites are tested and sampled for dissolved oxygen, pH levels, nitrate and phosphate levels, and water temperature. The purpose of water chemistry testing is to assess the impact of waters from streams entering the bays. The testing and sampling is done year round, with the data in the table representing the past five years.

The data from the testing and sampling stations do not show any exceedance of State water quality standards.

**Table 3-6  
Coastal Water Quality Mean Physical/Chemical Data Summary<sup>1</sup>**

Location	Dissolved Oxygen (% saturation) <sup>4</sup>				pH (units)				Nitrate (mg/l)				Phosphate (mg/l)				Temperature (oC)											
	No. of Samples	Mean	High	Low	No. of Samples	Mean	High	Low	No. of Samples	Mean	High	Low	No. of Samples	Mean	High	Low	No. of Samples	Mean	High	Low								
State Standards (wet) for Class A,AA	Not less than 75% saturation				pH (units) shall not deviate more than 0.5 units from a value of 8.1				Class A mean: Wet - 0.15 Dry 0.11				Class AA mean: Wet - 0.20 Dry 0.15				Class A mean: Wet - 0.020 Dry 0.016				Class AA mean: Wet - 0.025 Dry 0.020				Shall not vary more than one degree Celsius from ambient conditions			
Station 190 - Kaneohe Beach Park	19	76	96	55	19	8.03	8.20	7.80	19	0.26	0.49	0.10	19	0.050	0.850	0.006	19	24.94	27.00	20.90								
Station 191 - Kokokahi Pier	20	70	91	34	20	8.05	8.20	7.90	20	0.16	0.57	0.10	20	0.020	0.037	0.010	20	24.62	28.00	20.90								
Station 193 - Kailua Beach Park	9	78	87	66	9	8.07	8.10	8.00	9	0.13	0.20	0.10	9	0.095	0.411	0.015	9	24.48	26.20	21.70								
Station 362 - Heeia Kea Pier	20	70	82	55	20	8.00	8.10	7.80	20	0.13	0.20	0.10	20	0.010	0.024	0.005	20	24.83	26.90	22.10								
Station 401 - Kaneohe Bay (south) <sup>2</sup>	74	64	138	38	77	8.11	8.50	8.00	77	0.14	0.30	0.10	77	0.010	0.065	0.005	74	25.61	28.90	21.00								
Station 402 - Kaneohe Bay (north) <sup>2</sup>	75	63	127	36	78	8.10	8.20	7.90	78	0.17	0.80	0.10	78	0.010	0.108	0.005	75	25.66	28.90	21.80								
Station 403 - Kaneohe Bay (central) <sup>2</sup>	73	63	142	35	76	8.09	8.20	7.40	76	0.14	0.30	0.10	76	0.010	0.021	0.005	73	25.52	28.90	21.00								
Various Kailua Bay Monitoring Stations <sup>3</sup>	n/d	n/d	n/d	n/d	n/d	n/d	n/d	n/d	624	0.09	n/a	n/a	624	0.008	n/a	n/a	n/d	n/d	n/d	n/d								
Mokapu Outfall <sup>3</sup>	n/d	n/d	n/d	n/d	n/d	n/d	n/d	n/d	780	0.09	n/a	n/a	780	0.008	n/a	n/a	n/d	n/d	n/d	n/d								

n/d - no data available

Notes:

1. Data is based on sample dates starting on 1/1/94 and ending on 10/6/97. Not all parameters sampled on all dates.
2. Sampling was done over varying amounts of depth on each day.
3. Data is based on sample dates starting on 10/94 and ending on 12/98.
4. Data was converted from mg/l using oxygen solubility tables provided by the U.S.G.S. Water Resources Division.

Source: Department of Health, Clean Water Branch and Kailua Regional Wastewater Treatment Plant 1998 Annual Assessment Report, April 30, 1999.

A series of reports on water quality and circulation in Kailua Bay and the impact of the Mokapu Outfall was conducted by the University of Hawaii at Manoa Water Resources Research Center in 1993. The studies found that water quality conditions in the recreational area near Kailua Beach are primarily influenced by land-derived inputs and that the Mokapu Outfall discharge has an insignificant effect in this area (*Ahuna and Fujioka, 1993*). The outfall discharge is transported in a northerly direction and was noted to have some effect on the bacteriological conditions in the waters off the Mokapu Peninsula beach area.

Ongoing water quality monitoring and sampling by the City Department of Environmental Services at shoreline and nearshore monitoring stations in Kailua Bay have found no evidence that associates discharges from the Mokapu Outfall with exceedances of recreational water quality. Exceedances of the State recreational water standard (enterococcus values greater than 7 cfu/1000 ml) were found at nearly all shoreline monitoring stations, but there were no exceedances at any of the nearshore stations (Department of Environmental Services, 1998). This indicates that the source of pollutants is from upstream and onshore sources rather than from the Outfall.

Bacteriological Water Quality of Coastal Waters: Five sites in and around Kaneohe Bay are sampled approximately once a month by the DOH for fecal coliform, enterococci, clostridium perfringens, and salinity. The sampling locations are shown in Figure 3-6 and the sampling results are summarized in Table 3-7.

The bacteriological data show that the stations closest to the shore have the highest average enterococci counts. These sampling stations exceed the DOH Chapter 54 limit of 7 cfu/100 ml by a large amount. None of the stations exceed the fecal coliform limits of 200 cfu/100 ml. One reason given for exceedance is the amount of bacteria that gets carried by streams and storm runoff. The bacteria carried downstream is generated from livestock waste, feral and domestic animal waste, and overflows from cesspools and septic tank systems (*Ahuna & Fujioka, 1993*). This would explain the high enterococci concentrations at stations near the shoreline where streams empty into the bay.



**Table 3-7  
Kaneohe Bay Coastal Water Mean Bacteriological Data Summary<sup>1</sup>**

Location	Fecal Coliform (cfu/100 ml)				Enterococci (cfu/100 ml)				Clostridium Perfringens (cfu/100 ml)				Salinity (ppt)			
	No. of Samples	Mean	High	Low	No. of Samples	Mean	High	Low	No. of Samples	Mean	High	Low	No. of Samples	Mean	High	Low
Station 191-Kokokahi Pier	67	149.89	2800.00	1.00	109	155.08	3300.00	1.00	42	12.10	71.00	0.80	111	33.27	35.00	9.00
Station 362-Heeia Kea Pier	65	28.82	330.00	1.00	103	26.47	520.00	0.30	38	1.67	13.00	0.30	106	33.17	35.00	31.00
Station 401-Kaneohe Bay (south) <sup>2</sup>	n/d	n/d	n/d	n/d	30	63.13	300.00	1.00	7	16.86	78.00	1.00	90	33.50	35.60	27.60
Station 402-Kaneohe Bay (north) <sup>2</sup>	n/d	n/d	n/d	n/d	30	19.07	340.00	1.00	7	5.00	19.00	1.00	92	33.52	34.80	27.10
Station 403-Kaneohe Bay (central) <sup>2</sup>	n/d	n/d	n/d	n/d	29	1.90	17.00	1.00	7	2.00	8.00	1.00	88	33.91	35.50	30.50

n/d - No data available

**Notes:**

1. Data is based on sample dates starting on 1/11/94 and ending on 10/26/98. Not all parameters sampled on all dates.
2. Sampling was done over varying amounts of depths on each day.

Source: Department of Health, Clean Water Branch

The Mokapu Outfall, which disposes treated wastewater from the Kailua Regional WWTP, requires monitoring of Kailua Bay (nearshore and shoreline) for occurrences of noncompliance of the State recreational waters standard. Noncompliance is defined as whenever the State monthly recreational waters standard for the geometric mean (GM) of 7 cfu of enterococcus/100 ml is exceeded. When a monthly shoreline GM is calculated and found to exceed the recreational waters standard, results from other monitoring stations during the same month or sampling period are reviewed for the existence of an "Enterococcus Gradient". If, for example, an enterococcus concentration diminishes from the offshore stations to the shoreline stations, and the shoreline station(s) exceed the recreational waters standard, this could be evidence that treated effluent from the Outfall could be related to the exceedance. For all reported noncompliant events, this gradient was not in existence.

All shoreline, nearshore and offshore stations were monitored by the City Department of Environmental Services during 1998 as required by the Kailua Regional WWTP's NPDES permit. The locations of all ocean monitoring stations are depicted in Figure 3-6. Shoreline stations that had months when the State recreational waters standard are exceeded are presented in Table 3-8. There is no evidence that associates shoreline exceedances with the discharge of treated effluent through the Mokapu Outfall. Shoreline station exceedances of the State GM standard of 7 cfu/100 ml were not the result of discharges from the Outfall. For the entire year of 1998, no nearshore station exceeded the State recreational waters standard. The highest nearshore monthly geometric mean value for enterococcus was 1.67 cfu/100 ml, about one-fourth of the allowed State standard.

#### **3.3.4 Flood Zones and Tsunami Hazards**

Floods are caused by heavy rainfall associated with tropical and rain storms. The greatest dangers to flooding occur where mountain streams emerge onto low-lying coastal areas, monthly rainfall in the surrounding watershed exceeds 8 inches, and adequate flood control structures are lacking to channel excessive runoff (Jurvis and Jurvis, 1998). In Hawaii, streams originate in steep mountains and flow relatively quickly to the ocean, triggering flash floods in coastal areas. Coastal plains and stream floodplains in the Kailua,

**Table 3-8  
Kailua Bay Monthly Geometric Mean Enterococcus Values (cfu/100ml)  
Exceeding the State Recreational Waters Standard<sup>1</sup>**

Station	JANUARY	FEBRUARY	MARCH	APRIL	MAY	JUNE	JULY	AUGUST	SEPTEMBER	OCTOBER	NOVEMBER	DECEMBER
MS-2	501.41	51.78	21.10							26.09	25.77	19.28
KAWAINUI CHANNEL	423.55	114.49	86.47	35.01	22.06	13.33	7.81	11.10	9.11		20.21	144.05
KAILUA BEACH	17.61										11.16	
MS-4	15.39										14.73	
KAELEPULU STREAM	101.51	44.92	94.81	48.83	16.46		20.30	63.27	82.11	21.49	76.38	34.14

**Notes:**

- 1. Data is based on data for year 1998.
- \* - State standard for enterococci is when the geometric mean exceeds 7 cfu/100ml.

Source: Kailua Regional Wastewater Treatment Plant 1998 Annual Assessment Report, April 30, 1999.

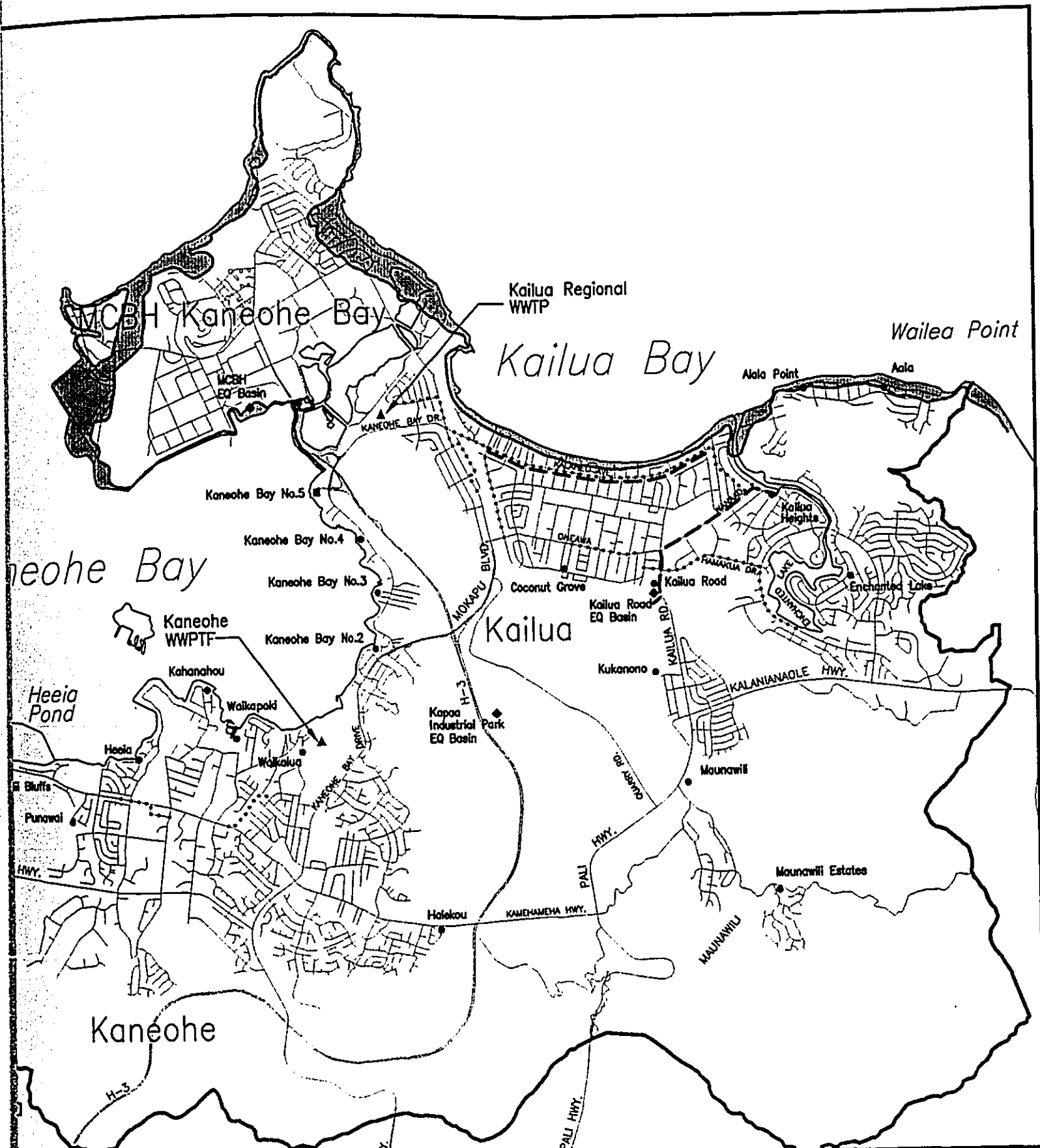
Kaneohe and Kahaluu areas are susceptible to flooding, especially where urban development prevents infiltration of water into the ground. Further discussion of flood hazards and maps showing flood hazard zones are presented in Section 4.2.3.1.

Tsunami is a series of very long waves triggered by a disturbance at the sea floor that displaces water, either by an earthquake, volcanic eruption, or underwater landslide. These waves travel at a high rate of speed and can cause significant damage to coastal areas. Tsunami have such enormous energy that waves can reach far inland with great force.

According to the Civil Defense Tsunami Inundation Map for Oahu, the shoreline areas in Kailua, from Lanikai to Mokapu Peninsula, are within the tsunami inundation zone (see Figure 3-8). The inundation area extends to include the airfield area of Mokapu Peninsula. Due to the broad coastal reef extending seaward and the shape of the bottom of the bay, most of the Kaneohe Bay shoreline does not lie in the inundation zone. The shoreline extending from Moli Pond northward lies within the inundation zone. Coastal inundation events include 1946, when a wave reaching a height of 22 feet caused damage to outlying buildings and roads around the MCBH Kaneohe Bay, a wave 7 feet high was recorded at Lanikai, and waves between 5 to 6 feet were recorded north of Kailua Beach Park. Other wave events include Kualoa Point which had 4- and 5-foot wave heights, and locations in Kaneohe Bay that had wave heights between 1 and 3 feet (Loomis, 1976).

### **3.3.5 Earthquake/Seismic Hazards**

While the majority of earthquakes center near the Island of Hawaii, Oahu has experienced a number of earthquakes. Most earthquakes that occur near Oahu are not strong and cause little or no damage. The most recent occurred in 1978 off the North Shore coastline, causing little or no damage. Generally, the risk of earthquake hazard to Oahu is moderate.










ES PLAN

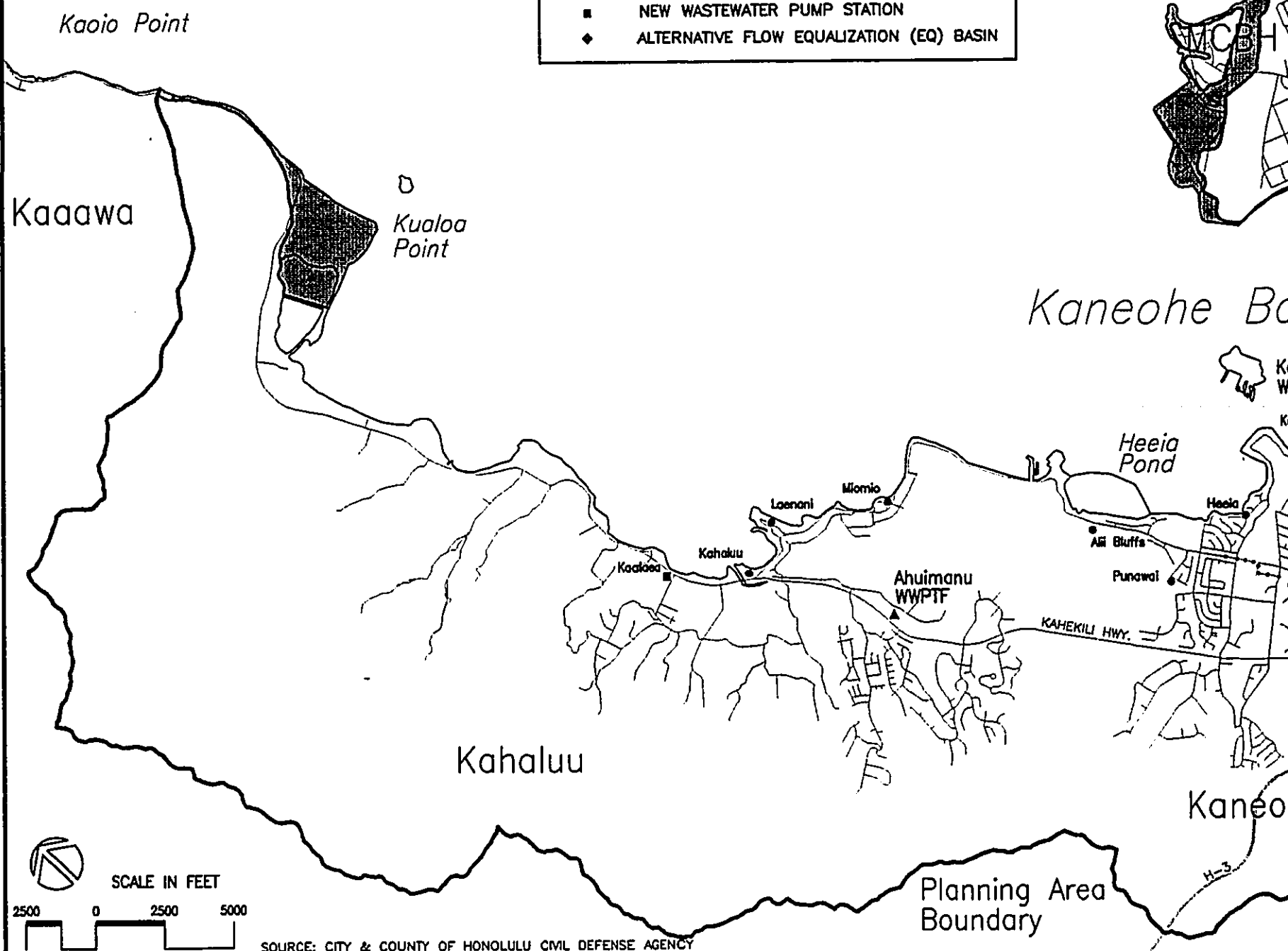
MAP

TSUNAMI INUNDATION  
MAP

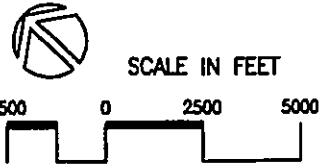
FIGURE  
3-8

### LEGEND

-  TSUNAMI INUNDATION AREA
-  PROPOSED PIPE STORAGE
-  RECONSTRUCTED SEWER LINES
-  WASTEWATER TREATMENT PLANT/  
WASTEWATER PRELIMINARY TREATMENT  
FACILITY IMPROVEMENTS
-  WASTEWATER PUMP STATION IMPROVEMENTS
-  NEW WASTEWATER PUMP STATION
-  ALTERNATIVE FLOW EQUALIZATION (EQ) BASIN



NW-INUNDATION.DWG 14:24 01/06/99 M:\DWG\3378-01\FIGURE



SOURCE: CITY & COUNTY OF HONOLULU CIVIL DEFENSE AGENCY



**WILSON OKAMOTO  
& ASSOCIATES, INC.**  
ENGINEERS • PLANNERS

KAILUA-KANEOHE-KAHALUU FACILITIES PLAN

**TSUNAMI INUNDATION MAP**

### 3.4 Natural Environment

#### 3.4.1 Flora

The botanical characterization of the planning area is generally that of developed or urbanized areas flanked by forest reserves. The developed areas are landscaped with plants typically found in urban areas. Natural vegetation found in the undeveloped lower elevations include pili grass, kiawe, koa haole, and finger grasses. Within the higher elevations are scrub forest vegetation such as guava, Christmas berry, Java plum, and lantana. Toward the pali cliffs, native species begin to predominate.

Endangered and threatened flora found within the planning region include 'Akoko (*Chamaesyce kuwaleana*, *Chamaesyce rocki*), Haha (*Cyanea grimesiana*, *Cyanea truncata*), Ha'iwale (*Cryptandra viridiflora*), *Hesperomannia arborescens*, *Lysimachia filifolia*, and *Phyllostegia hirsuta* (U.S. Fish and Wildlife Service, 1996). Most of the endangered and threatened flora are found deep within the valleys or on the steep slopes of the Koolau Range.

The existing and proposed wastewater facility sites in the planning area are of a highly disturbed environment in which open areas are encumbered by wastewater facilities or graded, paved or landscaped areas. Most of the Kapaa Industrial Park EQ site has been developed as an industrial subdivision, with uses including warehouses and other light industrial and commercial businesses. Vegetation at the site includes koa haole, kiawe, finger grasses, and other introduced species.

The Kailua Road EQ site, located between Kailua Road and Kawai Nui Marsh, is an irregular-shaped site of approximately 1.6 acres in size. A botanical survey was conducted by Botanical Consultants in January 1999 of the Kailua Road EQ site (see Appendix A). No candidate, proposed or listed threatened or endangered species as set forth in the Endangered Species Act of 1973, as amended, are known to exist within the proposed Kailua Road EQ site, and none were found during the survey. The vegetation at the site consists entirely of introduced plant species, except for the hau (*Hibiscus tiliaceus*). The canopy is comprised of banyan (*Ficus microcarpia*) and coconut trees (*Cocos nucifera*). Ground cover consists of ivy gourd (*Coccinia grandis*).

Chinese violet (*Asystasia gangetica*) and morning glory vines (*Ipomoea alba* and *I. indica*). Other plants found at the site include Guinea grass (*Panicum maximum*), Hibiscus, Naupaka, and wiliwili (*Erythrina indica*).

### 3.4.2 Fauna

Feral mammals in the planning area include mongoose, mice, rats, wild pigs, dogs, and cats. There are also livestock and other farm animals in the planning region, including cattle, horses, roosters, and chickens. Other types of fauna include frogs, dragonfly naiads, and various aquatic insects.

The planning area provides a habitat for a multitude of native and introduced bird species. The coastal regions provide natural habitat and feeding areas for many introduced exotic birds such as finches, bulbul, shama, munia, cardinals, linnets, sparrows, mynah birds, and doves. Native herons habituate and feed in the fishponds of Moli, Kahaluu and Heeia. The endangered thrush and Hawaiian Owl, or Pueo, are also found within the planning area.

The marsh areas and wetlands described in Section 3.4.4 provide a habitat for four species of endangered endemic waterbirds. These species include the Hawaiian Stilt or ae`o kukuluao (*Himantopus mexicanus knudsenii*), Hawaiian Coot or alae ke`oke`o (*Fulica americana alai*), Hawaiian Gallinule or `alae `ula (*Gallinula Chloropus sandvicensis*), and the Hawaiian Duck or koloa maoli (*Anas wyvilliana*). In addition, the Blackcrowned Night Heron, the Great Frigatebird, Cattle Egrets, Golden Plover, a variety of seasonal migratory waterfowl (including Pintails and Northern Shovelers), and introduced urban and forest birds are prevalent in wetland areas.

### 3.4.3 Aquatic Resources

The coastal and inland waters (streams and marshes) of the planning region constitute a complex ecosystem and contain a variety of aquatic resources.



Inland Waters: The planning region contains many streams that provide natural habitat and feeding areas for many types of native aquafauna, including one specie that is a candidate for endangered status, the o`opu alamo`o (*Lentipes concolor*). Other native species include shrimp `O`pae kala`ole (*Atyoida bisulcata*), eleotrids `O`opu okuhe (*Eleotris sandwicensis*), `O`opu akupa, `O`apu oau, `O`apu owau, kuhliid Aholehole (*Kuhlia sandwicensis*), prawn `O`pae `oeha`a (*Macrobrachium grandimanus*), mullet `Ama`ama, goby `O`opu naniha (*Stenogobius genivittatus*), and snail Hapawai. Introduced aquafauna in the streams include cichlids, catfish, milkfish, clams, mosquito fish, Malaysian prawn, small mouth bass, guppies, tilapia, and swordtail (CWRM, 1990).

Nuupia Ponds, with its eight (8) ponds, contain a variety of native and introduced aquatic fauna including the introduced tilapia and top minnow, and the native barracuda (*Sphyraena barracuda*), mullet (*Mugil cephalus*), milkfish or awa (*Chanos chanos*), awa`awa (*Elops hawaiiensis*), lizardfish or `ulae (*Saurida gracilis*), goby or o`opu, the smooth puffer or keke (*Arothron hispidis*), bonefish or o`io (*Albula vulpes*), leatherback or la`i (*Scombroides laysan*), and threadfin or moi (*Polydactylus sexifilis*). Invertebrates in the ponds include the blue pincher crab (*Thalmita crenulata*), white crab (*Portunus sanguinolentus*), brown swimming crab (*Thalmita edwardsi*), and glass shrimp or `opae (*Palaemon debilis*). In general, there are approximately 18 species of fish in the ponds (Department of the Army, 1995).

Coastal Waters: The coastal waters of Kailua Bay and Kaneohe Bay collect water from the planning region. Both bays host a variety of marine biota.

The coral reefs fronting Kaneohe Bay provide a favorable environment for supporting varied types of marine biota including fishes, crustaceans, invertebrates, and eels. Coral reefs also prevent erosion and absorb nutrients and suspended particulates from the water.

Marine mammals found in off-shore waters include Green and Hawksbill sea turtles, Hawaiian Monk Seals, Pacific Bottlenose and Spinner dolphins, false killer whales, and tiger sharks. The Hawksbill and Green sea turtles and the Hawaiian Monk seals are endangered and threatened species. Most marine animals can be found in the shallow nearshore waters due to the large

amounts of food sources available, such as fish, algae, and invertebrates (Sanctuaries and Reserves Division and Office of State Planning, 1995).

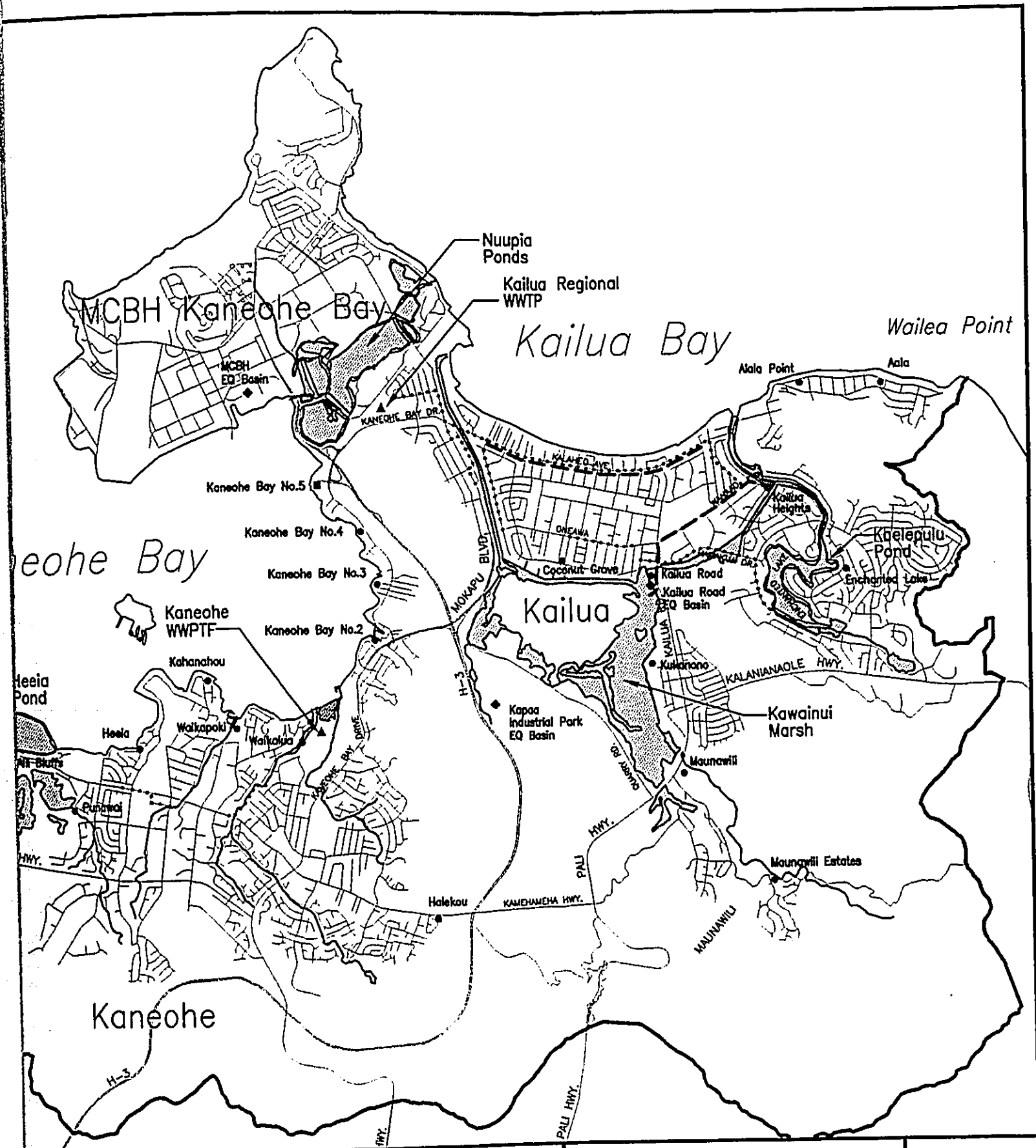
#### 3.4.4 Wetlands

The moist climate in the planning area supports numerous wetlands, including Kawai Nui Marsh, Heeia Marsh and Nuupia Ponds, the three largest wetlands on the windward side of Oahu (see Figure 3-9).

Molii Fishpond, located near Kualoa Point south of Kamehameha Highway, consists of two ponds covering a total of approximately 113 acres. Not fed directly by any existing perennial streams, it is supplied water from springs and rainfall runoff. The bottom is mostly sandy, although areas of suspended silt or dense mud are present. The fishpond is lined with mangrove and its shores are covered with California grass and various shrubs. This wetland provides habitat for the Hawaiian Stilt, Hawaiian Coot, migratory shorebirds, and other exotic species of birds, fish and invertebrates.

Waihee Marsh lies adjacent to Kamehameha Highway between Waihee Road and Wailehua Road and extends about 1,000 feet inland or west of the Highway. Haiamoa Stream empties into the marsh where it becomes undefined in the matted growth of bulrush, honohono, cattail, and California grass, predominant throughout the 30 acres of the marsh. The underlying soil is mucky with 1 to 2 feet of standing water. Residences surround the marsh land. The wetland provides a habitat for endangered Hawaiian Gallinules and migratory shorebirds.

Heeia Marsh, the second largest wetland on the windward shore of Oahu, is located near Kaneohe Bay, west of King Intermediate School, where Heeia Stream enters the ocean. The wetland includes an 85-acre fishpond, a 35-acre mangrove swamp, and a 150-acre grassy meadowland. Diversion of Heeia Stream and urban development have decreased the marshland to a fraction of its size. Open water in the meadowland ranges in depth from 6 inches to 3 feet, however, after rain the depth increases to over 5 feet. Future degradation will continue at the marsh due to animal and alien plant invasions. Heeia Marsh provides a habitat for all four endangered waterbirds, migratory waterbirds, shorebirds, and native freshwater fish and invertebrates.










S PLAN

WETLANDS

FIGURE

3-9

**LEGEND**

-  WETLANDS
-  PROPOSED PIPE STORAGE
-  RECONSTRUCTED SEWER LINES
-  WASTEWATER TREATMENT PLANT/  
WASTEWATER PRELIMINARY TREATMENT  
FACILITY IMPROVEMENTS
-  WASTEWATER PUMP STATION IMPROVEMENTS
-  NEW WASTEWATER PUMP STATION
-  ALTERNATIVE FLOW EQUALIZATION (EQ) BASIN

Kaoio Point

Kaaawa

Kualoa Point

Molii Pond

Kaneohe Bay

Kaneohe WWPTF

Heeia Pond

Heeia Marsh

Ahuimanu WWPTF

Waihee Marsh

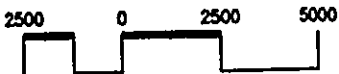
Kahaluu

Kaneohe

Planning Area Boundary



SCALE IN FEET



SOURCE: CITY & COUNTY OF HONOLULU DIGITAL MAPS

**KAILUA-KANEOHE-KAHALUU FACILITIES PLAN**

**WETLANDS**



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The Kawa Stream Estuary is an ephemerally-flooded grassland located between Kaneohe Stream and Kawa Stream. Located adjacent to the Bayview Golf Links and near the Kaneohe WWPTF, the marsh area is fed from Kawa Stream and two drainage channels. Growth in the area includes California grass, Job's tears and honohono. The area provides a habitat for native species.

Kawai Nui Marsh, located in Kailua, is the largest freshwater wetland in Hawaii. The main body of the 830-acre marsh is generally bounded by Kawai Nui Canal to the east, Kailua Road to the south and Kapaa Quarry Road to the west and north. The marsh also extends about 3,000 feet south of Kailua Road along the corridors of Kahanaiki and Maunawili Streams. Vegetation found within marsh areas varies considerably depending on salinity.

Vegetation within Kawai Nui Marsh consists almost exclusively of alien and introduced species. The predominately freshwater environment supports four major categories of vegetation: California grass bog meadow in the southeastern and southwestern perimeter, open water plants in the central marsh, and bullrush and sawgrass floating mats in the northern portion. A fifth category is comprised of mixed forest exotic trees, found on the slopes of the marsh (State Department of Land and Natural Resources (DLNR), 1994).

Aquatic fauna in Kawai Nui Marsh includes exotic insect, fish and invertebrate species. Tilapia, top minnows and small mouth bass dominate open waters of the marsh. Other fauna in the marsh include the oriental rice eel (*Monopterus albus*), Louisiana crayfish (*Procambarus clarkii*), and pond snail (*Physa*) (DLNR, 1994).

Kawai Nui Marsh provides important habitat for all four endangered species of native Hawaiian waterbirds and for migratory bird species. The marsh also provides recreational and educational opportunities for the community, and serves as a critical flood control basin to protect the developed low-lying areas of urban Kailua. With its numerous and significant archaeological sites, the entire marsh has been determined to be eligible for listing on the National Register of Historic Places.

In July 1994, a master plan for Kawai Nui Marsh was prepared by the State DLNR to preserve, protect and enhance the natural and cultural resources of

the Marsh. The DLNR Land Division is currently preparing a Management Plan for Kawai Nui Marsh to implement the Master Plan recommendations which actions include flood control, public lands management, management of wildlife preserves, protection of endangered species, preservation of historic and cultural properties, development and management of State parks and recreational facilities, and the protection and development of water resources.

Pu'u O Ehu wetland is located adjacent to Kawai Nui Marsh, on the eastern side of Kailua Road along Kawai Nui Canal. This wetland is a remnant floodplain that once linked Kawai Nui Marsh to Kaelepulu Pond. Because it is subject to tidal variation that exposes mudflats and concentrates invertebrates during low tide, the area periodically attracts a variety of foraging waterbirds, including four endangered endemic waterbird species. Pu'u O Ehu wetland is bordered along its length by a thick growth of red mangrove which separates the waterway from the marsh proper. A master plan and waterbird enhancement program has been undertaken for this wetland which is under the ownership and jurisdiction of the State DLNR.

Nuupia Ponds, located near the MCBH Kaneohe Bay EQ site, encompasses wetland areas exhibiting vegetation and other characteristics of natural wetlands. Plants in the Nuupia Ponds area include Pickleweed, American mangrove, Honohono, Swollen fingergrass, Beach dropseed, Kikuyu grass, Sea purslane, Ironwood, Australian slat bush, Indian pluchea, Pluchea, Hau, and Milo (Elliot and Hall, 1977, and DLNR, 1994).

The Nuupia Ponds Wildlife Management Area is located within the MCBH Kaneohe Bay, approximately 1.6 miles north of Kawai Nui Marsh and adjacent to and north of the Kailua Regional WWTP. This area encompasses significant natural and cultural features, including a historic fishpond complex, and provides a habitat for the endangered Hawaiian stilt as well as herons and egrets. The ponds are surrounded by extensive mudflats where the dominant vegetation is pickleweed. A total of eight (8) ponds consisting of approximately 231.8 acres comprise the fishpond complex. The wetland also serves as a natural buffer for Marine Corps activities.

The MCBH Kaneohe Bay EQ site is located on the south side of Mokapu Peninsula and encompasses wetlands exhibiting vegetation and other

characteristics similar to the nearby Nuupia Ponds. Located adjacent to an existing waste reclamation facility, the site attracts endangered Hawaiian waterbird species that come to feed upon the fly larvae. Land uses to the north of the EQ site is urban in nature with existing buildings and roadways.

Kaelepulu Pond is located in the Enchanted Lake subdivision of Kailua. Once more than 400 acres of natural habitat, urbanization has reduced its size to its present condition. Much of its natural condition no longer remains, replaced with concrete, stone walls, and ornamental plants. There have been no recent reports of fauna in the area, except for dwindling numbers of herons at the settling basin above the pond.

#### **3.4.5 Historic Sites and Archaeological/Cultural Sites**

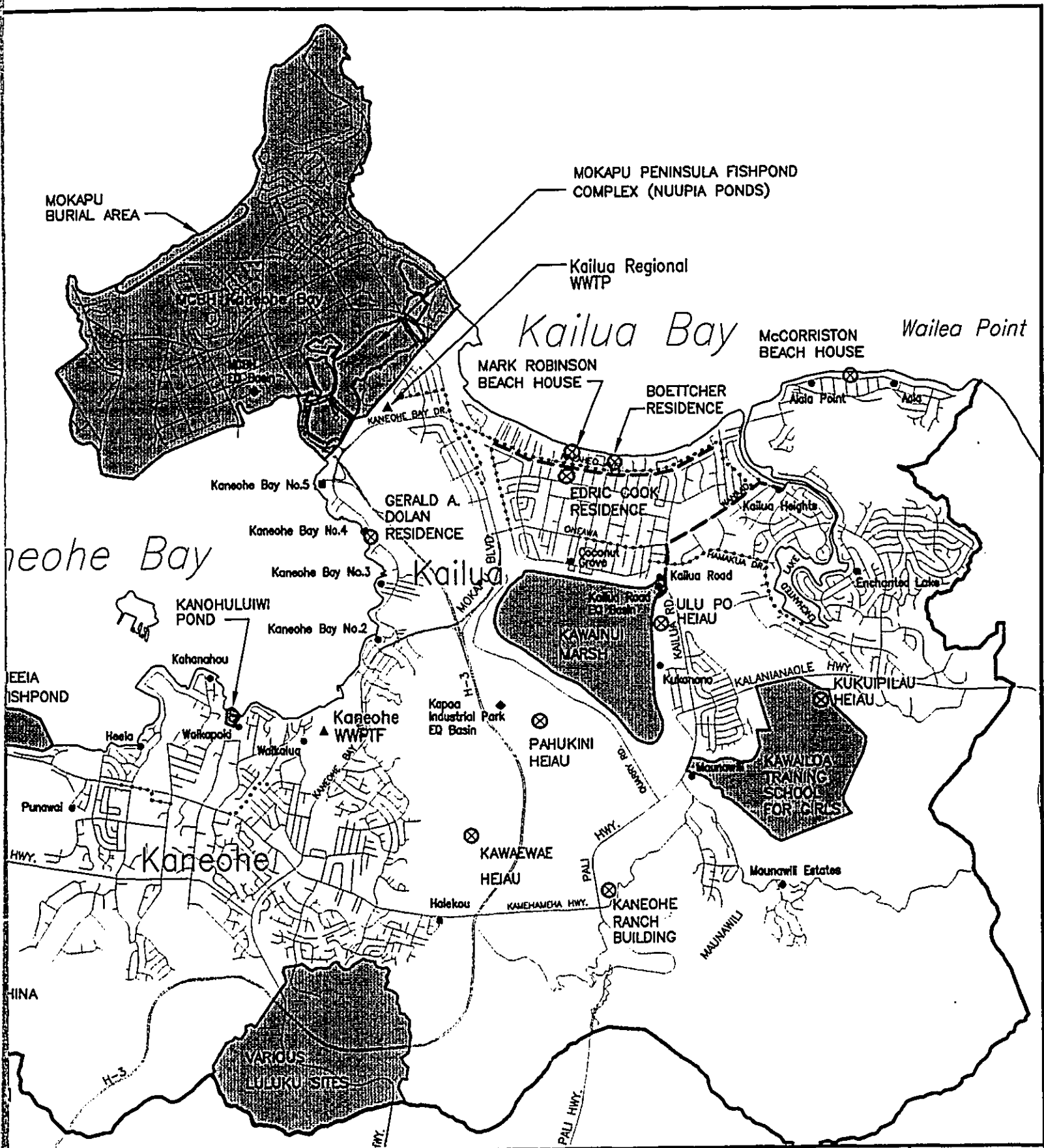
Historic and archaeological/cultural areas of concern in the planning area are mainly in the vicinity of coastal ponds and marshes. Historic and archaeological/cultural sites in the Kailua-Kaneohe-Kahaluu planning region are shown in Figure 3-10. A list of eligible and registered historic sites is included in Table 3-9.

The Nuupia Ponds, adjacent to the Kailua Regional WWTP, is an important wildlife habitat for the Hawaiian Stilt. The ponds and supporting fish are sensitive to changes in water temperature and chemical composition. Located near the Kaneohe WWPTF is the Waikalua Fishpond. Kawai Nui Marsh is in the vicinity of the proposed Kailua Road EQ Basin. The marsh serves as a wildlife habitat for various avifauna and aquatic animals.

Other significant historic and archaeological districts and complexes in the planning region include fishponds. Built mainly on the coastline through the use of rock walls, they were used in the old Hawaiian culture to cultivate fish. Existing fishponds in the planning region include the Kahaluu Fishpond, Heeia Fishpond, Moli Fishpond, and Kanohuluiwi Pond located at the mouth of Keaahala Stream. Due to the high precipitation in Windward Oahu, taro cultivation has and is a part of the Windward tradition. Excellent examples of existing and past taro cultivation can be found at the Waikane Taro Flats and Kahaluu Taro Loi.

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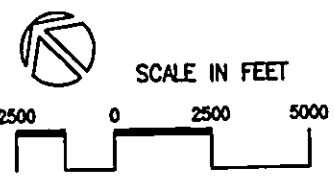
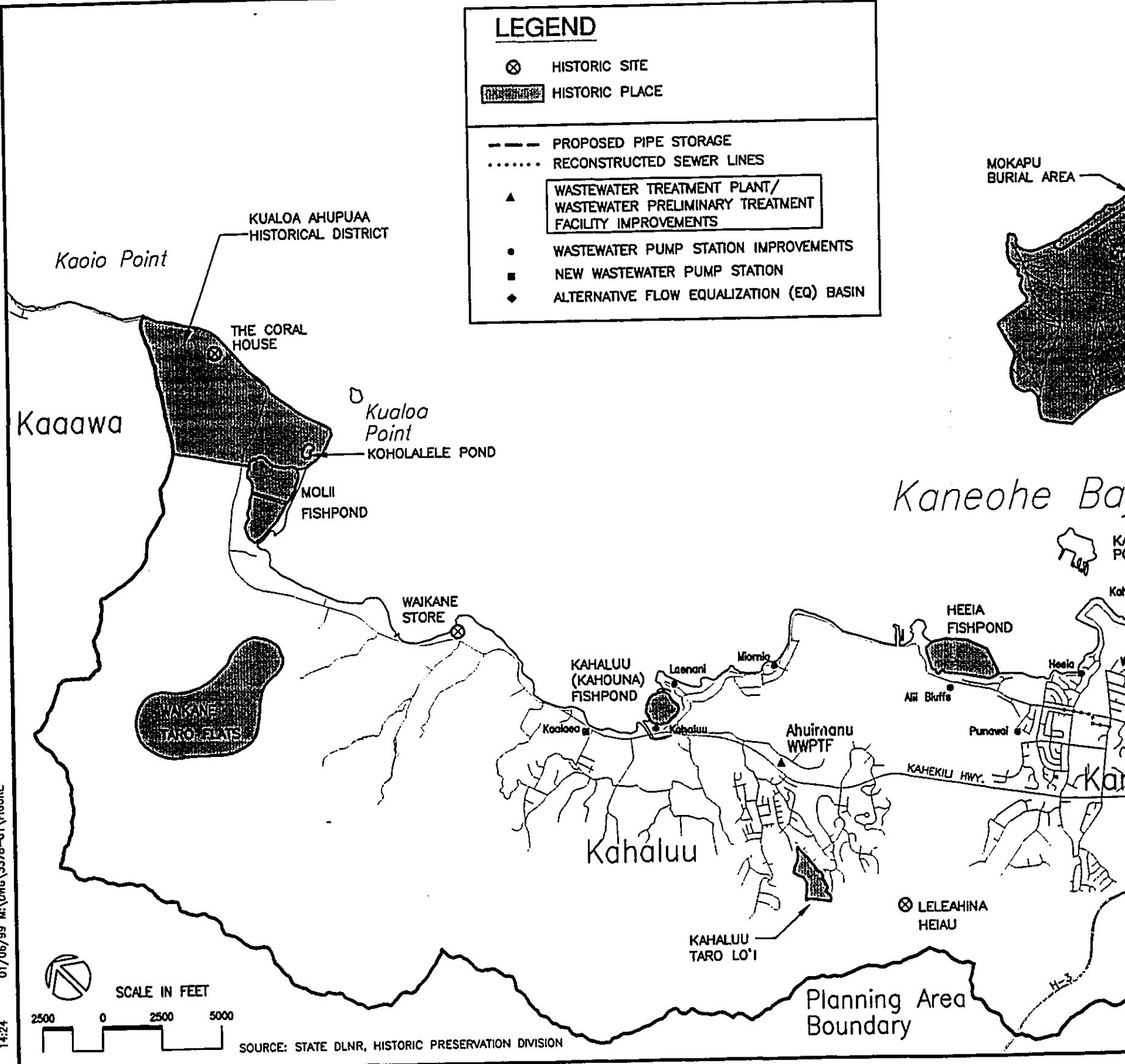
RED

ELIGIBLE AND REGISTERED  
HISTORIC PLACES

FIGURE  
3-10

### LEGEND

- ⊗ HISTORIC SITE
-  HISTORIC PLACE
- PROPOSED PIPE STORAGE
- ..... RECONSTRUCTED SEWER LINES
- ▲ WASTEWATER TREATMENT PLANT/  
WASTEWATER PRELIMINARY TREATMENT  
FACILITY IMPROVEMENTS
- WASTEWATER PUMP STATION IMPROVEMENTS
- NEW WASTEWATER PUMP STATION
- ◆ ALTERNATIVE FLOW EQUALIZATION (EQ) BASIN



SOURCE: STATE DLNR, HISTORIC PRESERVATION DIVISION

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### KAILUA-KANEOHE-KAHALUU FACILITIES PLAN

### ELIGIBLE AND REGISTERED HISTORIC PLACES

**Table 3-9  
Eligible and Registered Historical and Archaeological Sites  
in the Planning Area**

Site Number	Site Name	Location	Registered Status	Placed on Register	National Register Eligible
80-06-312	Koholalele Pond	Kualoa	Hawaii	06-01-71	
80-06-313	Molii Fishpond	Hakipuu	National	12-05-72	
80-06-528	Kualoa Ahupuaa Historical District	Kualoa	National	10-16-74	
80-06-1078	Waikane Taro Flats	Waikane	National	04-11-73, Rev. 02-04-85	
80-06-1101	Small Heiau	Hakipuu	National	03-14-73	
80-06-9803	The Coral House	Hakipuu	Hawaii	07-19-97	
80-06-9815	Waikane Store	Waiahole	Hawaii	07-25-98	
80-10-319	Kahaluu Fishpond (Kahouna Fishpond)	Kahaluu	National	03-14-73	
80-10-327	Heeia Fishpond	Heeia	National	01-17-73	
80-10-329	Leleahina Heiau	Heeia	National	03-20-73	
80-10-344	Kanohuluwiwi Pond	Kaneohe	National		04-25-80
80-10-354	Kawaewae Heiau	Kaneohe	National	08-21-72	
80-10-1153	Kapapa Island Complex	Offshore Mokapu	National Hawaii	08-21-72 01-29-81	
80-10-1165	Kahaluu Taro Loi	Kahaluu	National	03-14-73	
80-10-1360	Kaneohe Ranch Building	Kaneohe	National Hawaii	06-05-87 06-27-83	
80-10-1383	Edric Cook Residence	Kailua	Hawaii	08-15-87	
80-10-1386	MCBH-Kaneohe Bay	Kaneohe	National	05-28-87	
80-10-2914	Luluku Discontiguous Archaeological District	Kaneohe	National		03-04-86
80-10-9747	Gerald A. Dolan Residence	Kailua	Hawaii	06-02-90	
80-11-359	Pahukini Heiau	Kailua	National	09-11-72	
80-11-371	Ulu Po Heiau	Kailua	National Hawaii	11-09-72 09-21-81	
80-11-1002	Mokapu Peninsula Fishpond Complex (Nuupia Ponds)	Kaneohe	National		08-08-84
80-11-1017	Mokapu Burial Area	Kaneohe	National Hawaii	11-15-72 07-25-81	

**Table 3-9 (cont.)  
Eligible and Registered Historical and Archaeological Sites  
in the Planning Area**

Site Number	Site Name	Location	Registered Status	Placed on Register	National Register Eligible
80-11-1362 80-15-1362	Kawailoa Training School for Girls	Kailua	Hawaii	11-05-84	
80-11-2029	Kawai Nui Marsh	Kailua	National		07-13-79
80-11-9748	Mark Robinson Beach House	Kailua	Hawaii	06-29-90	
80-11-9760	Boettcher Residence	Kailua	Hawaii	09-28-92	
80-11-9763	McCorriston Beach House	Kailua	Hawaii	06-28-93	
80-15-372	Kukuipilau Heiau	Kailua	National Hawaii	11-16-84 9-14-84	

*Source: Hawaii/National Register of Historic Places, 1998 and The Hawaii Register of Historic Places, Vol II, 1974.*

Heiau are constructed mainly of stacked stone or earth terraces and were places of worship in the old Hawaiian culture. Heiau in the planning region include the Leleahina Heiau, Kawaewae Heiau, Pahukini Heiau, Ulu Po Heiau, and Kukuipilau Heiau (Sterling and Summers, 1977).

Other sites in the planning region include archaeological and historical districts such as Kualoa and Luluku, burial sites in Mokapu Peninsula, and various structures. Some of these structures include the Coral House; Waikane Store; the Marine Corps Base on Mokapu Peninsula; the Gerald A. Dolan, Boettcher, Edric Cook, Mark Robinson and McCorriston residences; the Kaneohe Ranch building near the Pali Golf Course; and, the Kawailoa Training School for Girls in Kailua.

There are no known historic or archaeological sites on or near the existing Kailua Regional WWTP, Kaneohe and Ahuimanu WWPTFs, and Kapaa Industrial Park EQ site.

### 3.5 Socio-Economic Characteristics

The planning region encompasses the Kailua, Kaneohe, MCBH Kaneohe Bay, and Kahaluu Neighborhood Board areas. The majority of development has

occurred on the relatively flat plains along the coast. The precipitous terrain of much of the inland areas makes these areas largely unsuitable for development. The neighborhoods in the planning area are predominantly residential in nature with supporting business establishments located along major thoroughfares.

### **3.5.1 Kailua**

Kailua has a mix of uses, including residential, commercial and industrial uses. While business establishments are dispersed throughout the neighborhood, most are concentrated along Kailua and Kuulei Roads, and in Enchanted Lake along Keolu Drive. According to the U.S. Bureau of the Census, in 1992 Kailua had 259 service establishments, 189 retail establishments, and 39 wholesale establishments. Other demographic data for Kailua is shown in Table 3-10.

### **3.5.2 Kaneohe**

A mix of land uses can be found in the Kaneohe area, including residential, commercial, industrial, and agricultural activities. The Kaneohe area is split into two neighborhood board areas, the Kaneohe Neighborhood Board and the predominately military MCBH Kaneohe Bay Neighborhood Board. Other demographic data for Kaneohe is displayed in Table 3-10.

Commercial activity in Kaneohe is centered along Kamehameha Highway and Kahuhipa Street where numerous retail, office and other business establishments are located. According to the U.S. Bureau of the Census, in 1992 Kaneohe had 226 service establishments, 223 retail establishments, and 34 wholesale establishments.

### **3.5.3 MCBH Kaneohe Bay**

The MCBH Kaneohe Bay installation located in Kaneohe on Mokapu Peninsula sustains a permanent population and provides self-contained services to its base personnel. The demographics of this area are not similar to the Island due to all the residents being active-duty military personnel and their dependents. Demographic data for the installation is displayed in Table 3-10.

## 3.5.4 Kahaluu

The Kahaluu area consists primarily of single-family residential homes and agricultural lots. Commercial activity is generally limited to small establishments which serve area residents, with the majority of establishments located on Kamehameha Highway. Other demographic data for Kahaluu is shown in Table 3-10.

Statistics	State	Kailua	Kaneohe	MCBH K-Bay	Kahaluu
Population	1,108,229	38,700	47,700	11,500	16,200
Caucasian	33.3%	57%	32%	68.1%	35%
Japanese	22.3%	16%	33%	n/a	21%
Hawaiian	12.5%	13%	15%	n/a	21%
Average Household Size	3.01	3.13	3.25	3.85	3.37
Single-Family Housing Units	161,571	11,696	9,545	1,468	3,845
Multi-Family Housing Units	116,214	1,840	2,753	557	496
Median Family Income	\$40,581	\$56,788	\$51,497	\$26,927	\$50,454
Median Home Value	\$283,600	\$317,800	\$253,400	n/a <sup>1</sup>	\$267,000
Median Age	32.2	34.8	33.1	22.1	33
Unemployment Rate	2.2%	2.8%	2.5%	5.1%	1.8%
Poverty Level	5.4%	2.1%	2.9%	4.3%	4.7%
Education					
High School	81.2%	88.9%	84.7%	94.7%	85.7%
Bachelors Degree	24.6%	34.5%	26.4%	13.3%	26.4%

<sup>1</sup> - Housing on MCBH K-Bay provided by the Federal Government.  
Source: U.S. Bureau of the Census, 1990

### 3.6 Air Quality

For the planning area as a whole, air quality is principally affected by vehicular emissions generated from traffic along the major roadways. Air quality during peak travel periods are worse than off-peak periods. During peak periods, there is a degradation of air quality due to the increase in traffic congestion. At some locations, State of Hawaii 1-hour ambient air quality standards (AAQS) of 10 micrograms per cubic meter ( $\text{mg}/\text{m}^3$ ) for carbon monoxide (CO) are exceeded (State Department of Transportation (DOT), 1991). At various intersections along both Pali and Likelike Highways, there are 8-hour State air quality exceedances for CO ( $5 \text{ mg}/\text{m}^3$ ). These intersections include Kamehameha and Likelike Highways, Kamehameha and Kahekili Highways, Pali and Kamehameha Highways, and Pali Highway and Kailua Road (DOT, 1991). However, all locations meet the National AAQS standard of  $10 \text{ mg}/\text{m}^3$  for CO.

Air quality concerns stemming from wastewater facilities are mainly in the vicinity of the Kailua Regional WWTP. The inherent nature of wastewater leads to the generation of noxious nuisance odors and potentially offensive off-gases, due either to the nature of materials introduced into the system or to chemical and biological changes during transport to the treatment site and during the treatment process. The treatment plant releases odor emissions that can be noticed in the residential areas surrounding the plant, including Aikahi Park residential subdivision, Aikahi Gardens townhouses and the neighboring Aikahi Elementary School. In public meetings held for the Facilities Plan, odors are reported by surrounding area residents to have continued following plant improvements and modifications over the past decade.

The Kailua Regional WWTP uses various odor control devices, including an odor oxidation process, followed by granular activated carbon towers and various types of scrubbers. Previous construction at the plant has included significant investments in odor control features. Odor control equipment installed at Kailua Regional WWTP includes a Calvert chemical mist scrubbing tower, which captures foul air and converts it to non-odorous sulfates, two foul air treatment facilities (ARI Lo-Cat packed tower catalytic scrubber system), one each for the primary and secondary odor control system, and a supplementary odor control system for the influent pump station and

headworks, which include screening/grit removal areas. Despite these odor control facilities, odor problems remain unresolved.

### 3.6.1 Regulated Air Emissions

The State DOH issues a "Noncovered Source Permit" (NSP) to the City and County of Honolulu for certain wastewater facilities that regulate the level of specified air emissions at both the source of emission and at the property line. The Kailua Regional WWTP was issued NSP No. 0217-01-N in 1997 which expires on September 1, 2002. In general, the permit covers operation and maintenance of odor reducing systems and combustion devices that release sulfurous compounds such as sludge heaters, gas burners and diesel engines. Allowable levels are expressed in parts per billion by volume (ppbv), parts per million by volume (ppmv) or percent by weight.

Odor control systems are limited by regulation to the following hydrogen sulfide (H<sub>2</sub>S) levels:

- Granular activated carbon vessels      0.25 ppmv
- Mist scrubbing tower                      3.00 ppmv
- Property line                                    25.00 ppbv

Combustion systems are regulated by visible emission standards, by quantity of fuel, or by sulfur content of fuels used. Visible emissions are measured by "percent opacity". Fuels are judged by quantity in gallons per year (gpy) or by percent of sulfur content by weight.

The City Department of Environmental Services is required by NSP No. 0217-01-N to manage a program of regular air quality sampling on a daily, weekly and monthly basis on various odor control systems throughout the wastewater treatment plant. The results of air quality monitoring are shown on Table 3-11, with monitoring station locations on Figure 3-11. In 1998, the weekly monitoring of H<sub>2</sub>S emission concentration at property lines resulted in 6 exceedances of the State standard of 25 ppb.

At the Kaneohe and Ahuimanu WWPTFs, odor sensitive uses are located farther from the respective facilities and only preliminary treatment of



wastewater (screening and removal of coarse debris) is performed at both of these sites, resulting in reduced odor impacts. There are occasional odor problems and some complaints have been received regarding the Ahuimanu pre-treatment facility.

Table 3-11 Property Line and In-Plant Hydrogen Sulfide (H <sub>2</sub> S) Monitoring Station Results in Parts Per Billion (ppb) at Kailua Regional Wastewater Treatment Plant, 1998											
Stations											
	1P	2P	3P	4P	5P	6P	7P	8P	9P		
<b>In-Plant</b>											
Average	2	1	4	2	1	4	2	2	6		
Maximum	49	11	39	44	10	174	58	17	50		
Stations											
	1	2	3	4	5	6	7	8	9	10	11
<b>Property Line</b>											
Average	4	5	5	4	3	2	4	2	2	2	4
Maximum	39	37	22	26	30	20	98	21	17	18	17
Note: State DOH standards are hydrogen sulfide emission concentrations at all property lines of the facility and shall not exceed 25 ppb during any one hour period. Figures denote average annual and maximum daily instantaneous readings.											
Source: City and County of Honolulu, Department of Environmental Services											

### 3.7 Noise

Ambient noise in the planning region is typical of urban environments in cities. The principal source of noise is related to vehicular traffic along transportation corridors. Major roads in the planning region include Kamehameha, Kahekili, Pali, and Likeliike Highways. Other sources of noise include construction-related activities, including road improvements and structural construction.

Noise levels from the Kailua Regional WWTP, Kaneohe and Ahuimanu WWPTFs, and pump stations in the planning region are primarily associated with equipment used in the collection and treatment process. Noise concerns stemming from wastewater facilities, however, occur mainly in the vicinity of the Kailua Regional WWTP. *Nexious Nuisance* noise levels emanating from the plant are a concern to nearby residents as expressed in public meetings held for the Facilities Plan. In spite of significant investments in noise control

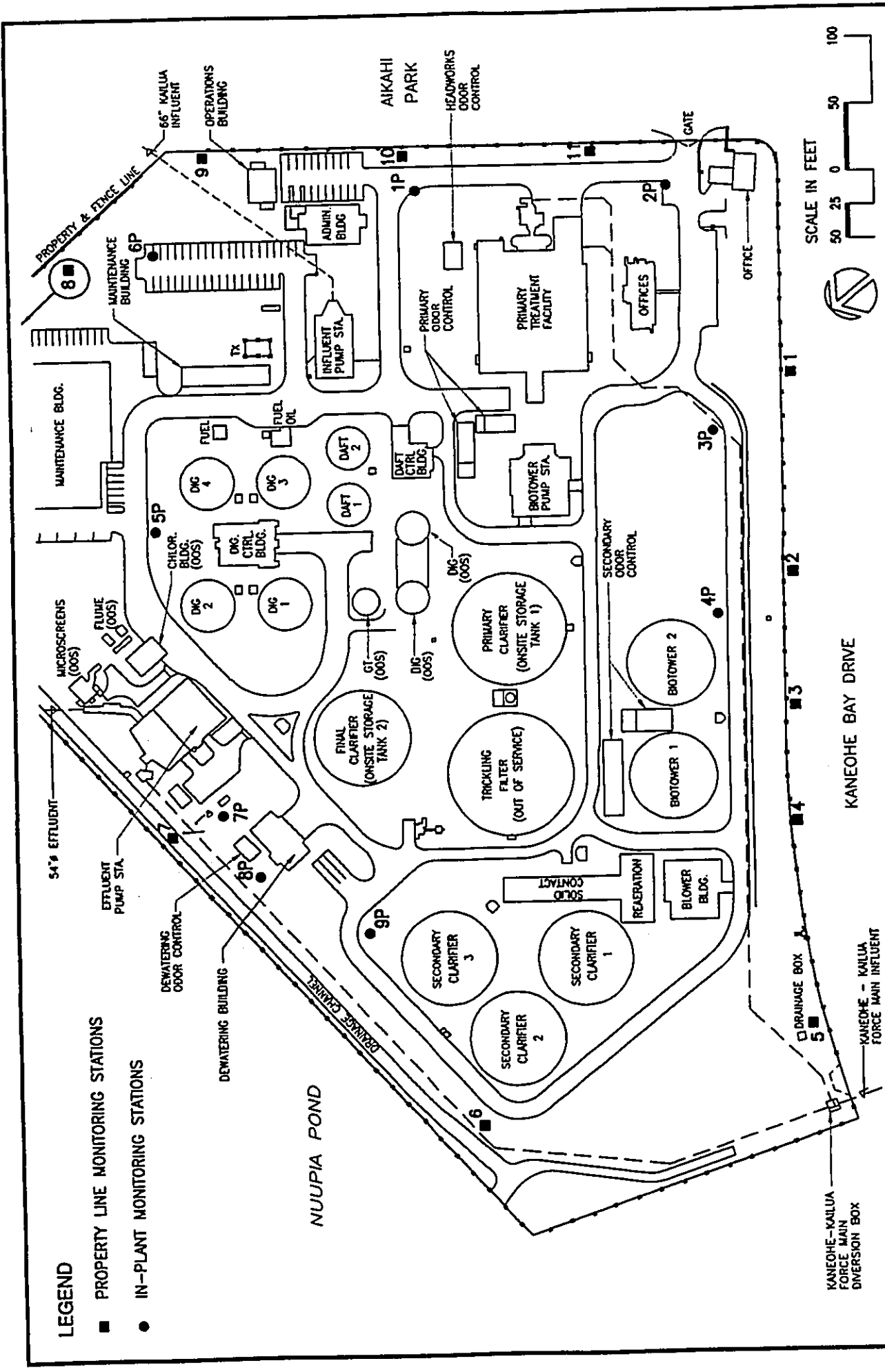


FIGURE 3-11

KAILUA-KANEHOE-KAHALUU FACILITIES PLAN  
 AIR QUALITY MONITORING STATIONS AT KAILUA REGIONAL WASTEWATER TREATMENT PLANT

SOURCE: CITY & COUNTY OF HONOLULU DEPARTMENT OF ENVIRONMENTAL SERVICES

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features which have been implemented in previous construction at the plant, some noise problems remain to be resolved. Noise concerns are not as prevalent at the Kaneohe and Ahuimanu WWPTFs since noise sensitive uses, such as residential areas, are located farther from the respective facilities.

A noise assessment was conducted for the Kailua Regional WWTP by D.L. Adams Associates, Ltd. dba Darby & Associates in August 1999 (see Appendix B). The purpose of the assessment was to assess the existing and future noise impacts on nearby residential areas resulting from operations at the plant and to recommend appropriate noise mitigation, as may be required.

### **3.7.1 Noise Standards and Guidelines**

Noise standard rules are enforced by the State Department of Health pursuant to Title 11, Chapter 46, HAR, Community Noise Control. These rules define three classes of zoning districts and specify corresponding maximum permissible sound levels due to stationary noise sources, such as air-conditioning units, exhaust systems, generators, compressors, pumps, etc., and equipment related to industrial, agricultural and construction activities. These levels are applicable to any location at or beyond the property line, and are not to be exceeded for more than 10 percent of the time during any 20-minute period. The maximum permissible sound levels are a function of the zoning and time of day as shown in Table 3-12.

### **3.7.2 Existing Noise Environment**

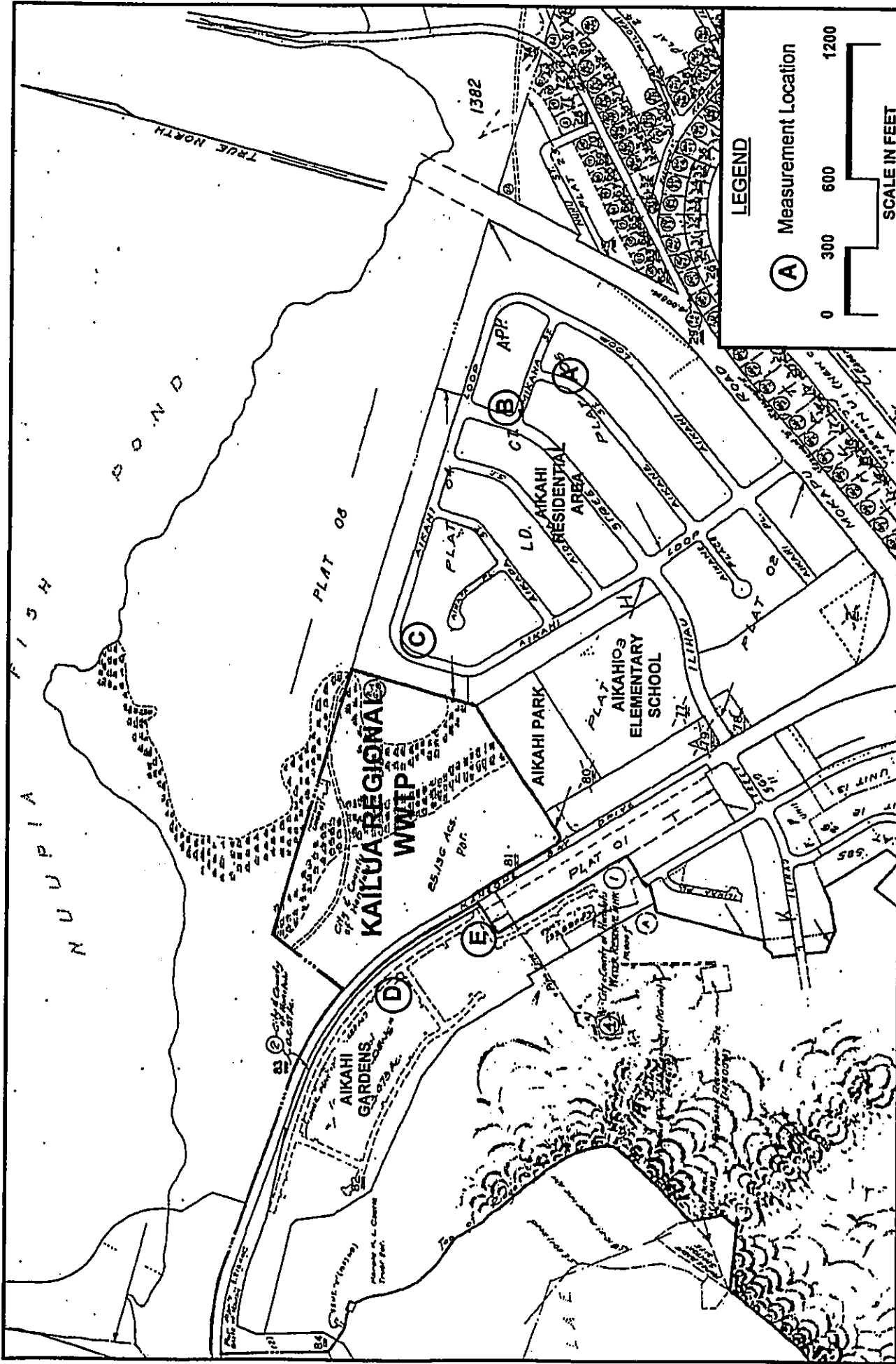
Noise level measurements were conducted at three locations within the Kailua Regional WWTP. These locations were selected to obtain "nearfield" noise data for the three primary noise sources at the plant: the Headworks Odor Control Fans, Primary Odor Control Fans, and Effluent Pumps (see Appendix B, Figure 3). The recorded noise levels are as follows: Headworks Odor Control Fans - 78.5 dBA, Primary Odor Control Fans - 78.0 dBA, and Effluent Pump No. 6 - 55.0 dBA. Additionally, the Administration Building's exterior air-conditioning unit, an air-cooled condenser, was identified as a secondary noise source due to its close proximity to nearby homes in the Aikahi residential area northeast of the plant.

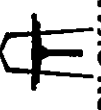
<b>Table 3-12 Maximum Permissible Sound Levels</b>	
<b>Zoning District</b>	<b>Maximum Permissible Sound Level (in dBA)</b>
Class A – Nighttime (residential, conservation, preservation, public space, open space)	45
Class B – Nighttime (multi-family dwellings, apartment, business, commercial, hotel, resort)	50
Class A – Daytime (residential, conservation, preservation, public space, open space)	55
Class B – Daytime (multi-family dwellings, apartment, business, commercial, hotel, resort)	60
Class C – Daytime and Nighttime (agriculture, country, industrial)	70
Source: State Department of Health, Title 11, Chapter 46, Community Noise Control, HAR	

Frequency analyses of the recorded noise levels at the plant were subsequently performed to determine characteristic "noise signature" data for these primary noise sources.

Noise level measurements were recorded at five locations in the vicinity of the Kailua Regional WWTP. Noise measurements were taken between the hours of 3:00 AM and 4:00 AM at three locations in the Aikahi residential area on July 2, 1999 and at two locations at the Aikahi Gardens townhouse development on August 6, 1999 (see Figure 3-12). Locations A and B were selected as they were in the general vicinity of the sources of noise complaints. Location C was selected because it was the closest off-site, public-accessible location to the Effluent Pumps. Light trade wind conditions prevailed during the recording of the noise measurements.

The results of the noise level measurements are presented in Table 3-13. According to the noise assessment, noise measurements in the nearby residential areas which could be attributed to the Kailua Regional WWTP did not exceed State or Federal noise standards, regulations or guidelines. Noise from the plant was not audibly detected during the measurements conducted



 <b>WILSON OKAMOTO &amp; ASSOCIATES, INC.</b> ENGINEERS - PLANNERS	<b>KAILUA-KANEOHE-KAHALUU FACILITIES PLAN</b>	
	<b>COMMUNITY NOISE MEASUREMENT LOCATIONS</b>	
		<b>FIGURE 3-12</b>

<b>Measurement Location</b>	<b>Identifiable Noise Sources</b>	<b>Average Sound Level (in dBA)</b>
A	Insects, wind-in-foliage, occasional distant motor vehicle, distant surf	41.0
B	Insects, wind-in-foliage	34.0
C	Insects, occasional barking dog, birds, low-level "broad-band" noise*	37.5
D	Plant noise, occasional nearby traffic, wind-in-foliage	45.9
E	Plant noise, occasional nearby traffic, wind-in-foliage	50.4

\* The source of the "low-level, broad band" noise could not be specifically identified. It was noted that this noise could possibly have originated from the WWTP or equally as likely from a nearby residential air-conditioning unit.

at the Aikahi residential area, except possibly at Location C, where an audible, low-level, steady broad-band noise was detected. The source of this noise was uncertain and could not be identified as originating from the plant. It was noted that the source could have been from a nearby residential air-conditioning unit.

Frequency analyses were also performed on the sound level data recorded in the Aikahi residential community and comparisons of the results with those from the on-site near-field noise measurements were conducted. The characteristic "whine" of the Effluent Pumps was not identifiable in the noise data from any of the three locations in the Aikahi residential area.

Noise from the WWTP was audible during the measurements at Locations D and E, more so at Location E than D. In the noise consultant's opinion, the plant noise at the Aikahi Gardens noise measurement locations was subjectively characterized as that of one or more large fans, which led to the conclusion that the noise was most likely emanating from the Headworks and Primary Odor Control Fans. The characteristic "whine" of the Effluent Pumps was not detected.

### **3.8 Traffic**

The planning area is served by five main thoroughfares from various points on the Island. The Interstate H-3 Freeway connects the planning region with Leeward and Central Oahu; Pali and Likelike Highways link the planning region with Honolulu; Kamehameha Highway, which runs north/south through the planning region, links the region to the North Shore area and Kalaniana'ole Highway, which exits the planning region to the south and circles the southeastern portion of the Island. Other major roads in the region include Mokapu Boulevard, Kalaheo Avenue, Oneawa Street, and Keolu Drive in Kailua; Kahuhipa Street, Haiku Road and Kaneohe Bay Drive in Kaneohe; and Kahekili Highway and Ahuimanu Road in the Kahaluu area.

Road improvements and construction by State and City transportation and public works agencies are ongoing activities in the Koolaupoko region. Proposed State highway projects in the planning region include the construction of an interchange at Kahekili and Likelike Highways, the widening of Likelike Highway from Kamehameha to Kahekili Highway, and the widening of Kalaniana'ole Highway from Castle Junction to Kailua Road. Proposed City projects include the widening of Kamehameha Highway between Haiku Road and Ipuka Street, and the widening of Kailua Road between Hahani Street to Wanaao Road (Oahu Metropolitan Planning Organization, 1995).

Access to the Kailua Regional WWTP is provided by Kaneohe Bay Drive, a two-lane road providing access between the communities of Kaneohe and Kailua. Access to the Kaneohe WWPTF is provided by Kulauli Street, a local two-lane road providing local residential and school access, terminating at the treatment facility. The four-lane Kahekili Highway provides access to the Ahuimanu WWPTF. Access to the MCBH Kaneohe Bay EQ site is provided by G Street, a primary collector road located at the north terminus of the H-3 Interstate Freeway, Third Street, which intersects G Street, and secondary streets within the Base. Access to the Kapaa Industrial Park EQ site is provided by the two-lane Kapaa Quarry Road. The Kailua Road EQ site is accessed from Kailua Road.

Traffic conditions on the roadways throughout the planning area and at the respective wastewater facilities operate fairly well throughout the weekday.

Most of the roadways within the remainder of the planning area are two-lane streets providing localized access to residential, commercial and industrial areas.

### **3.9 Aesthetics**

The viewshed within the Koolaupoko region is characterized by steep cliffs and ridges extending from the Koolau Range, and a coastline predominantly lined with residential dwellings and interspersed with areas of park space and natural vegetation. Coastal roads providing mauka and intermittent makai views include Kamehameha Highway, Kaneohe Bay Drive and Lilipuna Road. In the Kahaluu area, continuous mauka/makai views are afforded from Kaoio Point south to Kualoa Park, with intermittent makai views in Kahaluu and a significant view opening near the Kahaluu Fishpond. Along Kamehameha Highway, intermittent makai views are afforded across Kaneohe Bay toward Kaoio Point, with mostly continuous makai views in Heeia. Lilipuna Road in the vicinity of Coconut Island has some intermittent views of Kaneohe Bay, with some views over and between residential dwellings along the sloping topography on the makai side. Kaneohe Bay Drive and the H-3 Interstate Freeway provide intermittent views of Kaneohe Bay. In the Kailua area, a significant roadway view occurs at Kailua Beach Park near Alala Point. Other significant views include mauka and makai view corridors at Kawai Nui Canal, continuous and intermittent views from Kaelepulu Stream to Alala Point, and mauka views of Kaelepulu Stream and the Mid-Pacific Golf Course (*Coastal View Study*, City Department of Land Utilization, 1987).

The Kailua Regional WWTP, Kaneohe and Ahuimanu WWPTFs, and pump station sites are currently occupied by wastewater treatment and collection system facilities, respectively. The Kailua Road EQ site, located near the entrance to Kailua, is currently undeveloped and vegetated with trees and scrub vegetation. Located in the vicinity of the EQ site are the Kailua Road WWPS facility and landscaped area to the north, Kawai Nui Marsh to the west and south, Kailua Road to the east, and commercial establishments to the north and east. The MCBH Kaneohe Bay EQ site is currently a vacant area adjacent to and east of the existing MCBH's wastewater treatment plant. The Kapaa Industrial Park EQ site, located between the H-3 Interstate Freeway and the former Kapaa Landfill, has been developed as an industrial subdivision.



Existing uses include warehouses and other light industrial and commercial businesses.

### **3.10 Solid Waste**

Solid waste in the planning area is collected by the City and County of Honolulu, Department of Environmental Services' Refuse Collection and Disposal Division. Refuse collection for high-rise buildings, military facilities, and commercial establishments is provided by licensed commercial haulers. Other agencies in the City also collect trash, including the Department of Transportation Services and Department of Parks and Recreation.

Previously, solid waste from the region was disposed of at the Kapaa Sanitary Landfill. Since the closing of the Kapaa Sanitary Landfill in January 1997, refuse from the planning region has been transported to the Kapaa Transfer Station where it is collected and transferred to one of two locations. One location is the Honolulu Program of Waste Energy Recovery (H-POWER) facility at Campbell Industrial Park where refuse is converted to electricity. The other location is the Waimanalo Gulch Sanitary Landfill located near the Kahe Power Plant on the Leeward side of Oahu. This landfill is expected to reach its capacity in approximately 10 years.

### **3.11 Infrastructure and Utilities**

#### **3.11.1 Water System**

The planning area is served by potable water from the City and County of Honolulu's Board of Water Supply (BWS) water system. The BWS potable water system consists of a system of tunnels, wells, storage tanks and reservoirs, pumps, and water mains. The BWS also provides potable water to the MCBH Kaneohe Bay through a 20-inch transmission line.

A number of BWS deep water wells are located in the planning area. These include the Waihee Wells and Waihee Inclined Wells located in the valleys of the Waihee-Ahuimanu area, Kahaluu Well located in the valley behind Kahaluu, Iolekaa Well located in Iolekaa Valley, Haiku Well located in Haiku Valley, Lulukuu Well located in Kaneohe near the headwaters of Lulukuu Stream, and

Kuou Well I, Kuou Wells II and Kuou Wells III, all located mauka of Likelike Highway near the Luluku Well (see Figure 3-13). The combined capacities of these various wells is 6.77 mgd (Board of Water Supply, 1998).

The BWS tunnels in the planning area include the Waihee Tunnel, Kahaluu Tunnel, Haiku Tunnel, and Luluku Tunnel (see Figure 3-13). The combined capacities of these tunnels is approximately 8.18 mgd (Board of Water Supply, 1998).

The State DOH Safe Drinking Water Branch maintains information on wells used for drinking water, irrigation and industrial purposes located throughout the State in which organic chemical contaminants have been detected and confirmed in the wells. None of the potable water wells in the planning region are identified as containing detectable levels of groundwater contamination.

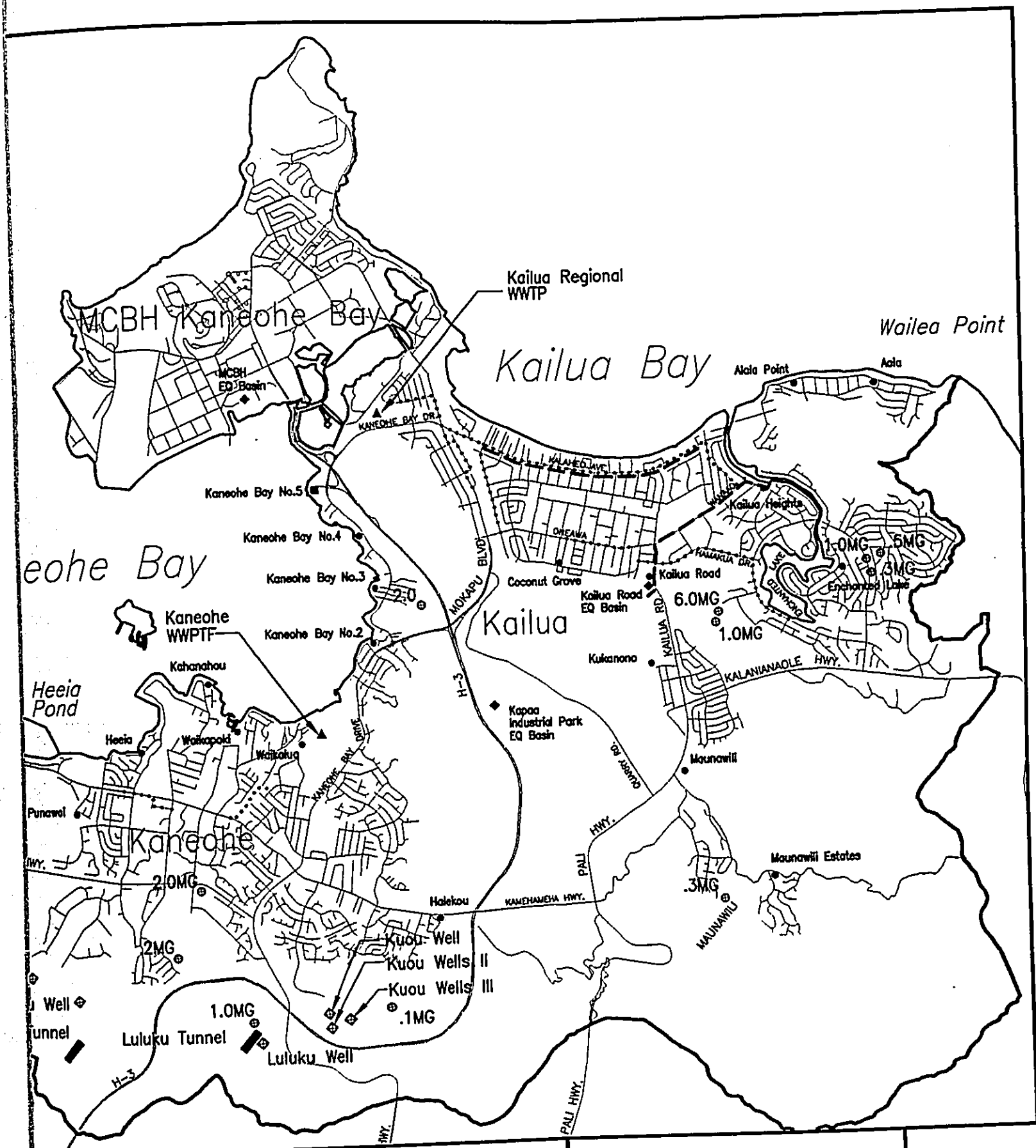
Various sizes of water lines extend throughout the planning region serving residential and commercial customers. Existing large water lines in the planning area include 20-, 24-, 30-, and 36-inch pipes that extend along major collector roads such as Kamehameha Highway, Kahekili Highway, Kaneohe Bay Drive, Mokapu Boulevard, and Kailua Road. Smaller water lines include 12- and 16-inch lines along various streets serving residential and commercial developments. Smaller ¼- to 2-inch lines branch off to service individual customers.

### **3.11.2 Wastewater System**

This section provides background information on the existing wastewater system for the Kailua-Kaneohe-Kahaluu service area (see Figure 1-2).

#### **3.11.2.1 Collection System**

The collection system includes gravity lines, force mains and pump stations which extend through most of the developed areas of the region. The three major basins in the region are the Ahuimanu Basin, Kaneohe Basin and Kailua Basin. Unsewered areas are primarily in the Kahaluu area.



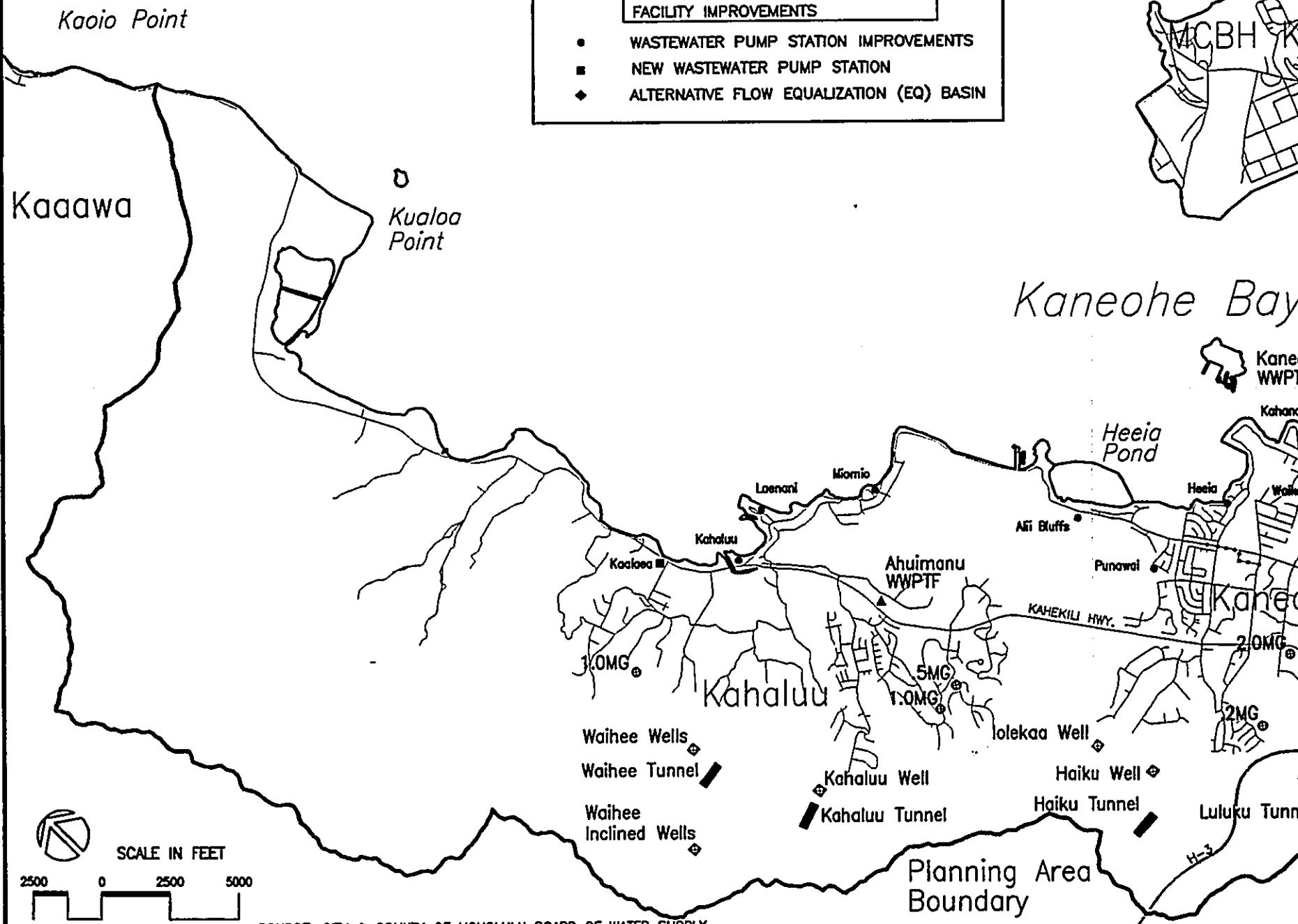
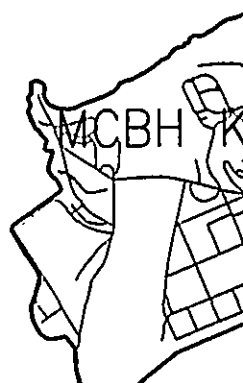
PLAN  
 ES

POTABLE WATER  
 SOURCES

FIGURE  
 3-13

**LEGEND**

- TUNNELS
- ☒ WELLS
- ⊙ STORAGE TANKS
- - - PROPOSED PIPE STORAGE
- ..... RECONSTRUCTED SEWER LINES
- ▲ WASTEWATER TREATMENT PLANT/  
WASTEWATER PRELIMINARY TREATMENT  
FACILITY IMPROVEMENTS
- WASTEWATER PUMP STATION IMPROVEMENTS
- NEW WASTEWATER PUMP STATION
- ◆ ALTERNATIVE FLOW EQUALIZATION (EQ) BASIN



SOURCE: CITY & COUNTY OF HONOLULU BOARD OF WATER SUPPLY

**KAILUA-KANEOHE-KAHALUU FACILITIES PLAN**

**POTABLE WATER SOURCES**



**WILSON OKAMOTO & ASSOCIATES, INC.**  
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NW-RESOURCE.DWG 14:24 01/06/99 M:\DWG\3378-01\FIGURE

**Major Collection System Basins:**

**Ahuimanu Basin:** The Ahuimanu WWTPF receives all wastewater flows generated in the Ahuimanu Basin. Four (4) WWPSs are located within this Basin. The combined flows from the Miomio and Laenani WWPSs are sent to the Kahaluu WWPS where they are pumped to the Ahuimanu WWTPF via a 12-inch force main and 24-inch gravity line located along Kahekili Highway. Flows from the Ahuimanu WWTPF, which has an average dry weather flow of 0.82 mgd, are pumped to the Kaneohe WWPTF through a 16-inch force main.

**Kaneohe Basin:** The Kaneohe Basin can be divided into two tributary areas, the Heeia-Kaneohe Town Tributary and the Kaneohe Bay South Tributary. The Heeia-Kaneohe Town Tributary includes the portion of Kaneohe from Heeia to Waikalua. There are seven (7) WWPSs located within this Tributary. Flows from these WWPSs are ultimately conveyed to the Kaneohe WWPTF via a 36-inch interceptor.

The Kaneohe Bay South Tributary includes the portion of Kaneohe from Kokokahi to Yacht Club Knolls. Located within this tributary are three WWPSs. The combined flows from the Kaneohe Bay No. 3 and No. 4 WWPSs are sent to the Kaneohe Bay South No. 2 WWPS, and then pumped to the Kaneohe Bay No. 1 WWPS and effluent pump station at the Kaneohe WWPTF through a 14-inch force main and 27-inch gravity line. Flows from the Kaneohe WWPTF, which has an average dry weather flow of 6.5 mgd, are pumped to the Kailua Regional WWPTF.

**Kailua Basin:** The Kailua Basin can be divided into two tributary areas, the Maunawili-Coconut Grove Tributary and the Kailua Heights Tributary. The Maunawili-Coconut Grove Tributary includes the communities of Maunawili, Olomana, Pohakupu, and Coconut Grove. There are five (5) WWPSs located within this Tributary. The combined flows from the WWPSs are ultimately conveyed to a 48-inch interceptor which runs along Oneawa Street. Flows from this interceptor are then combined with flows from the Lanikai-Kailua Heights Tributary at the intersection of Kalaheo Avenue and Kainui Drive.

The Lanikai-Kailua Heights Tributary includes the communities of Lanikai, Keolu Hills, Kailua Heights, and Enchanted Lake. Four (4) WWPSs are located within

this Tributary. The combined flows from the WWPSs are ultimately conveyed to a 36-inch interceptor. Flows from this interceptor are combined with flows from the Maunawili-Coconut Grove Tributary at the intersection of Kalaehe Avenue and Kainui Drive. The flows are then directed through the 54-/66-inch Mokapu Interceptor to the Kailua Regional WWTP.

**Gravity Collection System:** The gravity collection system for the Kailua-Kaneohe-Kahaluu wastewater service area consists of approximately 200 miles of pipe, ranging in diameter from 6 to 66 inches. An inventory of the sewer pipes is included in Table 3-14. Most of the system consists of the smaller pipes of 6 to 12 inches in diameter, with 8-inch pipes comprising approximately 75 percent of all lines. Vitrified clay pipes are used in 90 percent of the lines, with larger lines 21 inches and greater using reinforced concrete pipes. Most of the system is less than 35 years old.

**Table 3-14**  
**Inventory of Sewer Pipes**  
**Kailua-Kaneohe-Kahaluu Service Area**

Pipe Size Diameter (inches)	Kailua Basin (lineal feet)	Kaneohe Basin (lineal feet)	Kahaluu Basin (lineal feet)	Total length (lineal feet)
6	45,463	35,894	1,318	82,675
8	392,143	338,165	53,109	783,417
10	15,786	21,147	9,200	46,133
12	20,911	8,857	727	30,495
15	5,213	8,180	2,382	15,775
18	8,048	1,735	0	9,783
21	4,418	4,454	0	8,872
24	13,156	6,830	634	20,620
27	4,352	9,071	0	13,423
30	21	1,861	0	1,882
36	11,644	7,049	0	18,693
42	3,745	24	0	3,769
48	6,126	0	0	6,126
54	1,865	0	0	1,865
66	3,360	0	0	3,360
<b>Totals</b>	<b>536,251</b>	<b>443,267</b>	<b>67,370</b>	<b>1,046,888</b>

Source: City and County of Honolulu, Department of Wastewater Management, WIMS 1996

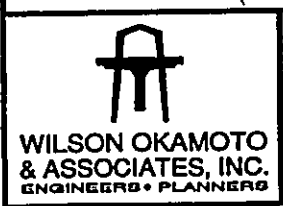
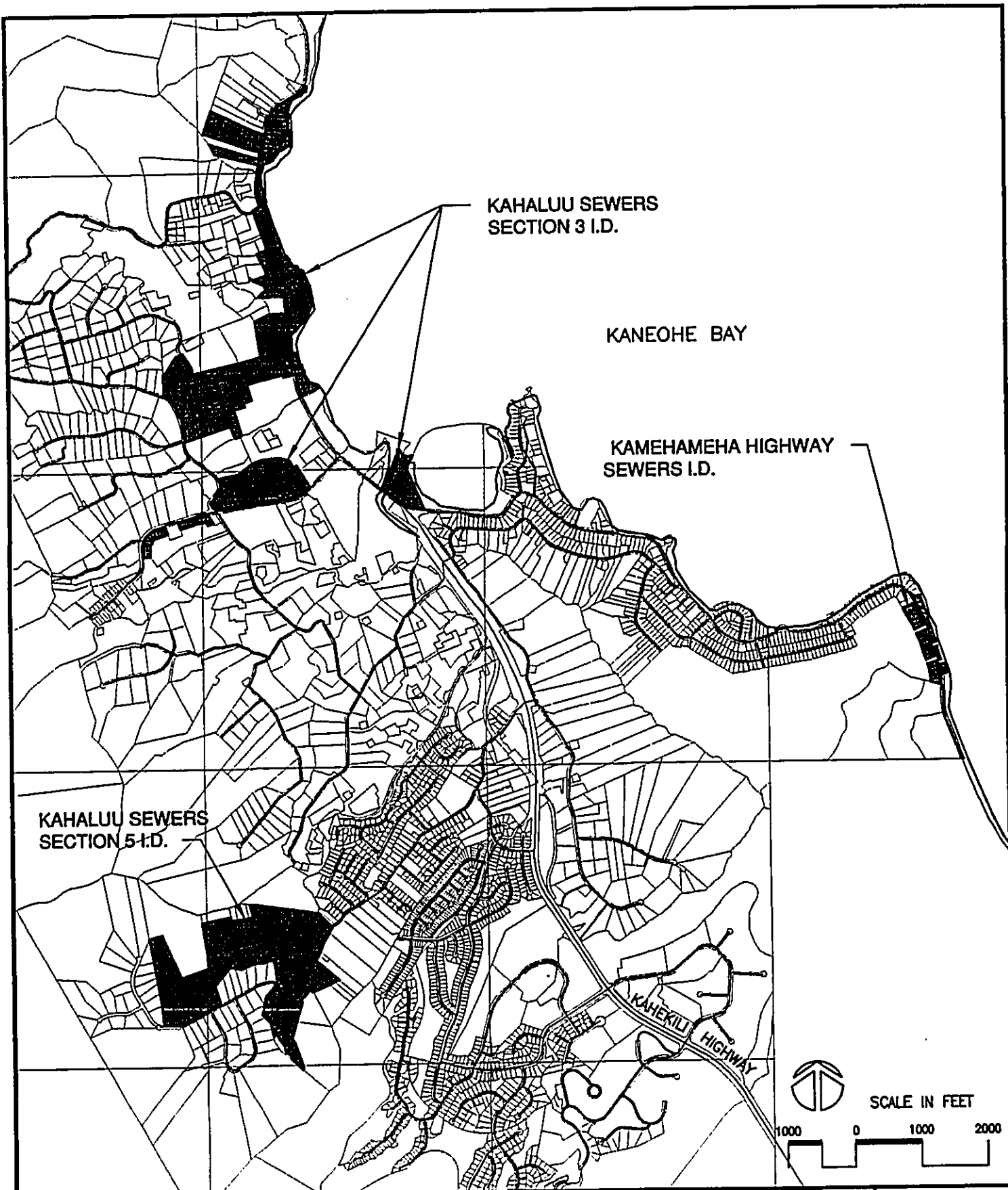
Groundwater infiltration and storm water inflow into the sanitary sewer system are two of the major problems creating hydraulic overloads through the pipes, pump stations and treatment plant during heavy rainfall periods. Systems in low-lying areas along the coast are also subject to seawater and root intrusion to the collection system.

An assessment of the physical conditions and problem areas in the gravity lines was compiled through the City Division of Collection System Maintenance, as well as from the City's Sewer Rehabilitation and Infiltration and Inflow (I/I) Minimization Study. Gravity line deficiencies were identified in various areas throughout the region. These problems relate primarily to root intrusion, seawater, hydrogen sulfide corrosion, and sagging pipes.

Pump Stations and Force Mains: The collection system has 23 wastewater pump stations, excluding the pump stations at the Kaneohe and Ahuimanu WWPTFs. There are nine (9) pump stations in Kailua, 10 in Kaneohe, and four (4) in Ahuimanu. The pump stations are mostly less than 30 years old, with the older stations in Kailua and the newer stations in Kahaluu, all of which were placed into operation within the past 10 years.

Unsewered Areas: An estimated 2,199 lots are unsewered in the planning region, based on a review of BWS records used to bill customers for sewer service. Most of the unsewered areas in the region are in the Kahaluu area which has 1,333 unsewered lots. Kaneohe has 456 unsewered lots and Kailua has 330 unsewered lots. Individual wastewater systems are widely used in the unsewered areas of the region. These include primarily cesspools and septic tank systems.

Existing unsewered areas include lots in the following sewer improvement districts: Kahaluu Sewers Section 3, Kahaluu Sewers Section 5, Kailua Sewers Section 10, Kaneohe Bay Sewers, Kaneohe Sewers Section 10, and Kamehameha Highway Sewers (see Figures 3-14 to 3-16).

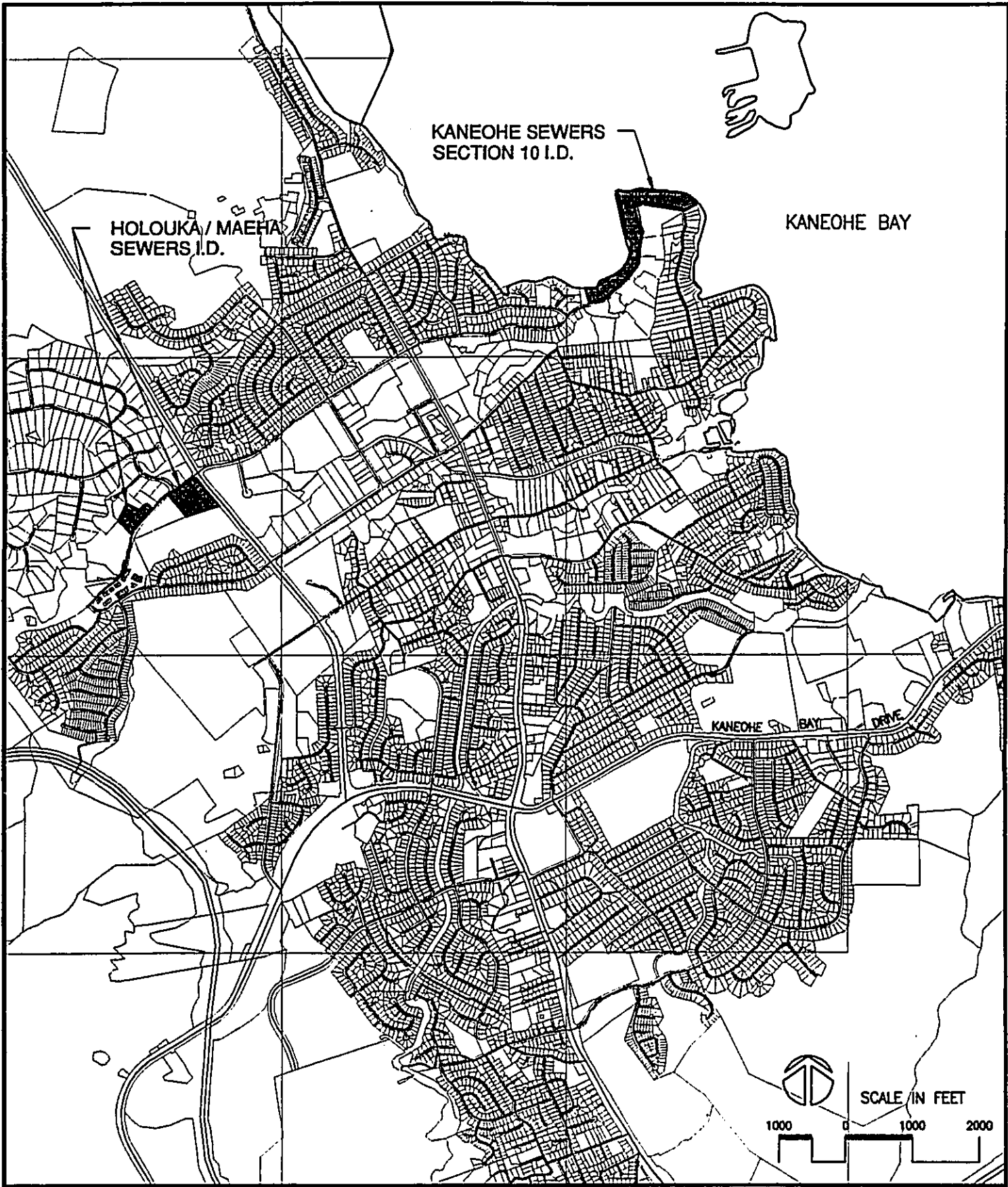


KAILUA-KANEOHE-KAHALUU FACILITIES PLAN

**KAHALUU SEWER IMPROVEMENT  
AREAS**

**FIGURE  
3-14**

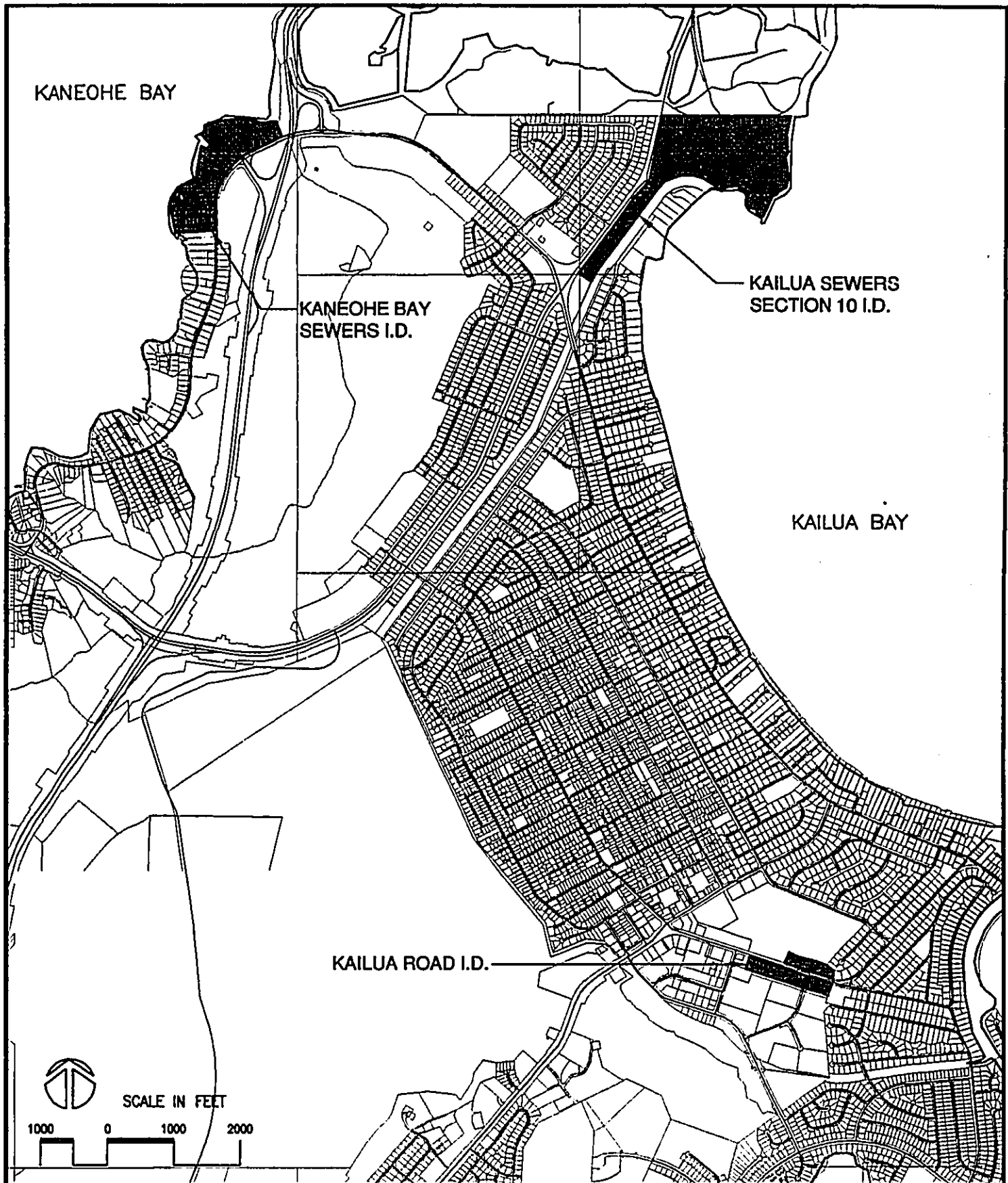




  
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KAILUA-KANEOHE-KAHALUU FACILITIES PLAN  
**KANEOHE SEWER IMPROVEMENT  
 AREAS**

**FIGURE  
 3-15**



  
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KAILUA-KANEOHE-KAHALUU FACILITIES PLAN

**KAILUA/KANEOHE SEWER  
 IMPROVEMENT AREAS**

**FIGURE  
 3-16**

### **3.11.2.2 Treatment and Disposal System**

**Kailua Regional WWTP:** The Kailua Regional WWTP is a secondary treatment facility using the biotower/solids contact process for secondary treatment and anaerobic digestion for solids treatment. The existing site plan for the Kailua Regional WWTP is depicted in Figure 2-2. The facility is currently designed to treat an average daily flow of 15.25 mgd.

Influent wastewater enters the plant via two separate lines: the 66-inch Mokapu Interceptor Sewer from the Kailua Basin and the 42-inch Kaneohe-Kailua Force Main from the Kaneohe WWPTF. The 1998 average combined influent flow was 12.52 mgd.

**Preliminary Treatment:** Wastewater from the Kailua-Maunawili-Enchanted Lake-Lanikai areas receives preliminary treatment. Preliminary treated wastewater enters a distribution channel leading to the primary clarifiers. The preliminary treated flows from the Kaneohe and Ahuimanu WWPTFs also enter this distribution channel.

**Primary Clarification:** The Kailua Regional WWTP has four rectangular clarifiers that settle suspended solids by gravity. Primary effluent is then transported to the Biotower Pump Station and two Biotowers for secondary treatment.

**Biotowers:** The facility operates two 100-foot diameter biotowers as part of its secondary treatment process. The biotowers are designed to process an organic loading of 46 lbs BOD<sub>5</sub>/1000 cubic feet of biotower media. Biotower effluent goes to the solids contact tanks, then to the secondary clarifiers.

**Aerated Solids Contactors:** The two aerated solids contactors are designed to remove soluble BOD<sub>5</sub> by providing contact time between biotower effluent and reaerated return sludge from the secondary clarifiers.

**Secondary Clarification:** The plant has three 110-foot diameter secondary clarifiers which settle solids generated by the secondary treatment process. Return activated sludge from the secondary clarifiers goes to the solids contact tank or optionally can go to the reaeration tanks before mixing with biotower effluent in the solids contact tank.

Effluent Pumping and Outfall Disposal: Treated effluent from the secondary clarifiers goes to the effluent pump station. There are a total of seven (7) pumps in the effluent pumping system with a rated capacity of 61 mgd. The 54-inch force main from the effluent pump station extends to the south shore of Mokapu Point, then continues along the shoreline for about 14,000 feet. The 48-inch Mokapu Outfall extends offshore a total of 5,083 feet, including 4,100 feet for the outfall pipe and 983 feet for the diffusers, which are located offshore at a depth of about 110 feet.

The Mokapu Outfall is the only permitted effluent disposal point for the MCBH Kaneohe Bay wastewater treatment plant and Kailua-Kaneohe-Kahaluu wastewater facilities. Annual inspection of the Outfall shows no structural or operational deficiencies.

Dissolved Air Flotation Thickening: The plant operates two Dissolved Air Flotation Thickeners (DAFT) designed to thicken sludge prior to digestion. The floating sludge is skimmed from the surface and pumped to the digesters for further treatment. The settled material is returned to the headworks for further treatment.

Anaerobic Digestion: There are four 64-foot diameter covered tanks (digesters) designed to anaerobically stabilize raw sludge prior to dewatering.

Centrifuges: Sludge dewatering is accomplished through the operation of centrifuges designed to dewater either digested or raw sludge. Odors generated in the sludge dewatering facility are collected and processed through a Calvert odor control system. Sludge cake from the centrifuge building is trucked to the Waimanalo Gulch Sanitary Landfill in Nanakuli. In 1998, the Kailua Regional WWTP processed approximately 855 dry tons of sludge which was disposed of at the landfill.

Because of the close proximity of residences and the Aikahi Elementary School, previous construction at the plant has included significant investments in odor and noise control features. To date, more than \$5.7 million has been spent to control both odor and noise emanating from the plant.

**Kaneohe WWPTF:** The Kaneohe WWPTF was previously a secondary treatment plant. The facility was converted to a preliminary treatment facility in 1994 as part of the regionalization plan for the Kailua Regional WWTP. The facility provides screening, grit removal and some flow equalization processes. Grit and solid collection from screening are trucked to the Waimanalo Gulch Landfill for disposal. The existing site plan for the Kaneohe WWPTF is depicted in Figure 2-3.

Raw wastewater entering the facility from the 36-inch Kaneohe Stream Interceptor Sewer and the 42-inch Kawa Interceptor Sewer flows to a new influent pump station. The 10 mgd capacity influent pump station discharges the raw wastewater for preliminary treatment. The preliminary treated wastewater then flows by gravity to the Kaneohe Effluent Pump Station which has an estimated pumping capacity of 20 mgd.

Raw wastewater entering the facility from the 27-inch Kaneohe Bay Interceptor Sewer receives preliminary treatment before entering the Kaneohe Bay No. 1 Pump Station. Effluent is then discharged to the Kaneohe Effluent Pump Station.

In the event wastewater flows from the Kaneohe Stream Interceptor Sewer and 42-inch influent sewer exceed the capacity of the new influent pump station and the Kawa Pump Station (typically maintained in a standby mode), it is possible to use the old 42-inch bypass to Kaneohe Stream to prevent backup of sewage in the collection system or a sewage spill. Preliminary treated wastewater from the Ahuimanu and Kaneohe WWPTF force main and Kaneohe WWPTF could be diverted to the old Kaneohe Bay Outfall to reduce or prevent a wastewater spill at the plant.

**Ahuimanu WWPTF:** The Ahuimanu WWPTF was previously a secondary treatment plant. The facility was converted to a preliminary treatment facility in 1994 as part of the regionalization of the Kailua WWTP. The facility now provides screening, grit removal and flow equalization processes. Grit and solid collection from screening are trucked to the Waimanalo Gulch Landfill for disposal. The existing site plan for the Ahuimanu WWPTF is depicted in Figure 2-4. The facility's hydraulic capacity is limited by the effluent force main to 3.3 mgd. The influent flow capacity is 8.5 mgd at the headworks.

Influent wastewater enters via a 24-inch gravity line and undergoes screening and grit removal. Wastewater flows from the aerated grit chamber to two equalization basins, then to the effluent pumping station.

Preliminary treated wastewater conveyed by the 16-inch force main from the Ahuimanu WWPTF goes directly to the Kaneohe Effluent Pump Station wet-well.

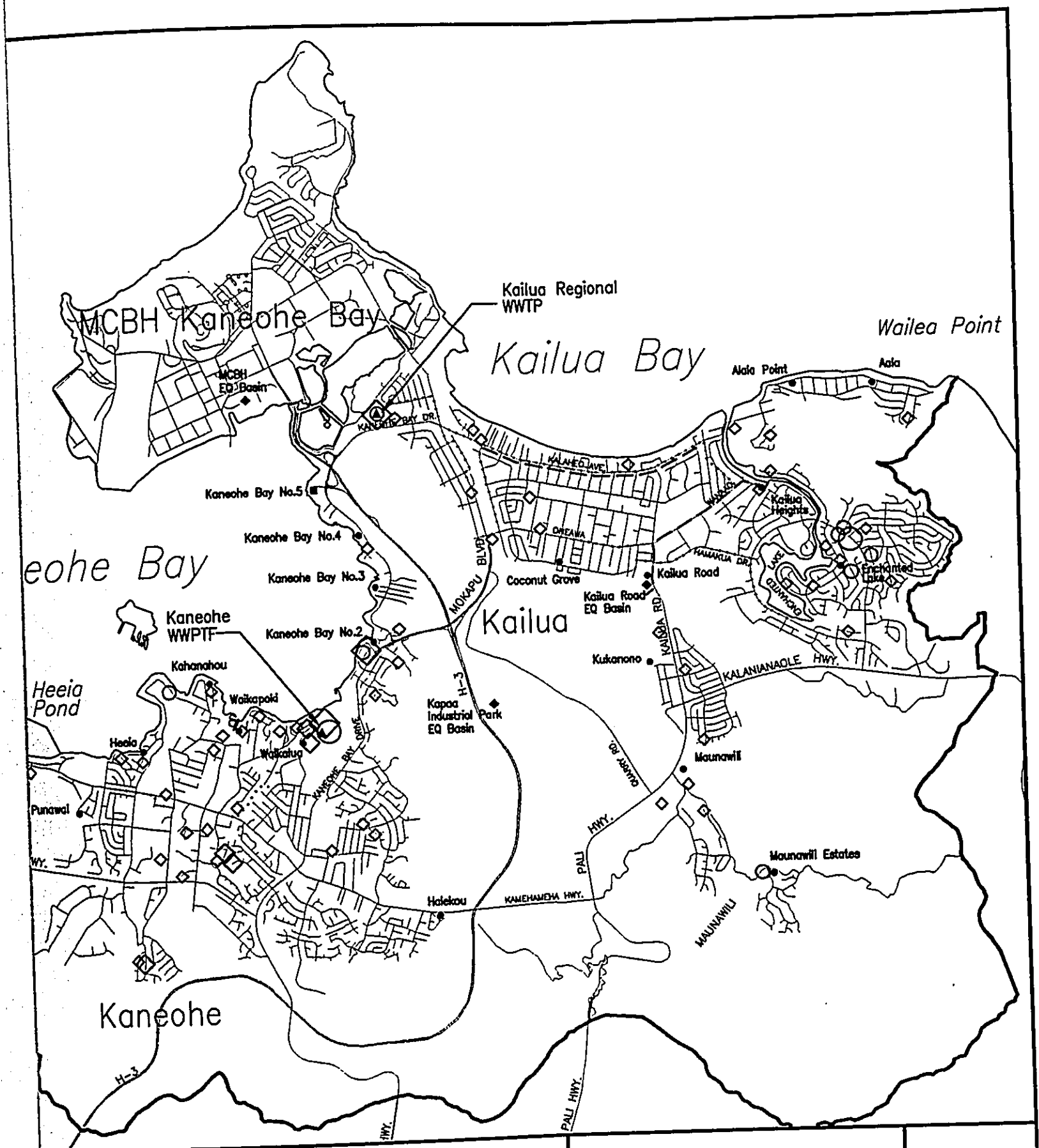
The former Polishing Pond is now an unlined holding pond available for temporary storage of raw wastewater if influent flows exceed the headworks capacity. In addition, in excess of the equalization basins and effluent pump station capacity, flows can be diverted to the decommissioned WWPS facilities which can pump preliminary treated wastewater to the former Polishing Clarifier, Aerobic Digester Tank and the old Rapid Block tanks for temporary storage.

#### **3.11.2.3 Sanitary Sewer Overflows**

Figure 3-17 depicts the frequency of sanitary sewer overflows in the planning region based on the City and County of Honolulu's Quarterly Spills and Bypass Reports from January 1994 through March 1998. The collection system overflows occurred during both dry weather and wet-weather or periods of heavy rainfall. Dry weather overflows were due to maintenance, damaged pipes, roots, and/or grease. Wet-weather overflows were due to peak flows that exceeded the wastewater system capacity.

#### **3.11.2.4 Effluent Reuse Potential**

*Currently, an average of 13 mgd of secondary treated effluent from the Kailua Regional WWTP is discharged through the Mokapu Outfall. This water could be used for many productive purposes including golf course and crop irrigation, landscaping and for various industrial and commercial uses. Reclaimed water is currently being used for irrigation at several sites including the BYU-Hawaii Campus, Kaneohe Klipper Golf Course at the Marine Corps Base Hawaii Kaneohe Bay, and at several parks, golf courses, and agricultural lots on Maui.*



PLAN

HISTORIC OVERFLOWS

FIGURE 3-17

**LEGEND**

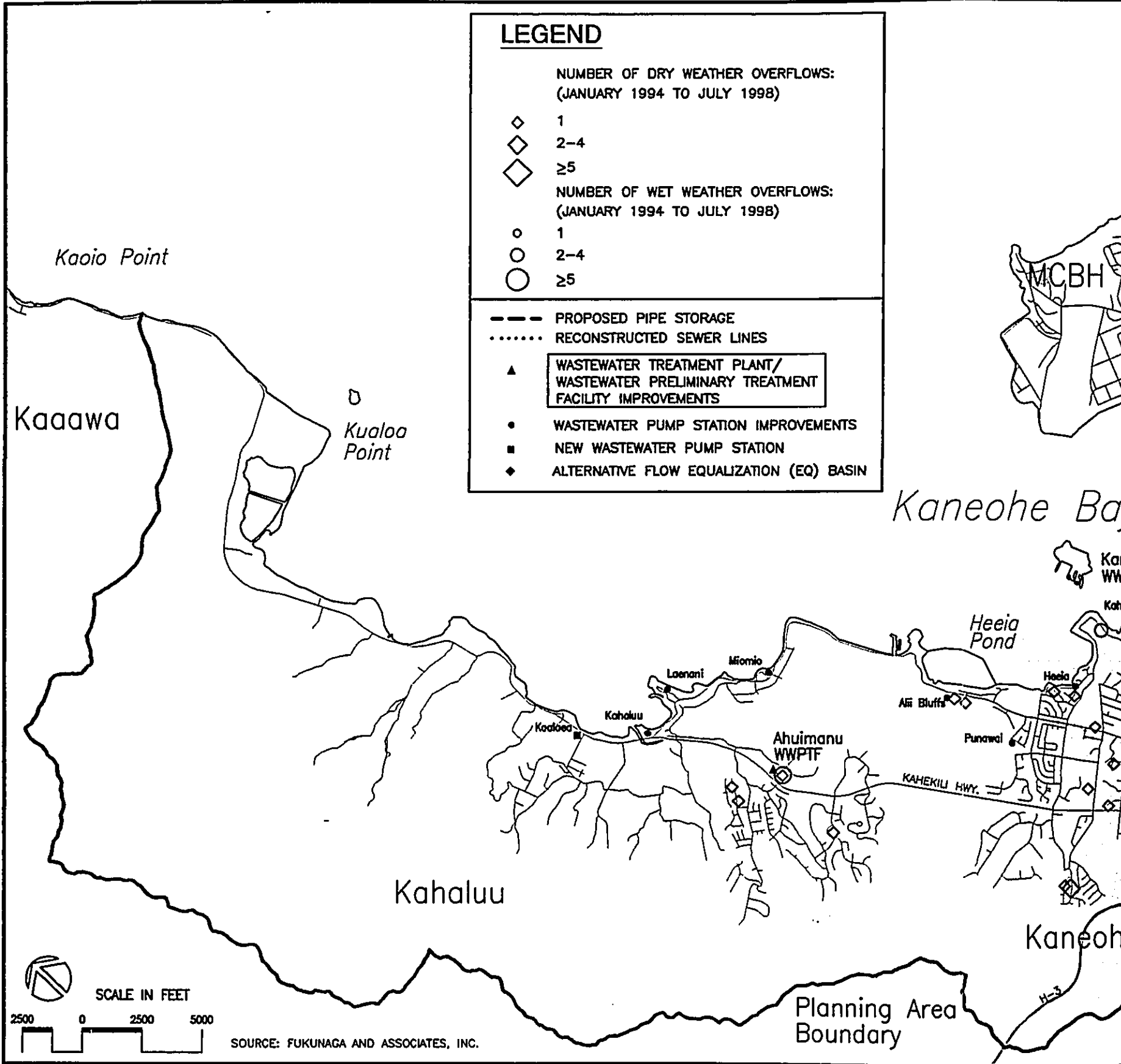
NUMBER OF DRY WEATHER OVERFLOWS:  
(JANUARY 1994 TO JULY 1998)

- ◊ 1
- ◊ 2-4
- ◊ ≥5

NUMBER OF WET WEATHER OVERFLOWS:  
(JANUARY 1994 TO JULY 1998)

- 1
- 2-4
- ≥5

- PROPOSED PIPE STORAGE
- ..... RECONSTRUCTED SEWER LINES
- ▲ WASTEWATER TREATMENT PLANT/  
WASTEWATER PRELIMINARY TREATMENT  
FACILITY IMPROVEMENTS
- WASTEWATER PUMP STATION IMPROVEMENTS
- NEW WASTEWATER PUMP STATION
- ◆ ALTERNATIVE FLOW EQUALIZATION (EQ) BASIN



Kaneohe Bay

Kaoio Point

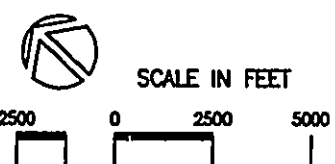
Kaaawa

Kualoa Point

Kahaluu

Planning Area Boundary

Kaneohe



SOURCE: FUKUNAGA AND ASSOCIATES, INC.

KAILUA-KANEOHE-KAHALUU FACILITIES PLAN

**HISTORIC OVERFLOWS**

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NW-HISTOVR.DWG 14:24 01/06/99 M:\DWG\3378-01\FIGURE



***Reclaimed Water Quality Standards and Treatment Facilities:*** The State DOH has defined three standards of reclaimed water quality, R-1, R-2 and R-3. R-1 reclaimed water is disinfected to achieve a significant reduction in viral and bacterial pathogens; R-2 water is disinfected to achieve a fecal coliform limit of 4 cfu/100ml; and R-3 water is undisinfected secondary treated wastewater. R-1 water is approved for the most uses and would provide the greatest flexibility for potential users of reclaimed water.

To produce R-1 quality water, effluent from the Kailua Regional WWTP would have to undergo additional treatment including coagulation/flocculation, filtration and disinfection. Chemical coagulation/flocculation is a treatment process which is used to enhance particulate removal during the filtration process.

Wastewater effluent is typically disinfected by using chlorine. However, the DOH recommends alternative forms of disinfection since chlorine can have serious adverse effects on aquatic life and can also react with wastewater to form various chlorinated hydrocarbons. In addition, reverse osmosis demineralization can be used to remove trace organics and allow reclaimed water to recharge drinking water aquifers.

***Storage and Transmission Facilities:*** Storage impoundments for reclaimed water must have liners which are impervious to water and be of sufficient capacity to retain reclaimed water under adverse wet-weather conditions based on a 50-year storm recurrence interval. In addition, runoff should be prevented from entering the impoundment unless the impoundment is of sufficient size to accept the runoff without discharge, or an NPDES permit has been issued for the discharge. A backup disposal system should also be provided to prevent overflows or discharges when the system is not in use or when the reclaimed water quantities exceed the system demand.

To reduce the likelihood of cross-connection between reclaimed water lines and potable water lines, the Board of Water Supply has set standards for horizontal and vertical clearances between potable water lines and reclaimed water lines. Reclaimed water lines must also be colored purple and be clearly labeled as such.

**Potential Users of Reclaimed Water:** An assessment of non-potable water demand was conducted for various water users on the Windward side of Oahu by CH2M Hill for the Board of Water Supply. A list of the water users identified in the study and other potential users of non-potable water is shown in Table 3-15.

The State DOH's current regulations do not allow the reuse of R-1 water above the State's Underground Injection Control (UIC) line. Potential users currently affected by this regulation include Pali Golf Course, Hawaii State Hospital, Hoomaluhia Botanical Garden, Valley of the Temples Memorial Park, Koolau Golf Course, Luana Hills Golf Course, and a few public parks and schools located in the Ahuimanu, Kaneohe and Maunawili areas.

<b>Site</b>	<b>Estimated Irrigated Acres</b>	<b>Average Water Demand (gpd)</b>	<b>Peak Water Demand (gpd)</b>
Olomana Golf Links	129.9	97,800	503,871
Mid-Pacific Country Club	150	118,500	581,837
Pali Golf Course	150	105,400	581,837
Hawaii Pacific University-Hawaii Loa Campus	20	6,200	77,578
Hawaii State Veterans Cemetery	72	27,400	279,282
Hawaii State Hospital	32	21,687	124,125
Hoomaluhia Botanical Garden	300	174,551	1,163,674
Hawaiian Memorial Cemetery	65	37,819	252,129
Bay View Golf Links	100	58,184	387,891
Public Parks	50	29,092	193,946
Schools	50	29,092	193,946
Valley of the Temples Memorial Park	55	32,001	213,340
Koolau Golf Course	95	55,275	368,496
Luana Hills Golf Course	130	75,639	504,257
<b>Total</b>	<b>1,398.9</b>	<b>868,640</b>	<b>5,426,209</b>

The Board of Water Supply has established that the water requirement for turf grass irrigation is one-inch per week. Average water demand for the Olomana Golf Links, Mid-Pacific Country Club, Pali Golf Course, Hawaii Pacific University, Hawaii State Veterans Cemetery, and Hawaii State Hospital was

determined in the Non-Potable Water Study by reviewing Board of Water Supply records. Average water demand for the remaining sites was assumed to be 0.15 inch irrigation/acre/week, with the remaining 0.85 inch of irrigation coming from rainfall.

The reclaimed water supply system should be designed for extreme cases in which weeks can pass with little or no rainfall. Peak water demand was calculated by assuming that no rainfall would occur and that the full one-inch of irrigation per week would come from the water reclamation system.

Salinity of Kailua Regional Wastewater Treatment Plant Effluent: Reclaimed water that will be used for irrigation must fall within acceptable salinity levels. This is especially true in areas which recharge groundwater aquifers since application of high chloride content water may eventually cause chlorides to leach into underlying groundwater bodies. Generally, the maximum chloride concentration for turf irrigation water is 600 parts per million.

Preliminary salinity measurements taken at the Kailua Regional WWTP indicate that the effluent currently exceeds acceptable levels. Wastewater samples were taken from four locations at the Kailua Regional WWTP including the Kailua-Kaneohe force main, Kailua gravity line, Clarifier No. 3 weir, and Clarifier No. 2 weir. The samples were analyzed for electrical conductivity (EC) and were converted to parts per million (ppm) total dissolved solids (TDS). Estimates of chloride (Cl) concentration were made using two different methods. The measures EC and estimated TDS ppm and Cl concentrations for each location are shown in Table 3-16. The measurements from Clarifier No. 2 weir should be considered anomalous as it does not correlate to the other readings.

The current high chloride concentrations are most likely caused by the infiltration of seawater into sewer lines. As a result, following the substantial rehabilitation of sewer lines in the Kailua-Kaneohe-Kahaluu area, salinity levels may fall within acceptable levels (below 600 ppm). A program for periodically monitoring influent salinity levels should be undertaken by the City and County of Honolulu to determine the feasibility of planning and eventually developing reuse facilities for the region.

**Table 3-16**  
**Measured EC and Estimated TDS and Cl**

<i>Location</i>	<i>Measured EC micromhos/cm</i>	<i>Est. TDS<sup>1</sup> PPM</i>	<i>Est. Cl<sup>2</sup> PPM</i>	<i>Est. Cl<sup>3</sup> ppm</i>
<i>Kailua-Kaneohe Force Main</i>	4,700	3,525	1,914	2,187
<i>Kailua Gravity Sewer</i>	7,100	5,325	2,891	3,303
<i>Clarifier 3 Weir</i>	6,400	4,800	2,606	2,978
<i>Clarifier 2 Weir</i>	1,000	750	407	465

<sup>1</sup> Uses a 0.75 multiplier: Est. TDS = EC\*0.75

<sup>2</sup> Applies principles of physical chemistry

<sup>3</sup> Assumes linearity and applies a factor to the TDS estimates based on TDS and Cl of seawater

### 3.11.3 Drainage System

Drainage in the planning region follows a basic mauka (mountain) to makai (sea) flow. Water is channeled through streams that flow from the valleys in the Koolau Range to the ocean. Other factors that affect drainage patterns include area topography and natural and manmade barriers to water flow. Surface water runoff is collected in various catch basins and into storm mains. Most storm mains empty into area streams and canals. All of the streams and canals in the planning region empty into one of two coastal waters: Kaneohe Bay and Kailua Bay.

Streams that drain into Kaneohe Bay include Hakipuu Stream which drains the Hakipuu area, and Waikēē and Waikane Streams which drain storm runoff in the Waikane Valley area. Waiahole and Uwau Streams drain the Waiahole Valley area. The Kahaluu area is drained by Kaalaea and Waihee Streams and the Kahaluu River system. The Heeia and Iolekaa Streams drain the Heeia area which empties into Heeia Marsh and Pond before emptying into Kaneohe Bay. Streams that drain the Kaneohe area include Keahala, Kapunahala, Kamooalii, Luluku, and Kaneohe. Draining the southern portion of Kaneohe is Kawa Stream which empties near Waikalua Fishpond in Kaneohe Bay (see Figure 3-5).

Canals that drain into Kailua Bay include Kawai Nui and Kaelepulu Canals. Kawai Nui Canal drains Kawai Nui Marsh which acts as the area's drainage basin, holding surface runoff before releasing it into Kailua Bay. Kahanaiki, Maunawili and Olomana Streams drain the Maunawili Valley area into Kawai

Nui Marsh. Kaelepulu Canal drains Kaelepulu Pond which is the drainage basin for the surrounding areas, including Enchanted Lake and Keolu Hills (see Figure 3-5).

Existing drainage facilities in the Kailua, Kaneohe and Kahaluu areas are managed by the City and County of Honolulu Department of Facility Maintenance. Storm drain lines are located in various areas throughout the planning region to serve local residential and commercial needs. Storm drain lines vary in diameter from 18 to 48 inches. Areas without storm drain lines include most of Kahaluu, various areas within Ahuimanu, and the Kalaheo Avenue area in Kailua. In addition to storm drain lines, the City also maintains various culverts throughout the planning region.

#### **3.11.4 Electrical System**

Electrical service in the planning region is provided by Hawaiian Electric Company, Inc. (HECO) through a network of underground ductlines and aerial power lines. There are 13 46-kV substations throughout the planning region. These include one in Kahaluu near the intersection of Kamehameha Highway and Waihee Road, three throughout Kaneohe, one in the Kailua Industrial Area, one in Mokapu, one near the Kailua Regional WWTP, one near the H-3 Interstate Freeway and Kamehameha Highway Interchange, one in the Kalaheo area, one in the Enchanted Lake area, two near the commercial and industrial areas of Kailua, and one near Castle Medical Center. Extending from these HECO substations are 46-kV aerial and underground transmission lines that run throughout the planning region and over the Koolau Range toward Honolulu (Hawaiian Electric Company, Inc., 1998).

#### **3.11.5 Communications System**

Telephone service in the planning region is provided by GTE Hawaiian Telephone Company. Existing underground and aerial telephone lines are located throughout the planning region, serving private residential and commercial properties.

Cable service in the planning region is provided by Oceanic Cable. Existing underground and aerial cable lines are located throughout the planning region, serving private residential and commercial properties.

### **3.11.6 Gas System**

Gas service throughout the planning region is provided by Citizens Energy Services' The Gas Company. The region is served by propane gas which is transported throughout the area by underground lines. The lines serve private residential and commercial properties and range in size from 1 to 4 inches. These lines are connected to one of two large storage tanks located in Kaneohe and Kailua. Locations not connected to a gas line have gas tanks at the individual private residential and commercial properties, which are served by tanker trucks (The Gas Company, 1999).

### **3.12 Recreation Resources**

The Kailua-Kaneohe-Kahaluu planning region includes numerous shoreline and inland recreational facilities. The major coastal and inland recreation facilities are shown in Table 3-15 3-17. All of the recreation facilities dispose of their wastewater through the existing collection system and the Kailua Regional WWTP.

Coastal Recreation Resources: Coastal recreation resources can include any type of park or recreation activity in close vicinity to the shoreline. Within the planning region, coastal recreation resources include Kailua Beach Park; Kualoa Regional Park; Heeia State Park; and Kaneohe, Kainoa, Laenani, Kahaluu, and Waiahole Beach Parks. Coastal recreation areas are of particular concern due to the direct effect that wastewater disposal has on these sensitive areas.

Inland Recreation Resources: Inland recreation resources include the numerous trails in the Koolau and Olomana Ranges, and the Kaneohe Klipper, Koolau, Luana Hills Country Club, Bayview Golf Links, Mid-Pacific Country Club, and Pali Golf Courses. There are many district and community parks located throughout the planning region which provide various facilities, including pools, athletic fields, courts, and gyms.

<b>Table 3-45 3-17</b>			
<b>Existing Recreational and Open Space Resources in the Kailua-Kaneohe-Kahaluu Planning Region</b>			
<b>Recreational and Open Space Resources</b>	<b>Organizational or Government Jurisdiction</b>	<b>Location</b>	<b>Acreage</b>
<b>Golf Courses</b>			
Mid-Pacific Country Club	Private	Kailua	163.1
Pali Golf Course	C & C of Honolulu	Kailua	215.5
Luana Hills Country Club	Private	Maunawili	N/A
Bay View Golf Links	Private	Kaneohe	66.7
Koolau Golf Course	Private	Kaneohe	219.8
Kaneohe Klipper Golf Course	Federal Government	Mokapu	N/A
<b>Beach Parks</b>			
Lanikai Beach Park	C & C of Honolulu	Lanikai	N/A
Kailua Beach Park	C & C of Honolulu	Kailua	35.2
Kalama Beach Park	C & C of Honolulu	Kailua	4.3
Kaneohe Beach Park	C & C of Honolulu	Kaneohe	1.1
North Beach	Federal Government	Mokapu	N/A
Laenani Beach Park	C & C of Honolulu	Kahaluu	1.4
Kahaluu Beach Park	C & C of Honolulu	Kahaluu	2.7
Waiahole Beach Park	C & C of Honolulu	Waiahole	110.0
<b>Regional and District Parks</b>			
Kualoa Regional Park	C & C of Honolulu	Kualoa	153.4
Kahaluu Regional Park	C & C of Honolulu	Kahaluu	34.6
Kaneohe District Park	C & C of Honolulu	Kaneohe	31.4
Kailua District Park	C & C of Honolulu	Kailua	18.7
<b>Community Parks</b>			
Ahuimanu Community Park	C & C of Honolulu	Ahuimanu	4.0
Aikahi Community Park	C & C of Honolulu	Aikahi	4.0
Enchanted Lake Community Park	C & C of Honolulu	Enchanted Lake	5.8
Kahaluu Community Park	C & C of Honolulu	Kahaluu	5.6
Kaneohe Community Park	C & C of Honolulu	Kaneohe	5.5
Kaneohe Community and Senior Center	C & C of Honolulu	Kaneohe	2.0
<b>Neighborhood Parks</b>			
Bayview Neighborhood Park	C & C of Honolulu	Kaneohe	8.0
Kaneohe Civic Center Park	C & C of Honolulu	Kaneohe	4.2
Kapunahala Neighborhood Park	C & C of Honolulu	Kaneohe	3.9
Puohala Neighborhood Park	C & C of Honolulu	Kaneohe	3.9
Kalaheo Neighborhood Park	C & C of Honolulu	Kailua	1.4

Table 3-15 3-17 (cont.) Existing Recreational and Open Space Resources in the Kailua-Kaneohe-Kahaluu Planning Region			
Recreational and Open Space Resources	Organizational or Government Jurisdiction	Location	Acreage
<b>Neighborhood Parks (continued)</b>			
Kawainui Neighborhood Park	C & C of Honolulu	Kailua	4.8
Keolu Hills Neighborhood Park	C & C of Honolulu	Enchanted Lake	6.3
Heeia Neighborhood Park	C & C of Honolulu	Heeia	4.0
Maunawili Valley Neighborhood Park	C & C of Honolulu	Maunawili	8.1
Maunawili Neighborhood	C & C of Honolulu	Maunawili	4.2
<b>Other</b>			
Ulupo Heiau State Monument	State of Hawaii	Kailua	1.0
Heeia State Park	State of Hawaii	Heeia	18.5
Hoomaluhia Botanical Garden	City and County	Kaneohe	211.0
Waihee Valley Nature Park	City and County	Waihee	149.6
Waikane Valley Nature Park	City and County	Waikane	503.0
Source: City and County of Honolulu GIS Maps, 1997; USGS Topographic Maps, 1977; State Comprehensive Outdoor Recreation Plan, 1996; Koolau-poko Sustainable Communities Plan, June 1999.			

**Recreational Activities:** Coastal recreation activities in the planning region include swimming, sunbathing, body surfing, board surfing, windsurfing, thrillcraft, canoeing, snorkeling, walking, boating, fishing, and camping. Both Kailua Bay and Kaneohe Bay are heavily used by various recreation users. Inland activities include golfing, walking, hiking, bicycling, and various sports such as basketball, softball, soccer, and football.



#### **4. IMPACTS AND MITIGATION MEASURES**

This chapter describes the anticipated direct, indirect and cumulative impacts on the environment resulting from the proposed project improvements and the associated mitigative measures. The assessment of impacts include the proposed improvements described in Chapter 2, including:

- Kailua Regional WWTP – modifications within existing plant facilities, UV disinfection facility, and odor and noise control improvements
- Kaneohe WWPTF – 6.4 MG flow equalization basin, odor control system modifications, and Kaneohe-Kailua force main replacement
- Ahuimanu WWPTF – new preliminary treatment system, 0.6 MG flow equalization basin, odor control system modifications, and Ahuimanu effluent force main replacement
- Kailua Basin Flow Equalization Facilities Alternatives:
  - In-pipe storage along Kalaheo Avenue and along Wanaao and Kailua Roads (Recommended)
  - Existing storage at Kailua Regional WWTP (Option)
  - Equalization basin at the MCBH Kaneohe Bay (Option)
  - Equalization basin adjacent to the Kailua Road WWPS (Option)
  - Equalization basin at Kapaa Industrial Park (Option)
- Rehabilitation of up to seven (7) collection system basins throughout the region
- Provision of relief lines and rehabilitation/replacement of lines throughout the Kailua and Kaneohe Basins
- Pump station modifications at 22 WWPSs
- Implementation of nine (9) Sewer Improvement Districts.

##### **4.1 Physiography**

##### **4.1.1 Geology and Topography**

Direct Impacts and Mitigation Measures: No significant impacts on the geology or topography of the affected project sites are anticipated as a result of the construction and operation of the proposed wastewater facility improvements.

Construction of the proposed improvements will involve grading, excavation and trenching of presently undeveloped and developed areas within the affected project sites. Construction activities related to the rehabilitation/replacement and installation of new sewer lines, as well as equalization basins and modifications to the wastewater pump stations, will entail removal of sand and beach deposits near the coastal areas and various compositions of alluvium within the inland areas. Although the construction activities will not adversely impact or alter the geological character of the affected project sites, there is the potential for increased erosional runoff and loss of soil due to the increase in impervious surface area. The potential impacts resulting from any increase in erosional runoff and applicable mitigative measures are discussed in Section 4.1.2.

The relatively flat terrain of the affected project sites would minimize the amount of grading required during construction activities. The excavated areas will either be built over, paved over, or backfilled to its existing contours. Development of the equalization basin (EQ) option at the Kailua Road WWPS site, if pursued, would slightly alter the existing topography, as the basin would be placed partially underground and mounded on top to a height of approximately seven (7) feet above existing grade level. A landscaped mini-park would be developed above the basin to maintain aesthetic compatibility (see Section 4.8).

Indirect Impacts: No indirect impacts to geology or topography are anticipated as a result of the construction and operation of the proposed wastewater facility improvements.

Cumulative Impacts: No cumulative impacts to geology or topography are anticipated as a result of the construction and operation of the proposed wastewater facility improvements.

#### 4.1.2 Soils

Direct Impacts and Mitigation Measures: No significant impacts on soils at the affected project sites are anticipated as a result of the construction and operation of the proposed wastewater facility improvements.

Ground disturbing activities associated with construction of the proposed wastewater facility improvements will potentially result in increased storm runoff and soil erosion due to the increase in impervious surface area. Construction activities related to the rehabilitation/replacement and installation of new sewer lines, as well as excavation associated with construction of the partially underground Kailua Road EQ basin, will potentially result in the exposure of relatively large volumes of soil.

Excavation and grading activities associated with construction of the proposed improvements will be regulated by the City and County of Honolulu's grading ordinance and the National Pollutant Discharge Elimination System (NPDES) permit requirements administered by the State DOH, as may be required. The grading ordinance includes provisions related to reducing and minimizing the discharge of pollutants associated with soil-disturbing activities in grading, grubbing and stockpiling. A NPDES General Permit for Storm Water Associated with Construction Activity will be required to control storm water discharges should the area of soil disturbance from activities such as clearing and grubbing, grading and stockpiling be in excess of five (5) acres. The permit requires compliance with a Best Management Practices (BMP) plan which, in turn, requires compliance with City ordinances pertaining to grading, grubbing, stockpiling, soil erosion and sedimentation. The BMP plan typically includes appropriate structural or non-structural mitigative methods such as containment berms and filtration/detention ponds that would control the discharge of storm water runoff resulting from construction activities. Other erosion and sediment control mitigative measures may include appropriately stockpiling materials on-site to prevent runoff, covering or stabilizing topsoil stockpiles, use of sediment basins and sediment traps, and establishing revegetation or landscaping as early as possible on completed areas.

If the MCBH Kaneohe Bay EQ facility option is pursued, construction will be in accordance with the Base's *Storm Water Pollution Control Plan* (1996). The objectives of this Plan are to: 1) identify and describe potential sources of storm water pollutants at MCBH Kaneohe Bay; and, 2) prescribe BMPs or control measures for minimizing or eliminating the discharge of pollutants into storm water runoff.

Phased construction of the proposed wastewater facility improvements encompassing a larger area, such as the rehabilitation/replacement and installation of new sewer lines along lengthy corridors, will minimize the amount of soils exposed at a given time, thereby reducing the potential for increased soil erosion.

For dewatering that may be required during excavation and construction of the proposed improvements, a NPDES General Permit for Construction Activity Dewatering would be required for discharging dewatering effluent into City drainage systems and waters of the United States. The permit will require a BMP, erosion control plan and water quality monitoring plan to mitigate any impacts on receiving waters (see Section 4.2.1).

Subsurface construction associated with the proposed wastewater facility improvements will remove most of the existing soils near the surface of the affected areas. It will be the responsibility of the construction contractor(s) to dispose of any excess soils removed during construction of the facility improvements. Depending on its quality and usefulness, the excess soils would be used as fill at other projects or locations or disposed of in a landfill.

Following construction, exposed soils will have been built over, paved over, or re-vegetated to control erosion.

Construction of the proposed wastewater facility improvements will have no significant impact on the Agricultural Lands of Importance to the State of Hawaii (ALISH).

Indirect Impacts and Mitigation Measures: During construction of the proposed wastewater facility improvements, storm runoff may carry increased amounts of sediment into nearby streams and drainage systems, potentially impacting the water quality of the streams. Potential impacts to the quality of surface waters during construction will be mitigated by adherence to State of Hawaii and City and County of Honolulu water quality regulations governing grading, excavation, stockpiling, and dewatering (see Sections 4.1.2 and 4.2.1).

The proposed wastewater facility improvements will have beneficial long-term water quality impacts on surface waters in the planning region. The provision of flow equalization facilities and collection system improvements to reduce infiltration and inflow will reduce the probability of spills and bypasses to streams and drainage systems during periods of heavy rainfall.

**Cumulative Impacts and Mitigation Measures:** During construction of the proposed facility improvements, storm runoff may carry increased amounts of sediment into the storm drain system and streams due to erosion from exposed soils. This runoff could potentially impact the water quality of nearshore coastal waters in the area. Potential water quality impacts to nearshore coastal waters during construction will be mitigated by controlling sedimentation in surface flows and by adherence to State and City water quality regulations governing grading, excavation, stockpiling, and dewatering (see Sections 4.1.2 and 4.2.1).

The proposed wastewater facility improvements will have beneficial long-term water quality impacts on nearshore coastal waters. The provision of flow equalization facilities and collection system improvements to reduce infiltration and inflow will reduce the probability of spills and bypasses to the coastal waters during periods of heavy rainfall.

#### **4.2 Hydrology and Water Quality**

Current water quality and public health hazard concerns associated with the region's wastewater collection and treatment systems stem primarily from the infrequent spills and bypasses of wastewater into surface and coastal waters. Such spills and bypasses typically result from overflows from heavy rainfall (due to infiltration and inflow of rainwater into the system), line blockages, breaks in sewer lines and force mains, and mechanical malfunctions at the wastewater pump stations. Exfiltration from leaking wastewater collection systems also has the potential to impact groundwater resources.

Another source which could potentially contribute to groundwater, surface and coastal water quality degradation is individual wastewater systems, including cesspools and septic tank systems. These systems have the potential to contribute to the microbiological and nutrient pollutant loads on surface and

nearshore waters as a result of spills and overflows from failing systems. Failing individual wastewater systems which are unable to percolate the applied flows may result in wastewater backing up in household plumbing fixtures and spilling into yards. Wastewater overflows may pond in low-lying areas or flow into drainage systems and, particularly during heavy rainfall conditions, may enter streams and nearshore coastal waters.

#### 4.2.1 Surface Water

Direct Impacts and Mitigation Measures: No significant impacts to drainage systems or streams in the planning region are anticipated as a result of the construction and operation of the proposed wastewater facility improvements.

During construction of the proposed facility improvements, storm runoff may carry increased amounts of sediment into nearby streams and drainage systems, potentially impacting the water quality of the streams. Potential impacts to the quality of surface waters in streams and drainage systems during construction of facility improvements will be mitigated by adherence to State of Hawaii and City and County of Honolulu water quality regulations governing grading, excavation and stockpiling (see Section 4.1.2). Construction of the MCBH Kaneohe Bay EQ facility, if pursued, will also be in accordance with the Base's *Storm Water Pollution Control Plan* (1996) as discussed in Section 4.1.2.

Dewatering of excavated areas may be required where wastewater and transmission facilities will lie below the water table. Discharging dewatering effluent into the City's drainage systems and waters of the United States has the potential for increasing sediment loads in surface waters. A NPDES Permit for Discharges Associated with Construction Activity Dewatering will be required for discharging dewatering effluent into the City drainage systems and waters of the United States. In conjunction with the NPDES permit, a dewatering plan is required which addresses the anticipated rate of dewatering and method of treatment and disposal.

The NPDES permit for dewatering activities will include a BMP plan, erosion control and water quality monitoring plans, as may be required. A BMP plan establishes procedures for operating the dewatering system, including

appropriate or applicable structural or non-structural methods that will be established and implemented to reduce and control discharge or effluent resulting from dewatering activities. Typically, specific procedures are provided for the maintenance of dewatering equipment, including disposal of sediments collected in settling containers; monitoring water quality of samples collected from designated points in the dewatering system; preventing storm runoff and erosion from surrounding areas from entering the excavated area; and, procedures for modifying or terminating dewatering activities if the system is failing to operate as intended. Water quality impacts associated with the disposal of dewatering effluent are also addressed, including appropriate characterization of any potential pollutants such as sediments and nutrients in the effluent.

If it is determined that dewatering effluent will be discharged into a municipal drainage system, a permit from the City and County of Honolulu Department of Planning and Permitting will also be required. The municipal storm drains in the planning region discharge into area streams and canals and ultimately into either Kaneohe Bay or Kailua Bay.

Phased construction of the proposed wastewater facility improvements encompassing a larger area, such as the rehabilitation/replacement and installation of new sewer lines along lengthy corridors, will minimize the amount of soils exposed at a given time, thereby reducing the amount of storm runoff into nearby streams and drainage systems.

Following construction, exposed soils will have either been built over or re-vegetated to control erosion.

The proposed wastewater facility improvements will have beneficial long-term water quality impacts on surface waters on the planning region. The provision of flow equalization facilities to reduce peak flows and collection system improvements to reduce infiltration and inflow will reduce the probability of spills and bypasses to surface waters during periods of heavy rainfall, thereby improving the level of water quality. Rehabilitation of the seven (7) collection system basins and improvements to the collection system are anticipated to result in up to approximately 45 percent reduction in infiltration and inflow during heavy storms. This will reduce peak flows to the Kailua Regional

WWTP, pretreatment facilities and WWPSs since less rainwater will get into the system.

Implementation of the proposed nine (9) Sewer Improvement Districts will connect approximately 35 percent of the unsewered lots in the region to the municipal wastewater system. This will reduce the probability of spills and overflows from failing individual wastewater systems to surface waters and further contribute to the beneficial impact on water quality.

*Potential impacts to surface waters and drainage systems due to leakage or accidental breakage in the transmission system will be mitigated by proper design, construction and operation of facilities. Standard procedures for detecting leaks and breaks and for shutting down and repairing the lines will minimize impacts. Appropriate public health warnings will be issued to mitigate risks of public contact with the wastewater.*

Any potential for wastewater spills at the affected wastewater facilities affecting streams and drainage systems in the vicinity in the event of flow diversion or flooding will be mitigated by designing the proposed facilities with adequate capacities (see Section 1.4.2 and Chapter 2) and flood protection (see Section 4.2.4).

Indirect Impacts and Mitigation Measures: During construction of the proposed facility improvements, storm runoff may carry increased amounts of sediment into nearby streams, ultimately potentially impacting the water quality of coastal waters. Potential water quality impacts to nearshore coastal waters during construction will be mitigated by controlling sedimentation in surface flows and by adherence to State and City water quality regulations governing grading, excavation, stockpiling, and dewatering (see Sections 4.1.2 and 4.2.1, Direct Impacts and Mitigation Measures).

The proposed wastewater facility improvements will have beneficial long-term water quality impacts on nearshore coastal waters. The provision of flow equalization facilities and collection system improvements to reduce infiltration and inflow will reduce the probability of spills and bypasses to surface waters during periods of heavy rainfall, beneficially impacting the quality of downstream coastal waters. The proposed Sewer Improvement Districts will



reduce the probability of spills and overflows from failing individual wastewater systems to coastal waters and further contribute to the beneficial impact on water quality.

**Cumulative Impacts and Mitigation Measures:** During construction of the proposed facility improvements, storm runoff may carry increased amounts of sediment into nearby surface and coastal receiving waters, potentially impacting water quality. Adherence to State and City water quality regulations governing grading, excavation, stockpiling, and dewatering during construction activities will control sedimentation in surface flows (see Sections 4.1.2 and 4.2.1). This will reduce the cumulative impacts on surface and coastal waters resulting from regional non-point source pollution.

The proposed wastewater facility improvements will have beneficial, cumulative long-term water quality impacts on surface and coastal receiving waters. The provision of flow equalization facilities and collection system improvements to reduce infiltration and inflow will reduce the probability of spills and bypasses to the surface and coastal waters during periods of heavy rainfall. The proposed Sewer Improvement Districts will reduce the probability of spills and overflows from failing individual wastewater systems to surface and coastal waters and further contribute to the beneficial impact on water quality. The reduction of spills and bypasses to surface and coastal receiving waters will help to reduce the cumulative impacts on the water quality resulting from regional non-point source pollution.

**Kailua Bay Advisory Council:** In accordance with the Consent Decree executed in August 1995, the Kailua Bay Advisory Council (KBAC) was appointed for the purpose of: 1) studying the non-point sources of pollution in the Kailua/Kaneohe/Waimanalo watershed areas and, to the extent deemed appropriate by the Advisory Council, point sources; 2) determining effective measures to mitigate such pollution to the maximum extent practicable; 3) overseeing the implementation of measures to mitigate such pollution as may be adopted by decision of the Council pursuant to the Consent Decree; and 4) overseeing the volunteer water quality monitoring project to be implemented pursuant to the Consent Decree. The KBAC is comprised of volunteer representatives of various government agencies, political representatives and

community organizations. In March 1998, Eugene Dashiell, Planning Services was selected as the technical consultant to KBAC.

As set forth in the Consent Decree, the KBAC is tasked with formulating three programs: 1) the Technical Program which will result in a report recommending measures to improve water quality; 2) Implementation Program for the mitigation measures adopted by the Council; and 3) Volunteer Water Quality Monitoring Program. As part of the Technical Program, a preliminary draft report entitled *Preliminary Problem Identification* was prepared for KBAC by Mr. Dashiell in September 1998 which describes the watershed and water quality problems in the Kailua/Kaneohe/Waimanalo area and suggested strategies which might be considered for planning and implementation by KBAC. Completion of the report is anticipated within a year or so.

Proposed work tasks to be initiated by KBAC include the following:

- Pilot Erosion Control Projects – throughout Koolaupoko
- Litter and Dumping Controls – throughout Koolaupoko
- Waimanalo Algal Blooms – Waimanalo
- Enchanted Lake, Kaelepulu Stream, Kawai Nui Canal – Kailua
- Stream Restoration – Kaneohe and Waimanalo Watersheds
- Education and Community-Building – throughout Koolaupoko

Work has been initiated on the Pilot Erosion Control Project as well as monitoring activities through the Volunteer Water Quality Monitoring Program. Upon completion of the Technical Report, the various projects will require preparation of plans and environmental assessments, as deemed appropriate, and procurement of the necessary permits prior to project implementation. The tentative schedule for completion of these projects is in late 2001.

#### **4.2.2 Groundwater**

Direct Impacts and Mitigation Measures: No significant impacts on groundwater underlying the proposed wastewater facility improvements are anticipated as a result of the construction and operation of the project.

Construction activities associated with the proposed facility improvements are not likely to introduce, nor release from the soil, any materials which could adversely affect groundwater, including groundwater sources for domestic use. Dewatering of excavated areas may be required where wastewater and transmission facilities will lie below the water table. As discussed in Section 4.2.1, a NPDES permit for dewatering activities will be required in conjunction with construction of the proposed facility improvements. The NPDES permit will also address the anticipated rate of dewatering.

The proposed wastewater facility improvements will have beneficial long-term impacts on groundwater in the planning region. The proposed implementation of the nine (9) Sewer Improvement Districts would eliminate approximately 35 percent of the unsewered lots in the region, thereby reducing the potential of groundwater contamination. Improvements to the collection system to reduce infiltration and inflow will also reduce exfiltration and any potential resulting infiltration on groundwater sources.

Potential impacts to groundwater due to leakage or accidental breakage in the transmission system will be mitigated by proper design, construction and operation of facilities. Standard procedures for detecting leaks and breaks and for shutting down and repairing the lines will minimize impacts.

The potential for wastewater spills impacting groundwater underlying the affected facility improvements during rain storms will be mitigated by design and operation of the facilities to accommodate peak flows and plant upset situations.

Indirect Impacts: No indirect impacts on groundwater are anticipated as a result of the construction and operation of the proposed wastewater facility improvements.

Cumulative Impacts and Mitigation Measures: The proposed wastewater facility improvements will have beneficial, cumulative impacts on groundwater. The proposed implementation of Sewer Improvement Districts and improvements to the collection system will reduce the potential of infiltration on groundwater sources. This will help to reduce the cumulative impacts on groundwater from regional point and non-point source pollution.

#### 4.2.3 Coastal Waters

Direct Impacts and Mitigation Measures: No significant impacts on coastal waters in the planning region are anticipated as a result of the construction and operation of the proposed wastewater facility improvements.

During construction of the proposed facility improvements, storm runoff may carry increased amounts of sediment into the storm drain system and streams due to erosion from exposed soils. This runoff could potentially impact the water quality of nearshore coastal waters in the area. Potential water quality impacts to nearshore coastal waters during construction of the proposed facility improvements will be mitigated by adherence to State of Hawaii and City and County of Honolulu water quality regulations governing grading, excavation and stockpiling (see Section 4.1.2). Construction of the MCBH Kaneohe Bay EQ facility, if pursued, will also be in accordance with the Base's *Storm Water Pollution Control Plan* (1996) as discussed in Section 4.1.2.

For dewatering that may be required during excavation and construction of the proposed improvements, a NPDES General Permit for Construction Activity Dewatering will be required for discharging dewatering effluent into City drainage systems and waters of the United States. The permit will require a BMP, erosion control plan and water quality monitoring plan (see Section 4.2.1).

Phased construction of the proposed wastewater facility improvements encompassing a larger area, such as the rehabilitation/replacement and installation of new sewer lines along lengthy corridors, will minimize the amount of soils exposed at a given time, thereby reducing the amount of storm runoff into coastal receiving waters.

The proposed wastewater facility improvements will have beneficial long-term water quality impacts on coastal waters. The provision of flow equalization facilities and collection system improvements to reduce infiltration and inflow will reduce the probability of spills and bypasses to the coastal waters during rain storms. The improved facilities would enable flows that would otherwise potentially be overflows to be treated to a secondary level and eventually discharged through the Mokapu Outfall.

The proposed improvements and flows from the Kailua Regional WWTP would not cause a significant change in the ambient coastal water quality condition, which under normal circumstances, meets State Water Quality Standards. An increase in the secondary treatment capacity at the WWTP from the present 28 mgd to 35.6 mgd will not cause an exceedance in the DOH Water Quality Standards in the receiving waters at the outfall.

The UV disinfection facility currently under construction at the Kailua Regional WWTP will also contribute to the beneficial long-term water quality impacts on coastal waters. The UV disinfection facility will be comprised of a modular ultraviolet light array that will treat up to 30 mgd of effluent to the highest level of disinfection and will be capable of passing up to 45 mgd hydraulically prior to discharge through the Mokapu Outfall. The UV radiation is a physical, rather than a chemical, process that damages the nucleic acids of the microorganisms in the water, leaving them unable to reproduce. At the Kailua Regional WWTP, UV radiation is expected to kill 99 percent of enterococci, which is the standard indicator used for marine recreational waters.

Implementation of the nine (9) Sewer Improvement Districts will reduce the probability of spills and overflows from failing individual wastewater systems to nearshore coastal waters and further contribute to the beneficial impact on water quality.

*Potential impacts to coastal waters due to leakage or accidental breakage in the transmission system will be mitigated by proper design, construction and operation of facilities. Standard procedures for detecting leaks and breaks and for shutting down and repairing the lines will minimize impacts. Appropriate public health warnings will be issued to mitigate risks of public contact with the wastewater.*

Any potential for wastewater spills at the affected wastewater facilities affecting nearshore coastal waters in the event of flow diversion or flooding will be mitigated by designing the proposed facilities with adequate capacities (see Section 1.4.2 and Chapter 2) and flood protection (see Section 4.2.4).

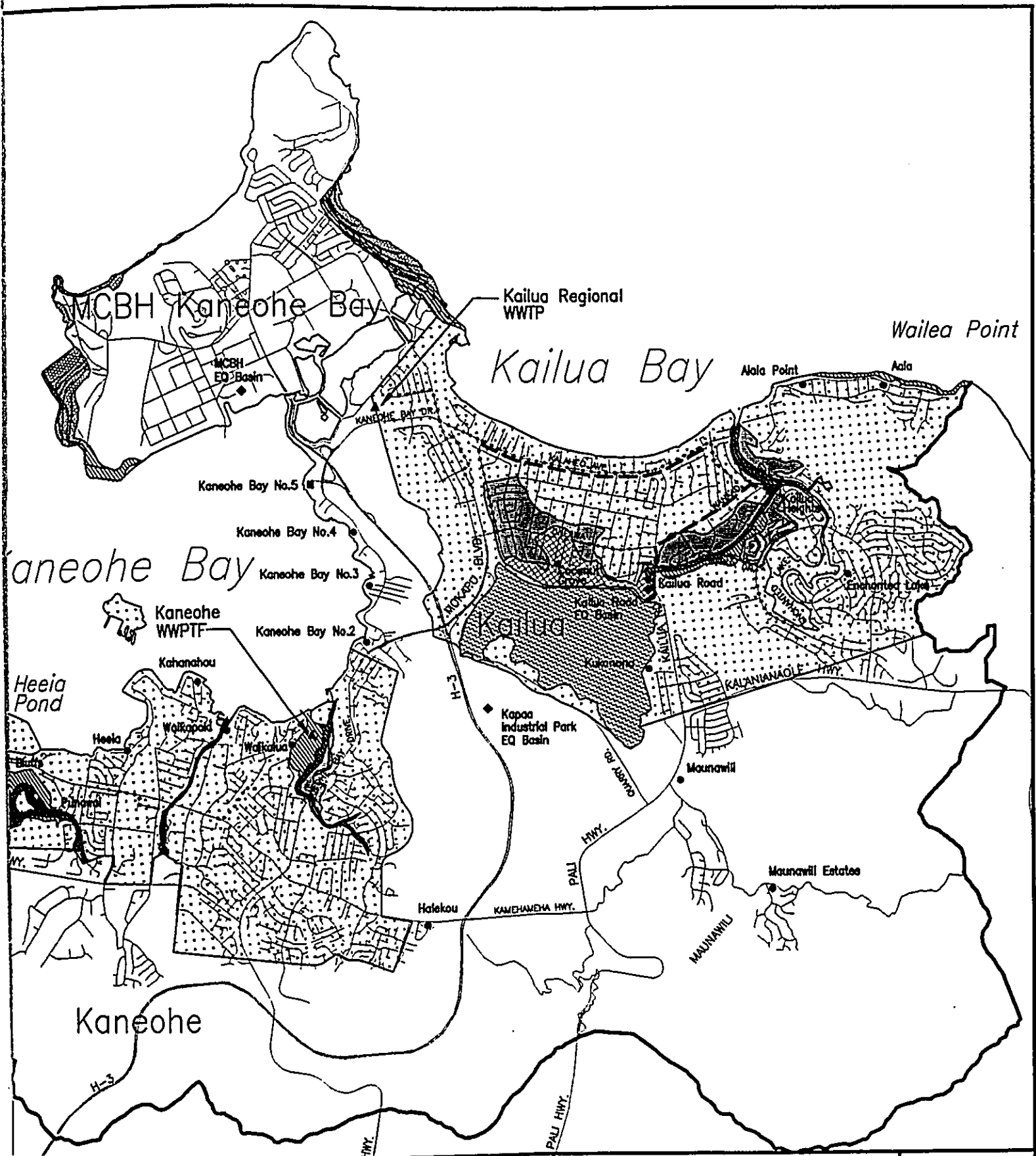
**Indirect Impacts:** No indirect impacts on coastal waters are anticipated as a result of the construction and operation of the proposed wastewater facility improvements.

**Cumulative Impacts and Mitigation Measures:** During construction of the proposed wastewater facility improvements, storm runoff may carry increased amounts of sediment into nearshore coastal waters, potentially impacting water quality. Adherence to State and City water quality regulations governing grading, excavation, stockpiling, and dewatering during construction activities will control sedimentation in surface flows (see Sections 4.1.2 and 4.2.1). This will reduce the cumulative impacts on coastal waters resulting from non-point source pollution.

The proposed wastewater facility improvements will have beneficial, cumulative water quality impacts on nearshore coastal waters. The provision of flow equalization facilities and collection system improvements to reduce infiltration and inflow will reduce the probability of spills and bypasses to the coastal waters during rain storms. The proposed Sewer Improvement Districts will reduce the probability of spills and overflows from failing individual wastewater systems to nearshore coastal waters and further contribute to the beneficial impact on water quality. The reduction of spills and bypasses to nearshore coastal waters will help to reduce the cumulative impacts on the water quality resulting from regional non-point source pollution.

#### **4.2.3.1 Flood Zones and Tsunami Hazards**

The flood zone designations of the existing and proposed wastewater facility sites as set forth in the respective Federal Emergency Management Agency (FEMA) Flood Insurance Rate Maps (FIRM), and the sites' location relative to the tsunami inundation zone are identified in Table 4-1 and depicted in Figures 4-1, 4-2 and 4-3.









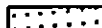
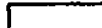
PLAN







FLOOD ZONES

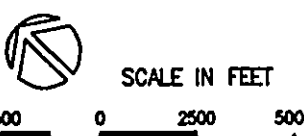
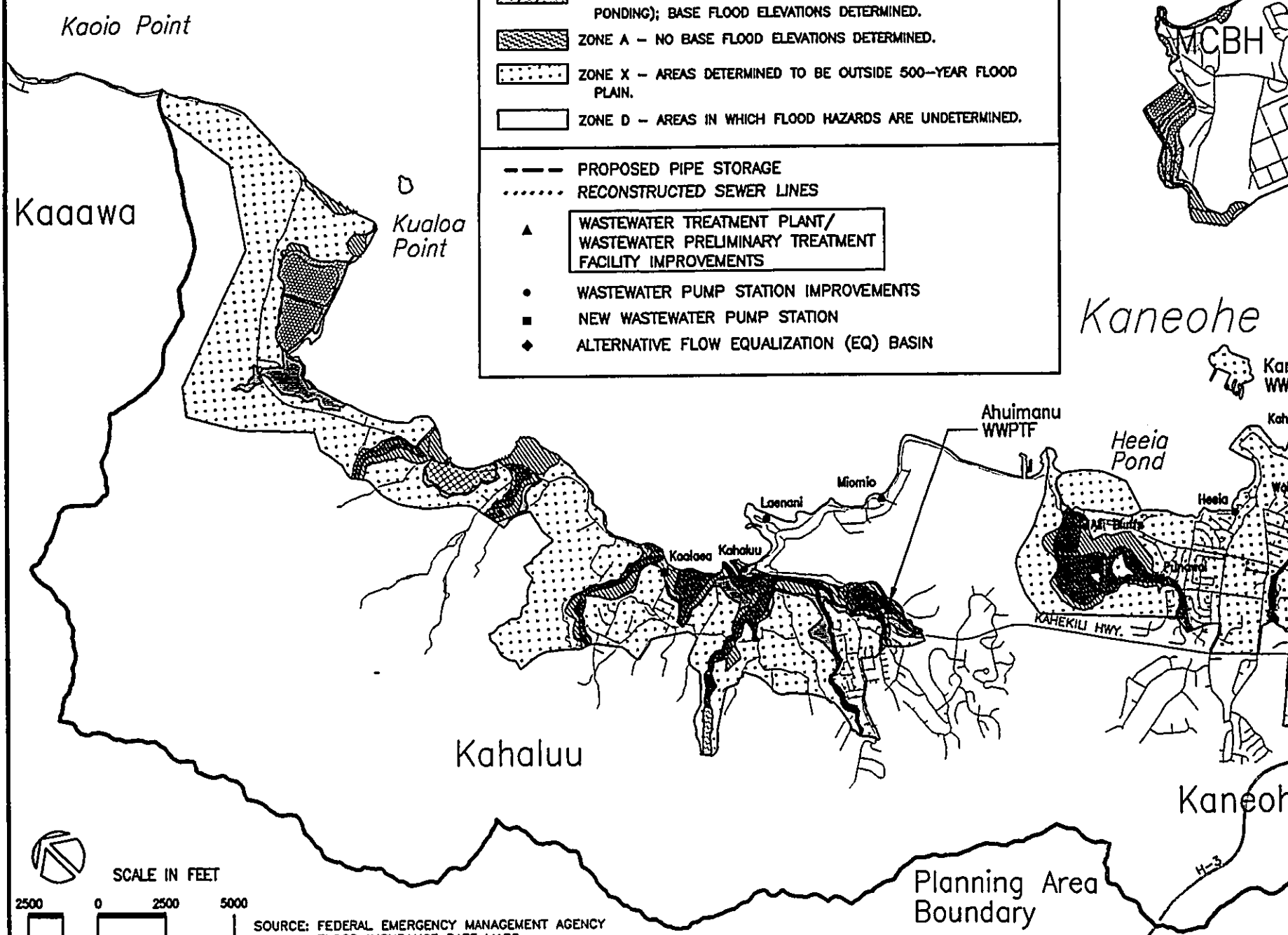
FIGURE

4-1

### LEGEND

-  FLOODWAY AREAS IN ZONE AE
-  ZONE AE -- BASE FLOOD ELEVATIONS DETERMINED.
-  ZONE X -- AREAS OF 500 YEAR FLOOD; AREAS OF 100-YEAR FLOOD WITH AVERAGE DEPTHS OF LESS THAN 1 FT. OR WITH DRAINAGE AREAS LESS THAN 1 SQ. MI.; AND AREAS PROTECTED BY LEVEES FROM 100-YEAR FLOOD.
-  ZONE VE -- COASTAL FLOOD WITH VELOCITY HAZARD (WAVE ACTION); BASE FLOOD ELEVATIONS DETERMINED.
-  ZONE AH -- FLOOD DEPTHS OF 1 TO 3 FT. (USUALLY AREAS OF PONDING); BASE FLOOD ELEVATIONS DETERMINED.
-  ZONE A -- NO BASE FLOOD ELEVATIONS DETERMINED.
-  ZONE X -- AREAS DETERMINED TO BE OUTSIDE 500-YEAR FLOOD PLAIN.
-  ZONE D -- AREAS IN WHICH FLOOD HAZARDS ARE UNDETERMINED.

-  PROPOSED PIPE STORAGE
-  RECONSTRUCTED SEWER LINES
-  WASTEWATER TREATMENT PLANT/  
WASTEWATER PRELIMINARY TREATMENT  
FACILITY IMPROVEMENTS
-  WASTEWATER PUMP STATION IMPROVEMENTS
-  NEW WASTEWATER PUMP STATION
-  ALTERNATIVE FLOW EQUALIZATION (EQ) BASIN



SOURCE: FEDERAL EMERGENCY MANAGEMENT AGENCY  
FLOOD INSURANCE RATE MAPS

### KAILUA-KANEOHE-KAHALUU FACILITIES PLAN

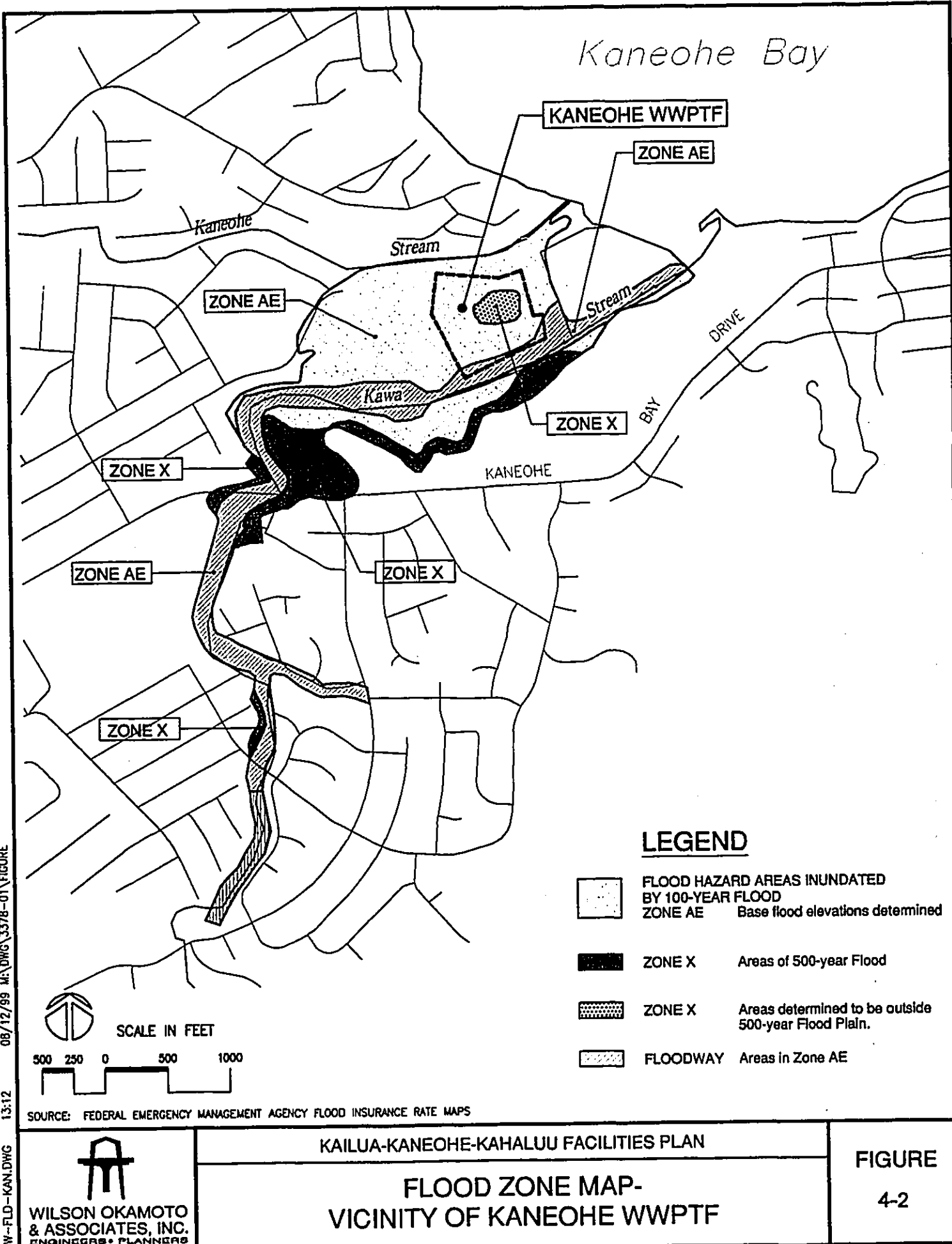
### FLOOD ZONES



**WILSON OKAMOTO  
& ASSOCIATES, INC.**  
ENGINEERS • PLANNERS

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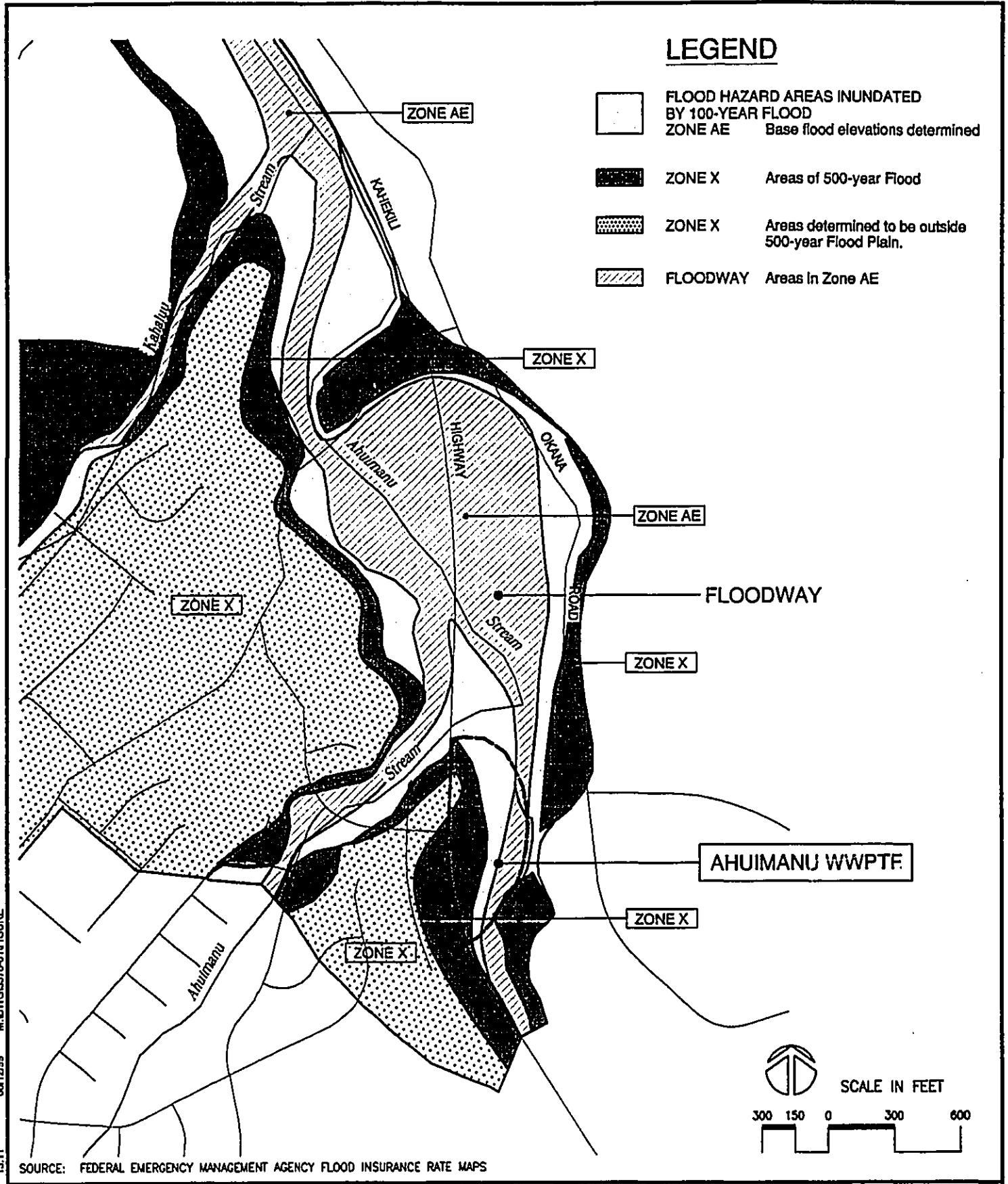


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KAILUA-KANEOHE-KAHALUU FACILITIES PLAN

**FLOOD ZONE MAP-  
VICINITY OF KANEOHE WWPTF**

**FIGURE  
4-2**



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KAILUA-KANEOHE-KAHALUU FACILITIES PLAN  
**FLOOD ZONE MAP-  
 VICINITY OF AHUIMANU WWPTF**

**FIGURE  
 4-3**

<b>Table 4-1 Flood Zone and Tsunami Hazard Designations at Wastewater Facility Sites</b>		
<b>Facility</b>	<b>Flood Zone Designation</b>	<b>Located in Tsunami Inundation Zone</b>
Kailua Regional WWTP	Zone D – areas of undetermined flood hazards Zone X – areas outside the 500-year flood plain.	No
Kaneohe WWPTF	Zone AE – 100-year flood plain (flood elevations ranging from 8 to 9 ft.). Floodway area within Zone AE – within southernmost portion of site. Zone X – areas outside 500-year flood plain (within central portion of site).	No
Ahuimanu WWPTF	Zone X – areas of 500-year flood. Zone AE. Floodway area in Zone AE – base flood elevations ranging from 48 to 56 ft. (within eastern portion of site). Zone X – areas determined to be outside 500-year flood plain.	No
<b>Pump Stations</b>		
<b>Kailua Basin:</b>		
Aala WWPS	Zone X – areas outside 500-year flood plain.	Yes
Alala Point WWPS	Zone X – areas outside 500-year flood plain.	Yes
Coconut Grove WWPS	Zone X – areas outside 500-year flood plain.	No
Enchanted Lake WWPS	Zone X – areas outside 500-year flood plain.	No
Kailua Heights WWPS	Zone X – areas outside 500-year flood plain.	No
Kukanono WWPS	Zone D – areas of undetermined flood hazards	No
Maunawili WWPS	Zone D – areas outside 500-year flood plain.	No
Maunawili Estates WWPS	Zone D – areas of undetermined flood hazards.	No
<b>Kaneohe Basin:</b>		
Kahanahou WWPS	Zone X – areas outside 500-year flood plain.	No
Waikalua WWPS	Zone X – areas outside 500-year flood plain.	No
Punawai WWPS	Zone X – areas outside 500-year flood plain.	No
Alii Bluffs WWPS	Zone X – areas outside 500-year flood plain.	No
Heeia WWPS	Zone X – areas outside 500-year flood plain.	No
Waikapoki WWPS	Zone X – areas outside 500-year flood plain.	No
Halekou WWPS	Zone D – areas of undetermined flood hazards.	No

Table 4-1 (cont.) Flood Zone and Tsunami Hazard Designations at Wastewater Facility Sites		
Facility	Flood Zone Designation	Located in Tsunami Inundation Zone
<b>Kaneohe Basin (continued):</b>		
Kaneohe Bay #2 WWPS	Zone X – areas outside 500-year flood plain.	No
Kaneohe Bay #3 WWPS	Zone D – areas of undetermined flood hazards.	No
Kaneohe Bay #4 WWPS	Zone D – areas of undetermined flood hazards.	No
Kaneohe Bay #5 WWPS	Zone D – areas of undetermined flood hazards.	No
<b>Ahuimanu Basin:</b>		
Miomio WWPS	Zone D – areas of undetermined flood hazards.	No
Kahaluu WWPS	Zone X – areas of 500-year flood; areas of 100-year flood with ave. depths of less than 1 ft. or with drainage area less than 1 square mile, and areas protected by levees	No
Laenani WWPS	Zone D – areas in which flood hazards are undetermined.	No
Kaalaee WWPS (Proposed Alternative to the LPSS)	Zone X – areas of 500-year flood, areas of 100-year flood with ave. depths of less than 1 ft or with drainage area less than 1 mi <sup>2</sup> ; and areas protected by levees. Zone AE – base flood elevation ranging from 6 to 7 ft.	No
<b>Alternative Flow Equalization Facilities</b>		
Kailua Road EQ	Zone X – areas outside the 500-year flood plain.	No
Kapaa Industrial Park EQ	Zone D – areas of undetermined flood hazards.	No
MCBH Kaneohe Bay EQ	Zone D – areas of undetermined flood hazards..	Yes

Source: Federal Emergency Management Agency, Flood Insurance Rate Maps, 1987 and 1990.

**Direct Impacts and Mitigation Measures:** The Kailua Regional WWTP site is located outside the tsunami inundation zone in Flood Zone X – areas determined to be outside the 500-year flood plain and in Zone D – areas in which flood hazards are undetermined.

Facility improvements at the Kaneohe WWPTF are proposed to be constructed outside of the floodway boundary in Zone AE. The new equalization basin at

the Ahuimanu WWPTF is proposed to be near the floodway area in Zone AE. Further study is needed to determine if the basin would need to be relocated.

Proposed facility improvements at the Kaneohe and Ahuimanu WWPTFs and Coconut Grove WWPS and construction of the proposed Kaalaea WWPS (alternative to the LPSS), all of which are located within the respective designated flood hazard districts, raise the potential of facilities damage and operational disruptions and/or wastewater spills which may occur during a major flood event. The presence of structures within flood hazard districts also potentially impacts flood elevations. Also during a major flood event, individual wastewater systems may become inundated by the resulting high water table conditions, potentially resulting in wastewater backing up into homes or yards and ultimately flowing into surface and nearshore coastal waters.

Development of the proposed wastewater facility improvements within the respective flood hazard districts will be in accordance with regulations set forth in Section 21-9.10 Flood Hazard Districts of the City and County of Honolulu's Land Use Ordinance (LUO), and subject to the preparation of flood studies pursuant to the Section, as may be required. The studies will be conducted to ensure that any proposed encroachment of facilities in the floodway will not result in any increase in the regulatory flood elevations during occurrence of the regulatory flood. The studies will identify a certified flood elevation and evaluate flooding impacts, including the potential impact of proposed structures on flood elevations.

Construction of the proposed facility improvements will be mitigated by designing the facilities to minimize adverse effects on flood heights, as well as minimize operational disruptions and facilities damage during a major flood event. Any potential for operational disruptions or wastewater spills from the proposed facility improvements in the event of flooding will be mitigated by designing the facilities with adequate capacities and flood protection. Specific measures may include protective facility design, placing sensitive instruments and control panels above anticipated flood elevations, and use of submersible pumps.

Implementation of the proposed Sewer Improvement Districts will reduce the number of individual wastewater systems that could potentially become inundated to overflow conditions during a major flood event.

The proposed MCBH Kaneohe Bay EQ site and Aala and Alala Point WWPSs are located within the tsunami inundation zone. The proposed facility improvements at these sites raise the potential of facilities damage and operational disruptions and/or wastewater spills which may occur from flooding during a tsunami event. Any potential for such disruptions or spills in the event of a tsunami will be mitigated by designing these facility improvements in accordance with the City and County of Honolulu's Building Code, Subsection (f) Coastal Floodwater Design.

Indirect Impacts: No indirect impacts associated with flood and tsunami hazards are anticipated as a result of the construction and operation of the proposed wastewater facility improvements.

Cumulative Impacts: No cumulative impacts associated with flood and tsunami hazards are anticipated as a result of the construction and operation of the proposed wastewater facility improvements.

#### **4.2.4 Earthquake/Seismic Hazards**

No impacts associated with earthquake/seismic hazards are anticipated as a result of the construction and operation of the proposed wastewater facility improvements as such hazards on Oahu are minimal. All proposed structures will be designed to meet Zone 2A and applicable Uniform Building Code (UBC) requirements.

Indirect Impacts: No indirect impacts associated with earthquake/seismic hazards are anticipated as a result of the construction and operation of the proposed wastewater facility improvements.

Cumulative Impacts: No cumulative impacts associated with earthquake/seismic hazards are anticipated as a result of the construction and operation of the proposed wastewater facility improvements.

### **4.3 Natural Environment**

#### **4.3.1 Flora**

Direct Impacts and Mitigation Measures: As the affected project sites do not provide a unique habitat, no significant impacts on flora are anticipated from the construction and operation of the proposed wastewater facility improvements. No candidate, proposed, or listed threatened or endangered flora species will be disturbed as a result of the proposed project.

The proposed modifications to the Kailua Regional WWTP, Kaneohe and Ahuimanu WWPTFs, and WWPSs will involve construction within a highly disturbed environment of which the affected areas either were previously or are currently encumbered by facilities, or are unencumbered areas maintained as open lawns. As deemed appropriate, existing landscaped and lawn areas will be restored following construction.

Construction of the Kailua Road EQ basin, if pursued, will require the removal of mostly introduced flora species. Following construction, a landscaped mini-park will be developed above the partially underground EQ basin to maintain aesthetic compatibility.

The Kapaa Industrial Park EQ facility, if pursued, would be constructed within an existing light industrial subdivision. Depending on the selected location of the EQ basin, construction of the facility would displace introduced vegetation at most. Upon construction, unpaved areas within the EQ facility will be landscaped, as deemed appropriate.

Potential impacts and mitigation measures associated with construction of the MCBH Kaneohe Bay EQ facility on flora are discussed in Section 4.3.4.

As the majority of the proposed rehabilitation/replacement and sewer line installation projects will occur within existing street right-of-ways which are mostly paved, little or no vegetation will be impacted. Following construction, the regrowth of natural roadside vegetation will be allowed to occur. Implementation of the Sewer Improvement Districts will require the

installation of lateral hook-ups from the adjacent streets to the individual residences which will entail disturbance and the removal of existing vegetation and landscaped areas within the respective alignment. This impact will be temporary as the regrowth of vegetation and replanting of landscaped areas would occur.

Indirect Impacts: No indirect impacts on flora are anticipated as a result of the construction and operation of the proposed wastewater facility improvements.

Cumulative Impacts: No cumulative impacts on flora are anticipated as a result of the construction and operation of the proposed wastewater facility improvements.

#### **4.3.2 Fauna**

Direct Impacts and Mitigation Measures: With the exception of the MCBH Kaneohe Bay EQ site, no significant impacts on fauna within the affected project sites are anticipated from the construction and operation of the proposed wastewater facility improvements. The existing and proposed wastewater facility sites are of a highly disturbed environment in which the affected areas were previously or are currently encumbered by facilities, or are unencumbered areas maintained as open lawns or of introduced vegetated areas. Construction and operation of the proposed wastewater facility improvements will not adversely affect any candidate, proposed, or listed threatened or endangered faunal species or their habitat.

Construction of the Kailua Road and Kapaa Industrial Park EQ basins, if pursued, will result in the removal of introduced vegetation that provide a habitat for various bird and feral mammal species. When the Kailua Road EQ basin is constructed and landscaped with the mini-park above, these species are anticipated to reinhabit the site. Construction of the Kapaa Industrial Park EQ basin will include landscaping of unpaved areas which would provide limited habitat for species.

Construction of the MCBH Kaneohe Bay EQ facility, if pursued, will likely impact endangered faunal species which may inhabit the site, as well as those



that inhabit Nuupia Ponds. If this alternative is pursued, environmental permitting requirements, including a wetlands mitigation plan, would need to be addressed in coordination with environmental managers at the MCBH Kaneohe Bay, the U.S. Army Corps of Engineers and the U.S. Fish and Wildlife Service to mitigate such impacts. Construction of the MCBH Kaneohe Bay EQ facility would also be in accordance with the Base's *Integrated Resources Management Plan for the Nuupia Ponds Management Zone* (June 1997), the *Fish and Wildlife Management Plan* (1992), and *Mokapu: Manual for Watershed Health and Water Quality* (1998). Further discussion of the potential impacts and mitigation measures associated with construction of the MCBH Kaneohe Bay EQ facility on wetlands is included in Section 4.3.4.

As the majority of the proposed rehabilitation/replacement and sewer line installation projects will occur within existing street right-of-ways which are mostly paved, there will be no impact on faunal species habitat.

Indirect Impacts: No indirect impacts on fauna are anticipated as a result of the construction and operation of the proposed wastewater facility improvements.

Cumulative Impacts: No cumulative impacts on fauna are anticipated as a result of the construction and operation of the proposed wastewater facility improvements.

#### **4.3.3 Aquatic Resources**

Direct Impacts and Mitigation Measures: With the exception of the MCBH Kaneohe Bay EQ site, no significant impacts on aquatic resources in inland and coastal waters are anticipated as a result of the construction and operation of the proposed wastewater facility improvements.

During construction of the proposed facility improvements, storm runoff may carry increased amounts of sediment into nearby streams and coastal receiving waters, potentially impacting aquatic fauna and their associated habitat and feeding areas. The potential impacts of sedimentation flows into streams and coastal receiving waters during construction activities will be

mitigated by controlling sedimentation in surface flows as described in Sections 4.1.2, 4.2.1 and 4.2.3. For dewatering that may be required during excavation and construction of the proposed improvements, a NPDES General Permit for Construction Activity Dewatering will be required for discharging dewatering effluent into City drainage systems and waters of the United States (see Section 4.2.1).

In the long-term, potential impacts to aquatic resources will be mitigated by the provision of flow equalization facilities to reduce peak flows and collection system improvements to reduce infiltration and inflow, thereby reducing the probability of spills and bypasses to streams and coastal receiving waters during periods of heavy rainfall. Any potential for wastewater spills at the proposed facilities which may affect aquatic resources in streams and coastal receiving waters will be mitigated by designing the facilities with adequate capacities (see Section 1.4.2 and Chapter 2) and flood protection (see Section 4.2.4).

The effluent discharge at the Mokapu Outfall resulting from the proposed wastewater facility improvements is anticipated to have no significant impact on aquatic resources in coastal waters. As part of the NPDES permit process for the Kailua Regional WWTP, the City is required to implement a biological monitoring program to evaluate potential impacts on aquatic fauna. Static bioassay chronic toxicity tests were conducted monthly during 1998 with *Ceriodaphnia dubia* (water flea) and *Trypneustes gratilla* (Hawaiian sea urchin). In accordance with permit provisions, the WWTP was required to meet the whole effluent toxicity (WET) test requirement. Based on the 186 toxic units chronic (TU<sub>c</sub>) allowed by the permit to achieve a No Observable Effect Concentration (NOEC), the mean toxicity level for *Ceriodaphnia dubia* and *Trypneustes gratilla* was 45.4 TU<sub>c</sub> and 77.86 TU<sub>c</sub>, respectively.

In 1998, the University of Hawaii Water Resource Research Center, under contract to the City and County of Honolulu, conducted a study of the impact of the Mokapu Outfall's effluent discharges on the marine environment. The results of the study are detailed in a report entitled *Benthic Faunal Sampling in the Vicinity of Mokapu Ocean Outfall*, March 1998. This biomonitoring of marine life marks the third time that the

Mokapu Outfall area has been studied, the other two times being in 1986 and 1992. Although benthic monitoring is not required by the Kailua Regional WWTP's NDPES Permit, the City attempts to conduct comprehensive benthic sampling and analysis approximately once every five years.

For the study, benthic infauna in the vicinity of the Mokapu Outfall was sampled at six stations along the Outfall's diffuser isobath in March 1998. A total of 7,576 nonmollusks of 216 taxa and 7,320 mollusks of 206 taxa were collected. The results of the study indicated that there continued to be no significant indication that marine life is influenced by the discharge of effluent through the Outfall. There was no pattern or grouping of stations for nonmollusk or mollusk taxa composition which indicated an outfall effect on benthos. Due to the Outfall's proximity to Kailua, it may be impacted by non-point discharges common to urban areas and that impact to nearshore waters may increase during significant rainfall events. The Outfall is also regularly impacted by storms that affect the benthic community (*Kailua Regional Wastewater Treatment Plant 1998 Annual Assessment Report*, April 30, 1999).

The potential impacts and mitigation measures associated with construction of the MCBH Kaneohe Bay EQ facility on aquatic resources is discussed in Section 4.3.4.

Indirect Impacts: No indirect impacts on aquatic resources in inland and coastal waters are anticipated as a result of the construction and operation of the proposed wastewater facility improvements.

Cumulative Impacts: During construction of the proposed wastewater facility improvements, storm runoff may carry increased amounts of sediment into nearby streams and coastal receiving waters, potentially impacting aquatic resources. Adherence to State and City water quality regulations governing grading, excavation, stockpiling and dewatering during construction activities will control sedimentation in surface flows (see Sections 4.1.2 and 4.2.1). This will reduce the cumulative impacts on aquatic resources resulting from regional non-point source pollution.

The proposed facility improvements will have beneficial, cumulative long-term impacts on aquatic resources in inland and coastal waters. The provision of flow equalization facilities and collection system improvements to reduce infiltration and inflow will reduce the probability of spills and bypasses to streams and coastal waters during periods of heavy rainfall. The reduction of spills and bypasses to streams and coastal receiving waters will help to reduce the cumulative impacts on aquatic resources resulting from regional non-point source pollution.

#### 4.3.4 Wetlands

Direct Impacts and Mitigation Measures: With the exception of the MCBH Kaneohe Bay EQ site, no significant impacts on wetlands are anticipated during construction or operation of the proposed wastewater facility improvements.

Ground disturbing activities associated with construction of the proposed wastewater facility improvements may result in soil erosion and runoff into nearby wetlands. The potential impacts of soil erosion and sedimentation into wetlands during construction activities will be mitigated by controlling sedimentation in surface flows as described in Sections 4.1.2, 4.2.1 and 4.2.3.

The Kailua Road EQ basin, if pursued, will be built partially underground on land not in the wetland areas and, therefore, will not impact the adjacent Kawai Nui Marsh. Should the Kailua EQ basin be the recommended alternative, the proposed improvements will be designed and constructed in consideration of the Kawai Nui Marsh Management Plan being prepared by the State DLNR Land Division.

In the long-term, potential impacts to wetlands will be mitigated by the provision of flow equalization facilities to reduce peak flows and collection system improvements to reduce infiltration and inflow, thereby reducing the probability of spills and bypasses to wetlands during periods of heavy rainfall. Any potential for wastewater spills at the proposed facilities which may affect wetlands will be mitigated by designing the facilities with adequate capacities (see Section 1.4.2 and Chapter 2) and flood protection (see Section 4.2.4).

Construction of the MCBH Kaneohe Bay EQ facility, if pursued, will have an impact on existing wetlands. The EQ site is located north of Nuupia Ponds and includes wetland areas that would need to be taken into consideration in the siting and development of the facility. Facility improvements will also include installation of a transmission line between a new pump station at the Kailua Regional WWTP and the EQ site, potentially impacting Nuupia Ponds. Impacts on faunal and aquatic resources associated with construction of the transmission line would be significantly reduced if the pipeline follows the existing transmission line located on fastland within Nuupia Ponds between the Kailua Regional WWTP and MCBH Kaneohe Bay wastewater treatment plant.

Potential impacts to faunal and aquatic resources due to wastewater spills from the proposed MCBH Kaneohe Bay EQ basin or leakage or accidental breakage in the transmission line crossing Nuupia Ponds and the wetlands will need to be mitigated by proper design, construction and operation of the facility. Standard procedures for detecting leaks and breaks and for shutting down and repairing the line will minimize impacts.

If the MCBH Kaneohe Bay EQ facility alternative is pursued, environmental permitting requirements, including a wetlands mitigation plan, would need to be addressed in coordination with environmental managers at the MCBH Kaneohe Bay, the U.S. Army Corps of Engineers and the U.S. Fish and Wildlife Service to mitigate the associated impacts. Additional environmental investigations and mitigation, such as the enhancement of wetland habitat elsewhere on the Base, may be required. Should the wetland habitat enhancement be the recommended course of action, the potential for damage to the ecosystem which cannot be offset will more appropriately be evaluated at that time.

Construction of the MCBH Kaneohe Bay EQ facility would also be in accordance with the Base's *Integrated Resources Management Plan for the Nuupia Ponds Management Zone* (June 1997), the *Fish and Wildlife Management Plan* (1992), and *Mokapu: Manual for Watershed Health and Water Quality* (1998).

Indirect Impacts: No indirect impacts on wetlands are anticipated as a result of the construction and operation of the proposed wastewater facility improvements.

Cumulative Impacts and Mitigation Measures: During construction of the proposed wastewater facility improvements, storm runoff may carry increased amounts of sediment which may impact wetlands. Adherence to State and City water quality regulations governing grading, excavation, stockpiling, and dewatering during construction activities will control sedimentation in surface flows (see Sections 4.1.2 and 4.2.1). This will reduce the cumulative impacts on wetlands resulting from regional non-point source pollution.

The proposed facility improvements will have beneficial, cumulative long-term impacts on wetlands. The provision of flow equalization facilities and collection system improvements to reduce infiltration and inflow will reduce the probability of spills and bypasses to wetlands during rain storms. The reduction of spills or bypasses will help to reduce the cumulative impacts to wetlands resulting from regional non-point source pollution.

#### 4.3.5 Historic Sites and Archaeological/Cultural Sites

Direct Impacts and Mitigation Measures: Construction of the proposed wastewater facility improvements will require excavation of the affected areas to a sufficient width and depth which may potentially encounter subsurface archaeological or historic sites, especially in previously undeveloped areas.

Commenting in a letter dated December 10, 1998 to the EIS Preparation Notice for the subject project, the State DLNR Historic Preservation Division (SHPD) indicated that improvements within the existing Kailua Regional WWTP and Kaneohe and Ahuimanu WWPTFs will have "no effect" on historic sites as these areas have been developed, making it unlikely that historic sites would be found. The SHPD also indicated that improvements to the collection system and pump station modifications may have an adverse effect on historic

sites. According to the SHPD, historic sites, including human burials, have been found in subsurface deposits throughout the area. During the project's design phase, the SHPD will have the opportunity to review specific development plans for each project involving sewer rehabilitation, reconstruction and new construction in order to determine the project's effect, if any, on historic sites.

Potential impacts to any archaeological, cultural or historic resources that may be encountered during construction of the proposed improvements will be mitigated by complying with Chapter 6E, Hawaii Revised Statutes, Historic Preservation. All phases of subsurface removal and excavation during construction of the proposed improvements will be monitored by an archaeologist to minimize potential impacts to archaeological or historic deposits and features that may be present. Should any archaeological or historic resources be encountered during construction activities, all work in the vicinity will cease and the SHPD will be notified immediately.

Construction of the MCBH Kaneohe Bay EQ facility, if pursued, will be in accordance with the Base's *Cultural Resources Management Plan* (1996). The Plan provides guidelines to manage all forms of ground disturbance on Mokapu Peninsula in order to avoid or mitigate negative effects on historical and cultural resources which may be present. This effort is in compliance with the National Historic Preservation Act of 1966, as amended, and related regulations, laws and executive orders.

Over the years, many Native Hawaiian burial sites have been uncovered on Mokapu Peninsula. Should any Native Hawaiian burial sites be encountered during construction of the MCBH Kaneohe Bay EQ facility, mitigation will be in accordance with the Base's *Cultural Resources Management Plan*. As deemed appropriate, a burial treatment plan would be prepared in compliance with the Native American Graves Protection and Repatriation Act of 1990.

Potential impacts to any archaeological or historic resources that may be encountered during construction of the MCBH Kaneohe Bay EQ facility will be mitigated by complying with Federal and State regulations for the management of such resources. As deemed appropriate, Section 106

coordination and consultation as mandated by the National Historic Preservation Act of 1966, as amended, and its implementing regulations set forth in 36 CFR 800, will be completed prior to constructing the proposed facility improvements.

Indirect Impacts: No indirect impacts on archaeological, cultural or historic resources are anticipated as a result of the construction and operation of the proposed wastewater facility improvements.

Cumulative Impacts: No cumulative impacts on archaeological, cultural or historic resources are anticipated as a result of the construction and operation of the proposed wastewater facility improvements.

#### **4.4 Socio-Economic**

Direct Impacts and Mitigation Measures: The proposed project will have both beneficial and adverse social and economic impacts in the planning region.

In the short-term, the project will confer some positive benefits in the local area. Direct economic benefits will result from construction expenditures both through the purchase of material from local suppliers and through the employment of local labor, thereby stimulating that sector of the economy.

Construction activities associated with the proposed project will create some adverse impacts such as temporary disruption of traffic and on-street parking, unavoidable noise impacts in the vicinity of the project sites, and air pollution emissions from soil excavation and construction vehicle equipment and movement. The properties which are anticipated to be most affected by construction activity impacts are those residences and businesses located adjacent to and along the proposed wastewater facility improvements. Construction contractors will be required to mitigate potential vehicular and pedestrian traffic impacts through appropriate traffic control measures and safety devices (see Section 4.7). Unavoidable construction noise impacts on nearby land uses in the immediate vicinity of the proposed facility improvements will be mitigated to some degree by complying with the provisions of the State DOH Administrative Rules, Title 11, Chapter 46, Community Noise Control (see Section 4.6). Potential air quality impacts



during construction of the proposed project will be mitigated by complying with the State DOH Administrative Rules, Title 11, Chapter 60, Air Pollution Control (see Section 4.5.1). The degree of impact resulting from construction activities along major roadways will be mitigated by phasing sewer line projects into zones, thereby minimizing traffic, noise and air quality impacts to residents and businesses at any given time. Emerging "trenchless" technologies such as microtunneling (use of a subsurface boring machine for pipe installation) may also be used to minimize disruption to residences and businesses.

In the long-term, the proposed wastewater facility improvements will accommodate projected flows up to the year 2020 and will provide adequate wastewater systems to support the projected population and economic growth in the Kailua-Kaneohe-Kahaluu region.

Existing odor problems from the Kailua Regional WWTP have been a primary area of concern expressed by residents in the nearby community. As expressed by the nearby residents, air emissions from the WWTP raise the concern of potential health impacts on residents in the immediate vicinity and students and faculty of the nearby Aikahi Elementary School, as well as facility workers. Nearby residents have also expressed concern regarding the impact of odors from the WWTP which may not present a health hazard, but are considered by many to reduce the quality of life in the community.

The City is undertaking short-, intermediate- and long-term odor mitigation measures to reduce the ~~presence of all sources of noxious air emissions~~ *emission of air pollutants*. These measures include maintenance and operation activities, chemical treatment to reduce entry level of odorous compounds into treatment processes, and odor reduction systems installed to handle off-gases from unit processes (see Section 4.5).

*Noxious Nuisance* noise levels emanating from the Kailua Regional WWTP are a concern to nearby residents as expressed in public meetings held for the Facilities Plan. Although the proposed improvements to the plant would

mostly entail modifications within existing facilities and are not expected to contribute to higher levels of noise, consideration should be given to further reducing noise emanating from the plant due to noise complaints from nearby residents.

Noise mitigation measures are recommended to further reduce noise emanating from the WWTP's primary and secondary noise sources, namely the Odor Control Fans, Effluent Pumps and the Administration Building's exterior air-conditioning unit (see Section 4.6).

The long-term economic impacts of the proposed wastewater facility improvements are significant. The total estimated capital cost for the proposed facility improvements is approximately \$386.1 million (April 1998 dollars). This includes approved capital improvement projects. The estimated annual operating cost is approximately \$30.6 million (April 1998 dollars).

The City and County of Honolulu would be expected to fund the capital and operating costs for the proposed improvements. To initially fund these costs, the City will pursue the borrowing of wastewater revenue bonds for a 30-year period. Based on current City policy, the financial impact of the City's cost would be distributed among the large number of wastewater system customers on Oahu. For determination of sewer rates, all of the facilities operated by the City are considered to be a single system and the costs of the system are therefore distributed among all its customers. There will be a need for increased sewer rates resulting from the planned construction of the proposed improvements in the Facilities Plan.

Residents currently served by individual wastewater systems that are proposed to be serviced by the municipal sewer system under the proposed action would be required to pay for the cost of construction of the sewer lateral within their property and the demolition of the existing individual sewer system. This cost is estimated at approximately \$4,000. The homeowners would also be responsible for paying the City's one-time Sewer Improvement District assessment fee which is currently \$0.25 per square foot of lot area for residential areas up to the zoning lot size. For example,

in an area with R-10 zoning, the charge for a lot that is greater than 10,000 square feet would be calculated based on a 10,000-square foot lot size. Residents would be required to pay the monthly sewer user service charge which covers operation and maintenance costs and a portion of the City's debt service.

Indirect Impacts and Mitigation Measures: In the short-term, positive indirect economic impacts may include benefits to local retail businesses resulting from construction activities.

Cumulative Impacts and Mitigation Measures: The project improvements are proposed to accommodate the projected wastewater flows based on the City and County of Honolulu Department of Planning and Permitting's population projections for the planning region. However, any cumulative impacts resulting from such increased population and subsequent development would be more appropriately attributed to land use planning policies rather than the proposed project. Therefore, the proposed wastewater facility improvements are not anticipated to induce increased development in the region which would otherwise have a cumulative impact on the existing infrastructure, public services and facilities, public utilities, and traffic in the region.

#### **4.5 Air Quality**

The direct impacts and mitigation measures resulting from the construction and operation of the proposed wastewater facility improvements on air quality are discussed herein.

##### **4.5.1 Short-Term Construction Impacts**

During construction of the proposed wastewater facility improvements, two potential types of air pollution emissions will likely occur, resulting in air quality impacts: 1) airborne dust from vehicle movement and soil excavation; and 2) carbon monoxide and nitrogen oxide emissions from on-site construction equipment and from construction worker's vehicles and equipment traveling to and from the project work site. The properties which are anticipated to be most affected by air quality impacts during construction

are those residences and businesses located adjacent to and along the proposed wastewater facility improvements.

Potential air quality impacts during construction of the proposed improvements will be mitigated by complying with the State of Hawaii DOH Administrative Rules, Title 11, Chapter 60, Air Pollution Control. The construction contractor is responsible for complying with State DOH regulations which prohibit visible dust emissions at property boundaries. Compliance with State regulations will require adequate measures to control airborne dust by methods such as water spraying and sprinkling of loose or exposed soil or ground surface areas and dust-generating equipment during construction. As may be deemed appropriate, paving and/or reestablishment of vegetated areas early in the construction schedule will also help to control dust. Nevertheless, the presence of nearby residences and buildings in the vicinity of most of the affected project sites suggest that open-air areas and naturally ventilated structures could be impacted by dust in spite of compliance with these regulations. Exhaust emissions from construction vehicles are anticipated to have negligible impact on air quality in the project vicinities as the emissions would be relatively small and readily dissipated.

No significant impacts on air quality resulting from vehicular traffic associated with the operations of the proposed wastewater facility improvements are anticipated. There is anticipated to be no significant increase in traffic associated with the proposed facility improvements.

#### **4.5.2 Odor Impacts from Wastewater Treatment Facilities**

Air emissions from wastewater treatment facilities have two major impacts -- potential health impacts on facility workers and residents in the immediate vicinity, and the impacts of odors which may not present a health hazard but are considered by many to reduce the quality of life in the community.

Regulated air emissions which may present a health hazard include odor and criteria pollutants which are addressed in the source permit administered by DOH and air toxins which are covered by U.S. Environmental Protection

Agency (EPA) standards. A description of the Non-Covered Source Permit and associated monitoring results are discussed in Section 3.6. Not addressed in the permit are odor control and air emissions due to non-sulfurous compounds which have an impact on the community's quality of life. One category that has been mentioned in previous public meetings is that of volatile organic compounds, or VOCs.

These compounds have been the topic of investigation, particularly at mainland wastewater facilities treating large quantities of industrial wastes. The EPA has established levels at which these compounds may represent health problems to workers and the community. At the Kailua Regional WWTP, an examination of records maintained by the City which tests for over 180 of these compounds revealed that none approach a level that present a hazard to either workers or the community. Ninety five percent of them fall in the "non-detectable" range; the balance are barely detectable. Thus, there are no discernible levels of VOCs present at the Kailua Regional WWTP.

In a national study performed to quantify the amount of these substances entering the treatment plant, only 10.2 percent of the volatile compounds were released into the atmosphere (WEF, 1994). In another study performed in a facility much larger than the Kailua Regional WWTP, it was concluded that for three major compounds of concern "...workers were not exposed to toxic compound concentrations that would cause immediate health concerns" (WEF/ASCE, 1995). Nationally, only 10 wastewater treatment facilities have been required to reduce VOC levels, with all of these plants being in the 100 mgd plus range or serving collection systems receiving significant levels of industrial wastes.

#### **4.5.3 Mitigation of Odor Problems**

Odor problems have been the single most discussed topic in public meetings held in connection with the Facilities Plan for Kailua-Kaneohe-Kahaluu, with the primary focal point being the Kailua Regional WWTP. In spite of the amount of money spent to-date on odor control facilities, neighborhood complaints persist. The City has recognized the need for increased attention

to increasing the efficiency of existing systems and providing more efficient odor controls in the near future.

#### **4.5.3.1 Short-Term Odor Mitigation Measures**

The City is undertaking odor mitigation steps to reduce the ~~presence of all sources of noxious air emissions~~ *emission of air pollutants*. These steps include maintenance activities, as well as equipment upgrades and additions.

Maintenance and operation activities: During construction of the Kailua Regional WWTP, tanks and treatment processes that might allow ~~noxious~~ *nuisance* gases to escape to the atmosphere were covered or enclosed in a building. Air from these covered sources was diverted to odor removal systems and treated to reduce odorous compounds to a level that could be discharged without causing nuisance conditions. It is recognized that this goal has not always been achieved. Recent maintenance and operation measures implemented to improve efficiency of the odor control processes include the following:

- Increased operator awareness of performing certain duties that might cause the release of gases at times of least possibility of affecting the neighbors. In the event maintenance is to be performed that would cause sustained releases, the neighborhood is alerted by announcements in the newspapers.
- Sealing air ducts and tank enclosures that have gaps allowing airborne emissions.
- Smoke testing air handling systems to assure new leaks are not occurring.
- Increased air quality monitoring to detect gradual deterioration of treatment system efficiency, allowing maintenance to occur before problems arise.

**Chemical addition:** Reduction of odor producing compounds at the source is far more effective than capturing and treating at the plants or pump stations. Development of a program adding chemicals to convert odor-producing compounds to forms that do not emit odorous gases will commence in 1999.

Chemical addition, either upstream of the treatment plant or at various wastewater processes, reduces the aqueous sulfur compounds, including sulfide, by chemical reaction. Application of chemical addition will be initially applied to the Kaneohe-Kailua force main by adding caustic at the Kaneohe site and capturing the "slug" in a covered primary clarifier at the Kailua Regional WWTP.

The odor problem associated with the sludge entering the centrifuges will be reduced indirectly by the introduction of ferric chloride at the headworks which, *if continued*, should result in a reduction of hydrogen sulfide in the entire process. Reduction in odor producing compounds will ~~improve the efficiency of the Calvert mist tower used to treat odor produced by the sludge dewatering process.~~ *be enhanced in two ways; first, by the chemical action of ferric chloride removal of odor compounds, and secondly, by the addition of a carbon tower in the odor treatment train ahead of the Calvert mist tower. Although air emission violations have occurred in the past at the Calvert discharge point, newly implemented actions are designed to bring the unit into compliance on a continuous basis. The tower has recently (1998-99) been the site of air emission violations.* By reducing the level of odor compounds entering the *carbon tower, the efficiency of the chemical used for odor control will be improved. the overall life of the carbon will be prolonged.* In the past, because entry level sulfurous compounds have been excessively high, inordinate amounts of chemical for neutralizing the noxious gases have caused mists to be expelled from the top of the tower to possibly be in violation of the air quality permit, although no quantitative data is available. Reduction of the levels of compounds "in" will reduce the level of the compounds "out".

#### **4.5.3.2 Intermediate- and Long-Term Odor Mitigation**

In addition to chemical treatment to reduce entry level of odorous compounds into treatment processes, there are odor reduction systems

installed to handle off-gases from unit processes. A summary of these treatment systems is presented below, followed by a discussion of newer technologies recommended in the Facilities Plan for inclusion in engineering studies for future upgrades and replacement of existing systems.

**Packed Bed Wet Scrubbers:** The system at the Kailua Regional WWTP uses packed bed wet scrubbers for hydrogen sulfide control. In these designs, scrubbing liquid is sprayed over packing through which the odorous gases pass and sulfur compounds in the odorous gases are converted from an odorous state to elemental sulfur which has no odor. The foul air is passed through the gas-liquid contacting packed bed, then through a mist eliminator and exhausted to a second, granular carbon tower for further air scrubbing. As a result, expelled gas should contain very low levels of odor producing compounds when the system is operating properly.

**Mist Scrubbers:** A second type of tower is the Calvert system used to reduce odors from the solids handling process. A fiberglass contact chamber and air atomized chemical injection nozzle are used to achieve absorption of odorous gases. When properly designed, removal of organic sulfur compounds tends to be better in this type of scrubber because the oxidant concentration is higher and the fine droplets promote greater direct contact of odorous compounds and scrubbing chemicals. A disadvantage is that some mist is inevitably carried in the treated air discharged from the scrubber. This carryover brings with it the potential for complaints of a chlorine-like odor and the possibility of damage to vegetation and metals impacted by the plume. In some instances, the plume from mist scrubbers may cause visibility complaints.

**Activated Carbon:** Activated carbon adsorption has been used extensively in wastewater treatment plants for odor control. The vapor phase Granular Activated Carbon (GAC) contactors contain the carbon beds which adsorb the odorous compounds from the foul air. The contactors are typically designed for upward and downward routing of the foul air. Odorous constituents adsorb to surfaces within the pore spaces of the carbon; chemical oxidation or reduction of some compounds can also occur. As these surfaces become occupied, efficiency degrades and the carbon has to be replaced or regenerated. Carbon is most effective on higher molecular



weight polar molecules such as organic sulfur compounds. Thus, carbon is often the technology of choice to follow packed bed scrubbers which are typically ineffective in removing these odorants.

**Liquid-Based Systems:** Trickling filters such as those in use at the Kailua Regional WWTP have been used for odor treatment at some treatment plants. This liquid-based system is successfully used at the Waianae treatment facility. In contrast to the system described below, specifically constructed for odor removal, foul air is introduced into a unit built originally to treat wastewater. Technically, the same method could be applied at Kailua and is recommended to be evaluated in a future engineering study planned for the City's FY 2000 budget.

Generally, primary or secondary effluent is used to provide the biomass which has adequate source of carbon and other nutrients for process maintenance and sufficient liquid flow through the media. In operation, foul air enters at the bottom of the tower, travels up through the packed bed or media, through the spray area and demister section, and exhausts at the top through an exhaust stack. The biological tower scrubber utilizes a large recirculating sump. Water is withdrawn from the bottom sump and recirculated to maintain liquid flow.

**Bulk Media-Based Systems:** The use of a bulk media bed biological odor filter system (biofiltration) is the most cost-effective method of treating large volumes of foul air with relatively low concentrations of odorous compounds as are typically found in wastewater treatment plants. Biofilter design for treatment of foul air is typically open or closed bed. The open bed design is best suited for locations not limited by land area. A closed bed biofilter is recommended where protection from excess precipitation or excess evaporation is needed or where land is limited. Foul air is collected from various wastewater treatment processes and blown out of a perforated pipe which is buried in a 3- to 6-foot deep bed of composted sewage sludge or other organic bulking material. As the foul air passes through the bed, the organic material adsorbs and biologically oxidizes contaminants in the foul air. Compounds such as H<sub>2</sub>S, sulfur dioxide, ammonia, and oxides of nitrogen are oxidized to carbon dioxide, water, sulfates, and nitrates. Toxic hydrocarbons in the foul air can be converted to nontoxic compounds.

Biofiltration can reduce emissions of a wide variety of air contaminants to a level not achievable with packed bed wet chemical scrubbing or other absorption systems with chemical addition. Biofilter systems have the disadvantage of requiring a large amount of space. For example, treatment of 10,000 cfm of foul air would require about 3,000 to 5,000 square feet of bed surface area. Space requirements for biological beds can be reduced by using multiple levels or by placing the beds on top of wastewater treatment processes.

An effective odor control strategy usually includes a combination of chemical control, treatment technologies, facilities planning and design, foul air containment and treatment, and dilution. At the Kailua Regional WWTP's dewatering building, the City is exploring medium- to long-range design alternatives to provide a new odor control design or modify the existing Calvert Odor Control Unit to reduce the hydrogen sulfide emissions from the dewatering building.

Design of future facilities will need to incorporate both latest technologies, as well as well-defined operation and maintenance procedures, to assure reduction of *noxious nuisance* air emissions from collection system, storage facilities and treatment sites. An additional area of potential odor source would be any equalization storage facilities developed for use during storm events. New odor control systems are proposed at the Kaneohe and Ahuimanu WWPTFs, and Kailua Road and MCBH Kaneohe Bay EQ sites (if pursued) to treat odors from the respective proposed wastewater facility improvements.

For storage basins, the technologies and control systems described for the Kailua Regional WWTP apply and specific facilities will be assessed as part of preliminary engineering design. Control of odor emissions for long reaches of collection system pipes used for storm flow storage will require that provisions be made for maintenance cleaning to be performed immediately after a storage event.

Islandwide, an Odor Control Assessment Program is scheduled to start in FY2000. This project involves the preparation of a study to address the effectiveness of all City-owned and operated existing odor control units, as well as address future odor control requirements. The study will provide a

master plan to control odors from the collection system, pump stations, and treatment plants.

Indirect Impacts: No indirect air quality impacts are anticipated as a result of the construction and operation of the proposed wastewater facility improvements.

Cumulative Impacts: No cumulative air quality impacts are anticipated as a result of the construction and operation of the proposed wastewater facility improvements.

#### **4.6 Noise**

The direct impacts and mitigation measures resulting from the construction and operation of the proposed wastewater facility improvements on noise are discussed herein.

##### **4.6.1 Short-Term Construction Impacts**

During construction of the proposed wastewater facility improvements, construction noise will be unavoidable during the duration of the respective project construction period. Operation of construction equipment such as backhoes, trucks, compactors, pumps, generators, pile drivers, and pavers will raise ambient noise levels in the project vicinity, impacting nearby residents, businesses and occupants of public facilities. Noise generated by construction activity which may occur on a 24-hour basis or at night will adversely impact nearby residents. The properties which are anticipated to experience the highest noise levels during construction are those residences and businesses located adjacent to and along the proposed wastewater facility improvements.

Unavoidable construction noise impacts on nearby land uses in the immediate vicinity of the proposed wastewater facility improvements will be mitigated to some degree by complying with the provisions of the State DOH Administrative Rules, Title 11, Chapter 46, Community Noise Control. These rules require a noise permit if the noise levels from construction activities are expected to exceed the allowable levels stated in the Chapter 46 rules.

Construction work which may be performed 24 hours a day, 7 days a week will require a Community Noise Variance permit from the DOH. It shall be the contractor's responsibility to minimize noise by properly maintaining noise mufflers and other noise-attenuating equipment, and to maintain noise levels below allowable regulatory limits. Construction pumps or generators which may operate for a continuous duration or at night would require an acoustically attenuated enclosure to reduce noise levels. Also, the guidelines for the hours of heavy equipment operation and noise curfew times as set forth by the DOH noise control regulations must be adhered to.

Should there be a need to conduct pile driving activities, the use of a non-combustion type of pile driver (i.e., a computer-controlled, hydraulic pile driver), a portable noise barrier shroud, or the use of concrete rather than steel piles are recommended to mitigate the noise source.

Construction associated with the rehabilitation/replacement and installation of new sewer lines along lengthy corridors will likely occur in separate work zones. Therefore, the specific location where construction activity will be occurring will change such that the actual length of exposure to construction noise from any particular receptor location will likely be less than the total construction time for the particular project.

#### **4.6.2 Potential Noise Impacts from Operation of Wastewater Facilities**

The noise assessment conducted for the Kailua Regional WWTP (see Appendix B) concluded that the noise levels produced by the current operations at the plant do not significantly impact the nearby residential communities. Since the proposed improvements to the WWTP would mostly entail modifications within existing facilities, the operations are not expected to contribute to higher levels of noise from the plant. However, due to noise complaints from nearby residents and the potential effect of adverse climatic conditions as described below, consideration should be given to further reducing the noise emanating from the plant's primary and secondary noise sources, namely the Odor Control Fans, Effluent Pumps and the Administration Building's exterior air-conditioning unit (see Section 4.6.3).

Potential Effect of Adverse Climatic Conditions: Under certain climatic conditions, such as no wind or southwesterly (Kona) winds and temperature inversions, a "diffraction" or "channeling" effect could result in less attenuation of noise with distance than typical methods would predict. It is commonly accepted that the "channeling" condition may yield noise levels 10 to 20 dB higher than expected for the distance the noise has traveled. "Diffraction" is described as a bending of the noise in the direction of the wind, resulting in levels downwind from the source being 5 to 10 dB higher than expected, based on distance traveled. Although it is unknown if these adverse conditions existed when the noise complaints were made by Aikahi residents, two of the complainants acknowledged that noise from the WWTP is loudest under Kona wind conditions. The "channeling" effect is more likely to be experienced at distances much greater than those from the WWTP to the Aikahi residential area or Aikahi Gardens (i.e., one-half mile or more). However, the "diffraction" effect could conceivably be occurring when the residential areas are downwind of the plant.

No significant noise impacts resulting from the proposed facility improvements at the Kaneohe and Ahuimanu WWPTFs are anticipated due to the farther distance of residences, schools and other noise sensitive uses in relation to the respective facilities. Most of the pump station improvements would be internal modifications and, therefore, would not significantly impact nearby residents or other noise sensitive uses.

No significant impacts on noise resulting from vehicular traffic associated with the operations of the proposed wastewater facility improvements are anticipated. There is anticipated to be no significant increase in traffic associated with the proposed facility improvements.

#### **4.6.3 Recommended Noise Mitigation**

The recommended noise mitigation measure for the Kailua Regional WWTP's Headworks and Primary Odor Control Fans is to construct 10-foot high noise barrier walls for these facilities. These walls should be constructed of a material having a minimum surface weight of two pounds per square foot, and the side facing the fans should be covered with a sound absorbing material.

The walls should be located as close as possible to the fans, allowing access room for maintenance and repairs.

For mitigating noise from the Effluent Pumps, it is recommended that a limp-mass barrier material with 2-inch thick fiberglass insulation on the side facing the pumps be hung from the eave of the roof over the pumps. Adjacent panels of this limp-mass material should be joined with velcro fasteners for easy removal for maintenance/repairs, and the material should be long enough to block the line-of-sight from the nearby residences to the pump motors.

The recommended noise mitigation for the air-cooled condensing unit of the Administration Building should consist of a three-sided, open-top noise enclosure constructed of the same materials as recommended for the Odor Control Fans. The enclosure walls should be located as close to the unit as allowed by the unit's manufacturer, and the height should be three feet higher than the top of the unit.

Indirect Impacts: No indirect noise impacts are anticipated as a result of the construction and operation of the proposed wastewater facility improvements.

Cumulative Impacts: No cumulative noise impacts are anticipated as a result of the construction and operation of the proposed wastewater facility improvements.

#### 4.7 Traffic

Direct Impacts and Mitigation Measures: During construction, traffic along the respective corridors proposed for rehabilitation/replacement or installation of new sewer lines will be disrupted for the period of the construction activity. Residents and businesses in the immediate work area may be inconvenienced by restrictions to driveway access and street frontage usage. It may be necessary for the contractor to use portions of the public right-of-way for the temporary staging of construction vehicles and equipment and parking. Where necessary, the potential closure of traffic lanes and temporary restriction or elimination of on-street parking during construction activities may cause inconveniences to motorists as well as residents and businesses in the affected vicinity. The temporary shortage of

stalls could increase competition for street parking in the vicinity and hurt businesses in the immediate area during construction. Temporary traffic congestion that could result from the movement of construction-related vehicles may inconvenience motorists in the vicinity. The proposed rehabilitation/replacement or installation of sewer lines may also require the temporary closure of sidewalks along the affected street right-of-ways for pedestrian safety. Designated bikeways within the affected corridors may also be temporarily disrupted, requiring cyclists to use an alternate route in the interim.

During construction of the proposed sewer line rehabilitation projects, the temporary installation of bypass piping and/or diversion pumping of wastewater flows will be required in the vicinity of the work area. Bypass piping/diversion pumping will also be required to maintain and prevent backup of wastewater in service laterals connected to the sewer line being rehabilitated. The bypass piping would be placed above ground either on the median strip or curbside, except at driveways and street intersections where it would be installed in temporary underground trenches or under surface ramps to minimize traffic flow impacts.

Construction-related traffic impacts at the treatment, pretreatment, pump stations, and equalization storage facilities will be largely confined to the respective adjacent street. Effects on local traffic should be primarily limited to the slight increase in construction vehicles accessing the respective sites during construction. This increase of construction vehicles on adjacent roadways would not adversely affect traffic as it is anticipated to be negligible.

As appropriate, construction contractors will be required to mitigate potential vehicular and pedestrian traffic impacts through appropriate traffic control measures and safety devices. Examples of measures that may be employed include:

- Publication of newspaper notices to alert the public of construction projects.

- Appraisal of the affected residents, businesses and Neighborhood Boards of the project(s) and its traffic impacts prior to commencement of construction. Coordination by the contractor(s) and City on temporary closure of private driveways with the affected property owners prior to the closure. *Work with affected businesses to address construction phase traffic-related concerns (e.g., parking and access to businesses).*
- Provide for emergency access and full access during non-working hours for residential and business driveways.
- Provide for advance signage and other warnings to alert approaching motorists and pedestrians to construction activities ahead.
- Provide for barriers, cones, signage, lighting, non-skid covering over trenches, adequate and safe sidewalk widths, adequate intersection visibility, and other provisions to promote safe passage of vehicles and pedestrians through the construction zone.
- Restrict the transport of construction vehicles during the peak traffic hours. *To the extent possible, require construction vehicles to use available main routes/roads as alternate routes to the project site rather than local streets, to minimize the project's impact on area residents.*
- Provide for flaggers and/or police officers, when necessary, to control the traffic and pedestrian flow.
- Notification of emergency services (fire, ambulance and police) prior to implementation of any required detours or street closures. Notification of the City Department of Transportation Services to allow the City to alert Oahu Transit Services of the construction activity.
- *Maintain fire apparatus access throughout the project sites for the duration of construction of the proposed facility improvements. Notify the Fire Communication Center (phone: 523-4411) of any interruption*



*in the existing fire hydrant system during construction of the proposed projects.*

The construction contractors will also be required to provide appropriate barriers as necessary to deter the public from unauthorized entry into restricted or hazardous construction zones during working and non-working hours.

No significant impacts on vehicular traffic associated with the operation of the proposed wastewater facility improvements are anticipated. An insignificant increase in traffic associated with the proposed facility improvements is anticipated.

Indirect Impacts: No indirect traffic impacts are anticipated as a result of the construction and operation of the proposed wastewater facility improvements.

Cumulative Impacts: No cumulative traffic impacts are anticipated as a result of the construction and operation of the proposed wastewater facility improvements. The project improvements are proposed to accommodate the projected wastewater flows based on the City and County of Honolulu Department of Planning and Permitting's population projections for the region. Therefore, the proposed improvements are not anticipated to induce increased development in the region which would otherwise potentially have a cumulative impact on traffic.

#### **4.8 Aesthetics**

Direct Impacts and Mitigation Measures: No significant visual or aesthetic impacts are anticipated as a result of the proposed wastewater facility improvements. Since the proposed facility improvements at the existing WWTP, WWPTFs and pump station sites will be similar in visual character to those of the existing facilities, the change in views from public areas will either be negligible or of a slight intensification of the existing uses. Most of the proposed improvements to the WWTP and pump station facilities will consist of internal modifications to existing facilities. Landscape improvements to the Kailua Regional WWTP site consisting of the planting of a row of trees along the Aikahi Park boundary and infilling of the existing hedge near the plant's

entrance along Kaneohe Bay Drive have recently been completed to enhance the appearance and screen the facility from the Park and nearby residential area.

Development of the equalization basin at the Kailua Road EQ site will be placed partially underground and landscaped with a mini-park above to maintain aesthetic compatibility, as well as enhance views of the site and Kawai Nui Marsh beyond from Kailua Road. Since this site is located at the entrance to Kailua Town, a rendering was prepared given the importance of aesthetic considerations (see Figure 4-4). The landscaped mini-park would also provide a scenic vantage point for views of the adjacent marsh.

The above-ground Kapaa Industrial Park EQ basin would not introduce new visual elements to the area due to the industrial nature of adjacent uses.

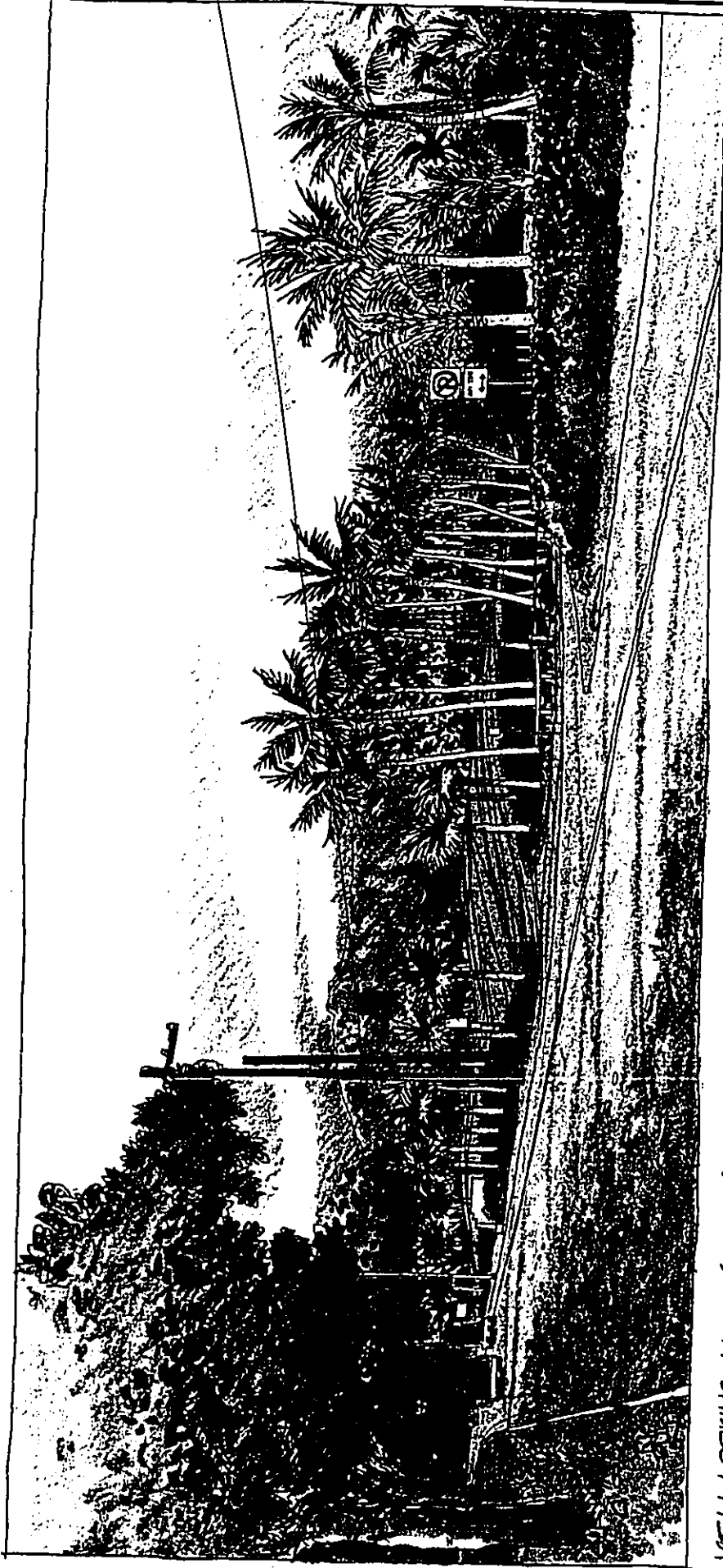
The above-ground equalization basin at the MCBH Kaneohe Bay EQ site will be similar in visual character to the adjacent wastewater treatment plant and will contribute to a slight intensification of the adjacent use.

Construction of the proposed Kaalaea WWPS (alternative to the LPSS) will not visually impact the surrounding area as the site is located within an existing residential area. The visual character and size of the WWPS will be compatible with the surrounding residential character.

The proposed collection system sewer line improvements will be installed underground and will not be visible.

**Indirect Impacts:** No indirect visual or aesthetic impacts are anticipated as a result of the proposed wastewater facility improvements.

**Cumulative Impacts:** No cumulative visual or aesthetic impacts are anticipated as a result of the proposed wastewater facility improvements.



*VIEW LOOKING WEST (MAUIKA)*

Prepared by: Miyabara Associates



WILSON OKAMOTO  
& ASSOCIATES, INC.  
ENGINEERS - PLANNERS

KAILUA-KANEOHE-KAHALUU FACILITIES PLAN

VIEW OF KAILUA ROAD EQ SITE FROM KAILUA ROAD

FIGURE  
4-4

#### 4.9 Solid Waste

Direct Impacts and Mitigation Measures: No significant impacts to the municipal solid waste collection and disposal system are anticipated during construction and operation of the proposed wastewater facility improvements.

Construction of the proposed facility improvements will require grading and excavation activities for the new pump stations, collection system lines, and equalization facilities, resulting in excess soil. It will be the responsibility of the construction contractor(s) to dispose of any excess soil removed during construction. Depending on its quality and usefulness, the excess soil would be used as fill at other projects or locations or disposed of in a landfill. Disposal of unusable excavated soil will slightly increase the amount of material received at the Waimanalo Gulch Sanitary Landfill.

Stabilized dewatered wastewater sludge from the Kailua Regional WWTP is currently landfilled at the Waimanalo Gulch Sanitary Landfill. In 1998, the Kailua Regional WWTP processed approximately 855 dry tons of sludge which was disposed of at the landfill. Due to the limited population growth expected over the next 20 years in the region, no significant impacts to the municipal solid waste system are anticipated as a result of the additional volume of sludge to be produced by the proposed project's increased wastewater flows.

Indirect Impacts: No indirect impacts on solid waste are anticipated as a result of the construction and operation of the proposed wastewater facility improvements.

Cumulative Impacts and Mitigation Measures: In 1995, the City and County of Honolulu prepared an islandwide *Sludge Management Plan* which outlines the preferred alternative for sludge disposal for the Kailua Regional WWTP as Beneficial Reuse by Alkaline Stabilization by a private contractor. The end product of this process can be used as a soil conditioner. The City is investigating other ways to produce and beneficially reuse biosolids using the framework set out in the *Biosolids Reuse Plan* which amended the *Sludge Management Plan* in April 1998. The results of a priority pollutant scan

conducted in 1998 indicates that the sludge produced at the Kailua Regional WWTP is of a superior quality that would permit all beneficial uses regulated under 40 CFR 503 pursuant to the Clean Water Act (*Kailua Regional Wastewater Treatment Plant 1998 Annual Assessment Report, April 30, 1999*). Such alternatives to sludge disposal would contribute to efficient use of waste products and have a positive cumulative effect on solid waste management. While some of these alternatives may need additional facilities for treatment and disposal in order to comply with Federal, State and County regulations, such additional facilities needs are not intended to be addressed in No adverse cumulative impacts on the existing solid waste collection and disposal system are anticipated as a result of the construction and operation of the proposed wastewater facility improvements. The project improvements are proposed to accommodate the projected wastewater flows based on the City and County of Honolulu Department of Planning and Permitting's population projections for the region. Therefore, the proposed improvements are not anticipated to induce increased development in the region which would otherwise potentially have a cumulative impact on the existing solid waste system.

#### **4.10 Infrastructure and Utilities**

##### **4.10.1 Water System**

Direct Impacts and Mitigation Measures: No significant impacts are anticipated on the existing water system as a result of the construction and operation of the proposed wastewater facility improvements. During design and construction of the proposed improvements which may affect the existing water system facilities, close coordination will be maintained with the City and County Board of Water Supply to ensure that the water system will not be adversely impacted and water service will not be interrupted to adjacent areas.

Operation of the proposed wastewater facility improvements will result in a slight increase in water consumption demand, although it would not require any upgrade of the potable water distribution system.

Construction and operation of the proposed wastewater facility improvements are anticipated to have no impact on the City and County of Honolulu Board of Water Supply's deep water wells and tunnels in the planning region as they are located in the higher elevation areas of the Koolau Range.

Indirect Impacts: No indirect impacts on the existing water system are anticipated as a result of the construction and operation of the proposed wastewater facility improvements.

Cumulative Impacts: No cumulative impacts on the existing water system are anticipated as a result of the construction and operation of the proposed wastewater facility improvements. The project improvements are proposed to accommodate the projected wastewater flows based on the City and County of Honolulu Department of Planning and Permitting's population projections for the region. Therefore, the proposed improvements are not anticipated to induce increased development in the region which would otherwise potentially have a cumulative impact on the existing water system.

#### **4.10.2 Drainage System**

Direct Impacts and Mitigation Measures: No significant impacts are anticipated on the existing storm drainage collection and transmission system as a result of the construction and operation of the proposed wastewater facility improvements. During design and construction of the proposed improvements which may affect existing drainage facilities, close coordination will be maintained with the City Department of Facility Maintenance to ensure that functions of the existing area drainage improvements are not impacted or impeded.

During construction of the proposed improvements, storm runoff may carry increased amounts of sediment into the storm drain system as a result of erosion from newly exposed land. This will be adequately mitigated by compliance with the City's grading ordinance and, as may be required, the NPDES General Permit for Storm Water Associated with Construction Activity, as discussed in Section 4.1.2.

Dewatering during construction will be required for work where sewer and transmission facilities will lie below the water table. As discussed in Section 4.2.1, a NPDES General Permit for Construction Activity Dewatering will be required for discharging dewatering effluent into City drainage systems and waters of the United States. The permit will require a BMP, erosion control plan, and water quality monitoring plan.

After construction, the volume of storm runoff from the WWTP, WWPTFs and existing WWPS sites will be no greater than present since mostly internal modifications to existing facilities would have been made or new facilities would have been constructed in areas previously occupied by structures or pavement. The volume of storm runoff from development of the new WWPSs and equalization basin facilities on presently undeveloped land will decrease the permeable surface areas, resulting in a slight increase in runoff. The addition of landscaping at these sites would increase the amount of infiltration, thereby reducing the volume of runoff. Storm runoff from the proposed wastewater facility improvement sites will be directed toward existing drainage systems in the nearby vicinity of the respective project sites.

Indirect Impacts and Mitigation Measures: During construction of the proposed facility improvements, storm runoff may carry increased amounts of sediment into the storm drain system, potentially impacting the water quality of area streams and canals and coastal receiving waters. These impacts will be mitigated by adherence to State and City water quality regulations governing grading, excavation, stockpiling, and dewatering (see Sections 4.1.2, 4.2.1 and 4.2.3).

The proposed wastewater facility improvements will have beneficial long-term water quality impacts on streams, canals and coastal receiving waters. The provision of flow equalization facilities and collection system improvements to reduce infiltration and inflow will reduce the probability of spills and bypasses to the coastal waters during rain storms.

Cumulative Impacts and Mitigation Measures: During construction of the proposed facility improvements, storm runoff may carry increased amounts of sediment into nearby surface and coastal receiving waters, potentially

impacting water quality. Adherence to State and City water quality regulations governing grading, excavation, stockpiling, and dewatering during construction activities will control sedimentation in surface flows (see Sections 4.1.2, 4.2.1 and 4.2.3). This will reduce the cumulative impacts on surface and coastal waters resulting from regional non-point source pollution.

The proposed wastewater facility improvements will have beneficial, cumulative long-term water quality impacts on surface and coastal receiving waters. The provision of flow equalization facilities and collection system improvements to reduce infiltration and inflow will reduce the probability of spills and bypasses to the surface and coastal waters during rain storms. The reduction of spills and bypasses to surface and coastal receiving waters will help to reduce the cumulative impacts on the water quality resulting from regional non-point source pollution.

No adverse cumulative impacts on the existing storm drainage system are anticipated as a result of the operation of the proposed wastewater facility improvements. The project improvements are proposed to accommodate the projected wastewater flows based on the City and County of Honolulu Department of Planning and Permitting's population projections for the region. Therefore, the proposed improvements are not anticipated to induce increased development in the region which would otherwise potentially have a cumulative impact on the existing drainage system.

#### **4.10.3 Electrical System**

Direct Impacts and Mitigation Measures: No significant impacts are anticipated on the existing electrical system as a result of the construction and operation of the proposed wastewater facility improvements. During design and construction of the proposed improvements which may affect existing underground and aerial power lines and utility poles, close coordination will be maintained with Hawaiian Electric Company, Inc. (HECO) to ensure that electrical utilities will not be adversely impacted and electrical service will not be interrupted to adjacent areas.

Operation of the new wastewater facilities will increase demand in energy consumption. As the proposed modifications are made to the existing



wastewater facilities, however, energy consumption could be reduced. The projected energy consumption and adequacy of electrical power distribution to the affected facility improvements will be determined in consultation with HECO.

Indirect Impacts: No indirect impacts on the existing electrical system are anticipated as a result of the construction and operation of the proposed wastewater facility improvements.

Cumulative Impacts: No cumulative impacts on the existing electrical system are anticipated as a result of the construction and operation of the proposed wastewater facility improvements. The project improvements are proposed to accommodate the projected wastewater flows based on the City and County of Honolulu Department of Planning and Permitting's population projections for the region. Therefore, the proposed improvements are not anticipated to induce increased development in the region which would otherwise potentially have a cumulative impact on the existing electrical system.

#### **4.10.4 Communications System**

Direct Impacts and Mitigation Measures: No significant impacts are anticipated on the existing telephone and cable systems as a result of the construction and operation of the proposed wastewater facility improvements. During design and construction of the proposed improvements which may potentially affect existing underground and aerial cables and utility poles, close coordination will be maintained with GTE Hawaiian Telephone Company and Oceanic Cable to ensure that the respective utility lines will not be adversely impacted and the appropriate utility services will not be interrupted to adjacent areas. Operation of the proposed wastewater facility improvements will not require any upgrade of the telephone system or cable system improvements.

Indirect Impacts: No indirect impacts on the existing telephone and cable systems are anticipated as a result of the construction and operation of the proposed wastewater facility improvements.

Cumulative Impacts: No cumulative impacts on the existing telephone and cable systems are anticipated as a result of the construction and operation of the proposed wastewater facility improvements. The project improvements are proposed to accommodate the projected wastewater flows based on the City and County of Honolulu Department of Planning and Permitting's population projections for the region. Therefore, the proposed improvements are not anticipated to induce increased development in the region which would otherwise potentially have a cumulative impact on the existing communication system.

#### **4.10.5 Gas System**

Direct Impacts and Mitigation Measures: No significant impacts are anticipated on the existing gas system as a result of the construction and operation of the proposed wastewater facility improvements. During design and construction of the proposed improvements which may affect existing underground gas lines, close coordination will be maintained with The Gas Company to ensure that the gas lines will not be adversely impacted and service will not be interrupted to adjacent areas. Operation of the proposed facility improvements will not require gas system improvements.

Indirect Impacts: No indirect impacts on the existing gas system are anticipated as a result of the construction and operation of the proposed wastewater facility improvements.

Cumulative Impacts: No cumulative impacts on the existing gas system are anticipated as a result of the construction and operation of the proposed wastewater facility improvements. The project improvements are proposed to accommodate the projected wastewater flows based on the City and County of Honolulu Department of Planning and Permitting's population projections for the region. Therefore, the proposed improvements are not anticipated to induce increased development in the region which would otherwise potentially have a cumulative impact on the existing gas system.

#### 4.11 Recreation Resources

Direct Impacts and Mitigation Measures: No significant impacts on recreation resources in the planning region are anticipated as a result of the construction and operation of the proposed wastewater facility improvements.

During construction of the proposed facility improvements, storm runoff may carry increased amounts of sediment into the storm drain system and streams due to erosion from exposed soils, potentially impacting the water quality of recreational coastal waters in the area. Potential water quality impacts during construction of the proposed facility improvements will be mitigated by adherence to State of Hawaii and City and County of Honolulu water quality regulations governing grading, excavation and stockpiling (see Section 4.1.2). Construction of the MCBH Kaneohe Bay EQ facility, if pursued, will also be in accordance with the Base's *Storm Water Pollution Control Plan* (1996) as discussed in Section 4.1.2.

For dewatering that may be required during excavation and construction of the proposed improvements, a NPDES General Permit for Construction Activity Dewatering will be required for discharging dewatering effluent into City drainage systems and waters of the United States. The permit will require a BMP, erosion control plan and water quality monitoring plan (see Section 4.2.1).

Phased construction of the proposed wastewater facility improvements encompassing a larger area, such as the rehabilitation/replacement and installation of new sewer lines along lengthy corridors, will minimize the amount of soils exposed at a given time, thereby reducing the amount of storm runoff into recreational coastal waters.

The proposed wastewater facility improvements will have beneficial long-term water quality impacts on recreational coastal waters. The provision of flow equalization facilities and collection system improvements to reduce infiltration and inflow will reduce the probability of spills and bypasses to the coastal waters during rain storms. The improved facilities would enable flows that would otherwise potentially be overflows to be treated to a secondary level and eventually discharged through the Mokapu Outfall.

The proposed improvements and flows from the Kailua Regional WWTP would not cause a significant change in the ambient coastal water quality condition, which under normal circumstances, meets State Water Quality Standards. An increase in the secondary treatment capacity at the WWTP from the present 28 mgd to 35.6 mgd will not cause an exceedance in the DOH Water Quality Standards in the receiving waters at the outfall. The UV disinfection facility currently under construction at the Kailua Regional WWTP will also contribute to beneficial long-term water quality impacts on recreational coastal waters.

Implementation of the nine (9) Sewer Improvement Districts will reduce the probability of spills and overflows from failing individual wastewater systems to recreational coastal waters and further contribute to the beneficial impact on water quality.

*Potential impacts to recreational coastal waters due to leakage or accidental breakage in the transmission system will be mitigated by proper design, construction and operation of facilities. Standard procedures for detecting leaks and breaks and for shutting down and repairing the lines will minimize impacts. Appropriate public health warnings will be issued to mitigate risks of public contact with the wastewater.*

Any potential for wastewater spills at the affected wastewater facilities affecting recreational coastal waters in the event of flow diversion or flooding will be mitigated by designing the proposed facilities with adequate capacities (see Section 1.4.2 and Chapter 2) and flood protection (see Section 4.2.4).

Indirect Impacts: No indirect impacts on recreational coastal waters are anticipated as a result of the construction and operation of the proposed wastewater facility improvements.

Cumulative Impacts and Mitigation Measures: During construction of the proposed wastewater facility improvements, storm runoff may carry increased amounts of sediment into recreational coastal waters, potentially impacting water quality. Adherence to State and City water quality regulations governing grading, excavation, stockpiling, and dewatering during construction activities will control sedimentation in surface flows (see Sections 4.1.2 and

4.2.1). This will reduce the cumulative impacts on recreational coastal waters resulting from non-point source pollution.

The proposed wastewater facility improvements will have beneficial, cumulative water quality impacts on recreational coastal waters. The provision of flow equalization facilities and collection system improvements to reduce infiltration and inflow will reduce the probability of spills and bypasses to the coastal waters during rain storms. The proposed Sewer Improvement Districts will reduce the probability of spills and overflows from failing individual wastewater systems to recreational coastal waters and further contribute to the beneficial impact on water quality. The reduction of spills and bypasses to recreational coastal waters will help to reduce the cumulative impacts on the water quality resulting from regional non-point source pollution.

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

This section discusses the State of Hawaii and City and County of Honolulu plans, policies and controls that affect the proposed project.

### **5.1 Hawaii State Plan**

The Hawaii State Plan, embodied in Chapter 226, Hawaii Revised Statutes, serves a guide for goals, objectives, policies, and priorities for the State. The State Plan provides a basis for determining priorities, allocating limited resources, and improving coordination of State and County plans, policies, programs, projects, and regulatory activities. The proposed project is consistent with the following State Plan objectives, policies and priority guidelines.

*Section 226-11 Objectives and policies for the physical environment - land based, shoreline, and marine resources.*

*(b) (2) Ensure compatibility between land-based and water-based activities and natural resources and ecological systems.*

*(b) (3) Take into account the physical attributes of areas when planning and designing activities and facilities.*

*(b) (8) Pursue compatible relationships among activities, facilities, and natural resources.*

The proposed wastewater facility improvements will have beneficial water quality impacts on recreational coastal waters. The provision of flow equalization facilities and collection system improvements to reduce infiltration and inflow will reduce the probability of spills and bypasses to coastal waters during extended periods of rainfall. The improved facilities would enable flows that would otherwise potentially be overflows to be treated to a secondary level and eventually discharged through the Mokapu Outfall. The proposed Sewer Improvement Districts will reduce the probability of spills and overflows from failing individual wastewater systems to recreational coastal waters and further contribute to the beneficial impact on water quality.

The effluent discharge at the Mokapu Outfall resulting from the proposed facility improvements is anticipated to have no significant impact on aquatic resources in coastal waters. Any potential for wastewater spills at the proposed facilities which may affect aquatic resources in coastal waters will be mitigated by designing the facilities with adequate capacities and flood protection.

*Section 226-13 Objectives and policies for the physical environment - land, air, and water quality.*

*(b) (3) Promote effective measures to achieve desired quality in Hawaii's surface, ground, and coastal waters.*

*(b) (4) Encourage actions to maintain or improve aural and air quality levels to enhance the health and well-being of Hawaii people.*

The proposed improvements will reduce infiltration and inflow to surface and coastal waters during periods of heavy rainfall, thereby improving water quality. Implementation of the Sewer Improvement Districts will reduce the potential of coastal and groundwater contamination. The potential for wastewater spills impacting surface, ground and coastal waters during rain storms will be mitigated by design and operation of the facilities to accommodate peak flows and plant upset situations.

The City is undertaking short-, intermediate- and long-term odor mitigation measures to reduce the ~~presence of all sources of noxious air emissions~~ *emission of air pollutants* at the Kailua Regional WWTP. These measures include maintenance and operation activities, chemical treatment to reduce entry level of odorous components into treatment processes, and odor reduction systems installed to handle off-gases from unit processes.

Noise mitigation measures are recommended at the Kailua Regional WWTP to further reduce noise emanating from the plant's primary and secondary noise sources, namely the Odor Control Fans, Effluent Pumps and the Administration Building's exterior air-conditioning unit.

*Section 226-14 Objective and policies for facility systems - in general.*

*(b) (1) Accommodate the needs of Hawaii's people through coordination of facility systems and capital improvement priorities in consonance with state and county plans*

*(b) (2) Encourage flexibility in the design and development of facility systems to promote prudent use of resources and accommodate changing public demands and priorities.*

*(b) (3) Ensure that required facility systems can be supported within resource capacities and at a reasonable cost to the user.*

*Section 226-15 Objectives and policies for facility systems - solid and liquid wastes.*

*(b) (1) Encourage the adequate development of sewerage facilities that complement planned growth.*

The Kailua-Kaneohe-Kahaluu Facilities Plan is a 20-year plan which identifies the future wastewater needs for the Kailua-Kaneohe-Kahaluu wastewater service area and required improvements to the Kailua Regional WWTP, preliminary treatment facilities, pump stations, and collection and disposal system. The Facilities Plan was prepared in accordance with various Federal, State and City and County of Honolulu regulations and programs. The project improvements are proposed to accommodate the projected wastewater flows based on the City and County of Honolulu Department of Planning and Permitting's population projections for the planning region.

The City's capital and operating costs for the proposed improvements would be distributed among all wastewater system customers on Oahu. There will be a need for increased sewer rates resulting from the planned construction of the proposed improvements in the Facilities Plan.

*All facilities will be designed to meet the requirements of the Americans with Disabilities Act Accessibility Guidelines and the requirements of §103-50 and §103-50.5 Hawaii Revised Statutes. Buildings, facilities and sites shall also incorporate best design practices as noted in the recommendations from the U.S. Architectural and Transportation Barriers Compliance Board and the U.S.*



*Department of Transportation/Federal Highway Administration's May 1999 draft of "Accessible Rights-of-Way: A Design Guide" and the Regulatory Negotiating Committee - September 1999 Final Report on "Accessibility Guidelines For Outdoor Developed Areas".*

**Part III. Priority Guidelines**

The purpose of establishing priority guidelines is to address areas of statewide concern. The proposed project conforms to the following priority guidelines.

*Section 226-104 Population growth and land resources priority guidelines.*

*(a) (3) Ensure that adequate support services and facilities are provided to accommodate the desired distribution of future growth throughout the State.*

The proposed wastewater facility improvements will accommodate projected flows up to the year 2020 and will provide adequate wastewater systems to support the projected population and economic growth in the Kailua-Kaneohe-Kahaluu region. The project improvements are proposed to accommodate the projected wastewater flows based on the City and County of Honolulu Department of Planning and Permitting's population projections for the planning region. By the year 2020, the population of the Kailua-Kaneohe-Kahaluu region is projected to increase 3.2 percent from 105,819 in 1995 to 109,236.

**5.2 State Functional Plans**

The Statewide planning system requires the development of State Functional Plans which are approved by the Governor of Hawaii. The State Functional Plans guide the implementation of State and County actions in the areas of agriculture, conservation lands, education, energy, health, higher education, historic preservation, housing, recreation, tourism, water resources development, transportation, employment, and human services. The proposed project is consistent with the following objectives, policies and implementing actions:

**State Recreation Functional Plan**

*Objective IV-B: Prevent degradation of the marine environment.*

*Policy IV-B(1): Enhance water quality to provide high-quality ocean recreation opportunities.*

*Implementing Action IV-B(1)a: Regularly monitor water quality at key ocean recreation sites.*

The proposed wastewater facility improvements will have beneficial water quality impacts on recreational coastal waters. The provision of flow equalization facilities and collection system improvements to reduce infiltration and inflow will reduce the probability of spills and bypasses to recreational coastal waters during periods of heavy rainfall. The improved facilities would enable flows that would otherwise potentially be overflows to be treated to a secondary level and eventually discharged through the Mokapu Outfall. The UV disinfection facility currently under construction at the Kailua Regional WWTP will also contribute to beneficial water quality impacts on recreational coastal waters. The proposed Sewer Improvement Districts will reduce the probability of spills and overflows from failing individual wastewater systems to recreational coastal waters and further contribute to the beneficial impact on water quality.

As part of the NDPEs permit which the Kailua Regional WWTP operates under, the City is required to regularly monitor shoreline, nearshore and offshore stations to ensure that nutrient levels do not exceed State water quality standards.

**5.3 State Land Use District**

The State Land Use Law, Chapter 205, Hawaii Revised Statutes (HRS), is intended to preserve, protect and encourage the development of lands in the State for uses which are best suited to the public health and welfare for Hawaii's people. All lands in the State are classified into four land use districts by the State Land Use Commission: Urban, Agricultural, Conservation, and Rural.

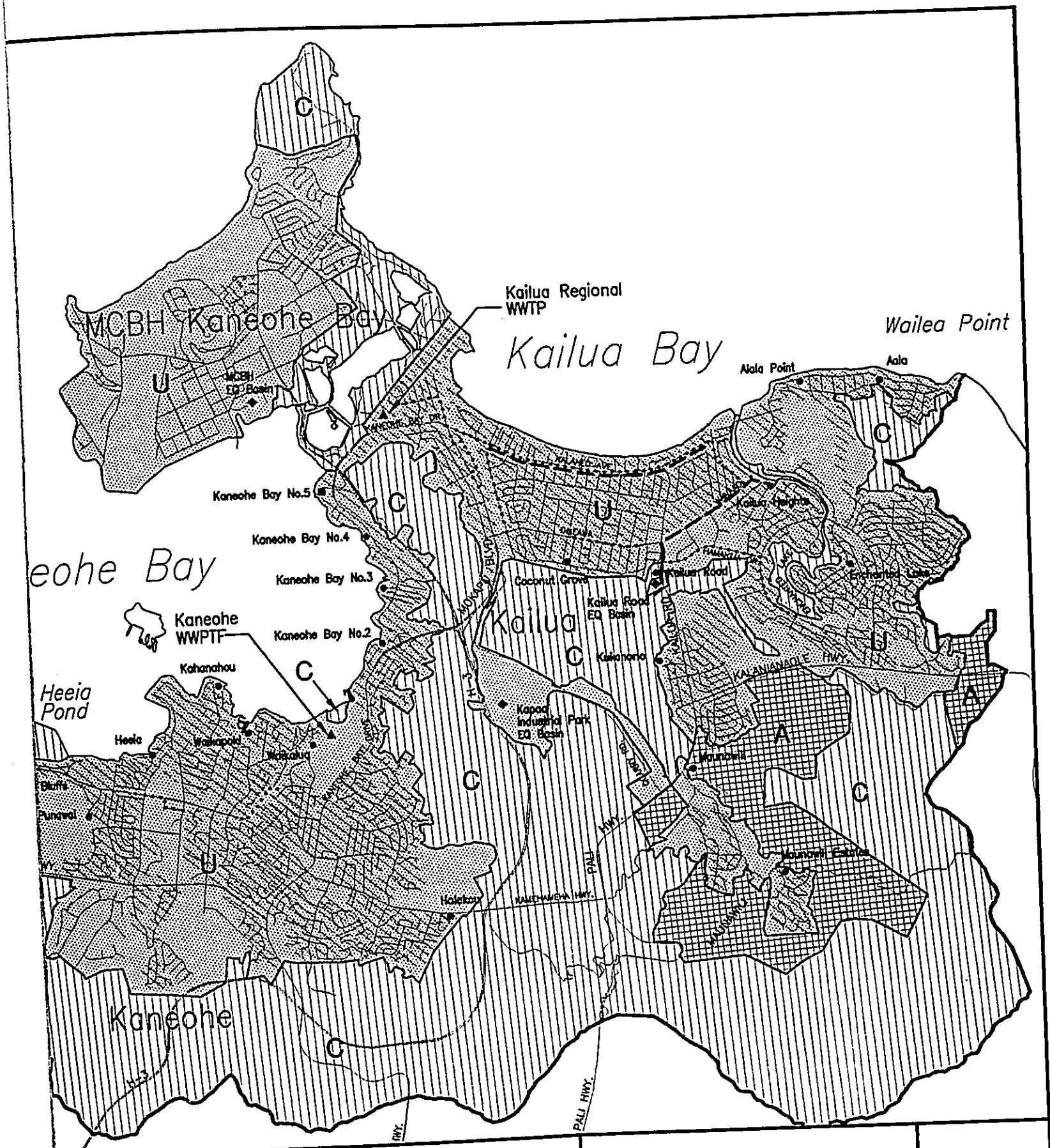
Three land use districts are found in the planning area: Urban, Agricultural and Conservation (see Figure 5-1). Conservation lands are the most prevalent, encompassing the forest reserves, ridges and slopes of the Koolau Range, Oneawa Hills bordering Kaneohe and Kailua, Kawai Nui Marsh, Nuupia Ponds, Moli and Heeia Fishponds, and portions of Heeia and Kahaluu. Agricultural lands are found mainly in the Kahaluu area extending from Kaoio Point south to the Waiahole area, and in Maunawili. Urban lands comprise the remainder of the planning area. Most of the lands within the MCBH Kaneohe Bay facility are classified Urban, with the exception of lands within the southeastern portion of the facility which are designated Conservation. Although State land use designations do not regulate land use on Federal property, they are mentioned here for reference.

With the exception of the Maunawili WWPS which is located within the Agricultural District and the Kailua Road WWPS which is located within the Conservation District, all existing and proposed wastewater treatment, pretreatment, WWPS, and equalization storage facilities are located within the Urban District. These existing and proposed improvements are consistent with the respective Urban, Agricultural and Conservation District classifications.

The Kailua Road WWPS site is located within the Protective (P) subzone of the Conservation District. Proposed improvements to the Kailua Road WWPS would be subject to a Conservation District Use Application (CDUA) pursuant to the State Department of Land and Natural Resources (DLNR) Administrative Rules, Title 13, Chapter 5 for lands designated in the Conservation District. The proposed installation of sewer lines within the Conservation District would also be subject to the CDUA requirements.




#### **5.4 State Coastal Zone Management Program**

Hawaii's Coastal Zone Management (CZM) Program, established pursuant to Chapter 205A, HRS, as amended, is administered by the State Office of Planning (OP) and provides for the beneficial use, protection and development of the State's coastal zone. The objectives and policies of the Hawaii CZM Program encompass broad concerns such as impact on recreational resources, historic and archaeological resources, coastal scenic resources and open space, coastal ecosystems, coastal hazards, and the







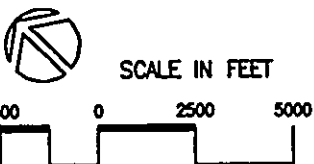
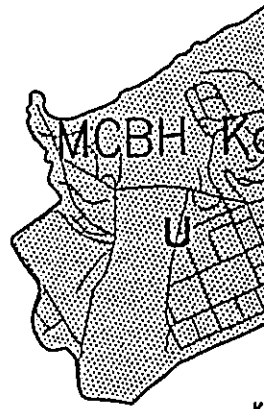
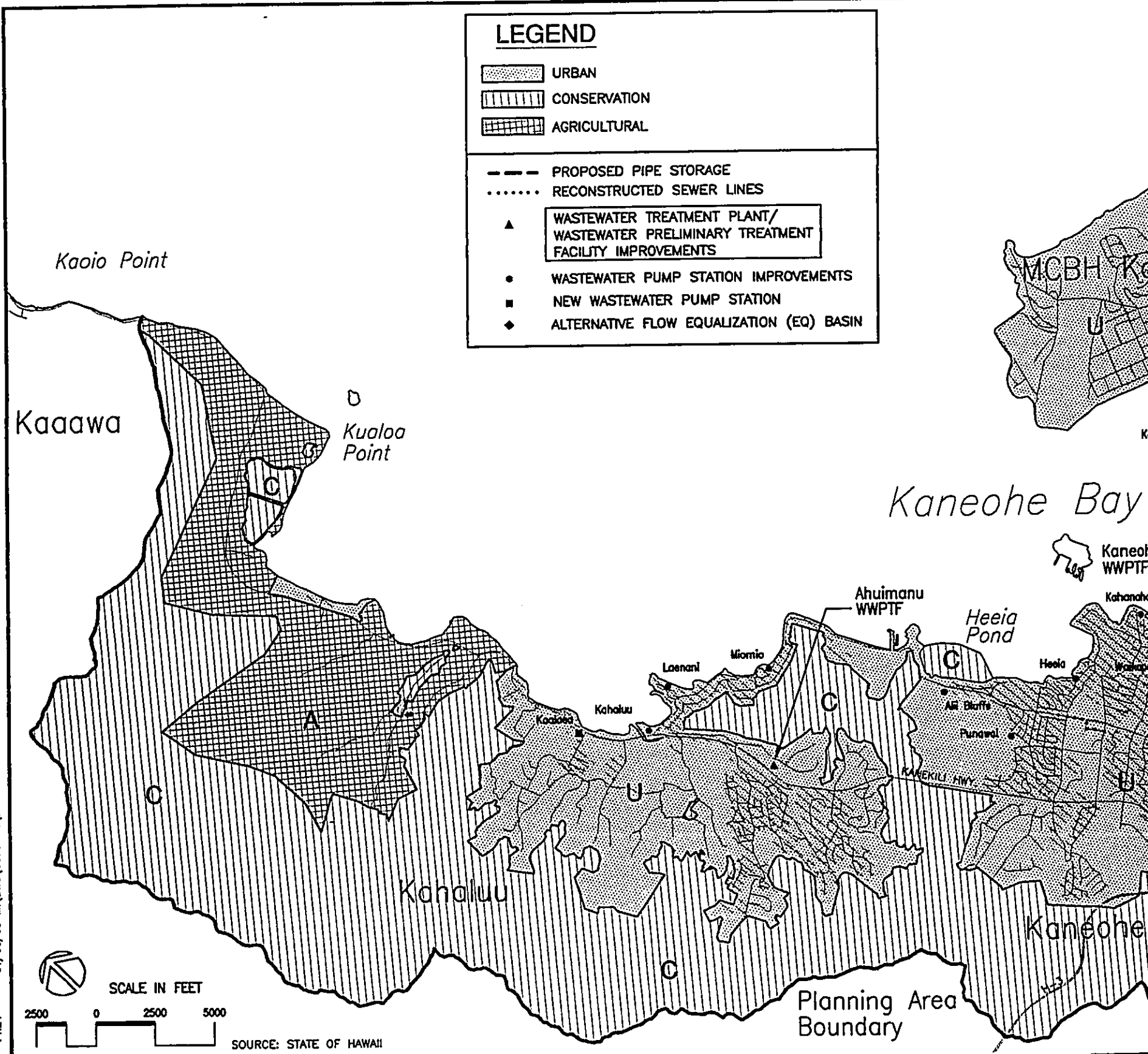
PLAN	STATE LAND USE DISTRICTS	FIGURE 5-1
CTS		

### LEGEND

-  URBAN
-  CONSERVATION
-  AGRICULTURAL

-  PROPOSED PIPE STORAGE
-  RECONSTRUCTED SEWER LINES

-  WASTEWATER TREATMENT PLANT/  
WASTEWATER PRELIMINARY TREATMENT  
FACILITY IMPROVEMENTS
-  WASTEWATER PUMP STATION IMPROVEMENTS
-  NEW WASTEWATER PUMP STATION
-  ALTERNATIVE FLOW EQUALIZATION (EQ) BASIN



SOURCE: STATE OF HAWAII

## KAILUA-KANEOHE-KAHALUU FACILITIES PLAN STATE LAND USE DISTRICTS



WILSON OKAMOTO  
& ASSOCIATES, INC.  
ENGINEERS • PLANNERS

01/06/99 M:\DWG\3378-01\FIGURE 14:24 NW-LINDUSE.DWG

management of development. The applicability of the CZM objectives and policies to the Kailua-Kaneohe-Kahaluu Facilities Plan is as follows:

**1. *Recreational Resources***

*Objective: Provide coastal recreational opportunities accessible to the public.*

*Policies:*

*(B) Provide adequate, accessible, and diverse recreational opportunities in the coastal zone management area by:*

- (vi) Adopting water quality standards and regulating point and nonpoint sources of pollution to protect, and where feasible, restore the recreational value of coastal waters.*

The proposed wastewater facility improvements will have beneficial water quality impacts on recreational coastal waters. The provision of flow equalization facilities and collection system improvements to reduce infiltration and inflow will reduce the probability of spills and bypasses to coastal waters during periods of heavy rainfall. The improved facilities would enable flows that would otherwise potentially be overflows to be treated to a secondary level and eventually discharged through the Mokapu Outfall. The UV disinfection facility currently under construction at the Kailua Regional WWTP will also contribute to beneficial water quality impacts on recreational coastal waters. The proposed Sewer Improvement Districts will reduce the probability of spills and overflows from failing individual wastewater systems to recreational coastal waters and further contribute to beneficial water quality impact. The reduction of spills and bypasses to recreational coastal waters will help to reduce the cumulative impacts on the water quality resulting from regional non-point source pollution.

**4. *Coastal Ecosystems***

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

*Policies:*

*(C) Minimize disruption or degradation of coastal water ecosystems by effective regulation of stream diversions, channelization, and similar land and water uses, recognizing competing water needs;*

*(D) Promote water quantity and quality planning and management practices which reflect the tolerance of fresh water and marine ecosystems and prohibit land and water uses which violate state water quality standards.*

Potential impacts to aquatic resources will be mitigated by the provision of flow equalization facilities to reduce peak flows and collection system improvements to reduce infiltration and inflow, thereby reducing the probability of spills and bypasses to streams and coastal waters during rain storms. Any potential for wastewater spills at the proposed facilities which may affect aquatic resources in coastal waters will be mitigated by designing the facilities with adequate capacities and flood protection.

The effluent discharge at the Mokapu Outfall resulting from the proposed facility improvements is anticipated to have no significant impact on aquatic resources in coastal waters. As part of the NPDES permit process for the Kailua Regional WWTP, the City is required to monitor coastal water quality, and implement a biological monitoring program to evaluate potential impacts on aquatic fauna.

**5. Coastal Hazards**

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

*Policies:*

*(C) Ensure that developments comply with requirements of the Federal Flood Insurance Program.*

Development of the proposed wastewater facility improvements within the designated flood hazard districts will be in accordance with regulations set forth in Section 21-9.10 Flood Hazard Districts of the City and County of Honolulu's LUO, and subject to the preparation of flood studies pursuant to

the Section, as may be required. Construction of the proposed facility improvements will be mitigated by designing the facilities to minimize adverse effects on flood heights, as well as minimize operational disruptions and facilities damage during a major flood event. For facility improvements located within the tsunami inundation zone, any potential for disruptions or spills in the event of a tsunami will be mitigated by designing these improvements in accordance with the City and County of Honolulu's Building Code, Subsection (f) Coastal Floodwater Design.

### **5.5 City and County of Honolulu General Plan**

The General Plan for the City and County of Honolulu, initially adopted in 1977, is a statement of the long-range social, economic, environmental, and design objectives for the general welfare and prosperity of the people of Oahu. The Plan is also a statement of broad policies which facilitate the attainment of the objectives of the Plan. Eleven subject areas provide the framework for the City's expression of public policy concerning the needs of the people and functions of government. These areas include population; economic activity; the natural environment; housing; transportation and utilities; energy; physical development and urban design; public safety, health and education; culture and recreation; and, government operations and fiscal management. The relationship of the proposed project improvements to the relevant objectives and policies of the General Plan are as follows:

#### *I. Population*

*Objective B: To plan for future population growth.*

*Policy 1: Allocate efficiently the money and resources of the City and County in order to meet the needs of Oahu's anticipated future population.*

The current Facilities Plan is a 20-year plan which identifies the future wastewater needs for the Kailua-Kaneohe-Kahaluu wastewater service area and required improvements to the Kailua Regional WWTP, preliminary treatment facilities, pump stations, and collection and disposal system. Existing and projected wastewater flows for the region incorporate population and land use considerations as provided by the City and County of Honolulu Department of Planning and Permitting.



*The project improvements are proposed to accommodate the projected wastewater flows based on the City and County of Honolulu Department of Planning and Permitting's population projections for the region. By the year 2020, the population of the region is projected to increase 3.2 percent from 105,819 in 1995 to 109,236.*

*III. Natural Environment*

*Objective A: To protect and preserve the natural environment.*

*Policy 7: Protect the natural environment from damaging levels of air, water, and noise pollution.*

The City is undertaking short-, intermediate- and long-term odor mitigation measures to reduce the ~~presence of all sources of noxious air emissions~~ *emission of air pollutants* at the Kailua Regional WWTP. These measures include maintenance and operation activities, chemical treatment to reduce entry level of odorous components into treatment processes, and odor reduction systems installed to handle off-gases from unit processes.

The provision of flow equalization facilities and collection system improvements to reduce infiltration and inflow will reduce the probability of spills and bypasses to surface and coastal waters during rain storms, thereby improving the level of water quality. The proposed Sewer Improvement Districts will reduce the probability of spills and overflows from failing individual wastewater systems to surface and coastal waters and further contribute to the beneficial impact on water quality. The reduction of spills and bypasses to surface and coastal waters will help to reduce the cumulative impacts on water quality resulting from regional non-point source pollution.

Although the noise assessment conducted for the Kailua Regional WWTP concluded that the noise levels produced by the current operations at the plant do not significantly impact the nearby residential communities, noise mitigation measures are recommended at the Kailua Regional WWTP to further reduce noise emanating from the plant's primary and secondary noise sources, namely the Odor Control Fans, Effluent Pumps and the Administration Building's exterior air-conditioning unit.

**V. *Transportation and Utilities***

***Objective B: To meet the needs of the people of Oahu for an adequate supply of water and for environmentally sound systems of waste disposal.***

***Policy 5: Provide safe, efficient, and environmentally sensitive waste-collection and waste-disposal services.***

The proposed wastewater facility improvements will generally be environmentally sensitive. The provision of flow equalization facilities and collection system improvements to reduce infiltration and inflow will reduce the probability of spills and bypasses to surface and coastal waters during rain storms, thereby improving the level of water quality. Implementation of the Sewer Improvement Districts will reduce the probability of spills and overflows from failing individual wastewater systems to surface and coastal waters and further contribute to the beneficial impact on water quality.

If the MCBH Kaneohe Bay EQ facility alternative were to be pursued, environmental permitting requirements would need to be met, and a wetlands mitigation plan would need to be addressed, in coordination with environmental managers at the MCBH Kaneohe Bay, the U.S. Army Corps of Engineers and the U.S. Fish and Wildlife Service to mitigate such impacts.

***Objective C: To maintain a high level of service for all utilities.***

***Policy 1: Maintain existing utility systems in order to avoid major breakdowns.***

***Policy 2: Provide improvements to utilities in existing neighborhoods to reduce substandard conditions.***

***Policy 3: Plan for the timely and orderly expansion of utility systems.***

The proposed improvements to the wastewater collection system are intended to prevent groundwater infiltration and storm water inflow which currently plague the system. Improvements include the rehabilitation of up to seven (7) collection system basins to reduce storm water infiltration/inflow to the collection system, the rehabilitation/replacement of corrosive and structurally deteriorated sewer lines throughout the region, and

pump station replacement and force main replacement and/or rehabilitation due to the design life of these facilities or pump station component systems expiring during the planning period.

Service will be provided to unsewered areas with the proposed implementation of nine (9) Sewer Improvement Districts serving 764 lots in the region. This will reduce the probability of spills and overflows from failing individual wastewater systems to surface and coastal waters, as well as reduce the potential of groundwater contamination.

In the planning region, although limited population growth is expected over the next 20 years, flows are substantially influenced by infiltration and inflow to the collection system during heavy rainfall periods. The project's phasing plan gives priority to odor and noise control improvements and the rehabilitation/replacement of collection system lines which show severe corrosion or deterioration.

#### **5.6 City and County of Honolulu Development Plan**

The City and County of Honolulu's Development Plan (DP) program provides a relatively detailed framework for implementing the objectives and policies of the General Plan on an islandwide basis. Eight Development Plans have been adopted covering the entire island. The Development Plan Ordinance consists of Common Provisions applicable to all Development Plan areas, Special Provisions for each area, Land Use Map, and Public Facilities Map.

The project area is located within the Koolaupoko DP which spans the windward coastal and valley areas from Makapuu Point to Kaoio Point at the northern end of Kaneohe Bay. The Koolaupoko DP area is bounded by the Koolau Mountain Range and the sea, and includes the agricultural communities of Kahaluu, Waiahole-Waikane, Kuaioa, and Waimanalo, and the more suburban communities of Kailua and Kaneohe.

The existing Koolaupoko DP is currently undergoing revision by the City and County of Honolulu's Department of Planning and Permitting. The plan for this region has been titled "Koolaupoko *Sustainable* Communities Plan" to reflect the relatively stable population and economic activity growth envisioned for the region. Further discussion of the Koolaupoko *Sustainable* Communities Plan is included in Section 5.6.3.

**Common Provisions:** The DP Common Provisions establish general design principles and controls applicable to all DP amendments and proposed developments. In Section 24-1.9(b) of the Common Provisions, priority is given to those projects that:

*(1)(A) will improve or replace existing public facilities in unsound condition.*

*(2)(B) are consistent with the general plan pattern of population distribution for each development plan area.*

*(2)(D) will not encourage growth in urban fringe and rural areas.*

The proposed improvements to the wastewater collection system are intended to prevent groundwater infiltration and inflow which currently plague the system. Improvements include the rehabilitation of up to seven (7) collection system basins to reduce storm water infiltration/inflow to the collection system, the rehabilitation/replacement of corrosive and structurally deteriorated sewer lines throughout the region, and pump station replacement and force main replacement and/or rehabilitation due to the design life of these facilities or pump station component systems expiring during the planning period.

The project improvements are proposed to accommodate the projected wastewater flows based on the City and County of Honolulu Department of Planning and Permitting's population projections for the region. By the year 2020, the population of the region is projected to increase 3.2 percent from 105,819 in 1995 to 109,236. As such, the proposed improvements are not anticipated to induce increased development in the region.

**Special Provisions:** In Section 24-6.2 of the Special Provisions for Koolaupoko, specific urban design considerations relevant to the proposed facility improvements include the following:

*(a)(2) Public Views*

*In order to promote pleasing and attractive living environments and panoramic mauka and makai views from public places, views of major landmarks from public places shall be protected whenever possible. Important views include, but are not limited to the following:*

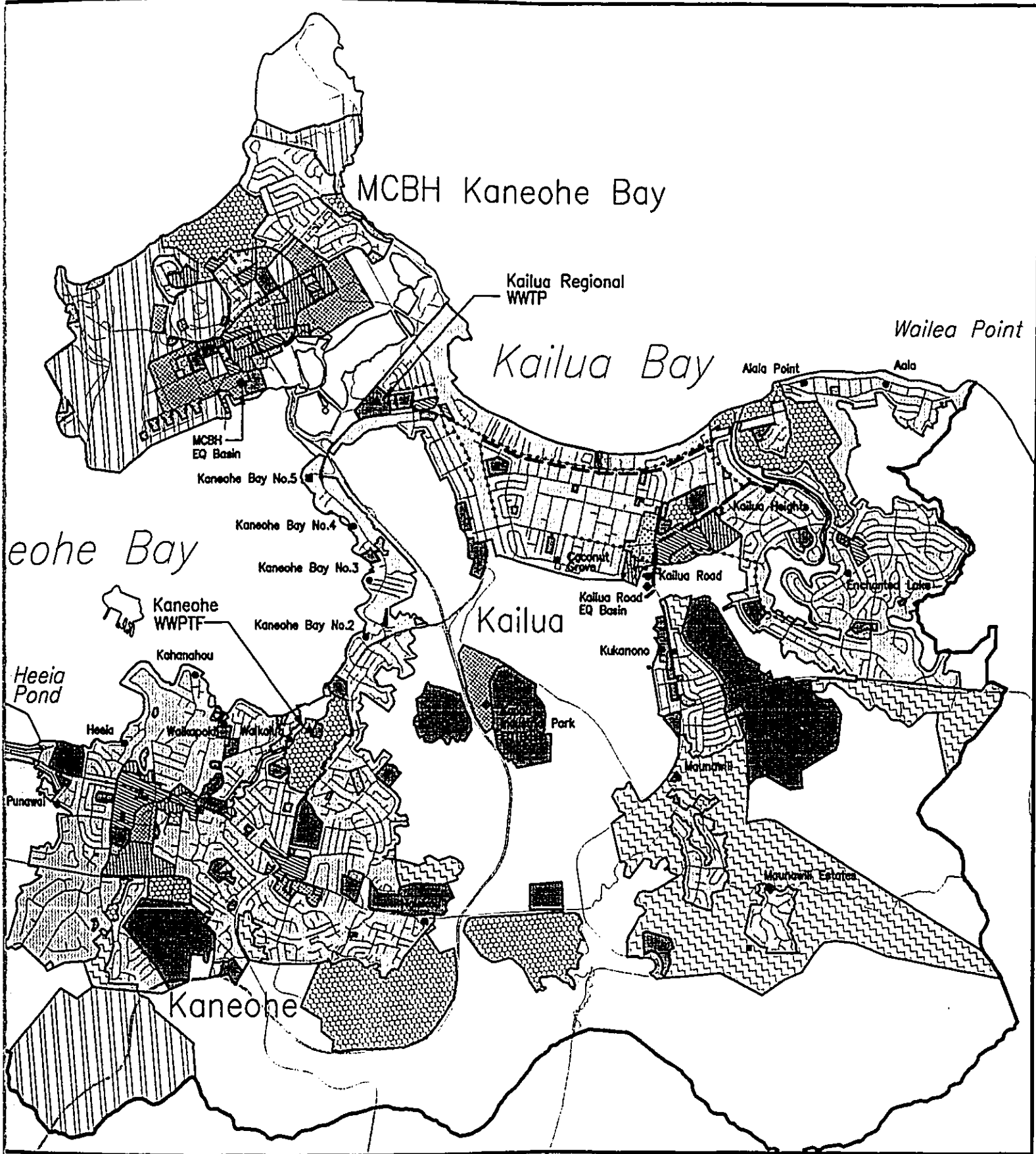
*(H) Views of Kawainui Marsh from Mokapu Boulevard, Kalaniana'ole Highway and Kailua Road.*

Development of the equalization basin at the Kailua Road EQ site, if pursued, will be placed partially underground and landscaped with a mini-park above to maintain aesthetic compatibility, as well as enhance views of the site and Kawai Nui Marsh beyond from Kailua Road. The landscaped mini-park would also provide a scenic vantage point for views of the adjacent marsh.

**5.6.1 Development Plan Land Use Map**

The Development Plan Land Use Maps depict land use patterns which are consistent with the objectives and policies for the General Plan. The Land Use Map presents land use classifications for both existing built-up areas, as well as projected development areas, and public and quasi-public facilities. All major and minor roadways are considered "undesigned" on the DP Land Use Map. The inclusion of projected development areas on the Land Use Map provides the mechanism by which the DP is able to allocate population densities recommended in the General Plan.

As shown in Figure 5-2, the predominant DP land use in the planning area is Preservation which encompasses the Koolau Range, Oneawa Hills, Kawai Nui Marsh, Nuupia Ponds and various other fishponds in the region, and areas of Heeia. Residential designated lands are mostly located within the central core areas of Kailua, Kaneohe and Kahaluu, with Commercial and Public Facility lands scattered throughout the respective town core areas. Agriculture designated lands are predominant in Kahaluu and Maunawili. Lands designated Military are located within the western portion of the MCBH Kaneohe Bay and within the slopes and foothills of the Koolau Range in Kaneohe.



PLAN

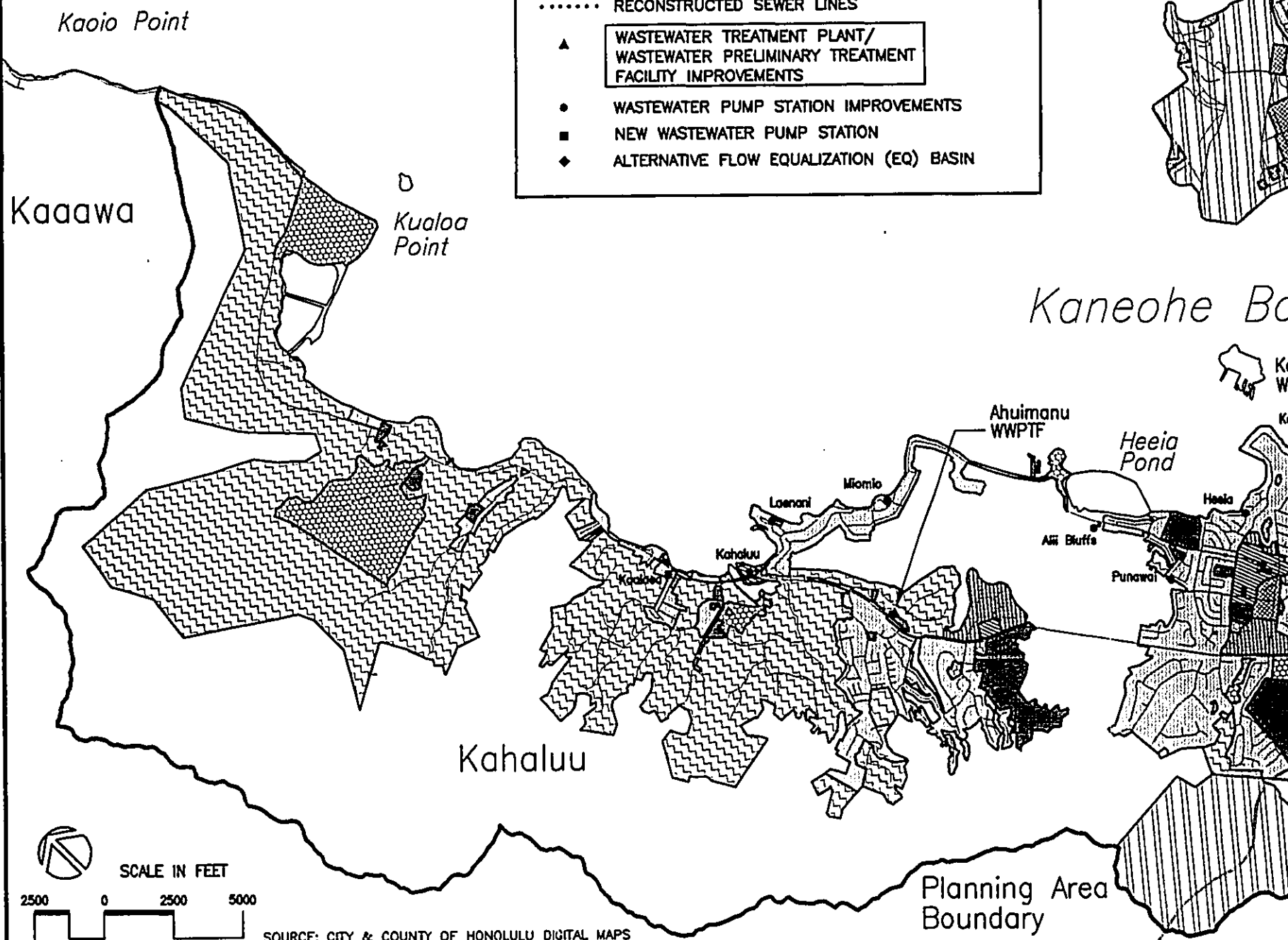
DEVELOPMENT PLAN  
LAND USE MAP

FIGURE  
5-2

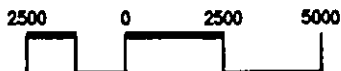
### LEGEND

	AGRICULTURE		APARTMENT
	PARK		MILITARY
	PUBLIC FACILITY		INDUSTRIAL
	RESIDENTIAL		COMMERCIAL EMPHASIS MIXED USE
	COMMERCIAL		PRESERVATION

- PROPOSED PIPE STORAGE
- ..... RECONSTRUCTED SEWER LINES
- ▲ WASTEWATER TREATMENT PLANT/  
WASTEWATER PRELIMINARY TREATMENT  
FACILITY IMPROVEMENTS
- WASTEWATER PUMP STATION IMPROVEMENTS
- NEW WASTEWATER PUMP STATION
- ◆ ALTERNATIVE FLOW EQUALIZATION (EQ) BASIN



SCALE IN FEET



SOURCE: CITY & COUNTY OF HONOLULU DIGITAL MAPS

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KAILUA-KANEOHE-KAHALUU FACILITIES PLAN

## DEVELOPMENT PLAN LAND USE MAP

The DP Land Use Map designations for the existing and proposed wastewater facilities in the planning region are described in Table 5-1 and shown in Figure 5-2.

The proposed wastewater facility improvements are consistent with the respective DP Land Use Map designations. Regarding the MCBH Kaneohe Bay EQ facility, although City and County of Honolulu land use designations do not regulate land use on Federal property, it is mentioned here for reference.

<b>Table 5-1 Development Plan Land Use Map, Zoning and Special Management Area Designations Existing and Proposed Wastewater Facilities</b>			
<b>Facility</b>	<b>DP Land Use Map</b>	<b>Zoning</b>	<b>Within SMA</b>
Kailua Regional WWTP	Public Facilities	R-10 Residential District	No
Kaneohe WWPTF	Public Facilities	I-2 Intensive Industrial District and P-2 General Preservation District	Yes
Ahuimanu WWPTF	Public Facilities	Country District	No
<b>Pump Stations</b>			
<b>Kailua Basin:</b>			
Aala WWPS	Residential	R-10 Residential District	Yes
Alala Point WWPS	Public Facilities	R-10 Residential District	Yes
Coconut Grove WWPS	Public Facilities	R-5 Residential District	No
Enchanted Lake WWPS	Public Facilities	R-5 Residential District	No
Kailua Heights WWPS	Public Facilities	R-10 Residential District	Yes
Kailua Road WWPS	Public Facilities	P-1 Restricted Preservation District	Yes
Kukanono WWPS	Public Facilities	P-2 General Preservation District	Yes
Maunawili WWPS	Public Facilities	Ag-2 General Agricultural District	Yes
Maunawili Estates WWPS	Public Facilities	R-20 Residential District	No
<b>Kaneohe Basin:</b>			
Kahanahou WWPS	Public Facilities	R-10 Residential District	Yes
Waikalua WWPS	Public Facilities	R-5 Residential District	Yes
Punawai WWPS	Public Facilities	R-7.5 Residential District	Yes
Alii Bluffs WWPS	Preservation	P-2 General Preservation District	Yes
Heeia WWPS	Public Facilities	R-7.5 Residential District	Yes
Waikapoki WWPS	Public Facilities	R-10 Residential District	Yes
Halekou WWPS	Public Facilities	R-5 Residential District	No
Kaneohe Bay #2 WWPS	Public Facilities	R-7.5 Residential District	Yes
Kaneohe Bay #3 WWPS	Public Facilities	R-5 Residential District	Yes
Kaneohe Bay #4 WWPS	Public Facilities	R-10 Residential District	Yes
Kaneohe Bay #5 WWPS	Residential	R-10 Residential District	Yes



<b>Table 5-1 (cont.)                      Development Plan Land Use Map, Zoning and                      Special Management Area Designations                      Existing and Proposed Wastewater Facilities</b>			
Facility	DP Land Use Map	Zoning	Within SMA
<b>Ahuimanu Basin:</b>			
Miomio WWPS	Public Facilities	R-10 Residential District	Yes
Kahaluu WWPS	Public Facilities	B-1 Neighborhood Business District	Yes
Laenani WWPS	Public Facilities	P-2 General Preservation District	Yes
Kaalaea LPSS(Proposed)	Residential	R-10 Residential District	Yes
<b>Alternative Flow Equalization Storage Facilities</b>			
Kailua Road EQ	Preservation and Commercial	P-2 General Preservation District and R-5 Residential District	Yes
Kapaa Industrial Park EQ	Industrial	I-2 Intensive Industrial District	Yes
MCBH Kaneohe Bay EQ	Military, Industrial, Public Facilities, and Various Other Land Use Designations	F-1 Military and Federal Preservation District	Yes

**5.6.2 Development Plan Public Facilities Map**

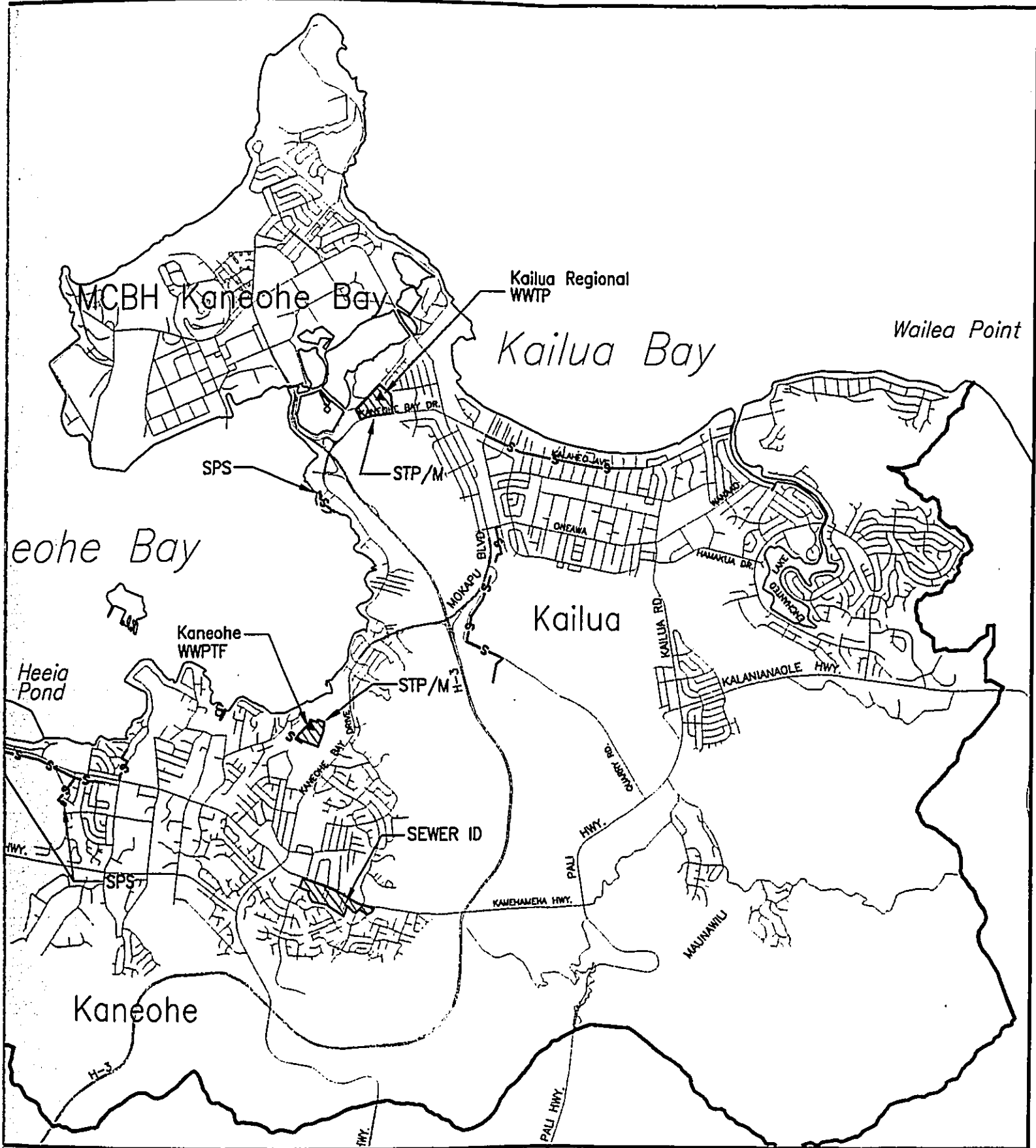
The Development Plan (DP) Public Facilities Map identifies public and private proposals for parks, streets and highways, major public buildings, utilities, terminals, and drainage. The approximate location of all major planned public facilities is shown on the PF Map. Major facilities generally include those which: 1) significantly increase system capacity; 2) expand service areas; 3) change the function of an existing facility; 4) involve replacement of or renovations to existing facilities which would permit significant new development or redevelopment; 5) have a significant impact on surrounding land uses; or 6) cost over \$1,000,000 for capital improvements; however, improvement districts, the addition of equipment, and the repair, replacement, renovation or modification of existing facilities which would not involve any significant expansion of existing facilities shall not be deemed a major public facility even if the cost exceeds \$1,000,000, so long as items 1) through 5) above are not affected. Amendments to the DP Public Facilities Map are processed by the City and County of Honolulu Department of Planning and Permitting and approved by the Honolulu City Council.

The Koolaupoko DP Public Facilities Map identifies major sewer facilities in the planning region as shown in Figure 5-3 and described below:

- The Kailua Regional WWTP site is designated for modification (STP/M).
- The Kaneohe WWPTF site is designated for modification and a park (Park/STP/M). Plans are currently being prepared for a park to be developed within a portion of the WWPTF site by the developers of the adjacent Bayview Golf Links.
- A sewer system is designated for the segment of Kalaheo Avenue between Kainui Drive and Makawao Street.
- A sewage pump station (SPS) is designated for the site proposed for the Kaneohe Bay No. 5 WWPS. Construction of a new 0.25 mgd pump station and approximately 1,200 feet of 8-inch force main to the Kailua Regional WWTP to service 67 lots in Malae was recently completed.
- A Sewer Improvement District (Sewer ID) is designated for the area in Kaneohe west of Kamehameha Highway between Mahinui Road and Luluku Road. This Sewer ID, identified as the Kaneohe Sewers Section 9 Improvement District, was recently completed by the City.
- A sewer system is designated for an area west of the Kaneohe WWPTF.
- A sewer system is designated along Lilipuna Road between Kamehameha Highway and Nahiku Street, and continuing north along Nahiku Street and east along Yacht Club Street to Punalei Place.
- A sewage pump station (SPS) is designated for the area west of Hinalani Street in Heeia. The Punawai WWPS was constructed in the nearby vicinity in 1994.

- A sewer system is designated along Halaulani Street between Kamehameha Highway and the aforementioned sewage pump station designated west of Hinalani Street.
- A sewage pump station (SPS) is designated in the area adjacent to and west of Kamehameha Highway in the vicinity of Heeia Pond. The Alii Bluffs WWPS was constructed in this area in 1995.
- A sewer system is designated along Kamehameha Highway between the aforementioned designated sewage pump station (Alii Bluffs WWPS) and the area between Heeia Street and Haiku Road.
- A sewage pump station (SPS) is designated for the area just west of Kahekili Highway and south of Ahuimanu Road. The Kahaluu Housing WWPS was completed in 1998 in the nearby vicinity.
- A Sewer Improvement District (Sewer ID) is designated for the area west of Kahekili Highway in the vicinity of Ahuimanu Road. This Sewer ID, identified as the Kahaluu Sewers Section 4 Improvement District, was recently completed by the City.
- A sewage pump station (SPS) is designated for the area adjacent to and east of Kamehameha Highway between Wailehua and Kaalaea Roads. The Kaalaea WWPS would be constructed along Wailehua Road, as an alternative to a proposed low-pressure sewer system (LPSS) to service the Kahaluu Sewers, Section 3 Improvement District.
- A sewer system is proposed along Kamehameha Highway from the aforementioned designated sewage pump station south to the vicinity of Kahaluu Pond.

Until the proposed Koolaupoko *Sustainable* Communities Plan is adopted (see Section 5.6.3), the Koolaupoko DP Public Facilities Map would need to be amended to reflect the proposed wastewater facility improvements designated as major planned public facilities. Regarding the MCBH Kaneohe Bay EQ facility, City and County of Honolulu land use designations do not regulate land use on Federal property.







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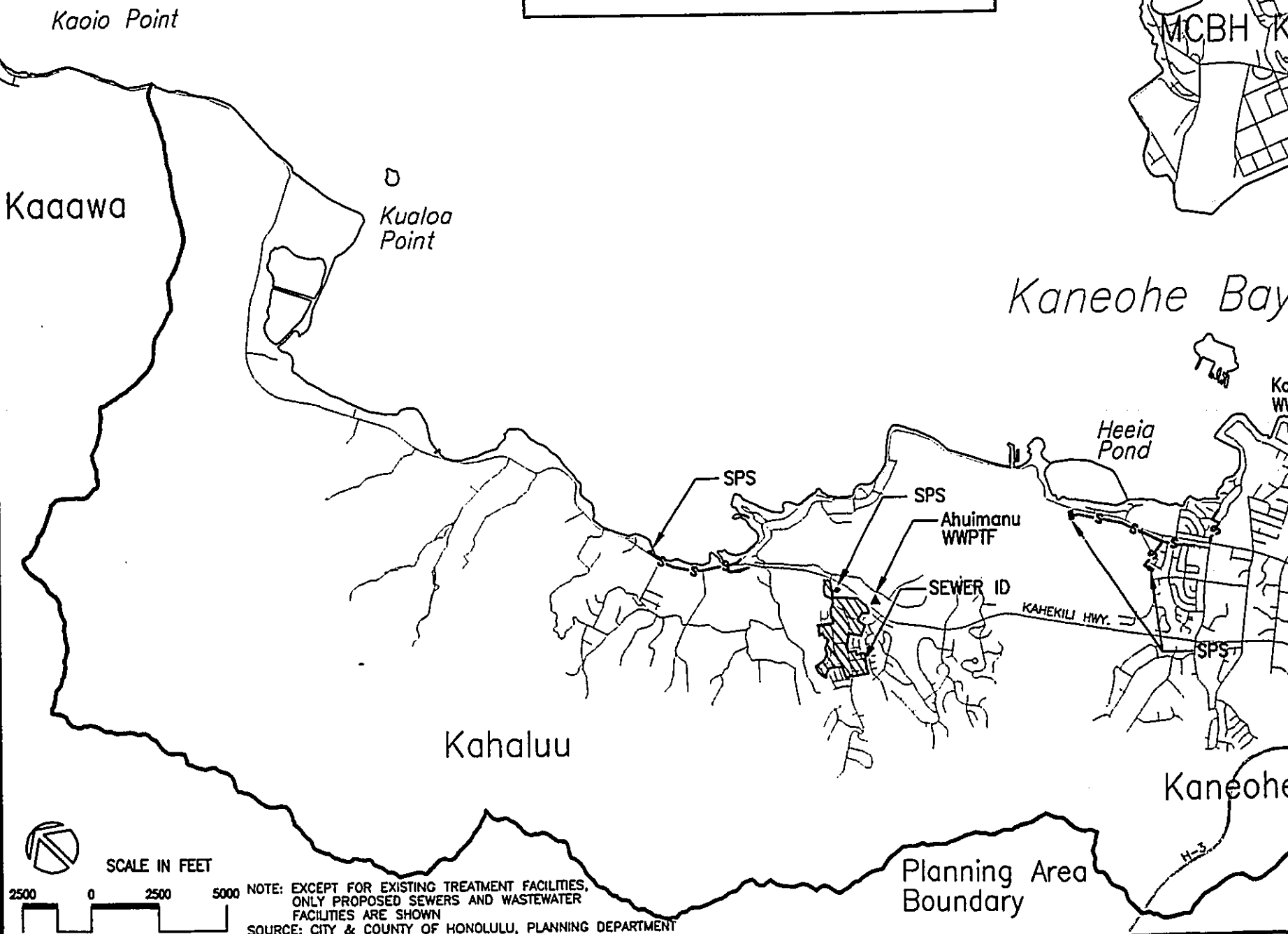
DEVELOPMENT PLAN PUBLIC  
FACILITIES MAP

FIGURE  
5-3

**LEGEND**

-  SEWER ID
-  SEWAGE TREATMENT PLANT -- MODIFY EXISTING FACILITY
-  SEWAGE PUMP STATION
-  SEWER SYSTEM

 WASTEWATER TREATMENT PLANT/  
WASTEWATER PRELIMINARY TREATMENT  
FACILITY IMPROVEMENTS



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SCALE IN FEET



NOTE: EXCEPT FOR EXISTING TREATMENT FACILITIES,  
ONLY PROPOSED SEWERS AND WASTEWATER  
FACILITIES ARE SHOWN  
SOURCE: CITY & COUNTY OF HONOLULU, PLANNING DEPARTMENT

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**DEVELOPMENT PLAN PUBLIC  
FACILITIES MAP**

### **5.6.3 Koolaupoko *Sustainable* Communities Plan**

The existing DP for the Koolaupoko area is currently undergoing revision by the City and County of Honolulu's Department of Planning and Permitting (DPP) as part of the Development Plan Revision Program initiated in 1993. The DP Revision Program entails comprehensive revisions of the eight DPs in response to a 1992 City Charter amendment to change the definition of DPs from "relatively detailed" plans to "conceptual schemes" for implementing General Plan development objectives and policies.

A draft of the Koolaupoko *Sustainable* Communities Plan was prepared by the City DDP in June 1999. It is one of eight community-oriented plans intended to help guide public policy, investment, and decision-making through the 2020 planning horizon. As the Koolaupoko planning region is envisioned to remain relatively stable in terms of population and economic activity growth, the plan for this region has been titled "Koolaupoko *Sustainable* Communities Plan" and is focused on serving as a policy guide for public actions in support of that goal. The vision for Koolaupoko focuses on the long-term protection of community resources and the adoption of public improvement programs and development regulations that reflect a stable population with changing community needs. The Plan will be processed through the City and County of Honolulu Planning Commission and then the Honolulu City Council for ordinance adoption.

The draft Koolaupoko *Sustainable* Communities Plan sets forth general policies and principles for public facilities and infrastructure in the region. The general policies and principles for wastewater treatment are as follows:

#### **4.3 General Policies**

*The following general policies apply to wastewater treatment in Koolaupoko:*

*Direct all wastewater produced within the Urban Community Boundary and Rural Community Boundary to municipal or military sewer service systems.*

*Treat and recycle, where feasible, wastewater effluent as a water conservation measure.*

*Mitigate visual, noise, and odor impacts associated with wastewater collection and treatment systems, especially when they are located adjacent to residential designated areas.*

#### **4.3.4 Planning Principles and Guidelines**

***Recycling of Wastewater Effluent.*** *Encourage or require, as feasible and appropriate, the use of recycled water from the WWTP as a source for irrigating golf courses and other uses compatible with the State's rules and guidelines for the treatment and use of recycled water.*

***Use of Buffer Zones and Landscape Elements.*** *Adequate horizontal separations and landscape elements (e.g. berms and windrows) should be provided between wastewater facilities and adjacent residential designated areas. In order to mitigate negative impacts of the wastewater treatment plant, site-specific studies should be conducted to determine the width of the buffer zone and specific types of landscaping elements to use.*

Currently, there are an estimated 2,199 lots that are unsewered in the Kailua-Kaneohe-Kahaluu region. Implementation of the proposed nine (9) Sewer Improvement Districts will connect approximately 35 percent of the unsewered lots (764 lots) to the municipal wastewater system.

A discussion of the potential of effluent reuse for irrigation purposes is included in the Kailua-Kaneohe-Kahaluu Facilities Plan. Currently, an average of 13 mgd of secondary treated wastewater is discharged through the Mokapu Outfall. To produce R-1 quality water which would provide the greatest flexibility for potential users, effluent from the Kailua Regional WWTP would have to undergo additional treatment including coagulation/flocculation, filtration and disinfection. Secondly, storage and transmission facilities for reclaimed water would need to be provided, including a backup disposal system.

Another consideration is that reclaimed water used for irrigation must fall within acceptable salinity levels. Preliminary salinity measurements taken at the Kailua Regional WWTP indicate that the effluent currently exceeds acceptable levels. The current high chloride concentrations in the effluent are most likely caused by the infiltration of seawater into sewer lines. Following the substantial rehabilitation of sewer lines in the planning region, salinity levels may fall within acceptable levels (below 600 ppm). As stated in the Facilities Plan, a program for periodically monitoring influent salinity levels should be undertaken by the City and County of Honolulu to determine the feasibility of planning and eventually developing reuse facilities for the region.

No significant visual impacts are anticipated as a result of the proposed wastewater facility improvements. Since the proposed facility improvements at the existing WWTP, WWPTFs and pump station sites will be similar in visual character to those of the existing facilities, the change in views from public areas will either be negligible or of a slight intensification of the existing use. Most of the proposed improvements to the WWTP and pump station facilities will consist of internal modifications to the existing facilities. At the Kailua Regional WWTP, landscape improvements for aesthetic purposes have recently been completed. This includes the planting of a row of trees along the Aikahi Park boundary of the treatment plant to screen the facility from the Park, Aikahi Elementary School and nearby residential area, and infilling of the existing hedge near the plant's entrance along Kaneohe Bay Drive. Additional trees, shrubs and flowering plants would be planted as necessary during other phases of capacity, odor and noise control improvements.

The City is undertaking short-, intermediate- and long-term odor mitigation measures to reduce the ~~presence of all sources of noxious air emissions~~ *emission of air pollutants* at the Kailua Regional WWTP. These measures include maintenance and operation activities, chemical treatment to reduce entry level of odorous components into treatment processes, and odor reduction systems installed to handle off-gases from unit processes.

Noise mitigation measures are recommended at the Kailua Regional WWTP to further reduce noise emanating from the plant's primary and secondary noise sources, namely the Odor Control Fans, Effluent Pumps and the Administration Building's exterior air-conditioning unit.



### **5.6.3.1 Public Infrastructure Map**

*A new ordinance (Ordinance No. 99-69) provides for the adoption of Public Infrastructure Maps reflecting major public infrastructure projects for each of the revised DPs that are adopted in accordance with the 1992 Charter amendments. For wastewater-related facilities, sewage treatment plants and sewage pump stations are identified as public improvement projects that shall be shown on the public infrastructure maps, provided they meet any one or more of the following applicability criteria:*

- 1. It has a significant impact on surrounding land uses or the natural environment;*
- 2. It establishes a new facility;*
- 3. It substantially changes the function of an existing facility;*
- 4. It involves modification (replacement or renovation) of an existing facility which would permit significant new development or redevelopment; or*
- 5. It costs over \$3,000,000.00 for capital improvements.*

*Based on the Facilities Plan, the following proposed projects represent a preliminary list which meets the applicable criteria and could be shown on the Public Infrastructure Map for Koolaupoko, subject to verification at the time of their inclusion. A description of the proposed project improvements and associated costs are included in Section 2. Project Description.*

- Kailua Regional WWTP – modifications within existing plant facilities, and odor and noise control improvements*
- Kaneohe WWPTF – flow equalization basin, odor control system modifications, and Kaneohe-Kailua force main replacement*
- Ahuimanu WWPTF – new preliminary treatment system, flow equalization basin, odor control system modifications, and Ahuimanu effluent force main replacement*
- Kailua Heights WWPS modification/rehabilitation*
- Kailua Road WWPS modification/rehabilitation/force main replacement*

- *Kahaluu Sewers Section 5 Improvement District WWPS*
- *Kamehameha Highway Sewers Improvement District WWPS – construct a new pump station to service 37 lots along Kamehameha Highway.*

*Inclusion of these proposed projects on the Public Infrastructure Map for Koolaupoko will be conducted in accordance with the procedures set forth in the Ordinance No. 99-69.*

### **5.7 City and County of Honolulu Land Use Ordinance and Zoning**

The City and County of Honolulu Land Use Ordinance (LUO) regulates land use in accordance with adopted land use policies, including the Oahu General Plan and Development Plans. The provisions are also referred to as the zoning ordinance. The LUO presents permitted uses and structures, development standards and height controls for each zoning district. Zoning designations are shown on the zoning maps for the City.

As shown in Figure 5-4, the zoning designations for the planning area are for the most part consistent with the land use policies of the Koolaupoko DP. Preservation zoned lands are prevalent throughout the region, with Residential and Business zoned lands designated within the core areas of Kailua, Kaneohe and Kahaluu. Agricultural zoned lands are designated in the Kahaluu and Maunawili areas, with Military zoned lands confined to the MCBH Kaneohe Bay facility.

The zoning designations for the existing and proposed wastewater facilities in the planning area are described in Table 5-1 and shown in Figure 5-4. According to the City DPP, wastewater facilities are permitted uses in all zoning districts; however, if the proposed facility exceeds the affected district's development standards (i.e., height, setbacks, etc.), a Waiver of Requirements would need to be obtained from the City DPP.

Under the LUO, all uses, structures and development standards within lands zoned P-1 Restricted Preservation District shall be governed by the appropriate State agencies. For the proposed improvements to be undertaken at the Kailua Road WWPS site, the governing agency is the State DLNR Land Division. As indicated in Section 5.3, improvements to the Kailua Road WWPS would be subject to a CDUA administered by the DLNR.

Regarding the MCBH Kaneohe Bay EQ facility, City and County of Honolulu land use designations do not regulate land use on Federal property.

**5.8 City and County of Honolulu Special Management Area**

The Coastal Zone Management Act contains the general objectives and policies upon which all counties within the State have structured specific legislation which created Special Management Areas (SMA). Any "development" within the SMA requires a SMA Use Permit, which is administered by the City and County of Honolulu Department of Planning and Permitting (DPP) pursuant to Ordinance No. 84-4, 85-105. Approval of a SMA Use Permit is granted by the Honolulu City Council.

According to Chapter 205A-22, Hawaii Revised Statutes, "development" means any of the uses, activities or operations on land or in or under water within the SMA. "Development" does not include repair and maintenance of underground utility lines and minor appurtenant structures such as sewer pump stations; repair, maintenance or interior alterations to existing structures; and, installation of underground utility lines and appurtenant aboveground fixtures less than four feet in height along existing corridors.

The SMA boundary for the planning region is shown in Figure 5-5. Table 5-1 indicates the location of the existing and proposed wastewater facility improvement sites relative to the SMA. The proposed wastewater facility improvements which would entail "development" within the SMA will require a SMA Use Permit.

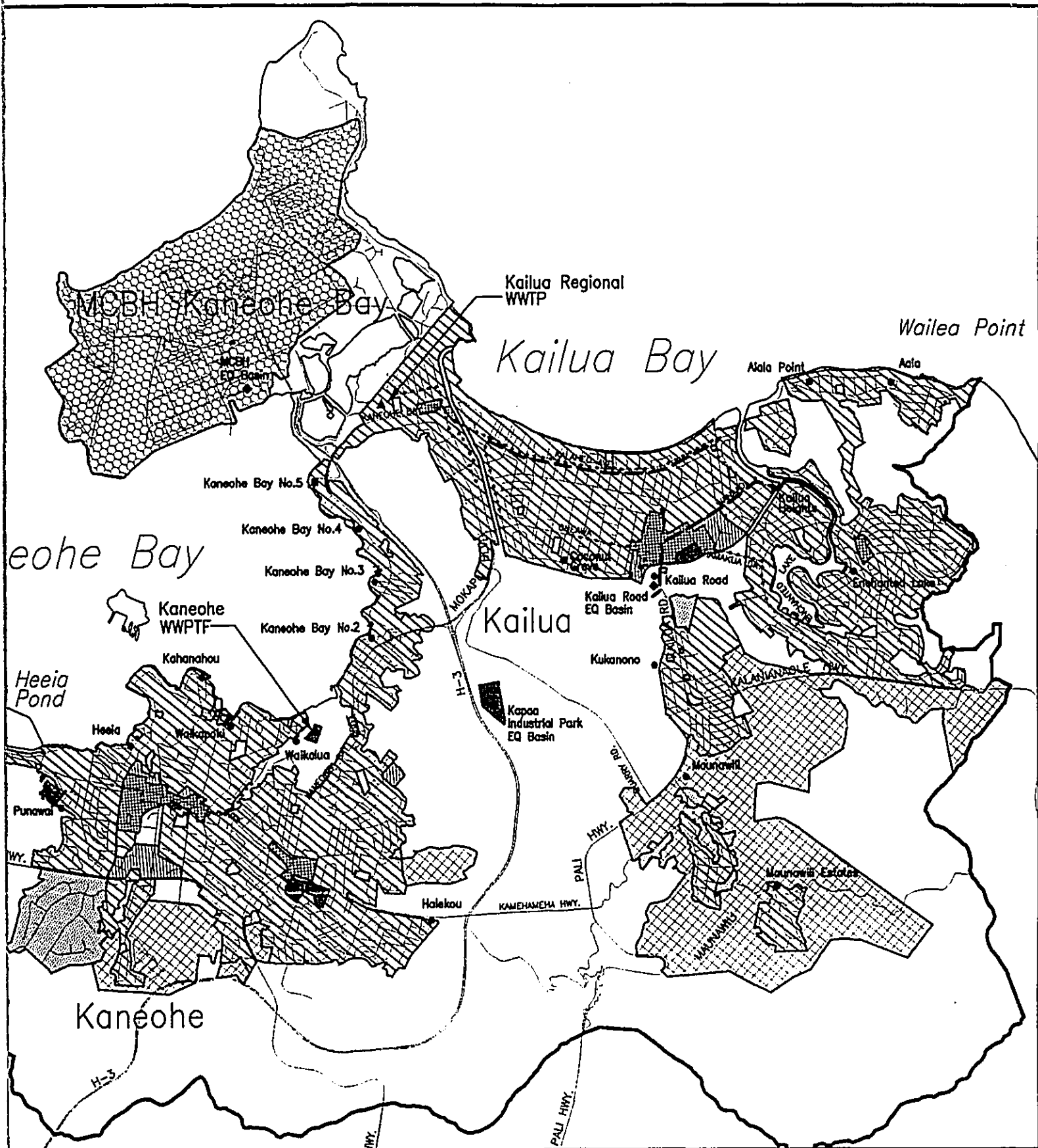
Regarding the MCBH Kaneohe Bay EQ facility, City and County of Honolulu land use designations do not regulate land use on Federal property.

**5.9 Permits and Approvals**

The following is a list of permits and approvals which may be required prior to construction and operation of the proposed improvements:

Federal

- U.S. Army Corps of Engineers
- Department of the Army



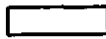







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ZONING

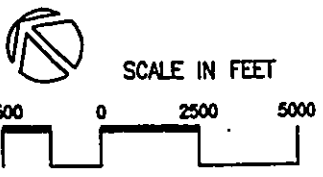
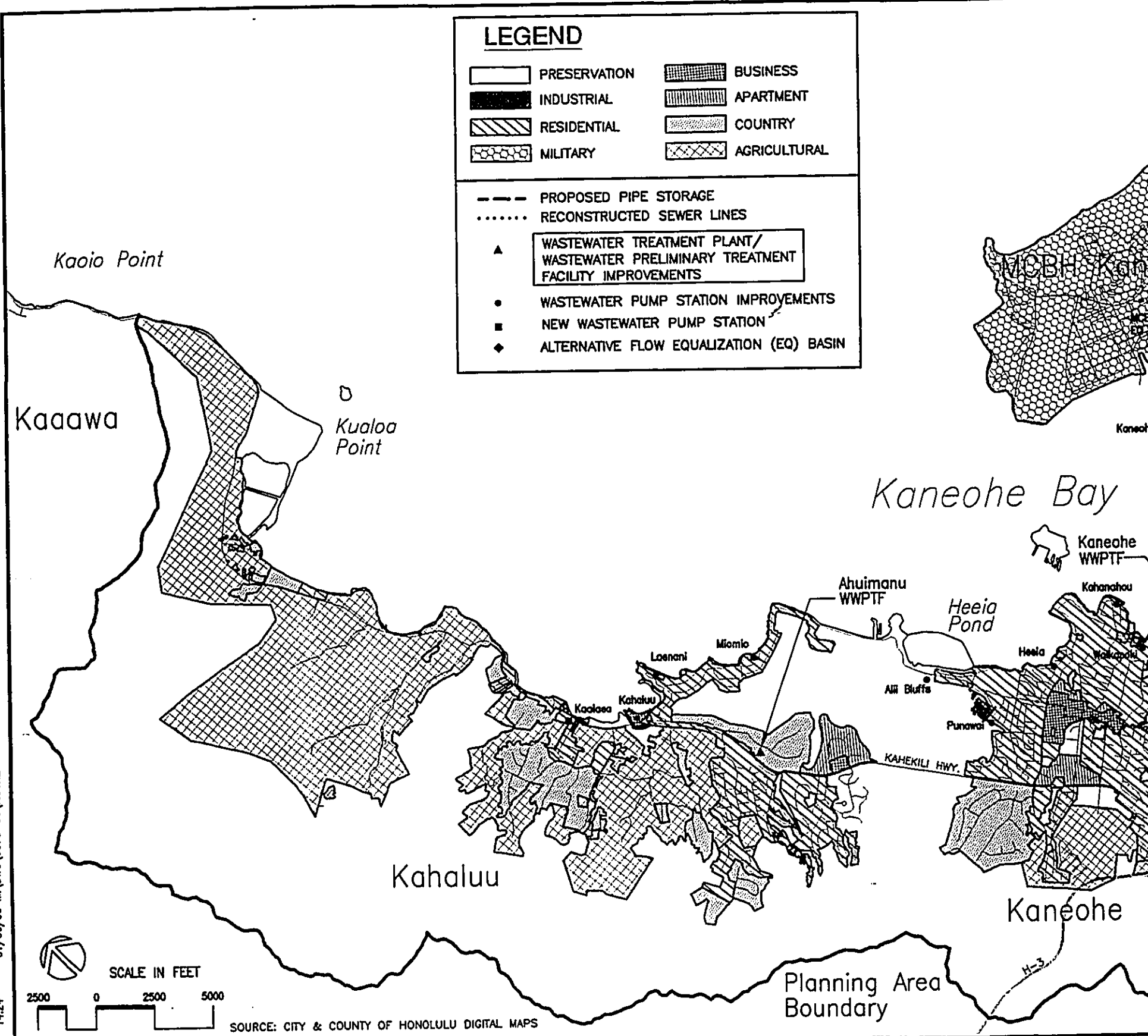
FIGURE

5-4

### LEGEND

	PRESERVATION		BUSINESS
	INDUSTRIAL		APARTMENT
	RESIDENTIAL		COUNTRY
	MILITARY		AGRICULTURAL

- PROPOSED PIPE STORAGE
- ..... RECONSTRUCTED SEWER LINES
- ▲ WASTEWATER TREATMENT PLANT/  
WASTEWATER PRELIMINARY TREATMENT  
FACILITY IMPROVEMENTS
- WASTEWATER PUMP STATION IMPROVEMENTS
- NEW WASTEWATER PUMP STATION
- ◆ ALTERNATIVE FLOW EQUALIZATION (EQ) BASIN



SOURCE: CITY & COUNTY OF HONOLULU DIGITAL MAPS

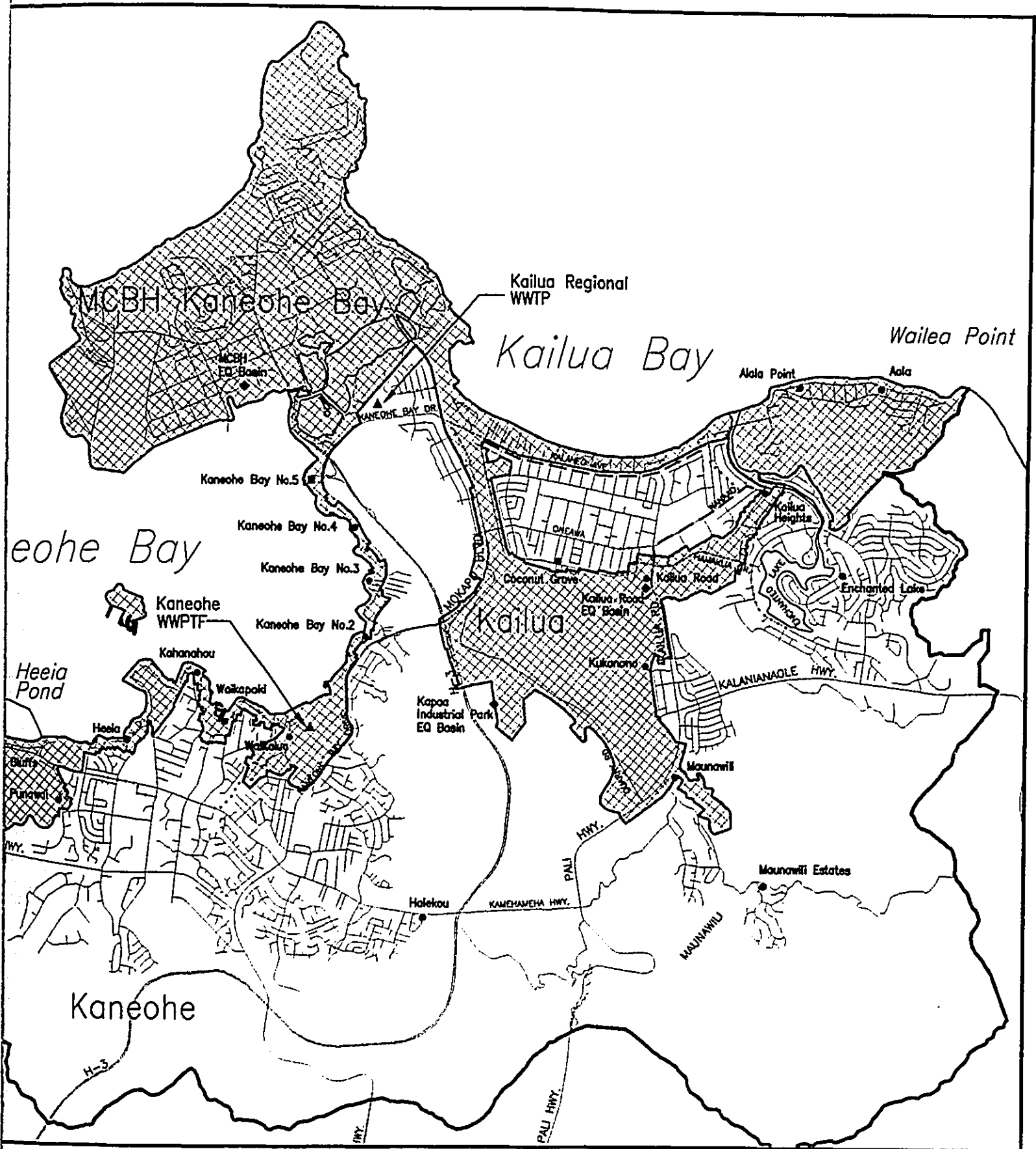
### KAILUA-KANEOHE-KAHALUU FACILITIES PLAN

### ZONING










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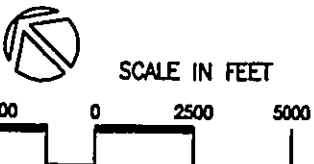
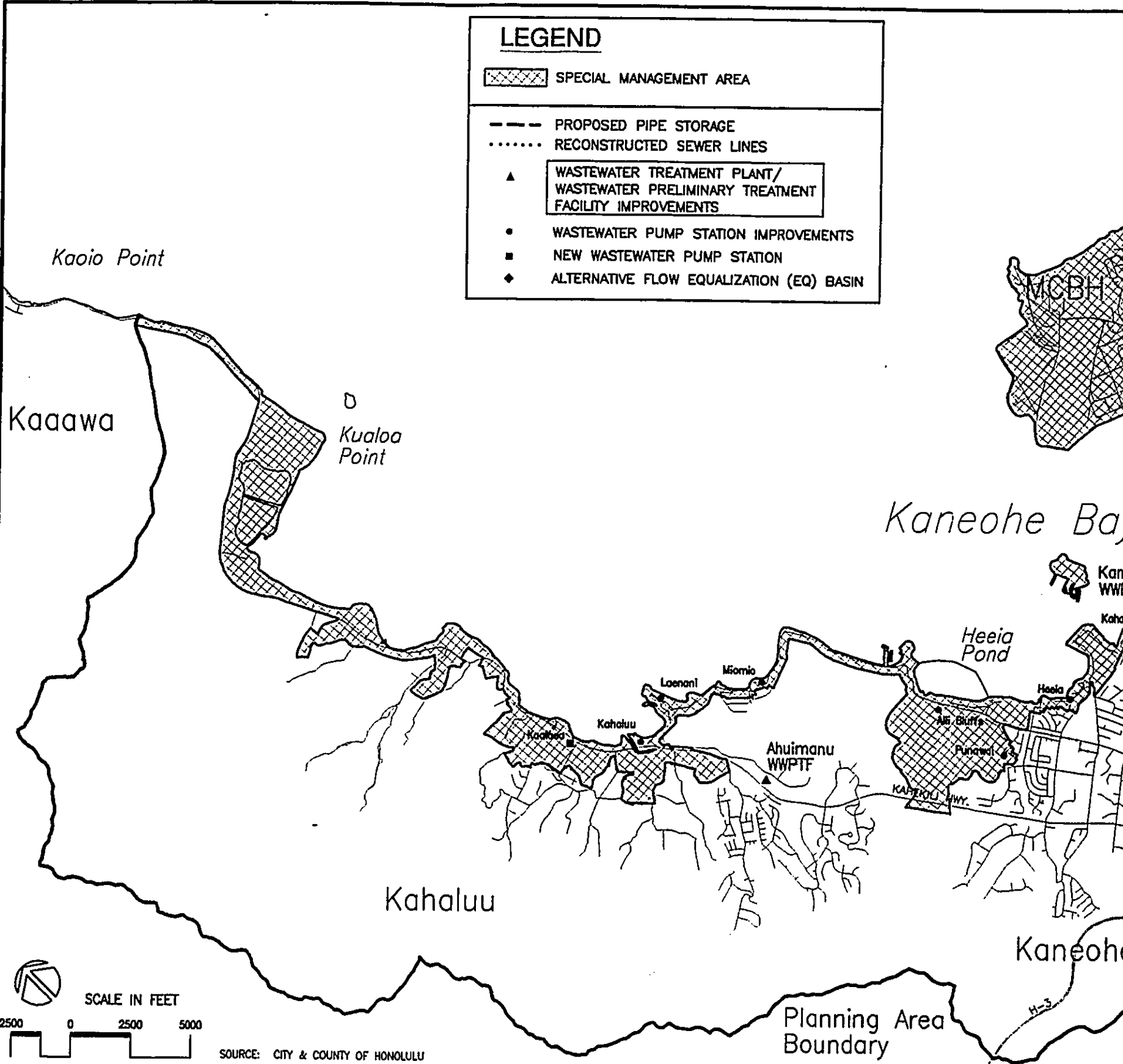
NW-ZONING.DWG 14:24 01/06/99 M:\DWG\3378-01\FIGURE



S PLAN		
A (SMA)	SPECIAL MANAGEMENT AREA (SMA)	FIGURE
		5-5

**LEGEND**

-  SPECIAL MANAGEMENT AREA
-  PROPOSED PIPE STORAGE
-  RECONSTRUCTED SEWER LINES
-  WASTEWATER TREATMENT PLANT/  
WASTEWATER PRELIMINARY TREATMENT  
FACILITY IMPROVEMENTS
-  WASTEWATER PUMP STATION IMPROVEMENTS
-  NEW WASTEWATER PUMP STATION
-  ALTERNATIVE FLOW EQUALIZATION (EQ) BASIN



SOURCE: CITY & COUNTY OF HONOLULU

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**KAILUA-KANEOHE-KAHALUU FACILITIES PLAN  
SPECIAL MANAGEMENT AREA (SMA)**

State of Hawaii

Department of Health

- National Pollutant Discharge Elimination System (NPDES) General Permit for Storm Water Associated with Construction Activity
- NPDES General Permit for Discharges Associated with Construction Activity Dewatering
- Section 401 Water Quality Certification
- Noise Permits
- Air Quality Permits
- *Disability and Communication Access Board (Review pursuant to Americans with Disabilities Act Accessibility Guidelines (ADAAG))*

Department of Land and Natural Resources Land Division

- Conservation District Use Application

Department of Land and Natural Resources Historic Preservation Division

- Chapter 6E, HRS Historic Preservation

Office of Planning

- Coastal Zone Management (CZM) Program Consistency Review

Department of Transportation

- Permit to Perform Work Within State Highways

City and County of Honolulu

Department of Planning and Permitting

- Environmental Impact Statement
- Special Management Area (SMA) Use Permit
- Development Plan Public Facilities Map Amendment
- Flood Hazard Development Approval
- Waiver of Requirements
- Building Permit
- Construction Dewatering Permit
- Demolition Permit
- Electrical Permit
- Plumbing Permit



City and County of Honolulu (continued)

Department of Planning and Permitting (continued)

- Sidewalk/Driveway Work Permit
- Street Usage Permit
- Grading and Drainage Permits
- Permit to Excavate Public Right-of-Way
- Grubbing Permit
- Drainage Plan Approval

Board of Water Supply

- Water and Water System Requirements
- Water Connection Approval

Other

Utility Companies

- Utility Service Requirements
- Permit Regarding Work on Utility Lines

## **6. ALTERNATIVES TO THE PROPOSED ACTION**

A wide range of alternatives for collecting and processing projected peak wastewater flows were evaluated in the Kailua-Kaneohe-Kahaluu Facilities Plan process. A total of 15 alternatives were evaluated in the course of preparing the Facilities Plan. Major alternatives evaluated included the restoration of secondary treatment at the Kaneohe and Ahuimanu WWPTFs, expanding wastewater storage at these facilities, at pump stations and elsewhere in the Kailua Basin to temporarily store flows during heavy rain storms, blending of primary and secondary treated wastewater at the Kailua Regional WWTP, and relocation of the entire WWTP from Aikahi. Public informational meetings held in March and April 1997 led to the exploration of alternatives to address concerns regarding existing problems stemming from odor and noise at the Kailua Regional WWTP, with objections to any substantial expansion of facilities at the regional plant. A summary of the alternatives development process, along with a discussion of the major project alternatives, are included in Section 6.1.

In response to public input received at a public informational meeting held in March 1998 and a community meeting held at Iana Street in June 1998, a total of 11 sub-alternatives were developed for temporary wastewater storage facilities during heavy rain storms. Except for an ultraviolet disinfection unit, these do not involve any new treatment processing facilities at the Kailua Regional WWTP. These sub-alternatives involve developing flow equalization storage facilities for the Kailua Basin. Six (6) of the sub-alternatives are discussed in Section 2.1.2.1, and four (4) are discussed below in Section 6.2.

### **6.1 Project Alternatives**

During the initial planning process, alternatives evaluated ranged from optimizing the existing facilities to handle the maximum amount of flows for treatment at the Kailua Regional WWTP site, to providing secondary treatment at all three treatment plant locations at Kailua, Kaneohe and Ahuimanu. Each alternative was assessed and evaluated against a set of evaluation criteria which included:

- Compliance with Water Quality Requirements - spill reduction, regulatory agency approval and other required permits

- **Cost-Effectiveness** - capital and estimated annual operation and maintenance costs for proposed improvements to the collection, treatment and disposal systems based on the 5-year storm flows
- **Community Compatibility** - odor/noise, recreation/visual, economic, and traffic
- **Environmental Impacts** - water quality, flooding, archaeology, and flora/fauna/other environmentally sensitive resources.

The evaluation of these alternatives showed that flow equalization facilities would provide the best and most cost-effective means of accommodating peak flows during heavy rain storms. A revised set of four (4) alternatives was prepared based on the use of equalization facilities. These included two alternatives using flow equalization and two versions of blending secondary treated effluent with primary treated wastewater which also incorporate flow equalization facilities. These alternatives were evaluated against the evaluation criteria.

The then-favored alternative was using blended primary and secondary effluent. However, community concerns expressed at two public informational meetings held in March and April 1997 regarding existing odor and noise problems at the Kailua Regional WWTP, and objections to substantial expansion of facilities at the plant, resulted in the development of five (5) supplemental alternatives which addressed these concerns. One alternative included the blending of secondary with primary treated effluent and flow equalization, along with the acquisition of lands surrounding the WWTP, and another maximized flow equalization at the Kaneohe WWPTF and rehabilitation of selected collection basins. Two alternatives included flow equalization at the Kaneohe and Ahuimanu WWPTFs and at either the MCBH Kaneohe Bay or Kapaa Industrial Park, respectively. The fifth alternative considered relocation of the entire Kailua Regional WWTP to Kapaa Industrial Park.

On the basis of the evaluation results, the alternative of maximum flow equalization at the Kaneohe WWPTF and rehabilitation of selected collection basins was rated the most favorable.

In addition to the No Action Alternative, four major project alternatives are described below, along with an assessment based on the evaluation criteria

categories discussed above. Of the many alternatives evaluated during the Facilities Plan process, these four represent distinctly different alternatives from the proposed action. The remaining alternatives are variations of the four major alternatives and the proposed action and, therefore, are not assessed herein.

In all of the alternatives, the collection system would need to be substantially improved to convey peak storm flows. Relief or replacement lines would be required to convey the peak flows where inadequate capacity exists. A program for structural rehabilitation of major collection system lines would also be required to address corrosion and other age and material-related pipe deficiencies. Sewer Improvement Districts are also included in all of the alternatives. The impacts associated with the construction and operation of improvements to the collection system and Sewer Improvement Districts would be similar to that of the proposed action.

#### **6.1.1 No Action Alternative**

Under the No Action alternative, the existing wastewater collection, treatment and disposal systems would remain in operation. Except for capital improvement projects already programmed, there would be no long-term improvements to the regional wastewater system. As such, the existing wastewater system would be unable to accommodate the projected treatment capacity of 85.5 mgd by the year 2020. Most of the collection system lines would continue to deteriorate and be increasingly costly to maintain, including problems related to root intrusion, seawater, hydrogen sulfide corrosion, and sagging pipes. Furthermore, the problems that currently plague the system would continue to occur, including groundwater infiltration and storm water inflow into the sanitary sewer system which create hydraulic overloads through the pipes, pump stations and treatment plant during heavy rainfall periods. Also, only a few homes served by individual wastewater systems would be connected to the municipal wastewater system through currently programmed Sewer Improvement Districts.

Compliance with Water Quality Requirements: The no action alternative would be contrary to the Consent Decree (Save our Bays and Beaches, etals vs. City and County of Honolulu, August 1995). It would greatly increase the probability of wastewater spills and bypasses to State waters, thereby

increasing water quality and public health hazard concerns. The result of not upgrading the collection system to accommodate the projected increases in wastewater flows would be surcharging of sewers throughout the collection system. The surcharge conditions would likely result in spills, overflows and backups throughout the collection system. Infiltration/inflow into the collection system would increase over the years as the sewer lines continue to deteriorate. The potential of spills and bypasses at the WWPSs, particularly those with limited capacity, would also increase significantly. Degradation of individual wastewater systems over the long-term may also potentially result in system backups and overflows, eventually impacting the water quality of streams and nearshore coastal waters.

Cost-Effectiveness: The total estimated capital cost for wastewater facility improvements already programmed is approximately \$113.0 million. In the long-term, however, degradation of the wastewater facilities and the resulting adverse water quality impacts to State waters would incur the potential for large fines to be levied by the State DOH, as well as the threat of lawsuits under the Clean Water Act.

Community Compatibility: The no action alternative would preclude all short- and long-term beneficial and adverse impacts described in this EIS. Construction-related impacts, including those on noise, air quality and traffic, would be avoided. Furthermore, the higher capital improvement cost to construct the wastewater facility improvements would be avoided. A major adverse impact resulting from implementation of this alternative would be the increased probability of spills, overflows and bypasses to recreational coastal waters during periods of heavy rainfall, thereby adversely impacting the water quality and increasing public health hazard concerns.

Environmental Impacts: The no action alternative would increase the probability of spills, overflows and bypasses to coastal receiving waters during periods of heavy rainfall, thereby adversely impacting the water quality. As there would be no construction of wastewater facility improvements, there would be no adverse impacts on archaeological and cultural resources, flora, fauna, and other environmentally sensitive resources.

Conclusion: The no action alternative is not a viable option due to its non-compliance with the Consent Decree which required the preparation of a

Facilities Plan to address current problems with the wastewater system, need for additional capacity to accommodate the projected population and increased flows in the region, and adverse impacts associated with spills and bypasses affecting water quality and public health concerns.

#### **6.1.2 Resumption of Secondary Treatment at Kaneohe and Ahuimanu Treatment Plants**

Under this alternative, the Kaneohe and Ahuimanu WWPTFs would be re-converted to secondary treatment facilities to handle the processing of flows from the Kaneohe and Ahuimanu basins, thereby requiring major facility improvements. At the Kaneohe plant, major facility improvements would include a new influent pumping station, new preliminary treatment facility, new primary clarifiers, secondary clarifiers, biotower pumping station, biotowers, solids contact tank and blower building, DAF thickening, anaerobic digestion, centrifuge facility, additional odor control, and replacement of the effluent force main. Solids treatment would be provided at the Kaneohe facility for those generated at this site. At the Ahuimanu plant, major facility improvements would include a new preliminary treatment facility, primary and secondary clarifiers, new effluent force main, biotower pumping station, biotower, solids contact tank and blower building, DAF thickening, aerobic digestion, centrifuge facility, and new odor control.

The Kailua WWTP would also need to be expanded to handle the modeled peak flows. Major facility improvements at the plant would include a new influent pumping station, new preliminary treatment facility, additional primary and secondary clarifiers, an ultraviolet disinfection facility, and additional odor control. The Kailua effluent pumping station would be replaced or modified to handle projected flows. The Mokapu force main and outfall would need to be modified to accommodate increased flows. One possible option to increasing the outfall capacity would be to construct a parallel outfall.

Compliance with Water Quality Requirements: This alternative would greatly reduce the probability of spills and bypasses to State waters during rain storms. However, permitting activities required to increase the capacity of the Mokapu Outfall would be costly and lengthy. Permits which may possibly be required include U.S. Army Corps of Engineers and State DOH permits, a Special Management Area Use Permit and Conservation District Use Permit.

The need for additional discretionary approvals would render this alternative potentially more uncertain, costly and time consuming. It should be noted that regulatory considerations were the main factors which led to excluding from consideration any alternative which would use the existing Kaneohe Outfall, although the outfall may be required as an emergency spill site.

Cost-Effectiveness: The resumption of secondary treatment at the Kaneohe and Ahuimanu plants would be high in capital costs. The total estimated capital cost for this alternative is approximately \$586.8 million. The estimated annual cost, including annualized life cycle capital costs and operation and maintenance costs, is \$51.1 million.

Community Compatibility: This alternative would be less favorable in terms of community compatibility, primarily with respect to the Kaneohe and Ahuimanu plants. The major facility improvements required at these two plants would result in increased odor and noise impacts, thereby requiring more extensive mitigation measures. Visual impacts would be greater under this alternative due to intensification of wastewater facilities at the Kaneohe and Ahuimanu plant sites. No significant impacts on recreational waters would be incurred with this alternative. Short-term socio-economic impacts would be similar to that of the proposed action, although noise and air quality impacts on nearby areas would be greater with construction of the facility improvements at the Kaneohe and Ahuimanu plants. There would also be a slight increase in vehicular traffic associated with the secondary treatment operations at these two plants, although it would have a negligible impact on roadways in relation to their capacities.

The expansion of facility improvements at the Kailua WWTP would be contrary to the community's objections to any substantial expansion of facilities at the plant until existing odor and noise problems are resolved. However, since secondary treatment will be occurring at the Kaneohe and Ahuimanu plants, there would be the potential for less odors being generated from the influent at the Kailua WWTP. Although there would be an increase in flows, this increase would be rain-induced peak flows which would not necessarily increase odors at the plant. Also, due to facilities expansion at the Kailua WWTP, there would be more potential for increase in noise, although to a certain extent, most of the noise would occur during periods of peak flow. From a visual standpoint, the facility expansion will contribute to a slight

intensification of wastewater facilities at the plant. Short-term noise and air quality impacts would result from construction of the proposed facility improvements at the Kailua WWTP. The high capital cost of this alternative would contribute to a higher increase in sewer rates for the wastewater system customers on Oahu.

**Environmental Impacts:** An increase in the overall capacity of secondary treated effluent would not cause an exceedance in the State DOH Water Quality Standards in the receiving waters at the Mokapu Outfall. Development of secondary treatment facilities at the Kaneohe and Ahuimanu plants, however, would potentially result in greater development in designated flood hazard areas. Improvements within the existing Kailua, Kaneohe and Ahuimanu plant sites would have "no effect" on historic sites as these areas have been developed. This alternative would result in no significant impacts on flora, fauna or other environmentally sensitive resources.

**Conclusion:** The resumption of secondary treatment at the Kaneohe and Ahuimanu plants is not considered a viable alternative due to the need for and uncertainty in obtaining additional discretionary approvals to increase the capacity of the Mokapu Outfall, the high capital cost, and the community compatibility and environmental impacts associated with development of major facility improvements at the Kailua, Kaneohe and Ahuimanu plants. Also, expansion of the Kailua Regional WWTP would be contrary to the community's objections to substantial expansion of facilities at the plant.

### **6.1.3 Blending Secondary With Primary Treatment and Flow Equalization**

Under this alternative, during peak rainfall periods, secondary treated effluent would be blended with primary treated effluent at the Kailua Regional WWTP, and flow equalization facilities would be provided at Kaneohe and Ahuimanu WWPTFs. The flows passing through the Kaneohe and Ahuimanu WWPTFs would receive preliminary treatment before being transported to the Kailua Regional WWTP.

Major facility improvements at the Kailua Regional WWTP would include a new influent pumping station, new preliminary treatment facility, additional odor control, three additional primary clarifiers, one additional secondary clarifier, an ultraviolet disinfection facility, additional centrifuge, additional odor



control, and increased effluent pumping station capacity. The existing outfall and force main are adequately sized and would not require any improvements. At the Kaneohe WWPTF, required improvements would include a flow equalization system and a new odor control system. The Kaneohe effluent force main would need to be replaced.

At the Ahuimanu WWPTF, a flow equalization facility, a new preliminary treatment facility, new effluent force main, and new odor control system would be needed.

**Buffer Area Acquisition:** To mitigate the impacts of additional expansion and development at the Kailua Regional WWTP, land areas within an established buffer zone of approximately 1,000 feet from the perimeter of the Kailua Regional WWTP would be acquired. In the siting of treatment facilities elsewhere, this distance has been used to provide a minimum buffer area in determining land area acquisition. Figure 6-1 shows the land area encompassed by the 1,000-foot buffer zone. The parcels proposed to be acquired have been adjusted slightly to coincide with the parcel boundaries or streets. Within this acquisition area, there are approximately 164 single-family residences and 158 condominium units. The majority of the condominiums are in TMK: 4-4-11: 82 (Aikahi Gardens), with the remaining 10 in TMK: 4-4-1. In the Aikahi Park Subdivision, there are 27 single-family homes in TMK: 4-4-3 and 106 single-family homes in TMK: 4-4-4. A summary of the single-family and condominium values by plat is shown in Table 6-1.

The total land and improvement value for privately-owned properties within 1,000 feet of the Kailua Regional WWTP is approximately \$94.6 million. Values were based on 1996/97 tax assessed values as provided by real property data files, and may be considered conservative market values given continuing declines in the past two years.

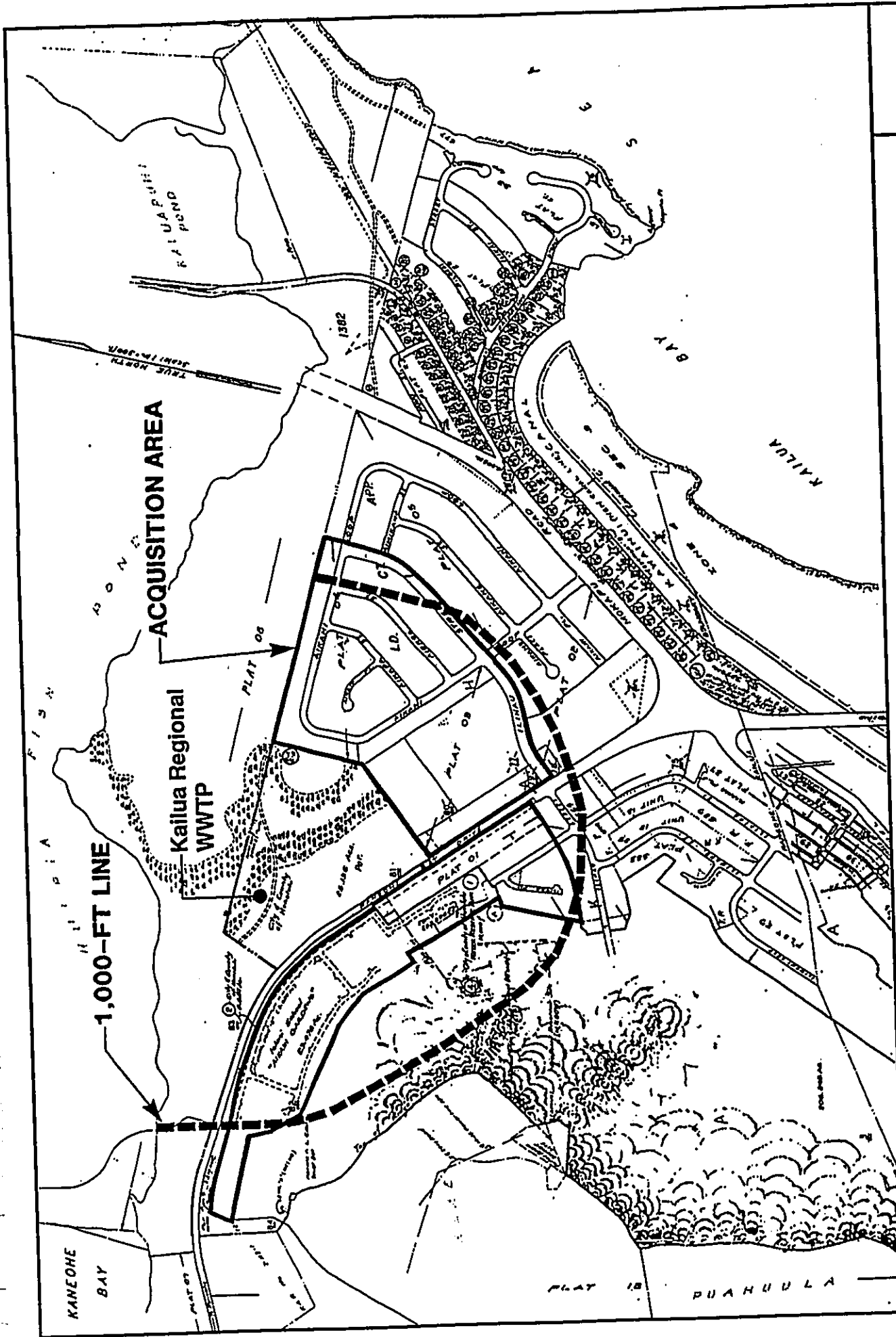



FIGURE  
6-1

KAILUA-KANEOHE-KAHALUU FACILITIES PLAN  
LAND ACQUISITION AREA

  
**WILSON OKAMOTO  
& ASSOCIATES, INC.**  
 ENGINEERS - PLANNERS

**Table 6-1**  
**Assessed Values by TMK Plat Area**  
**(lots within 1,000 feet of Kailua Regional WWTP)**

Tax Map Key Plat	Single Family Homes	SF Value - Land & Improvements	Condo Units	Condo Value Land & Improvements	Single Family & Condo Assessed Value
4-4-1	31	\$8,834,500	10	\$2,810,500	\$11,645,000
4-4-3	27	\$9,068,800	0	\$0	\$9,068,800
4-4-4	106	\$40,931,500	0	\$0	\$40,931,500
4-4-11-82	0	\$0	148	\$32,952,900	\$32,952,900
<b>Total</b>	<b>164</b>	<b>\$58,834,800</b>	<b>158</b>	<b>\$35,763,400</b>	<b>\$94,598,200</b>

**Compliance with Water Quality Requirements:** This alternative would likely affect water quality impacts due to the blending of primary and secondary treated wastewater. The need for and uncertainty of the State DOH and EPA approving blending secondary with primary treated effluent may likely affect compliance with water quality. Regulatory approval would also be required to permit blending of primary and preliminary treatment waste streams. This alternative would greatly reduce the probability of spills and bypasses to State waters during rain storms.

**Cost-Effectiveness:** Although this alternative would have low capital costs, the need to acquire surrounding properties to create a buffer significantly contributes to an increase in overall costs. The total estimated capital cost for this alternative is approximately \$479.8 million, inclusive of the surrounding property acquisition. The estimated annual cost, including annualized life cycle capital costs and operation and maintenance costs, is \$40.5 million.

**Community Compatibility:** The acquisition of the buffer area would result in an improved setting for mitigating the effects of odor and noise from the Kailua Regional WWTP. Visual impacts of the Kailua Regional WWTP would be greater under this alternative due to intensification of wastewater facilities at the plant. Visual impacts at the Ahuimanu WWPTF site would be of a slight intensification of wastewater facilities due to the new equalization and preliminary treatment facilities. Construction of the partially underground flow

equalization facility at the Kaneohe WWPTF site would only slightly contribute to a visual impact. No significant impacts on vehicular traffic would be incurred with this alternative.

Socio-economic impacts would include those associated with noise and air quality during the construction period. Acquisition of the properties within the buffer area would entail either acquisition or condemnation by the City, resulting in the temporary displacement of residents. This would potentially inconvenience the affected property owners as they would need to acquire another place of residence. The cost to acquire properties within the buffer area would also contribute to a higher increase in sewer rates for the wastewater system customers on Oahu.

Environmental Impacts: A major premise of the blending alternative is to meet the NPDES permit's effluent limits while minimizing the costs of facilities upgrades. The blended effluent flow would meet present NPDES limits and *would add far less load to receiving waters than if spills occurred upstream of the plant and reached the ocean in storm water.* It is also important to note that loadings from storm water sources alone would add significantly higher loads during high flow events.

The alternative of blending primary and secondary effluent employs a method that has proven successful in a number of cases on the mainland. The rationale is that the loads imposed on the receiving waters are within the allowable loading in the NPDES permit. In addition, it is more desirable to collect the wastewater and route it to a point off shore with a good zone of mixing as opposed to causing nearshore and onshore overflows because the raw wastewater cannot be accommodated by the collection and treatment system. The relative cost to provide all of the projected flow with full secondary treatment is also a factor that must be considered.

Improvements within the existing Kailua Regional WWTP and Kaneohe and Ahuimanu WWPTF sites would have "no effect" on historic sites as these areas have been developed. This alternative would result in no significant impacts on flora, fauna or other environmentally sensitive resources.

Conclusion: This alternative is not considered viable due to the need for and uncertainty of obtaining State DOH and EPA approval of blending secondary

with primary treated effluent, and its likely affect on water quality impacts. Although this alternative has low capital costs, the need to acquire surrounding properties to create a buffer increases the overall costs. Also, expansion of the Kailua Regional WWTP would be contrary to the community's objections to substantial expansion of facilities at the plant.

#### **6.1.4 Maximize Flow Equalization at Kaneohe WWPTF and Rehabilitate Selected Collection Basins**

Under this alternative, parts of the Kailua wastewater collection system would be renovated to reduce infiltration and inflow, the Kailua Regional WWTP would be modified to handle secondary treatment of the projected flows, and equalization facilities would be provided at the Kaneohe and Ahuimanu WWPTFs.

Major facility improvements at the Kailua Regional WWTP would include a new *influent pumping station, new preliminary treatment facility, one additional primary clarifier, one additional secondary clarifier, an ultraviolet disinfection facility, additional centrifuge, and additional odor control.* The existing effluent pumping station, outfall and force main are adequately sized and would not require any improvements.

At the Kaneohe WWPTF, required improvements would include a flow equalization system, a new odor control system, and replacement of the effluent force main.

At the Ahuimanu WWPTF, a flow equalization facility, a new preliminary treatment facility, new odor control system, and a new effluent force main would be needed.

This alternative differs from the proposed action in that the facility improvements at the Kailua Regional WWTP do not consider the use of flow equalization facilities in the Kailua Basin. The facility improvements at the Kaneohe and Ahuimanu WWPTFs are identical to that of the proposed action.

Compliance with Water Quality Requirements: This alternative would greatly reduce the probability of spills and bypasses to State waters during rain storms. The need for regulatory agency approval or additional discretionary

approvals would not differ from the proposed action, exclusive of the flow equalization sub-alternatives for the Kailua Basin.

**Cost-Effectiveness:** This alternative has low capital costs despite the need to rehabilitate the collection system lines in up to seven (7) basins. The total estimated capital cost for this alternative is approximately \$391.5 million. The estimated annual cost, including annualized life cycle capital costs and operation and maintenance costs, is \$33.2 million. Phasing of development would be most efficient under this alternative which occurs entirely on existing City-owned land and where the flow equalization facilities can be developed incrementally.

**Community Compatibility:** The expansion of facility improvements at the Kailua Regional WWTP would be contrary to the community's objections to any substantial expansion of facilities at the plant. The major facility improvements required at the plant would result in increased odor and noise impacts, thereby requiring more extensive mitigation measures. Visual impacts at the Kailua Regional WWTP would be greater under this alternative due to intensification of wastewater facilities at the plant. Short-term socio-economic noise and air quality impacts would result from construction of the proposed facility improvements at the plant.

No significant impacts on recreational waters would occur with this alternative. Community-associated impacts resulting from the facility improvements at the Kaneohe and Ahuimanu WWPTFs would be the same as that of the proposed action.

**Environmental Impacts:** An increase in overall capacity of secondary treated effluent would not cause an exceedance in the State DOH Water Quality Standards in the receiving waters at the Mokapu Outfall. Improvements within the existing Kailua Regional WWTP and Kaneohe and Ahuimanu WWPTF sites would have "no effect" on historic sites as these areas have been developed. This alternative would result in no significant impacts on flora, fauna or other environmentally sensitive resources.

**Conclusion:** This alternative was deemed not viable due to the expansion of facility improvements at the Kailua Regional WWTP which is contrary to the community's objections to any substantial expansion of facilities at the plant.

Although this alternative received the highest score and ranking based on the evaluation criteria for the alternatives at the time, continuing concerns were expressed by residents at a March 1998 public informational meeting regarding the need to pursue solutions to existing odor and noise problems at the treatment plant. Until these problems are resolved, residents were opposed to any expansion of facilities at the Kailua Regional WWTP. In response to these concerns, an expanded set of sub-alternatives to this alternative was developed which does not include any new treatment processing facilities at the treatment plant.

#### **6.1.5 Relocation of Kailua Regional WWTP to Kapaa Industrial Park**

The Kailua Regional WWTP's location adjacent to residential areas and Aikahi Elementary School has posed land use incompatibilities and elicited community concerns relative to odor, noise, lights, and aesthetics. This alternative was developed in response to suggestion that the entire Kailua Regional WWTP be relocated to a site where there is less of a conflict in land uses.

Three sites were explored within a 5-mile radius of the existing WWTP: the Kapaa Industrial Park, Kapaa Refuse Transfer Station site (located at the base of the former Kapaa Sanitary Landfill), and the MCBH Kaneohe Bay. These sites were selected for review on the basis of land area and the existing and surrounding uses at these sites which could be compatible with the siting of a wastewater treatment plant.

Two of the three sites were determined to be not readily available for use. The Kapaa Refuse Transfer Station site and facility are required by the City to provide refuse transfer services for municipal and private refuse collection for the Windward region. The transfer facility was constructed in 1990 and the City plans continued long-term use of the site as a refuse transfer station and baseyard.

At MCBH Kaneohe Bay, most usable areas of the base are either developed or planned for future use. Based on discussions with Base Facilities staff and review of environmental constraints and land use plans, there is no available adequate land area for the relocation of the treatment plant to the MCBH. Open areas of 20+ acres are already planned for future use or have man-

made or environmental constraints such as airfield and explosive hazards, or wetlands.

The most feasible site among these three sites was determined to be the Kapaa Industrial Park area. Under this relocation alternative, the Kailua Regional WWTP treatment processes would be demolished and only preliminary treatment and pumping facilities would remain at the site. A new secondary treatment facility would be constructed at Kapaa Industrial Park on an approximately 20- to 25-acre site, and storage/equalization facilities would be provided at Kapaa, Kaneohe WWPTF and Ahuimanu WWPTF.

The existing Kailua treatment plant site would include a new influent pumping station, new preliminary treatment facility, odor control, and a new transmission pump station and force main to Kapaa. The existing effluent pump station would remain. All other decommissioned structures would be demolished. The existing Mokapu Outfall and force main are adequately sized and would not require any improvements.

At the Kapaa site, a flow equalization facility, a new secondary treatment plant with odor control, and a transmission pump station with force main to transfer wastewater back to the Kailua treatment plant effluent pump station would be needed. Acquisition or condemnation of land for the new secondary treatment plant at Kapaa would also be required.

At the Kaneohe WWPTF, required improvements would include a flow equalization system, new odor control system, and effluent force main replacement.

At the Ahuimanu WWPTF, a flow equalization facility, a new preliminary treatment facility, new odor control system, and a new effluent force main would be needed.

Due to the magnitude of relocating such a facility, a long-term staging concept might be implemented over a 20- to 40-year timeframe that could include the following sequence:

1. Locate equalization with sufficient sized piping to accommodate all future flows. This may require two lines of different size, one



for near-term and one for ultimate future flows. The lines would be necessary for both delivering flows to the Kapaa site and back to the existing plant. A sizable pump station would be required at the existing plant. This might be feasible near the end of the current 20-year planning period.

2. The next process that might be relocated could be the anaerobic digestors and solids handling facilities. These have high odor potential and there are precedents in the industry for locating digestors and solids handling facilities as far away as 20 miles from the liquids treatment site. A suggested timing consideration might be 10 years after the equalization basin.
3. Preliminary and primary treatment might be the next staged processes. Timing might be 5 to 10 years after moving the solids handling.
4. The balance of the plant would be staged a possible 5 to 10 years after the preliminary and primary unit move.
5. The existing site would still require a lift station to transfer flows to the new site, disinfection and effluent pumping units.

The above is only a concept and a preliminary engineering study would be required to identify all of the technical aspects involved in relocating the treatment plant.

**Compliance with Water Quality Requirements:** Regulatory and permitting approvals required to relocate the treatment plant to Kapaa would be costly, time consuming, and uncertain. Regulatory approvals from the State DOH would be required, including an Air Quality Authority to Construct Permit and Permit to Operate. Relocation of the treatment plant to Kapaa may also require approval in accordance with the City and County of Honolulu's Koolaupoko *Sustainable* Communities Plan (see Section 5.6.3). Although a portion of the Kapaa Industrial area is currently zoned industrial, adjacent areas would require City and County of Honolulu zone change approval to industrial to accommodate the new plant. Also, location of a new treatment plant at Kapaa would require coordination with landowner Kaneohe Ranch's expansion

plans for the Kapaa Industrial area. This alternative would greatly reduce the probability of spills and bypasses to State waters during rain storms.

**Cost-Effectiveness:** The capital costs for relocation of the Kailua Regional WWTP to Kapaa would be extremely high due to the need to acquire land and construct an entirely new secondary treatment facility. The total estimated capital cost for this alternative is approximately \$713.9 million. The estimated annual cost, including annualized life cycle capital costs and operation and maintenance costs, is \$59.9 million. The phasing of development of this alternative would be lengthy, extending over a 20- to 40-year timeframe, thereby potentially incurring increased costs.

A generalized cost breakdown of the major improvements which would be required at the Kailua and Kapaa sites are shown in Table 6-2.

<i>Item</i>	<i>Cost Estimate</i>
<i>New Secondary Treatment Plant</i>	<i>\$268,000,000</i>
<i>New Influent Pump Station at Kailua</i>	<i>\$15,000,000</i>
<i>4.5 MG Flow Equalization Tank at Kapaa</i>	<i>\$8,300,000</i>
<i>New Preliminary Treatment Facility at Kailua</i>	<i>\$1,830,000</i>
<i>New Transmission Pump Station at Kailua</i>	<i>\$19,500,000</i>
<i>New Transmission Pump Station at Kapaa</i>	<i>\$16,300,000</i>
<i>New Transmission Force Main to Kapaa</i>	<i>\$21,200,000</i>
<i>Force Main Back to Kailua</i>	<i>\$18,300,000</i>
<i>Kapaa Land Acquisition</i>	<i>\$11,000,000</i>
<i>Demolition of Structures at Kailua</i>	<i>\$5,000,000</i>
<i>Total</i>	<i>\$384,430,000</i>

**Community Compatibility:** Relocation of the plant to Kapaa would result in improved settings for mitigating the effects of odor and noise which currently plague the Kailua Regional WWTP. Relocation of the plant would also be more

conducive with the existing industrial nature of the Kapaa area and visually would be more compatible, although it would contribute to a visual intensification of the industrial landscape. However, relocation of the plant to Kapaa may encounter opposition from neighboring businesses and possibly from the closest residential areas in the Coconut Grove subdivision makai of Kawai Nui Marsh, the Kalaheo Village area, and Kalaheo High School. Depending on the selected site, use of the Kapaa site may require the displacement of existing industrial businesses.

Visual impacts at the Kailua plant would be significantly reduced with the demolition of decommissioned structures and retention of only preliminary treatment and pumping facilities. Visual impacts at the Kaneohe and Ahuimanu WWPTF sites would be of a slight intensification of wastewater facilities due to the new equalization and preliminary treatment facilities. No significant impacts on recreational waters would occur with this alternative. Relocation of the treatment plant to Kapaa would reduce the amount of wastewater vehicles accessing the Kailua WWTP site and traversing along the roadways in the nearby vicinity. Wastewater vehicular traffic would increase in the Kapaa area, mainly affecting Kapaa Quarry Road and Mokapu Boulevard.

Short-term socio-economic noise, air quality and traffic impacts would affect nearby businesses during construction of the secondary treatment plant at Kapaa. Noise and air quality impacts would also temporarily affect nearby residents and the Aikahi Elementary School during construction of facilities and demolition of existing structures at the Kailua plant. The capital improvement and annual operating costs associated with this alternative would result in a significant increase in sewer rates for the wastewater system customers on Oahu.

Environmental Impacts: An increase in overall capacity of secondary treated effluent would not cause an exceedance in the State DOH Water Quality Standards in the receiving waters at the Mokapu Outfall. Archaeological and botanical investigations would be needed for the use of the Kapaa site if undeveloped lands are involved. Construction of the plant in an undeveloped area would result in the removal of primarily introduced vegetation that provide habitat for various bird and feral mammal species. Improvements within the existing Kailua plant and Kaneohe and Ahuimanu WWPTF sites would have "no effect" on historic sites as these areas have been developed, and no

significant impacts on flora, fauna and other environmentally sensitive resources.

**Conclusion:** The relocation of the Kailua Regional WWTP to Kapaa Industrial Park is not deemed a feasible alternative due to the significantly high capital costs and the uncertainty of obtaining regulatory approvals to develop the facility. The distance and higher elevation of the Kapaa site in relation to the Kailua plant would require considerable transmission and pumping facility improvements to convey flows between the two sites, thereby contributing to substantial increased costs. The high capital cost would also have an adverse economic impact on municipal wastewater system ratepayers as the cost would be distributed among all the system customers. Long-term community compatibility impacts could be beneficial as the wastewater treatment plant would be removed from a predominantly residential area, thereby substantially eliminating odor, noise and visual impacts in the nearby Aikahi area. However, there also may be some transference of impacts to the Kalaheo-Coconut Grove area.

The Facilities Plan calls for a continuing evaluation of the possibility of transitioning wastewater facilities from Aikahi to the Kapaa Industrial Park. Such studies could focus on the long-term staging process, associated costs and funding of improvements which are the main impediments to relocation of the regional treatment plant.

## **6.2 Kailua Basin Equalization Alternatives**

To provide flow equalization facilities for the Kailua Basin, 11 sub-alternatives were considered, including EQ basins in the Kailua collection system, remote EQ basins, pipe storage, and WWTP EQ basins (see Figure 2-5). The 11 sub-alternatives were evaluated relative to the following criteria: construction costs, construction impacts, environmental impacts, and community compatibility. Community compatibility is defined as perceived community objections and concerns with the siting of the equalization facilities. In addition to the six (6) sub-alternatives discussed in Section 2.1.2.1, four (4) sub-alternatives are evaluated below.

### 6.2.1 Kailua Road WWPS-Mid Pacific Country Club

This alternative would provide flow equalization basins at the two largest pump stations in Kailua to temporarily store peak storm flows: adjacent to the Kailua Road WWPS, and near the Kailua Heights WWPS on the Mid-Pacific Country Club.

A flow equalization basin would be built on an approximately 1.6-acre site adjacent to the Kailua Road WWPS. The vacant site is owned by the State of Hawaii (TMK: 4-2-16: 2) and is bounded by Kailua Road to the south, the Kailua Road WWPS and landscaped area to the northeast and east, and Kawai Nui Marsh to the north and west. The equalization basin would be built partially underground with a landscaped mini-park developed above to maintain aesthetic compatibility.

A flow equalization basin would be built on an approximately 1-acre site on the Mid-Pacific Country Club (TMK: 4-2-02: 2) west of the 6<sup>th</sup> tee. The site, which is owned by the Trustees of Bishop Estate and leased to Mid-Pacific Country Club, is bounded to the south by single-family residences and the golf course along the remaining boundaries. The equalization basin would be placed completely underground and landscaped above to maintain aesthetic compatibility with the surrounding areas. Odor control improvements would be provided. A force main would be constructed from the Kailua Heights WWPS to the equalization basin, traversing beneath Kaelepulu Canal.

Construction Cost: Total improvement cost for this sub-alternative is approximately \$38.8 million.

Construction Impacts: Construction impacts would be high for this sub-alternative. Construction activities associated with the EQ basin at the Mid-Pacific Country Club site would result in short-term noise and air quality impacts to nearby residents and the Country Club. Golf play would be temporarily disrupted during certain phases of construction and measures to avoid damaging the course during mobilization of equipment would need to be employed. The method of construction used in installing the force main beneath Kaelepulu Canal would contribute to the degree of adverse construction impacts. Installation of the force main from the EQ basin to the

Kailua Heights WWPS would also result in noise, air quality and traffic impacts to nearby residents.

Environmental Impacts: Except for construction of the EQ basin along Kailua Road which would occur adjacent to Kawai Nui Marsh, this sub-alternative would result in no significant impacts on flora, fauna, archaeological/historical, or other environmentally sensitive resources.

Community Compatibility: This sub-alternative would have high community compatibility impacts. Short-term noise, air quality and traffic impacts would result from construction of the EQ basin at the Mid-Pacific Country Club and associated force main. At a community meeting held at Lana Street in June 1998, the community expressed opposition to constructing an EQ basin at the Mid-Pacific Country Club site, citing primarily odor concerns. Visually, the Kailua Road EQ basin would be placed partially underground and landscaped with a mini-park above, and the Mid-Pacific Country Club EQ basin would be placed completely underground with landscaping above to maintain aesthetic compatibility.

Conclusion: This sub-alternative was eliminated from further consideration due to its low ranking (*City News Release, August 6, 1998*).

#### **6.2.2 Oneawa Street-Mokapu Boulevard-Kailua Road Pipe Storage**

In this alternative, in-pipe storage for flow equalization would be provided in new large gravity lines running from the Kailua Heights WWPS and Kailua Road WWPS along Kailua Road, Oneawa Street and Mokapu Boulevard.

Improvements would include in-pipe storage for flow equalization in a new gravity line extending approximately 20,500 feet from the Kailua Road WWPS and Kailua Heights WWPS along Kailua Road, Oneawa Street, Mokapu Boulevard, and Wanaao Road. A drainage pump station would be constructed at Mokapu Boulevard to discharge flows back to the existing Kalaheo Avenue line when the rain storm subsides.

Construction Cost: Total improvement cost for this sub-alternative is approximately \$56.1 million.

**Construction Impacts:** Construction activities associated with installation of the new gravity line would result in noise, air quality and traffic impacts to nearby residents, businesses and motorists. The method of construction used in installing the gravity line would affect the degree of adverse construction impacts. Potential short-term traffic impacts would include restrictions to driveway access, closure of traffic lanes, restriction of on-street parking, and temporary traffic congestion.

**Environmental Impacts:** This sub-alternative would result in no significant impacts on flora, fauna, archaeological/historical, or other environmentally sensitive resources.

**Community Compatibility:** Socio-economic impacts associated with noise, air quality and traffic during construction of the gravity line would affect nearby residents, business and motorists.

**Conclusion:** This sub-alternative is not considered a viable option due to the high cost, construction impacts associated with the installation of a lengthy gravity line, and maintenance considerations.

### **6.2.3 Puu O Ehu Tunnel Storage**

In this alternative, tunnel storage would be provided in the Puu O Ehu hillside south of Hamakua Drive to equalize flows from the Kailua Heights WWPS. The Puu O Ehu hillside is owned by the Harold K. L. Castle Trust Estate and identified as TMK: 4-2-03: 17. Residences are located at the base of the hillside along its southern and eastern sides. A transmission line of approximately 4,700 feet would extend from the Kailua Heights WWPS to the Puu O Ehu tunnel storage. Improvements to the Kailua Heights WWPS would include pumps, wet-well and capacity upgrades.

Additional storage would be provided at the Kailua Road equalization basin site, including odor control. The Kailua Road equalization basin would be placed partially underground with a landscaped mini-park developed above to maintain aesthetic compatibility. Improvements to the Kailua Road WWPS would include pump and wet-well capacity upgrades.

**Construction Cost:** Total improvement cost for this sub-alternative is approximately \$33.8 million.

**Construction Impacts:** Construction activities associated with the tunnel storage and associated transmission line and EQ basin would result in short-term noise, air quality and traffic impacts to nearby residents, businesses and motorists. The method of construction used in tunnel excavation would affect the degree to which nearby residents would be impacted.

**Environmental Impacts:** Except for construction of the Kailua Road EQ basin which would occur adjacent to Kawai Nui Marsh, this sub-alternative would result in no significant impacts on flora, fauna, archaeological/historical, or other environmentally sensitive resources.

**Community Compatibility:** Short-term noise, air quality and traffic impacts would result from construction of the tunnel storage and associated transmission line and EQ basin. Visually, the tunnel storage would be completely within the Puu O Ehu hillside, and the Kailua Road EQ basin would be placed partially underground and landscaped with a mini-park above.

**Conclusion:** This alternative is not a viable option due to construction impacts associated with the tunnel storage on nearby residents, and vehicular access and maintenance considerations regarding the tunnel storage. Also, there would be the uncertainty of obtaining Conservation District Use Permit approval for construction of the tunnel storage.

#### **6.2.4 Kailua District Park Equalization Basin**

Under this alternative, a flow equalization basin would be constructed at the Kailua District Park located along South Kainalu Drive. The EQ basin would be built underground beneath the tennis courts or playing field and include odor control and an adjacent pump station. The park is under the jurisdiction of the City and County of Honolulu Department of Parks and Recreation and is identified as TMK: 4-3-56: 9. It is bounded by South Kainalu Drive to the northeast, Kailua Intermediate School to the east, Kailua Road and the Kailua Shopping Center to the south, Kailua Elementary School and Kailua Public Library to the west, and the Kailua Fire Station to the northwest.



A force main would extend approximately 3,800 feet along Kailua Road from the Kailua Road WWPS to the Kailua District Park equalization basin. Improvements to the Kailua Road WWPS would include pump and wet-well capacity upgrades. Another force main would extend approximately 3,900 feet along Wanaao and Kailua Roads from the Kailua Heights WWPS to the equalization basin. Improvements to the Kailua Heights WWPS would include new pumps and a wet-well.

Construction Cost: Total improvement cost for this sub-alternative is approximately \$33.0 million.

Construction Impacts: Construction activities associated with the EQ basin would result in short-term noise and air quality impacts to park users. Recreational activities and some park facilities would be temporarily disrupted during certain phases of construction, and measures to avoid damaging the recreational field during mobilization of equipment would need to be employed. Installation of the force mains would also result in noise, air quality and traffic impacts to park users and nearby residents, businesses and motorists.

Environmental Impacts: This sub-alternative would result in no significant impacts on flora, fauna, archaeological/historical, or other environmentally sensitive resources.

Community Compatibility: This sub-alternative would have high community compatibility impacts. Socio-economic impacts associated with noise, air quality and traffic during construction of the EQ basin and force mains would affect park users and nearby residents, businesses and motorists. Recreational activities at the park would also be temporarily disrupted during construction activities. Visually, the EQ basin would be placed completely underground and would not have an aesthetic impact.

Conclusion: This sub-alternative is not a viable option due to the high community compatibility impacts associated with construction of the EQ basin and force mains.

## **7. RELATIONSHIP BETWEEN LOCAL AND SHORT-TERM USES OF HUMANITY'S ENVIRONMENT AND THE MAINTENANCE OF LONG-TERM PRODUCTIVITY**

### **7.1 Short-Term Uses**

The proposed project improvements will involve short-term uses of the environment during the construction phase. These uses will have both positive and negative impacts. Construction activities associated with the proposed project will create temporary adverse impacts, including increased noise, airborne dust, traffic disruptions, and loss of on-street parking in the vicinities of the project improvements.

In the short-term, the project will also confer some positive benefits in the local area. Direct economic benefits will result from construction expenditures both through the purchase of materials from local suppliers and through the employment of local labor. Indirect economic impacts may include benefits to local retail businesses resulting from construction activities.

### **7.2 Long-Term Productivity**

Benefits of the proposed action in terms of long-term maintenance and enhancement of the environment include improvement of coastal water quality, ecosystems, public health, and safety. The provision of flow equalization facilities and collection system improvements to reduce infiltration and inflow will reduce the probability of spills and bypasses to coastal waters during extended periods of rainfall. The improved facilities will enable flows that would otherwise potentially be overflows to be treated at a secondary level and eventually discharged through the Mokapu Outfall. The designing of facilities with adequate capacities and flood protection will mitigate any potential for wastewater spills at the proposed facilities which may affect aquatic resources in coastal waters. The reduction of spills and bypasses to coastal waters will help to reduce the cumulative impacts on the water quality resulting from regional non-point source pollution.

The proposed action involves a long-term commitment of land for the wastewater facility improvements. The siting of the proposed wastewater

system improvements would constitute a constraint on the full and unencumbered use of the impacted land. To the extent possible, however, major collection system lines are located within the rights-of-way of City- and State-owned roadways. Where the collection system improvements would encumber private property with easements for the location of lateral lines, the use of the affected property would not be substantially impacted. The affected landowner would only be prevented from placing permanent structures over the easement, and not from its general use. Collection and treatment system facility improvements would be located on public-owned property and would not unreasonably burden neighboring property owners or the general public.

A substantial amount of financial resources would be required to construct, operate and maintain the proposed facility improvements. The funds would be drawn from a generally limited pool of assessment and operating fees. Funds expended for the proposed action would potentially reduce funds available for other wastewater improvement projects on Oahu.

## **8. IRRETRIEVABLE AND IRREVERSIBLE COMMITMENTS OF RESOURCES**

In the short-term, construction of the proposed wastewater facility improvements will require an irreversible and irretrievable commitment of a number of resources, including land, capital, construction materials, manpower, energy, fuel, and water. Financial, material and manpower resources will also be irretrievably committed to the planning and design of the improvements.

There will be a long-term commitment to the use of land with the proposed action. With the exception of those areas proposed for addition to the collection system and new pump stations, most of the remaining improvements constitute modifications and upgrades to the existing system and, therefore, do not require the acquisition of property by the City.

Effective operation of the project will also require irreversible and irretrievable commitments of labor, materials and resources (consumption of potable water and fuel). Certain materials, however, may be derived from renewable sources. Also, substitution of renewable non-fossil derived fuel to power the facilities may be realized in the future.

Financial resources used for construction and operation of the proposed wastewater facility improvements, once committed and used for the project, will not be available for other uses. The extent of irreversible and irretrievable financial commitment towards capital expenses will increase steadily with time as the value of the facilities decline due to the effects of age and depreciation. The funds used for operation and maintenance of the facilities are largely irreversible and irretrievable upon expenditure.

In the long-term, the impact of undertaking these irreversible and irretrievable commitments of resources should be weighed against the environmental and public health benefits to be derived from the improved operation of the Kailua-Kaneohe-Kahaluu wastewater system.

## **9. PROBABLE ADVERSE ENVIRONMENTAL EFFECTS WHICH CANNOT BE AVOIDED**

Adverse impacts can be defined as short- and long-term effects relative to the construction and implementation of a specific use. Short-term impacts are usually construction-related which will occur during the course of construction and cease upon completion of the project. Long-term impacts generally result from the implementation of the proposed project.

### **9.1 Short-Term Effects**

Unavoidable short-term impacts, despite mitigation efforts, include those related to noise and air quality, and traffic inconveniences. These impacts will be greatest during installation and rehabilitation of sewer lines in residential areas and along major roadway corridors within the business districts.

Noise: Construction noise will be unavoidable during the duration of the respective project construction period. Short-term increases in noise levels will result from construction activities, vehicles and equipment. Noise generated by construction activity which may occur on a 24-hour basis or at night will adversely impact nearby residents and businesses. The use of muffled equipment and restrictions on construction hours, as well as adherence to State DOH regulations on noise mitigation, will minimize construction and traffic-related noise. Construction work which may be performed 24 hours a day, 7 days a week will require a Community Noise Variance permit from the DOH.

Air Quality: Construction-related air quality impacts would result from site preparation and earth moving activities, the movement of construction vehicles on unpaved areas of the site, emissions from construction equipment, and construction of structures. The construction contractor is responsible for complying with State DOH regulations which prohibit visible dust emissions at property boundaries. Nevertheless, the presence of nearby residences and buildings in the vicinity of most of the affected project sites suggest that open-air areas and naturally ventilated structures could be impacted by dust in spite of compliance with these regulations.

Traffic: During construction, traffic along the respective corridors proposed for rehabilitation or installation of new sewer lines will be disrupted for the period of the construction activity. Residents and businesses in the immediate work area may be inconvenienced by restrictions to driveway access and street frontage usage. To avoid potential traffic congestion, movement of construction vehicles to and from the project site and any lane closures will be restricted during the morning and afternoon peak traffic periods. The increased traffic from construction-related vehicles should be insignificant during off-peak traffic periods, but may cause inconveniences to residents, businesses and motorists in the vicinity. ~~The use of flaggers or off-duty police officers to direct traffic, as may be needed, during significant phases of construction will control traffic and pedestrian flow.~~ *Flaggers and/or off-duty police officers will be used, as may be needed, during significant phases of construction to control traffic and pedestrian flow.*

The potential temporary restriction or elimination of on-street parking during construction activities could increase competition for street parking in the vicinity and hurt businesses in the immediate area.

## 9.2 Long-Term Effects

Unavoidable long-term impacts resulting from development of the proposed wastewater facility improvements include air quality, noise, economic, visual, wetlands, and energy consumption.

Air Quality: Despite odor mitigation measures which would be implemented at the Kailua Regional WWTP and odor control system modifications proposed at the Kaneohe and Ahuimanu WWPTFs, there may be instances when *noxious nuisance* air emissions from these facilities would be detectable in the nearby vicinities. Such instances may potentially occur during maintenance activities, or due to inadvertent leakage of air handling systems or malfunction of odor control equipment. The detectability of odor would be greatest in the vicinity of the Kailua Regional WWTP due to its close proximity to residential areas.

Noise: In spite of implementation of the recommended noise mitigation for the Kailua Regional WWTP's Odor Control Fans, Effluent Pumps and Administration Building's exterior air-conditioning unit, there may be instances when noise from the plant would be audible to residents in the

vicinity. This may potentially occur during periods of no wind or southwesterly (Kona) wind conditions as discussed in Section 4.6.2.

**Economic:** The capital improvement and annual operating costs associated with the proposed facility improvements would result in an increase in sewer rates for the wastewater system customers on Oahu.

**Visual:** Since the proposed facility improvements at the existing WWTP, WWPTFs and pump station sites will be similar in visual character to those of the existing facilities, the change in views from public places will be of a slight intensification of the existing uses at most. The above-ground Kapaa Industrial Park and MCBH Kaneohe Bay EQ facilities, if pursued, would be similar in visual character to adjacent uses and would contribute to a slight intensification of the uses. Development of the partially underground Kailua Road EQ basin, if pursued, will change the visual landscape of the area; however, the basin will be landscaped with a mini-park above to maintain aesthetic compatibility.

**Wetlands:** If the MCBH Kaneohe Bay EQ facility alternative is pursued, construction of the facility will have an impact on existing wetlands and associated aquatic resources and endangered faunal species which may inhabit the site, as well as those of Nuupia Ponds. The MCBH site is located north of Nuupia Ponds and includes wetland areas that would need to be taken into consideration in the siting and development of the facility. Facility improvements will also include installation of a transmission line between the Kailua Regional WWTP and the MCBH site, potentially impacting Nuupia Ponds. Impacts on the wetlands associated with construction of the transmission line would be significantly reduced if the pipeline follows the existing transmission line which is located on fastland within Nuupia Ponds.

If this alternative is pursued, environmental permitting requirements and a wetlands mitigation plan would need to be addressed in coordination with environmental managers at the MCBH Kaneohe Bay, the U.S. Army Corps of Engineers and the U.S. Fish and Wildlife Service to mitigate the associated impacts. Additional environmental investigations and mitigation, such as the enhancement of wetland habitat elsewhere on the Base, may be required.

**Energy Consumption:** Operation of the new wastewater facilities will increase demand in energy consumption. As the proposed modifications are

made to the existing wastewater facilities, however, energy consumption could be reduced. The use of electrical power on Oahu results in the use of fossil fuel resources and production of air pollution.



## 10. SUMMARY OF UNRESOLVED ISSUES

Unresolved issues are invariably associated with projects in the planning and design stages. Consequently, the planning process, which includes this Environmental Impact Statement, attempts to identify these issues and to develop appropriate mitigative measures.

Kailua Basin Flow Equalization Facilities Alternatives and Extent of Rehabilitation of the Collection System Lines: Presently, major uncertainties exist in the selection of a Kailua Basin equalization alternative.

The Facilities Plan recommended flow equalization for the Kailua Basin as depicted by scenarios in Table 2-1 in Section 2.1.2.1. At the time of the Final Facilities Plan, it was undecided whether the 2-year storm or the 5-year storm would be pursued as the basis for determining design peak flows. However, the City has since established a policy to use the 2-year, 6-hour storm event *with pending* the concurrence of the EPA (see Section 1.4.2).

The other uncertainty in the selection of a Kailua Basin equalization alternative is the extent of reduction in infiltration and inflow (I/I) to the sewer system that would be achieved by rehabilitation projects. The City proposes to rehabilitate up to seven (7) collection system basins in the Kailua-Kaneohe-Kahaluu region, having begun with the pilot project for basins in the Enchanted Lake area (see Section 2.1.2.2). The extent of reduction in infiltration/inflow achieved by the rehabilitation of lines is expected to be approximately 35 to 38 percent, based on experiences elsewhere as well as results from the pilot project rehabilitation of main lines in a basin in the Enchanted Lake area.

With the City's decision to pursue the 2-year storm as the basis for planning and design, the 5-year alternatives could be eliminated. However, they are retained for consideration since these options could be found to be more favorable upon further engineering analysis.

Project Plans and Design: The conceptual plans and detailed design features of the proposed individual wastewater projects remain to be finalized and may undergo further formulation based on response to public input and to conform to applicable permits and other requirements. The method of

construction deemed most appropriate for the individual projects will be determined during the planning and design phases for each project. As the individual projects progress toward the design and construction phases, preliminary engineering studies and environmental review will be undertaken for each project on an as-needed basis.

Funding of Improvements: The funds required for construction of the proposed individual wastewater projects may vary depending on the final design of each project, bidding conditions, and other factors. Also, the actual cost to be assessed per wastewater system ratepayer for the proposed facility improvements remains to be determined.

Necessary Permits and Approvals: Land use and environmental permits and approvals will be required prior to construction of the proposed projects, and are identified in Section 5.9. The required permits and approvals will be determined during the more detailed planning and design phases for each project.

Phasing of Improvements: The actual phasing of construction of the majority of the proposed individual wastewater projects is unresolved as it will be largely dependent on the availability of funding for the improvements, as well as Honolulu City Council approval. Additionally, future changes to the City's land use plans and policies affecting build-out capacity cannot be anticipated, nor can the actual rate of population growth. Any such changes may impact both the need for and timing of wastewater projects proposed to increase future capacity.

Odor Mitigation: In addition to short-term odor mitigation measures being undertaken by the City at the Kailua Regional WWTP, the City is also pursuing intermediate- and long-term odor mitigation at the plant. This includes consideration of various odor reduction systems, as well as newer technologies recommended in the Facilities Plan for inclusion in engineering studies for future upgrades and replacement of existing systems. At the plant's dewatering building, the City is exploring medium- to long-range design alternatives to provide a new odor control design or modify the existing Calvert Odor Control Unit to reduce the hydrogen sulfide emissions from the building. Design of future facilities will need to incorporate both the latest technologies, as well as well-defined operation and maintenance

procedures to assure reduction of ~~noxious~~ *nuisance* air emissions from the collection system, storage facilities and treatment sites. For storage basins, the technologies and control systems described for the Kailua Regional WWTP apply and specific facilities will be assessed as part of the preliminary engineering design.

Islandwide, the Odor Control Assessment Program scheduled to start in FY 2000 will involve the preparation of a study to address the effectiveness of all City-owned and operated existing odor control units, as well as address odor control requirements. The study will provide a master plan to control odors from the collection system, pump stations and treatment plants.

Facilities in Flood Hazard Districts: The Kaneohe and Ahuimanu WWPTFs, Coconut Grove WWPS and proposed Kaalaea WWPS are all located within the respective flood hazard districts. Development of the proposed wastewater facility improvements within the flood hazard districts will be in accordance with regulations set forth in Section 21-9.10 Flood Hazard Districts of the City's Land Use Ordinance (LUO), and subject to the preparation of flood studies pursuant to the Section, as may be required. The studies will be conducted to ensure that any proposed encroachment of facilities in the floodway will not result in any increase in the regulatory flood elevations during occurrence of the regulatory flood.

MCBH Kaneohe Bay EQ Basin Alternative: If the MCBH Kaneohe Bay EQ alternative is pursued, environmental permitting requirements must be met, and a wetlands mitigation plan would need to be addressed in coordination with environmental managers at the MCBH Kaneohe Bay, the U.S. Army Corps of Engineers and the U.S. Fish and Wildlife Service to mitigate the associated impacts. Additional environmental investigations and mitigation, such as the enhancement of wetland habitat elsewhere on the Base, may be required. Should the wetland habitat enhancement be the recommended course of action, the potential for damage to the ecosystem which cannot be offset will be more appropriately be evaluated at that time.

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of Land and Natural Resources. March 1992.

**12. PREPARERS OF THE EIS**

**12.1 Proposing Agency**

**City and County of Honolulu  
Department of Design and Construction  
~~Randall K. Fujiki~~ Gary Q.L. Yee, AIA  
Carl Arakaki**

*Acting Director  
Project Manager*

**City and County of Honolulu  
Department of Environmental Services  
Dr. Kenneth E. Sprague**

*Director*

**12.2 EIS Consultant**

**Wilson Okamoto & Associates, Inc.  
Rodney Funakoshi, AICP  
Frances Yamada  
Troy Fujimoto  
Tiffany Mathias  
Richard Harada, P.E.  
Jason Antonio  
Glynn Mayeshiro**

*Project Manager  
Senior Planner  
Planner  
Planner  
Civil Engineer  
Graphics  
Design Layout*

**12.3 EIS Technical Studies/Support**

**Brown and Caldwell  
Ray Matasci  
Charles Zickefoose  
D.L. Adams Associates, Ltd.  
dba Darby & Associates  
David L. Adams  
Botanical Consultants  
Evangeline Funk**

*Sanitary Engineer  
Air Quality*

*Noise*

*Botanical*

**13. CONSULTATION**

**13.1 Pre-Assessment Consultation**

The following agencies, organizations and elected officials were consulted during the pre-assessment phase of the EIS Preparation Notice. In addition, the following meetings were held to solicit input on the Kailua-Kaneohe-Kahaluu Facilities Plan: four public information meetings held in March and April 1997 and March and August 1998, an Iana Street community meeting held in June 1998, a Kailua Neighborhood Board No. 31 Planning/Zoning and Environmental Committee meeting held in April 1998, and two Kailua Neighborhood Board No. 31 meetings held in May and July 1998. A public hearing on the Final Plan was held in September 1998.

Federal

Marine Corps Base Hawaii Kaneohe Bay

State of Hawaii

Department of Health  
Department of Land and Natural Resources (DLNR) Division of Forestry and  
Wildlife

City and County of Honolulu

Planning Department

Elected Officials

Representative Cynthia Thielen  
Councilmember John Henry Felix  
Councilmember Steve Holmes

Organizations

Kailua Neighborhood Board No. 31  
Kailua Neighborhood Board No. 31 Planning/Zoning and Environmental  
Committee  
Kailua Regional WWTP Steering Committee  
Kawai Nui Heritage Foundation  
Save Our Bays and Beaches  
Kailua Urban Design Task Force  
Hawaii's Thousand Friends  
Hawaii Audobon Society  
Lani-Kailua Outdoor Circle  
Mid-Pacific Country Club  
Kaneohe Ranch

PLANNING DEPARTMENT  
CITY AND COUNTY OF HONOLULU  
650 SOUTH KING STREET, 8TH FLOOR • HONOLULU, HAWAII 96813-3017  
PHONE: (808) 523-4333 • FAX: (808) 523-4890



PATRICK T. ONISHI  
CHIEF PLANNING OFFICER  
DONALD MARSH  
DEPUTY CHIEF PLANNING OFFICER  
GW 3/98-0528

RECEIVED  
MAR 25 1998

WILSON OKAMOTO & ASSOCIATES, INC. March 23, 1998

JEREMY MARSH  
MAYOR

98-357  
SC

PLANNING DEPARTMENT  
COUNTY OF HONOLULU  
650 SOUTH KING STREET, 8TH FLOOR • HONOLULU, HAWAII 96813-3017  
PHONE: (808) 523-4333 • FAX: (808) 523-4890



PATRICK T. ONISHI  
CHIEF PLANNING OFFICER  
DONALD MARSH  
DEPUTY CHIEF PLANNING OFFICER  
GW 2/98-0279

'98 FEB 25 P2-28

DEPT. OF WASTEWATER MGMT.  
DIVISION OF PLANNING  
& SERVICE CONTROL

JEREMY MARSH  
MAYOR

February 24, 1998

TO: KENNETH E. SPRAGUE, DIRECTOR  
DEPARTMENT OF WASTEWATER MANAGEMENT

FROM: PATRICK T. ONISHI  
CHIEF PLANNING OFFICER

SUBJECT: WCC 98-25: ENVIRONMENTAL IMPACT STATEMENT PREPARATION NOTICE (EISP/N) PRE-ASSESSMENT CONSULTATION KAILUA-KANEOHE-KAHALUU WASTEWATER FACILITIES PLAN, WINDWARD, OAHU, HAWAII

Thank you for soliciting this department's comments as part of the pre-assessment consultation process. We have reviewed the materials provided, and have no comments at this time.

You should note that this department is currently involved in efforts to revise the Development Plan for Koolauapoko, which encompasses the communities addressed by the Kailua-Kaneohe-Kahaluu Wastewater Facilities Plan. Therefore, as a means of providing mutual benefits to both projects, I request that you coordinate information interchanges and exchanges of draft work products through Gordon Wood, this department's project manager for the Koolauapoko Development Plan Revision Program. Mr. Wood may be reached at local 6073.

Thank you for your consideration in this matter.

PTO:lh

RECEIVED  
'98 FEB 25 AM 11 58  
DEPT. OF WASTEWATER MANAGEMENT

TO: KENNETH E. SPRAGUE, DIRECTOR  
DEPARTMENT OF WASTEWATER MANAGEMENT

FROM: PATRICK T. ONISHI  
CHIEF PLANNING OFFICER

SUBJECT: KAILUA-KANEOHE-KAHALUU FACILITIES PLAN AND ENVIRONMENTAL IMPACT STATEMENT PREPARATION NOTICE (EISP/N) PRE-ASSESSMENT CONSULTATION

Thank you for providing a copy of the above-referenced document for our review and coordination with our current efforts to revise the Development Plan for Koolauapoko. We understand the Planning Department will be the accepting authority for the subject EIS.

In Section B of the Executive Summary, and elsewhere, this document states the estimated number of unsewered lots in the subject region and notes that sewer improvement districts are being implemented. It may be useful to note the number of unsewered lots that will be affected by the current improvement districts and the estimated number that will remain unsewered.

The EIS should address conformance to the provisions of the City and County's General Plan and the Development Plan for Koolauapoko. We have no other comments to offer at this time.

Should you have any questions or concerns, please contact Gordon Wood of the Planning Department staff at 527-6073.

PTO:lh  
c: Rodney Funakoshi, Wilson Okamoto & Associates, Inc.

**13.2 EIS Preparation Notice Consultation**

The following agencies, organizations and elected officials were consulted and comments solicited for the EIS Preparation Notice. As of December 10, 1998, a total of 21 comment letters were received. Of those who formally replied, some had no comments while others provided substantive comments as indicated by the \* and \*\*, respectively. All written comments and responses are reproduced herein.

Federal

- U.S. Fish and Wildlife Service
- \*\* U.S. Army Engineer Division
- \* U.S. Department of Agriculture, Natural Resources Conservation Service
- U.S. Environmental Protection Agency, Region IX
- \*\* Marine Corps Base Hawaii Kaneohe Bay

State of Hawaii

- Department of Health
- \*\* DLNR Land Division
- \*\* DLNR Division of Forestry and Wildlife
- \*\* DLNR Historic Preservation Division
- DLNR Commission on Water Resource Management
- DLNR Division of Aquatic Resources
- Department of Business, Economic Development & Tourism (DBED&T)
- DBED&T Energy Resources and Technology Division
- \*\* Office of Environmental Quality Control
- \*\* Office of Planning
- Office of Hawaiian Affairs
- \*\* Land Use Commission
- Department of Transportation
- Department of Hawaiian Home Lands
- University of Hawaii (UH) Environmental Center
- UH Water Resources Research Center
- UH Institute of Marine Biology



City and County of Honolulu

- Board of Water Supply
- \*\* Department of Planning and Permitting
- \* Department of Facility Maintenance
- \*\* Department of Transportation Services
- \* Department of Environmental Services
- \* Department of Parks and Recreation Services
- Department of Finance

Elected Officials

- Senator Marshall Ige
- \*\* Representative Cynthia Thielen
- Councilmember John Henry Felix
- Councilmember Steve Holmes

Organizations

- \*\* Kailua Neighborhood Board No. 31
- Kaneohe Neighborhood Board No. 30
- Kahaluu Neighborhood Board No. 29
- Kailua Regional WWTP Steering Committee
- Kawai Nui Heritage Foundation
- Save Our Bays and Beaches
- Kailua Bay Advisory Council
- Kailua Urban Design Task Force
- Hawaii's Thousand Friends
- Hawaii Audobon Society
- Lani-Kailua Outdoor Circle
- Kailua Chamber of Commerce
- Kaneohe Ranch
- Kaneohe Bay Regional Council
- Kaneohe Business Group
- Kaneohe Outdoor Circle
- Kualoa-Heeia Ecumenical Youth (KEY) Project

Organizations (continued)

- Sierra Club Hawaii Chapter
- \*\* A.O.A.O. Aikahi Gardens Board of Directors
- \*\* Aikahi Elementary School PTA

Public Utility Agencies

- Hawaiian Electric Company, Inc.
- \* GTE Hawaiian Telephone Company
- Oceanic Cable
- The Gas Company

Individuals

- \*\* Trudy Burns Stone
- \*\* Nancy Cullen



DEPARTMENT OF THE ARMY  
U. S. ARMY ENGINEER DISTRICT, HONOLULU  
FT. SHAFTER, HAWAII 96826-3440

SENT TO  
ATTENTION OF

October 2, 1998

Civil Works Branch

Mr. Carl Arakaki  
City and County of Honolulu  
Department of Design and Construction  
650 South King Street, 2nd Floor  
Honolulu, Hawaii 96813

Dear Mr. Arakaki:

Thank you for the opportunity to review and comment on the Environmental Impact Statement Preparation Notice (EISP/N) for the Kailua-Kaneohe-Kahaluu Facilities Plan, Koolauopoko, Oahu (TMKS 4-2, 4-3, 4-4, 4-5, 4-6, 4-7, 4-8, and 4-9). The following comments are provided in accordance with U.S. Army Corps of Engineers authorities to provide flood hazard information and to issue Department of the Army (DA) permits.

- a. As noted on page 6-1 of the EISP/N, a DA permit may be required for the proposed improvements. For further information, please contact Mr. Peter Galloway of our Regulatory Section at 438-3258 (extension 15) and refer to file number 980000303.
- b. The flood information provided on pages 3-10 to 3-13 of the EISP/N is correct.

Due to the recent 1998 reorganization of the local Corps of Engineers office, all correspondence concerning comments to environmental and planning documents should be sent to the Honolulu Engineer District, Attention: CEPOH-ED-C. Thank you for your attention to this matter.

Sincerely,

Paul Mizue, P.E.  
Chief, Civil Works Branch

Copy Furnished:

Mr. Rodney Funakoshi  
Wilson Okamoto and Associates  
1907 South Beretania Street, Suite 400  
Honolulu, Hawaii 96826

**RECEIVED**  
OCT 06 1998

WILSON OKAMOTO & ASSOC, INC

DEPARTMENT OF DESIGN AND CONSTRUCTION  
**CITY AND COUNTY OF HONOLULU** Jun 23 1999

650 SOUTH KING STREET, 2ND FLOOR  
HONOLULU, HAWAII 96813  
PHONE: (808) 523-4584 • FAX: (808) 523-4587



JEREMY HARRIS  
MAYOR

RANDALL K. FUJIKI, AIA  
DIRECTOR  
ROLAND D. LIBBY, JR., AIA  
DEPUTY DIRECTOR

June 24, 1999

DCP 99-414

Mr. Paul Mizue, P.E., Chief  
Civil Works Branch  
Department of the Army  
U.S. Army Engineer District, Honolulu  
Fort Shafter, Hawaii 96858-5440

Attention: CEPOH-ED-C

Dear Mr. Mizue:

Subject: Kailua-Kaneohe-Kahaluu Facilities Plan  
Environmental Impact Statement (EIS) Preparation Notice  
Koolauopoko, Oahu, Hawaii

Thank you for your letter of October 2, 1998, regarding the subject EIS Preparation Notice. We acknowledge your confirmation that a Department of the Army permit may be required for the proposed improvements, and that the information on flood hazards as provided in the EIS Preparation Notice is correct.

As indicated in your letter, all subsequent correspondence concerning comments on the subject EIS will be sent to the Honolulu Engineer District, Attention: CEPOH-ED-C.

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

If you have any questions, please contact Carl Arakaki at 523-4671.

Very truly yours,

RANDALL K. FUJIKI  
Director

cc: Rodney Funakoshi, Wilson Okamoto & Associates, Inc.



United States  
Department of  
Agriculture  
Natural  
Resources  
Conservation  
Service  
P.O. Box 50004  
Honolulu, HI  
96850

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

October 23, 1998

Mr. Carl Arakaki  
Department of Design and Construction  
City and County of Honolulu  
650 South King Street  
Honolulu, Hawaii 96813

RECEIVED  
OCT 28 1998  
WILSON OKAMOTO & ASSOCIATES, INC.

Dear Mr. Arakaki:

Subject: DCP 98-244 - Environmental Impact Statement Preparation Notice (EISP/N) -  
Kailua-Kaneohe-Kahaluu Facilities Plan, Koolauapoko, Oahu, HI

We have reviewed the above mentioned document and have no comments to offer at this time.

Thank you for the opportunity to review this document.  
Sincerely,

*Kenneth M. Kaneshiro*

KENNETH M. KANESHIRO  
State Conservationist

cc: Mr. Patrick T. Onishi, Planning Department, City and County of Honolulu,  
650 South King Street, Honolulu, HI 96813  
Mr. Rodney Funakoshi, Wilson Okamoto & Associates, Inc., 1907 South Beretania St.,  
Suite 400, Honolulu, HI 96826

DEPARTMENT OF DESIGN AND CONSTRUCTION  
CITY AND COUNTY OF HONOLULU

650 SOUTH KING STREET, 2ND FLOOR  
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JEREMY HARRIS  
MAYOR

RANDALL K. FUJIKI, AIA  
DIRECTOR  
ROLAND D. LIBBY, JR., AIA  
DEPUTY DIRECTOR

DCP 99-415

June 24, 1999

Mr. Kenneth M. Kaneshiro, State Conservationist  
Natural Resources Conservation Service  
U.S. Department of Agriculture  
P.O. Box 50004  
Honolulu, Hawaii 96850

Dear Mr. Kaneshiro:

Subject: Kailua-Kaneohe-Kahaluu Facilities Plan  
Environmental Impact Statement (EIS) Preparation Notice  
Koolauapoko, Oahu, Hawaii

Thank you for your letter of October 23, 1998, indicating that you have no comments on the subject EIS Preparation Notice.

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

If you have any questions, please contact Carl Arakaki at 523-4671.

Very truly yours,

*Randall K. Fujiki*  
RANDALL K. FUJIKI  
Director

cc: Rodney Funakoshi, Wilson Okamoto & Associates, Inc.

The Natural Resources Conservation Service works hand-in-hand with the American people to conserve natural resources on private lands.  
AN EQUAL OPPORTUNITY EMPLOYER



UNITED STATES MARINE CORPS  
MARINE CORPS BASE HAWAII  
BOX 5302  
KAHEOHE BAY, HAWAII 96702

4535  
See LFD/0345-98e  
October 22, 1998

MINUTELY REFER TO:

Mr. Carl Arakaki  
Department of Design and Construction  
City and County of Honolulu  
650 South King Street  
Honolulu, Hawaii 96813

Dear Mr. Arakaki:

SUBJECT: EIS PREPARATION NOTICE FOR THE KAILUA-KANEOHE-KAHALUU  
FACILITIES PLAN

Thank you for the opportunity to review the EIS Preparation Notice for the Kailua-Kaneohe-Kahaluu Facilities Plan. Enclosed are our comments to the EIS Preparation Notice. Please call me at (808) 257-2171, extension 222 if you have any questions.

Sincerely,

LEE YAMAMOTO  
Deputy Director  
Facilities Department  
By direction of the  
Commanding General

Copy to: Mr. Patrick T. Onishi, Planning Department  
Mr. Rodney Funakoshi, Wilson Okamoto & Associates, Inc.  
Mr. Randall K. Fujiki, Director, Department of Design and  
Construction  
Major Brennan, Director, Environmental Branch (LE)

Comments to Environmental Impact Statement Preparation Notice for the  
Kailua-Kaneohe-Kahaluu Facilities Plan

1. Impacts to Marine Corps Base Hawaii (MCBH) in the following general areas need to be addressed in the forthcoming EIS: wetlands and historic properties/cultural resources. Each will be briefly addressed below.
  - a. Wetlands. One of the alternatives in the proposed action is to use about 5 acres of wetlands aboard MCBH. Several major problems arise from this:
    - a. The EIS Preparation Notice discusses offsetting this loss by enhancing other wetland aboard MCBH. This would be nearly impossible to do since space is so limited aboard the base.
    - b. Scientific opinion in the area of wetlands offsetting is mixed. Some scientists are of the opinion that by taking wetlands you cause damage to an ecosystem that cannot be offset by building new wetlands or enhancing existing ones. The question as to whether damage is being caused that cannot be offset must be addressed.
    - c. This wetland area is habitat for the Hawaiian stilt, which is an endangered species. Potential impacts on this species must be closely examined.
2. Historic Properties/Cultural Resources. The Nu'upia Ponds complex is a Wildlife Management Area, an eligible National Historic Property, and a cultural resource. Though the proposed site of the equalization facility (EF) is not in the ponds complex, the proposed action could very well affect it. More piping will have to be laid and construction work done in or near the ponds complex to allow for the increased flow to the EF. Since there will be increased effluent flow near and/or across the ponds complex, the increased potential for a large effluent spill must be examined. Finally, since many Native Hawaiian burials have been uncovered on Mokuauia peninsula, potential impacts upon Native Hawaiian burial sites must be addressed.

DEPARTMENT OF DESIGN AND CONSTRUCTION  
CITY AND COUNTY OF HONOLULU

650 SOUTH KING STREET, 2ND FLOOR  
HONOLULU, HAWAII 96813  
PHONE: (808) 523-4564 • FAX: (808) 523-4587



JEREMY HARRIS  
MAYOR

RANDALL K. FUJIKI, AIA  
DIRECTOR  
RODNEY D. LIBBY, JR., AIA  
DEPUTY DIRECTOR

DCP 99-416

June 24, 1999

Mr. Lee Yamamoto, Deputy Director  
Facilities Department  
United States Marine Corps  
Marine Corps Base Hawaii  
Box 63002  
Kaneohe Bay, Hawaii 96863-3002

Dear Mr. Yamamoto:

Subject: Kailua-Kaneohe-Kahaluu Facilities Plan  
Environmental Impact Statement (EIS) Preparation Notice  
Koolauoko, Oahu, Hawaii

Thank you for your letter of October 22, 1998 (Ref. 4535, Ser LFD/0345-98c), regarding the subject EIS Preparation Notice. We offer the following responses in the respective order of your comments:

1. The Draft EIS will address potential impacts associated with a proposed equalization facility on wetlands and historic properties/cultural resources within the MCBH Kaneohe Bay, and appropriate mitigation measures.
2. Wetlands.
  - a. The potential enhancement of wetland habitat elsewhere on the MCBH Kaneohe Bay to offset the loss of wetland habitat resulting from construction of an equalization basin is intended as only one means of possible mitigation. As mentioned in the EIS Preparation Notice, if this alternative were to be pursued, a wetlands mitigation plan would need to be developed in coordination with environmental managers at the MCBH Kaneohe Bay to mitigate such impacts.

Mr. Lee Yamamoto  
Page 2  
June 24, 1999

b. If the development of an equalization basin at the MCBH Kaneohe Bay were to be pursued, a wetlands mitigation plan would need to be developed in coordination with the environmental managers at the MCBH Kaneohe Bay to mitigate such impacts. Should the wetland habitat enhancement be the recommended course of action, the potential of damage to the ecosystem which could result and of which cannot be offset will more appropriately be evaluated at that time.

c. We acknowledge your confirmation that the subject wetland area within the MCBH Kaneohe Bay is habitat for the endangered Hawaiian stilt. As indicated, should the equalization basin alternative at the MCBH Kaneohe Bay be pursued, a wetlands mitigation plan would need to be developed in coordination with environmental managers at the Base to mitigate associated impacts, including those on the Hawaiian stilt.

3. Historic Properties/Cultural Resources. The Draft EIS will include a discussion of the impact of potential wastewater spills on the Nuupia Ponds complex and appropriate mitigation measures. The potential impact resulting from the construction of a proposed equalization facility on Native Hawaiian burial sites and appropriate mitigation measures will also be addressed in the Draft EIS.

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

If you have any questions, please contact Carl Arakaki at 523-4671.

Very truly yours,

for RANDALL K. FUJIKI  
Director

cc: Rodney Funakoshi, Wilson Okamoto & Associates, Inc.



STATE OF HAWAII  
 DEPARTMENT OF LAND AND NATURAL RESOURCES  
 LAND DIVISION  
 P.O. BOX 621  
 HONOLULU, HAWAII 96809

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 DESIGN & CONSTRUCTION  
 DIVISION OF  
 PLANNING & PROGRAMMING

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DESIGN & CONSTRUCTION  
 DIVISION OF  
 PLANNING & PROGRAMMING

OCT 23 1998

LD-NAV  
 REF.: EISKKK.P.RCM  
 Mr. Carl Arakaki  
 Department of Design  
 and Construction  
 City and County of Honolulu  
 650 S. King Street 2nd Floor  
 Honolulu, Hawaii 96813

Dear Mr. Arakaki:  
 SUBJECT: Kailua-Kaneohe-Kahaluu Facilities Plan  
 Environmental Impact Statement Preparation Notice  
 Koolaulopoko, Island of Oahu, Hawaii

Thank you for the opportunity to review and comment on the subject matter. We have the following comments:

Division of Aquatic Resources: Suggest that the forthcoming Draft Environmental Impact Statement (DEIS) discuss in detail potential short term impacts to aquatic resource values and propose specific means for averting or minimizing adverse effects, and provide possible mitigation for unavoidable damage to natural resources. Any proposed freshwater streams or shoreline modifications necessary for the project should be adequately described in the forthcoming DEIS.

Engineering Branch: Their current projects and programs are not affected by the proposed project.

Division of State Parks: The Heeia State Park at Kealahi Point (former Ulu Mau Village) is currently without Municipal Sewage Services. They request that the service trunk line, probably from the Ahuimanu WPTF, be extended to this location. They would appreciate if any commitment to do so and a time frame be included in the DEIS.

Please provide us with 3 copies of the forthcoming DEIS. Should you have any questions, please contact Nick Vaccaro of the Land Division Support Services Branch at 587-0438.

Very truly yours,

*Dean Y. Uchida*  
 DEAN Y. UCHIDA  
 Administrator

c: Oahu Land Board Member - Aquatic Resources - State Parks - ODLO

DEPARTMENT OF DESIGN AND CONSTRUCTION  
 CITY AND COUNTY OF HONOLULU

650 SOUTH KING STREET, 2ND FLOOR  
 HONOLULU, HAWAII 96813  
 PHONE: (808) 523-4568 • FAX: (808) 523-4587



June 24, 1999

RANDALL K. FUJIKI, AIA  
 DIRECTOR  
 ROLAND D. LIBBY, JR., AIA  
 DEPUTY DIRECTOR

DCP 99-417

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

Dear Mr. Uchida:

Subject: Kailua-Kaneohe-Kahaluu Facilities Plan  
 Environmental Impact Statement (EIS) Preparation Notice  
 Koolaulopoko, Oahu, Hawaii

Thank you for your letter of October 23, 1998 (LD-NAV Ref. EISKKK.P.RCM), regarding the subject EIS Preparation Notice. We offer the following responses in the respective order of your comments:

- Division of Aquatic Resources: The Draft EIS will include a discussion of the potential short-term impacts to aquatic resource values which may result from the proposed project, including proposed means for averting or minimizing adverse effects, and mitigation for unavoidable damage to natural resources, as appropriate. The proposed project improvements are not anticipated to require any freshwater stream or shoreline modifications.
- Engineering Branch: We acknowledge that the Engineering Branch's current projects and programs are not affected by the proposed project.
- Division of State Parks: Please be informed that the State could extend a sewer line from Heeia State Park to the existing municipal system at its expense, provided there is adequate capacity in the line which would be connected to. Should the Division of State Parks wish to further pursue this, they may contact our Department of Planning and Permitting Wastewater Branch at 527-6064.


Mr. Dean Y. Uchida  
Page 2  
June 24, 1999

As requested, three copies of the forthcoming Draft EIS will be provided to you upon its distribution for public review.

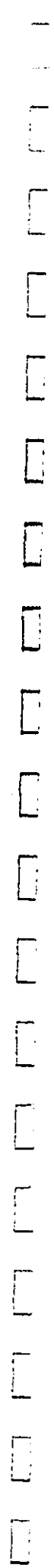
We appreciate your interest and participation in the consultation phase of the environmental review process.

If you have any questions, please contact Carl Arakaki at 523-4671.

Very truly yours,

  
RANDALL K. FUJIKI  
Director

cc: Rodney Funakoshi, Wilson Okamoto & Associates, Inc.





SPURDINE J. CATELAND  
Governor of Hawaii



STATE OF HAWAII  
DEPARTMENT OF LAND AND NATURAL RESOURCES  
DIVISION OF FORESTRY AND WILDLIFE  
1151 PUNCHBOWL STREET  
HONOLULU, HAWAII 96813

September 22, 1998

Mr. Carl Arakaki  
Department of Design and Construction  
City and County of Honolulu  
650 S. King Street  
Honolulu, Hawaii 96813

Subject: Kailua-Kaneohe-Kahaluu Facilities Plan EIS Preparation Notice,  
Koolauapoko, Oahu, Hawaii

Dear Mr. Arakaki:

We have reviewed the information provided by your September 22, 1998 letter to the Department of Land and Natural Resources, Division of Forestry and Wildlife regarding the subject EIS Preparation Notice. With the exception of MCBH Kaneohe Bay EQ site, page 3-17 of the EIS Preparation Notice indicates that no significant impacts will be anticipated on the wetlands within the planning area which includes Kawaiinui marsh. A master plan was developed by DLNR, for the protection of the waterbirds and their habitat i.e. wetlands in this region. We ask that the City follow this master plan to avoid potential impacts on the wetlands by the proposed wastewater facility improvements.

Thank you for the opportunity to comment on the EIS Preparation Notice.

Sincerely yours,

Michael G. Buck  
Administrator

C: DOFAW, Oahu Branch  
Planning Dept., CCH  
Wilson Okamoto Associates

DEPARTMENT OF DESIGN AND CONSTRUCTION  
CITY AND COUNTY OF HONOLULU  
650 SOUTH KING STREET, 2ND FLOOR  
HONOLULU, HAWAII 96813  
PHONE: (808) 523-4584 • FAX: (808) 523-4587



JEREMY HARRIS  
Director

RANDALL K. FUJIKI, AIA  
DIRECTOR  
ROLAND D. LIBBY, JR., AIA  
DEPUTY DIRECTOR

DCP 99-418

June 24, 1999

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

Dear Mr. Buck:

Subject: Kailua-Kaneohe-Kahaluu Facilities Plan  
Environmental Impact Statement (EIS) Preparation Notice  
Koolauapoko, Oahu, Hawaii

Thank you for your letter of September 22, 1998, regarding the subject EIS Preparation Notice.

The Draft EIS will discuss the potential impacts and mitigation measures associated with the proposed project on wetlands within the planning area, including the Kawai Nui Marsh Master Plan.

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

If you have any questions, please contact Carl Arakaki at 523-4671.

Very truly yours,

RANDALL K. FUJIKI  
Director

cc: Rodney Funakoshi, Wilson Okamoto & Associates, Inc.

EDUARDO C. JIMENEZ  
GOVERNOR OF HAWAII



STATE OF HAWAII

DEPARTMENT OF LAND AND NATURAL RESOURCES

HISTORIC PRESERVATION DIVISION  
KALANIKULANI BUILDING, ROOM 555  
501 KAMOKILA BOULEVARD  
HONOLULU, HAWAII 96813

December 10, 1998

Mr. Carl Arakaki  
Department of Design and Construction  
City and County of Honolulu  
650 South King Street  
Honolulu, HI 96813

Dear Mr. Arakaki:

**SUBJECT:** Chapter 6E-8 Historic Preservation Review - Kailua-Kaneohe-Kahaluu Facilities Plan  
Environmental Impact Statement Preparation Notice (EISP/N)  
Ko'oleupoko, O'ahu  
TMK: 4-2-15; pars. 6 & 8, 4-2-16; par. 1; 4-4-11; 81; 4-5-30; 36;  
4-7-04; 6; and various other TMKs in 4-2, 4-3, 4-4, 4-5, 4-6, 4-7, 4-8

LOG NO: 22622 -  
DOC NO: 9812EJ07

Thank you for the opportunity to review EISP/N for the Kailua-Kaneohe-Kahaluu Facilities Plan dated September 1998. We apologize for the delay in providing our comments. The City and County proposes to undertake various long-term improvements to the wastewater collection, treatment and disposal system, for the Kailua-Kaneohe-Kahaluu wastewater service areas. We believe that improvements within the existing wastewater treatment plants, Kailua WWTP, Kaneohe WWPTF and the Ahuimanu WWPTF, will have "no effect" on historic sites because these areas have been developed making it unlikely that historic sites would be found.

We are concerned that improvements to the collection systems and the pump station modifications may have an adverse effect on historic sites. Historic sites, including human burials have been found in subsurface deposits throughout this area. Therefore, we request the opportunity to review the specific development plans for each project involving sewer rehabilitation, reconstruction and new construction in order to determine the project's effect, if any, on historic sites.

If you have any questions please call Sara Collins at 692-8026 or Elaine Jourdane at 692-8027.

Aloha,

Don Hibbard, Administrator  
Historic Preservation Division

EJjk

c: Patrick T. Onishi, Planning Department City and County of Honolulu, 650 South King Street, Honolulu, HI 96813  
/ Rodney Funakoshi, Wilson Okamoto & Associates, Inc. 1907 South Beretania Street, Suite 400, Honolulu, HI 96826

MICHAEL S. WILSON, CHAIRPERSON  
BOARD OF LAND AND NATURAL RESOURCES

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CONTRACTS

FORESTRY AND WILDLIFE

HISTORIC PRESERVATION

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WATER RESOURCE MANAGEMENT

DEPARTMENT OF DESIGN AND CONSTRUCTION  
CITY AND COUNTY OF HONOLULU

650 SOUTH KING STREET, 2ND FLOOR  
HONOLULU, HAWAII 96813  
PHONE: (808) 523-4564 • FAX: (808) 523-4587



JEREMY HARRIS  
MAYOR

RANDALL K. FUJIKI, AIA  
DIRECTOR  
ROLAND B. LEBBY, JR., AIA  
DEPUTY DIRECTOR

DCP 99-419

June 24, 1999

Mr. Don Hibbard, Administrator  
Historic Preservation Division  
Department of Land and Natural Resources  
State of Hawaii  
Kakuhilewa Building, Room 555  
501 Kamokila Boulevard  
Kapolei, Hawaii 96707

Dear Mr. Hibbard:

**Subject:** Kailua-Kaneohe-Kahaluu Facilities Plan  
Environmental Impact Statement (EIS) Preparation Notice  
Keoluauoko, Oahu, Hawaii

Thank you for your letter of December 10, 1998 (Log No.: 22622, Doc. No.: 9812EJ07), indicating that the proposed improvements within the existing Kailua Regional WWTP and Kaneohe and Ahuimanu WWPTFs will have "no effect" on historic sites as these areas have been developed.

We acknowledge your concern that the proposed improvements to the collection system and the pump station modifications may have an adverse effect on historic sites. As specific development plans for each proposed project involving sewer rehabilitation, reconstruction and new construction are developed, copies of the plans will be provided to your Department for review to determine the project's effect on historic sites, if any. Furthermore, in the event that historic sites are inadvertently uncovered during construction activities, construction will be halted and immediate contact will be made with the State Historic Preservation Division.

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

If you have any questions, please contact Carl Arakaki at 523-4671.

Very truly yours,

RANDALL K. FUJIKI  
Director

cc: Rodney Funakoshi, Wilson Okamoto & Associates, Inc.

BENJAMIN J. CAVETAKO  
GOVERNMENT



STATE OF HAWAII  
OFFICE OF ENVIRONMENTAL QUALITY CONTROL

325 SOUTH BERTANAMA STREET  
SUITE 702  
HONOLULU, HAWAII 96813  
TELEPHONE: 808/548-4115  
FACSIMILE: 808/548-4116

October 23, 1998

Mr. Carl Arakaki  
Department of Design and Construction  
City and County of Honolulu  
650 South King Street  
Honolulu, Hawaii 96813

Dear Mr. Arakaki:

Having reviewed the September 1998, final environmental assessment (FEA)/environmental impact statement preparation notice (EIS/PSN) for the "Kaitua-Kaneohe-Kahaione Facilities Plan, Kooiaupoko, Oahu, Hawaii" we submit the following comments for your response.

1. **DISCUSSION OF IMPACTS AND MITIGATIVE MEASURES:** While the FEA includes a section showing the various elements of the environmental setting (groundwater, surface water, soils, noise, topography, etc.) in relation to various impacts and mitigative measures, the assessment does not clearly identify the specific environmental impacts. For example, in section 3.2.1, the FEA states that "[d]evelopment of the proposed improvements will involve grading and some excavation of presently undeveloped and developed areas within the affected project sites. However, the relatively flat terrain of these areas would minimize the amount of grading required. The excavated areas will either be built over, paved over, or backfilled to its existing contours (fillies supplied)."

Under the current administrative framework there are three types of impacts: direct (effects which are caused by the action and occur at the same time and place); indirect (effects which are by the action and are later in time or farther removed in distance, but are still reasonably foreseeable); and cumulative (impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency or person undertakes such other actions - cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time.)

Neither "grading" or "excavation" are project impacts, but component actions of the project. The "impacts" of the project would probably be: "increased erosional runoff and loss of soil" and "increased runoff velocity due to possible increase in impervious surface area" (direct impacts); "sediment deposition in streams and surface water bodies (indirect impact); and "increased sedimentation and nutrient loading in Kaneohe Bay" (cumulative impact).

In the draft environmental impact statement (DEIS) for the project, please identify in tabular format, all (beneficial and adverse) direct, indirect and cumulative impacts and their corresponding mitigative measures. We also refer you to section 11-200-17, Hawaii Administrative Rules, particularly subsections (g), (i) and (m) for other requirements concerning the environmental setting, impacts and mitigative measures.

2. **EXAMINATION OF GROUND WATER AND SURFACE WATER QUALITY MONITORING DATA:** The proposed improvements constitute, for the purposes of section 11-200-17(f), Hawaii Administrative Rules, a "direct or indirect source of pollution." Hence in your analysis of direct, indirect and cumulative impacts, we request that you contact appropriate agencies (such as your agency's ongoing monitoring efforts of water quality in Kaitua Bay, the Board of Water Supply, Marine Corps

Mr. Carl Arakaki  
Department of Design and Construction  
October 23, 1998  
Page 2 of 2

Base Hawaii, the Clean Water and Safe Drinking Water programs of the Department of Health) to examine ground water and surface-water quality monitoring data for the project planning area.

3. **KAWAI NUI MARSII MANAGEMENT PLAN:** The Department of Land and Natural Resources is currently proposing a management plan for the Kawai Nui marsh area. We are unclear as to whether this plan is an update of the 1994 master plan or a new plan. Please consult with the Department of Land and Natural Resources Land Division (Mr. Thomas Eisen, telephone 587-0385) on this plan as it relates to your proposed action.

Thank you for the opportunity to comment. If there are any questions, please call Leslie Segundo, Environmental Health Specialist, at 586-4185.

Sincerely,

GARY GILL  
Director

Attachments

cc → Mr. Patrick T. Onishi, Planning Department  
Mr. Rodney Funakoshi, Wilson Okamoto & Associates, Inc.

DEPARTMENT OF DESIGN AND CONSTRUCTION  
CITY AND COUNTY OF HONOLULU

650 SOUTH KING STREET, 2ND FLOOR  
HONOLULU, HAWAII 96813  
PHONE: (808) 523-4584 • FAX: (808) 523-4587



JENEMY HARRIS  
MAYOR

RANDALL K. FUJIKI, AIA  
DIRECTOR  
ROLAND O. LUBY, JR., AIA  
DEPUTY DIRECTOR

DCP 99-422

June 24, 1999

Ms. Genevieve Salmonson, Director  
Office of Environmental Quality Control  
State of Hawaii  
235 South Beretania Street, Suite 702  
Honolulu, Hawaii 96813

Dear Ms. Salmonson:

Subject: Kaitua-Kaneohe-Kahaluu Facilities Plan  
Environmental Impact Statement (EIS) Preparation Notice  
Koolauloapoko, Oahu, Hawaii

This is in response to the letter of October 23, 1998 from Mr. Gary Gill, regarding the subject EIS Preparation Notice. We offer the following responses in the respective order of the comments:

1. Discussion of Impacts and Mitigation Measures: The Draft EIS will more clearly identify the specific environmental impacts of the proposed wastewater facility improvements, including the identification of all direct, indirect and cumulative impacts and their corresponding mitigative measures.
2. Examination of Groundwater and Surface Water Quality Monitoring Data: The Draft EIS' analysis of direct, indirect and cumulative impacts will include an examination of available groundwater and surface water quality monitoring data obtained from appropriate agencies such as the Kaitua Bay Advisory Council, City and County Board of Water Supply, Marine Corps Base Hawaii Kaneohe Bay, and the Clean Water and Safe Drinking Water Programs of the State Department of Health.
3. Kawai Nui Marsh Management Plan: The State Department of Land and Natural Resources' (DLNR) proposed management plan for the Kawai Nui Marsh area is based on the 1994 Kawai Nui Marsh Master Plan. The management plan is currently undergoing the environmental review process. The City will consult with DLNR on the management plan as it relates to the proposed wastewater facility improvements, as appropriate.

Ms. Genevieve Salmonson  
Page 2  
June 24, 1999

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

If you have any questions, please contact Carl Arakaki at 523-4671.

Very truly yours,

RANDALL K. FUJIKI  
Director

cc: Rodney Funakoshii, Wilson Okamoto & Associates, Inc.



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

BENJAMIN J. CAWTEANG  
COUNTY DIRECTOR  
SELIE NAYA  
DIRECTOR  
BRADLEY J. MOSSMAN  
COUNTY DIRECTOR  
DIRECTOR, OFFICE OF PLANNING

**OFFICE OF PLANNING**

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

Tel: (808) 587-2846  
Fac: (808) 587-2824

Ref. No. P-7757

October 22, 1998

Mr. Randall Fujiki  
Director  
Department of Design and Construction  
City and County of Honolulu  
650 South King Street  
Honolulu, Hawaii 96813

**RECEIVED**  
OCT 27 1998

WILSON OKAMOTO & ASSOC., INC.

Attn: Mr. Carl Arakaki

Dear Mr. Fujiki:

Subject: Kailua-Kaneohe-Kahaluu Facilities Plan  
Environmental Impact Statement Preparation Notice (EISPN)

We have reviewed the proposed Kailua-Kaneohe-Kahaluu project which will improve the wastewater collection, treatment and disposal system for the Kailua-Kaneohe-Kahaluu wastewater service area. The EISPN indicates that the wastewater flows are "substantially influenced by wet weather infiltration and inflow to the collection system." However, there is little information as to how infiltration and inflow affect the capacity of the regional system, the magnitude of the problem, and which improvements will directly address this problem. A discussion on these issues should be in the draft EIS.

The project will require a Special Management Area (SMA) Permit. Therefore, the EIS should also include an assessment of the proposed project's compliance with the Coastal Zone Management (CZM) objectives and policies, Chapter 205A, HRS. We are especially concerned with the impact on coastal water ecosystems due to the increased temperature and volume of fresh water being discharged into the ocean. Will the proposed expansion make available treated sewage water for irrigation purposes?

The draft EIS should also detail mitigation measures that will be implemented to control polluted runoff during and after construction of the facility improvements. We suggest that you follow our recommended mitigation measures in the "Management Measures for Urban Areas" section of our report entitled *Hawaii's Coastal Nonpoint Pollution Control Plan*. These mitigation measures may also be helpful in expanding the Project Alternatives discussion by examining the potential of source reduction in addressing regional capacity problems.

With regard to potential odor, the draft EIS should contain additional information on potential technology and efforts to reduce the odor. It may be useful to expand the discussion to include mitigation measures used by other cities. Since the EISPN indicates that the Marine Corps Base Hawaii (MCBH) Kaneohe Bay wastewater treatment facility is listed as an alternative, it

Mr. Randall Fujiki  
Page 2  
October 22, 1998

would be beneficial for the draft EIS to discuss ongoing communication with them regarding the use of their facility.

If you have questions, please contact Claire Cappelle of our Coastal Zone Management Program at 587-2880.

Sincerely,  
*Bradley J. Mossman*

Bradley J. Mossman  
Director  
Office of Planning

cc: Seiji F. Naya  
Patrick Onishi  
Rodney Funakoshi

DEPARTMENT OF DESIGN AND CONSTRUCTION  
CITY AND COUNTY OF HONOLULU

830 SOUTH KING STREET, 2ND FLOOR  
HONOLULU, HAWAII 96813  
PHONE: (808) 523-4564 • FAX: (808) 523-4567



JEREMY HARRIS  
MAYOR

RANDALL K. FUJIEL, MA  
DIRECTOR  
ROLAND D. LIMBY, JR., AIA  
DEPUTY DIRECTOR

DGP 99-470

June 24, 1999

Mr. David Blane, Director  
Office of Planning  
Department of Business, Economic Development & Tourism  
State of Hawaii  
235 South Beretania Street, 6th Floor  
Honolulu, Hawaii 96813

Dear Mr. Blane:

Subject: Kailua-Kaneohe-Kahaluu Facilities Plan  
Environmental Impact Statement (EIS) Preparation Notice  
Koolauooboko, Oahu, Hawaii

Thank you for your letter of October 22, 1998 (Ref. No. P-7757), regarding the subject EIS Preparation Notice. We offer the following responses in the respective order of your comments:

1. The Kailua-Kaneohe-Kahaluu Facilities Plan which was completed in September 1998, includes a detailed discussion of the effect of infiltration and inflow on the capacity of the regional system, the extent of the problem, and the proposed project improvements to address the problem. The Draft EIS will summarize the infiltration/inflow problems and address the environmental and socio-economic impacts resulting from the proposed project improvements and appropriate mitigation measures to minimize or reduce such impacts.
2. We acknowledge your confirmation that various proposed project improvements will require a Special Management Area (SMA) Use Permit. An assessment of the proposed project's compliance with the Coastal Zone Management (CZM) objectives and policies, Chapter 205A, Hawaii Revised Statutes, will be included in the Draft EIS. The Draft EIS will discuss the potential impact on coastal water ecosystems as a result of the proposed project.  
A discussion of the potential of effluent reuse for irrigation purposes is included in the Kailua-Kaneohe-Kahaluu Facilities Plan. Currently, an average of 13 mgd of secondary treated wastewater is discharged through the Mokuapu Outfall. This water could be used for many productive purposes including golf course and crop irrigation, landscaping and for various industrial and commercial uses. To produce R-1 quality water which would provide the greatest flexibility for potential users, effluent from the Kailua Regional Wastewater Treatment Plant (RWTP) would have to undergo additional treatment including coagulation/flocculation, filtration and disinfection. Secondly, storage and transmission facilities for reclaimed water would need to be provided, including a backup disposal system.

Mr. David Blane  
Page 2  
June 24, 1999

Another consideration is that reclaimed water used for irrigation must fall within acceptable salinity levels. Preliminary salinity measurements taken at the Kailua Regional WTP indicate that the effluent currently exceeds acceptable levels. The current high chloride concentrations in the effluent are most likely caused by the infiltration of seawater into sewer lines. Following the substantial rehabilitation of sewer lines in the Kailua-Kaneohe-Kahaluu area, salinity levels may fall within acceptable levels (below 600 ppm). As stated in the Facilities Plan, a program for periodically monitoring influent salinity levels should be undertaken by the City and County of Honolulu to determine the feasibility of planning and eventually developing reuse facilities for the region.

3. The Draft EIS will address the potential for run-off resulting from the proposed project during and after construction and potential mitigation measures that may be required, as recommended in your report entitled *Hawaii's Coastal Nonpoint Pollution Control Plan*. These mitigation measures will be reviewed in relation to discussion of the Project Alternatives as suggested in your letter.

4. The Draft EIS will include a discussion of the potential odor impacts resulting from the proposed project and mitigation measures and efforts aimed at reducing such impacts. Prior to finalizing the Facilities Plan, the option of siting equalization facilities at MCBII Kaneohe Bay was coordinated with the Base Facilities and Environmental Compliance Departments of the MCBII Kaneohe Bay. They have indicated that, while it is possible to site equalization facilities next to their wastewater treatment facility, specific environmental regulations need to be addressed since the proposed area is designated as a wetland and an endangered species habitat. EIS, permitting, and real estate regulatory requirements will need to be addressed if this option is pursued.

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

If you have any questions, please contact Carl Arakaki at 523-4671.

Very truly yours,

Director

cc: Rodney Funakoshi, Wilson Okamoto & Associates, Inc.



DEPARTMENT OF BUSINESS, ECONOMIC DEVELOPMENT & TOURISM  
LAND USE COMMISSION

P.O. Box 2359  
Honolulu, HI 96804-2359  
Telephone: 808-587-3822  
Fax: 808-587-3827

September 29, 1998

Mr. Carl Arakaki  
Department of Design and  
Construction  
City and County of Honolulu  
650 South King Street  
Honolulu, Hawaii 96813

Dear Mr. Arakaki:

Subject: Environmental Impact Preparation Notice (EISPN)  
for the Kailua-Kaneohe-Kahaluu Facilities Plan,  
Koolauloko, Oahu, Hawaii, THK 4-2 through 4-2

We have reviewed the EISPN for the subject project and find that based on the general representation of the project depicted in Figure 2-1, the major improvements to the Kailua Regional Wastewater Treatment Plant and the Ahulimanu Wastewater Preliminary Treatment Facility (MWPTF) appear to be located within the State Land Use Urban District. The Kaneohe MWPTF appears to be located within the State Land Use Conservation District.

The other improvements, including the new wastewater pump stations, the net flow equalization basins, the reconstructed sewer lines, the collection system basin rehabilitation, and the sewer improvement districts, appear to be located within the Urban District, with the exception of the equalization basin near the Kaneohe MWPTF and the collection system basin rehabilitation near Laeanani, both of which appear to be within the Conservation District.

We suggest that the draft Environmental Impact Statement (DEIS) include a map showing the proposed improvements in relation to the State Land Use Districts. We also suggest that the DEIS include a more detailed location map of the proposed improvements at a larger scale (e.g., 1" to 2000') to facilitate a more precise determination of the improvements' land use designation.

Mr. Carl Arakaki  
September 29, 1998  
Page 2

We have no further comments to offer at this time. We appreciate the opportunity to comment on the subject EISPN.

Should you have any questions, please feel free to call me or Bert Saruwatari of our office at 587-3822.

Sincerely,

ESTHER UEDA  
Executive Officer

EU:th

cc: Patrick T. Onishi  
Rodney Funakoshi

1998 SEP 30 1998  
MAIL ROOM

DEPARTMENT OF DESIGN AND CONSTRUCTION  
**CITY AND COUNTY OF HONOLULU**  
650 SOUTH KING STREET, 2ND FLOOR  
HONOLULU, HAWAII 96813  
PHONE: (808) 523-4564 • FAX: (808) 523-4587



RANDALL K. FUJIKI, AIA  
DIRECTOR  
ROLAND D. LIBBY, JR., AIA  
DEPUTY DIRECTOR

DCP 99-421

JENNY HARRIS  
MAIL ROOM

June 24, 1999

Ms. Esther Ueda, Executive Officer  
Land Use Commission  
Department of Business, Economic Development & Tourism  
State of Hawaii  
P.O. Box 2359  
Honolulu, Hawaii 96804-2359

Dear Ms. Ueda:  
Subject: Kailua-Kanoho-Kahaluu Facilities Plan  
Environmental Impact Statement (EIS) Preparation Notice  
Koolauapoko, Oahu, Hawaii

Thank you for your letter of September 29, 1998, regarding the subject EIS Preparation Notice.

With the exception of the Maunawili Wastewater Pump Station (WWPS) which is located within the State Agricultural District and the Kailua Road WWPS which is located within the State Conservation District, all existing and proposed wastewater treatment, pretreatment, WWPS, and equalization storage facilities are located within the State Urban District. The Draft EIS will include a map showing the proposed improvements in relation to the State Land Use Districts.

We acknowledge that you have no further comments to offer at this time.

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

If you have any questions, please contact Carl Arakaki at 523-4671.

Very truly yours,

RANDALL K. FUJIKI  
Director

cc: Rodney Funakoshi, Wilson Okamoto & Associates, Inc.





PLANNING DEPARTMENT  
**CITY AND COUNTY OF HONOLULU**

630 SOUTH KING STREET, 3RD FLOOR • HONOLULU, HAWAII 96813-2017  
PHONE: (808) 525-4225 • FAX: (808) 525-4220



PATRICK T. OHNISHI  
CHIEF PLANNING OFFICER  
DONALD MARRASKE  
DEPUTY CHIEF PLANNING OFFICER

MH 9/98-1851

October 20, 1998

TO: RANDALL K. FUJIKI, DIRECTOR  
DEPARTMENT OF DESIGN AND CONSTRUCTION

DATE: 10/20

ATTN: CARL KAKAKI

FROM: PATRICK T. OHNISHI  
CHIEF PLANNING OFFICER

SUBJECT: ENVIRONMENTAL IMPACT STATEMENT (EIS) PREPARATION  
NOTICE FOR THE KAILUA-KANEOHE-KAHALUU FACILITIES PLAN,  
TAX MAP KEYS: VARIOUS TMS IN 4-2, 4-3, 4-4, 4-5, 4-6, 4-7, 4-8  
AND 4-9, KOOLAUPOKO, OAHU, HAWAII

In response to your department's request of September 21, 1998, we have the following comments to offer:

1. The Draft EIS should discuss the relationship and consistency of the Kailua-Kaneohe-Kahaluu Facilities Plan to applicable objectives and policies of the City and County of Honolulu's General Plan.
2. The Draft EIS should also discuss the relationship and consistency of the Kailua-Kaneohe-Kahaluu Facilities Plan to the existing Koolauoko Development Plan and the ongoing Koolauoko Development Plan Revision Program that the Planning Department is conducting.
3. Other organizations which should be consulted in the preparation of the Draft EIS include:
  - Friends of He'eia
  - Ahupua'a Action Alliance

Randall K. Fujiki, Director  
Department of Design and Construction  
October 20, 1998  
Page 2

4. Regarding "Collection System Lines" (pages 2-9 and 2-10) and "Pump Station Modifications" (page 2-11), please consider evaluation of coordinating repairs to other underground utilities and undergrounding of overhead utilities in those areas for which extensive sub-grade work is anticipated.

5. We welcome the opportunity to discuss the items above with you and your consultants to help assure that the Draft EIS will be an adequately accurate disclosure document.

Should you have any questions, please contact Matthew Higashiida of our staff at 527-6056.

PTO:ft

c:  Wilson Okamoto & Associates, Inc.  
Office of Environmental Quality Control

DEPARTMENT OF DESIGN AND CONSTRUCTION  
**CITY AND COUNTY OF HONOLULU**

650 SOUTH KING STREET, 2ND FLOOR  
HONOLULU, HAWAII 96813  
PHONE: (808) 523-4354 • FAX: (808) 523-4587



JEREMY HARRIS  
MAYOR

RANDALL K. FUJIKI, AIA  
DIRECTOR  
ROLAND D. LIBBY, JR., AIA  
DEPUTY DIRECTOR

DCP 99-423

June 24, 1999

Ms. Jan Naoe Sullivan -2- June 24, 1999

MEMORANDUM

TO: MS. JAN NAOE SULLIVAN, DIRECTOR  
DEPARTMENT OF PLANNING AND PERMITTING

FROM: RANDALL K. FUJIKI, DIRECTOR  
DEPARTMENT OF DESIGN AND CONSTRUCTION

SUBJECT: KAILUA-KANEOHE-KAHALUU FACILITIES PLAN  
ENVIRONMENTAL IMPACT STATEMENT (EIS) PREPARATION NOTICE  
KOOLAUPOKO, OAHU, HAWAII

5. We appreciate the offer to discuss with your Department the above items to ensure that the Draft EIS will be an adequately accurate disclosure document.

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

If you have any questions, please contact Carl Arakaki at 523-4671.

cc: Rodney Funakoshi, Wilson Okamoto & Associates, Inc.

This is in response to the memorandum of October 20, 1998 from Patrick T. Onishi, regarding the subject EIS Preparation Notice. We offer the following responses in the respective order of the comments:

1. The Draft EIS will include a discussion of the relationship and consistency of the Kailua-Kaneohe-Kahaluu Facilities Plan to applicable objectives and policies of the City and County of Honolulu's General Plan.
2. The Draft EIS will include a discussion of the relationship and consistency of the Kailua-Kaneohe-Kahaluu Facilities Plan to the existing Koolaupoko Development Plan and the ongoing Koolaupoko Development Plan Revision Program being conducted by the Department of Planning and Permitting.
3. The Friends of He'eia and the Ahupua'a Action Alliance will be consulted in the subject EIS process.
4. To the extent possible, the City will consider evaluation of coordinating repairs with other underground utilities and undergrounding of overhead utilities in those areas for which extensive sub-grade work is anticipated.



DEPARTMENT OF DESIGN AND CONSTRUCTION  
CITY AND COUNTY OF HONOLULU

650 SOUTH KING STREET, 2ND FLOOR  
HONOLULU, HAWAII 96813  
PHONE: (808) 521-3984 • FAX: (808) 523-4587



JEREMY HARRIS  
MAYOR

RANDALL K. FUMIKI, AIA  
DIRECTOR  
ROLAND D. LUBRY, JR., AIA  
COUNTY DIRECTOR

SEP 20 1998 DCP 98-239

September 21, 1998

MEMORANDUM FOR THE DIRECTOR

MEMORANDUM

TO: DR. JONATHAN K. SHIMADA, DIRECTOR  
DEPARTMENT OF FACILITY MAINTENANCE

FROM: RANDALL K. FUMIKI, DIRECTOR  
DEPARTMENT OF DESIGN AND CONSTRUCTION

SUBJECT: ENVIRONMENTAL IMPACT STATEMENT (EIS) PREPARATION  
NOTICE FOR THE KAILUA-KAHOEHE-KAHALUU FACILITIES PLAN  
TAX MAP KEYS: VARIOUS TMKS IN 4-2, 4-3, 4-4, 4-5,  
4-6, 4-7, 4-8 and 4-9  
KOOLAUPOKO, OAHU, HAWAII

RECEIVED  
DEPARTMENT OF FACILITY MAINTENANCE  
SEP 22 7 37 AM '98

Enclosed for your review is the EIS Preparation Notice for the Kailua-Kahoehoe-Kahaluu Facilities Plan which was prepared pursuant to Chapter 343, Hawaii Revised Statutes, and Title 11, Chapter 200 Administrative Rules, Department of Health, State of Hawaii. Please send original comments to:

Department of Design and Construction  
City and County of Honolulu  
650 South King Street  
Honolulu, Hawaii 96813  
ATTENTION: Mr. Carl Arakaki

Please send copies of the comments to the following:

Planning Department  
City and County of Honolulu  
650 South King Street  
Honolulu, Hawaii 96813  
ATTENTION: Mr. Patrick T. Onishi

and

Dr. Jonathan K. Shimada

-2-

September 21, 1998

Wilson Okamoto & Associates, Inc.  
1907 South Beretania Street, Suite 400  
Honolulu, Hawaii 96826  
ATTENTION: Mr. Rodney Funakoshi

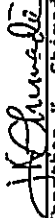
Your comments must be received or postmarked by October 23, 1998. Your input in the EIS Preparation Notice is appreciated.

Enclosure

cc: Rodney Funakoshi, Wilson Okamoto & Associates, Inc.

September 23, 1998

We have no comments. If you have any questions, please call Laverne Higa at 527-6246.

  
Jonathan K. Shimada, PhD  
Director and Chief Engineer  
Department of Facility Maintenance

DEPARTMENT OF DESIGN AND CONSTRUCTION  
**CITY AND COUNTY OF HONOLULU**  
650 SOUTH KING STREET, 2ND FLOOR  
HONOLULU, HAWAII 96813  
PHONE: (808) 523-4354 • FAX: (808) 523-4587



MANDALL K. FUJIKI, AIA  
DIRECTOR  
ROLAND D. LEBBY, JR., AIA  
DEPUTY DIRECTOR

BRENNY HARRIS  
MAYOR

DCP 99-424

June 24, 1999

**MEMORANDUM**

**TO:** MR. ROSS SASAMURA, DIRECTOR  
DEPARTMENT OF FACILITY MAINTENANCE

**FROM:** *[Signature]*  
MANDALL K. FUJIKI, DIRECTOR  
DEPARTMENT OF DESIGN AND CONSTRUCTION

**SUBJECT:** KAILUA-KANEHOHE-KAHALUU FACILITIES PLAN  
ENVIRONMENTAL IMPACT STATEMENT (EIS) PREPARATION NOTICE  
KOOLAUPOKO, OAHU, HAWAII

This is in response to the memorandum of September 21, 1998 from Dr. Jonathan K. Shimada, indicating that your Department has no comments on the subject EIS Preparation Notice.

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

If you have any questions, please contact Carl Arakaki at 523-4671.

cc: Rodney Funakoshi, Wilson Okamoto & Associates, Inc.



*Wilson Okamoto*

DEPARTMENT OF TRANSPORTATION SERVICES  
**CITY AND COUNTY OF HONOLULU**

PACIFIC PAPER PLANT, 2111 KAPOLAHU DRIVE, SUITE 1200 • HONOLULU, HAWAII 96813  
PHONE: (808) 522-4319 • FAX: (808) 522-4720



JEREMY HARRIS  
MAYOR

CHERYL D. SOON  
DIRECTOR  
JOSEPH M. MAGALON, JR.  
DEPUTY DIRECTOR

TP9/98-05642R

October 23, 1998

**RECEIVED**  
OCT 27 1998

MEMORANDUM

TO: RANDALL K. FUJIKI, DIRECTOR  
DEPARTMENT OF DESIGN AND CONSTRUCTION WILSON OKAMOTO & ASSOCIATES, INC.

ATTN: CARL ARAKAKI

FROM: CHERYL D. SOON, DIRECTOR

SUBJECT: KAILUA-KANEOHE-KAHALUU FACILITIES PLAN

In response to your September 21, 1998 memorandum, the environmental impact statement (EIS) preparation notice for the subject project was reviewed.

On Page 3-23, the potential traffic impacts during the construction phase of the project are discussed. The draft EIS should elaborate on the project's impact on area residents and roadway users, such as the extent of work in the City's right-of-way, and the possible mitigation measures that would be implemented.

As the project becomes more defined as it progresses toward implementation, site-specific anticipated traffic impacts during construction and their proposed mitigation measures need to be detailed and coordinated with this department.

Area residents and the neighborhood board should be apprised of the project and its traffic impacts prior to its commencement. Any required closure of private driveways should be coordinated with affected property owners prior to such closure.

Should any detours or street closures be required during the construction phase of this project, the emergency services (fire, ambulance and police) should be notified prior to implementation of the detours or street closures. We also ask that this department be notified so that we can then alert Oahu Transit Services of the construction activity.

Randall K. Fujiki  
Page 2  
October 23, 1998

Should you have any questions regarding these comments, please contact Faith Miyamoto of the Transportation Planning Division at Local 6976.

*Cheryl D. Soon*

CHERYL D. SOON

cc: Mr. Patrick T. Onishi, Planning Department  
Mr. Rodney Funakoshi, Wilson Okamoto & Associates, Inc.

DEPARTMENT OF DESIGN AND CONSTRUCTION  
**CITY AND COUNTY OF HONOLULU**  
650 SOUTH KING STREET, 2ND FLOOR  
HONOLULU, HAWAII 96812  
PHONE: (808) 523-4564 • FAX: (808) 523-4567



JOREAN HARRIS  
MAYOR

RANDALL K. FUJIKI, AIA  
DIRECTOR  
ROLAND D. LIBBY, JR., AIA  
DEPUTY DIRECTOR

DCP 99-425

June 24, 1999

**MEMORANDUM**

TO: MS. CHERYL D. SOON, DIRECTOR  
DEPARTMENT OF TRANSPORTATION SERVICES

FROM: *[Signature]* RANDALL K. FUJIKI, DIRECTOR  
DEPARTMENT OF DESIGN AND CONSTRUCTION

SUBJECT: KAILUA-KANEOHE-KAHALUU FACILITIES PLAN  
ENVIRONMENTAL IMPACT STATEMENT (EIS) PREPARATION NOTICE  
KOOLAUPOKO, OAHU, HAWAII

Thank you for your memorandum of October 23, 1998, regarding the subject EIS Preparation Notice.

The Draft EIS will include a discussion of the proposed project's traffic-related impact on area residents and roadway users and possible mitigation measures that would be implemented, including those described in your memorandum. Construction plans for work within the City's right-of-way will be submitted for review and approval during the design phase of the project. As the proposed project progresses toward implementation, site-specific construction-related traffic impacts and proposed mitigation measures will be detailed and coordinated with your Department.

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

If you have any questions, please contact Carl Arakaki at 523-4671.

cc: Rodney Funakoshi, Wilson Okamoto & Associates, Inc.



DEPARTMENT OF ENVIRONMENTAL SERVICES  
CITY AND COUNTY OF HONOLULU  
650 SOUTH KING STREET, 2ND FLOOR • HONOLULU, HAWAII 96813  
PHONE: (808) 527-4584 • FAX: (808) 527-4585



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NOV 09 1998

WILSON OKAMOTO & ASSOCIATES, INC.

November 6, 1998

KENNETH E. SPRAGUE, P.L. P.D.  
Director  
CHERYL K. OKUMA-SEFE, E.D.  
Deputy Director

ENV 98-201

MEMORANDUM

TO: MR. RANDALL K. FUJIKI, DIRECTOR  
DEPARTMENT OF DESIGN AND CONSTRUCTION

ATTENTION: MR. CARL ARAKAKI

FROM: KENNETH E. SPRAGUE, DIRECTOR  
DEPARTMENT OF ENVIRONMENTAL SERVICES  
CHERYL K. OKUMA-SEFE

SUBJECT: ENVIRONMENTAL IMPACT STATEMENT PREPARATION NOTICE  
(EISPNI) FOR THE KAILUA-KANEOHE-KAHALUU FACILITIES PLAN  
IMK: VARIOUS

We have reviewed the subject EISPNI and have no comments to offer at this time.  
Should you have any questions, please contact Alex Ho at extension 4150.

cc: Mr. Rodney Funakoshi - Wilson Okamoto & Associates ✓  
Planning - Patrick Onishi

DEPARTMENT OF DESIGN AND CONSTRUCTION  
CITY AND COUNTY OF HONOLULU  
650 SOUTH KING STREET, 2ND FLOOR  
HONOLULU, HAWAII 96813  
PHONE: (808) 523-4584 • FAX: (808) 523-4587



JEREMY HARRIS  
Director

RANDALL K. FUJIKI, AIA  
DIRECTOR  
ROLAND D. LIBBY, JR., AIA  
DEPUTY DIRECTOR

June 24, 1999

DCP 99-426

MEMORANDUM

TO: DR. KENNETH E. SPRAGUE, DIRECTOR  
DEPARTMENT OF ENVIRONMENTAL SERVICES

FROM: RANDALL K. FUJIKI, DIRECTOR  
DEPARTMENT OF DESIGN AND CONSTRUCTION

SUBJECT: KAILUA-KANEOHE-KAHALUU FACILITIES PLAN  
ENVIRONMENTAL IMPACT STATEMENT (EIS) PREPARATION NOTICE  
KOOLAUPOKO, OAHU, HAWAII

Thank you for your memorandum of November 6, 1998, indicating that you have no comments on the subject EIS Preparation Notice.

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

If you have any questions, please contact Carl Arakaki at 523-4671.

cc: Rodney Funakoshi, Wilson Okamoto & Associates, Inc.

DEPARTMENT OF PARKS AND RECREATION  
CITY AND COUNTY OF HONOLULU

650 SOUTH KING STREET, 10TH FLOOR • HONOLULU, HAWAII 96813  
PHONE: (808) 523-4182 • FAX: (808) 523-4076



JEREMY HARRIS  
MAYOR

WILLIAM D. BALFOUR, JR.  
DIRECTOR  
DEPARTMENT OF PARKS AND RECREATION

October 19, 1998

TO: RANDALL K. FUJIKI, DIRECTOR  
DEPARTMENT OF DESIGN AND CONSTRUCTION

ATTENTION: CARL ARAKAKI

FROM: WILLIAM D. BALFOUR, JR., DIRECTOR WILSON OKAMOTO & ASSOC., INC.

SUBJECT: ENVIRONMENTAL IMPACT STATEMENT (EIS) PREPARATION  
NOTICE FOR THE KAILUA-KANEHOHE-KAHALUU FACILITIES PLAN  
TAX MAP KEYS: VARIOUS TAX MAP KEYS IN 4-2, 4-3, 4-4,  
4-5, 4-6, 4-7, 4-8, AND 4-9, KOOLAUPOKO, OAHU, HAWAII

We have reviewed the above-referenced EIS preparation notice and find that the project does not significantly impact on any of our recreation services to the public in the affected areas.

Thank you for the opportunity to review and comment on the EIS preparation notice.

If you have any questions, please contact Mr. John Eveland, Executive Assistant, at 527-6038.

*W.D. Balfour, Jr.*

WILLIAM D. BALFOUR, JR.  
Director

WDB:cu

cc: Patrick T. Onishi, Planning Department  
✓Rodney Funakoshi, Wilson Okamoto & Associates, Inc.

DEPARTMENT OF DESIGN AND CONSTRUCTION  
CITY AND COUNTY OF HONOLULU

650 SOUTH KING STREET, 2ND FLOOR  
HONOLULU, HAWAII 96813  
PHONE: (808) 523-4564 • FAX: (808) 523-4587



JEREMY HARRIS  
MAYOR

RANDALL K. FUJIKI, AIA  
DIRECTOR  
ROLAND D. LIBBY, JR., AIA  
DEPUTY DIRECTOR

DCP 99-427

June 24, 1999

MEMORANDUM

TO: MR. WILLIAM D. BALFOUR, JR., DIRECTOR  
DEPARTMENT OF PARKS AND RECREATION

FROM: *Randall K. Fujiki*  
RANDALL K. FUJIKI, DIRECTOR  
DEPARTMENT OF DESIGN AND CONSTRUCTION

SUBJECT: KAILUA-KANEHOHE-KAHALUU FACILITIES PLAN  
ENVIRONMENTAL IMPACT STATEMENT (EIS) PREPARATION NOTICE  
KOOLAUPOKO, OAHU, HAWAII

Thank you for your memorandum of October 19, 1998, indicating that the subject project does not significantly impact any of your recreation services to the public in the affected areas.

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

If you have any questions, please contact Carl Arakaki at 523-4671.

cc: Rodney Funakoshi, Wilson Okamoto & Associates, Inc.





**HOUSE OF REPRESENTATIVES**

STATE OF HAWAII  
STATE CAPITOL  
HONOLULU, HAWAII 96813

October 22, 1998

Mr. Carl Arakaki  
Department of Design & Construction  
City & County of Honolulu  
650 South King Street, 2<sup>nd</sup> Floor  
Honolulu, Hawaii 96813

Mr. Patrick T. Onishi, Director  
Planning Department  
City & County of Honolulu  
650 South King Street  
Honolulu, Hawaii 96813

Mr. Rodney Funakoshi  
Wilson Okamoto & Associates, Inc.  
1907 South Beretania Street, Suite 400  
Honolulu, Hawaii 96826

Re: Kailua-Kaneohe-Kahaluu Wastewater Facilities Plan  
Environmental Impact Statement Preparation Notice

Gentlemen:

This letter is being submitted to address the above EISPN. Please address the following in the EIS:

1. An intermediate plan to relocate parts of the Kailua (Aikahi Park) Wastewater Facility to the Kapaa Quarry.
2. A long-range plan to move the entire facility to Kapaa Quarry and turn the existing Aikahi site into a recreational park.

Please keep me on your list as an interested party during the entire EIS process.

With warm aloha,

Cynthia Thielens  
State Representative  
49<sup>th</sup> District

**RECEIVED**  
OCT 26 1998

WILSON OKAMOTO & ASSOC., INC.

**DEPARTMENT OF DESIGN AND CONSTRUCTION  
CITY AND COUNTY OF HONOLULU**

650 SOUTH KING STREET, 2ND FLOOR  
HONOLULU, HAWAII 96813  
PHONE: (808) 523-4564 • FAX: (808) 523-4567



June 24, 1999

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JUN 30 1999

WILSON OKAMOTO & ASSOC., INC.

JEREMY HARRIS  
LAWYER

RANDALL K. FUJIKI, AIA  
DIRECTOR  
ROLAND D. LORRY, JR., AIA  
DEPUTY DIRECTOR

DCP 99-429

The Honorable Cynthia Thielens  
State Representative, 49<sup>th</sup> District  
House of Representatives  
State of Hawaii  
State Capitol  
Honolulu, Hawaii 96813

Dear Representative Thielens:

Subject: Kailua-Kaneohe-Kahaluu Facilities Plan  
Environmental Impact Statement (EIS) Preparation Notice  
Koolauloapoko, Oahu, Hawaii

Thank you for your letter of October 22, 1998, regarding the subject EIS Preparation Notice.

The Draft EIS will include a discussion of the possible relocation of the Kailua Regional Wastewater Treatment Plant (WWTP) to the Kapaa Industrial Park as an alternative action. The discussion will include a long-term staging concept which might be implemented over a 20- to 40-year time frame.

Even if the plant were completely relocated, however, collection and pump station facilities would need to be maintained at the Aikahi site. This would affect its use as a recreational park.

You will be retained on our list of parties to be consulted throughout the EIS process.

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

If you have any questions, please contact Carl Arakaki at 523-4671.

Very truly yours,

RANDALL K. FUJIKI  
Director

cc: Rodney Funakoshi, Wilson Okamoto & Associates, Inc.



KAILUA NEIGHBORHOOD BOARD NO. 31

P.O. BOX 487 • KAILUA, HAWAII 96734

RECEIVED

OCT 14 1998

WILSON OKAMOTO & ASSOC., INC.

October 13, 1998

Wilson Okamoto & Associates Inc.  
1907 South Beretania Street  
Honolulu, Hawaii 96814

RE: ENVIRONMENTAL IMPACT STATEMENT; KAILUA WASTEWATER TREATMENT FACILITY

Dear Mr. Okamoto,

During our regular meeting of October 1, 1998, the Kailua Neighborhood Board voted on a motion to send this correspondence to:

- ♦ Assure that the Environmental Impact Statement for the Kailua Wastewater Treatment Facility addresses the issue of chemical emission. (The motion carried with 11 yes, 0 No, and 3 Abstain)

Thank you for your attention to this matter. We look forward to your response in seven calendar days.

Sincerely,

*Claudine M. Tomasa*

Claudine M. Tomasa,  
Chair

Cc: Ken Sprague, Dept. of Environmental Services  
Bernice Pool, Aikahi Resident  
Representative Cynthia Thielen  
Councilman John Henry Felix  
Neighborhood Commission

DEPARTMENT OF DESIGN AND CONSTRUCTION  
CITY AND COUNTY OF HONOLULU

850 SOUTH KING STREET, 2ND FLOOR  
HONOLULU, HAWAII 96813  
PHONE: (808) 523-4584 • FAX: (808) 523-4587



JEREMY HARRIS  
MAYOR

RANDALL K. FUJIKI, AIA  
DIRECTOR  
ROLAND D. LUSBY, JR., AIA  
DEPUTY DIRECTOR

DCP 99-430

June 24, 1999

Ms. Claudine M. Tomasa, Chair  
Kailua Neighborhood Board No. 31  
P.O. Box 487  
Kailua, Hawaii 96734

Dear Ms. Tomasa:

Subject: Kailua-Kaneohe-Kahaluu Facilities Plan  
Environmental Impact Statement (EIS) Preparation Notice  
Koolaulopoko, Oahu, Hawaii

Thank you for your letter of October 13, 1998, regarding the subject EIS Preparation Notice. The Draft EIS will include a discussion of the potential odor impacts including chemical emission resulting from the proposed project at the Kailua Regional Wastewater Treatment Plant, and mitigation measures and efforts aimed at reducing such impacts.

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

If you have any questions, please contact Carl Arakaki at 523-4671.

Very truly yours,

*Randall K. Fujiki*  
RANDALL K. FUJIKI  
Director

cc: Rodney Funakoshi, Wilson Okamoto & Associates, Inc.



Board of Directors  
A.O.A.O. Alkahi Gardens  
174-3 Noke St.  
Kaliua, HI 96734

Mr. Rodney Funakoshi  
Wilson Okamoto & Assoc.  
1907 S. Beretania St. #400  
Honolulu, HI 96826

Mr. Patrick Onishi  
City & County of Honolulu  
Planning Dept.  
and  
Mr. Carl Arakaki  
Dept. of Design and Construction  
650 South King St.  
Honolulu, HI 96813

Subject: Kaliua-Kaneohe-Kahaluu Wastewater Facilities Plan  
Environmental Impact Statement Preparation Notice

Gentlemen,

This letter is being submitted under Chapter 343 Hawaii Revised Statutes as amended following our review of the Environmental Impact Statement Preparation Notice dated September 1998.

Our association is concerned about the pending work planned for the plant. We have already had to put up with constant problems of odor and noise and now we are being told more upgrades are needed and that all considerations and concerns will be addressed. But it took weeks of calls to even have a cover put over one of the many piles of dirt that are in a field directly across from our homes and our heavily used recreation center.

Odors from the plant are with us daily; around our homes and common areas and as we travel past the plant. At times our staff will have to take longer breaks because they become nauseous from the smells.

The need for clean water should not supersede, the right to clean, fresh air and quiet neighborhoods. Many of our residents have asthma and other lung problem that could be due to the plant emissions. A number of owners have had to move to other areas to escape the foul odors and insure the health of their families.

page 2

We are trying to work with city officials and elected representatives, but have not had seen much improvement in the situation. Our members are hardworking family people that pay their share of taxes and should not be ignored or treated so badly.

We are annoyed at having to deal with "fugitive odors" and being called "sensitive receptors" instead of people and don't feel we should constantly have to call the plant and other officials to get a fair solution

In the 1984 EIS, Public Works Director Michael Chun's letter assured our association that the new design would minimize or eliminate release of all odors and there would be no negative impact created. Since that time three similar directors have made those same promises.

It is understood that a lot of money has been spent trying to identify and eliminate the sources of noise, dirt and odor, but as there has been little improvement in the past 15yrs., it would seem that the only reasonable solution would be to plan now to move the plant away from any residential or business community and put in an appropriate industrial area such as Kapaa.

Sincerely,

A.O.A.O. Alkahi Gardens Board of Directors

DEPARTMENT OF DESIGN AND CONSTRUCTION  
CITY AND COUNTY OF HONOLULU

650 SOUTH KING STREET, 2ND FLOOR  
HONOLULU, HAWAII 96813  
PHONE: (808) 523-4364 • FAX: (808) 523-4587



JERRY HARRIS  
MAYOR

RAMONALI K. FUREL, AIA  
DIRECTOR  
ROLAND D. LIBBY, JR., AIA  
DEPUTY DIRECTOR

DCP 99-433

June 24, 1999

Board of Directors  
A.O.A.O. Aikahi Gardens  
174-3 Noke Street  
Kailua, Hawaii 96734

Aloha!

Subject: Kailua-Kaneohe-Kahaluu Facilities Plan  
Environmental Impact Statement (EIS) Preparation Notice  
Koolauloko, Oahu, Hawaii

Thank you for your letter (undated), regarding the subject EIS Preparation Notice. We offer the following responses in the respective order of your comments:

1. We acknowledge your concerns regarding the odor and noise impacts associated with the Kailua Regional WWTP on your neighborhood. The Draft EIS will include a discussion of the potential odor and noise impacts resulting from the proposed project and mitigation measures and efforts aimed at reducing such impacts. The discussion of odor impacts will also address the potential health impact on area residents in the immediate vicinity of the plant and facility workers.
2. We acknowledge and apologize for the inconvenience which you experienced during past construction activities at the plant. Prior to construction of the proposed project improvements that would potentially directly impact area residents and businesses, the City will work with the respective contractors to ensure that appropriate construction-related mitigation measures are employed. This would include notification to the affected residents, businesses and Neighborhood Boards of the proposed project. The Draft EIS will address the contractors' compliance requirements with the provisions of the State Department of Health Administrative Rules, Title 11, Chapter 46, Community Noise Control, and Title 11, Chapter 60, Air Pollution Control during construction activities.

Board of Directors  
Page 2  
June 24, 1999

3. In response to the numerous community concerns expressed to City officials and elected representatives at various forums, construction at the Kailua Regional WWTP has included significant investments in odor control features and noise attenuation measures. Toward this end, we are committed to continuing to work closely with the affected community in attempting to resolve the concerns as best we can.

4. In the Draft EIS, we will seek to minimize the use of terms which may be confusing to the general public.

5. In regard to the City's past efforts in attempting to mitigate the Kailua Regional WWTP's odor problems, there is a continuing earnest effort underway to resolve these concerns. Current efforts are directed at identifying as many of the problem areas as possible, correcting any equipment or process problems, developing requirements for any improvements to the existing odor control systems, and looking at any equipment or system that may need to be installed at the plant. The City is also seeking information on current and new odor control technologies for assessing and mitigating odor problems at the plant and in the collection system.

6. In response to community concerns, the Final Facilities Plan included a discussion of the possible relocation of the Kailua Regional WWTP to the Kapaa Industrial Park as an alternative action, with a long-term staging concept which might be implemented over a 20- to 40-year time frame.

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

If you have any questions, please contact Carl Arakaki at 523-4671.

Very truly yours,

RANDALL K. FUJIKI  
Director

cc: Rodney Funakoshi, Wilson Okamoto & Associates, Inc.



**AIKAHI ELEMENTARY SCHOOL PTA • 281 ILIHAU STREET • KAILUA, HAWAII 96734**

Mr. Rodney Funakoshi  
Wilson Okamoto & Assoc.  
1907 S. Beretania St #400  
Honolulu, HI 96826

Mr. Patrick Onishi  
City & County of Honolulu  
Planning Dept.

and  
Mr. Carl Arakaki  
Dept. of Design and Construction  
650 South King St.  
Honolulu, HI 96813

**Subject: Kailua-Kaneohe-Kahaluu Wastewater Facilities Plan  
Environmental Impact Statement Preparation Notice**

Gentlemen,

This letter is being submitted under Chapter 343 Hawaii Revised Statutes as amended following our review of the Environmental Impact Statement Preparation Notice dated September, 1998.

Our school's PTA is very concerned about the impact any additional activity at the adjacent plant will have on our children. They already have to contend with not only the visual aspect of the plant, but also noise and odors.

We have already had to spend thousands of dollars for extra fans for the classrooms as sometimes it is impossible to keep the windows open. The smells do have an affect on the children's ability to concentrate and learn.

The P.E. classes are held outside and it is difficult to watch the children holding their noses to block out the smells while they run their laps. We are also concerned with the long term health effects the plant emissions may have on the students.



**AIKAHI ELEMENTARY SCHOOL PTA • 281 ILIHAU STREET • KAILUA, HAWAII 96734**

In addition, many of our children play sports and attend summer activities at the Aikahi District Park. We continue to encourage all our members to call in complaints to the plant and to write to local officials. We don't feel that we should have to continue to take precious time away from our families to attend informational meetings, and then have our concerns dismissed or ignored.

In the 1984 EIS, Public Works Director Michael Chun's letters assured our neighborhood that there would be no negative impact created from the plant. Since that time three similar directors have made those same promises.

Although a lot of money has been spent trying to identify and eliminate the sources of noise, dirt and odor, but as there has been little improvement in the past 15 yrs., it would seem that the only reasonable solution would be to plan now to move the plant away from any residential or business community and put in an appropriate industrial area such as Kapaa.

Sincerely,

Aikahi Elementary School PTA

DEPARTMENT OF DESIGN AND CONSTRUCTION  
CITY AND COUNTY OF HONOLULU JUN 25 1999  
650 SOUTH KING STREET, 2ND FLOOR  
HONOLULU, HAWAII 96813  
PHONE: (808) 523-4564 • FAX: (808) 523-4587



JEREMY HARRIS  
MAYOR

RAHOALLI K. FUJIKI, AIA  
DIRECTOR  
ROLAND D. LISBY, JR., AIA  
DEPUTY DIRECTOR

DCP 99-434

June 24, 1999

Aikahi Elementary School PTA  
281 Ilihu Street  
Kailua, Hawaii 96734

Aloha!

Subject: Kailua-Kaneohe-Kahaluu Facilities Plan  
Environmental Impact Statement (EIS) Preparation Notice  
Koolaulaopoko, Oahu, Hawaii

Thank you for your letter (undated), regarding the subject EIS Preparation Notice. We offer the following responses in the respective order of your comments:

1. We acknowledge your concerns regarding the existing odor, noise and visual impacts and the potential impact that the proposed project improvements at the Kailua Regional WWTP would have on the students at your school. The Draft EIS will include a discussion of the potential odor and noise impacts resulting from the proposed project and mitigation measures and efforts aimed at reducing such impacts. The discussion of odor impacts will also address the potential health impact on persons residing or occupying facilities in the immediate vicinity of the plant and facility workers. Regarding the visual aspect, landscape improvements to the plant consisting of trees along the Aikahi Park boundary have recently been completed to enhance the appearance of the facility from the Park and school.
2. We welcome your members to continue discussions with City and local officials to voice their concerns regarding odor and noise being emitted from plant activities. Plant modifications have included significant investments in odor control features and noise attenuation measures in response to the numerous community concerns expressed to City and elected officials. Reduction of the existing odor and noise at the plant remains one of our highest priorities, and we are committed to continuing to work closely with the affected community in attempting to resolve the concerns as best we can.

Aikahi Elementary School PTA  
Page 2  
June 24, 1999

3. In regard to the City's past efforts in attempting to mitigate the Kailua Regional WWTP's odor problems, current efforts are directed at identifying as many of the problem areas as possible, correcting any equipment or process problems, developing requirements for any improvements to the existing odor control systems, and looking at any equipment or system that may need to be installed at the plant. The City is also seeking information on current and new odor control technologies for assessing and mitigating odor problems at the plant and in the collection system.

4. In response to community concerns, the Final Facilities Plan included a discussion of the possible relocation of the Kailua Regional WWTP to the Kapaa Industrial Park as an alternative action, with a long-term staging concept which might be implemented over a 20- to 40-year time frame.

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

If you have any questions, please contact Carl Arakaki at 523-4671.

Very truly yours

RAHOALLI K. FUJIKI  
Director

cc: Rodney Funakoshi, Wilson Okamoto & Associates, Inc.

**GTE Hawaiian Tel**

GTE Hawaiian Telephone Company Incorporated  
P.O. Box 2200 • Honolulu, HI 96841 • 808/546-2095

*Beyond the call*

Susan K. Eichor  
General Manager  
Infrastructure Provisioning

October 15, 1998

Mr. Carl Arakaki  
Department of Design and Construction  
City and County of Honolulu  
650 South King Street  
Honolulu, HI 96813

Dear Mr. Arakaki:

Subject: KAILUA-KANEHOHE-KAHALUU FACILITIES PLAN  
ENVIRONMENTAL IMPACT STATEMENT (EIS) PREPARATION NOTICE

We at GTE Hawaiian Tel thank you for the notification of your utility rehabilitation plan and for the opportunity to review the preliminary construction proposals.

At this time we foresee no major impact to our facilities. As detailed plans are formulated, a number of our underground and aerial cables could possibly be affected. We would appreciate continued coordination with our Engineering Department as these plans become available. Please send them to:

GTE Hawaiian Tel  
Attention: Wayne Cabral - Section Manager  
3239 Ualena Street  
Honolulu, HI 96819

If clarification is required, please call Keith Yoshino at 546-7868.

Sincerely,

*Susan K. Eichor*

Susan K. Eichor  
General Manager -  
Infrastructure Provisioning

c: Patrick Onishi, City & County of Honolulu  
Rodney Funakoshi, Wilson Okamoto & Associates

A part of GTE Corporation

DEPARTMENT OF DESIGN AND CONSTRUCTION  
CITY AND COUNTY OF HONOLULU

850 SOUTH KING STREET, 2ND FLOOR  
HONOLULU, HAWAII 96813  
PHONE: 808/523-4584 • FAX: 808/523-4567



JEREMY HARRIS  
MAYOR

RANDALL K. FUJIKI, AIA  
DIRECTOR  
ROLAND D. LIBBY, JR., AIA  
DEPUTY DIRECTOR

DCP 99-428

June 24, 1999

Ms. Susan K. Eichor, General Manager  
Infrastructure Provisioning  
GTE Hawaiian Telephone Company Incorporated  
P.O. Box 2200  
Honolulu, Hawaii 96841

Dear Ms. Eichor:

Subject: Kailua-Kaneohe-Kahaluu Facilities Plan  
Environmental Impact Statement (EIS) Preparation Notice  
Kaalapaokoa, Oahu, Hawaii

Thank you for your letter of October 15, 1998, indicating that you foresee no major impacts to your facilities at this time. As the proposed project progresses through the design phase and detailed plans are formulated, the City will coordinate with your Engineering Department to ensure that underground and aerial cables will not be affected.

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

If you have any questions, please contact Carl Arakaki at 523-4671.

Very truly yours,

*Randall K. Fujiki*  
RANDALL K. FUJIKI  
Director

cc: Rodney Funakoshi, Wilson Okamoto & Associates, Inc.

Bill and Trudy Stone  
409 Iana Street  
Kailua, Hawaii 96734  
(808) 261-2556

October 21, 1998

**CERTIFIED MAIL RETURN RECEIPT REQUESTED**

Mr. Carl Arakaki  
Department of Design and Construction  
City and County of Honolulu  
650 South King Street, 2nd Floor  
Honolulu, Hawaii 96813

Mr. Patrick T. Onishi, Director  
Planning Department  
City and County of Honolulu  
650 South King Street  
Honolulu, Hawaii 96813

Mr. Rodney Funakoshi  
Wilson Okamoto & Associates, Inc.  
1907 South Beretania Street, Suite 400  
Honolulu, Hawaii 96826

Re: Kailua-Kaneohe-Kahaluu Wastewater Facilities Plan  
Environmental Impact Statement Preparation Notice

Gentlemen:

This letter is being submitted under Chapter 343 Hawaii Revised Statutes, as amended, following our review of the Environmental Impact Statement Preparation Notice dated September 1998 (EISPN).

Please address the following concerns and make the following revisions and additions to the text of the proposed Environmental Impact Statement:

1. Section 2.1.2 Collection System Improvements/ Kailua Basin Flow Equalization Facilities Alternatives (EISPN at page 2-21):
  - A. Following the last sentence of the first full paragraph at the top of the page, add the following text:

Mr. Carl Arakaki  
Department of Design and Construction  
October 21, 1998  
Page 2

"Of the eleven (11) sub-alternatives listed as possible sites for equalization basins, only Final Plan Alternative 3C, which called for the basin's location on the Mid-Pacific Country Club, was eliminated from further consideration due to its low ranking. (City News Release, August 6, 1998)."

Mayor Jeremy Harris announced, in pertinent part, that a new planning strategy for Windward Oahu's future wastewater system would "eliminate the need for a controversial storage tank at the Mid-Pacific Country Club" and that "the Mid-Pacific storage tank will no longer be considered because of its low ranking." (Emphasis added).

B. We support the city's preferred proposal, 2-Year Storm, Anticipated I/I Reduction of 40% (Final Plan Alternative 3L), which calls for the construction of underground pipe storage along Kalahao Avenue and Wanaao Road. Our approval of such pipe storage construction is conditional, however. We believe that construction should be commenced only after prior written notice to and in cooperation with all of the neighbors who will be most directly affected by the resulting disruption; that construction should be performed only in compliance with all noise and other regulations; and that the city should enforce all such regulations strictly and impose financial penalties against any contractor(s) who fail(s) to comply.

C. We oppose the construction of an underground holding tank at the entrance to Kailua as proposed in the 5-Year, Anticipated I/I Reduction of 35% alternative (Final Plan Alternative 3F) because of its potentially harmful impact on nearby homes and businesses.

2. Section 3.6 Air Quality (EISPN at pages 3-20 and 3-21):

The EISPN states at page 3-21: "Sensitive receptors of odor are the nearby residences located to the southwest and east of the plant and Aikahi Elementary School located to the southeast."

Why not call those "sensitive receptors" what they are: *people, including little children*? Our greatest concern remains the odor and noise problems which continue to plague our friends and neighbors in Aikahi.



Mr. Carl Arakaki  
Department of Design and Construction  
October 21, 1998  
Page 3

Although there have been recent efforts by the Department of Environmental Services to improve the nuisance and harm caused by the facility's operations (pages 3-21 and 3-22), the problem is by no means resolved.

Back in 1984, the people of Aikahi Park were repeatedly assured there would be NO noise and odor problems connected with the expansion of the facility. The city has not kept those promises. This new EIS, which is anticipated to be approved in 1999, must not allow such a pattern of empty promises to continue. We believe it must be a pre-condition for approval of this EIS that all such noise and odor problems be eliminated prior to and following the commencement of any further work at the facility.

3. Section 3.7 Noise (EISPN at pages 3-21 and 3-22):

Regarding (a) the proposed improvements at the Aikahi facility and (b) the proposed wastewater collection and treatment systems improvements referenced on page 3-22, the EISPN states: "It shall be the contractor's responsibility to minimize noise by properly maintaining noise mufflers and other noise-attenuating equipment, and to maintain noise levels below allowable regulatory limits." By all reports, the contractor(s) at the Aikahi facility has failed to do so with any consistency.

<sup>1</sup> See, for example, *Revised Environmental Impact Statement for Kaneohe-Kailua Wastewater Facilities* dated March 8, 1984, Appendix B: (a) letter dated October 12, 1983 from Michael J. Chun ("Chun"), Director and Chief Engineer, Department of Public Works, City and County of Honolulu, stating (regarding odor): "We acknowledge the odor nuisance from Kailua STP which has affected Aikahi Gardens from time to time despite our best efforts and considerable expense for chemical abatement of the odors. We believe that the positive steps for odor control, as specified in the Facilities Plan, will reduce odors to acceptable levels"; or (b) letter from Chun dated December 30, 1983, which states (regarding odor): "There is presently an occasional odor problem at Kailua. Although the added influents will contain components capable of causing even more odor in the community than at present, the new design for Kailua will minimize or eliminate release of all odors, an improvement over the present situation. Accordingly, no negative impact will be created which requires mitigation"; or (c) letter from Chun dated December 13, 1983, which states (regarding noise): "This in turn means more noise generation. However, as stated in the EIS, this noise will be mitigated with appropriate acoustical shielding." Fifteen years later, Aikahi families are still suffering from the WWTP's odor and noise pollution.

Mr. Carl Arakaki  
Department of Design and Construction  
October 21, 1998  
Page 4

It should be a pre-condition for approval of the EIS that the city's contract documents with the contractor(s) hired to do (a) and (b) above provide for strict financial penalties for any contractor(s) found in violation of such noise regulations.

4. Section 4 Project Alternatives (EISPN at page 4-1):

Just before the last sentence of the first full paragraph at the top of the page, add the following text:

"Of these, only Alternative 3C, which called for an equalization basin to be located on the Mid-Pacific Country Club, was eliminated from further consideration due to its low ranking. (City News Release, August 6, 1998)."

5. Section 4.6 Relocation of Kailua Regional WWTP to Kapaa Industrial Park (EISPN at pages 4-5 and 4-6):

Sadly, it appears that, despite overwhelming community support to do so, the city lacks the will to move the plant away from the homes, schools and businesses of Aikahi Park and to build it on land which the city, itself, zoned for such industrial uses, namely, Kapaa Quarry. The excuse most commonly given is a lack of funding; however, the land will likely never be any cheaper to purchase than it is today, nor the facility any cheaper to construct.

We believe that during this EIS review process, this alternative should at least be thoroughly investigated as to environmental and archaeological impacts in the event that developments require or permit its removal to Kapaa Quarry in years to come.

6. Section 7 References (EISPN at page 7-1):

Add the following text:

"City and County of Honolulu, Mayor's Office of Information and Complaint. *News Release*. August 6, 1998."

A copy of the City News Release from the Mayor's Office of Information and Complaint dated August 6, 1998 is enclosed.

Mr. Carl Arakaki  
Department of Design and Construction  
October 21, 1998  
Page 5

My husband and I thank you for the opportunity to make these comments to the EISPN. Please add us to your list of consulted parties for this Environmental Impact Statement review process.

Very truly yours,

Trudy Burns Stone

TBS: 25010.2  
Enclosure

- cc: The Honorable Mayor Jeremy Harris
- Randall K. Fujiki, Director, Department of Design and Construction
- Kenneth Sprague, P.E., Ph. D., Director, Department of Environmental Services
- Gary Gill, Director, OEQC
- City Council Member John Henry Felix
- Representative Cynthia Thielen
- Claudine Tomasa, Chair, Kailua Neighborhood Board
- Mike Okada, President, Mid-Pacific Country Club
- Curtis Lum, *The Honolulu Advertiser*
- Keoki Kerr, KITV 4
- Ms. Nancy Cullen
- Ms. Holly Hoffer
- Richard Barney, Esq.



**NEWS RELEASE**  
Mayor's Office of Information and Complaint  
City & County of Honolulu  
808-538-4885

August 6, 1998

Contact Doug Woo, Office of Information and Complaint, 527-6669

Mayor Jeremy Harris announced today a new planning strategy for Windward Oahu's future wastewater system that would eliminate the need for a controversial storage tank at the Mid-Pacific Country Club.

"After working with the community and hearing its concerns, we have devised a more flexible plan for the 20-year wastewater system of Kailua, Kaneohe and Kahala," the Mayor said. "We have developed a number of alternatives, and after evaluating them, the Mid-Pacific storage tank will no longer be considered because of its low ranking."

Under a 1995 consent decree, the City is required to plan improvements that will meet the wastewater needs of Windward Oahu for the next 20 years. The goal is to strengthen the system against sewage spills, which often occur when groundwater leaks into sewer lines during heavy storms, creating high flows that overwhelm the system.

The City has been basing its calculations on the intensity of the statistical 6-hour storm that hits once every 5 years. However, growing data indicates that sizing the system for a less-severe 2-year statistical storm would be greatly as effective at much less the cost.

Mayor Harris noted that the City has been studying the problem of storm water leaking into the sewer system and that data from this study is suggesting that sizing the system to a 2-year, rather than a 5-year, storm would be more appropriate. Therefore, Windward Oahu's wastewater plan will be guided by a multi-pronged strategy:

- A more aggressive effort to reduce leakage into the system (a significant amount which comes from private properties); and
- Separate planning scenarios for a 2-year storm and a 5-year storm.

The wastewater plan and its latest alternatives will be presented at a public information meeting at Alkahi Elementary School on Wednesday, August 19, at 7 p.m.

DEPARTMENT OF DESIGN AND CONSTRUCTION  
CITY AND COUNTY OF HONOLULU

650 SOUTH KING STREET, 2ND FLOOR  
HONOLULU, HAWAII 96813  
PHONE: (808) 523-4564 • FAX: (808) 523-4587



KREMY HARRIS  
MAYOR

RAMDALL E. TUAKI, AIA  
DIRECTOR  
ROLAND D. LUBY, JR., AIA  
CHIEF ENGINEER

DCP 99-431

June 24, 1999

Ms. Trudy Burns Stone  
409 Iana Street  
Kailua, Hawaii 96734

Dear Ms. Stone:

Subject: Kailua-Kaneohe-Kahalua Facilities Plan  
Environmental Impact Statement (EIS) Preparation Notice  
Koolahaupoko, Oahu, Hawaii

Thank you for your letter of October 21, 1998, regarding the subject EIS Preparation Notice. We offer the following responses in the respective order of your comments:

1. Section 2.1.2 Collection System Improvements/Kailua Basin Flow Equalization Facilities Alternatives (EISPN at page 2-7):
  - a. In accordance with Title 11, Chapter 200, Administrative Rules, State Department of Health, the Draft EIS will include a discussion of the previously considered flow equalization basin at the Mid-Pacific Country Club as an alternative action under the Kailua Basin equalization alternatives. The discussion will include an explanation as to why this alternative was rejected from further consideration.
  - b. Your support for the 2-year storm, anticipated 1/1 reduction of 40% (Final Plan Alternative 3L) is acknowledged.  
Prior to construction of the proposed project improvements that would potentially directly impact area residents and businesses, the City will work with the respective contractors to ensure that appropriate construction-related mitigation measures are employed. This would include notification to the affected residents, businesses and Neighborhood Boards of the proposed project. The Draft EIS will address the contractors' compliance requirements with the provisions of the State Department of Health Administrative Rules, Title 11, Chapter 46, Community Noise Control, and Title 11, Chapter 60, Air Pollution Control during construction activities.

Ms. Trudy Burns Stone  
Page 2  
June 24, 1999

To the extent legally possible and as may be included in any future City contract documents in regard to the proposed project, the City will enforce the contractors' compliance with such regulations and provide penalties for any contractor who fails to comply.

c. Your opposition to the construction of an equalization basin near the entrance to Kailua is acknowledged. The Draft EIS will address the potential impacts resulting from the construction and operation of a potential equalization basin at this location, and associated mitigation measures.

2. Section 3.6 Air Quality (EISPN at pages 3-20 and 3-21):

The term "sensitive receptors" is used in this context to include all persons who may reside at or occupy any residence, building or location in proximity to the Kailua Regional WWTP and who may be exposed to odor or noise being emitted from the plant.

The Draft EIS will include a discussion of the potential odor and noise impacts resulting from the proposed project and mitigation measures and efforts aimed at reducing such impacts.

In regard to the City's past efforts in attempting to mitigate the Kailua Regional WWTP's odor and noise problems, there is a continuing earnest effort underway to resolve these concerns. Current efforts are directed at identifying as many of the problem areas as possible, correcting any equipment or process problems, developing requirements for any improvements to the existing odor control systems, and looking at any equipment or system that may need to be installed at the plant. The City is also seeking information on current and new odor control technologies for assessing and mediating odor problems at the plant and in the collection system.

3. Section 3.7 Noise (EISPN at pages 3-21 and 3-22):

To the extent legally possible and as may be included in any future City contract documents in regard to the proposed project, the City will provide for penalties for any contractor found in violation of such noise regulations.

4. Section 4 Project Alternatives (EISPN at page 4-1):

Please refer to our response in 1.a.

Ms. Trudy Burns Stone  
Page 3  
June 24, 1999

5. Section 4.6 Relocation of Kailua Regional WWTP to Kapaa Industrial Park (EISPN at pages 4-5 and 4-6):

The Draft EIS will include a discussion of the possible relocation of the Kailua Regional WWTP to the Kapaa Industrial Park as an alternative action, including associated potential impacts. The discussion will include a long-term staging concept which might be implemented over a 20- to 40-year time frame.

6. Section 7 References (EISPN at page 7-1):

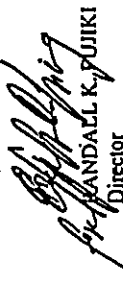
The News Release of August 6, 1998 from the City and County of Honolulu Mayor's Office of Information and Complaint will be included in the References section of the Draft EIS.

You will be retained on our list of parties to be consulted throughout the EIS process.

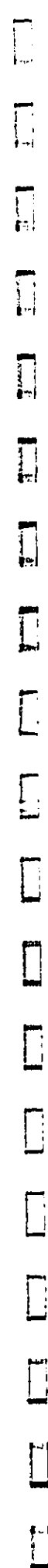
We appreciate your interest and participation in the consultation phase of the environmental review process.

If you have any questions, please contact Carl Arakaki at 523-4671.

Very truly yours,

  
RANDALL K. FUJIKI  
Director

cc: Rodney Funakoshi, Wilson Okamoto & Associates, Inc.



Nancy and Roland Cullen  
320-4 Molo St.  
Kailua, HI 96734

Mr. Rodney Furukoshi  
Wilson Okamoto & Assoc.  
1907 S. Beretania St. #400  
Honolulu, HI 96826

Mr. Patrick Onishi  
City & County of Honolulu  
Planning Dept.  
and  
Mr. Carl Arakaki  
Dept. of Design and Construction  
650 South King St.  
Honolulu, HI 96813

Subject: Kailua-Kaneohe-Kahaluu Wastewater Facilities Plan  
Environmental Impact Statement Preparation Notice

Gentlemen,

This letter is being submitted under Chapter 343 Hawaii Revised Statutes as amended following our review of the Environmental Impact Statement Preparation Notice dated September 1998.

We are have been homeowners at Aikahi Gardens since 1989 and are very concerned about the constant annoyances with odor and noise that impact our neighborhood.

When we bought the unit we understood that there was a treatment facility across the street, but we were told repeatedly by city officials that the plant was being upgraded and were assured time and again that everything was being done to eliminate the problems. The "upgrades" suddenly turned into a "state-of-the-art" facility that was then taking waste products from surrounding communities.

We then had to live through a horrid construction phase in which various contractors assaulted us with pile driving, trucks, dust, dirt, paint spray and noise on an almost round-the-clock basis. Little consideration was given to the effect this had on our quality of life and many hours were spent trying to resolve the problems. We were met with a constant run around and finger pointing with no agency or contractor willing to take the blame or responsibility. Again, more empty promises from all involved, including our elected officials.

page 2

Now we are being told more upgrades are needed and that all considerations and concerns will be addressed. Before any construction has even started, we look out daily at huge piles of uncovered rock and dirt that is not only an eyesore, but is causing extra dust in the area.

The smells from the plant are with us daily, around our home and common areas and as we travel past the plant. It is just always there, it is just the degree of odor that changes.

As ocean lovers we are in agreement for the need for clean water, but not at the expense of clean air and quiet neighborhoods. We are trying to be patient, attend meeting, call in complaints, make suggestions, etc. but not much has changed over the past few years, the problems still exist, and are, at time even worse than before.

It is embarrassing to have friends over and have to try to explain the smells. And although there have been no concrete studies done, we feel sure that there is some effect on our general health due to the plant's emissions.

We try to follow the volumes of paperwork and technical wording, but that can be almost a full time job. But then, if we don't, we will be criticized by officials, as we were by Council member Holmes for not being aware of what was going on around us and speaking up.

Terms like "fugitive odors" and "sensitive receptors" would be comical, if it wasn't part of the smokescreen of wording used to confuse the general public. Department officials continue to talk down to us and smirk when we ask that the plant be moved.

In the 1984 EIS, Public Works Director Michael Chin's letter assured our association that the new design would minimize or eliminate release of all odors and there would be no negative impact created. Since that time three similar directors have made those same promises.

At this point it seems that the problems cannot be solved and will continue to hurt us not just health wise, and economically but our general quality of life. We don't want any of our other Kailua neighbors effected, so it seems clear that a long-range plan to move the plant to Kapaa is the only answer. It is time to listen to the community and put that plan in motion, rather than do more work at the present location.

Sincerely,

  
Nancy Cullen

DEPARTMENT OF DESIGN AND CONSTRUCTION  
**CITY AND COUNTY OF HONOLULU**  
850 SOUTH KING STREET, 2ND FLOOR  
HONOLULU, HAWAII 96813  
PHONE: (808) 533-4584 • FAX: (808) 533-4587



JEREMY LUBBERS  
MAYOR

RANDALL K. FUJIKI, AIA  
DIRECTOR  
ROLAND D. LIBBY, JR., AIA  
DEPUTY DIRECTOR

DCP 99-432

June 24, 1999

Ms. Nancy Cullen  
320-4 Molo Street  
Kailua, Hawaii 96734

Dear Ms. Cullen:

Subject: Kailua-Kaneohe-Kahaluu Facilities Plan  
Environmental Impact Statement (EIS) Preparation Notice  
Koolaupoko, Oahu, Hawaii

Thank you for your letter (undated), regarding the subject EIS Preparation Notice. We offer the following responses in the respective order of your comments:

1. We acknowledge your concerns regarding the odor and noise impacts associated with the Kailua Regional WWTP on your neighborhood. The Draft EIS will include a discussion of the potential odor and noise impacts resulting from the proposed project and mitigation measures and efforts aimed at reducing such impacts. The discussion of odor impacts will also address the potential health impact on area residents in the immediate vicinity of the plant and facility workers.
2. We acknowledge and apologize for the inconvenience which you experienced during past construction activities at the plant. Prior to construction of the proposed project improvements that would potentially directly impact area residents and businesses, the City will work with the respective contractors to ensure that appropriate construction-related mitigation measures are employed. This would include notification to the affected residents, businesses and Neighborhood Boards of the proposed project. The Draft EIS will address the contractors' compliance requirements with the provisions of the State Department of Health Administrative Rules, Title 11, Chapter 46, Community Noise Control, and Title 11, Chapter 60, Air Pollution Control during construction activities.
3. In the Draft EIS, we will seek to minimize the use of terms which may be confusing to the general public.

Ms. Nancy Cullen  
Page 2  
June 24, 1999

4. In regard to the City's past efforts in attempting to mitigate the Kailua Regional WWTP's odor problems, there is a continuing earnest effort underway to resolve these concerns. Current efforts are directed at identifying as many of the problem areas as possible, correcting any equipment or process problems, developing requirements for any improvements to the existing odor control systems, and looking at any equipment or system that may need to be installed at the plant. The City is also seeking information on current and new odor control technologies for assessing and mitigating odor problems at the plant and in the collection system.

5. In response to community concerns, the Final Facilities Plan included a discussion of the possible relocation of the Kailua Regional WWTP to the Kapaa Industrial Park as an alternative action, with a long-term staging concept which might be implemented over a 20- to 40-year time frame.

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

If you have any questions, please contact Carl Arakaki at 523-4671.

Very truly yours,

RANDALL K. FUJIKI  
Director

cc: Rodney Funakoshi, Wilson Okamoto & Associates, Inc.

**13.3 Draft EIS Consultation**

*The following agencies, organizations and elected officials were consulted and comments solicited for the Draft EIS. As of February 7, 2000, a total of 31 comment letters were received. Of those who formally replied, some had no comments while others provided substantive comments as indicated by the \* and \*\*, respectively. All written comments and responses are reproduced herein.*

*Federal*

- U.S. Fish and Wildlife Service*
- U.S. National Marine Fisheries Service*
- \* *U.S. Department of Agriculture, Natural Resources Conservation Service*
- \* *U.S. Army Engineer District*
- \* *U.S. Geological Survey*
- U.S. Environmental Protection Agency, Pacific Islands Contact Office*
- U.S. Environmental Protection Agency, Region IX*
- Marine Corps Base Hawaii Kaneohe Bay*
- \* *Commander, Naval Base Pearl Harbor*

*State of Hawaii*

- Department of Agriculture*
- \* *Department of Accounting and General Services*
- Department of Business, Economic Development and Tourism (DBED&T)*
- DBED&T Energy, Resources and Technology Division*
- \* *DBED&T Office of Planning*
- \*\* *DBED&T Land Use Commission*
- \* *DBED&T Housing and Community Development Corporation of Hawaii*
- Department of Defense*
- \* *Department of Hawaiian Home Lands*
- \*\* *Department of Health (DOH)*
- \*\* *DOH Disability and Communication Access Board*
- Department of Land and Natural Resources (DLNR)*
- \*\* *DLNR Land Division*
- \*\* *DLNR Historic Preservation Division*
- \* *DLNR Division of Forestry and Wildlife*

State of Hawaii (continued)

- \*\* DLNR Commission on Water Resource Management  
DLNR Division of Aquatic Resources
- \*\* Department of Transportation
- \*\* Office of Hawaiian Affairs  
Office of Environmental Quality Control  
University of Hawaii Environmental Center  
University of Hawaii Water Resources Research Center  
University of Hawaii Institute of Marine Biology  
University of Hawaii Marine Options Program

City and County of Honolulu

- \*\* Board of Water Supply
- \*\* Department of Planning and Permitting
- \*\* Department of Environmental Services
- \*\* Department of Transportation Services
- \* Department of Parks and Recreation
- \* Department of Facility Maintenance  
Department of Budget and Fiscal Services
- \*\* Police Department
- \*\* Fire Department

Elected Officials

- \*\* Senator Marshall Ige  
Representative Cynthia Thielen  
Councilmember John Henry Felix  
Councilmember Steve Holmes

Organizations

- Kailua Neighborhood Board No. 31
- Kailua Neighborhood Board No. 31 Planning and Zoning Committee
- Kaneohe Neighborhood Board No. 30
- Kahaluu Neighborhood Board No. 29
- Kawai Nui Heritage Foundation



Organizations (continued)

- Save Our Bays and Beaches*
- Kailua Bay Advisory Council*
- Kailua Urban Design Task Force*
- Hawaii's Thousand Friends*
- Hawaii Audobon Society*
- Lani-Kailua Outdoor Circle*
- Kailua Chamber of Commerce*
- \*\* *Kaneohe Ranch*
- Kaneohe Bay Regional Council*
- Kaneohe Business Group*
- Kaneohe Outdoor Circle*
- Koolaupoko Community Development Plan Coalition*
- Kualoa-Heeia Ecumenical Youth (KEY) Project*
- Sierra Club Hawaii Chapter*
- A.O.A.O. Aikahi Gardens Board of Directors*
- Aikahi Elementary School PTA*
- Friends of Heeia*
- Ahupuaa Action Alliance*

Public Utility Agencies

- \* *Hawaiian Electric Company, Inc.*
- \* *GTE Hawaiian Telephone Company*
- Oceanic Cable*
- The Gas Company*

Individuals

- Trudy Burns Stone*
- Nancy Cullen*
- \*\* *Holly Hoffer*
- \*\* *Lt. Michael Wheeler*



United States  
Department of  
Agriculture

Natural  
Resources  
Conservation  
Service

P.O. Box 50004  
Honolulu, HI  
96850

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

February 2, 2000

Mr. Carl Arakaki  
Department of Design and Construction  
City and County of Honolulu  
650 South King Street  
Honolulu, Hawaii 96813

Dear Mr. Arakaki:

Subject: Draft Environmental Impact Statement (DEIS) - Kailua-Kanoehe-Kahaluu  
Facilities Plan, Koolauoko, Oahu, Hawaii

We have reviewed the above mentioned document and have no comments to offer at  
this time.

Thank you for the opportunity to review this document.

Sincerely,

KENNETH M. KANESHIRO  
State Conservationist

Cc:  
Dr. Kenneth E. Sprague, Department of Environmental Services, City and County of  
Honolulu, 650 South King Street, Honolulu, Hawaii 96813  
Ms. Jan Nace Sullivan, Department of Planning and Permitting, City and County of  
Honolulu, 650 South King Street, Honolulu, Hawaii 96813  
Mr. Rodney Funakoshi, Wilson Okamoto & Associates, Inc., 1907 S. Baretania St.,  
Ste. 400, Honolulu, HI 96826  
Ms. Genevieve Salmonson, Director, State of Hawaii, Office of Environmental Quality  
Control, 235 N. Baretania Street, Ste. 702, Honolulu, HI 96813

The Natural Resources Conservation Service works hand-in-hand with  
the American people to conserve natural resources on private lands.

AN EQUAL OPPORTUNITY EMPLOYER

OC 11-1127



DEPARTMENT OF THE ARMY  
U.S. ARMY ENGINEER DISTRICT, HONOLULU  
FT. SHAFTER, HAWAII 96854-5440

PLEASE TO  
ATTENTION OF

December 10, 1999

RECEIVED

99 DEC 15 P2:36

Civil Works Technical Branch

DESIGN & CONSTRUCTION  
DIVISION OF  
PLANNING & PROGRAMMING

JEREMY HARRIS  
MAYOR



DEPARTMENT OF DESIGN AND CONSTRUCTION  
CITY AND COUNTY OF HONOLULU

650 SOUTH KING STREET, 2ND FLOOR  
HONOLULU, HAWAII 96813  
PHONE: (808) 533-4544 • FAX: (808) 522-4387  
WEB SITE ADDRESS: www.cc.honolulu.hi.us

GARY Q.L. YEE, AIA  
ACTING DIRECTOR  
ROLAND D. LIBBY, JR., AIA  
DEPUTY DIRECTOR

DCP 2000-065

January 31, 2000

Mr. Carl Arakaki  
Department of Design and Construction  
City and County of Honolulu  
650 South King Street  
Honolulu Hawaii 96813

Dear Mr. Arakaki:

Thank you for the opportunity to review and comment on the Kailua-Kaneohe-Kahaluu Facilities Plan, Koolauopoko, Oahu. We do not have any additional comments to offer beyond those previously provided in our letter dated October 2, 1998.

Sincerely,

*James Pennaz*  
James Pennaz, P.E.  
Chief, Civil Works  
Technical Branch

Mr. James Pennaz, P.E., Chief  
Department of the Army  
U.S. Army Engineer District, Honolulu  
Civil Works Technical Branch  
Fort Shafter, Hawaii 96858-5440

Dear Mr. Pennaz:

Subject: Kailua-Kaneohe-Kahaluu Facilities Plan  
Draft Environmental Impact Statement (EIS)  
Koolauopoko, Oahu, Hawaii

Thank you for your letter of December 10, 1999 indicating that the Army does not have any additional comments to offer beyond those previously provided in your letter dated October 2, 1998.

We appreciate your time and effort in reviewing the Draft EIS.

Very truly yours,

*Gary Q.L. Yee*  
FOR GARY Q.L. YEE, AIA  
Acting Director

cc: Rodney Funakoshi, Wilson Okamoto & Associates, Inc.  
Ms. Genevieve Salmonson, State Office of Environmental Quality Control



United States Department of the Interior

U.S. GEOLOGICAL SURVEY  
WATER RESOURCES DIVISION  
677 Ala Moana Boulevard, Suite 415  
Honolulu, Hawaii 96813

November 18, 1999

Attention: Mr. Carl Arakaki  
Department of Design and Construction  
City and County of Honolulu  
650 South King Street  
Honolulu, Hawaii 96813

Dear Mr. Arakaki:

Subject: Kailua-Kaneohe-Kahalaui Facilities Plan  
Draft Environmental Impact Statement (EIS)  
Tax Map Keys: Various TMKs in 4-2, 4-3, 4-4, 4-5, 4-6, 4-7, 4-8, and 4-9  
Koolauapoko, Oahu, Hawaii

Thank you for forwarding the subject Draft EIS for review and comment by the staff of the U.S. Geological Survey, Water Resources Division, Hawaii District Office. We regret however, that due to prior commitments and lack of available staff, we are unable to review this document and are returning it for your future use.

We appreciate the opportunity to participate in the review process.

Sincerely,

Gordon W. Tribble  
District Chief

Enclosure

cc w/o enclosure:

Dr. Kenneth E. Sprague, Dept. of Environmental Services, City & County of Honolulu  
Ms. Jan Naoe Sullivan, Dept. of Planning and Permitting, City & County of Honolulu  
Mr. Rodney Funakoshi, Wilson Okamoto & Associates, Inc.  
Office of Environmental Quality Control, State of Hawaii

DEPARTMENT OF DESIGN AND CONSTRUCTION  
CITY AND COUNTY OF HONOLULU

650 SOUTH KING STREET, 2ND FLOOR  
HONOLULU, HAWAII 96813  
PHONE: (808) 523-4544 FAX: (808) 523-4587  
WEB SITE ADDRESS: www.ddc.honolulu.gov



JEREMY HARRIS  
MAYOR

GARY O.L. YEE, AIA  
ACTING DIRECTOR  
ROLAND D. LEBBY, JR., AIA  
DEPUTY DIRECTOR

DCP 2000-067

January 31, 2000

Mr. Gordon W. Tribble, District Chief  
U.S. Geological Survey  
Water Resources Division  
United States Department of the Interior  
677 Ala Moana Boulevard, Suite 415  
Honolulu, Hawaii 96813

Dear Mr. Tribble:

Subject: Kailua-Kaneohe-Kahalaui Facilities Plan  
Draft Environmental Impact Statement (EIS)  
Koolauapoko, Oahu, Hawaii

Thank you for your letter of November 18, 1999, indicating that your Division was unable to review the subject Draft EIS due to prior commitments and lack of available staff.

We appreciate your response to our request for a review of the Draft EIS.

Very truly yours,

FOR GARY O.L. YEE, AIA  
Acting Director

cc: Rodney Funakoshi, Wilson Okamoto & Associates, Inc.  
Ms. Genevieve Salmonson, State Office of Environmental Quality Control



DEPARTMENT OF THE NAVY  
 COMMANDER  
 NAVY REGION HAWAII  
 517 RUSSELL AVENUE  
 PEARL HARBOR, HAWAII 96860-4884

Mr. Carl Arakaki  
 Department of Design and Construction  
 City and County of Honolulu  
 650 South King Street  
 Honolulu, HI 96813

**RECEIVED**  
 DEC 13 1999

WILSON OKAMOTO & ASSOC., INC.

Dear Mr. Arakaki:

Subj: DRAFT ENVIRONMENTAL IMPACT STATEMENT (DEIS) FOR THE  
 KAILUA-KAHOEHE-KAHALUU FACILITIES PLAN (VARIOUS TMS IN:  
 4-2, 4-3, 4-4, 4-5, 4-6, 4-7, 4-8 AND 4-9) KOOLAUPOKO, OAHU, HAWAII

Thank you for the opportunity to review the subject DEIS. The Navy has no comments to offer  
 this time and appreciates the opportunity to participate in your review process.

The Navy's point of contact is Mr. Randy Miyashiro at 471-1171, ext 233.

Sincerely,

*C. K. Yokota*

C. K. YOKOTA  
 REC Engineer  
 Regional Environmental Department  
 By direction of the Commander

Copy to:  
 Mr. Kenneth E. Sprague  
 Department of Environmental Services  
 City and County of Honolulu  
 650 South King Street  
 Honolulu, HI 96813

Ms. Jan Naoo Sullivan  
 Department of Planning and Permitting  
 City and County of Honolulu  
 650 South King Street  
 Honolulu, HI 96813

5090.1H7A  
 Ser N465(PLN231)/10306  
 December 9, 1999

Mr. Rodney Funakoshi  
 Wilson Okamoto & Associates  
 1907 South Beretania Street, Suite 400  
 Honolulu, HI 96826  
 Office of Environmental Quality Control  
 State of Hawaii  
 235 South Beretania Street, Room 702  
 Honolulu, HI 98813

NO REPLY NEEDED TO:  
 5090.1H7A  
 Ser N465(PLN231)/10306  
 December 9, 1999

DEPARTMENT OF DESIGN AND CONSTRUCTION  
CITY AND COUNTY OF HONOLULU

650 SOUTH KING STREET, 2ND FLOOR  
HONOLULU, HAWAII 96813  
PHONE: (808) 533-4587  
FAX: (808) 533-4587  
WEB SITE ADDRESS: www.cd.honolulu.gov



GARY Q.L. YEE, AIA  
ACTING DIRECTOR  
ROLAND D. LIBBY, JR., AIA  
DEPUTY DIRECTOR

DCP 2000-066

January 31, 2000

Mr. C. K. Yokota, REC Engineer  
Department of the Navy  
Commander  
Navy Region Hawaii  
Regional Environmental Department  
517 Russell Avenue  
Pearl Harbor, Hawaii 96860-4884

Dear Mr. Yokota:

Subject: Kailua-Kaneohe-Kahaluu Facilities Plan  
Draft Environmental Impact Statement (EIS)  
Koolaulopoko, Oahu, Hawaii

Thank you for your letter of December 9, 1999 (Ref. 5090.1H7A, Ser N465(PLN231)10306),  
indicating that the Navy has no comments to offer this time.

We appreciate your time and effort in reviewing the Draft EIS.

Very truly yours,

  
FOR GARY Q.L. YEE, AIA  
Acting Director

cc: Rodney Funakoshi, Wilson Okamoto & Associates, Inc.  
Ms. Genevieve Salmonson, State Office of Environmental Quality Control

DEC 0 3 1999

WILSON OKAMOTO & ASSOCIATES, INC.

DEC 6 1999

Department of Design and Construction  
City and County of Honolulu  
650 South King Street  
Honolulu, Hawaii 96813

Attention: Mr. Carl Arakaki

Gentlemen:

Subject: Kailua-Kaneohe-Kahaluu Facilities Plan  
Draft Environmental Impact Statement (EIS)  
Koolaulopoko, Oahu, Hawaii

Thank you for the opportunity to review the EIS for the  
subject project.

The proposed project does not impact any of our facilities,  
therefore, we have no comments to offer.

Should you have further questions regarding the above,  
please have your staff contact Mr. Ralph Yukumoto of the Planning  
Branch at 586-0488.

Sincerely,



GORDON MATSUOKA  
Public Works Administrator

RY:mo  
c: Department of Environmental Services, C&C of Honolulu  
Department of Planning and Permitting, C&C of Honolulu  
Wilson Okamoto & Assoc., Inc.  
Office of Environmental Quality Control



DC 99-1043

DEPARTMENT OF DESIGN AND CONSTRUCTION  
CITY AND COUNTY OF HONOLULU  
650 SOUTH KING STREET, 2ND FLOOR  
HONOLULU, HAWAII 96813  
PHONE: (808) 533-4564 • FAX: (808) 522-4587  
WEB SITE ADDRESS: www.cc.honolulu.gov



JEREMY HARRIS  
MAYOR



DEPARTMENT OF BUSINESS, DEVELOPMENT  
ECONOMIC DEVELOPMENT & TOURISM

OFFICE OF PLANNING

235 South Beretania Street, 6th Floor, Honolulu, Hawaii 96813  
Mailing Address: P.O. Box 2359, Honolulu, Hawaii 96813  
Ref. No. P-8343

GARY O.L. YEE, AIA  
ACTING DIRECTOR  
ROLAND D. LUSKY, JR., AIA  
DEPUTY DIRECTOR

BEKURAH J. CAVETANO  
GOVERNOR  
SEEM F. NATAL, Ph.D.  
BRADLEY A. MOSESMAN  
DEPUTY DIRECTOR  
DAVID W. BLANE  
DIRECTOR, OFFICE OF PLANNING

Telephone: (808) 587-2846  
Fax: (808) 587-2844

November 4, 1999

DCP 2000-068

January 31, 2000

Mr. Gordon Matsuoka, Public Works Administrator  
State of Hawaii  
Department of Accounting and General Services  
Division of Public Works  
P.O. Box 119  
Honolulu, Hawaii 96810-0119

Dear Mr. Matsuoka:

Subject: Kailua-Kaneohe-Kaialuu Facilities Plan  
Draft Environmental Impact Statement (EIS)  
Koolaulopoko, Oahu, Hawaii

Thank you for your letter of December 6, 1999 (Ref. (P)1837.9), indicating that the proposed project does not impact any of your facilities and, therefore, you have no comments to offer.

We appreciate your time and effort in reviewing the Draft EIS.

Very truly yours,

FOR GARY O.L. YEE, AIA  
Acting Director

cc: Rodney Funakoshi, Wilson Okamoto & Associates, Inc.  
Ms. Genevieve Salmonson, State Office of Environmental Quality Control

Dear Project Manager:

Subject: Environmental Assessment and Environmental Impact Statement Reviews

For your information, the Hawaii Coastal Zone Management (CZM) Program is no longer routinely reviewing environmental assessment and environmental impact statement reports. If there are any questions, please call John Nakagawa of our CZM Program at (808) 587-2878.

Sincerely,

David W. Blane  
Director

Office of Planning

ESTHER UEDA  
EXECUTIVE OFFICER



STATE OF HAWAII  
DEPARTMENT OF BUSINESS, ECONOMIC DEVELOPMENT & TOURISM  
LAND USE COMMISSION

P.O. Box 2359  
Honolulu, HI 96804-2359  
Telephone: 808-587-3822  
FAX: 808-587-3827

December 23, 1999

RECEIVED  
DEC 28 1999

WILSON OKAMOTO & ASSOCIATES, INC.

Mr. Randall K. Fujiki, Director  
Department of Design and Construction  
City and County of Honolulu  
650 South King Street  
Honolulu, Hawaii 196813

Dear Mr. Fujiki:

Subject: Kailua-Kaneohe-Kahaluu Facilities Plan  
Draft Environmental Impact Statement (EIS)  
TMK: Various in 4-2, 4-3, 4-4, 4-5, 4-6, 4-7, 4-8, and 4-9  
Koolaulopoko, Oahu, Hawaii

We have reviewed the subject draft EIS and offer the following comments:

1. In Figure 5-1, State Land Use Districts, a correction is needed for the rectangular boot shaped area in the Waikane area near the Moliit Ponds. This area is identified as being in the Conservation District and should be identified as being in the Urban District.
2. On page 4-20, first complete paragraph, it is stated that during a major flood event that may be a potential of individual wastewater systems backing up and ultimately flowing into surface and nearshore coastal waters. Will the Koolaulopoko regional facilities plan address improvements to individual systems as well as major facilities, either directly or through other agencies?

We have no further comments to offer at this time. Thank you for the opportunity to review and comment on the draft EIS for the Kailua-Kaneohe-Kahaluu Facilities Plan.

BENJAMIN J. CASTANO  
COMMISSIONER

DEPARTMENT OF DESIGN AND CONSTRUCTION  
CITY AND COUNTY OF HONOLULU

650 SOUTH KING STREET, 2ND FLOOR  
HONOLULU, HAWAII 96813  
PHONE: (808) 533-4564 • FAX: (808) 533-4567  
WEB SITE ADDRESS: www.dcd.honolulu.gov



January 31, 2000

DCP 2000-069

GARY Q.L. YEE, AIA  
ACTING DIRECTOR  
ROLAND D. LIBBY, JR., AIA  
DEPUTY DIRECTOR

Mr. David W. Blane, Director  
State of Hawaii  
Department of Business, Economic Development & Tourism  
Office of Planning  
P.O. Box 2359  
Honolulu, Hawaii 96804

Dear Mr. Blane:

Subject: Kailua-Kaneohe-Kahaluu Facilities Plan  
Draft Environmental Impact Statement (EIS)  
Koolaulopoko, Oahu, Hawaii

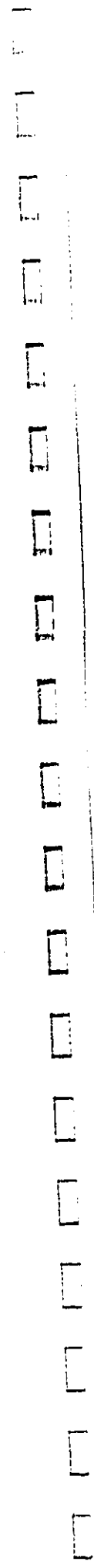
This is to acknowledge your letter of November 4, 1999 (Ref. No. P-8343), indicating that the Hawaii Coastal Zone Management (CZM) Program is no longer routinely reviewing environmental assessment and environmental impact statement reports.

We appreciate your response to our request for a review of the Draft EIS.

Very truly yours,

FOR  
GARY Q.L. YEE, AIA  
Acting Director

cc: Rodney Funakoshi, Wilson Okamoto & Associates, Inc.  
Ms. Genevieve Salmonson, State Office of Environmental Quality Control





Mr. Randall K. Fujiki  
December 23, 1999  
Page 2

DEPARTMENT OF DESIGN AND CONSTRUCTION  
CITY AND COUNTY OF HONOLULU  
650 SOUTH KING STREET, 2ND FLOOR  
HONOLULU, HAWAII 96813  
PHONE: (808) 523-4564 • FAX: (808) 523-4587  
WEB SITE ADDRESS: www.cc.honolulu.hi.us



JEREMY HARRIS  
MAYOR

GARY O. YEE, AIA  
ACTING DIRECTOR  
ROLAND D. LUBBY, JR., AIA  
DEPUTY DIRECTOR

DCP 2000-098

February 4, 2000

If you have any questions in regards to this matter, please contact me or Russell Kumabe at 587-3822. Thank you for your cooperation in this matter.

Sincerely,

ESTHER UEDA  
Executive Officer

Ms. Esther Ueda, Executive Officer  
State of Hawaii  
Department of Business, Economic Development & Tourism  
Land Use Commission  
P.O. Box 2359  
Honolulu, Hawaii 96804-2359

c: Mr. Carl Arakaki, Department of  
Design & Construction  
Dr. Kenneth E. Sprague, Department  
Of Environmental Services  
Ms. Jan Naoe Sullivan, Department of  
Planning & Permitting  
✓ Mr. Rodney Funakoshi, Wilson Okamoto  
& Associates, Inc.,  
Office of Environmental Quality Control

Dear Ms. Ueda:

Subject: Kailua-Kaneohe-Kahaluu Facilities Plan  
Draft Environmental Impact Statement (EIS)  
Koolaupoko, Oahu, Hawaii

EU:j

Thank you for your letter of December 23, 1999, regarding the subject Draft EIS. We offer the following in response to your comments:

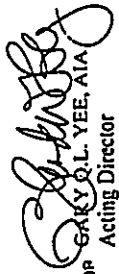
1. Figure 5-1 State Land Use Districts will be corrected in the Final EIS to reflect the rectangular boot-shaped area in the Waikane area near the Moili Ponds as being in the Urban rather than the Conservation District. Thank you for calling this to our attention.
2. The Kailua-Kaneohe-Kahaluu Facilities Plan is a 20-year plan which identifies the future wastewater needs for the Kailua-Kaneohe-Kahaluu wastewater service area and required improvements to the Kailua Regional Wastewater Treatment Plant (WWTP), preliminary treatment facilities, pump stations, collection and disposal system, and the establishment of Sewer Improvement Districts for much of the unserved areas. Chapter 2 Project Description of the Draft EIS describes in detail the Facilities Plan's proposed wastewater facility improvements. The proposed improvements will be undertaken by the City and County of Honolulu's Department of Design and Construction and Department of Environmental Services.

Ms. Esther Ueda  
Page 2  
February 4, 2000

As the Facilities Plan identifies proposed improvements to the municipal wastewater system, the Plan does not address improvements to existing privately-owned individual wastewater systems. However, the Plan does call for the implementation of nine (9) Sewer Improvement Districts serving 764 lots in the region to provide service to currently unserved areas. As indicated in Section 4.2.3.1 Flood Zones and Tsunami Hazards -- Impacts and Mitigation Measures of the Draft EIS, implementation of the proposed Sewer Improvement Districts will reduce the number of individual wastewater systems that could potentially become inundated to overflow conditions during a major flood event.

We acknowledge that you have no further comments to offer at this time. We appreciate your time and effort in reviewing the Draft EIS.

Very truly yours,

  
FOR  
GARY Q. LEE, AIA  
Acting Director

cc: Rodney Funakoshi, Wilson Okamoto & Associates, Inc.  
Ms. Genevieve Salmonson, State Office of Environmental Quality Control

JRN-13-2000 15:41 FROM WRESTLEARTER MGMT PLS/CEC TO

99462253 P.06

DC 4A-1142



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99 DEC 27 11 25 AM '99  
STATE OF HAWAII  
DEPARTMENT OF BUSINESS, ECONOMIC DEVELOPMENT & TOURISM  
HOUSING AND COMMUNITY DEVELOPMENT CORPORATION OF HAWAII  
677 OUECH STREET, SUITE 300  
HONOLULU, HAWAII 96813  
FAX (808) 587-0600

December 17, 1999

Mr. Carl Arakaki  
Department of Design and Construction  
City and County of Honolulu  
650 South King Street  
Honolulu, Hawaii 96813

Dear Mr. Arakaki:

Re: Draft Environmental Impact Statement (EIS) for the Kailua-Kaneohe-Kahaluu  
Facilities Plan

We have reviewed the subject draft EIS and have no comments to offer.

Thank you for the opportunity to comment.

Sincerely,

DONALD K.W. LAU  
Executive Director

c: Department of Environmental Services  
Department of Planning and Permitting  
Wilson Okamoto & Associates, Inc.  
Office of Environmental Quality Control

DEPARTMENT OF DESIGN AND CONSTRUCTION  
CITY AND COUNTY OF HONOLULU

650 SOUTH KING STREET, 2ND FLOOR  
HONOLULU, HAWAII 96813  
PHONE: (808) 523-4564 • FAX: (808) 523-4567  
WEB SITE ADDRESS: WWW.DDC.HONOLULU.HI.US



JEREMY HARRIS  
MAYOR

GARY Q.L. YEE, AIA  
ACTING DIRECTOR  
ROLAND D. LIBBY, JR., AIA  
DEPUTY DIRECTOR

DCF 2000-070

January 31, 2000

Mr. Donald K. W. Lau, Executive Director  
State of Hawaii  
Department of Business, Economic Development & Tourism  
Housing and Community Development Corporation of Hawaii  
677 Queen Street, Suite 300  
Honolulu, Hawaii 96813

Dear Mr. Lau:

Subject: Kailua-Kaneohe-Kahaluu Facilities Plan  
Draft Environmental Impact Statement (EIS)  
Koolaulapoko, Oahu, Hawaii

Thank you for your letter of December 17, 1999 (Ref. 99:PEO3705), indicating that you have no  
comments to offer on the subject Draft EIS.

We appreciate your time and effort in reviewing the Draft EIS.

Very truly yours,

FOR GARY Q.L. YEE, AIA  
Acting Director

cc: Rodney Funakoshi, Wilson Okamoto & Associates, Inc.  
Ms. Genevieve Salmonson, State Office of Environmental Quality Control

COPY

BEAUMONT C. CATTANO  
GOVERNOR  
STATE OF HAWAII



STATE OF HAWAII  
DEPARTMENT OF HAWAIIAN HOME LANDS  
P.O. BOX 1879  
HONOLULU, HAWAII 96808

RAYNARD C. SOON  
CHAIRMAN  
HAWAIIAN HOMES COMMISSION  
JOSE M. S. M. TANAKA  
DEPUTY TO THE CHAIRMAN

November 16, 1999

The Honorable Randall K. Fujiki, Director  
City and County of Honolulu  
Department of Design and Construction  
Honolulu Municipal Building  
650 South King Street, Second Floor  
Honolulu, Hawaii 96813

Attn: Carl Arakaki

Dear Mr. Fujiki:

Subject: Kailua-Kaneohe-Kahaluu Facilities Plan, Draft  
Environmental Impact Statement, TMK 4-2 to 4-9,  
Koolaulopoko, Oahu, Dated October 1999

Thank you for the opportunity to review the subject application.  
The Department of Hawaiian Home Lands has no comment to offer.

If you have any questions, please call Daniel Ornellas at  
586-3836.

Aloha,

*Daniel Ornellas*  
Raynard C. Soon, Chairman  
Hawaiian Homes Commission

DEPARTMENT OF DESIGN AND CONSTRUCTION  
CITY AND COUNTY OF HONOLULU

650 SOUTH KING STREET, 2ND FLOOR  
HONOLULU, HAWAII 96813  
PHONE: (808) 523-4584 • FAX: (808) 523-4587  
WEB SITE ADDRESS: WWW.DDC.HONOLULU.HI



JOSEPH HARRIS  
MAYOR

GARY Q.L. YEE, AIA  
ACTING DIRECTOR  
ROLAND O. LARRY, JR., AIA  
DEPUTY DIRECTOR

DCP 2000-071

January 31, 2000

Mr. Raynard C. Soon, Chairman  
Hawaiian Homes Commission  
State of Hawaii  
Department of Hawaiian Home Lands  
P.O. Box 1879  
Honolulu, Hawaii 96805

Dear Mr. Soon:

Subject: Kailua-Kaneohe-Kahaluu Facilities Plan  
Draft Environmental Impact Statement (EIS)  
Koolaulopoko, Oahu, Hawaii

Thank you for your letter of November 16, 1999, indicating that your Department has no  
comments on the subject Draft EIS.

We appreciate your time and effort in reviewing the Draft EIS.

Very truly yours,

*Gary Q.L. Yee*  
FOR  
GARY Q.L. YEE, AIA  
Acting Director

cc: Rodney Fumakoshi, Wilson Okamoto & Associates, Inc.  
Ms. Genevieve Salmonson, State Office of Environmental Quality Control





STATE OF HAWAII  
DEPARTMENT OF HEALTH  
PO. BOX 3378  
HONOLULU, HAWAII 96801

December 20, 1999

98-198A/epo

BRUCE S. JACKSON, D.D., M.P.H.  
DIRECTOR OF HEALTH

In Reply, Please Refer to:  
File #

DEC 27 1999

BERNARD J. CANTUARO  
GOVERNOR OF HAWAII

Mr. Randall J. Fujiki, Director  
Department of Design and Construction  
City and County of Honolulu  
650 South King Street  
Honolulu, Hawaii 96813

ATTENTION: Mr. Carl Arakaki

Dear Mr. Fujiki:

Subject: Draft Environmental Impact Statement (DEIS)  
Kailua-Kaneohe-Kahaluu Facilities Plan  
Koolauopoko, Oahu  
TMK: 4-2 and Various Others

Thank you for allowing us to review and comment on the subject plan. Besides the comments that we made to you in our letter of November 9, 1998 (enclosed), we have the following additional comments to make:

Control of Fugitive Dust

Due to the nature of the project, there is a significant potential for fugitive dust to be generated during the removal of debris and during the grading, trenching, and construction activities that would impact nearby residential, business, and thoroughfares. It is suggested that a dust control management plan be developed which identifies and addresses activities that have a significant potential for generating fugitive dust. Implementation of adequate dust control measures during all phases of the project is warranted.

Construction activities must comply with provisions of Hawaii Administrative Rules Section 11-60.1-33 on Fugitive Dust. The contractor should provide adequate measures to control dust from road areas and during the various phases of construction activities. These measures include, but are not limited to:

98-198A/epo

Mr. Randall J. Fujiki  
December 20, 1999  
Page 2

- a. planning the different phases of construction, focusing on minimizing the amount of dust-generating materials and activities, centralizing material transfer points and on-site vehicular traffic routes, and locating potentially dusty equipment in areas of the least impact;
- b. providing an adequate water source at the site prior to start-up of construction activities;
- c. landscaping and rapid covering of bare areas, including slopes, starting from the initial grading phase;
- d. controlling of dust from shoulders, project entrances, and access roads; and
- e. providing adequate dust control measures during weekends, after hours, and prior to daily start-up of construction activities.

If you have any questions regarding fugitive dust, please contact Mr. Calen Miyahara of the Clean Air Branch at 586-4200.

Wastewater Branch

The Department of Health's Wastewater Branch supports the City and County's efforts to improve and expand their wastewater treatment and disposal system.

Sincerely,

  
GARY GILL  
Deputy Director for  
Environmental Health

Enclosure

- c: CAB  
WYB  
Dept. of Env. Services  
Dept. of Plng. & Permitting  
Wilson Okamoto & Assoc.  
OEQC

ENCLOSURE



STATE OF HAWAII  
DEPARTMENT OF HEALTH  
P.O. BOX 1378  
HONOLULU, HAWAII 96811  
November 9, 1998

Lawrence M. Lee  
Director of Health

By: [Signature]

98-198/epo

Mr. Randall J. Fujiki  
November 9, 1998  
Page 2

Environmental Control  
Department of Health

2. Through facility design, sound levels emanating from stationary equipment such as air conditioning systems, must exhaust fans, refrigeration compressors or generators, must be attenuated to comply with the provisions of the Department of Health's Administrative Rules, Chapter 11-46, "Community Noise Control."

Should there be any questions on this matter, please call Mr. Jerry Haruno, Environmental Health Program Manager of the Noise, Radiation and Indoor Air Quality Branch at 586-4701.

We support the City and County's efforts to improve and expand their wastewater treatment and disposal systems.

Sincerely,

[Signature]

BRUCE S. ANDERSON, Ph.D.  
Deputy Director for  
Environmental Health

c: NR&IAQB  
MWB

Mr. Randall J. Fujiki, Director  
Department of Design and Construction  
City and County of Honolulu  
650 South King Street  
Honolulu, Hawaii 96813

ATTENTION: Mr. Carl Arakaki

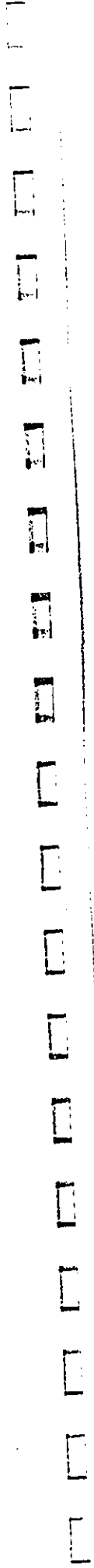
Dear Mr. Fujiki:

Subject: Environmental Impact Statement Preparation Notice  
(EISPN)  
Kaliua-Kaneohe-Kahaluu Facilities Plan  
Koolaupoko, Oahu  
TRK: 4-2 and Various Others

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

Noise

1. Activities associated with the construction phase of the project must comply with the Department of Health's Administrative Rules, Chapter 11-46, "Community Noise Control."
  - a. The contractor must obtain a noise permit if the noise levels from the construction activities are expected to exceed the allowable levels of the rules as stated in Section 11-46-6(a).
  - b. Construction equipment and on-site vehicles requiring an exhaust of gas or air must be equipped with mufflers as stated in Section 11-46-6(b)(1)(A).
  - c. The contractor must comply with the requirements pertaining to construction activities as specified in the rules and the conditions issued with the permit as stated in Section 11-46-7(d)(4).



DEPARTMENT OF DESIGN AND CONSTRUCTION  
CITY AND COUNTY OF HONOLULU

650 SOUTH KING STREET, 2ND FLOOR  
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JEREMY HARRIS  
MAYOR

GARY Q.L. YEE, AIA  
ACTING DIRECTOR  
ROLAND D. LARBY, JR., AIA  
DEPUTY DIRECTOR

DCP 2000-099

February 4, 2000

Mr. Gary Gill  
Page 2  
February 4, 2000

c. The construction contractor(s) will be required to comply with the requirements pertaining to construction activities as specified in the rules and conditions issued with the noise permit as stated in Section 11-46-7(d) (4).

2. Through facility design, sound levels emanating from stationary equipment such as air-conditioning systems, exhaust fans, refrigeration compressors, or generators will be attenuated to comply with the provisions of the Department of Health's Administrative Rules, Chapter 11-46, "Community Noise Control".

Control of Fugitive Dust

The construction contractor(s) for the proposed project improvements will be required to comply with the provisions of HAR, Section 11-60.1-33 on Fugitive Dust. A discussion of this is included in Section 4.5.1 Short-Term Construction Impacts (Air Quality) in the Draft EIS. The contractor(s) will also be required to implement adequate measures to control dust from road areas and during the various phases of construction activities, including the applicable measures identified in your letter.

Wastewater Branch

The Department of Health Wastewater Branch's support of the City's efforts to improve and expand its wastewater treatment and disposal system is gratefully acknowledged.

We appreciate your time and effort in reviewing the Draft EIS.

Very truly yours,

FOR  
GARY Q.L. YEE, AIA  
Acting Director

cc: Rodney Funakoshi, Wilson Okamoto & Associates, Inc.  
Ms. Genevieve Salmonson, State Office of Environmental Quality Control

Mr. Gary Gill  
Deputy Director for Environmental Health  
State of Hawaii  
Department of Health  
P.O. Box 3378  
Honolulu, Hawaii 96801

Dear Mr. Gill:

Subject: Kailua-Karaoke-Kahaluu Facilities Plan  
Draft Environmental Impact Statement (EIS)  
Koolaupoko, Oahu, Hawaii

Thank you for your letter of December 20, 1999 (98-198A/epo), regarding the subject Draft EIS. Your Department's attached November 9, 1998 comment letter to the EIS Preparation Notice was inadvertently overlooked and is also responded to at this time.

Noise

1. Activities associated with the construction phase of the proposed project improvements will comply with the Department of Health's Administrative Rules (HAR), Chapter 11-46, "Community Noise Control". A discussion of this is included in Section 4.6.1 Short-Term Construction Impacts (Noise) - Impacts and Mitigation Measures of the Draft EIS.
  - a. The construction contractor(s) for the proposed project improvements will be required to obtain a noise permit if the noise levels from the construction activities are expected to exceed the allowable levels of the rules as stated in Section 11-46-6(a).
  - b. The construction contractor(s) will be required to equip construction equipment and on-site vehicles requiring an exhaust of gas or air with mufflers as stated in Section 11-46-6(b) (1) (A).



**COMMISSION ON PERSONS WITH DISABILITIES**

919 Ala Moana Boulevard, Room 101 • Honolulu, Hawaii 96814  
Ph. (808) 586-8121 (VTDD) • Fax (808) 586-8122

JM -5 AB 56

DESIGN & CONSTRUCTION  
DIVISION OF  
PLANNING & PROGRAMMING

December 30, 1999

Mr. Carl Arakaki  
Project Manager  
Department of Design and Construction  
City and County of Honolulu  
650 South King Street  
Honolulu, HI 96813

Subject: Kailua-Kaneohe-Kahaluu Facilities Plan  
Draft Environmental Impact Statement (EIS)  
Koolauoko, Oahu, Hawaii  
Pursuant to Chapter 343, Hawaii Revised Statutes & Chapter 200,  
Administrative Rules, Department of Health, State of Hawaii

Intent: Proposal to undertake various improvements to the waste water collection,  
treatment and disposal system, and the establishment of Sewer Improvement  
Districts for unanswered areas in the above locations

Dear Mr. Arakaki:

The Draft Environmental Impact Statement for the Kailua-Kaneohe-Kahaluu Facilities Plan has been submitted to our office for comment. The purpose of our review is to ensure that the planning and design development phases of this proposed project take into account accessibility for persons with disabilities.

We offer the following comments:

This project falls within the scope of the Americans with Disabilities Act (ADA) Title II, covering state and local governments, and §103-50 Hawaii Revised Statutes, which contains a requirement for a review process by the Commission on Persons with Disabilities hereinafter will be known as the "Disability and Communication Access Board" effective January 1, 2000.

Also it appears that the proposed facility may contain outdoor areas that are being addressed as mini-parks. The plan should ensure that all features and routes will incorporate appropriate walking surfaces starting from accessible parking or public transportation stops, if applicable, to the outdoor features of interest.

Provide a general accessibility statement under the draft's Section 5 - RELATIONSHIP TO PLANS, POLICIES AND CONTROLS. It should read as follows:

*All facilities will be designed to meet the requirements of the Americans with Disabilities Act Accessibility Guidelines and the requirements of §103-50 and §103-50.5 Hawaii Revised Statutes. Buildings, facilities, and sites shall also incorporate best design practices as noted in the recommendations from the U.S. Architectural and Transportation Barriers Compliance Board and the U.S. Department of Transportation/Federal Highway Administration's - May 1999 draft of Accessible Rights-of-Way: A Design Guide and the Regulatory Negotiating Committee - September 1999 Final Report on Accessibility Guidelines For Outdoor Developed Areas.*

The above reflects staff's technical assistance comments. They do not reflect our Board's approval or disapproval of the draft per se. There are no further comments to offer at this time. Thank you for giving us this opportunity to provide comment.

If you have any further questions or concerns, please feel free to contact Mr. Ben Gorospe, Facility Access Coordinator, or Mr. Gary Batcheller, Facility Access Specialist at 586-8121.

Sincerely,  
*Charlotte J. Townsend*  
CHARLOTTE L. TOWNSEND  
Acting Executive Director



DEPARTMENT OF DESIGN AND CONSTRUCTION  
CITY AND COUNTY OF HONOLULU

650 SOUTH KING STREET, 2ND FLOOR  
HONOLULU, HAWAII 96814  
PHONE: (808) 522-4384 • FAX: (808) 522-4587  
WEB SITE ADDRESS: [WWW.DDC.HONOLULU.GOV](http://WWW.DDC.HONOLULU.GOV)



JEREMY HARRIS  
MAYOR

GARY D.L. YEE, AIA  
ACTING DIRECTOR  
ROLAND D. LIBBY, JR., AIA  
DEPUTY DIRECTOR

DCP 2000-102

February 4, 2000

Ms. Charlotte Townsend,  
Acting Executive Director  
State of Hawaii  
Department of Health  
Disability and Communication Access Board  
919 Ala Moana Boulevard, Room 101  
Honolulu, Hawaii 96814

Dear Ms. Townsend:

Subject: Kailua-Kaneohe-Kahalua Facilities Plan  
Draft Environmental Impact Statement (EIS)  
Koolaulopoko, Oahu, Hawaii

Thank you for your letter of December 30, 1999, regarding the subject Draft EIS. We offer the following in response to your comments:

We acknowledge that the proposed project falls within the scope of the Americans with Disabilities Act (ADA) Title II, covering State and local governments, and §103-50, Hawaii Revised Statutes, which contains a requirement for a review process by the Disability and Communication Access Board (formerly Commission on Persons with Disabilities). The *Disability and Communication Access Board (Review pursuant to Americans with Disabilities Act Accessibility Guidelines (ADAAG))* will be listed in Section 5.10 Permits and Approvals of the Final EIS under State of Hawaii Department of Health.

Should the Kailua Road WWPS equalization basin alternative be pursued, the proposed mini-park and associated features will be designed and constructed in accordance with the Americans with Disabilities Act Accessibility Guidelines.

As requested, the following general accessibility statement will be included in the Final EIS under Section 5.1 Hawaii State Plan - Section 226-14 *Objective and policies for facility systems - in general: "All facilities will be designed to meet the requirements of the Americans with Disabilities Act Accessibility Guidelines and the requirements of §103-50 and §103-50.5*

Ms. Charlotte Townsend  
Page 2  
February 4, 2000

*Hawaii Revised Statutes. Buildings, facilities and sites shall also incorporate best design practices as noted in the recommendations from the U.S. Architectural and Transportation Barriers Compliance Board and the U.S. Department of Transportation/Federal Highway Administration's May 1999 draft of "Accessible Rights-of-Way: A Design Guide" and the Regulatory Negotiating Committee - September 1999 Final Report on "Accessibility Guidelines For Outdoor Developed Areas".*

We appreciate your time and effort in reviewing the Draft EIS.

Very truly yours,

  
FOR GARY D.L. YEE, AIA  
Acting Director

cc: Rodney Funakoshi, Wilson Okamoto & Associates, Inc.  
Ms. Genevieve Salmonson, State Office of Environmental Quality Control



99 DEC -9 AM 8:29

STATE OF HAWAII  
DEPARTMENT OF LAND AND NATURAL RESOURCES  
DIVISION OF STATE PARKS  
P.O. BOX 621  
HONOLULU, HAWAII 96809

DEC 17 1999

LD-NAY  
REF.: DEAKKCP.RMT

Honorable Jan Naoe Sullivan  
Director of Land Utilization  
City and County of Honolulu  
650 S. King Street 7th Floor  
Honolulu, Hawaii 96813

Dear Ms. Sullivan:

SUBJECT: Review Draft Environmental Impact Statement for the  
Kailua-Kaneohe-Kahaluu Facilities Plan, Koolauopoko,  
Island of Oahu, Hawaii

Thank you for the opportunity to review and comment on the  
proposed project.

The Department of Land and Natural Resources' Land Division  
submitted a copy of the Plan Review Use Permit Application to our  
Division of Aquatic Resources and Division of State Parks for their  
review and comment on the subject matter.

Attached is a copy of our Division of State Parks' comments.

We have no other comment to offer on the subject matter.  
Should you have any questions, please contact Nicholas Vaccaro of  
our Land Division's Support Services Branch at 587-0438.

Very truly yours,

*Dean Y. Uchida*  
DEAN Y. UCHIDA  
Administrator

c: Oahu District Land Office



99 DEC -9 AM 8:29

STATE OF HAWAII  
DEPARTMENT OF LAND AND NATURAL RESOURCES  
DIVISION OF STATE PARKS  
P.O. BOX 621  
HONOLULU, HAWAII 96809

November 18, 1999

MEMORANDUM:

TO: Dean Y. Uchida, Administrator  
Land Division

FROM: Ralston H. Nagata  
State Parks Administrator

SUBJECT: Review Draft Environmental Impact Statement  
for the Kailua-Kaneohe-Kahaluu Facilities  
Plan, Koolauopoko, Oahu, Hawaii

We believe the plan should be revised to include sewer system  
extension to the heavily used public facilities at Heeia Kea Small  
Boat Harbor and Heeia State Park.

RECEIVED  
DIVISION OF  
LAND MANAGEMENT  
Nov 19 10 07 AM '99

- Mr. Tolson
- Mr. Ladd
- Mr. Nichols
- Mr. Belmont
- Mr. Mohr
- Mr. Casper
- Mr. Callahan
- Mr. Felt
- Mr. Gale
- Mr. Rosen
- Mr. Sullivan
- Mr. Tavel
- Mr. Trotter
- Mr. Tele. Room
- Miss Holmes
- Miss Gandy

99 DEC -9 AM 8:29

STATE OF HAWAII  
 DEPARTMENT OF LAND AND NATURAL RESOURCES  
 Land Division  
 Honolulu, Hawaii  
 November 8, 1999

LD/NAV  
 Ref.: DEAKKKFP.COM  
 Suspension Date: 11/27/99

**MEMORANDUM:**

- TO:  XXX Division of Aquatic Resources  
 Division of Forestry & Wildlife  
 Division of State Parks  
 Division of Boating and Ocean Recreation  
 Historic Preservation Division  
 Commission on Water Resource Management  
 Land Division Branches of:  
 Planning and Technical Services  
 Engineering Branch  
 Oahu District Land Office  
 Shoreline Processing Services

FROM: Dean Y. Uchida, Administrator  
 Land Division

SUBJECT: Review Draft Environmental Impact Statement for the  
 Kailua-Kaneohe-Kahaluu Facilities Plan Koolauapoko, Oahu,  
 Hawaii

Please review the following:  
Draft Environmental Impact Statement  
 and submit your comments (if any) on Division letterhead within the  
 time requested above. Should you need more time to review the  
 subject matter, please contact Nick Vaccaro at ext.: 7-0438.

If this office does not receive your comments on or before the  
 suspense date, we will assume there are no comments.

( ) We have no comments.  
 We believe the plan should be reviewed to include sewer system attention to the heavily used public facilities at Heia Kea Small Boat Harbor and Heia Kea State Park.

(X) Comments attached.  
 Signed: *[Signature]*  
 Date: 1/16/99

DEPARTMENT OF DESIGN AND CONSTRUCTION  
**CITY AND COUNTY OF HONOLULU**

850 SOUTH KING STREET, 2ND FLOOR  
 HONOLULU, HAWAII 96813  
 PHONE: (808) 523-4564 FAX: (808) 523-4587  
 WEB SITE ADDRESS: www.cc.honolulu.gov



JEREMY HARRIS  
 Mayor

GARY Q.L. YEE, AIA  
 ACTING DIRECTOR  
 ROLAND D. LARRY, JR., AIA  
 DEPUTY DIRECTOR

February 4, 2000  
 DCP 2000-101

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

Dear Mr. Uchida:

Subject: Kailua-Kaneohe-Kahaluu Facilities Plan  
 Draft Environmental Impact Statement (EIS)  
 Koolauapoko, Oahu, Hawaii

Thank you for your letter of December 7, 1999 (LD-NAV, REF.: DEAKKKFP.RMT), regarding comments from the Division of State Parks on the subject Draft EIS.

Your request for an extension of the sewer system in the Heeia area is acknowledged, however, revision of the Facilities Plan is not necessary to accommodate your request. The State of Hawaii could extend a sewer line from Heeia State Park and the Heeia Kea Small Boat Harbor to the existing municipal system at its expense, provided there is adequate capacity in the line which would be connected to. Should the Division of State Parks wish to further pursue this, they may contact our Department of Planning and Permitting Wastewater Branch at 527-6064.

We appreciate your time and effort in reviewing the Draft EIS.

Very truly yours,

*[Signature]*  
 FOR GARY Q.L. YEE, AIA  
 Acting Director

cc: ✓ Rodney Funakoshi, Wilson Okamoto & Associates, Inc.  
 Ms. Genevieve Salmonson, State Office of Environmental Quality Control

ROSLAND J. GIBBY, JR.  
GOVERNOR OF HAWAII



STATE OF HAWAII

DEPARTMENT OF LAND AND NATURAL RESOURCES

HISTORIC PRESERVATION DIVISION

601 Kamohiwa Building, Room 555

Kapolei, Hawaii 96707

**RECEIVED**  
DEC 20 1999

STATE OF HAWAII  
DEPARTMENT OF LAND AND NATURAL RESOURCES  
HISTORIC PRESERVATION DIVISION  
601 Kamohiwa Building, Room 555  
Kapolei, Hawaii 96707

THOMAS L. JONES, CHAIRMAN  
BOARD OF LAND AND NATURAL RESOURCES  
COMMISSIONER OF STATE HISTORIC PRESERVATION

200-7115  
-JAGT & CLAYTON  
-MAIL ROOM

STATE OF HAWAII  
DEPARTMENT OF LAND AND NATURAL RESOURCES  
HISTORIC PRESERVATION DIVISION  
601 Kamohiwa Building, Room 555  
Kapolei, Hawaii 96707

STATE OF HAWAII  
DEPARTMENT OF LAND AND NATURAL RESOURCES  
HISTORIC PRESERVATION DIVISION  
601 Kamohiwa Building, Room 555  
Kapolei, Hawaii 96707

JEREMY HARRIS  
MAYOR

DEPARTMENT OF DESIGN AND CONSTRUCTION  
CITY AND COUNTY OF HONOLULU

650 SOUTH KING STREET, 7th FLOOR  
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WEB SITE ADDRESS: www.ddc.honolulu.hi.us



GARY Q.L. YEE, AIA  
ACTING DIRECTOR  
ROLAND D. LEBBY, JR., AIA  
DEPUTY DIRECTOR

DCP 2000-073

January 31, 2000

Mr. Don Hibbard, Administrator  
State of Hawaii  
Department of Land and Natural Resources  
Historic Preservation Division  
Kakuhihewa Building, Room 555  
601 Kamohiwa Boulevard  
Kapolei, Hawaii 96707

Dear Mr. Hibbard:

Subject: Kailua-Kaneohe-Kahaluu Facilities Plan  
Draft Environmental Impact Statement (EIS)  
Koolauapoko, Oahu, Hawaii

Thank you for your letter of December 10, 1999 (Log No: 24545, Doc. No.: 9912EJ01), indicating that the proposed improvements within the existing Kailua Regional WWTP and Kaneohe and Ahuimanu WWTPs will have "no effect" on historic sites as these areas have been developed, making it unlikely that historic sites would be found.

We acknowledge your concern that the proposed improvements to the collection system and the pump station modifications may have an "adverse effect" on subsurface historic sites, including human burials throughout this area. As specific development plans for proposed projects involving sewer rehabilitation, reconstruction and new construction are developed, your Department will be consulted for review to determine the project's effect, if any, on historic sites.

We appreciate your time and effort in reviewing the Draft EIS.

Very truly yours,

FOR GARY Q.L. YEE, AIA  
Acting Director

cc: Rodney Funakoshi, Wilson Okamoto & Associates, Inc.  
Ms. Genevieve Salmonson, State Office of Environmental Quality Control

December 10, 1999

Randall K. Fujiki, Director  
Department of Design and Construction  
City and County of Honolulu  
650 South King Street, 7th Floor  
Honolulu, Hawaii 96813  
Attn: Carl Arakaki

WILSON OKAMOTO & ASSOC., INC. LOG NO: 24545  
DOC NO: 9912EJ01

Dear Mr. Fujiki:

SUBJECT: Chapter 6E-8 Historic Preservation Review -- Kailua-Kaneohe-Kahaluu Facilities Plan  
DRAFT Environmental Impact Statement  
Koolauapoko, Oahu  
IMK: various in 4-2, 4-3, 4-4, 4-5, 4-6, 4-7, 4-8 and 4-9

Thank you for the opportunity to review the Draft EIS for the Kailua-Kaneohe-Kahaluu Facilities Plan dated October 1999. The City and County proposes to undertake various long-term improvements to the wastewater collection, treatment and disposal system, for the Kailua-Kaneohe-Kahaluu wastewater service areas. We commented earlier on the EIS Preparation Notice. Our earlier comments are provided in Section 4.3.5 and in Section 13.2. We have previously commented on the Kanehe Street, Hamakua Drive, Keolu Drive Reconstructed Sewer, the Kaimui Drive Trunk Sewer Reconstruction, and the Kalaheo Avenue Reconstruction Sewer.

As stated in our earlier EISP comments we believe that improvements within the existing wastewater treatment plants, Kailua WWTP, Kaneohe WWTP and the Ahuimanu WWTP, will have "no effect" on historic sites because these areas have been developed, making it unlikely that historic sites would be found.

However, improvements to the collection systems, and the pump station modifications may have an "adverse effect" on subsurface historic sites including human burials throughout this area. Therefore, we reiterate our request to review the specific development plans for each project involving sewer rehabilitation, reconstruction, and new construction in order to determine the project's effect, if any, on historic sites. If you have any questions please call Sara Collins at 692-8026 or Elaine Jourdan at 692-8027.

Aloha,

Don Hibbard, Administrator  
Historic Preservation Division

EJ:jk

cc: Dr. Kenneth E. Sprague, Department of Environmental Services, City and County of Honolulu, 650 South King Street, Honolulu, HI 96813  
Jan Naoe Sullivan, Director, Department of Planning and Permitting, City and County of Honolulu, 650 South King Street, 7th Floor, Honolulu, HI 96813  
Rodney Funakoshi, Wilson Okamoto & Associates, Inc. 1907 South Beretania Street, Suite 400, Honolulu, HI 96826  
OEQC, State of HI 235 South Beretania Street, Room 702, Honolulu, HI 96813

DEPARTMENT OF DESIGN AND CONSTRUCTION  
CITY AND COUNTY OF HONOLULU

650 SOUTH KING STREET, 2ND FLOOR  
HONOLULU, HAWAII 96813  
PHONE: (808) 533-4584 • FAX: (808) 533-4587  
WEB SITE ADDRESS: www.dcc.honolulu.hi.us



GARY Q.L. YEE, AIA  
ACTING DIRECTOR  
ROLAND D. LIBBY, JR., AIA  
DEPUTY DIRECTOR

DCP 2000-072

JEREMY HARRIS  
BAYTOR

January 31, 2000

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

Dear Mr. Buck:

Subject: Kailua-Kaneohe-Kahaluu Facilities Plan  
Draft Environmental Impact Statement (EIS)  
Koolaupoko, Oahu, Hawaii

Thank you for your letter of November 9, 1999, indicating that the proposed actions will not impact Forestry and Wildlife Program responsibilities, including mitigation of threatened and endangered species.

We appreciate your time and effort in reviewing the Draft EIS.

Very truly yours,

FOR GARY Q.L. YEE, AIA  
Acting Director

cc: Rodney Funakoshi, Wilson Okamoto & Associates, Inc.  
Ms. Genevieve Salmonson, State Office of Environmental Quality Control

THOMAS L. JOHNS  
Commissioner  
BUREAU OF LAND AND NATURAL RESOURCES  
JANET E. STREIBEL  
BAYTOR

AGRICULTURE DEVELOPMENT  
ARCHITECTURE  
ARTS AND RECREATION  
COMMUNITY DEVELOPMENT  
CONSTRUCTION AND  
CONSTRUCTION AFFAIRS  
CORRECTIONS  
COURT AND PUBLIC  
HEALTH SERVICES  
CIVIL SERVICE  
GENERAL INVESTIGATION  
HUMAN RESOURCE MANAGEMENT  
INFORMATION SYSTEMS  
LAND AND NATURAL RESOURCES  
PLANNING AND  
RECREATION  
RESEARCH AND  
STATISTICS  
TRAINING AND  
WORKERS COMPENSATION



STATE OF HAWAII  
DEPARTMENT OF LAND AND NATURAL RESOURCES  
DIVISION OF FORESTRY AND WILDLIFE  
1151 PUNCHBOWL STREET  
HONOLULU, HAWAII 96813

November 9, 1999

Mr. Carl Arakaki  
Department of Design and Construction  
City and County of Honolulu  
650 South King Street  
Honolulu, Hawaii 96813

Dear Mr. Arakaki:

Subject: Kailua-Kaneohe-Kahaluu Facilities Plan, Draft Environmental Impact Statement (EIS) Tax Map Keys: Various TMKs in 4-2, 4-3, 4-4, 4-5, 4-6, 4-7, 4-8, and 4-9 Koolaupoko, Oahu, Hawaii.

We have reviewed the draft EIS for the subject matter above and the proposed actions consisting of various improvements to the wastewater collection, treatment and disposal system, and the establishment of sewer improvement districts in this area will not impact Forestry and Wildlife Program responsibilities including mitigation of Threatened and Endangered Species. Sections 3.4.1 Flora and 3.4.2 Fauna provide no indication that the facility improvements will impact plant species that are identified as threatened or endangered by U.S. Fish and Wildlife Service. Thank you for allowing us to comment on this draft EIS, Koolaupoko, Oahu, Hawaii.

Sincerely yours,

Michael G. Buck  
Administrator

Copy: DOFAW, Oahu District  
C&C Honolulu Depts.  
Wilson Okamoto & Associates  
OEQC

Enclosure

RECEIVED  
NOV 15 1999

WILSON OKAMOTO & ASSOC., INC.

BENJAMIN J. CAYetano



STATE OF HAWAII  
DEPARTMENT OF LAND AND NATURAL RESOURCES  
COMMISSION ON WATER RESOURCE MANAGEMENT  
P.O. BOX 671  
HONOLULU, HAWAII 96809

November 29, 1999

Mr. Carl Arakaki  
Department of Design and Construction  
City and County of Honolulu  
650 South King Street  
Honolulu, HI 96813

Dear Mr. Arakaki:

SUBJECT: Kaneohe-Kailua-Kahaluu Facilities Plan Draft EIS

FILE NO.: DCP 99-796

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

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

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

If there are any questions, please contact Ryan Imata at 587-0255.

Sincerely,  
  
LINNEL T. NISHIOKA  
Deputy Director

R1:SS

c: Kenneth E. Sprague, City & County of Honolulu, Department of Environmental Services  
Jan Naea Sullivan, City & County of Honolulu, Department of Planning and Permitting  
Rodney Funakoshi, Wilson Otamoto & Associates  
State of Hawaii, Office of Environmental Quality Control

DEPARTMENT OF DESIGN AND CONSTRUCTION  
CITY AND COUNTY OF HONOLULU

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JEREMY HARRIS  
MAYOR

GARY O.L. YEE, AIA  
ACTING DIRECTOR  
ROLAND D. LIBBY, JR., AIA  
DEPUTY DIRECTOR

DCP 2000-100

February 4, 2000

Ms. Linnel T. Nishioka, Deputy Director  
State of Hawaii  
Department of Land and Natural Resources  
Commission on Water Resource Management  
P.O. Box 621  
Honolulu, Hawaii 96809

Dear Ms. Nishioka:

Subject: Kailua-Kaneohe-Kahaluu Facilities Plan  
Draft Environmental Impact Statement (EIS)  
Koolauapoko, Oahu, Hawaii

Thank you for your letter of November 29, 1999 (File No.: DCP 99-796), regarding the subject Draft EIS. We offer the following in response to your comments:

- 1. The Commission on Water Resource Management's promotion of the efficient use of our water resources through conservation measures and use of alternative non-potable water resources whenever available and feasible is acknowledged. A discussion of the potential of effluent reuse for irrigation purposes was included in the Kailua-Kaneohe-Kahaluu Facilities Plan, and will be incorporated in the Final EIS under a new subsection in Section 3.11.2 Wastewater System as follows:

3.11.2.4 Effluent Reuse Potential

Currently, an average of 13 mgd of secondary treated effluent from the Kailua Regional WWTTP is discharged through the Makapu Outfall. This water could be used for many productive purposes including golf course and crop irrigation, landscaping and for various industrial and commercial uses. Reclaimed water is currently being used for irrigation at several sites including the BYU-Hawaii Campus, Kaneohe Klipper Golf Course at the Marine Corps Base Hawaii Kaneohe Bay, and at several parks, golf courses, and agricultural lots on Maui.

**Reclaimed Water Quality Standards and Treatment Facilities:** The State DOH has defined three standards of reclaimed water quality, R-1, R-2 and R-3. R-1 reclaimed water is disinfected to achieve a significant reduction in viral and bacterial pathogens; R-2 water is disinfected to achieve a fecal coliform limit of 4 cfu/100ml; and R-3 water is undisinfectated secondary treated wastewater. R-1 water is approved for the most uses and would provide the greatest flexibility for potential users of reclaimed water.

To produce R-1 quality water, effluent from the Kailua Regional WTPP would have to undergo additional treatment including coagulation/flocculation, filtration and disinfection. Chemical coagulation/flocculation is a treatment process which is used to enhance particulate removal during the filtration process.

Wastewater effluent is typically disinfected by using chlorine. However, the DOH recommends alternative forms of disinfection since chlorine can have serious adverse effects on aquatic life and can also react with wastewater to form various chlorinated hydrocarbons. In addition, reverse osmosis demineralization can be used to remove trace organics and allow reclaimed water to recharge drinking water aquifers.

**Storage and Transmission Facilities:** Storage impoundments for reclaimed water must have liners which are impervious to water and be of sufficient capacity to retain reclaimed water under adverse wet-weather conditions based on a 50-year storm recurrence interval. In addition, runoff should be prevented from entering the impoundment unless the impoundment is of sufficient size to accept the runoff without discharge, or an NPDES permit has been issued for the discharge. A backup disposal system should also be provided to prevent overflows or discharges when the system is not in use or when the reclaimed water quantities exceed the system demand.

To reduce the likelihood of cross-connection between reclaimed water lines and potable water lines, the Board of Water Supply has set standards for horizontal and vertical clearances between potable water lines and reclaimed water lines. Reclaimed water lines must also be colored purple and be clearly labeled as such.

**Potential Users of Reclaimed Water:** An assessment of non-potable water demand was conducted for various water users on the Windward side of Oahu by CH2M Hill for the Board of Water Supply. A list of the water users identified in the study and other potential users of non-potable water is shown in Table 3-15.

The State DOH's current regulations do not allow the reuse of R-1 water above the State's Underground Injection Control (UIC) line. Potential users currently affected by this regulation include Pali Golf Course, Hawaii State Hospital, Hoomaluhia Botanical Garden, Valley of the Temples Memorial Park, Koolau Golf Course, Luana Hills Golf Course, and a few public parks and schools located in the Ahuimani, Kaneohe and Maunawili areas.

**Table 3-15  
Windward Oahu Non-Potable Water Demand**

Site	Estimated Irrigated Acres	Average Water Demand (gpd)	Peak Water Demand
Olanesa Golf Links	129.9	97,800	303,871
Mid-Pacific Country Club	150	118,500	581,817
Pali Golf Course	150	105,400	581,817
Hawaii Pacific University-Hawaii Loa Campus	20	6,200	27,528
Hawaii State Hospital	72	27,400	279,282
Hoomaluhia Botanical Garden	32	21,687	124,173
Hawaiian Memorial Cemetery	100	174,551	1,163,672
Pan-View Golf Links	65	37,819	232,129
Public Parks	100	38,184	387,801
Schools	50	29,002	193,016
Valley of the Temples Memorial Park	50	29,092	193,946
Koolau Golf Course	35	32,001	213,340
Luana Hills Golf Course	95	55,275	368,496
<b>Total</b>	<b>1,398.9</b>	<b>868,640</b>	<b>5,436,209</b>

The Board of Water Supply has established that the water requirement for turf grass irrigation is one-inch per week. Average water demand for the Olanesa Golf Links, Mid-Pacific Country Club, Pali Golf Course, Hawaii Pacific University, Hawaii State Veterans Cemetery, and Hawaii State Hospital was determined in the Non-Potable Water Study by reviewing Board of Water Supply records. Average water demand for the remaining sites was assumed to be 0.15 inch irrigation/acre/week, with the remaining 0.85 inch of irrigation coming from rainfall.

The reclaimed water supply system should be designed for extreme cases in which weeks an pass with little or no rainfall. Peak water demand was calculated by assuming that no rainfall would occur and that the full one-inch of irrigation per week would come from the water reclamation system.

*Salinity of Kailua Regional Wastewater Treatment Plant Effluent: Reclaimed water that will be used for irrigation must fall within acceptable salinity levels. This is especially true in areas which recharge groundwater aquifers since application of high chloride content water may eventually cause chlorides to leach into underlying groundwater bodies. Generally, the maximum chloride concentration for turf irrigation water is 600 parts per million.*

*Preliminary salinity measurements taken at the Kailua Regional WTP indicate that the effluent currently exceeds acceptable levels. Wastewater samples were taken from four locations at the Kailua Regional WTP including the Kailua-Kaneohe force main, Kailua gravity line, Clarifier No. 3 weir, and Clarifier No. 2 weir. The samples were analyzed for electrical conductivity (EC) and were converted to parts per million (ppm) total dissolved solids (TDS). Estimates of chloride (Cl) concentration were made using two different methods. The measures EC and estimated TDS ppm and Cl concentrations for each location are shown in Table 3-16. The measurements from Clarifier No. 2 weir should be considered anomalous as it does not correlate to the other readings.*

Table 3-16

	Measured EC	Est. TDS	Est. Cl <sup>1</sup>	Est. Cl <sup>2</sup>
Kailua-Kaneohe Force	4,700	3,525	1,914	2,187
Kailua Gravity Sewer	7,100	5,325	2,891	3,303
Clarifier 3 Weir	6,400	4,800	2,606	2,928
Clarifier 2 Weir	1,000	750	407	465

<sup>1</sup> Based on EC multiplier: Est. TDS = EC \* 0.75  
<sup>2</sup> Based on EC multiplier: Est. Cl = EC \* 0.3  
<sup>3</sup> Assumes 1 liter of physical chemistry  
<sup>4</sup> Assumes 1 liter of physical chemistry and applies a factor to the TDS estimates based on TDS and Cl of seawater

*The current high chloride concentrations are most likely caused by the infiltration of seawater into sewer lines. As a result, following the substantial rehabilitation of sewer lines in the Kailua-Kaneohe-Kahala area, salinity levels may fall within acceptable levels (below 600 ppm). A program for periodically monitoring influent salinity levels should be undertaken by the City and County of Honolulu to determine the feasibility of planning and eventually developing reuse facilities for the region.*

2. As discussed in Section 4.2.1 Surface Water – Impacts and Mitigation Measures of the Draft EIS, potential impacts to the quality of surface waters in streams and drainage systems during construction of facility improvements will be mitigated by adherence to State Department of Health (DOH) and City and County of Honolulu water quality regulations governing grading, excavation and stockpiling. The National Pollutant Discharge Elimination System (NPDES) General Permit for Storm Water Associated

with Construction Activity administered by the State DOH will be required to control storm water discharges should the area of soil disturbance from activities such as clearing and grubbing, grading and stockpiling be in excess of five (5) acres. The Best Management

Practices (BMP) plan typically includes appropriate structural or non-structural mitigative methods such as containment berms and filtration/detention ponds that would control the discharge of storm water runoff resulting from construction activities.

The proposed wastewater facility improvements will have beneficial long-term water quality impacts on surface waters in the planning region. The provision of flow equalization facilities to reduce peak flows and collection system improvements to reduce infiltration and inflow will reduce the probability of spills and bypasses to surface waters during periods of heavy rainfall, thereby improving the level of water quality. Rehabilitation of the seven (7) collection system basins and improvements to the collection system are anticipated to result in up to approximately 45 percent reduction in infiltration and inflow during heavy storms. Implementation of nine (9) proposed Sewer Improvement Districts will connect approximately 35 percent of the unsewered lots in the region to the municipal wastewater system, thereby reducing the probability of spills and overflows from failing individual wastewater systems to surface waters.

As discussed in Section 4.2.2 Groundwater – Impacts and Mitigation Measures of the Draft EIS, construction activities associated with the proposed facility improvements are not likely to introduce, nor release from the soil, any materials which could adversely affect groundwater, including groundwater for domestic use. Dewatering of excavated areas where wastewater and transmission facilities will lie below the water table will require a NPDES Permit for Discharges Associated with Construction Activity Dewatering administered by the State DOH. This NPDES permit will include a BMP plan, erosion control and water quality monitoring plans, as may be required.

The proposed wastewater facility improvements will have beneficial long-term impacts on groundwater in the planning region. In addition to the proposed implementation of the nine (9) Sewer Improvement Districts which would reduce the potential of groundwater contamination, improvements to the collection system to reduce infiltration and inflow will also reduce exfiltration and any potential resulting infiltration on groundwater sources.



GEORGE J. CATTEANO  
GOVERNOR



KAZU HAYASHIDA  
DIRECTOR  
DEPUTY DIRECTORS  
BRAND K. IMAI  
GLENN H. OKAMOTO

Ms. Linnel T. Nishioka  
Page 6  
February 4, 2000

STATE OF HAWAII  
DEPARTMENT OF TRANSPORTATION  
869 PUNCHBOWL STREET  
HONOLULU, HAWAII 96813-5097

IN REPLY REFER TO:  
HWY-PS  
2.6346

NOV 24 1999

3. Your recommendation that no development take place affecting highly erodible slopes which drain into streams within or adjacent to the project is acknowledged. As discussed in Section 4.1.1 Geology and Topography - Impacts and Mitigation Measures of the Draft EIS, the relatively flat terrain of the affected project sites would minimize the amount of grading required during construction activities. The excavated areas will either be built over, paved over, or backfilled to its existing contours.

We appreciate your time and effort in reviewing the Draft EIS.

Very truly yours,

GARY Q.L. YEE, AIA  
Acting Director

**RECEIVED**  
NOV 26 1999  
WILSON OKAMOTO & ASSOC., INC.

Mr. Randall K. Fujiki, Director  
Department of Design and Construction  
City and County of Honolulu  
650 South King Street  
Honolulu, Hawaii 96813

Attention: Mr. Carl Arakaki

Dear Mr. Fujiki:

cc: ~Rodney Funakoshi, Wilson Okamoto & Associates, Inc.  
Ms. Genevieve Salmonson, State Office of Environmental Quality Control

Subject: Draft Environmental Impact Statement (EIS), Kailua-Kaneohe-Kahaluu  
Facilities Plan, Koolauoko, Oahu, TMK: 4-2 through 9

Thank you for requesting our review of the draft EIS for the Kailua-Kaneohe-Kahaluu Facilities Plan.


The proposed facilities improvements, renovations, and construction are not anticipated to have a significant impact on our State highway facilities. Work on facilities infrastructure within the State's highway right-of-way should be coordinated with the Highways Division as needed to avoid affecting or minimizing the effects on our transportation facilities.

Plans for construction work within our right-of-way must be submitted for our review and approval.

HWY-PS 2.6346

Mr. Randall K. Fujiki  
Page 2  
NOV 24 1999

If you have any questions regarding our comments, please contact Ronald Tsuzuki, Highways  
Division, Head Planning Engineer, at 587-1830.

Very truly yours,  
  
KAZU HAYASHIDA  
Director of Transportation

c: Dr. Kenneth E. Sprague, Department of Environmental Services  
Ms. Jan Naoe Sullivan, Department of Planning and Permitting  
Mr. Rodney Funakoshi, Wilson Okamoto & Associates, Inc.  
Office of Environmental Quality Control

DEPARTMENT OF DESIGN AND CONSTRUCTION  
CITY AND COUNTY OF HONOLULU

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JEREMY HARRIS  
MAYOR

GARY Q. L. YEE, AIA  
ACTING DIRECTOR  
ROLAND D. LIBBY, JR., AIA  
DEPUTY DIRECTOR

DCP 2000-075

January 31, 2000

Mr. Kazu Hayashida, Director  
State of Hawaii  
Department of Transportation  
869 Punchbowl Street  
Honolulu, Hawaii 96813-5097

Dear Mr. Hayashida:

Subject: Kailua-Kaneohe-Kahaluu Facilities Plan  
Draft Environmental Impact Statement (EIS)  
Koolaupeke, Oahu, Hawaii

Thank you for your letter of November 9, 1999 (Ref. HWY-PS 2.6346), indicating that the proposed facilities improvements, renovations and construction are not anticipated to have a significant impact on State highway facilities.

Work on the proposed facilities infrastructure within the State's highway right-of-ways will be coordinated with the Highways Division to avoid affecting or to minimize the effects on the State's transportation facilities. As the proposed improvements progress through the design phase and detailed plans are formulated, plans for construction work within the State's highway right-of-ways will be submitted to your Department for review and approval.

We appreciate your time and effort in reviewing the Draft EIS.

Very truly yours,

  
GARY Q. L. YEE, AIA  
Acting Director

cc: Rodney Funakoshi, Wilson Okamoto & Associates, Inc.  
Ms. Genevieve Salmonson, State Office of Environmental Quality Control



PHONE (808) 594-1888



STATE OF HAWAII  
OFFICE OF HAWAIIAN AFFAIRS  
711 KAPOLOANI BOULEVARD, SUITE 500  
HONOLULU, HAWAII 96813

December 20, 1999

Mr. Carl Arakaki  
Department of Design and Construction  
City and County of Honolulu  
650 South King Street  
Honolulu, Hawaii 96813

Aloha Mr. Arakaki

Mahalo for the opportunity to comment on the Draft EIS for the Kailua-Kāne'ohē-Kahalu'i Facilities Plan.

The Office of Hawaiian Affairs has no comment, at this time, on the proposed improvements within the existing Kailua Regional WWTP and Kāne'ohē and 'Āhūimanu WWTP as these areas have been developed and it is highly unlikely that historic sites will be found. As to the construction of the proposed wastewater facility improvements that will require excavation of the affected areas where below surface archaeological or historic sites may be uncovered, we are pleased that you intend to develop a plan with the State Historic Preservation Division to mitigate effects on those sites.

As to the construction of the MCBH Kāne'ohē Bay EQ facility, if pursued, the May 1999 amendments to the National Historic Preservation Act, of 1966 requires that the Office of Hawaiian Affairs be consulted when an undertaking is planned for on any federal property. The proposed MCBH Kāne'ohē Bay EQ facility is such a project. We trust that the Office of Hawaiian Affairs will be consulted early should this project become a reality.

Mahalo again for the opportunity to comment on the Draft EIS for this project. Should you have any concerns or questions, please contact Pūkake Pelekai, Policy Analyst, at 594-1954 or by facsimile at 594-1865.

Sincerely

Colin C. Kippen, Jr.  
Deputy Administrator

CCK:pp

c: BOT

FAX (808) 594-1865

DEC 25 1999  
DEC 25 1999

WILSON OKAMOTO & ASSOC. INC.

EIS #350

DEPARTMENT OF DESIGN AND CONSTRUCTION  
CITY AND COUNTY OF HONOLULU

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January 31, 2000

JEREMY HARRIS  
SAVON

GARY O.L. YEE, AIA  
ACTING DIRECTOR  
ROLAND D. LUBBY, JR., AIA  
DEPUTY DIRECTOR

DCP 2000-074

Mr. Colin C. Kippen, Jr., Deputy Administrator  
State of Hawaii  
Office of Hawaiian Affairs  
711 Kapiolani Boulevard, Suite 500  
Honolulu, Hawaii 96813

Dear Mr. Kippen:

Subject: Kailua-Kaneohe-Kahalu'u Facilities Plan  
Draft Environmental Impact Statement (EIS)  
Koolaupeko, Oahu, Hawaii

Thank you for your letter of December 20, 1999 (EIS #350), indicating that the Office of Hawaiian Affairs has no comment at this time on the proposed Facilities Plan improvements.

As specific development plans are prepared for proposed improvements that will require excavation of areas where subsurface archaeological or historic sites may be uncovered, the State Department of Land and Natural Resources Historic Preservation Division will be consulted for review to determine the project's effect on historic sites, if any.

We acknowledge that the May 1999 amendments to the National Historic Preservation Act of 1966, as amended, requires that the Office of Hawaiian Affairs be consulted when an undertaking on federal property is planned. If the MCBH Kaneohe Bay EQ facility alternative is pursued, please be assured that the Office of Hawaiian Affairs will be consulted early in the process.

We appreciate your time and effort in reviewing the Draft EIS.

Very truly yours,

FOR  
GARY O.L. YEE, AIA  
Acting Director

cc: Rodney Funakoshi, Wilson Okamoto & Associates, Inc.  
Ms. Genevieve Salmonson, State Office of Environmental Quality Control

JARD OF WATER SUPPLY  
11 AND COUNTY OF HONOLULU  
10 SOUTH BERETANA STREET  
HONOLULU, HAWAII 96843



December 6, 1999

JEFFREY W. HARRIS, Chief  
EDEE E. KERR, Jr., Chairman  
CHARLES A. STEVENS, Vice Chairman  
JAMES W. ALLEN  
MELVIN S. K. KIMURA, SP  
BARBARA KOSI, STATIONER  
KAZUYASUHIKO KAWANO  
ACHIE S. SICALALAN, E.O. Office  
CLIFFORD S. JAMBLE  
Manager and Chief Engineer

11:09 AM

MR. RANDALL K. FUJIKI, DIRECTOR  
DEPARTMENT OF DESIGN AND CONSTRUCTION

CARL ARAKAKI

*Clifford S. Jamble*  
CLIFFORD S. JAMBLE

TO:  
ATTN:  
FROM:  
SUBJECT:

YOUR TRANSMITTAL OF NOVEMBER 3, 1999 OF THE DRAFT  
ENVIRONMENTAL IMPACT STATEMENT FOR THE KAILUA-  
KANEHOE-KAHALU WASTEWATER FACILITIES PLAN,  
KOOLAUPOKO, OAHU, VICINITY OF TMS'S: 4-2 TO 4-9

Thank you for the opportunity to review and comment on the proposed Kailua, Kaneohe and Kahaluu wastewater systems to the proposed alternative of treatment and flow equalization improvements at the Kailua, Kaneohe and Ahuimanu wastewater treatment plants, sewer system reconstruction and sewer improvement districts. We have the following comments:

1. We support the expansion of the sewer system to areas of Kailua, Kaneohe and Kahaluu to reduce the occurrences of sewage spills, overflows and leakage from failing individual wastewater systems to the underlying groundwater aquifers, streams, estuaries, wetlands, fish ponds and coastal waters. The sewer system is presently proposed to extend to Kaimalolo Place at the north end of Kahaluu. The Environmental Impact Statement (EIS) should provide a discussion on the extension of the sewer system to the Waiahole, Waikane and Hibopua valleys. Our community outreach efforts indicate a strong community concern for the water quality of streams and near shore waters affecting native biology. Extending the sewer system to these ecologically sensitive areas, although more costly, will protect the environment.
2. The large capital investment for the preferred alternative of \$386 million necessitates the prioritization and 20-year phasing plan. Extending major capital investment over a longer period of time, if possible, will minimize increases in sewer rates.

Mr. Randall K. Fujiki  
December 6, 1999  
Page 2

3. We understand the Kailua community is concerned about future expansions of the Kailua Wastewater Treatment Plant (WWTP) in lieu of an emphasis on odor and noise abatement facilities. However, the EIS should consider and evaluate tertiary treatment to provide reclaimed water for the irrigation needs of the Kailua and Kaneohe communities and the Kaneohe Marine Base. The Board of Water Supply's Integrated Water Resources Planning will be evaluating nonpotable distribution infrastructure master plans around the Kailua WWTP. Tertiary treatment has minimal odor concerns and the reconstruction and rehabilitation of the sewer system will eventually reduce the chloride content of the wastewater.

4. The construction plans should be submitted for our review and approval to minimize any potential impact to our water system facilities.

If you have any questions, please contact Barry Usagawa at 527-5235.

cc: Kenneth Sprague, Department of Environmental Services  
Jan Naoe Sullivan, Department of Planning and Permitting  
Kōdōney Funakoshi, Wilson Okamoto & Associates, Inc.  
Office of Environmental Quality Control

DEPARTMENT OF DESIGN AND CONSTRUCTION  
**CITY AND COUNTY OF HONOLULU**

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JEREMY HARRIS  
MAYOR

GARY Q.L. YEE, AIA  
ACTING DIRECTOR  
ROLAND O. LIBBY, JR., AIA  
DEPUTY DIRECTOR

DCP 2000-103

February 4, 2000

MEMORANDUM

TO: MR. CLIFFORD S. JAMILE, MANAGER AND CHIEF ENGINEER  
BOARD OF WATER SUPPLY

FROM: GARY Q.L. YEE, AIA, ACTING DIRECTOR

DEPARTMENT OF DESIGN AND CONSTRUCTION

SUBJECT: KAILUA-KANEOHE-KAHALUU FACILITIES PLAN  
DRAFT ENVIRONMENTAL IMPACT STATEMENT (EIS)  
KOOLAUPOKO, OAHU, HAWAII

Thank you for your memorandum of December 6, 1999, indicating that your Department has no objections to the proposed Facilities Plan improvements. We offer the following in response to your comments:

1. We gratefully acknowledge your Department's support of the expansion of the municipal sewer system to areas of Kailua, Kaneohe and Kahaluu to reduce the occurrences of sewage spills, overflows and leakage from failing individual wastewater systems to the underlying groundwater aquifers, streams, estuaries, wetlands, fish ponds, and coastal waters. Relative to parcels within the Waiahole, Waikane and Hakipuu valleys, the municipal sewer system is generally not extended to areas with zoning designations of Agricultural, Preservation and Country. The connection of the municipal sewer system to such areas would not be cost-effective due to the typically larger parcel sizes, relatively remote locations, and generally low-density areas. Other considerations affecting cost-effectiveness include the proximity to the existing municipal sewer system, and the need to construct and maintain pump stations. Community concerns regarding the water quality of streams and nearshore waters are more appropriately addressed through the State Department of Health (DOH), which has promulgated wastewater system rules for meeting environmental and health standards.

Mr. Clifford S. Jamile  
Page 2  
February 4, 2000

2. We acknowledge that extending the major capital investment over a longer period than the 20-year phasing plan will minimize increases in sewer rates. Implementation of the regional Facilities Plan is programmed over a period of 20 years in accordance with the U.S. Environmental Protection Agency guidance on facilities planning. The annual programming of projects will be undertaken in consideration of islandwide priorities and available funding.

3. The potential of effluent reuse for irrigation purposes was explored in the Kailua-Kaneohe-Kahaluu Facilities Plan. The discussion is based on producing R-1 reclaimed water which, in addition to being in accordance with State Department of Health (DOH) standards, would provide the greatest flexibility for potential users of reclaimed water. A new subsection discussing the effluent reuse potential will be included in the Final EIS in Section 3.11.2 Wastewater System as follows:

**3.11.2.4 Effluent Reuse Potential**

Currently, an average of 13 mgd of secondary treated effluent from the Kailua Regional WTPP is discharged through the Makapu Outfall. This water could be used for many productive purposes including golf course and crop irrigation, landscaping and for various industrial and commercial uses. Reclaimed water is currently being used for irrigation at several sites including the BYU-Hawaii Campus, Kaneohe Klipper Golf Course at the Marine Corps Base Hawaii Kaneohe Bay, and at several parks, golf courses, and agricultural lots on Maui.

**Reclaimed Water Quality Standards and Treatment Facilities:** The State DOH has defined three standards of reclaimed water quality, R-1, R-2 and R-3. R-1 reclaimed water is disinfected to achieve a significant reduction in viral and bacterial pathogens; R-2 water is disinfected to achieve a fecal coliform limit of 4 cfu/100ml; and R-3 water is undisinfected secondary treated wastewater. R-1 water is approved for the most uses and would provide the greatest flexibility for potential users of reclaimed water.

To produce R-1 quality water, effluent from the Kailua Regional WTPP would have to undergo additional treatment including coagulation/flocculation, filtration and disinfection. Chemical coagulation/flocculation is a treatment process which is used to enhance particulate removal during the filtration process.

Wastewater effluent is typically disinfected by using chlorine. However, the DOH recommends alternative forms of disinfection since chlorine can have serious adverse effects on aquatic life and can also react with wastewater to form various chlorinated hydrocarbons. In addition, reverse osmosis demineralization can be used to remove trace organics and allow reclaimed water to recharge drinking water aquifers.

**Storage and Transmission Facilities:** Storage impoundments for reclaimed water must have liners which are impervious to water and be of sufficient capacity to retain reclaimed water under adverse wet-weather conditions based on a 50-year storm recurrence interval. In addition, runoff should be prevented from entering the impoundment unless the impoundment is of sufficient size to accept the runoff without discharge, or an NPDES permit has been issued for the discharge. A backup disposal system should also be provided to prevent overflows or discharges when the system is not in use or when the reclaimed water quantities exceed the system demand.

To reduce the likelihood of cross-connection between reclaimed water lines and potable water lines, the Board of Water Supply has set standards for horizontal and vertical clearances between potable water lines and reclaimed water lines. Reclaimed water lines must also be colored purple and be clearly labeled as such.

**Potential Users of Reclaimed Water:** An assessment of non-potable water demand was conducted for various water users on the Windward side of Oahu by CH2M Hill for the Board of Water Supply. A list of the water users identified in the study and other potential users of non-potable water is shown in Table 3-15.

The State DOH's current regulations do not allow the reuse of R-1 water above the State's Underground Injection Control (UIC) line. Potential users currently affected by this regulation include Pali Golf Course, Hawaii State Hospital, Hoomaluhia Botanical Garden, Valley of the Temples Memorial Park, Koolau Golf Course, Luana Hills Golf Course, and a few public parks and schools located in the Ahuimanu, Kaneohe and Maunawili areas.

The Board of Water Supply has established that the water requirement for turf grass irrigation is one-inch per week. Average water demand for the Olomana Golf Links, Mid-Pacific Country Club, Pali Golf Course, Hawaii Pacific University, Hawaii State Veterans Cemetery, and Hawaii State Hospital was determined in the Non-Potable Water Study by reviewing Board of Water Supply records. Average water demand for the remaining sites was assumed to be 0.15 inch irrigation/acre/week, with the remaining 0.85 inch of irrigation coming from rainfall.

The reclaimed water supply system should be designed for extreme cases in which weeks can pass with little or no rainfall. Peak water demand was calculated by

assuming that no rainfall would occur and that the full one-inch of irrigation per week would come from the water reclamation system.

**Table 3-15  
Windward Oahu Non-Potable Water Demand**

Site	Estimated Irrigated Acres	Average Water Demand	Peak Water Demand
Olomana Golf Links	129.9	97,800	503,871
Mid-Pacific Country Club	150	118,500	581,837
Pali Golf Course	150	103,400	581,837
Hawaii Pacific University-Hawaii Los Campus	20	6,200	71,578
Hawaii State Veterans Cemetery	72	27,400	279,282
Hawaii State Hospital	32	21,681	124,123
Hoomaluhia Botanical Garden	300	174,351	1,163,674
Hawaiian Memorial Cemetery	65	37,819	252,129
Bay View Golf Links	100	58,184	387,891
Public Parks	50	29,092	193,946
Schools	55	32,001	213,340
Valley of the Temples Memorial Park	95	55,275	368,496
Koolau Golf Course	130	75,639	504,257
Luana Hills Golf Course	130	75,639	504,257
<b>Total</b>	<b>1,398.9</b>	<b>868,840</b>	<b>5,426,209</b>

**Salinity of Kailua Regional Wastewater Treatment Plant Effluent:** Reclaimed water that will be used for irrigation must fall within acceptable salinity levels. This is especially true in areas which recharge groundwater aquifers since application of high chloride content water may eventually cause chlorides to leach into underlying groundwater bodies. Generally, the maximum chloride concentration for turf irrigation water is 600 parts per million.

Preliminary salinity measurements taken at the Kailua Regional WWTP indicate that the effluent currently exceeds acceptable levels. Wastewater samples were taken from four locations at the Kailua Regional WWTP including the Kailua-Kaneohe force main, Kailua gravity line, Clarifier No. 3 weir, and Clarifier No. 2 weir. The samples were analyzed for electrical conductivity (EC) and were converted to parts per million (ppm) total dissolved solids (TDS). Estimates of chloride (Cl) concentration were made using two different methods. The measures EC and estimated TDS ppm and Cl concentrations for each location are shown in Table 3-16. The measurements from Clarifier No. 2 weir should be considered anomalous as it does not correlate to the other readings.

Mr. Clifford S. Jamile  
 Page 5  
 February 4, 2000

Table 3-16  
 Measured EC and Estimated TDS and Cl

Location	Measured EC		Est. TDS <sup>1</sup>		Est. Cl <sup>2</sup>	
	micromhos/c	m	ppm	ppm	ppm	ppm
Kailua-Kaneohe Force	4,700		3,525	1,914	2,187	
Kailua Gravity Sewer	7,100		5,325	2,891	3,303	
Clarifier 3 Weir	6,400		4,800	2,606	2,978	
Clarifier 2 Weir	1,000		750	407	465	

<sup>1</sup> Uses a 0.75 multiplier. Est. TDS = EC\*0.75  
<sup>2</sup> Applies principles of physical chemistry  
<sup>3</sup> Assumes linearity and applies a factor to the TDS estimates based on TDS and Cl of seawater

*The current high chloride concentrations are most likely caused by the infiltration of seawater into sewer lines. As a result, following the substantial rehabilitation of sewer lines in the Kailua-Kaneohe-Kahaluu area, salinity levels may fall within acceptable levels (below 600 ppm). A program for periodically monitoring influent salinity levels should be undertaken by the City and County of Honolulu to determine the feasibility of planning and eventually developing reuse facilities for the region.*

*We support the Board of Water Supply's Integrated Water Resources Planning and evaluation of non-potable distribution infrastructure master plans around the Kailua Regional WWTTP.*

4. As the proposed improvements progress through the design phase, construction plans will be submitted to your Department for review and approval to minimize any potential impact to your water system facilities.

We appreciate your time and effort in reviewing the Draft EIS.

cc: Rodney Funakoshi, Wilson Okamoto & Associates, Inc.  
 Ms. Genevieve Salmonson, State Office of Environmental Quality Control

DEPARTMENT OF DESIGN AND CONSTRUCTION  
CITY AND COUNTY OF HONOLULU

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JEREMY HARRIS  
MAYOR

MH 1999-0809

December 1, 1999

GARY Q.L. YEE, AIA  
ACTING DIRECTOR  
ROLAND D. LEBBY, JR., AIA  
DEPUTY DIRECTOR

DCP 2000-104

February 4, 2000

MEMORANDUM

TO: MR. RANDALL K. FUJIKI, ACTING DIRECTOR  
DEPARTMENT OF PLANNING AND PERMITTING

FROM: GARY Q.L. YEE, AIA, ACTING DIRECTOR  
DEPARTMENT OF DESIGN AND CONSTRUCTION

SUBJECT: KAILUA-KANEHOHE-KAHALUU FACILITIES PLAN  
DRAFT ENVIRONMENTAL IMPACT STATEMENT (EIS)  
KOOLAUPOKO, OAHU, HAWAII

TO: STEVE TAGAWA, PLANNER  
LAND USE PERMITS DIVISION

VIA: RANDY HARA, CHIEF  
POLICY PLANNING BRANCH

GARY OKINO, CHIEF  
LONG RANGE PLANNING DIVISION

FROM: MATT HIGASHIDA, PLANNER  
POLICY PLANNING BRANCH

SUBJECT: DRAFT ENVIRONMENTAL IMPACT STATEMENT (EIS) FOR THE  
KAILUA-KANEHOHE-KAHALUU FACILITIES PLAN, KOOLAUPOKO,  
OAHU, HAWAII

In response to your request for comments on November 17, 1999, we have reviewed the subject DEIS and have the following comment to offer:

Bill 72 (1999), CD2, FD1, relating to adoption of Public Infrastructure Maps for the new Development Plans, passed Third Reading on November 10, 1999. Since this bill will eventually become an ordinance, the Final EIS should identify projects which meet the applicable criteria that shall be shown on the Public Infrastructure Map for Koolaupoko.

Should you have any questions, please contact Matthew Higashida at extension 6056.

Thank you for your memorandum of December 1, 1999 (Ref: MH 1999-0809), regarding the subject Draft EIS.

The following discussion will be added as a new subsection to Section 5.6.3 Koolaupoko Sustainable Communities Plan of the Final EIS:

5.6.3.1 Public Infrastructure Map

A new ordinance (Ordinance No. 99-69) provides for the adoption of Public Infrastructure Maps reflecting major public infrastructure projects for each of the revised DPs that are adopted in accordance with the 1992 Charter amendments. For wastewater-related facilities, sewage treatment plants and sewage pump stations are identified as public improvement projects that shall be shown on the public infrastructure maps, provided they meet any one or more of the following applicability criteria:

1. It has a significant impact on surrounding land uses or the natural environment;
2. It establishes a new facility;
3. It substantially changes the function of an existing facility;





Di 99-10 ft

DEPARTMENT OF ENVIRONMENTAL SERVICES  
CITY AND COUNTY OF HONOLULU  
DIVISION OF ENVIRONMENTAL QUALITY  
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NOV 24 P3:17



EDMUND L. SPALDING, P.L.P.  
Mayor  
SILVESTRE L. ULEP  
City Engineer  
ENV 99-124

DESIGN & CONSTRUCTION  
DIVISION OF  
PLANNING & PROGRAMMING

NOV 24 1999

MEMORANDUM

TO: STEPHEN T.C. CHING, CHIEF  
DIVISION OF PLANNING AND PROGRAMMING, DDC

FROM: *[Signature]*  
SILVESTRE L. ULEP, CHIEF  
DIVISION OF ENVIRONMENTAL QUALITY, ENV

SUBJECT: DRAFT ENVIRONMENTAL IMPACT STATEMENT (DEIS)  
KAILUA-KAHOHOE-KAHALUU FACILITY PLAN  
TMK: VARIOUS

We have reviewed the subject DEIS and have the following comments:

1. During the Draft Environmental Assessment review period, we had provided comments which we assume to be incorporated in this DEIS.
2. Page 2-6 Odor Control Improvements: Please revise the phrase "reduce the presence of all sources of noxious air emission" to "reduce the emission of air pollutants." On other pages, please take out the word "noxious" and replace with "emission of air pollutants."
3. Page 2-6 Noise Control Improvements: We feel that 10-foot high noise barrier wall may not resolve the noise problems since noise can be diverted into other direction. We prefer to enclose the source of noise.
4. Page 2-7 Odor Control System Modification (Kaneohe Preliminary Treatment Facility): Please provide the objective of initiating a preliminary engineering report.
5. Page 2-10 Odor Control System Modification (Ahuimanu Preliminary Treatment Facility): Please provide the objective of initiating a preliminary engineering report.
6. Page 4-38 Chemical Addition:
  - a) Third paragraph, fourth line: The statement of "Reduction in odor producing compounds...the efficiency of the chemical used for odor control will be improved" is not correct since the addition of ferric chlorinide does not improve the efficiency removal of the chemical currently used in the Calvert odor control unit.
  - b) Third paragraph, eighth line: The sentence of "In the past, because entry level sulfurous compounds...although no quantitative data is available," should be deleted since the statement is incorrect.

Should you have any questions, please contact Alex Ho at extension 4150.

Mr. Randall K. Fujiki -2- February 4, 2000

4. It involves modification (replacement or renovation) of an existing facility which would permit significant new development or redevelopment; or
5. It costs over \$3,000,000.00 for capital improvements.

Based on the Facilities Plan, the following proposed projects represent a preliminary list which meets the applicable criteria and could be shown on the Public Infrastructure Map for Koolauapoko, subject to verification at the time of their inclusion. A description of the proposed project improvements and associated costs are included in Section 2. Project Description.

- Kailua Regional WWTP - modifications within existing plant facilities, and odor and noise control improvements
- Kaneohe WWPTF - flow equalization basin, odor control system modifications, and Kahohe-Kailua force main replacement
- Ahuimanu WWPTF - new preliminary treatment system, flow equalization basin, odor control system modifications, and Ahuimanu effluent force main replacement
- Kailua Heights WWPS modification/rehabilitation
- Kailua Road WWPS modification/rehabilitation/force main replacement
- Kahala Sewers Section 5 Improvement District WWPS
- Kamehameha Highway Sewers Improvement District WWPS - construct a new pump station to service 37 lots along Kamehameha Highway.

Inclusion of these proposed projects on the Public Infrastructure Map for Koolauapoko will be conducted in accordance with the procedures set forth in the Ordinance No. 99-69.

We appreciate your time and effort in reviewing the Draft EIS.

cc: Rodney Funakoshi, Wilson Okamoto & Associates, Inc.  
Ms. Genevieve Salmonson, State Office of Environmental Quality Control

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FREEMAN HARRIS  
MAYOR

GARY Q.L. YEE, AIA  
ACTING DIRECTOR  
ROLAND D. LIBBY, JR., AIA  
DEPUTY DIRECTOR

DCP 2000-107

February 4, 2000

MEMORANDUM

TO: DR. KENNETH E. SPRAGUE, DIRECTOR  
DEPARTMENT OF ENVIRONMENTAL SERVICES

FROM: FOR: GARY Q.L. YEE, AIA, ACTING DIRECTOR  
DEPARTMENT OF DESIGN AND CONSTRUCTION

SUBJECT: KAILUA-KA NEOHE-KA HALUO FACILITIES PLAN  
DRAFT ENVIRONMENTAL IMPACT STATEMENT (EIS)  
KOOLAUPOKO, OAHU, HAWAII

Thank you for your memorandum of November 24, 1999 (Ref. ENV 99-124), regarding the subject Draft EIS. We offer the following in response to your comments:

1. Comments from the Division of Environmental Quality were received on the preliminary Draft EIS and incorporated in the Draft EIS, as deemed appropriate.
2. Page 2-6 Odor Control Improvements:  
In response to your comment, the first sentence will be revised in the Final EIS as follows: "The City is undertaking short-, intermediate- and long-term odor mitigation measures to reduce the presence of all sources of noxious air emissions *emission of air pollutants*."  
Where referenced throughout the document, the word "noxious" will be replaced with "emission of air pollutants", as deemed appropriate, in the Final EIS.

Dr. Kenneth E. Sprague

-2-

February 4, 2000

3. Page 2-6 Noise Control Improvements:

To minimize the reflection of sound energy in other directions, the recommended noise barrier wall construction includes 2-inch thick, 3-pound per cubic foot fiberglass insulation on the sides of the noise barrier walls facing the fans. This sound absorbing material should be adequate to reduce the sound reflected from the walls. However, there are other ways to reduce the noise emanating from these fans - one of which is the construction of noise enclosures as suggested in your memorandum.

Noise enclosures for the Headworks Odor Control Fans will need to be improved so as to allow adequate cooling for the fans and associated motors. Separate ventilation fans may be required for the enclosures with ducted inlets and outlets.

With respect to the Primary Odor Control Fans, a bank of silencers will need to be added to the existing enclosure for the fan outlets. This bank of silencers may introduce additional static pressure for the fans, which might necessitate increasing the horsepower of the fan motors.

While noise enclosures can be designed to adequately reduce the fan noise propagating to the surrounding communities, the noise barrier walls will provide a more economical solution to this problem.

4. Page 2-7 Odor Control System Modifications (Kaneohe Preliminary Treatment Facility):

The text in the Final EIS will be revised as follows to reflect the objective of initiating a preliminary engineering report:

"Odor Control System Modifications: An analysis will be performed in the preliminary engineering phase defining the approach to review options or approaches in defining odor control improvements to determine if the existing odor control system can be expanded or modified for the new equalization basin, or if a new system is needed."

5. Page 2-10 Odor Control System Modifications (Ahuimanu Preliminary Treatment Facility):

The text in the Final EIS will be revised as follows to reflect the objective of initiating a preliminary engineering report:

"Odor Control System Modifications: An analysis will be performed in the preliminary engineering design phase defining the approach to review options or approaches in defining odor control improvements to determine if the existing odor control system will be adequate for the new equalization basin, or if a new system is needed."

Dr. Kenneth E. Sprague

-3-

February 4, 2000

6. Page 4-38 Chemical Addition:

- a) The third paragraph will be revised as follows in the Final EIS:
- "The odor problem associated with the sludge entering the centrifuges will be reduced indirectly by the introduction of ferric chloride at the headworks which, if continued, should result in a reduction of hydrogen sulfide in the entire process. Reduction in odor producing compounds will improve the efficiency of the Calvert mist tower used to treat odor produced by the sludge dewatering process. *be enhanced in two ways: first, by the chemical action of ferric chloride removal of odor compounds, and secondly, by the addition of a carbon tower in the odor treatment train ahead of the Calvert mist tower. Although air emission violations have occurred in the past at the Calvert discharge point, newly implemented actions are designed to bring the unit into compliance on a continuous basis. The tower has recently (1998-99) been the site of air emission violations. By reducing the level of odor compounds entering the carbon tower, the efficiency of the chemical used for odor control will be improved; the overall life of the carbon will be prolonged. In the past, because entry level sulfurous compounds have been excessively high, inordinate amounts of chemical for neutralizing the noxious gases have caused mists to be expelled from the top of the tower to possibly be in violation of the air quality permit, although no quantitative data is available. Reduction of the levels of compounds "in" will reduce the level of the compounds "out".*"
- b) As indicated in response no. 6. a) above, the 8<sup>th</sup> line in the third paragraph of the Draft EIS will be deleted in the Final EIS as follows: "In the past, because entry level sulfurous compounds have been excessively high, inordinate amounts of chemical for neutralizing the noxious gases have caused mists to be expelled from the top of the tower to possibly be in violation of the air quality permit, although no quantitative data is available."

We appreciate your time and effort in reviewing the Draft EIS.

cc: Rodney Funakoshi, Wilson Okamoto & Associates, Inc.  
Ms. Genevieve Salmonson, State Office of Environmental Quality Control

DEPARTMENT OF TRANSPORTATION SERVICES  
**CITY AND COUNTY OF HONOLULU**  
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1999

CHERYL D. SOON  
DIRECTOR

DEC 27 1999

JOSEPH M. MAGALDI, JR.  
SCOTT DIRECTOR

WILSON OKAMOTO & ASSOC., INC.

December 22, 1999

TPD11/99-05536R

MEMORANDUM

TO: RANDALL K. FUJIKI, DIRECTOR  
DEPARTMENT OF DESIGN AND CONSTRUCTION

ATTN: CARL ARAKAKI

FROM: CHERYL D. SOON, DIRECTOR

SUBJECT: KAILUA-KANEOHE-KAHALUUI FACILITIES PLAN

In response to your November 3, 1999 memorandum, the draft environmental impact statement for the subject project was reviewed. The following comments are the result of this review:

1. The contractor should work with affected businesses to address construction phase traffic-related concerns (e.g., parking and access to businesses). This would be especially critical if the construction work is anticipated to be of long duration.
2. Safe pedestrian access adjacent to the work site/area should be provided whenever and wherever feasible. Equipment and/or material (e.g., dirt, culverts, etc.) should not be stored on the sidewalk area.
3. Whenever a main route/road is available as an alternate route to the project site, construction vehicles should be required to use the main route rather than area local streets. This would minimize the project's impact on area residents.
4. The contractor should designate a phone number that is to be used to report project traffic concerns. This phone number should be listed on roadway signs posted on the approaches to the work area(s) informing the public of the work being done.

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JEREMY HARRIS  
LIVON

GARY D. L. YEE, AIA  
ACTING DIRECTOR  
ROLAND D. URSBY, JR., AIA  
DEPUTY DIRECTOR

DCP 2000-105

February 4, 2000

MEMORANDUM

TO: MS. CHERYL D. SOON, DIRECTOR  
DEPARTMENT OF TRANSPORTATION SERVICES

FROM: FOR SAK Q.L. YEE, AIA, ACTING DIRECTOR  
DEPARTMENT OF DESIGN AND CONSTRUCTION

SUBJECT: KAILUA-KANEHOHE-KAHALUU FACILITIES PLAN  
DRAFT ENVIRONMENTAL IMPACT STATEMENT (EIS)  
KOO LAUPOKO, OAHU, HAWAII

Thank you for your memorandum of December 22, 1999 (TPD 1199-05536R), regarding the subject Draft EIS. We offer the following in response to your comments:

1. Section 4.7 Traffic - Impacts and Mitigation Measures of the Final EIS will include the following additional mitigation measure under the second bulleted item:

*Work with affected businesses to address construction phase traffic-related concerns (e.g., parking and access to businesses).*

2. During construction of the proposed wastewater facility improvements, the construction contractor(s) will be required to provide safe pedestrian access adjacent to the respective work site/area whenever and wherever feasible. As indicated in Section 4.7 Traffic - Impacts and Mitigation Measures of the Draft EIS, construction contractors will be required to mitigate potential vehicular and pedestrian traffic impacts through appropriate traffic control measures and safety devices. This includes providing for barriers, cones, signage, lighting, non-skid covering over trenches, adequate and safe sidewalk widths, adequate intersection visibility, and other provisions to promote safe passage of vehicles and pedestrians through the construction zone.

Randall K. Fujiki  
December 23, 1999  
Page 2

5. The first paragraph on Page 9-2 states that flaggers or off-duty police officers will be used to "direct" traffic. It should be noted that only police officers can control/direct traffic at intersections. Flaggers can only use hand-signaling devices (STOP/SLOW signs or flags) to control traffic through temporary traffic control zones.

Should you have any questions regarding these comments, please contact Faith Miyamoto of the Transportation Planning Division at Local 6976.

CHERYL D. SOON

cc: Dr. Kenneth E. Sprague  
Department of Environmental Services  
Ms. Jan Naoo Sullivan  
Department of Planning and Permitting  
Mr. Rodney Funakoshi  
Wilson Okamoto & Associates, Inc.  
Office of Environmental Quality Control

DEPARTMENT OF PARKS AND RECREATION  
CITY AND COUNTY OF HONOLULU

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PHONE: (808) 522-1182 • FAX: 522-2024



JORDY HARRIS  
DIRECTOR

WILLIAM D. BALFOUR, JR.  
DIRECTOR

MICHAEL T. AME  
DEPUTY DIRECTOR

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DEC 16 1999

December 9, 1999

TO: RANDALL K. FUJIKI, DIRECTOR  
DEPARTMENT OF DESIGN AND CONSTRUCTION

WILSON OKAMOTO & ASSOC., INC

ATTENTION: CARL ARAKAKI

FROM: WILLIAM D. BALFOUR, JR., DIRECTOR

SUBJECT: KAILUA-KANEOHE-KAHALUU FACILITIES PLAN  
DRAFT ENVIRONMENTAL IMPACT STATEMENT (EIS)  
TAX MAP KEYS: VARIOUS TMS IN 4-2, 4-3, 4-4, 4-5,  
4-6, 4-7, 4-8, and 4-9, KOOLAUPOKO, OAHU, HAWAII

We have reviewed the above-referenced document and do not anticipate any long-term adverse impact upon our recreation programs and facilities.

Thank you for the opportunity to review the draft environmental impact statement. Should you need further information, please contact Mr. John Eveland, Executive Assistant, at 527-6038.

W. D. Balfour, Jr.

WILLIAM D. BALFOUR, JR.  
Director

WDB:cu  
(11/22/99)

cc: Mr. Kenneth E. Sprague, Dept. of Environmental Services  
Ms. Jan Naoe Sullivan, Dept. of Planning and Permitting  
Mr. Rodney Funakoshi, Wilson Okamoto & Associates, Inc.  
Office of Environmental Quality Control

Ms. Cheryl D. Soon

-2-

February 4, 2000

The construction contractor(s) will also be required to store equipment and/or material (e.g., dirt, culverts, etc.) away from the sidewalk area.

3. Section 4.7 Traffic-Impacts and Mitigation Measures of the Final EIS will include the following additional mitigation measure under the sixth bulleted item:

To the extent possible, require construction vehicles to use available main routes/roads as alternate routes to the project site rather than local streets, to minimize the project's impact on area residents.

4. The construction contractor(s) will be required to designate a phone number to be used to report project-related traffic concerns. The phone number would potentially be listed on roadway signs posted on the approaches to the respective work area(s) informing the public of the work being done.

5. We appreciate your clarification regarding the distinction of duties between flaggers and police officers. The last sentence of the first paragraph under Section 9.1 Short-Term Effects - Traffic will be revised in the Final EIS as follows:

Flaggers and/or off-duty police officers will be used, as may be needed, during significant phases of construction to control traffic and pedestrian flow.

We appreciate your time and effort in reviewing the Draft EIS.

cc: Rodney Funakoshi, Wilson Okamoto & Associates, Inc.  
Ms. Genevieve Salmonson, State Office of Environmental Quality Control

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CITY AND COUNTY OF HONOLULU

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JEREMY HARRIS  
MAYOR

GARY Q.L. YEE, AIA  
ACTING DIRECTOR  
ROLAND D. LEBBY, JR., AIA  
DEPUTY DIRECTOR

DCP 2000-077

January 31, 2000

MEMORANDUM

TO: MR. WILLIAM D. BALFOUR, JR., DIRECTOR  
DEPARTMENT OF PARKS AND RECREATION

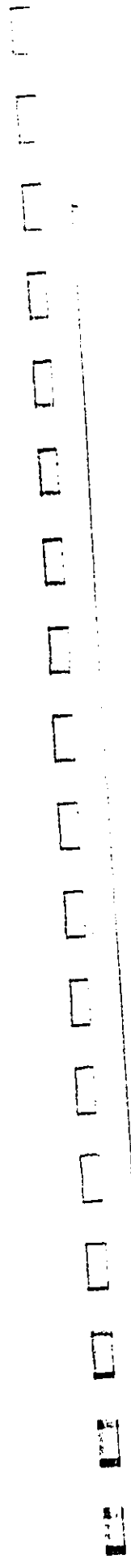
FROM: FOR GARY Q.L. YEE, AIA, ACTING DIRECTOR  
DEPARTMENT OF DESIGN AND CONSTRUCTION

SUBJECT: KAILUA-KANEHOHE-KAHALUU FACILITIES PLAN  
DRAFT ENVIRONMENTAL IMPACT STATEMENT (EIS)  
KOOLAUPOKO, OAHU, HAWAII

Thank you for your memorandum of December 9, 1999, indicating that you do not anticipate any long-term adverse impact upon your Department's recreation programs and facilities.

We appreciate your time and effort in reviewing the Draft EIS.

cc: Rodney Funakoshi, Wilson Okamoto & Associates, Inc.  
Ms. Genevieve Salmonson, State Office of Environmental Quality Control



DEPARTMENT OF DESIGN AND CONSTRUCTION  
**CITY AND COUNTY OF HONOLULU**  
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 DEPARTMENT OF  
 FACILITY MAINTENANCE  
 Nov 4 10 02 AM '99  
 RANDALL K. FUJIKI, AIA  
 DIRECTOR  
 RONALD G. LUBBY, JR., AIA  
 DEPUTY DIRECTOR

DCP 99-796

November 3, 1999

MEMORANDUM

TO: MR. ROSS SASAMURA, DIRECTOR  
 DEPARTMENT OF FACILITY MAINTENANCE

FROM: RANDALL K. FUJIKI, DIRECTOR  
 DEPARTMENT OF DESIGN AND CONSTRUCTION

SUBJECT: KAILUA-KAHOEHE-KAHALUU FACILITIES PLAN  
 DRAFT ENVIRONMENTAL IMPACT STATEMENT (EIS)  
 TAX MAP KEYS: VARIOUS TMKS IN 4-2, 4-3, 4-4, 4-5, 4-6, 4-7, 4-8, and 4-9  
 KOOLAPOKO, OAHU, HAWAII

Enclosed for your review is a copy of the Draft EIS for the Kailua-Kaneohe-Kahaluu Facilities Plan prepared pursuant to Chapter 343, Hawaii Revised Statutes, and Chapter 200 of Title 11, Department of Health Administrative Rules. As part of the review process, we are soliciting any comments you may have on the proposed project. Please send the original comments to:

Department of Design and Construction  
 City and County of Honolulu  
 650 South King Street  
 Honolulu, Hawaii 96813  
 ATTENTION: Mr. Carl Arakaki

Please send copies of the comments to the following:

Department of Environmental Services  
 City and County of Honolulu  
 650 South King Street  
 Honolulu, Hawaii 96813  
 ATTENTION: Dr. Kenneth E. Sprague

Department of Planning and Permitting  
 City and County of Honolulu  
 650 South King Street  
 Honolulu, Hawaii 96813  
 ATTENTION: Ms. Jan Naoe Sullivan

Wilson Okamoto & Associates, Inc.  
 1907 South Beretania Street, Suite 400  
 Honolulu, Hawaii 96826  
 ATTENTION: Mr. Rodney Funakoshi

Office of Environmental Quality Control  
 State of Hawaii  
 235 South Beretania Street, Room 702  
 Honolulu, Hawaii 96813

**RECEIVED**  
 NOV 12 1999  
 WILSON OKAMOTO & ASSOC, INC.

A notice of availability will be published in the November 8, 1999 edition of The Environmental Notice. In order to be included in the forthcoming Final EIS, your comments must be received or postmarked by December 23, 1999.

We appreciate your participation in the environmental review process.

Enclosure

cc: Mr. Rodney Funakoshi,  
 Wilson Okamoto & Associates, Inc.

November 8, 1999  
 We do not have any comments. If you have any questions, please call Laverne Higa at 527-6246.

*R. A. Laverne*  
 ROSS S. SASAMURA  
 Director and Chief Engineer  
 Department of Facility Maintenance

DEPARTMENT OF DESIGN AND CONSTRUCTION  
CITY AND COUNTY OF HONOLULU

650 SOUTH KING STREET, 2ND FLOOR  
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PHONE: (808) 523-4364 • FAX: (808) 523-4367  
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JEREMY HARRIS  
MAYOR

GARY Q.L. YEE, AIA  
ACTING DIRECTOR  
ROLAND D. LEBBY, JR., AIA  
DEPUTY DIRECTOR

DCP 2000-076

January 31, 2000

MEMORANDUM

TO: MR. ROSS SASAMURA, DIRECTOR  
DEPARTMENT OF FACILITY MAINTENANCE

FROM: *Gary Q.L. Yee, AIA*  
FOR GARY Q.L. YEE, AIA, ACTING DIRECTOR  
DEPARTMENT OF DESIGN AND CONSTRUCTION

SUBJECT: KAILUA-KANEHOHE-KAHALUU FACILITIES PLAN  
DRAFT ENVIRONMENTAL IMPACT STATEMENT (EIS)  
KOOLAUPOKO, OAHU, HAWAII

This is to acknowledge your memorandum of November 8, 1999, indicating that you have no comments on the subject Draft EIS.

We appreciate your time and effort in reviewing the Draft EIS.

cc: Rodney Funakoshi, Wilson Okamoto & Associates, Inc.  
Ms. Genevieve Salmonson, State Office of Environmental Quality Control

POLICE DEPARTMENT  
CITY AND COUNTY OF HONOLULU  
DEC 21 1999

801 SOUTH BERETANIA STREET  
HONOLULU, HAWAII 96813 - AREA CODE (808) 529-3111  
<http://www.honolulu.hi.us>

WILSON OKAMOTO & ASSOC., INC.



JEREMY HARRIS  
MAYOR

LEE D. DONOHUE  
CHIEF

MICHAEL CARVALHO  
DEPUTY CHIEFS

OUR REFERENCE CS-DL

December 17, 1999

TO: CARL ARAKAKI  
DEPARTMENT OF DESIGN AND CONSTRUCTION

FROM: LEE D. DONOHUE, CHIEF OF POLICE  
HONOLULU POLICE DEPARTMENT

SUBJECT: KAILUA-KANEHOHE-KAHALUU FACILITIES PLAN  
DRAFT ENVIRONMENTAL IMPACT STATEMENT (EIS)  
TAX MAP KEYS: VARIOUS TRKS IN 4-2, 4-3, 4-4, 4-5, 4-6, 4-7, 4-8,  
AND 4-9  
KOOLAUPOKO, OAHU, HAWAII

Thank you for the opportunity to review and comment on the subject document.  
In spite of mitigation measures, construction noise, dust and traffic problems are inevitable and will cause an impact on calls for police service to the area. We do not anticipate any significant problems after the project is completed.

If there are any questions, please call me at 529-3255 or Lieutenant John Thompson of District 4 at 247-2166.

LEE D. DONOHUE  
Chief of Police

*Eugene Uehura*  
BY  
EUGENE UEHURA  
Assistant Chief  
Support Services Bureau

cc: Dr. Kenneth F. Sprague  
Dept. of Environmental Services  
Ms. Jan Naoe Sullivan  
Dept. of Planning and Permitting  
Mr. Rodney Funakoshi  
Wilson Okamoto & Associates, Inc.  
Off. of Environmental Quality Control



FIRE DEPARTMENT  
CITY AND COUNTY OF HONOLULU  
3378 KOAPAKA STREET, SUITE 4122  
HONOLULU, HAWAII 96819-1889



ATTILIO K. LEONARDI  
FIRE CHIEF  
JOHN CLARE  
DEPUTY FIRE CHIEF

RECEIVED  
NOV 29 1999

November 24, 1999

TO: CARL ARAKAKI  
DEPARTMENT OF DESIGN AND CONSTRUCTION WILSON OKAMOTO & ASSOC., INC.

FROM: ATTILIO K. LEONARDI, FIRE CHIEF

SUBJECT: KAILUA-KANEOHE-KAHALUU FACILITIES PLAN  
DRAFT ENVIRONMENTAL IMPACT STATEMENT (EIS)  
TAX MAP KEYS: VARIOUS TMS IN 4-2, 4-3, 4-4, 4-5, 4-6, 4-7, 4-8, AND 4-9  
KOOLAUPOKO, OAHU, HAWAII

We received the memorandum from Randall Fujiki dated November 3, 1999, regarding the Kailua-Kaneohe-Kahaluu Facilities Plan.

The Honolulu Fire Department requests compliance with the following:

1. Maintain fire apparatus access throughout the construction site for the duration of the project.
2. Notify the Fire Communication Center (523-4411) of any interruption in the existing fire hydrant system during the project.

Should you have any questions, please call Acting Battalion Chief Lloyd Rogers of our Fire Prevention Bureau at 831-7778.

*Attilio K. Leonard*  
ATTILIO K. LEONARDI  
Fire Chief

AKL/LR:j

cc: Kenneth E. Sprague, Department of Environmental Services  
Jan Naoo Sullivan, Department of Planning and Permitting  
Rodney Funakoshi, Wilson Okamoto & Associates, Inc.  
Office of Environmental Quality Control, State of Hawaii

DEPARTMENT OF DESIGN AND CONSTRUCTION  
CITY AND COUNTY OF HONOLULU  
650 SOUTH KING STREET, 2ND FLOOR  
HONOLULU, HAWAII 96813  
PHONE: (808) 525-5200 • FAX: (808) 523-4587  
WEB SITE ADDRESS: WWW.DDC.HONOLULU.HI



GARY Q.L. YEE, AIA  
ACTING DIRECTOR  
ROLAND O. LIBBY, JR., AIA  
DEPUTY DIRECTOR

DCP 2000-078

January 31, 2000

MEMORANDUM

TO: MR. LEE D. DONOHUE, CHIEF OF POLICE  
HONOLULU POLICE DEPARTMENT

FROM: FOR GARY Q.L. YEE, AIA, ACTING DIRECTOR  
DEPARTMENT OF DESIGN AND CONSTRUCTION

SUBJECT: KAILUA-KANEOHE-KAHALUU FACILITIES PLAN  
DRAFT ENVIRONMENTAL IMPACT STATEMENT (EIS)  
KOOLAUPOKO, OAHU, HAWAII

Thank you for your memorandum of December 17, 1999 (Reference CS-DL), regarding the subject Draft EIS.

We acknowledge your concern that construction noise, dust and traffic problems are inevitable and will cause an impact on calls for police service to the area. As indicated in Section 4.5.1 Short-Term Construction Impacts (Air Quality) and Section 4.6.1 Short-Term Construction Impacts (Noise) of the Draft EIS, construction noise and dust emissions are regulated by State of Hawaii Department of Health (DOH) rules, regulations and permit requirements. The construction contractor(s) for the respective projects will be required to comply with such State regulations and permits to mitigate the impacts of construction noise and dust to the extent possible.

As indicated in Section 4.7 Traffic - Impacts and Mitigation Measures in the Draft EIS, the construction contractor(s) for the proposed projects will be required to mitigate potential vehicular and pedestrian traffic impacts through appropriate traffic control measures and safety devices. Such measures include the provision of flaggers and/or police officers, as may be needed, to control traffic and pedestrian flow.

We appreciate your time and effort in reviewing the Draft EIS.

cc: Rodney Funakoshi, Wilson Okamoto & Associates, Inc.  
Ms. Genevieve Salmonson, State Office of Environmental Quality Control



HOUSE OF REPRESENTATIVES  
STATE OF HAWAII  
STATE CAPITOL  
HONOLULU, HAWAII 96813

RECEIVED  
NOV 30 1999

November 24, 1999

Carl Arakaki  
Department of Design and Construction  
City and County of Honolulu  
650 South King Street  
Honolulu, Hawaii 96813

WILSON OKAMOTO & ASSOC., INC.

Re: Comments to: Kailua-Kaneohe-Kahaluu Facilities Plan  
Draft Environmental Impact Statement (EIS)  
Tax Map Keys: Various TMKs in 4-2, 4-3, 4-4, 4-5, 4-6, 4-7, 4-8,  
and 4-9  
Koolaupoko, Oahu, Hawaii

Dear Mr. Arakaki:

I vehemently oppose the conclusions and recommendations of the draft Environmental Impact Statement (EIS) for the Kailua-Kaneohe-Kahaluu Facilities Plan because the report fails to seriously consider the relocation of the Kailua Regional WWTP to Kapaa and ignores the odor and noise concerns of the immediate community.

The City and County of Honolulu's proposed plan to modify rather than relocate the Kailua Regional WWTP facilities is shortsighted, irresponsible, and likely to result in continued unhealthful odor and noise problems for the surrounding residents and public elementary school.

The EIS is completely defective because it fails to come up with legitimate cost estimates, and specific details for the relocation of the facilities. Modification is nothing more than a "band-aid" approach and will not eradicate the true problem with the existing Kailua facilities—excessive noise and sickening odors.

The relocation of the Kailua Regional WWTP has been disregarded as a viable alternative to improvement of the existing facilities because of "the significantly high capital costs and the uncertainty of obtaining regulatory approvals to develop the facility." These contentions are specious, disingenuous, and completely without merit. For example, the EIS criticizes relocation as an alternative because it would result in an adverse economic impact on municipal wastewater system ratepayers as the cost would

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GARY O. L. YEE, AIA  
ACTING DIRECTOR  
ROLAND D. LIBBY, JR., AIA  
DEPUTY DIRECTOR

DCP 2000-106

February 4, 2000

MEMORANDUM

TO: MR. ATTILIO K. LEONARDI, FIRE CHIEF  
HONOLULU FIRE DEPARTMENT

FROM: FOR CAROL L. YEE, AIA, ACTING DIRECTOR  
DEPARTMENT OF DESIGN AND CONSTRUCTION

SUBJECT: KAILUA-KANEOHE-KAHALUU FACILITIES PLAN  
DRAFT ENVIRONMENTAL IMPACT STATEMENT (EIS)  
Koolaupoko, Oahu, Hawaii

Thank you for your memorandum of November 24, 1999, regarding the subject Draft EIS. In response to your comments, the following will be reflected in Section 4.7 Traffic-Impacts and Mitigation Measures in the Final EIS:

- "Maintain fire apparatus access throughout the project sites for the duration of construction of the proposed facility improvements. Notify the Fire Communication Center (phone: 523-4411) of any interruption in the existing fire hydrant system during construction of the proposed projects."

We appreciate your time and effort in reviewing the Draft EIS.

cc: Rodney Funakoshi, Wilson Okamoto & Associates, Inc.  
Ms. Genevieve Salmonson, State Office of Environmental Quality Control

be distributed among all the system customers (page 6-18). However, the proposed plan would also result in increased sewer rates resulting from the planned construction of the proposed improvements in the Facilities Plan.

Kapaa has been and continues to be the most appropriate site for the relocation of the WWTP. As the EIS points out, there are two areas at Kapaa: the refuse area and the industrial park. The refuse area does not have to be acquired by the City, and because of its current use, regulatory approvals should not be a problem.

It is unclear where the \$713.9 million cost estimate came from (page 6-17). However, relocation to the Kapaa refuse area rather than the industrial park should not require the acquisition of property. Therefore relocation would not cost nearly as much as EIS has estimated. Amortization over a 20 to 40 year period would bring the annual cost within reasonable limits. Unfortunately, because the EIS fails to provide a detailed cost breakdown as originally anticipated, the community has no more detailed information.

The EIS states land in the industrial park would have to be acquired, but no analysis was made of the feasibility of doing a land exchange.

More importantly, as the EIS readily concedes, relocation would be quite compatible with the community. As the EIS states on page 6-17: "Relocation of the plant to Kapaa would result in improved settings for mitigating the effects of odor and noise which currently plague the Kailua Regional WWTP. Relocation of the plant would also be more conducive with the industrial nature of the Kapaa area and visually would be more compatible. . . ." Relocation to the refuse area would eliminate any concern from business because there are no businesses in the immediate vicinity.

A closer review of the EIS proposal to modify existing facilities reveals that many of the concerns raised by the City and County of Honolulu in opposition to relocation are of equal concern in the City and County's proposal.

#### Air Quality Impacts

The EIS pays "lip-service" to the elimination of the odor and noise problems occurring at the present location without providing any short or long term solutions. The report indicates that "Existing odor problems from the Kailua Regional WWTP have been a primary area of concern expressed by residents in the nearby community. . . . Nearby residents have also expressed concern regarding the impact of odors from the WWTP which may not present a health hazard, but are concerned by many to reduce the quality of life in the community." Yet, the proposed solution is "The City is undertaking short-, intermediate-, and long-term odor mitigation measures to reduce the presence of all sources of noxious air emissions. These measures include maintenance and operation activities, chemical treatment to reduce entry level of odorous compounds into treatment processes, and odor reduction systems installed to handle off-gases from unit processes (pages vi and vii)."

Measures undertaken by the City for the past many years have not worked. The odor problems still persist today. The intermediate- and long-term odor mitigation plans raised in the report are premature until the short-term odor problems have been successfully eliminated. It is important to note that odor mitigation is listed in the EIS as an unresolved issue (pages viii and ix). However only "mitigation" of the odor problem rather than "elimination" is recommended (page ix). As the EIS states, "Odor problems have been the single most discussed topic in public meetings held in connection with the Facilities Plan for Kailua-Kaneohe-Kahala, with the primary focal point being the Kailua Regional WWTP. In spite of the amount of money spent to-date on odor control facilities, neighborhood complaints persist. . . (page 4-36)." Frankly, complaints persist, because the plant smells!

It is important to point out that one of the proposed solutions to deal with the odor problems—Mist Scrubbers—"brings with it the potential for complaints of a chlorine-like odor and the possibility of damage to vegetation and metals impacted by the plume. In some instances, the plume from mist scrubbers may cause visibility complaints (page 4-39)."

#### Noise Impacts

Despite the City's attempts to alleviate the noise problems emanating from the WWTP, noxious noise persists. The EIS acknowledges that the City's efforts to eliminate noise at the Kailua Regional WWTP have failed.

*"Noxious noise levels emanating from the plant are a concern to nearby residents as expressed in public meetings held for the Facilities Plan. In spite of significant investments in noise control features which have been implemented in previous construction at the plant, some noise problems remain to be resolved. Noise concerns are not as prevalent at the Kaneohe and Ahuimanu WWTPs since noise sensitive uses, such as residential areas, are located farther from the respective facilities (page 3-56)."*

However, the EIS provides no solution other than the construction of walls and such measures as "himp-mass barrier with 2-inch thick fiberglass insulation" on the side facing the Effluent Pumps. Such solutions are unproven, unsightly, and appear to be a temporary "quick-fix." As above, despite the tremendous resources already spent attempting to control the noise, the problem still persists. Investing additional resources in the EIS recommendations will only perpetuate the noise problems.

#### Short-Term Noise, Air Quality and Traffic Impacts

Perhaps the most significant problem with the EIS is that the proposal to modify rather than relocate the Kailua Regional WWTP will result in adverse impacts to short-term noise, air quality and traffic. The EIS states in pertinent part:

*"Construction activities associated with the proposed project will create some adverse impacts such as unavoidable noise impacts in the vicinity of the project sites, air*


*pollution emissions from soil excavation and construction vehicle equipment and movement, and temporary disruption of traffic and on-street parking. . . (page vi).*"

The report shows that construction work may be performed 24 hours a day, 7 days a week. In other words, rather than relocate the plant to Kapaa, the City's proposal would exacerbate and add to the noise and odor problems that already plague the community and public elementary school.

Conclusion

In conclusion, the EIS proposal is nothing more than an effort to continue pouring money and resources into the Kailua Regional WWTP, a facility that continues to be unhealthy and harmful to the nearby residents and school, rather than set forth a long-term plan to relocate the plant.

It is time to start the detailed and immediate planning of the relocation of the Kailua Regional WWTP to a location that would benefit everyone—the Kapaa area.

Sincerely,  
  
Rep. Cynthia H. Thielen  
49<sup>th</sup> Representative District

DEPARTMENT OF DESIGN AND CONSTRUCTION  
CITY AND COUNTY OF HONOLULU

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JEREMY HARRIS  
MAYOR

GARY O. L. YEE, AIA  
ACTING DIRECTOR  
ROLAND D. UBBY, JR., AIA  
DEPUTY DIRECTOR

DCP 2000-108

February 4, 2000

The Honorable Cynthia H. Thielen  
State Representative, 49<sup>th</sup> District  
House of Representatives  
State of Hawaii  
State Capitol, Room 443  
Honolulu, Hawaii 96813

Dear Representative Thielen:

Subject: Kailua-Kaneohe-Kahaluu Facilities Plan  
Draft Environmental Impact Statement (EIS)  
Koolauapoko, Oahu, Hawaii

Thank you for your letter of November 24, 1999, regarding the subject Draft EIS. We offer the following responses in the order of your comments:

We regret your opposition to the conclusions and recommendations of the subject Draft EIS. We note, however, that the Draft EIS does reflect the Final Facilities Plan, which has undergone extensive community review as well as scrutiny from the Consent Decree plaintiff's special consultant retained to monitor its preparation.

The City's proposal to modify rather than relocate the Kailua Regional WWTP was determined based on the results of the assessment and evaluation conducted for all alternatives formulated in the course of the Facilities Plan preparation. The set of evaluation criteria used to evaluate each alternative included the following:

- Compliance with Water Quality Requirements – spill reduction, regulatory agency approval and other required permits
- Cost-Effectiveness – capital and estimated annual operation and maintenance costs for proposed improvements to the collection, treatment and disposal systems based on the 5-year storm flows
- Community Compatibility – odor/noise, recreation/visual, economic, and traffic
- Environmental Impacts – water quality, flooding, archaeology, and flora/fauna/other environmentally sensitive resources.



Detailed cost estimates for the alternative of relocating the plant to Kapaa were included in the Facilities Plan. In view of your concerns, however, a generalized cost breakdown of the major improvements which would be required at the Kailua and Kapaa sites are indicated below and will be included in the Final EIS under Section 6.1.5 Relocation of Kailua Regional WWTP to Kapaa Industrial Park - Cost-Effectiveness. As indicated in Section 6.1.5, the noted sequence for relocating the facility is only a concept and further planning or engineering studies would be required to identify all of the technical aspects involved in relocating the treatment plant. Modification of the existing WWTP will include mitigation measures to "reduce" ongoing odor and noise problems.

**Table 6-2**  
**Relocation of Kailua Regional WWTP to Kapaa Industrial Park**  
**Generalized Cost Estimates**

Item	Cost Estimate
New Secondary Treatment Plant	\$268,000,000
New Pump Influent Station at Kailua	\$15,000,000
4.5 MG Flow Equalization Tank at Kapaa	\$8,300,000
New Preliminary Treatment Facility at Kailua	\$19,500,000
New Transmission Pump Station at Kailua	\$16,300,000
New Transmission Pump Station at Kapaa	\$21,200,000
New Transmission Force Main to Kapaa	\$18,300,000
Force Main Back to Kailua	\$11,000,000
Kapaa Land Acquisition	\$5,000,000
Demolition of Structures at Kailua	\$387,430,000
<b>Total</b>	

The Draft EIS does not "disregard" the relocation of the Kailua Regional WWTP to Kapaa as a viable alternative, but rather indicates that it is not deemed a feasible alternative due to the significantly high capital costs and the uncertainty of obtaining regulatory approvals to develop the facility. As indicated in Section 6.1.5 - Compliance with Water Quality Requirements, regulatory and permitting approvals required to relocate the treatment plant to Kapaa would be costly, time consuming and uncertain. Regulatory approvals from the State Department of Health would be required. Although a portion of the Kapaa Industrial area is currently zoned industrial, adjacent areas would require City zone change approval to Industrial to accommodate the new plant. Also, coordination with landowner Kaneohe Ranch's expansion plans for the Kapaa Industrial area would be required. Although the proposed plan would also result in increased sewer rates to Oahu ratepayers as discussed in Section 4.4 Socio-Economic - Impacts and Mitigation Measures of the Draft EIS, the difference in capital costs between the relocation alternative (\$713.9 million) and the proposed plan (\$386.1 million) would contribute to substantially higher rate increases if the plant is relocated.

It is acknowledged that the Kapaa area is the most appropriate location for any potential relocation of the Kailua Regional WWTP. However, as discussed in Section 6.1.5 in the Draft EIS, the Kapaa Refuse Transfer Station site was determined to be unavailable for use. The transfer station site and associated facility are required by the City to provide refuse transfer services for municipal and private refuse collection for the Windward region. The transfer facility was constructed in 1990 and the City plans continued long-term use of the site as a refuse transfer station and base yard. The site also supports the City's Automotive Equipment Services and Refuse Collection yard.

The feasibility of conducting a land exchange in lieu of land acquisition at the Kapaa Industrial Park was not assessed in the Facilities Plan, however, comparably valued lands would need to be located, and there is a very short supply of suitable large land areas owned by the City.

Section 6.1.5 - Community Compatibility of the Draft EIS also indicates that relocation of the plant to Kapaa may encounter opposition from neighboring businesses and possibly from the closest residential areas in the Coconut Grove subdivision makai of Kawai Nui Marsh, the Kalaheo Village area, and Kalaheo High School. As previously indicated, the Kapaa Refuse Transfer Station site is unavailable for use.

Although the Draft EIS raises similar concerns between the proposed plan and the relocation alternative, the feasibility of the relocation alternative poses more substantive concerns due to its significantly higher capital costs, uncertainty of obtaining regulatory approvals, and the potential transference of impacts to the Kalaheo-Coconut Grove area.

**Air Quality Impacts**

Regarding the existing odor and noise problems at the Kailua Regional WWTP, the City's intent and representation in the course of the Facilities Plan preparation has been to "mitigate" and not "eliminate" these problems through the respective measures identified in the Draft EIS. The expectation to "eliminate" odor or noise from the WWTP would imply no deviation from a goal which, given the proximity of the plant to residences, would be impossible to attain. Also, measures undertaken by the City in the past have contributed to a reduction in odors emanating from the plant. We acknowledge that the intermediate- and long-term odor mitigation measures identified in the Draft EIS will not be fully effective until the short-term odor problems have been "mitigated".

Odor mitigation is identified as an unresolved issue in the Draft EIS since the decision on which odor reduction alternatives or technologies to implement will be determined based upon further engineering studies or as part of the preliminary engineering design phase. Also, the City's Islandwide Odor Control Assessment Program scheduled to start in FY 2000 will involve the preparation of a study to address the effectiveness of all City-owned and operated existing odor control units, as well as address odor control requirements.

The Honorable Cynthia H. Thielen

Page 4

February 4, 2000

Please note that the discussion of "Mist Scrubbers" on page 4-39 of the Draft EIS is not a recommendation to use them, but rather a statement indicating that this unit has been used at other locations. The existing Calvert unit is in the process of undergoing modification to eliminate the problem noted in the discussion.

#### Noise Impacts

Although the Draft EIS acknowledges that noise emanating from the Kailua Regional WWTP is a concern, efforts to eliminate noise have not failed. The Draft EIS states that "...some noise problems remain to be resolved." Again, the City's intent and representation in the course of the Facilities Plan preparation has been to "mitigate" and not "eliminate" noise problems at the plant.

In addition to the noise mitigation measures identified in the Draft EIS, other proposed improvements to mitigate noise at the plant will be implemented by the City pursuant to recently negotiated engineering contracts. Until the recommended noise measures in the Draft EIS are designed, implemented and operational, it would be premature to dismiss these solutions.


#### Short-Term Noise, Air Quality and Traffic Impacts

As discussed in Section 6.1.5 -- Community Compatibility in the Draft EIS, relocation of the plant to Kapaa will also result in adverse short-term noise, air quality and traffic impacts. The Draft EIS also indicates that noise and air quality impacts would also temporarily affect nearby residents and the Aikahi Elementary School during construction of facilities and demolition of existing structures at the Kailua plant.

#### Conclusion

As indicated in Section 6.1.5 -- Conclusion in the Draft EIS, the Facilities Plan calls for a continuing evaluation of the possibility of transitioning wastewater facilities from Aikahi to the Kapaa Industrial Park. Such studies could focus on the long-term staging process, associated costs and funding of improvements which are the main impediments to relocation of the regional treatment plant. Should the relocation of the plant to Kapaa be determined to be a more viable alternative in the future, the Facilities Plan could be amended and a Supplemental EIS could then be prepared. We appreciate your time and effort in reviewing the Draft EIS.

Very truly yours,

  
FOR GARY Q.L. YEE, AIA  
Acting Director

cc: ✓ Rodney Funakoshi, Wilson Okamoto & Associates, Inc.  
Ms. Genevieve Salinonson, State Office of Environmental Quality Control

**KANEOHE RANCH COMPANY, LIMITED**

Castle Junction  
1199 Aulua Road  
Kailua, Hawaii 96734-4606

Telephone (808) 266-1400  
Fax (808) 266-1419

November 23, 1999

Mr. Carl Arakaki  
Department of Design & Construction  
City & County of Honolulu  
650 South King Street  
Honolulu 96813

Dear Mr. Arakaki:

Subject: Draft Environmental Impact Statement for the Kailua-Kaneohe-Kahaluu  
Facilities Plan (October 1999)

I am responding to Randall K. Fujiki's letter of November 3 requesting that we address our comments on the subject draft EIS to you.

We compliment your consultant on the thoroughness of the review of the Kailua-Kaneohe-Kahaluu Facilities Plan and its alternatives. Our comments will be limited to those areas where the wastewater facilities plan affects our properties.

Although the preferred plan does not necessitate the taking of any Castle properties, several of the alternatives would involve the acquisition of certain Castle properties, including land in Kapaa Valley, land within the 1,000-foot buffer around the Kailua WWTP and land at Puu o Ehu for a storage facility. Please be assured that if the city selects any of the alternatives which require Castle land, we are prepared to cooperate fully with the city in the city's acquisition of Castle land.

We note that the Kailua Road sewer improvement district is presently planned for implementation in the time frame 2017-2020 (Table 2-6) at a cost in April 1998 dollars of \$287,000 (Table 2-4). We wonder why such a minor project is programmed so far into the future.

Numerous maps within the draft EIS indicate pipe storage is proposed for installation along Kailua Road in the same location as the proposed Kailua Road sewer improvement district. However, we were not able to determine from Table 2-6 the time frame for the installation of the pipe storage along Kailua Road. It appears to be lumped into the "Kailua relief sewers" category with a time frame of 2001-2020. It would be helpful if a more precise time frame for the installation of the individual programmed pipe storage facilities was provided in the final EIS.

The construction of the sewer improvements, while absolutely necessary, is also disruptive for residents and businesses adjacent to construction. Construction is a nuisance to residents. It is a financial hardship to businesses, whose revenues decline because access to them is inconvenient for customers. We appreciate the recent cooperation of the city and the contractor in scheduling construction and in routing traffic along the lower section of Kailua Road (fronting the Kailua Beach Center at 130 Kailua Road) to reduce the adverse impact on businesses of the construction of sewer improvements that will commence shortly. We look forward to the continuing sensitivity of the city and its contractors to the needs of neighboring businesses as implementation of the Kailua-Kaneohe-Kahaluu Facilities Plan progresses.

Thank you for the opportunity to comment.

Sincerely yours,



Randolph G. Moore

copies to:

Dr. Kenneth E. Sprague, Department of Environmental Services, 650 S. King St., 96813  
Ms. Jan Nee Sullivan, Department of Planning & Permitting, 650 S. King St., 96813  
Mr. Rodney Funakoshi, Wilson Okamoto & Associates, Inc., 1907 S. Beretania St., Suite 400, 96816  
Office of Environmental Quality Control, 233 S. Beretania St., Room 702, 96813

DEPARTMENT OF DESIGN AND CONSTRUCTION  
CITY AND COUNTY OF HONOLULU

650 SOUTH KING STREET, 2ND FLOOR  
HONOLULU, HAWAII 96813  
PHONE: (808) 523-4554 • FAX: (808) 523-4587  
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JEFFREY HARRIS  
MAYOR

GARY Q.L. YEE, AIA  
ACTING DIRECTOR  
ROLAND D. LIBBY, JR., AIA  
DEPUTY DIRECTOR

DCP 2000-109

February 4, 2000

Mr. Randolph G. Moore  
Kaneohe Ranch Company, Limited  
Castle Junction  
1199 Aulooa Road  
Kailua, Hawaii 96734-4606

Dear Mr. Moore:

Subject: Kailua-Kaneohe-Kahaluu Facilities Plan  
Draft Environmental Impact Statement (EIS)  
Koolaupoko, Oahu, Hawaii

Thank you for your letter of November 23, 1999, regarding the subject Draft EIS. We appreciate your compliments regarding our consultant's thoroughness of the review of the Kailua-Kaneohe-Kahaluu Facilities Plan and its alternatives. We offer the following responses in the order of your comments:

1. We gratefully acknowledge your company's willingness to fully cooperate with the City should acquisition of Castle properties be required in association with the potential selection of any of the project alternatives that involve Castle land.
2. Sewer Improvement Districts in the planning region that were not already programmed in the City's Capital Improvement Projects (CIP), such as the Kailua Road Sewer Improvement District, were generally given a lower priority in the phasing plan for the Kailua-Kaneohe-Kahaluu Facilities Plan. The emphasis is to address existing wastewater-related problems before adding new Improvement Districts to the municipal wastewater system. In general, the priority phasing of Improvement Districts is based on need and cost-effectiveness considerations.
3. According to Table 2-6 Kailua-Kaneohe-Kahaluu Facilities Plan Phasing Plan in the Draft EIS, the estimated timeframe for construction of the "Kailua Flow Equalization Storage", which includes the proposed installation of in-pipe storage along Kailua and Wanaao Roads between the Kailua Road and Kailua Heights WWPS, is from 2008 to 2011.

Mr. Randolph G. Moore  
Page 2  
February 4, 2000

To clarify, the "Kailua Relief Sewers" category as mentioned in your letter includes the installation of approximately 8,190 lineal feet of 8- to 36-inch relief lines throughout the Kailua area. As opposed to in-pipe storage, "relief" involves the installation of a new line to provide additional hydraulic capacity to an existing line.

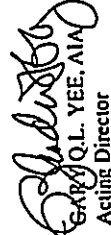
4. We acknowledge that the construction of sewer improvements is disruptive for residents and businesses adjacent to the construction area. As discussed in Section 4.4 Socio-Economic - Impacts and Mitigation Measures of the Draft EIS, construction activities associated with the proposed project will create some adverse impacts such as temporary disruption of traffic and on-street parking, unavoidable noise impacts in the vicinity of the project sites, and air pollution emissions from soil excavation and construction vehicle equipment and movement. The properties which are anticipated to be most affected by construction activity impacts are those residences and businesses located adjacent to and along the proposed wastewater facility improvements.

Construction contractors will be required to mitigate potential vehicular and pedestrian traffic impacts through appropriate traffic control measures and safety devices as detailed in Section 4.7 Traffic - Impacts and Mitigation Measures of the Draft EIS. The degree of impact resulting from construction activities along major roadways will be mitigated by phasing sewer line projects into zones, thereby minimizing traffic, noise and air quality impacts to residents and businesses at any given time. Emerging "trenchless" technologies such as microtunneling may also be used to minimize disruption to residences and businesses.

We appreciate your recognition of the cooperation of the City and the contractor in scheduling construction and routing traffic along the lower section of Kailua Road (fronting the Kailua Beach Center at 130 Kailua Road) to reduce adverse impacts on businesses during construction of the sewer improvements. The City and its contractors will continue to coordinate with the affected businesses, residents and Neighborhood Boards in mitigating, to the extent possible, any adverse impacts which may result from construction of the proposed wastewater facility improvements.

We appreciate your time and effort in reviewing the Draft EIS.

Very truly yours,

  
FOR GARY Q.L. YEE, AIA  
Acting Director

cc: ✓ Rodney Funakoshi, Wilson Okamoto & Associates, Inc.  
Ms. Genevieve Salmonson, State Office of Environmental Quality Control



Hawaiian Electric Company, Inc. • PO Box 2750 • Honolulu, HI 96840-0001

DI 99-1090  
for  
P/L



Scott W.H. Seu, P.E.  
Manager  
Environmental Department

DESIGN & CONSTRUCTION  
DIVISION OF  
PLANNING & PROGRAMMING

November 24, 1999

Department of Design and Construction  
City and County of Honolulu  
650 South King Street  
Honolulu, HI 96813

Attention: Mr. Carl Arakaki

Subject: Kailua-Kaneohe-Kahaluu Facilities Plan

Thank you for the opportunity to comment on your October 1999 DEIS for the Kailua-Kaneohe-Kahaluu Facilities Plan. We have reviewed the subject document and have no comments at this time.

HECO shall reserve further comments pertaining to the protection of existing powerlines bordering the project area until construction plans are finalized. Again, thank you for the opportunity to comment on this DEIS.

Sincerely,

cc: Department of Environmental Services  
City and County of Honolulu  
650 South King Street  
Honolulu, HI 96813  
ATTENTION: Dr. Kenneth E. Sprague



WINNER OF THE EDISON AWARD  
FOR DISTINGUISHED INDUSTRY LEADERSHIP

DEPARTMENT OF DESIGN AND CONSTRUCTION  
CITY AND COUNTY OF HONOLULU

650 SOUTH KING STREET, 2ND FLOOR  
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JEREMY HARRIS  
MAYOR

GARY Q.L. YEE, AIA  
ACTING DIRECTOR  
ROLAND D. LIBBY, JR., AIA  
DEPUTY DIRECTOR

DCP 2000-080

January 31, 2000

Mr. Scott W. H. Seu, P.E., Manager  
Hawaiian Electric Company, Inc.  
Environmental Department  
P.O. Box 2750  
Honolulu, Hawaii 96840-0001

Dear Mr. Seu:

Subject: Kailua-Kaneohe-Kahaluu Facilities Plan  
Draft Environmental Impact Statement (EIS)  
Koolaulopoko, Oahu, Hawaii

Thank you for your letter of November 24, 1999, indicating that you have no comments on the subject Draft EIS at this time. As the proposed projects progress through the design phase, the City will coordinate with HECO to ensure the protection of existing powerlines bordering the respective project areas.

We appreciate your time and effort in reviewing the Draft EIS.

Very truly yours,

FOR GARY Q.L. YEE, AIA  
Acting Director

cc: Rodney Funakoshi, Wilson Okamoto & Associates, Inc.  
Ms. Genevieve Salmonson, State Office of Environmental Quality Control

**GTE Hawaiian Tel**  
*Beyond the call*

GTE Hawaiian Telephone Company Incorporated  
P.O. Box 2200 • Honolulu, HI 96841 • 808 546-4311

November 10, 1999

Mr. Carl Arakaki  
Department of Design and Construction  
City and County of Honolulu  
650 South King Street  
Honolulu, Hawaii 96813

**RECEIVED**  
NOV 30 1999

WILSON OKAMOTO & ASSOC., INC.

Dear Mr. Arakaki:

Subject: Kailua-Kaneohe-Kahaluu Facilities Plan  
Draft Environmental Impact Statement (EIS)

Thank you for the opportunity to review the above subject Draft Environmental Impact Statement. As mentioned in Section 4.10.4, we do not foresee any major impact to the communications system as a result of this project. When this project moves to the design stages, we request to participate in the review to ensure that there are no conflicts.

Should you have any questions, please call Wayne Cabral at 840-5840.

Sincerely,

*for Susan K. Eichor*  
Susan K. Eichor  
General Manager -  
Infrastructure Provisioning

c: Dr. Kenneth E. Sprague, City and County of Honolulu  
Ms. Jan Nace Sullivan, City and County of Honolulu  
Mr. Rodney Funakoshi, Wilson Okamoto & Associates, Inc.  
State of Hawaii, Office of Environmental Quality Control

DEPARTMENT OF DESIGN AND CONSTRUCTION  
**CITY AND COUNTY OF HONOLULU**

650 SOUTH KING STREET, 2ND FLOOR  
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JEREMY HARRIS  
MAYOR

GARY L. YEE, AIA  
ACTING DIRECTOR  
ROLAND D. LEBBY, JR., AIA  
DEPUTY DIRECTOR

DCP 2000-079

January 31, 2000

Ms. Susan K. Eichor, General Manager  
GTE Hawaiian Telephone Company Incorporated  
Infrastructure Provisioning  
P.O. Box 2200  
Honolulu, Hawaii 96841

Dear Ms. Eichor:

Subject: Kailua-Kaneohe-Kahaluu Facilities Plan  
Draft Environmental Impact Statement (EIS)  
Koolauloopa, Oahu, Hawaii

Thank you for your letter of November 10, 1999, indicating no foreseen major impacts to the communications system as a result of the proposed project. As proposed projects progress through the design phase, the City will coordinate with your Department to ensure that there are no conflicts with the communications system.

We appreciate your time and effort in reviewing the Draft EIS.

Very truly yours,

*Gary L. Yee*  
FOR  
GARY L. YEE, AIA  
Acting Director

cc: Rodney Funakoshi, Wilson Okamoto & Associates, Inc.  
Ms. Genevieve Salmonson, State Office of Environmental Quality Control

JAN-13-2000 15:42 FROM WASTE/WATER MGMT PASC/EJC TO

99462253 P.09

DC 99-1116

DEPARTMENT OF DESIGN AND CONSTRUCTION  
CITY AND COUNTY OF HONOLULU

650 SOUTH KING STREET, 7TH FLOOR  
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GARY Q.L. YEE, AIA  
ACTING DIRECTOR  
ROLAND D. LIBBY, JR., AIA  
SECRETARY

DCP 2000-110

JEFFREY HARRIS  
LAWYER

February 4, 2000

Ms. Holly E. Hoffer  
252 Aikahi Loop  
Kailua, Hawaii 96734-1645

Dear Ms. Hoffer:

Subject: Kailua-Kaneohe-Kahalua Facilities Plan  
Draft Environmental Impact Statement (EIS)  
Koolaulopoko, Oahu, Hawaii

Thank you for your letter submitted regarding the subject Draft EIS. We offer the following responses to your comments:

In regard to the City's past efforts in attempting to mitigate the Kailua Regional WWTP's odor and noise problems, measures undertaken to date by the City have contributed to a reduction in odors and noise emanating from the plant. We appreciate your comments regarding the continuing efforts of the City to mitigate such impacts.

1. Your understanding is correct. The increase in secondary treatment capacity from 28 mgd to 35.6 mgd is to accommodate peak flow from a 2-year storm event and is not intended to accommodate substantial future development in the area. The following sentence will be added to the first paragraph of Section 2.1.1.1 Kailua Regional WWTP in the Final EIS: "The increased capacity is intended to accommodate peak flows from a 2-year, 6-hour storm event, and is not due to any anticipated or substantial future growth and development in the region."
2. Our Department does not have the authority to impose such a moratorium on proposed development. Regarding the existing odor and noise problems at the Kailua Regional WWTP, the City's intent and representation in the course of the Facilities Plan preparation has been to "mitigate" and not "eliminate" these problems through the respective measures identified in the Draft EIS. The expectation to "eliminate" odor or noise from the WWTP would imply no deviation from a goal which, given the proximity of the plant to residences, would be impossible to attain.

RECEIVED

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DESIGN & CONSTRUCTION  
DIVISION OF  
PLANNING & PROGRAMMING  
252 Aikahi Loop  
Kailua, HI 96734-1645  
Telephone: 254-0906  
December 23, 1999

City and County of Honolulu  
Department of Design and Construction  
650 South King Street  
Honolulu, Hawaii 96813  
Attention: Mr. Chad Anshaki  
Fax: 573-4367 or 523-4642

Subject: Kailua - Kaneohe - Kahalua Facilities Plan Draft Environmental Impact Statement (EIS)

In 1994, when the decision was made to construct secondary treatment of wastewater from Kailua, Kaneohe, and Kahalua at the Kailua Wastewater Treatment Facility, Aloha Gardens condominium owners strenuously objected to expansion of the facility on the grounds that it would cause even more odor problems. As recorded in the 1994 EIS, the director and chief engineer of the project responded that "Although the added influents will contain components capable of causing even more odor in the community than at present, the new design for Kailua will minimize or eliminate release of all odors, an improvement over the present situation. Accordingly, no negative impact will be caused which requires mitigation." (1994 EIS, Letter dated December 30, 1993 from Michael J. Chun, Director and Chief Engineer, Department of Public Works, City and County of Honolulu to Mr. Kent M. Keith, Department of Planning and Economic Development.) Also, the 1994 EIS states: "Odor problems in the residential subdivisions downwind of Kailua STP will be eliminated when the recommended revisions in odor control strategy is fully implemented." (1994 EIS, p. 9-4)

I think that these statements were made in good faith, that the problems of increased odors and noise could be satisfactorily controlled by technology. That, however, has not been the case—at least not to date. I appreciate the continuing efforts of the City to mitigate the negative impacts of siting a large regional wastewater facility in a residential neighborhood; however, the current plant was completed only five years ago, and already there is a need for yet more construction at the site. Therefore, I offer these comments:

1. It must be made clear that the increase in secondary treatment capacity from 28 million gallons per day (mgd) to 35.6 million mgd (page 6b) is not to be construed as an increase in capacity that would permit substantial future development in the service area. It is, if I understand correctly, to accommodate "peak flow" from a storm event. The design capacity for average daily flow will remain at 15.25 million gallons per day (Section 1.2, p. 1-3).
2. Until required improvements to and rehabilitation of the current system have eliminated noise and odor complaints as well as violations of the NPDES permit, no new development of industrial, commercial, or residential properties should be permitted in the service area.
3. I appreciate the City's renewed commitment to provide odor and noise abatement facilities at the current Kailua Regional Wastewater Treatment Plant. I hope that implementation will include using the best available technology rather than low-bid "Bandaid" fixes.
4. For the long term: If odor and noise problems at the current site cannot be controlled to the point that they no longer adversely affect the adjacent community, the right thing to do would be to move the facility to a suitable industrial area. Buying land in the vicinity of Kapaeha Industrial Park now would position the City to relocate this regional wastewater treatment facility within 20 to 40 years in an appropriate industrial area that is almost a mile from the closest residences rather than the 100 feet the present plant is. This long-term strategy, as outlined in the current October 1999 Draft EIS, could be implemented when the current facilities near the end of their useful life and need to be refurbished or replaced anyway.

Thank you for the opportunity to make these comments.

Sincerely,  
Holly E. Hoffer  
Holly E. Hoffer

Ms. Holly E. Hoffer  
Page 2  
February 4, 2000

3. We appreciate your acknowledgement of the City's continuing commitment to provide odor and noise abatement improvements at the Kailua Regional WWTP. Current efforts at mitigating odor problems are directed at identifying the problem areas, correcting any equipment or process problems, developing requirements for any improvements to the existing odor control systems, and looking at any information on current and new odor control technologies for assessing and mitigating odor problems at the plant and in the collection system. In addition to the noise mitigation measures identified in the Draft EIS, other proposed improvements to mitigate noise at the plant will be implemented by the City pursuant to recently negotiated engineering contracts.

4. Your support for relocating the WWTP in an industrial area is acknowledged. However, as indicated in Section 6.1.5 Relocation of Kailua Regional WWTP to Kapaa Industrial Park in the Draft EIS, relocation of the WWTP to Kapaa is not deemed a feasible alternative at this time primarily due to the significantly high capital costs which would be incurred, and the uncertainty of obtaining regulatory approvals to develop the facility. Should the relocation of the plant to Kapaa be determined to be a more viable alternative in the future, the Facilities Plan could be amended and a Supplemental EIS could then be prepared.

We appreciate your time and effort in reviewing the Draft EIS and interest and attendance at the Draft EIS public hearing.

Very truly yours,

  
GARY L. YEE, AIA  
Acting Director

cc: Rodney Funakoshi, Wilson Okamoto & Associates, Inc.  
Ms. Genevieve Salmonson, State Office of Environmental Quality Control

DC JWP - 000226

88 Aikahi Loop, Kailua HI 96734

Lieutenant Michael Wheeler  
MTWheeler@aol.com  
(808) 254-4878

RECEIVED  
TO JAN 10 A9 32

31 December 1999

Director, Department of Design and Construction  
City and County of Honolulu  
650 South King Street  
Honolulu, HI 96813

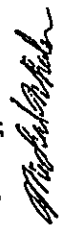
DESIGN & CONSTRUCTION  
DIVISION  
PLANNING & DESIGN SERVICES

Dear Mr Arakaki:

I am writing this letter in response to the Kailua-Kaneohe-Kahala Facilities Plan. As a concerned homeowner I vehemently oppose ANY expansion of the Kailua RWTP beyond the intolerable industrial complex that it has become. Currently that plant is not compatible with the residential zoning of the community that surrounds it and any expansion would only exacerbate that problem. The buildings there exceed the 25 feet height limit for the structures in the surrounding neighborhoods making it very unsightly and blocking what used to be beautiful views. Also the constant bombardment of noise and odors further highlight the need to limit any expansion.

After reviewing the current plan, I am convinced that the best long term solution to the future waste water requirements of the Windward side is to build a new facility on Kapaa Quarry Road where the proper industrial complex would be compatible with the area zoning. The current situation with Kailua RWTP is the result of shortsightedness that would only get worse if something is not done soon. Moving the plant would allow for a state of the art facility to be built that could serve the Windward side for generations with minimal impact on the residents who live here. That plant benefits everyone on this side of the island and it is not right that a few unwilling residents have to suffer for what is every resident's responsibility.

Sincerely,

  
Michael Wheeler  
LT USN

DEPARTMENT OF DESIGN AND CONSTRUCTION  
**CITY AND COUNTY OF HONOLULU**

650 SOUTH KING STREET, 2ND FLOOR  
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JEREMY HARRIS  
MAYOR

GARY Q.L. YEE, AIA  
ACTING DIRECTOR  
ROLAND D. LIBBY, JR., AIA  
QUALITY DIRECTOR

DCP 2000-111

February 4, 2000

Lieutenant Michael Wheeler  
88 Aikahi Loop  
Kailua, Hawaii 96734

Dear Lt. Wheeler:

Subject: Kailua-Kaneohe-Kahaluu Facilities Plan  
Draft Environmental Impact Statement (EIS)  
Koolauapoko, Oahu, Hawaii

Thank you for your letter of December 31, 1999, regarding the subject Facilities Plan. We offer the following responses to your comments:

Your opposition to any expansion of the Kailua Regional WWTP is acknowledged. Based on the Facilities Plan's recommendation, no expansion of the WWTP is planned. During the course of the Facilities Plan preparation, the community objections to any substantial expansion of facilities at the plant until existing odor and noise problems are resolved. As a result, a range of alternatives was considered for the provision of flow equalization facilities for the Kailua Basin. This would allow for peak flows during heavy rainstorms to be stored and then released back to the system at a reduced flow rate. The net effect of this equalization is a lower peak flow to the wastewater treatment plant than would have occurred if the storm peak flow were allowed to flow directly to the treatment plant for processing. The provision of flow equalization facilities for the Kailua Basin would reduce peak flows and eliminate the need to provide new and expanded treatment facilities. In lieu of facilities expansion at the plant, the Facilities Plan's recommendation provides for up to 1.5 MG of flow equalization facilities within the Kailua Basin and up to 7.0 MG of storage/equalization facilities at the Kaneohe and Ahuimanu Wastewater Preliminary Treatment Facilities (WWPTF).

Regarding your concern of the incompatibility of the plant with the residential zoning, please be apprised that wastewater facilities are permitted uses in all zoning districts in accordance with the City and County of Honolulu's Land Use Ordinance (LUO). The LUO provides for exceedance of the zoning district's 25-foot height limit pursuant to issuance of a Waiver of Requirements by the City which is applicable to public uses or structures.

Lieutenant Michael Wheeler  
Page 2  
February 4, 2000

Regarding odor and noise at the Kailua Regional WWTP, the City is continuing to address the ongoing odor and noise problems at the plant as indicated in Section 4.5.3 Mitigation of Odor Problems and Section 4.6.3 Recommended Noise Mitigation in the Draft EIS.

Your support for relocating the WWTP in an industrial area is acknowledged. However, as indicated in Section 6.1.5 Relocation of Kailua Regional WWTP to Kapaa Industrial Park in the Draft EIS, relocation of the WWTP to Kapaa is not deemed a feasible alternative at this time primarily due to the significantly high capital costs which would be incurred, and the uncertainty of obtaining regulatory approvals to develop the facility. As indicated in Section 6.1.5 - Conclusion in the Draft EIS, the Facilities Plan calls for a continuing evaluation of the possibility of transitioning wastewater facilities from Aikahi to the Kapaa Industrial Park. Such studies could focus on the long-term staging process, associated costs and funding of improvements which are the main impediments to relocation of the regional treatment plant. Should the relocation of the plant to Kapaa be determined to be a more viable alternative in the future, the Facilities Plan could be amended and a Supplemental EIS could then be prepared.

Regarding your comment that relocating the plant would have minimal impact on the residents who live there, Section 6.1.5 - Community Compatibility of the Draft EIS indicates that relocation of the plant to Kapaa may encounter opposition from neighboring businesses and possibly from the closest residential areas in the Coconut Grove subdivision makai of Kawai Nui Marsh, the Kalaheo Village area, and Kalaheo High School.

We appreciate your time and effort in reviewing the Draft EIS.

Very truly yours,

FOR GARY Q.L. YEE, AIA  
Acting Director

cc: ✓ Rodney Funakoshi, Wilson Okamoto & Associates, Inc.  
Ms. Genevieve Salmonson, State Office of Environmental Quality Control

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**13.4 Draft EIS Public Hearing**

*A public hearing on the Kailua-Kaneohe-Kahaluu Facilities Plan Draft EIS was held on December 9, 1999. The hearing was intended to inform residents of the anticipated impacts and associated mitigative measures resulting from the proposed project improvements, and to solicit oral and/or written testimony on the Draft EIS findings. A transcript of the public hearing is included herein.*

*Oral and written testimonies were presented by the following individuals and organization. Written responses to the oral testimonies are included in the public hearing transcript. The written testimonies and responses are reproduced herein.*

**Oral Testimony:**

*Kailua Neighborhood Board No. 31  
James Corcoran  
Vernon Thomason  
Steve Kubota  
Terry Carroll  
Charles Prentiss  
Cynthia Thielen  
Nancy Cullen  
Holly Hoffer*

**Written Testimony:**

*Kailua Neighborhood Board No. 31  
James Corcoran  
Charles Prentiss  
Larry Abbott  
Jean Stremming*

Public Hearing  
for the  
Kailua-Kaneohe-Kahaluu Facilities Plan  
Draft Environmental Impact Statement

Date: December 9, 1999  
Time: 7:00 p.m.  
Location: Aikahi Elementary School Cafeteria  
281 Ilihau Street  
Kailua, Hawaii

Attendance: See attached sign-in sheets.

(DeeDee Letts) My name is DeeDee Letts and I run a company called Resolutions Hawaii, which is a neutral company that does mediation and meeting management. I'm really here just to kind of play (inaudible) person this evening on the public hearing. Couple of things that I wanted to mention, some of which are different. I don't know about you -- one of the things I don't particularly care about at public hearings is you give your testimony for the law and then you can't talk with anybody. So when we finish the formal part of the public hearing, we're going to close that down, and you'll see informational stations in the back, and we're going to have some experts manning those stations so that you can get your questions answered and have some dialogue around the project. So we have to close at 9:30, so from whatever time we end the formal part of the public hearing till 9:30, those folks will be available to have some dialogue and question and answer with. So we hope that makes the evening a little more useful to those of you who have come out.

If you have your handout, couple of things I want to call your attention to. One is the green sheet on the back, which is a three-fold with an address. If you're anything like me, you come to these meetings and as soon as the meeting closes you have your best ideas. Don't want to lose them, so we've tried to make it easy. All you've got to do is fold it over and put a stamp on it. The address is on the back, so, and if you would prefer to fill those out rather than testify orally this evening, there is a drop box for them in the back. So whatever way you want to do it, if you have neighbors that couldn't come tonight that you know want to comment on

the project, please feel free to share those with them. You'll notice on the bottom, to be considered, they have to be in by December 23<sup>rd</sup>, and that's a legal thing, so we can't play too much with that.

We said, the purpose, the main purpose of the meeting is to have a public hearing and receive comments about the Draft EIS. We have a sign-in sheet in the back. There are two sign-in sheets, I hope, that got explained to folks. One is attendance, and one is if you want to testify this evening. We will be audio-taping the testimony and there will be a transcript of the testimony in the Draft EIS, as well as any written comments you want to turn in this evening, or mail by the 23<sup>rd</sup>. So if you want to speak, make sure you're signed up on the right sheet. And we will be calling people in the order they signed up, standard public hearing. We are kind of asking people to limit their comments; we don't have a lot of folks here, so I'll be a little generous with that. Usually it's three minutes, if you need more, I'm sure we can work a little more in. And we're asking that, you know, if previous speakers have really covered what you need to say, if you could just summarize it that would be helpful. Are there any questions on what we're doing this evening? Okay, I want to introduce Randall Fujiki who will be making some opening comments for the City.

(Randall K. Fujiki) Thank you DeeDee. I would like to say I'm Dr. Kenn Sprague, but unfortunately, he's a little bigger than I am. Anyway, I'm Randy Fujiki and I want to thank you for coming here tonight, for participating in our Kailua-Kaneohe-Kahaluu Facilities Plan and Environmental Impact Statement for it. I'm the Director of the Department of Design and Construction, and what I'd like to do is kind of go over what we're trying to do here and what we will be presenting. I understand that some people may have not been notified of tonight's meeting. We made announcements at a number of places. We had legal ads for the Star-Bulletin and Advertiser. We also had a press release that was given to both papers—the Advertiser picked it up but unfortunately did not put the date on it—they inserted our press release. We also sent out flyers and notices to approximately 70 community groups, associations, individuals, City Council, legislative representatives. We also provided notices for the libraries, both the Kaneohe and Kailua, and Kahuluu KEY Project. I think my staff has taken some fairly reasonable actions to inform everyone, but if some people did not hear about it, we apologize for that.



The K-K-K—or Kaneohe-Kailua-Kahului—we can actually mix it up any way we want—Facilities Plan proposes that the City undertake a number of improvements to the wastewater collection, treatment, and disposal system, and the establishment of sewer improvement districts for unsewered areas within these three districts. The design of these projects will probably not start—well, at the earliest, start in our 2001 budget, which we will be enacting in July of 2000, and will run 18 months. And that's the soonest we will start because of this EIS process and...*(question posed by Mr. Vernon Thomason "When in 2001?")* Well, actually the money—the design could start as early as July 1, 2000 and then proceed...and the improvements are anticipated to be completed by the year 2020. This is a long-range plan obviously. The estimated capital cost for our wastewater facilities in this EIS is approximately \$386 million. The construction of a previously approved ultraviolet disinfection facility project at the Aikahi Plant started in June 1999 and is expected to be completed in the latter part of 2000.

DeeDee expressed that tonight is our opportunity to hear from you. First, well, after I make my remarks, we're going to have a representative from our consultant, Wilson Okamoto, give you an overview of the EIS. We'll then ask for your opinions both orally and in writing, and we're going to listen to you, both your comments and your views. Unlike Federally-mandated projects, a public hearing is not required for this EIS, but the City wants to give the opportunity for the community to voice their comments. As DeeDee said, after the public comments, we'll have four stations in the back. And let me then provide you with our speaker from Wilson Okamoto. Thank you very much.

*(Rodney Funakoshi)* Good evening and thank you for coming. My name is Rodney Funakoshi, we're the consultants for this project, both for the preparation of the Facilities Plan as well as for the Environmental Impact Statement, which is currently in the Draft EIS stage. What I'll run through is about a 15-minute overview of both the Kailua-Kaneohe-Kahului Facilities Plan, as well as important points about the Environmental Impact Statement. And again, the deadline for comments on the EIS is December 23<sup>rd</sup>. And this project is sponsored by the City's Department of Design and Construction and Department of Environmental Services. And consultants on this project are Wilson Okamoto and Associates, we're a Honolulu planning and engineering firm, and Brown and Caldwell Consultants as well. So we have staff from both of our companies here tonight.

First, a brief overview of the regional wastewater system. The region is served by the Kailua Regional Wastewater Treatment Plant, located here in Aikahi, and the boundaries stretch from Kahului area—Waikane area down to the Lanikai-Keolu Hills area, so covering, basically, the communities of Kahului, Kaneohe, and Kailua. The former Ahuimanu Wastewater Treatment Plant and the Kaneohe Wastewater Treatment Plant were converted to preliminary treatment facilities in a regionalization of the system in the early 1990's, and this was a recommendation of the previous facilities plan. And therefore, all wastewater now is pretty much collected and transported to the Kailua Regional Wastewater Treatment Plant shown here in this picture. And at this plant it receives a secondary level of treatment and is then discharged through the Mokapu Outfall off of the Mokapu Peninsula, approximately 5,000 feet offshore.

The Facilities Plan preparation was triggered by a consent decree. Goals of the Facilities Plan update include the prevention of sewer spills and overflows; general improvement of the sewer service to Windward Oahu; the extension of service to residential areas not currently served by the public sewer system; planning for future improvements in a manner that reduces odor and noise impacts, protects the public health, and protects water resources and the environment. Finally, the—the planning process has sought to inform and seek public input in the Facilities Plan. Schedule: the Final Facilities Plan was approved in September 1998, and the EIS Preparation Notice was also issued in September 1998. The Draft EIS was published and issued in November 1999, in which we're currently in the public review phase of the Draft EIS, and the Final EIS is expected to be completed by March 2000.

Major aspects of the proposed Facilities Plan covered in the EIS: essentially, the proposed Facilities Plan proposes no new treatment facilities at the Kailua Wastewater Treatment Plant, with exception of the UV disinfection facility currently under construction; proposes to implement flow equalization in the Kailua area, and basically what this is is to provide for temporary storage of flows—wastewater flows during heavy storms because these provide—these result in the peak flows to the plant. We have miscellaneous regional wastewater treatment plant improvements. We have a storage, again, for flow equalization at the Kaneohe Preliminary Treatment Facility of 6.4 million gallons are proposed; at the Ahuimanu Preliminary Treatment Facility, 0.6 million gallon storage facility. The rehabilitation in the collection system of seven

basins; a variety of relief line projects, primarily major relief lines; the replacement of force mains that would occur within the 20-year period; improvements and modifications to virtually all of the pump stations, 22 pump stations in the region; and finally, implementation of nine sewer improvement districts. And the handout map summarizes and shows the locations of these various improvements.

At the Kailua Regional Wastewater Treatment Plant, primarily, again, internal modifications to existing facilities, with the exception of the ultraviolet disinfection facility shown in red, but beyond that we do have improvements to the influent pump station, the headworks, the primary and secondary clarifiers, and, as well as the dewatering building. At the Kaneohe Preliminary Treatment Facility, primarily flow equalization as well as improvements to the preliminary treatment system. At the Ahuimanu Preliminary Treatment Facility, a new preliminary treatment system, odor control, as well as a 0.6 flow equalization tank. And again, this map shows an overview of all the proposed wastewater system improvements throughout the region.

We mentioned the need for equalization in the Kailua area. If you recall from previous diagrams, we do have—we do provide for equalization in the Kahului and Kaneohe areas, but in the Kailua area, there is not a similar—aside from the existing treatment plant, any area, so we had to pretty much undertake a search. And we've looked at to provide for such storage. And I guess the reason why, again, the reason why we are trying to get an equalization basin or some facility established for this purpose is because of the need to temper the heavy flows that do—that could reach the plant during storms. And, what we have looked at is a number of places, including Mid-Pacific Country Club, Puu O Ehu Hillside, even at the Kailua Regional Park. We've looked at adjacent to pump stations, including the Kailua Road Wastewater Pump Station, as well as further up in the Kapaa Industrial Park area, as well as below the plant for the Marine Corps Base Hawaii and throughout the area, the potential for in-pipe storage, basically underground pipe storage of these flows.

What this diagram shows is sources of infiltration and inflow, which really are a cause for the high flows during peak storms, which really, the treatment plant would be taxed and would need to be substantially expanded. And therefore, we need to find some ways of controlling it. And one way, of course, is to control infiltration into the collection system,

as well as inflow—direct inflow during storms. And sources of this—the green shows the property line, and above that, where you have private property, you can have defective clean-outs, illegal storm drain connections to the sewer lateral, as well as various types of leaks and root penetrations. On the lateral side you can have all kinds of deterioration of the pipes, leaks at the joints, cracked pipes, deteriorated or leaking manholes that contribute to the problem. So the City does have a long-term infiltration/inflow study and plans to implement over the next 20 years, as well, to help address this problem.

Again, the alternatives for flow equalization in the Kailua area. We've looked at a number of alternatives, and what this table shows is basically scenarios dependent on the extent of the infiltration/inflow reduction. And we have here—what we consider a conservative 35 percent level of reduction as well as what we more likely anticipate, a 40 percent plus level of reduction in infiltration/inflow. And on the left hand column we have both a two-year storm and a five-year storm, which was, at the time of the Facilities Plan, both options were retained. The City has since decided to pursue a two-year storm, and has justified this to the satisfaction of the EPA. And, basically what the recommendation of this—the favored recommendation of the Facilities Plan was for in-pipe storage along a portion of the current Kalaheo Avenue Replacement Sewer Reconstruction Project, as well as placement of a new pipe for storage of these flows in the area between the Kailua Heights Wastewater Pump Station and the Kailua Road Wastewater Pump Station. So these would run along Wanaao Road and Kailua Road. But other options that were also looked at and are still feasible for consideration include storage at the Kailua Wastewater Treatment Plant at which there are currently some unused tanks which are simply laying idle. We also looked at—still retained the possibility of an equalization basin at the Marine Corps Base Hawaii Kaneohe Bay, as well as at the Kailua Road Wastewater Pump Station, and that's near the entrance to Kailua. And I guess this shows a combination of alternatives for storage. And this is a photo of the Marine Corps Base Hawaii. The treatment plant—the Marine Base has a treatment plant of its own that produces secondary treated effluent, and the equalization facility would be sited adjacent to it, approximately in this area. (*Vernon Thomason: Do they use the same outfall? The Marine Base, do they use the same outfall?*) Yes, the same outfall is used as the Kailua Plant. Of course, the other possibility that we looked at is a vacant parcel adjacent to the Kailua Road Wastewater Pump Station, and this is at the entrance to Kailua

where, you know, there's a Kailua sign on this side of the road. This is looking mauka and the vacant parcel does have the potential for use. It would be partially underground as well as mounded over and landscaped, and so—and because of the obvious potential visual impacts, we did provide a character sketch that might show what this would look like.

I'll run through some major identified impacts in the EIS. Of course, the EIS, again, is available at your major libraries as well as at the City for review. Relative to surface and coastal waters, we see beneficial impacts due to major improvements in the system to try to collect and store, and reduce the infiltration of storm water to the system that would help prevent spills and bypasses. Wetlands, there are potential impacts if the Marine Corps Base alternative is pursued because of potential impacts to adjacent wetlands and Nuupia Ponds. That would trigger, of course, the need for permitting mitigation-type measures. Socio-economic impacts, primarily due to the substantial capital cost to implement the system, approximately \$386 million, as well as, of course, sewer improvement district fees which would be assessed to the homeowners affected by the improvements districts. Construction impacts, of course, due to primarily noise, air quality, and traffic impacts for the duration of construction and the various projects, of course, primarily affecting the adjacent and surrounding residences and businesses. Odor and air quality, again, major impacts. As part of the Facilities Plan, as well as the ongoing program of the City, there is substantial efforts under way to try to mitigate odor and air quality emissions from the Plant. Noise impacts, as well, have been studied and primary noise sources at the Plant have been identified, and mitigation measures to baffle, or otherwise attenuate the sound have been proposed.

Major EIS alternatives, as well as Facilities Plan alternatives considered include no action, although this is not really an alternative because of the consent decree. We did look at, early on, the resumption of secondary treatment at the Kaneohe and Ahuimanu Plants. We looked at blending secondary treated and primary treated sewer flows, while still maintaining acceptable levels of effluent quality, and that was feasible but also rejected early on. We also looked at maximizing storage throughout the region, as well as maximum rehabilitation of various basins—collection basins in the area, and a variation of this is basically what has been proposed in the Facilities Plan. And finally, we also did look at the option of relocating the Kailua Regional Plant upland to the Kapaa Industrial

Park. And we did—this shows a view mauka. This is the former Kapaa Landfill. And this is the industrial area below, and that currently has some vacant acreage, but there's also potential for additional acreage that had been proposed at one time by the owner for additional industrial use as well. And so adequate area is available, and we have looked at a long-term staging plan, if the City had decided to pursue this, as well as costs. This of course is higher elevation land. Wastewater collected at the Kailua Treatment Plant would need to be pumped uphill to this area. But it is feasible for the long-term, except at a very substantial cost, approximately \$300 million more than the current Facilities Plan total cost. And we do have detailed costs provided in the Facilities Plan. Though the Facilities Plan did recommend a continued study of this alternative, it was rejected for the EIS in terms of the recommended alternative.

Unresolved issues... Which of the Kailua equalization alternatives to select, again, is really dependent on the current infiltration/inflow program and the extent of reduction that would be achieved, would help determine, you know, what would be the ultimate alternative for equalization there. Odor mitigation, it is ongoing and is yet unresolved. As mentioned, there are—there have been—you know, it is very high priority of the City, numerous initiatives underway to mitigate odor. And I guess I should also mention that the City does have a website that does summarize a lot of their odor and noise mitigation efforts. Of course, a lot of the details of the Facilities Plan project—in terms of funding, phasing, permitting—are pending. Future, more detailed designs and environmental reviews will be forthcoming as the preliminary engineering and design progress. And that concludes the overview.

(DeeDee Letts) At this time, if you didn't sign up on the sheet to testify and... (inaudible)...and if I mispronounce anybody's name I apologize in advance. James...? Corcoran. Thank you.

(James Corcoran) Guess I'll speak to the screen.

(DeeDee Letts) Oh, you can speak any way you want; it's just that the mike was back there. If you want to turn it around, I'll let you know when you're getting close to your time, that's all.

Testimony

(James Corcoran) My name is James Corcoran and I'm representing, first of all, the Kailua Neighborhood Board as the Vice-Chair for the Environmental Committee. The Chair has authorized me to provide this input. This is the result of the Kailua Neighborhood Board meeting on December 6th, 1999. The Kailua Neighborhood Board has the following comments regarding the Draft EIS, this is here for a Draft EIS tonight.

The Kailua Neighborhood Board generally supports the preferred alternative identified in the Facilities Plan and the EIS.

The Kailua Neighborhood Board strongly opposes the process that was used to develop the Facilities Plan. The Plan was developed and approved in September of 1998, prior to the completion of the revised Koolauapoko Development Plan, which has been renamed *Sustainable Communities Plan*.

City Response

(Kailua Neighborhood Board)

⇐ The Kailua Neighborhood Board's support of the Kailua-Kaneohe-Kahaluu Facilities Plan's preferred alternative is gratefully acknowledged.

⇐ As indicated in Section 1.2.1 Preparation of the Facilities Plan Update and Section 1.4.1 Consent Decree in the Draft EIS, the update of the Facilities Plan was triggered by a Consent Decree (Save Our Bays and Beaches, Hawaii's Thousand Friends, Sierra Club, and the Surfrider Foundation vs. City and County of Honolulu, Civil No. 92-00263 DAE) executed in August 1995. The Consent Decree stipulated that the Facilities Plan be completed by September 30, 1998.

Currently, the Koolauapoko *Sustainable Communities Plan* Public Review Draft (June 1999) is with the Honolulu City Council for approval. Section 5.6.3 Koolauapoko *Sustainable Communities Plan* of the Draft EIS discusses the relationship of the Facilities Plan to the applicable General Policies and Planning Principles and Guidelines of the draft Koolauapoko *Sustainable Communities Plan*.

⇐ In undertaking the Facilities Plan, environmental impacts of the Plan's recommended improvements and alternatives were carefully assessed, although not in a formal environmental impact statement format. A total of 15 alternatives were evaluated in the course of the Facilities Plan preparation, in which each alternative was assessed and evaluated against a set of evaluation criteria which included the following:

- Compliance with Water Quality Requirements - spill reduction, regulatory agency approval and other required permits
- Cost-Effectiveness - capital and estimated annual operation and maintenance costs for proposed improvements to the collection, treatment and disposal systems based on the 5-year storm flows

## Testimony

## City Response

- Community Compatibility – odor/noise, recreation/visual, economic, and traffic
- Environmental Impacts – water quality, flooding, archaeology, and flora/fauna/other environmentally sensitive resources.

The alternatives and evaluation were presented to the public for input at four public informational meetings held in March 1997, April 1997, March 1998, and August 1998. Additional meetings held to solicit input on the Facilities Plan included: an Iana Street community meeting held in June 1998, a Kailua Neighborhood Board No. 31 Planning/Zoning and Environmental Committee meeting held in April 1998, and two Kailua Neighborhood Board No. 31 meetings held in May 1998 and July 1998. A public hearing on the Final Facilities Plan was held in September 1998.

The City and County had not yet reconciled, at that time, whether to use the two-year or the five-year storm criteria. Again, the community was asked to accept a facilities plan, at that time, that had left a major issue unresolved. We suggest that the EIS include the recommendation that the Facilities Plan be re-examined by the community and others, based on the information in the revised Development Plan, the two-year storm designation, and the EIS, to assess if the Facilities Plan meets the needs and approval of the community.

← A range of scenarios were developed for the Facilities Plan to reflect the uncertainties in planning for a 2-year, 6-hour versus a 5-year, 6-hour storm event, instead of a recommended single course of action. The Facilities Plan also included an evaluation of the various 2-year and 5-year storm scenarios relative to the following criteria: construction costs, construction impacts, environmental impacts, and community compatibility. As such, the uncertainty of using the 2-year versus the 5-year storm event is not deemed to be a major unresolved issue with respect to acceptance of the Facilities Plan.

We do wish to clarify that the City does not as yet have written concurrence from the EPA to use the 2-year, 6-hour storm event. Therefore, Section 2.1.2.1 Kailua Basin Flow Equalization Facilities Alternatives, paragraph 2, last sentence of the Final EIS will be revised as follows: "However, the City has since established a policy to use the 2-year, 6-hour storm event with *pending* the concurrence of the EPA (see Section 1.4.2)." Likewise, Section 1.4.2 Projected Flows, paragraph 5, last sentence of the Final EIS will be revised as follows: "~~The EPA has indicated their concurrence with Concurrence by the EPA is pending regarding the approach used for this determination.~~"

Lastly, we would note that the Facilities Plan is not meant to be a static document, and will be subject to future revisions and updates, particularly as new information or further examination of major proposals indicate that a different direction should be pursued

City Response

← The Kailua Neighborhood Board's support of the discussion and possible staging strategy for relocating the Kailua Regional Wastewater Treatment Plant (WWTP) to Kapaa is acknowledged. However, since this alternative was not the recommended course of action for the Facilities Plan, it would be inappropriate to assess the relocation of the WWTP to Kapaa as a preferred alternative. However, should the relocation of the plant to Kapaa be determined to be a more viable alternative in the future, the Facilities Plan could be amended and a Supplemental EIS could then be prepared.

← The City is continuing to address the existing noise and odor problems at the Kailua Regional WWTP as indicated in Section 4.5.3 Mitigation of Odor Problems and Section 4.6.3 Recommended Noise Mitigation in the Draft EIS. As depicted in Table 2-6 Phasing Plan of the Draft EIS, the phasing plan gives priority to implementing odor and noise control improvements at the WWTP.

← Should the relocation of the Kailua Regional WWTP to Kapaa be determined to be a more viable alternative in the future, the Facilities Plan could be amended and a Supplemental EIS could then be prepared.

← The Mid-Pacific Country Club equalization basin alternative was eliminated from further consideration. Other alternatives which remain feasible include an equalization basin at the entrance to Kailua adjacent to the Kailua wastewater pump station, the reuse of existing unused clarifier tanks at the Kailua Regional WWTP, and a flow equalization basin at the industrial-zoned Kapaa Industrial Park.

The Facilities Plan's recommended option for flow equalization is the provision of in-pipe storage by rehabilitating portions of the existing 36-inch and 66-inch lines along Kalaheo Avenue, and providing a new 60-inch gravity line along Wanaao and Kailua Roads. As implementation of any Kailua Basin flow equalization is not expected until the year 2005 to 2010 period, preliminary engineering at this future stage will further define the best alternative to pursue. Accordingly, it would not be prudent for the City to eliminate any of the Kailua Basin flow equalization alternatives identified in Section 2.1.2.1 Kailua Basin Flow Equalization Facilities Alternatives in the Draft EIS from consideration at this time.

Testimony

The Kailua Neighborhood Board supports the discussion and a possible staging strategy for relocating the Plant, or placing the Plant at Kapaa Industrial zone. The Kailua Neighborhood Board would like the Final EIS to include that plan, not as an alternative to the proposed action, Section 6, but rather to have it included as part of the 20-year Facilities Plan.

The Kailua Neighborhood Board continues to urge the City to address the ongoing noise and odor problems at the current facility.

Also, we recommend that the City prepare a Supplemental EIS on the relocation of the facility to the Kapaa Quarry and the potential impact to the Kawai Nui Marsh.

On September 3rd, 1998 last year, the Kailua Neighborhood Board passed a motion that reads, "The Board opposes placement of a sewage holding tank, also known as an equalization basin, on Mid-Pacific Country Club property at the end of Iana Street, the entrance to Kailua, and at the existing Aikahi Treatment Plant. We further ask the City to issue a statement declaring that it has eliminated this proposal from all future planning. The Board also suggests that the City delay final decision on this matter, and that such final decision provide that any equalization basins necessary for the upgrade of the K-K-K wastewater system be located on industrial-zoned land in preference to sites near any homes or businesses. That motion carried last year 13 to 1.

### Testimony

The Kailua Neighborhood Board would like to continue working with the City and County in implementing the Facilities Plan. The KNB thanks you for the opportunity to provide comments on a subject which greatly impacts our community.

(James Corcoran) Now, I'd like to take off my Neighborhood Board hat and put on my resident Maunawili hat from Kailua.

One, this is not a public hearing as announced to present testimony for the K-K-K Wastewater Facilities Plan Environmental Impact Statement EIS, but rather it is to address the Draft EIS, and I should like to see that all of the paper work and slides and everything include the word "draft" before EIS.

Two, page 2-12, paragraph 1, the last sentence in the Draft EIS reads, "The City has established the policy to use the two-year, six-hour storm event, with the concurrence of the EPA." Discussions with Mr. Tim Steinberger on December 1, 1999 indicate that the City does not have EPA concurrence to use the two-year design plan. It is recommended that that sentence be changed to read, "The City has established a policy for—to use the 2-year, six hour storm event pending the concurrence of the EPA."

Three, in this regard, the public is to be made aware that all four alternatives as shown up here, and as shown in the Draft EIS, are still alive and that any one of these alternatives could end up being used, ultimately.

And then four, throughout the document where reference is made to the installation of a new sewer system on Maunawili Road, throughout the document that should be changed to read Maunawili Circle instead of Maunawili Road. Thank you.

(DeeDee Letts) Ok, Vernon Thomason?

### City Response

← The City looks forward to continuing working with the Kailua Neighborhood Board in implementing the Facilities Plan improvements.

(James Corcoran)

← We acknowledge that the subject public hearing was on the Kailua-Kaneohe-Kahaluu Facilities Plan Draft Environmental Impact Statement. This will be reflected in the Final EIS, where appropriate.

← We wish to clarify that the City does not as yet have written concurrence from the EPA to use the 2-year, 6-hour storm event. Section 2.1.2.1 Kailua Basin Flow Equalization Facilities Alternatives, paragraph 2, last sentence of the Final EIS will be revised as follows: "However, the City has since established a policy to use the 2-year, 6-hour storm event with pending the concurrence of the EPA (see Section 1.4.2)." Likewise, Section 1.4.2 Projected Flows, paragraph 5, last sentence of the Final EIS will be revised as follows: "The EPA has indicated their concurrence with Concurrence by the EPA is pending regarding the approach used for this determination."

← As indicated in Section 2.1.2.1 Kailua Basin Flow Equalization Facilities Alternatives of the Draft EIS, the four alternatives for the 5-year, 6-hour storm event are retained for consideration since these options could be found to be more favorable upon further engineering analysis.

← Figure 2-1 Proposed Wastewater System Improvements will be corrected in the Final EIS to reflect Maunawili Circle Sewers instead of Maunawili Road Sewers. All other references to Maunawili Circle Sewers Improvement District are properly referenced in the Draft EIS.

City Response

Testimony

(Vernon Thomason)  
← Your commendations to Mr. Scott Schultz, Windward Region Superintendent, are much appreciated.

(Vernon Thomason) I put my name down in case there was something came up that I wanted to comment on. Nothing really came up, so I would like to express a few thoughts. First of all, to thank Scott for being a good neighbor, for hearing us and doing all he can as far as the odor, the noise, the beautification, even though it seems as though the freeze has gotten some of your trees down there. Last, a Merry Christmas, a Happy New Year, and a good new century coming up, and may you have health and happiness throughout, and no foul-ups on the wastewater.

(DeeDee Letts) Steve Kubota.

(Steve Kubota) Good evening and thank you for the opportunity. I have made some notes, I wasn't prepared to finalize them in writing till I heard some of the comments this evening, but I'll submit them later. But I wanted to just share some concerns, and they're not in terms of criticizing the Plan, so much as perhaps suggesting areas that need to be clarified.

First of all, one issue that I wasn't clear on, there's a proposed upgrade of 7 MGD from 28 to 35 MGD. And yet, the planned sites that's based upon the basic 3 percent growth in population. So that's a 20 percent increase for a 3 percent population growth. Is that increased capacity based on the inflow/infiltration that's going to be processed? Why is that huge increase in capacity when the Plan also calls for controlling the infiltration? I couldn't understand that cost, if you will.

And that again speaks to what is the effectiveness of the control measures for infiltration. The issue on the infiltration, I was wondering whether, also, the assessment has been made, what's going in is also coming out. I mean, the infiltration issue is during peak flows, but during other times those pipes are obviously leaking. I didn't see any assessment on the environmental impact of the leaks of the pipes. I don't—and I, I apologize if it's in there, but I wasn't clear that that was going to be addressed also. Obviously, it's going to take a long time. So anyway, those are some of the general comments.

(Steve Kubota)

← The increase in plant capacity is needed, along with flow equalization facilities and rehabilitation of collection system lines, to accommodate a modeled peak flow of 85 MGD. This peak flow is mostly due to infiltration/inflow to the system, and not the population growth, which is very low as you point out.

← The provision of relief lines and the rehabilitation/replacement of lines throughout the region will result in improved structural integrity of the lines, in addition to increasing the collection system's capacity. Nevertheless, it is acknowledged that potential failure of the lines due to leakage or accidental breakage could result in water quality impacts to surface, coastal and recreational coastal waters and groundwater. Section 4.2.2 Groundwater and Section 4.3.4 Wetlands of the Draft EIS address the potential impacts to groundwater and wetlands and associated mitigative measures, respectively, due to leakage or accidental breakage in the lines. To address the potential water quality impacts on surface, coastal and recreational coast waters which could result from leakage or accidental breakage of the collection system lines, the Final EIS will include the discussions under the respective sections as indicated in Note 1 (attached).



City Response

Testimony

We acknowledge the Ahupuaa Action Alliance's efforts in working with various agencies in requesting use of the ahupuaa model for planning of water resource facilities, but we are unclear at this time how the concepts could be applied to our wastewater planning system.

More specifically, which I was trying to tie it in, I guess the previous gentleman commented that this plan was not—or addresses the Koolaupoko Sustainable Communities Plan. And I should address myself to you also speaking for the Ahupuaa Action Alliance. And we have been working quite a lot with the various agencies asking for the use of the ahupuaa model in planning for—for especially for facilities of this nature that deal with water resources.

The Koolaupoko Sustainable Communities Plan did incorporate the concept. This particular issue of the ahupuaa as a cultural landscape speaks to water management, but also in your assessment, Section 3.4.5 of Historic Sites, I'm assuming you're complying with Chapter 343. OEQC has produced guidelines for assessing cultural impacts, and they go beyond just addressing historical sites. It does speak to—in their guidelines, published in 1997, they speak to not only looking at the sites, but the social and cultural impacts of the use of those sites. And there are many, many resources, which you've identified, wetlands and so forth. But there are also areas that have cultural significance, especially for Native Hawaiians in terms of wetlands are not just wetlands, but they are also potential taro lands. So, if those traditional cultural uses are not accounted for, you might discount wetlands for birds or flood, but there may be a different water quality standard for raising taro. So I think it's important to look at those guidelines for cultural impacts. It would require more contact with the community than is apparent up to this stage in the Draft. So that's one general thing.

As indicated in Section 4.3.5 Historic Sites and Archaeological/Cultural Sites in the Draft EIS, construction of the proposed wastewater facility improvements will require excavation of the affected areas to a sufficient width and depth which may potentially encounter subsurface archaeological or historic sites, especially in previously undeveloped areas. Potential impacts to any archaeological, cultural or historic resources that may be encountered during construction of the proposed improvements will be mitigated by complying with Chapter 6E, Hawaii Revised Statutes, Historic Preservation. Construction of the Marine Corps Base Hawaii (MCBH) Kaneohe Bay equalization facility, if pursued, will be in accordance with the Base's Cultural Resources Management Plan (1996) which provides guidelines to manage all forms of ground disturbance on Mokapu Peninsula to avoid or mitigate negative effects on historical and cultural resources which may be present. With respect to cultural resources such as wetlands, Section 4.3.4 Wetlands of the Draft EIS indicates that no significant impacts on wetlands are anticipated during construction or operation of the proposed facility improvements, with the exception of the MCBH Kaneohe Bay equalization facility site. Potential impacts to wetlands will be mitigated by the provision of flow equalization facilities, collection system improvements and designing the facilities with adequate capacities, thereby reducing the probability of spills and bypasses to wetlands during periods of heavy rainfall.

A discussion of the potential of effluent reuse for irrigation purposes was included in the Kailua-Kaneohe-Kahaluu Facilities Plan, and will be incorporated in the Final EIS under a new subsection in Section 3.11.2 Wastewater System as indicated in Note 2 (attached).

In relation to that, reference is made to several other plans and policies—Hawaii State Plan, the Coastal Zone Management Plan, etceteras. I just would like for the record to note that the Water Commission, State Water Commission, has already announced a process to review the Hawaii Water Plan, and it's relationship to this plan is that the new Hawaii Water Plan is attempting to take an integrated approach which does call for looking at wastewater reuse. And I didn't see wastewater reuse addressed in this Facilities Plan. So under the overall constitutionally-

### Testimony

mandated Hawaii Water Plan and the Water Commission's announced strategy to look at an integrated plan, I think there should be some discussion about the potential for wastewater reuse. More specifically, the Oahu Water Use and Development Plan, which is mandated by the Water Code, the Board of Water Supply has also initiated a—what's been called the Integrated Resource Plan and the Board of Water Supply is acting on behalf of the County Planning and Permitting Department to implement that plan, and again, they're looking at integrated resource management. So again, the wastewater reuse issue should come into play.

More specifically, I think the question of the interrelationship of the storm water system has a major bearing on taking a more integrated approach. Your primary need for this plan other than the consent decree is stated as the inflow from groundwater infiltration and storm waters. The reason I mention the link to the Board of Water Supply is we've discussed with the Board of Water Supply the potential for doing upland detention of storm water. If somehow you could coordinate with the Board, with the storm water division to do—you know, I know you're talking about flow equalizers. But if that flow is coming from storm water, then it might help to do constructed wetlands or other storm water detention systems away from the sewer system to reduce the—what-do-you-call—the hydraulic overload. So the idea of doing a more integrated strategy with the other agencies might reduce some of the projected cost. I'm assuming your costs are based upon the Facilities Division assuming total control, but it may be cheaper for the rate payer that if this were done on an integrated basis.

There's another question on the health—just, maybe a technicality, I don't know, but in your water quality standards, water quality improvements, you cited Chapter 11-54, the Water Quality Standards. Just received a notice from the Department of Health. They are revising those standards. And those standards are including more attention to biological water impacts on—biological assessments of water quality, so I would think that it would be important to look—I think they will be finalizing those by the early part of next year. They're in the final stage; they've already completed the hearing. So any of your water quality standards in this project should take into account these new State Water Quality Standards.

### City Response

← For the most part, the infiltration of storm water flows into the existing municipal sewer system are not attributed to surface flows. The infiltration is caused primarily by storm water that percolates into the ground and enters the sewer system through cracks and breaks in the collection system lines. As such, constructed wetlands or storm water detention systems may not be effective in reducing this problem.

← At this time, the proposed amendments to the State Department of Health's Hawaii Administrative Rules, Title 11, Chapter 54, Water Quality Standards are not officially approved. Once the proposed amendments are approved and in effect, the City will take into account the new water quality standards as they may apply to the proposed wastewater facility improvements.

## Testimony

I guess, one other area that I think is a major concern is the aesthetics, and I wanted to just suggest that you examine the—the area, phyto remediation. The Department of Defense is doing a lot of this; the use of plants to actually mitigate pollution. And I think in the area of landscaping, a lot could be done there, and that simply is—to put it simply, this facility here could stand a lot of trees, not only for visual improvement, but, and I don't normally endorse eucalyptus, but the eucalyptus is one of those that could enhance odor—or mitigate odor, you know, so looking for plants that can actually be used to—around all of the facility. In many jurisdictions, these plants are also being used to remove pollutants from the soil. So where you had sewer spills or leaks, the selective use of plant landscapes could actually relieve some of that leakage or the bacteria, odor, etcetera.

So I would stress, especially in Hawaii, because of our climate, this might be also a very cheap—cheaper way, but also provide us with a lot of good research that could lead to wastewater reuse in terms of constructed wetlands. In other words, the time we spend studying the use of plants can pay off in the long-run, in the 20-year, because some of these technologies could be used for wetland treatment systems.

And just a final note on wetlands, the new wetlands policy for the State reflects the new Federal wetlands policy which shifted from no-net-loss to a new net-gain policy. And I would encourage you to look at that net-gain policy in terms of your assessments of the land in the area impacted by this Facilities Plan. Again, both in encouraging working with, for example, taro farmers to increase wetlands to keep storm water away from your facility. So there's a kind of a reaching beyond the usual jurisdiction in creating partnerships with the community.

## City Response

← Your suggestion regarding the use of phyto remediation to mitigate pollution such as odor and for aesthetic purposes is acknowledged. Landscape improvements for aesthetic purposes have recently been completed at the Kailua Regional WWTP, including the planting of a row of trees along the Aikahi Park boundary for screening purposes. Regarding odor, the City is pursuing the implementation of more permanent short-, intermediate- and long-term mitigation measures at the WWTP to reduce odor emissions. The proposed facility improvements, including the provision of flow equalization facilities, collection system improvements, Sewer Improvement Districts, and adequate capacity design are intended to reduce the probability of spills and leakage in the collection, treatment and disposal systems.

← The concept of wastewater reuse through constructed wetlands is not deemed to be a viable alternative. Foremost, it is a land-intensive use that would require a large amount of acreage. A suitable location would need to be found that is in close proximity to the treatment plant and preferably not located near any residential areas. Transmission lines would also need to be constructed from the treatment plant to the wetland, as well as a transmission system from the wetland to the reuse area(s). Furthermore, if sufficient wetland storage is not provided during periods of heavy rainfall, a diversion system for the effluent would need to be provided. Following wetland treatment, the quality of reclaimed water would need to meet State Department of Health reclaimed water quality standards. One potential concern would be the attraction of waterbirds to the wetland, which would increase the nitrogen concentration levels. Also, the entire wetland would need to be lined to prevent ground seepage.

← As indicated in Section 4.3.4 Wetlands of the Draft EIS, the proposed facility improvements are anticipated to have no significant impacts on wetlands, with the exception of the MCBH Kaneohe Bay equalization facility site. If the MCBH Kaneohe Bay equalization facility alternative is pursued, environmental permitting requirements, including a wetlands mitigation plan would need to be addressed. Additional environmental investigations and mitigation, such as the enhancement of wetland habitat elsewhere on the Base, may be required.

### Testimony

The final point I make is when you use an integrated strategy, I didn't see anything in here about consumer education, or actually, I should say user education. The idea of incentives... the rate-payers are paying flat rates. There is no incentive, for example, for the people from Kahaluu, who is primarily residential, compared to the people in the industrial area of Kaneohe or eicetera. In other words, it appears to me that residential users are subsidizing business and industrial user, under the flat rate system. So there is no incentive for people to do things like be careful about chemicals being introduced into the drain system. You do have a site that talks about household waste, and on your site you also have a pre-treatment program for commercial and industrial users. An integrated strategy would say the long-term, in the 20-year program, there should be a lot of user education; not just to keep building facilities, but to reduce what's going in the system, to reduce the chemicals, which reduces the cost of treatment. So really, I guess, bottom line is to look at bringing this Facilities Plan in line with the trend that's occurring in other planning, which is integrated resource management. Get the consumer involved, get the public involved. Make the public aware. You've made it clear that the public is going to pay for this. So they should have a role in helping to bring the cost down, maybe through better use and more awareness about what they put in the drain. You know, we're told that the water coming in our faucets is pure, but nobody cares about what goes down the drain. That's a 12-inch gap in our system. You know, every one of us uses the faucet daily. I think we could get a lot from that. Thank you.

(DeeDee Letts) Okay, thank you. I only have two more speakers signed up, so if anybody else would like to speak this evening, please sign up, and that's why I'm being generous with the time. Terry Carroll?

(Terry Carroll) Hi. Good evening. Thank you for coming out to the community, giving us an opportunity to speak on your plan. I'm just concerned, as the first speaker Mr. Corcoran had stated, about whether the EPA has given concurrence on the two-year versus the five-year storm plan. And my concern is that if you don't get the concurrence with the two-year storm plan and, or, if the preferred alternative changes, and it seemed to indicate on one of the last couple of slides that it's still an unresolved issue as to the flow equalization, which proposal you're actually going to use, that before the Final EIS document comes out, that

### City Response

← Your point is well taken. Increased emphasis on public education is needed. The City will be undertaking increased efforts to educate the public, especially through our Infiltration/Inflow Minimization Program.

(Terry Carroll)

← We acknowledge that the City does not yet have written concurrence from the EPA to use the 2-year, 6-hour storm event. Section 2.1.2.1 Kailua Basin Flow Equalization Facilities Alternatives, paragraph 2, last sentence of the Final EIS will be revised as follows: "However, the City has since established a policy to use the 2-year, 6-hour storm event with *pending* the concurrence of the EPA (see Section 1.4.2)." Likewise, Section 1.4.2 Projected Flows, paragraph 5, last sentence of the Final EIS will be revised as follows: "~~The EPA has indicated their concurrence with Concurrence by the EPA is pending regarding the~~ approach used for this determination."

### Testimony

if this preferred alternative changes or if the EPA does not grant you the two-year storm plan, that the community be given an opportunity again to comment on the Draft before it becomes a Final...you know, in the event that the preferred alternative changes. And so those are my comments and I thank you again for the opportunity to speak.

(DeeDee Letts) Thank you. Charles Prentiss? Chuck?

(Charles Prentiss) Good evening, Madam DeeDee, members of the group. I'm Chuck Prentiss and I'm the Chair of the Kailua Neighborhood Board Planning and Zoning Committee. Jim Corcoran covered most of the Neighborhood Board position, and I won't repeat any of that. I do have one statement, but the report has raised some questions in my mind that I can't resolve. Anyway, it might be just my way of reading the thing wrong.

But, for example, on page 1-3, you say that the current capacity, or average daily flow of the Plant is 15.25 million gallons per day, and that you will be expanding it to 28 to 35.6 million gallons a day...is the way I read that. That's on page 2-2, it says that. That's doubling the size of the Plant, in my mind, and as Steve Kubota mentioned that, the population of this area in the General Plan is programmed for very slow growth....a matter of three or four percent through year 2020. And it would—in my mind, be compared to that if the Plant capacity was being increased by three or four percent, rather than 50 percent. So I don't understand that and I was hoping that maybe you could clear that up.

### City Response

Please note that the Facilities Plan is not meant to be a static document, and will be subject to future revisions and updates, particularly as new information or further examination of major proposals indicate that a different direction should be pursued. Should a more viable alternative be determined in the future, the Facilities Plan could be amended and a Supplemental EIS could then be prepared.

(Charles Prentiss)

← We wish to clarify the distinction between wastewater flow (i.e., average daily flow) and treatment capacity at the Kailua Regional WWTP. Regarding wastewater flow, as indicated on page 1-3 of the Draft EIS, the WWTP is designed to treat an average daily flow of 15.25 mgd. In 1998, the facility processed an average of approximately 12.52 mgd. Section 1.4.2 Projected Flows of the Draft EIS indicates the projected daily average flow by year 2020 to be 13.9 mgd. Regarding treatment capacity, as indicated on page 2-2 of the Draft EIS, the Kailua Regional WWTP would be modified to handle secondary treatment from 28 mgd to 35.6 mgd. The plant's treatment capacity will always be higher than its average daily flow to ensure that the wastewater can be adequately processed and treated. The higher treatment capacity is also intended to accommodate peak flows and storm flows which may substantially increase wastewater flows through infiltration and inflow. Essentially, the higher the plant capacity, the greater the protection against potential spills and overflows.

Existing and projected wastewater flows for the region incorporate population and land use considerations as provided by the City and County of Honolulu Department of Planning and Permitting, as well as infiltration/inflow into the system from storm flows. This includes the 3.2 percent projected population increase for the projected wastewater flows.

### Testimony

The other thing was that, Terry Carroll touched on this, Rodney, in his presentation, said that the equalization issue was unresolved, but the report chooses one of the alternatives. So that confuses me also. Now, you choose the in-pipe storage in the report, but then in the presentation you say that it's unresolved. I don't know if that relates to the EPA approval and non-approval of the two-year design storm or not, but that's a question that I have.

### City Response

← A range of scenarios were developed for the Facilities Plan to reflect the uncertainties in planning for a 2-year, 6-hour versus a 5-year, 6-hour storm event, instead of a recommended single course of action. The Facilities Plan's recommended option for flow equalization is the provision of in-pipe storage by rehabilitating portions of the existing 36-inch and 66-inch lines along Kalaeo Avenue, and providing a new 60-inch gravity line along Wanao and Kailua Roads. As implementation of any Kailua Basin flow equalization is not expected until the year 2005 to 2010 period, preliminary engineering at this future stage will further define the best alternative to pursue.

We acknowledge that the City does not yet have written concurrence from the EPA to use the 2-year, 6-hour storm event. Section 2.1.2.1 Kailua Basin Flow Equalization Facilities Alternatives, paragraph 2, last sentence of the Final EIS will be revised as follows: "However, the City has since established a policy to use the 2-year, 6-hour storm event with pending the concurrence of the EPA (see Section 1.4.2)." Likewise, Section 1.4.2 Projected Flows, paragraph 5, last sentence of the Final EIS will be revised as follows: "~~The EPA has indicated their concurrence with Concurrence by the EPA is pending regarding the approach used for this determination.~~"

Now finally, this is a little bit repetition, I'm going to submit this into the comment box. The EIS has not discussed the treatment capacity of the Plant in comparison to the population policy guidelines of the General Plan. And that is key, I think, to—to people understanding whether or not what is proposed is in keeping with the future planning for the entire island. Thank you. Merry Christmas.

← As indicated above, the treatment capacity of the WWTP is not solely linked to the population of the region. Nevertheless, the discussion in Section 5.5 City and County of Honolulu General Plan, 1. Population will be supplemented as follows: "*The project improvements are proposed to accommodate the projected wastewater flows based on the City and County of Honolulu Department of Planning and Permitting's population projections for the region. By the year 2020, the population of the region is projected to increase 3.2 percent from 105,819 in 1995 to 109,236.*"

(DeeDee Letts) For those of you that came in late, if you notice the signs in the back, when we close the formal part of the public hearing, we are going to have experts in the back to talk about those kinds of questions. And I'm assuming the question on doubling the Plant will be at the "Facilities Plan," "Current Construction" that is not included in this EIS but is going on is back there, you can ask your questions on that. The "Long-Range Infiltration/Inflow Plan," there'll be people to talk about that, and the "Odor and Noise Control."

City Response

Testimony

So there will be an opportunity for you to ask your questions at the end of the formal receiving of testimony, for those of you who came in late. Representative Cynthia Thielen is next

(Representative Cynthia Thielen) Merry Christmas, everyone. I have a very serious objection with the Draft EIS.

(Representative Cynthia Thielen)

We regret your objection to subject Draft EIS. We note, however, that the Draft EIS does reflect the Final Facilities Plan, which has undergone extensive community review as well as scrutiny from the Consent Decree plaintiff's special consultant retained to monitor its preparation.

The City's proposal to modify rather than relocate the Kailua Regional WWTP was determined based on the results of the assessment and evaluation conducted for all alternatives formulated in the course of the Facilities Plan preparation. The set of evaluation criteria used to evaluate each alternative included the following:

- Compliance with Water Quality Requirements - spill reduction, regulatory agency approval and other required permits
- Cost-Effectiveness - capital and estimated annual operation and maintenance costs for proposed improvements to the collection, treatment and disposal systems based on the 5-year storm flows
- Community Compatibility - odor/noise, recreation/visual, economic, and traffic
- Environmental Impacts - water quality, flooding, archaeology, and flora/fauna/other environmentally sensitive resources.

In the different meetings that we have held in the past couple of years, we were led to believe that there would be a serious consideration of relocating the Plant to Kapaa. And I find that the Draft EIS gives really just lip service to that whole concept. There's no meat to it, it's like where's the beef, and the Draft EIS comes up as a major failure in that way. The City's plan to modify rather than locate the Kailua sewage facility is short-sighted, irresponsible, and likely to result in continued unhealthy odor and noise problems for the surrounding residents and this public elementary school. I believe that the EIS is completely defective because it fails to come up with legitimate cost estimates and specific details for the relocation of the facilities to Kapaa. Modification is nothing but a band-aid approach, and it will not eradicate the true problem with the existing Kailua facilities—excessive noise and sickening odors.

Detailed cost estimates for the alternative of relocating the plant to Kapaa were included in the Facilities Plan. In view of your concerns, however, a generalized cost breakdown of the major improvements which would be required at the Kailua and Kapaa sites are indicated below and will be included in the Final EIS under Section 6.1.5 Relocation of Kailua Regional WWTP to Kapaa Industrial Park - Cost-Effectiveness as indicated in Note 3 (attached). As indicated in Section 6.1.5, the noted sequence for relocating the facility is only a concept and further planning or engineering studies would be required to identify all of the technical aspects involved in relocating the treatment plant. Modification of the existing WWTP will include mitigation measures to "reduce" ongoing odor and noise problems.

### Testimony

More importantly, the EIS readily concedes relocation would be quite compatible with the community. It states on page 6-17, "Relocation of the Plant to Kapaa would result in improved settings for mitigating the effect of odor and noise which currently plague the Kailua sewage facility. Relocation of the Plant would also be more conducive with the industrial nature of the Kapaa area and visually would be more compatible."

Relocation to the refuse area would eliminate any concern from business, because there are no businesses in that immediate vicinity.

The EIS states one thing that's very puzzling. It goes on about the odor problems have been the most single discussed topic in public meetings held in connection with the Facilities Plan, with the primary focus being the complaints relating to the Kailua Plant. And then the EIS says "In spite of the amount of money spent to date on odor control facilities, neighborhood complaints persist." Well guess what folks, they persist because the Plant smells. I mean, that's just amazing to me that the EIS seems to assume it's puzzling why neighborhood complaints would persist. Nancy, I think you can tell them. There's odor, it smells. I drove over here, on the way in my windows were closed, the car is air-conditioned, the air-conditioning was on, and it smelled.

The short-term noise, air quality and traffic impacts, it talks about the adverse impacts, and states that construction activities associated with a proposed project will create some adverse impacts such as unavoidable noise impacts in the vicinity of the project site. Air pollution, emissions from soil excavation and construction vehicle equipment and movement, and temporary disruption of traffic and on-street parking. Well, you're right here at the elementary school. You talk about all of those, and I would love to be able to project the proponents of this Plan, this continued expansion of this Facility, I'd love to be able to put them back into elementary school, to have to deal with the noise, the odor, and have the sickening effect to that. I'd love to have you folks be back at age 6, age 7, age 8, see what it would do to your test scores and where you'd go from there, and your learning ability.

### City Response

← Section 6.1.5 – Community Compatibility of the Draft EIS also indicates that relocation of the plant to Kapaa may encounter opposition from neighboring businesses and possibly from the closest residential areas in the Coconut Grove subdivision makai of Kawai Nui Marsh, the Kalaheo Village area, and Kalaheo High School. As previously indicated, the Kapaa Refuse Transfer Station site is unavailable for use.

← As discussed in Section 6.1.5 in the Draft EIS, the Kapaa Refuse Transfer Station site was determined to be unavailable for use. The transfer station site and associated facility are required by the City to provide refuse transfer services for municipal and private refuse collection for the Windward region.

← The City's intent and representation in the course of the Facilities Plan preparation has been to "mitigate" and not "eliminate" odor problems at the Kailua Regional WWTP through the respective measures identified in the Draft EIS. The expectation to "eliminate" odor from the WWTP would imply no deviation from a goal which, given the proximity of the plant to residences, would be impossible to attain. Also, measures undertaken by the City in the past have contributed to a reduction in odors emanating from the plant.

← Section 4.5.1 Short-Term Construction Impacts (Air Quality), Section 4.6.1 Short-Term Construction Impacts (Noise) and Section 4.7 Traffic of the Draft EIS discuss measures to mitigate short-term air quality, noise and traffic impacts during construction of the proposed improvements. Also, to the extent possible, any future construction at the WWTP that involves pile driving activities will be scheduled so as not to conflict with the Aikahi Elementary School's sessions.



### Testimony

The report shows that the construction work may be performed 24 hours a day, seven days a week. Nancy, you folks better watch out, it's going to be really unpleasant.

The EIS proposal, I believe, is nothing more than an effort to continue pouring money and resources into a Kailua sewage facility, a facility that continues to be unhealthy and harmful to the nearby residents and school, and it fails to set forth the long-term plan to relocate the Plant. I think we've been sold a bill of goods. I've gone through this with the State Transportation Department for 10 years with H-3, as DeeDee will remember, where they tried the lip service with no meat. You folks have done that again. I think it's a tremendous disservice to the elementary school and to the community. I think it is time to bite the bullet, come up with a serious analysis of relocating the Plant, and then start those steps to do that. Merry Christmas.

(DeeDee Letts) I am again down to two speakers. If anybody else wants to sign up, please do so. Nancy Cullen.

(Nancy Cullen) I guess, tonight I'm speaking first as a homeowner in this area. I, too, would like to make the urge to move the Plant out of our neighborhood. You know, we've seen our property values dropping to the point where people are moving out and abandoning their houses in our neighborhood. It's very upsetting....empty houses and people unable to sell, and renting houses to, you know, people just to get somebody in there, and it's a transient area that's not comfortable for our lifestyle here.

If that can't happen, I would ask as the President of the PTA here at the school, that any efforts for any construction to be done during the summer months or the vacation months. As the children started school this year, the pile driving started right next door. You know, it's a very emotional time, especially for the younger children. The rooms are too hot, we can't keep the windows closed. I know it's unfortunate, I understand they tried their best to schedule it at an earlier time. But the first two weeks, while the Marine Base is doing bombing exercises, there's pile driving. It would go on till 5, 6 o'clock at night. It was very disruptive and it echoed, I guess it's the mountain effect. But that—that was very difficult for our students.

### City Response

← As indicated in Section 6.1.5 – Conclusion in the Draft EIS, the Facilities Plan calls for a continuing evaluation of the possibility of transitioning wastewater facilities from Aikahi to the Kapaa Industrial Park. Such studies could focus on the long-term staging process, associated costs and funding of improvements which are the main impediments to relocation of the regional treatment plant. Should the relocation of the plant to Kapaa be determined to be a more viable alternative in the future, the Facilities Plan could be amended and a Supplemental EIS could then be prepared.

(Nancy Cullen)

← Your support of relocating the Kailua Regional WWTP is acknowledged. However, as indicated in Section 6.1.5 Relocation of Kailua Regional WWTP to Kapaa Industrial Park in the Draft EIS, the relocation of the plant to Kapaa is not deemed a feasible alternative due to the significantly high capital costs and the uncertainty of obtaining regulatory approvals to develop the facility. Should the relocation of the plant to Kapaa be determined to be a more viable alternative in the future, the Facilities Plan could be amended and a Supplemental EIS could then be prepared.

← We acknowledge and apologize for the disruption and inconvenience which the Aikahi Elementary School students experienced during pile driving activities at the WWTP conducted at the beginning of this school year. To the extent possible, any future construction at the plant that involves pile driving activities will be scheduled so as not to conflict with the school's sessions. In consideration of Aikahi Elementary School's curriculum, the City will consider having the students participate in specific design-related improvements at the plant, as deemed appropriate.

### Testimony

And a lot of the children do have health problems. I think we have a higher incidence of asthma and lung-related problems than other areas. We would also ask that the students be included in any kind of decisions or design—things that could involve plantings or any sort of design things. Our curriculum is based on the environment and the water tables and they would—I think all of the children would be interested in having some input. I know our homeowners were involved in the decision of planting the mock orange, and we were—we really felt good about that, being included.

So I would like to ask you to continue the efforts on noise and odor. Thank you.

(DeeDee Letts) Holly Hoffer?

(Holly Hoffer) I'm a resident of Aikahi Park housing area—we're on this side of the Plant. And I'd actually intended to speak tonight because I thought I understood pretty much what the plan had to say. But I am hoping that before we break down into these groups that you'll explain this issue about the unresolved issues and under what circumstances the placement of the equalization tanks in Kailua is an unresolved issue. I didn't understand that on the slide and—and then I thought I heard you say that the EPA has concurred but other people say it hasn't, so I hope before we break down that you clarify that issue for us because I think most of us here would like to hear about that.

### City Response

← The City is continuing to address the ongoing noise and odor problems at the WWTP as indicated in Section 4.5.3 Mitigation of Odor Problems and Section 4.6.3 Recommended Noise Mitigation in the Draft EIS. As depicted in Table 2-6 Phasing Plan of the Draft EIS, the phasing plan gives priority to implementing odor and noise control improvements at the plant.

(Holly Hoffer)

← Presently, major uncertainties exist in the selection of a Kailua Basin equalization alternative. At the time of the Final Facilities Plan, it was undecided whether the 2-year, 6-hour storm or the 5-year, 6-hour storm event would be pursued as the basis for determining design peak flows. However, the City has since established a policy to use the 2-year, 6-hour storm event pending the concurrence of the EPA.

The other uncertainty in the selection of a Kailua Basin equalization alternative is the extent of reduction of infiltration and inflow to the sewer system that would be achieved by rehabilitation projects. The City proposes to rehabilitate up to seven (7) collection system basins in the Kailua-Kaneohe-Kahaluu region, having begun with the pilot project for basins in the Enchanted Lake area. The extent of reduction in infiltration/inflow achieved by the rehabilitation of lines is expected to be approximately 35 to 38 percent, based on experiences elsewhere as well as results from the pilot project rehabilitation of main lines in a basin in the Enchanted Lake area.

Testimony

City Response

We acknowledge that the City does not as yet have written concurrence from the EPA to use the 2-year, 6-hour storm event. Section 2.1.2.1 Kailua Basin Flow Equalization Facilities Alternatives, paragraph 2, last sentence of the Final EIS will be revised as follows: "However, the City has since established a policy to use the 2-year, 6-hour storm event with pending the concurrence of the EPA (see Section 1.4.2)." Likewise, Section 1.4.2 Projected Flows, paragraph 5, last sentence of the Final EIS will be revised as follows: "~~The EPA has indicated their concurrence with Concurrence by the EPA is pending regarding the approach used for this determination.~~"

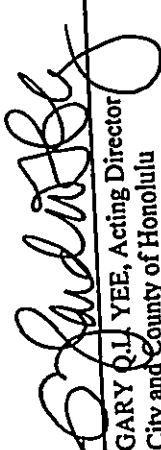
We appreciate your comments regarding the efforts of the City in making improvements to the Kailua Regional WWTP, including mitigating odor and noise. Also, your support for relocating the WWTP in an industrial area is acknowledged. However, as indicated in Section 6.1.5 Relocation of Kailua Regional WWTP to Kapaa Industrial Park in the Draft EIS, relocation of the WWTP to Kapaa is not deemed a feasible alternative primarily due to the significantly high capital costs which would be incurred, and the uncertainty of obtaining regulatory approvals to develop the facility. Should the relocation of the plant to Kapaa be determined to be a more viable alternative in the future, the Facilities Plan could be amended and a Supplemental EIS could then be prepared.

And I also wanted to say the Plant—I really appreciate all of the efforts the City has been making to make improvements to the Plant. It isn't perfect yet, certainly, but they have been making a lot of effort. And if you come to this joint committee meeting to find out they're working on noise and odor. I would love to see it put in an industrial area instead of right next to housing. It was a mistake in '84 to increase the size of that here, but I do appreciate that the City is trying to, under the circumstances, at least mitigate the odor and noise. Thank you.

(DeeDee Letts) We're at the end of the people signed up. I know that folks have questions which is why we have the stations set up in the back, so Rodney, are you going to handle that question at the Facilities Plan Station, or do you want to handle it now? Okay, so if you want to talk about size equalization, see Rodney back at the Facilities Plan Station. Again, if you look at the signs in the back, there's Long-Range Infiltration, Current Wastewater Construction for the construction that's going on that's not in this Plan, that's currently happening... Odor and Noise, and Facilities Plan. Those questions about size will be handled at the "Facilities Plan", infiltration stuff will be at the "Long-Range Infiltration/Inflow Plan."

(Nancy Cullen) I think Rodney mentioned a website and I just wanted to see if I could get that.

(DeeDee Letts) Okay, let me write the web site up here. We'll put it up here so people can copy it down. I'll also say it. Okay? So there will be experts at each of those stations. It looks like we have several per

  
FOR GARY Q.L. YEE, Acting Director  
City and County of Honolulu  
Department of Design and Construction  
Date 02/09/00

**Testimony**

station. So please, we have the room till 9:30, so ask your questions, have some discussion. I'll give folks about a ten-minute warning when we're coming up on 9:30 so people know.

(Web site address as announced later by DeeDee Letts: [co.honolulu.hi.us/env](http://co.honolulu.hi.us/env))

(The formal portion of the public hearing concluded at 8:15 p.m.)

  
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Tiffany Matias, Recorder

Note 1 (Steve Kubota)

Section 4.2.1 Surface Waters - Impacts and Mitigation Measures: "Potential impacts to surface waters and drainage systems due to leakage or accidental breakage in the transmission system will be mitigated by proper design, construction and operation of facilities. Standard procedures for detecting leaks and breaks and for shutting down and repairing the lines will minimize impacts. Appropriate public health warnings will be issued to mitigate risks of public contact with the wastewater."

Section 4.2.3 Coastal Waters - Impacts and Mitigation Measures: "Potential impacts to coastal waters due to leakage or accidental breakage in the transmission system will be mitigated by proper design, construction and operation of facilities. Standard procedures for detecting leaks and breaks and for shutting down and repairing the lines will minimize impacts. Appropriate public health warnings will be issued to mitigate risks of public contact with the wastewater."

Section 4.11 Recreation Resources - Impacts and Mitigation Measures: "Potential impacts to recreational coastal waters due to leakage or accidental breakage in the transmission system will be mitigated by proper design, construction and operation of facilities. Standard procedures for detecting leaks and breaks and for shutting down and repairing the lines will minimize impacts. Appropriate public health warnings will be issued to mitigate risks of public contact with the wastewater."

Note 2 (Steve Kubota)

3.11.2.4 Effluent Reuse Potential

Currently, an average of 13 mgd of secondary treated effluent from the Kailua Regional WTPP is discharged through the Mokapu Outfall. This water could be used for many productive purposes including golf course and crop irrigation, landscaping and for various industrial and commercial uses. Reclaimed water is currently being used for irrigation at several sites including the BYU-Hawaii Campus, Kaneohe Klipper Golf Course at the Marine Corps Base Hawaii Kaneohe Bay, and at several parks, golf courses, and agricultural lots on Maui.

Reclaimed Water Quality Standards and Treatment Facilities: The State DOH has defined three standards of reclaimed water quality, R-1, R-2 and R-3. R-1 reclaimed water is disinfected to achieve a significant reduction in viral and bacterial pathogens; R-2 water is disinfected to achieve a fecal coliform limit of 4 cfu/100ml; and R-3 water is undisinfectated secondary treated wastewater. R-1 water is approved for the most uses and would provide the greatest flexibility for potential users of reclaimed water.

(Note 2 - Continued)

To produce R-1 quality water, effluent from the Kailua Regional WTPP would have to undergo additional treatment including coagulation/flocculation, filtration and disinfection. Chemical coagulation/flocculation is a treatment process which is used to enhance particulate removal during the filtration process.

Wastewater effluent is typically disinfected by using chlorine. However, the DOH recommends alternative forms of disinfection since chlorine can have serious adverse effects on aquatic life and can also react with wastewater to form various chlorinated hydrocarbons. In addition, reverse osmosis demineralization can be used to remove trace organics and allow reclaimed water to recharge drinking water aquifers.

Storage and Transmission Facilities: Storage impoundments for reclaimed water must have liners which are impervious to water and be of sufficient capacity to retain reclaimed water under adverse wet-weather conditions based on a 50-year storm recurrence interval. In addition, runoff should be prevented from entering the impoundment unless the impoundment is of sufficient size to accept the runoff without discharge, or an NPDES permit has been issued for the discharge. A backup disposal system should also be provided to prevent overflows or discharges when the system is not in use or when the reclaimed water quantities exceed the system demand.

To reduce the likelihood of cross-connection between reclaimed water lines and potable water lines, the Board of Water Supply has set standards for horizontal and vertical clearances between potable water lines and reclaimed water lines. Reclaimed water lines must also be colored purple and be clearly labeled as such.

Potential Users of Reclaimed Water: An assessment of non-potable water demand was conducted for various water users on the Windward side of Oahu by CH2M Hill for the Board of Water Supply. A list of the water users identified in the study and other potential users of non-potable water is shown in Table 3-15.

The State DOH's current regulations do not allow the reuse of R-1 water above the State's Underground Injection Control (UIC) line. Potential users currently affected by this regulation include Pali Golf Course, Hawaii State Hospital, Hoomaluhia Botanical Garden, Valley of the Temples Memorial Park, Koolau Golf Course, Luana Hills Golf Course, and a few public parks and schools located in the Ahulimau, Kaneohe and Maunawili areas.

(Note 2 - Continued)

**Table 3-15**  
**Windward Oahu Non-Potable Water Demand**

Site	Estimated Irrigated Acres	Average Water Demand (gpd)	Peak Water Demand (gpd)
Olomana Golf Links	129.9	97,800	503,871
Afai-Pacific Country Club	130	118,500	581,837
Pali Golf Course	150	105,400	591,837
Hawaii Pacific University-Hawaii Loa Campus	20	6,200	77,578
Hawaii State Veterans Cemetery	72	27,400	279,282
Hawaii State Hospital	32	21,687	124,125
Hoomaluhia Botanical Garden	300	174,511	1,163,674
Hawaiian Memorial Cemetery	85	37,819	232,129
Bay View Golf Links	100	58,184	387,891
Public Parks	50	29,092	193,946
Schools	50	29,092	193,946
Valley of the Temples Memorial Park	55	32,001	213,340
Koolau Golf Course	95	55,275	368,496
Luana Hills Golf Course	130	75,639	504,257
<b>Total</b>	<b>1,398.9</b>	<b>868,640</b>	<b>5,476,209</b>

The Board of Water Supply has established that the water requirement for turf grass irrigation is one-inch per week. Average water demand for the Olomana Golf Links, Mid-Pacific Country Club, Pali Golf Course, Hawaii Pacific University, Hawaii State Veterans Cemetery, and Hawaii State Hospital was determined in the Non-Potable Water Study by reviewing Board of Water Supply records. Average water demand for the remaining sites was assumed to be 0.15 inch irrigation/acre/week, with the remaining 0.85 inch of irrigation coming from rainfall.

The reclaimed water supply system should be designed for extreme cases in which weeks can pass with little or no rainfall. Peak water demand was calculated by assuming that no rainfall would occur and that the full one-inch of irrigation per week would come from the water reclamation system.

Salinity of Kailua Regional Wastewater Treatment Plant Effluent: Reclaimed water that will be used for irrigation must fall within acceptable salinity levels. This is especially true in areas which recharge groundwater aquifers since application of high chloride content water may eventually cause chlorides to leach into underlying groundwater bodies. Generally, the maximum chloride concentration for turf irrigation water is 600 parts per million.

(Note 2 - Continued)

Preliminary salinity measurements taken at the Kailua Regional WTP indicate that the effluent currently exceeds acceptable levels. Wastewater samples were taken from four locations at the Kailua Regional WTP including the Kailua-Kaneohe force main, Kailua gravity line, Clarifier No. 3 weir, and Clarifier No. 2 weir. The samples were analyzed for electrical conductivity (EC) and were converted to parts per million (ppm) total dissolved solids (TDS). Estimates of chloride (Cl) concentration were made using two different methods. The measures EC and estimated TDS ppm and Cl concentrations for each location are shown in Table 3-16. The measurements from Clarifier No. 2 weir should be considered anomalous as it does not correlate to the other readings.

**Table 3-16**  
**Measured EC and Estimated TDS and Cl**

Location	Measured EC microhm/cm	Est. TDS <sup>1</sup> ppm	Est. Cl <sup>2</sup> ppm	Est. Cl <sup>2</sup> ppm
Kailua-Kaneohe Force Main	4,700	3,525	1,914	2,187
Kailua Gravity Sewer	7,100	5,325	2,891	3,103
Clarifier 3 Weir	6,400	4,800	2,606	2,978
Clarifier 2 Weir	1,000	750	407	465

<sup>1</sup> Uses a 0.51 multiplier: Est. TDS = EC (0.51)  
<sup>2</sup> Applies principles of physical chemistry  
<sup>3</sup> Assumes linearly and applies a factor to the TDS estimate based on TDS and Cl of seawater

The current high chloride concentrations are most likely caused by the infiltration of seawater into sewer lines. As a result, following the substantial rehabilitation of sewer lines in the Kailua-Kaneohe-Kahaluu area, salinity levels may fall within acceptable levels (below 600 ppm). A program for periodically monitoring influent salinity levels should be undertaken by the City and County of Honolulu to determine the feasibility of planning and eventually developing reuse facilities for the region.

Note 3 (Representative Cynthia Thieten)

**Table 6-2**  
**Relocation of Kailua Regional WWTTP to Kapaa Industrial Park**  
**Generalized Cost Estimates**  
*(June 1996 Dollars)*

<i>Item</i>	<i>Cost Estimate</i>
New Secondary Treatment Plant	\$268,000,000
New Influent Pump Station at Kailua	\$15,000,000
4.5 MG Flow Equalization Tank at Kapaa	\$8,300,000
New Preliminary Treatment Facility at Kailua	\$1,830,000
New Transmission Pump Station at Kailua	\$19,500,000
New Transmission Pump Station at Kapaa	\$16,300,000
New Transmission Force Main to Kapaa	\$21,200,000
Force Main Back to Kailua	\$18,300,000
Kapaa Land Acquisition	\$11,000,000
Demolition of Structures at Kailua	\$5,000,000
<b>Total</b>	<b>\$384,430,000</b>

# ATTENDANCE SIGN-IN

Kailua-Kaneohe-Kahaluu Wastewater Facilities Plan  
Environmental Impact Statement

Public Hearing

Thursday, December 9, 1999

Please Print Legibly

First Name	Last Name	Home Ph.	Work Ph.	Organization/Company/ Agency	Mailing Address	City	Zip Code
JAMES R. COLGAN Eldon and Judy	COLEMAN Franklin	263-2013	263-3013	KUB + RESIDENTIAL city	1177 LUMBERMAN PLACE	KAILUA HAILUA	96734 96817
Gene	Strenuous	254-2307			23 Amikene 755 Kapiolani Blvd	Kailua Honolulu	96734 96813
Chuck	Zinkefoss	597-1623			1907 S. Beretani	Hon	96826
Regina Dawn	Funakoshi		944-2217	Wilson skate	42 AERIAL LE	KAILUA	96734
Nancy Eve J. Anderson	Thompson	254-2919		CITIZEN	320-4 Malo CT		
Larry	D. Wilson	259-7706	259-9195	Rep. S. Kawai Nui	P.O. Box 25550 Hono		96825
Dawn GARY	Abbott	274-4951	714-926	Kawaiki Hiking Club	865 Iliiwa St	Kailua	96724
James	Fern-Ramsey	547	523-6363	KSBE	567 S. King St. Ste. 301	Honolulu	96803
CHARLES	YEE	947	547-7248	DRC	6177 Hobe	HON	96819
KEARY SUE GARCIA	LOUIS	9	586-0412		44-271 Kanohi Bay Dr	Kailua	96744
Rep. G. The John	PRENTISS	263-6121		MILWAU	519 WAWAHO RD	KAILUA	96734
	CARRILLO	262-8603		KAILUA RESIDENTIAL	534 HAWAII ST		
	GARCIA	262-6963		KAILUA OUTDOOR	792 N. KALANEOHE AVE	Kailua	96734
	POOLE	254-1848	533-0558	State Capitol	269 AIE-AHI PL.		







KAILUA NEIGHBORHOOD BOARD NO. 31  
P.O. BOX 487 • KAILUA, HAWAII 96734

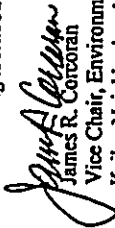
December 9, 1999

Kailua Neighborhood Board No. 31  
P. O. Box 487  
Kailua, Hawaii 96734

RE: Testimony submitted by the Kailua Neighborhood Board No. 31, P. O. Box 487, Kailua, Hawaii 96734 the Public Hearing for the Draft Kailua-Kaneohe-Kahaluu Wastewater Facilities Plan Environmental Impact Statement (Draft EIS), December 9, 1999 at Alkahi Elementary School Cafeteria, Kailua.

Letter of December 6, 1999, to Mr. Randy Fujiki, read as follows:

Kathy Bryant-Hunter  
Chair, Environment Committee  
Kailua Neighborhood Board No. 31

  
James R. Corcoran  
Vice Chair, Environment Committee  
Kailua Neighborhood Board No. 31

December 6, 1999

Mr. Randy Fujiki  
Director  
Department of Design and Construction  
630 South King Street  
Honolulu, Hawaii 96813

Re: 1. Kailua Neighborhood Board Position on Kailua-Kaneohe-Kahaluu Facilities Plan Draft EIS  
2. Letter of 12/6/99 - amended with addition of paragraph No. 5

Dear Mr. Fujiki:

The Kailua Neighborhood Board (KNB) has the following comments regarding the Draft EIS:

The KNB generally supports the preferred alternative identified in the Facilities Plan for addressing the wastewater needs for the region over the next 20 years. The KNB has the following comments and recommendations for the Final EIS:

1. The KNB strongly opposes the process that was used to develop the Facilities Plan. The Facilities Plan was developed and approved (9/98) prior to the completion of the revised Koolauopoko Development Plan which is the planning document for the region. While the document is cited in the Draft EIS, the Facilities Plan was approved prior to rather than after the completion of that overall planning document. The KNB has stated that for good long-term facilities planning the DP process should have been completed first. In addition, the KNB has stated that the environmental evaluation should have been conducted prior to the completion of the Facilities Plan. Many of the alternatives discussed throughout the development of the Facilities Plan have potential environmental impacts. The KNB felt that without all the environmental impact information available, the community was being asked to select alternatives that might not be in the long term best interests of the community. Finally, until the drafting of the EIS, the City and County had not yet reconciled whether to use the two-year or the five-year storm criteria. Again, the community was asked to accept a Facilities Plan that had left a major issue unresolved. We suggest that the EIS include the recommendation that the Facilities Plan be reexamined by the community and others based on the information in the revised DP, the two-year storm designation, and the EIS to assess if the Facilities Plan meets the needs and approval of the community.



Oahu's Neighborhood Board System - Established 1973

4. The community has continued to strongly advocate for the relocation of the Kailua Wastewater treatment plant to lands which the city has zoned for industrial purposes, Kapapa Quarry. We support the immediate and feasible staging strategy for relocating the plant to Kapapa. The KNB would like the final EIS to include that plan not as an "Alternative to the Proposed Action" (Section 6) but rather have it included as part of the 20 year Facilities Plan. As stated in Section 6.1.5 there are a number of relocation activities that should occur in the next 20 years in conjunction with relocation. The KNB recommends that this option be discussed as part of the preferred alternative in the EIS and that the Facilities Plan be amended accordingly.

3. The KNB continues to urge the city to address the ongoing noise and odors problems at the current facility. This issue should be the top priority in implementing the Facilities Plan.

4. We recommend that the city prepare a supplemental EIS on the relocation of the facility to the Kapapa Quarry and the potential impact to the Kawainui Marsh.

5. On September 3, 1998 the KNB passed a motion that reads: The Board opposes placement of a sewage holding tank, also known as an "equalization basin", on Mid Pacific County Club property at the end of Ina Street, the entrance to Kailua and the existing Aikahi Treatment Plant. We further ask the city to issue a statement declaring that it has eliminated this proposal from all future planning. The Board also suggests that the city delay final decision on this matter and that such final decision provide that any equalization basins necessary for the upgrade of the Kailua-Kaneohe-Kahala wastewater system be located on industrial zoned land in preference to sites near any homes or business. The motion carried, 13-1-0

The KNB would like to continue working with the City and County in implementing the Facilities Plan. The KNB thanks you for the opportunity to provide comments on a subject which greatly impacts our community.

Sincerely,



Faith P. Evans  
Chair

Kathy-Bryant Hunter  
Chair  
Environment Committee

DEPARTMENT OF DESIGN AND CONSTRUCTION  
CITY AND COUNTY OF HONOLULU

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JEREMY HARRIS  
MAYOR

GARY O.L. YEE, AIA  
ACTING DIRECTOR  
ROLAND O. LEBEK, JR., AIA  
DEPUTY DIRECTOR  
DCP 2000-115

February 4, 2000

Ms. Faith P. Evans, Chair  
Kailua Neighborhood Board No. 31  
P.O. Box 487  
Kailua, Hawaii 96734

Dear Ms. Evans:

Subject: Kailua-Kaneohe-Kahaluu Facilities Plan  
Draft Environmental Impact Statement (EIS)  
Koolauapoko, Oahu, Hawaii

Thank you for the Kailua Neighborhood Board's written testimony of December 6, 1999 in response to the public hearing for the subject Draft EIS. The Kailua Neighborhood Board's support of the Kailua-Kaneohe-Kahaluu Facilities Plan's preferred alternative is gratefully acknowledged. We offer the following in response to your specific comments:

1. Opposition to the process used to develop the Kailua-Kaneohe-Kahaluu Facilities Plan: As indicated in Section 1.2.1 Preparation of the Facilities Plan Update and Section 1.4.1 Consent Decree in the Draft EIS, the update of the Facilities Plan was triggered by a Consent Decree (Save Our Bays and Beaches, Hawaii's Thousand Friends, Sierra Club, and the Surfrider Foundation vs. City and County of Honolulu, Civil No. 92-00263 DAE) executed in August 1995. The Consent Decree, which required the Plaintiff's participation in the preparation of the Facilities Plan through a special consultant, stipulated that the Facilities Plan be completed by September 30, 1998.

Currently, the Koolauapoko Sustainable Communities Plan Public Review Draft (June 1999) is with the Honolulu City Council for approval. Section 5.6.3 Koolauapoko Sustainable Communities Plan of the Draft EIS discusses the relationship of the Facilities Plan to the applicable General Policies and Planning Principles and Guidelines of the draft Koolauapoko Sustainable Communities Plan. The Kailua Neighborhood Board's concern that the environmental evaluation should have been conducted prior to the completion of the Facilities Plan is acknowledged. In undertaking the Facilities Plan, however, environmental impacts of the Plan's recommended improvements and alternatives were carefully assessed, although not in a formal environmental impact statement format. A total of 15 alternatives were evaluated in the course of the Facilities Plan preparation, in which each alternative was assessed and evaluated against a set of evaluation criteria which included the following:

Ms. Faith P. Evans  
Page 2  
February 4, 2000

- Compliance with Water Quality Requirements – spill reduction, regulatory agency approval and other required permits
- Cost-Effectiveness – capital and estimated annual operation and maintenance costs for proposed improvements to the collection, treatment and disposal systems based on the 5-year storm flows
- Community Compatibility – odor/noise, recreation/visual, economic, and traffic
- Environmental Impacts – water quality, flooding, archaeology, and flora/fauna/other environmentally sensitive resources.

The alternatives and evaluation were presented to the public for input at four public informational meetings held in March 1997, April 1997, March 1998, and August 1998. Additional meetings held to solicit input on the Facilities Plan included: an Iana Street community meeting held in June 1998, a Kailua Neighborhood Board No. 31 Planning/Zoning and Environmental Committee meeting held in April 1998, and two Kailua Neighborhood Board No. 31 meetings held in May 1998 and July 1998. A public hearing on the Final Facilities Plan was held in September 1998.

The Kailua Neighborhood Board also expressed concern that until preparation of the Draft EIS, the City had not yet reconciled whether to use the 2-year, 6-hour or the 5-year, 6-hour storm event in the Facilities Plan. In light of this, a range of scenarios were developed for the Facilities Plan to reflect the uncertainties in planning for a 2-year versus a 5-year storm event, instead of a recommended single course of action. The Facilities Plan also included an evaluation of the various 2-year and 5-year storm scenarios relative to the following criteria: construction costs, construction impacts, environmental impacts, and community compatibility. As such, the uncertainty of using the 2-year versus the 5-year storm event is not deemed to be a major unresolved issue with respect to acceptance of the Facilities Plan.

We do wish to clarify that the City does not as yet have written concurrence from the EPA to use the 2-year, 6-hour storm event. Therefore, Section 2.1.2.1 Kailua Basin Flow Equalization Facilities Alternatives, paragraph 2, last sentence of the Final EIS will be revised as follows: "However, the City has since established a policy to use the 2-year, 6-hour storm event with pending the concurrence of the EPA (see Section 1.4.2)." Likewise, Section 1.4.2 Projected Flows, paragraph 5, last sentence of the Final EIS will be revised as follows: "The EPA has indicated their concurrence with Concurrence by the EPA is pending regarding the approach used for this determination."

Lastly, we would note that the Facilities Plan is not meant to be a static document, and will be subject to future revisions and updates, particularly as new information or further examination of major proposals indicate that a different direction should be pursued.

2. The Kailua Neighborhood Board's support of the discussion and possible staging strategy for relocating the Kailua Regional Wastewater Treatment Plant (WWTP) to Kapaa is acknowledged. However, since this alternative was not the recommended course of action for the Facilities Plan, it would be inappropriate to assess the relocation of the WWTP to Kapaa as a preferred

Ms. Faith P. Evans  
Page 3  
February 4, 2000

alternative. However, should the relocation of the plant to Kapaa be determined to be a more viable alternative in the future, the Facilities Plan could be amended and a Supplemental EIS could then be prepared.

3. The City is continuing to address the existing noise and odor problems at the Kailua Regional WWTP as indicated in Section 4.5.3 Mitigation of Odor Problems and Section 4.6.3 Recommended Noise Mitigation in the Draft EIS. As depicted in Table 2-6 Phasing Plan of the Draft EIS, the phasing plan gives priority to implementing odor and noise control improvements at the WWTP.

4. As indicated in response no. 2 above, should the relocation of the Kailua Regional WWTP to Kapaa be determined to be a more viable alternative in the future, the Facilities Plan could be amended and a Supplemental EIS could then be prepared.

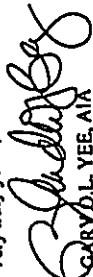
5. Regarding Kailua Basin flow equalization facilities alternatives, the Mid-Pacific Country Club equalization basin alternative was eliminated from further consideration. Other alternatives which remain feasible include an equalization basin at the entrance to Kailua adjacent to the Kailua wastewater pump station, the reuse of existing unused clarifier tanks at the Kailua Regional WWTP, and a flow equalization basin at the industrial-zoned Kapaa Industrial Park.

The Facilities Plan's recommended option for flow equalization is the provision of in-pipe storage by rehabilitating portions of the existing 36-inch and 66-inch lines along Kalaheo Avenue, and providing a new 60-inch gravity line along Wanaao and Kailua Roads. As implementation of any Kailua Basin flow equalization is not expected until the year 2005 to 2010 period, preliminary engineering at this future stage will further define the best alternative to pursue. Accordingly, it would not be prudent for the City to eliminate any of the Kailua Basin flow equalization alternatives identified in Section 2.1.2.1 Kailua Basin Flow Equalization Facilities Alternatives in the Draft EIS from consideration at this time.

The City looks forward to continuing working with the Kailua Neighborhood Board in implementing the Facilities Plan improvements.

We appreciate the Kailua Neighborhood Board's time and efforts in reviewing the Draft EIS and for participating in the Draft EIS public hearing.

Very truly yours,

  
FOR GARY L. YEE, AIA  
Acting Director

cc: ✓ Rodney Funakoshi, Wilson Okamoto & Associates, Inc.  
Ms. Genevieve Salmonson, State Office of Environmental Quality Control  
Paula Loomis, Mayor's Office

December 9, 1999

James R. Corcoran  
1171 Luna'apono Place  
Kailua, Hawaii

RE: Testimony submitted by James R. Corcoran, Kailua resident in the Public Hearing for the Draft Kailua-Kaneohe-Kahaluu Wastewater Facilities Plan Environmental Impact Statement (Draft EIS), December 9, 1999 at Aikahi Elementary School Cafeteria, Kailua.

1. This is not a public hearing (as announced) to present testimony on the "Kailua-Kaneohe-Kahaluu Wastewater Facilities Plan Environmental Impact Statement (EIS)" but rather on the Draft EIS.
2. Page 2-12, paragraph 1, last sentence reads "the City has . . . established a policy to use the 2 year, 6-hour storm event *with* the concurrence of the EPA" (*italics added*). Discussions with Mr. Tim Sternberger on December 1, 1999 indicate that the City does not have EPA concurrence to use the 2-year design plan. Recommend the sentence be changed to read "the City has . . . established a policy to use the 2-year, 6-hour storm event pending the concurrence of the EPA."
3. In this regard, the public is to be made aware that all four (4) alternatives as described in this Draft EIS are still alive, and that any one of them could end up being used in the end.
4. Throughout the document where reference is made to installation of a new sewer system on Maunawili Road, should be changed to read Maunawili Circle.

  
James R. Corcoran  
Kailua resident

DEPARTMENT OF DESIGN AND CONSTRUCTION  
CITY AND COUNTY OF HONOLULU

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JEREMY HARRIS  
MAYOR

GARY Q.L. YEE, AIA  
ACTING DIRECTOR  
ROLAND D. LIBBY, JR., AIA  
DEPUTY DIRECTOR

DCP 2000-114

February 4, 2000

Mr. James R. Corcoran  
1171 Luna'apono Place  
Kailua, Hawaii 96734

Dear Mr. Corcoran:

Subject: Kailua-Kaneohe-Kahaluu Facilities Plan  
Draft Environmental Impact Statement (EIS)  
Koolaupoko, Oahu, Hawaii

Thank you for your written testimony of December 9, 1999 in response to the public hearing for the subject Draft EIS. We offer the following in response to your comments:

1. We acknowledge that the subject public hearing was on the Kailua-Kaneohe-Kahaluu Facilities Plan Draft Environmental Impact Statement.
2. We wish to clarify that the City does not as yet have written concurrence from the EPA to use the 2-year, 6-hour storm event. Section 2.1.2.1 Kailua Basin Flow Equalization Facilities Alternatives, paragraph 2, last sentence of the Final EIS will be revised as follows: "However, the City has since established a policy to use the 2-year, 6-hour storm event *with pending* the concurrence of the EPA (see Section 1.4.2)."  
Likewise, Section 1.4.2 Projected Flows, paragraph 5, last sentence of the Final EIS will be revised as follows: "~~The EPA has indicated their concurrence with Concurrence by the EPA is pending regarding~~ the approach used for this determination."
3. As indicated in Section 2.1.2.1 Kailua Basin Flow Equalization Facilities Alternatives of the Draft EIS, the four alternatives for the 5-year, 6-hour storm event are retained for consideration since these options could be found to be more favorable upon further engineering analysis.

Mr. James R. Corcoran  
Page 2  
February 4, 2000

4. Figure 2-1 Proposed Wastewater System Improvements will be corrected in the Final EIS to reflect Maunawili Circle Sewers instead of Maunawili Road Sewers. All other references to Maunawili Circle Sewers Improvement District are properly referenced in the Draft EIS. Thank you for calling this to our attention.

We appreciate your interest and attendance at the Draft EIS public hearing.

Very truly yours,

  
FOR  
GARY D.L. YEE, AIA  
Acting Director

cc: ✓ Rodney Funakoshi, Wilson Okamoto & Associates, Inc.  
Ms. Genevieve Salmonson, State Office of Environmental Quality Control






Mr. Charles Prentiss  
Page 2  
February 4, 2000

The discussion in Section 5.5 City and County of Honolulu General Plan,  
I. Population will be supplemented as follows: "The project improvements are proposed to  
accommodate the projected wastewater flows based on the City and County of Honolulu  
Department of Planning and Permitting's population projections for the region. By the year  
2020, the population of the region is projected to increase 3.2 percent from 105,819 in 1995 to  
109,236."

The existing treatment capacity and future increased treatment capacity of the Kailua Regional  
WWTP can support the existing population of 105,819 (1995) and projected population of  
109,236 (2020), respectively.

We appreciate your interest and attendance at the Draft EIS public hearing.

Very truly yours,

  
FOR GARY Q.L. YEE, XIA  
Acting Director

cc: Rodney Funakoshi, Wilson Okamoto & Associates, Inc.  
Ms. Genevieve Salmonson, State Office of Environmental Quality Control

DEPARTMENT OF DESIGN AND CONSTRUCTION  
**CITY AND COUNTY OF HONOLULU**

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GARY Q. YE AIA  
 ACTING DIRECTOR  
 ROLAND D. LEBBY, JR., AIA  
 DEPUTY DIRECTOR

DCP 2000-112

JEREMY HARRIS  
 MAYOR

February 4, 2000

**KAILUA-KANEOHE-KAHALUU FACILITIES PLAN  
 ENVIRONMENTAL IMPACT STATEMENT (EIS)  
 PUBLIC HEARING**

Name: Larry Abbott  
 Agency/Organization: None  
 Address: 665 Iliaina St.  
Kailua HI 96734

I offer the following comments with respect to the Kailua-Kaneohe-Kahaluu Facilities Plan Draft EIS:

I approve of the rehabilitation of the wastewater collection system. It seems to be a critical element of the plan. To provide a structurally sound collection system is especially important where failure can cause contamination of surface waters and of ground waters near beaches and streams. The EIS does not address this impact of a failure in pipe integrity - it should. Failure of pipe may have serious public health impacts as well as negative impacts upon wildlife, birds and other animals using surface waters and pipe failure can have significant impacts. Recreational activities can be severely affected with resulting economic impacts. These should be discussed and sensitive parts of the system identified. (include additional sheets as necessary)

To be considered, please mail or deliver your comments no later than December 29, 1999 to the City and County of Honolulu Department of Design and Construction, 650 South King Street, Honolulu, Hawaii, 96813, Attention: Mr. Carl Arakaki, or fax at 523-4567 or 523-4642. Please legibly print your name and address on the comment sheet in order for the City to provide a written response to your comment.

Mr. Larry Abbott  
 665 Iliaina Street  
 Kailua, Hawaii 96734

Dear Mr. Abbott:

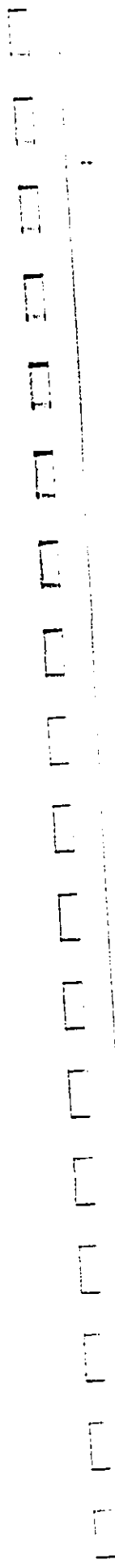
Subject: Kailua-Kaneohe-Kahaluu Facilities Plan  
 Draft Environmental Impact Statement (EIS)  
 Koolaupoko, Oahu, Hawaii

Thank you for your comments received in response to the public hearing for the subject Draft EIS.

We acknowledge your approval of the rehabilitation of the wastewater collection system. In response to your concerns regarding the potential failure of the collection system lines, the provision of relief lines and the rehabilitation/replacements of lines throughout the region will result in improved structural integrity of the lines, in addition to increasing the collection system's capacity. Nevertheless, it is acknowledged that potential failure of the lines due to leakage or accidental breakage could result in water quality impacts to surface, coastal and recreational coastal waters and groundwater, thereby contributing to public health concerns.

Section 4.2.2 Groundwater - Impacts and Mitigation Measures of the Draft EIS addresses the potential impacts to groundwater as follows: "Potential impacts to groundwater due to leakage or accidental breakage in the transmission system will be mitigated by proper design, construction and operation of facilities. Standard procedures for detecting leaks and breaks and for shutting down and repairing the lines will minimize impacts."

Section 4.3.4 Wetlands - Impacts and Mitigation Measures of the Draft EIS addresses the potential impacts to faunal and aquatic resources which could result should the Marine Corps Base Hawaii (MCBH) Kaneohe Bay equalization basin alternative be pursued as follows: "Potential impacts to faunal and aquatic resources due to wastewater spills from the proposed MCBH Kaneohe Bay EQ basin or leakage or accidental breakage in the transmission line crossing Nuupia Ponds and the wetlands will need to be mitigated by proper design, construction and operation of the facility. Standard procedures for detecting leaks and breaks and for shutting down and repairing the line will minimize impacts."



Mr. Larry Abbott  
Page 2  
February 4, 2000

To address the potential water quality impacts on surface, coastal and recreational coastal waters which could result from leakage or accidental breakage of the collection system lines, the Final EIS will include the following discussions under the respective sections:

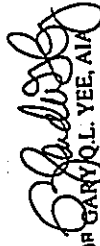
**Section 4.2.1 Surface Waters – Impacts and Mitigation Measures:** *“Potential impacts to surface waters and drainage systems due to leakage or accidental breakage in the transmission system will be mitigated by proper design, construction and operation of facilities. Standard procedures for detecting leaks and breaks and for shutting down and repairing the lines will minimize impacts. Appropriate public health warnings will be issued to mitigate risks of public contact with the wastewater.”*

**Section 4.2.3 Coastal Waters – Impacts and Mitigation Measures:** *“Potential impacts to coastal waters due to leakage or accidental breakage in the transmission system will be mitigated by proper design, construction and operation of facilities. Standard procedures for detecting leaks and breaks and for shutting down and repairing the lines will minimize impacts. Appropriate public health warnings will be issued to mitigate risks of public contact with the wastewater.”*

**Section 4.11 Recreation Resources – Impacts and Mitigation Measures:** *“Potential impacts to recreational coastal waters due to leakage or accidental breakage in the transmission system will be mitigated by proper design, construction and operation of facilities. Standard procedures for detecting leaks and breaks and for shutting down and repairing the lines will minimize impacts. Appropriate public health warnings will be issued to mitigate risks of public contact with the wastewater.”*

We appreciate your interest and attendance at the Draft EIS public hearing.

Very truly yours,

  
FOR GARY Q.L. YEE, AIA  
Acting Director

cc: ✓ Rodney Funakoshi, Wilson Okamoto & Associates, Inc.  
Ms. Genevieve Salmonson, State Office of Environmental Quality Control

DC 99-1182  
J. H. [Signature]

DESIGN & CONSTRUCTION  
DIVISION OF  
PLANNING PROGRAMS

KAILUA-KANEHOE-KAHALUU FACILITIES PLAN  
ENVIRONMENTAL IMPACT STATEMENT (EIS)  
PUBLIC HEARING

Name: JEAN STREMMING  
Agency/Organization: 23 AIMIKANA ST.  
Address: KAILUA, HI 96734

DEPARTMENT OF DESIGN AND CONSTRUCTION  
CITY AND COUNTY OF HONOLULU

650 SOUTH KING STREET, 2ND FLOOR  
HONOLULU, HAWAII 96813  
PHONE: (808) 523-4564 • FAX: (808) 523-4567  
WEB SITE ADDRESS: www.dcd.honolulu.hi.us



GARY OL-YEE, AIA  
ACTING DIRECTOR  
ROLAND D. LIBBY, JR., AIA  
DEPUTY DIRECTOR

DCP 2000-116

February 4, 2000

JEREMY HAARS  
MAYOR

I offer the following comments with respect to the Kailua-Kaneohe-Kahaluu Facilities Plan Draft EIS:

*I was shocked at how few people attended the recent hearing - Dec 9 at Aiekahie pk school. I understand that no time was given in the newspaper or personally about see it there.*  
*I agree with Cynthia Thielas that the only solution to these odor control is to move the sewage plant - in which money has been spent on these issues & still nothing really solved.*

Ms. Jean Stremming  
23 Aimikana Street  
Kailua, Hawaii 96734

Dear Ms. Stremming:

Subject: Kailua-Kaneohe-Kahaluu Facilities Plan  
Draft Environmental Impact Statement (EIS)  
Koolauapoko, Oahu, Hawaii

Thank you for your comments received in response to the public hearing for the subject Draft EIS. We offer the following responses to your comments:

Various means to notify the public about the Kailua-Kaneohe-Kahaluu Facilities Plan Draft EIS Public Hearing were undertaken by the City. A Notice of Public Hearing was published in the Legal Advertising section of the *Honolulu Advertiser* and *Honolulu Star-Bulletin* on November 23, 1999 which included the date, time and location of the hearing. A press release was also issued to both newspapers of which the *Honolulu Advertiser* published an article on November 21, 1999 regarding the Draft EIS, but made no mention of the public hearing. Additionally, notices and flyers were sent in November 1999 to approximately 70 community groups, associations, individuals, the Kailua, Kaneohe and Ahuimanu Neighborhood Boards, and City Council and State legislative representatives. Flyers were also sent to the Kailua and Kaneohe public libraries and the KEY Project in Kahaluu.

As indicated in Section 6.1.5 Relocation of Kailua Regional WWTTP to Kapaa Industrial Park in the Draft EIS, relocation of the WWTTP to Kapaa is not deemed a feasible alternative primarily due to the significantly high capital costs which would be incurred, and the uncertainty of obtaining regulatory approvals to develop the facility. However, should the relocation of the plant to Kapaa be determined to be a more viable alternative in the future, the Facilities Plan could be amended and a Supplemental EIS could then be prepared.

(include additional sheets as necessary)

To be considered, please mail or deliver your comments no later than December 23, 1999 to the City and County of Honolulu Department of Design and Construction, 650 South King Street, Honolulu, Hawaii, 96813. Attention: Mr. Carl Arakaki, or fax at 523-4567 or 523-4642. Please legibly print your name and address on the comment sheet in order for the City to provide a written response to your comment.



Ms. Jean Stremming  
Page 2  
February 4, 2000

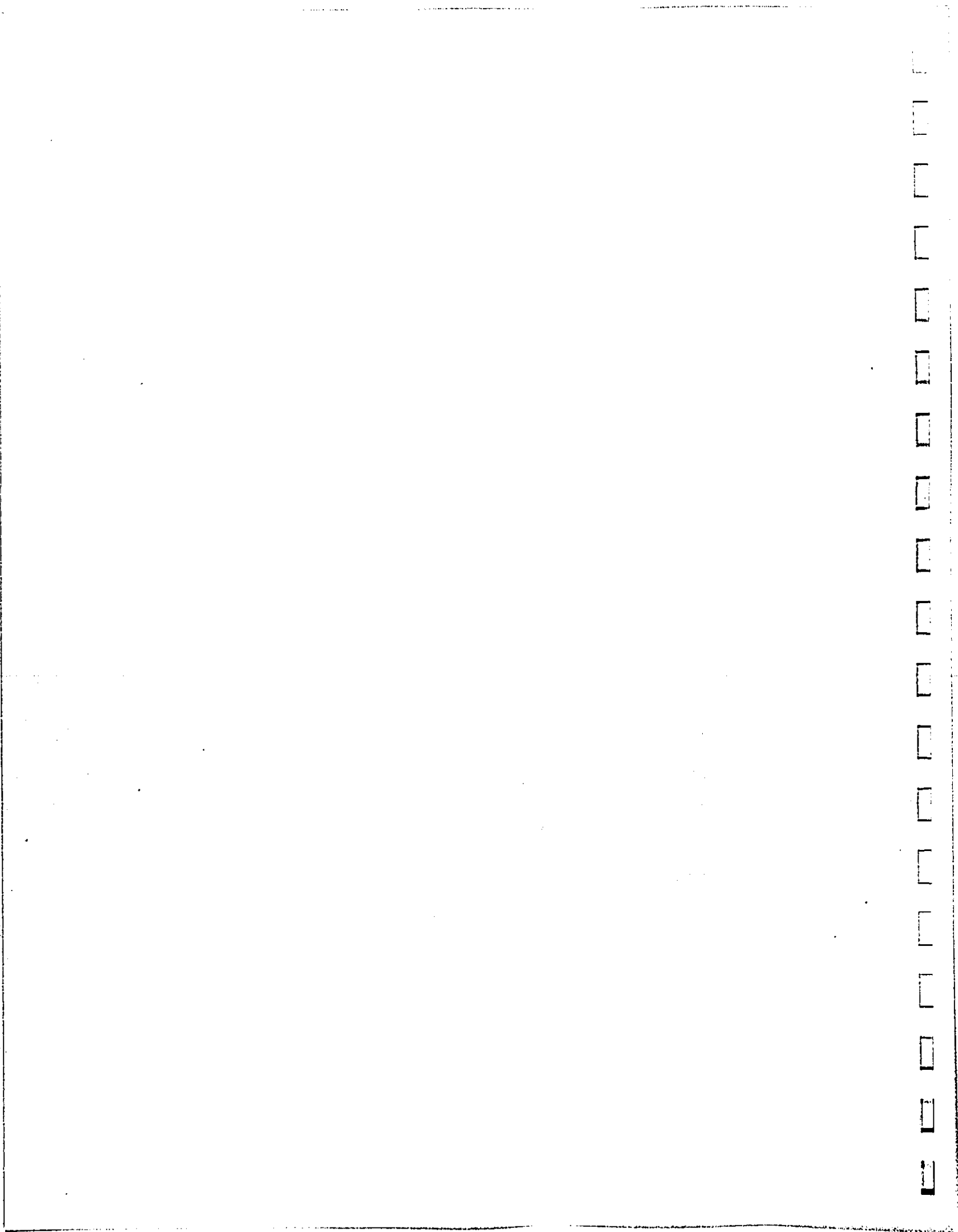
Regarding the odor and noise problems at the Kailua Regional WWTP, measures undertaken by the City in the past have contributed to a reduction in odor and noise emanating from the plant. The City is continuing to address the ongoing odor and noise problems at the plant as indicated in Section 4.5.3 Mitigation of Odor Problems and Section 4.6.3 Recommended Noise Mitigation in the Draft EIS.

We appreciate your interest and attendance at the Draft EIS public hearing.

Very truly yours,

  
FOR GARY Q.L. YEE, AIA  
Acting Director

cc: ✓ Rodney Funakoshi, Wilson Okamoto & Associates, Inc.  
Ms. Genevieve Salmonson, State Office of Environmental Quality Control



**APPENDIX A**  
**BOTANICAL SURVEY**  
**Botanical Consultants**

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BOTANICAL SURVEY REPORT FOR THE  
PROPOSED KAILUA ROAD EQUALIZATION BASIN SITE

FOR  
WILSON OKAMOTO & ASSOCIATES, INC.  
1907 SOUTH BERETANIA STREET, SUITE 400  
HONOLULU, HAWAII 96826

BY  
EVANGELINE J. FUNK, PH.D.  
BOTANICAL CONSULTANTS  
HONOLULU, HAWAII  
JANUARY 1999



## TABLE OF CONTENTS

INTRODUCTION.....	1
METHODS.....	1
RESULTS.....	1
ENDANGERED SPECIES.....	2
SPECIES LIST OF PLANTS ON SITE.....	3
BIBLIOGRAPHY.....	7

## INTRODUCTION

The proposed Kailua Road Equalization Basin Site is located between Kailua Road and Ka wai nui marsh just southwest of Kaelepulu Stream. It is an irregularly shaped site which consists of approximately one and seven tenths (1.7) acres of land. The substrate is made up largely of grading spoil produced when Kailua Road was widened, concrete rubble, and miscellaneous waste such as tree trunks and discarded furniture. The northwestern edge of the site is a steep slope into Ka wai nui marsh. In the 1950's and 60' a radio transmitting station occupied part of this site.

## METHODS

A walk through survey by a two person field team was carried out in January 1999. Access was gained by way of Kailua Road, existing trails and by forays into all parts of the site.

## RESULTS

The vegetation of this site is made up entirely of introduced plant species except perhaps for the hau (*Hibiscus tiliaceus* L.) thicket found at the southwestern end of the site near the Ka wai nui marsh service road. The canopy is made up of banyan (*Ficus microcarpa* L.) and coconut trees (*Cocos micifera* L.) that are fifteen to twenty meters in height. The subcanopy trees are wiliwili (*Erythrina indica* Lam..) and hau, ten to twelve meters in height.

The understory is koa haole (*Leucaena leucocephala* (Lam) de Wit) and castor bean (*Ricinus communis* L.). While the ground layer is a mix of weedy species such as ivy gourd (*Coccinia grandis* (L.) Voight), Chinese violet (*Asystasia gangetica* (L.) T. Anderson) and moringlory vines (*Ipomoea alba* L. and *I. indica* Merr.). in the open

sunny parts of the site the most common ground layer plant is Guinea grass (*Panicum maximum* Jacq.).

Part of the site, especially along Kailua Road, has been landscaped with red Hibiscus (*Hibiscus rosa-sinensis* L.) and Naupaka (*Scaevola sericea* Vahl) and the grass is kept mowed

#### ENDANGERED SPECIES

No candidate, proposed, or listed threatened or endangered species as set forth in the Endangered Species Act of 1973, as amended (16 U.S.C. 1531-1543) are known from near the proposed Kailua Road Equalization Basin Site and none were found during this survey.

LIST OF THE PLANTS FOUND ON THE PROPOSED KAILUA-ROAD  
EQUALIZATION BASIN SITE

The plant families in the following species list have been alphabetically arranged within two groups, Monocotyledons, and Dicotyledons. The genera and species are arranged alphabetically within families. The taxonomy and nomenclature follow that of Wagner, Herbst, and Sohmer (1990). For each taxon the following information is provided:

1. An asterisk before the plant name indicates a plant introduced to the Hawaiian Islands since Cook or by the aborigines.
2. The scientific name of the plant.
3. The Hawaiian name or the most widely used common name of the plant.
4. Abundance ratings are for this site only and they have the following meanings:
  - Uncommon = a plant that was found less than five times.
  - Occasional = a plant that was found between five and ten times.
  - Common = a plant considered an important part of the vegetation.
  - Locally abundant = plants found in large numbers over a limited area. For example the plants found in grassy patches.

This species list is the result of an extensive survey of this site during the wet, rainy season (January 1999) and it reflects the vegetation composition of the flora during a single season. Minor changes in the vegetation will occur due to introductions and losses and a slightly different species list would result from a survey conducted during a different growing season.

<u>Scientific Name</u>	<u>Common Name</u>	<u>Abundance</u>
<b>MONOCOTYLEDONS</b>		
<b>ARECACEAE - Palm Family</b>		
* <i>Cocos nucifera</i> L.	Coconut palm	Occasional
<b>COMMELINACEAE - Spiderwort Family</b>		
* <i>Commelina diffusa</i> N. L. Burm.	Honohono	Occasional
<b>POACEAE - Grass Family</b>		
* <i>Bambusa vulgaris</i> var. <i>aureo-variegata</i> Hort.	Golden bamboo	Locally abundant
* <i>Chloris barbata</i> (L.) Sw.	Swollen fingergrass	Common
* <i>Chloris divaricata</i> R. Br.	Star grass	Locally abundant
* <i>Chloris virgata</i> Sw.	Feather fingergrass	Locally abundant
* <i>Cynodon dactylon</i> (L.) Pers.	Bermuda grass	Common
* <i>Digitaria insularis</i> (L.) Mez. Ex Ekman	Sourgrass	Uncommon
* <i>Eleusine indica</i> (L.) Gaertn.	Wiregrass	Occasional
* <i>Panicum maximum</i> Jacq.	Guinea grass	Common
* <i>Rhynchelytrum repens</i> (Willd.) Hubb.	Natal redtop	Common
* <i>Sorghum halpense</i> (L.) Pers.	Johnson grass	Locally abundant
<b>DICOTYLEDONS</b>		
<b>ACANTHACEAE – Acanthus Family</b>		
* <i>Asystasia gangetica</i> (L.) T. Anderson	Chinese violet	Locally abundant
* <i>Blechnum brownii</i> Juss.		Locally abundant
<b>AMARANTHACEAE – Amaranth Family</b>		
* <i>Achyranthes aspera</i> L.		Uncommon
* <i>Alternanthera pungens</i> Kunth	Khaki weed	Uncommon
* <i>Amaranthus viridis</i> L.	Spiny amaranth	Occasional
<b>ARALIACEAE GINSENG Family</b>		
* <i>Schefflera actinophylla</i> (Endl.) Harms	Octopus tree	Uncommon

Scientific Name	Common Name	Abundance
<b>ASTERACEAE – Sunflower Family</b>		
* <i>Ageratum conyzoides</i> L.	Maile hohono	Common
* <i>Bidens alba</i> (L.) DC		Occasional
* <i>Bidens pilosa</i> Kunth		Common
* <i>Calyptocarpus vialis</i> Less.		Common
* <i>Conyza bonariensis</i> (L.) Cronq.	Hairy horseweed	Common
* <i>Eclipta alba</i> (L.) Hassk.	False daisy	Uncommon
* <i>Emilia sonchifolia</i> (L.) DC	Flora's paintbrush	Common
* <i>Erigeron bellioides</i> DC		Locally abundant
* <i>Pluchea indica</i> (L.) Less.	Indian fleabane	Common
* <i>Pluchea symphytifolia</i> (Mill.) Gillis	Sourbush	Common
* <i>Sonchus oleraceus</i> L.	Pualele	Common
* <i>Synedrella nodiflora</i> (L.) Gaertn.	Nodeweed	Occasional
* <i>Taraxacum officinale</i> W.W. Weber	Dandelion	Occasional
* <i>Tridax procumbens</i> L.	Coat buttons	Locally abundant
<b>BIGNONIACEAE – Bignonia Family</b>		
* <i>Spathodea campanulata</i> P. Beauv.	African tulip	Uncommon
<b>BORAGINACEAE – Borage Family</b>		
* <i>Heliotropium procumbens</i> Mill		Occasional
<b>BRASSICACEAE – Mustard Family</b>		
* <i>Lepidium virginicum</i> L.		Uncommon
<b>CONVOLVULACEAE – Morning glory Family</b>		
* <i>Ipomoea alba</i> L.	Moon flower	Occasional
* <i>Ipomoea indica</i> (J. Burm.) Merr.	Koali'awa.	Common
<b>CUCURBITACEAE – Gourd Family</b>		
* <i>Coccinia grandis</i> (L.) Voight	Ivy-fruited gourd	Common
* <i>Momordica charantia</i> L.	Balsam pear	Common

<u>Scientific Name</u>	<u>Common Name</u>	<u>Abundance</u>
<b>EUPHORBIACEAE – Spurge Family</b>		
* <i>Chamaesyce hirta</i> (L.) Millsp.	Hairy spurge	Occasional
* <i>Chamaesyce prostrata</i> (Aiton) Small.	Prostrate spruge	Occasional
* <i>Ricinus communis</i> L.	Castor bean	Common
<b>FABACEAE – Bean Family</b>		
* <i>Erythrina</i> sp.		Occasional
* <i>Indigofera suffruticosa</i> Mill.	Indigo	Occasional
* <i>Leucaena leucocephala</i> (Lam.) de Wit	Koa haole	Common
* <i>Mimosa pudica</i> L.	Sensitive plant	Common
* <i>Prosopis pallida</i> Kunth.	Kiawe	Occasional
* <i>Senna pendula</i> H. Irwin & Barney		Uncommon
<b>GOODENIACEAE – Goodenia Family</b>		
<i>Scaevola sericea</i> Vahl	Naupaka	Locally abundant
<b>LAMIACEAE – Mint Family</b>		
* <i>Hyptis pectinata</i> (L.) Poit.	Comb hyptis	Occasional
<b>MALVACEAE – Mallow Family</b>		
* <i>Abutilon grandifolium</i> (Willd.) Sweet	Hairy abutilon	Occasional
* <i>Hibiscus tiliaceus</i> L.	Hau	Locally abundant
* <i>Malva parviflora</i> L.	Cheese weed	Uncommon
* <i>Malvastrum coromandelianum</i> (L.) Garcke	False mallow	Common
* <i>Sida rhombifolia</i> L.		Occasional
* <i>Sida spinosa</i> L.	Prickly sida	Occasional
<b>MORACEAE – Fig Family</b>		
* <i>Ficus microcarpa</i> L. fil.	Chinese banyan	Common
<b>PORTULACACEAE – Purslane Family</b>		
* <i>Portulaca oleracea</i> L.	Pigweed	Common
<b>RUBIACEAE – Coffee Family</b>		
* <i>Spermacoce assurgens</i> Ruiz & Pav.	Buttonweed	Uncommon
<u>Scientific Name</u>	<u>Common Name</u>	<u>Abundance</u>

RUTACEAE – Rue Family

\**Murraya paniculata* (L.) Jack      Mock orange      Occasional

SOLANACEAE – Nightshade Family

*Solanum americanum* Mill.      Popolo      Common

VERBENACEAE – Verbena Family

\**Lantana camara* L.      Lantana      Occasional

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Ripperton, J.C. and E. Y. Hosaka. 1942. Vegetation Zones of Hawaii. Hawaii Agricultural Experiment Station Bulletin Number 89. Univ. of Hawaii.

Wagner, W. L., D. R. Herbst, & S. H. Sohmer. 1990. Manual of the Flowering Plants of Hawaii. Bishop Museum Special Publication #83. Univ. Of Hawaii Press. Vols 1 & 2.



**APPENDIX B**

**NOISE ASSESSMENT**

**D.L. Adams Associates, Ltd.**

**dba**

**Darby & Associates**



Project No. 99-24

ENVIRONMENTAL NOISE ASSESSMENT  
KAILUA REGIONAL WASTEWATER TREATMENT PLANT  
KAILUA, OAHU, HAWAII

August 6, 1999

Prepared for  
WILSON OKAMOTO & ASSOCIATES, INC.  
Honolulu, Hawaii

PALI PALMS PLAZA • 970 NO. KALAHEO AVENUE • SUITE A-311  
KAILUA, HAWAII 96734 • (808) 254-3318 • FAX (808) 254-5295

## TABLE OF CONTENTS

<u>Section</u>	<u>Description</u>	<u>Page</u>
1.0	Summary	1
2.0	Project Description	2
3.0	Noise Standards and Guidelines	2
4.0	Existing Acoustical Environment	4
5.0	Potential Noise Impacts Due to Kailua Regional Wastewater Treatment Plant	6
6.0	Recommended Noise Mitigation	7
7.0	References	8
Appendix A	Acoustical Terminology	A-1
 <u>Tables</u>		
4.1	Near-field Noise Level Measurement Results at Kailua RWWTP	4
4.2	Sound Level Measurement Results in Nearby Residential Areas	5
 <u>Figures</u>		
1	Kailua RWWTP and Vicinity Map	
2	Maximum Permissible Sound Levels for Various Zoning Districts	
3	On-Site Noise Measurement Locations	
4	Community Noise Measurement Locations	
5	Typical Sound Pressure Levels from Construction Equipment	
6	Noise Mitigation Recommendations for Odor Control Fans	

## **1.0 SUMMARY**

- 1.1** The Kailua Regional Wastewater Treatment Plant (RWWTP) is located in Windward Oahu in Kailua, Hawaii. This study was undertaken to assess the existing and future noise impacts on nearby residential areas due to the plant operations and, if necessary, to recommend appropriate noise mitigation.
- 1.2** The nearest residential-zoned area to the Plant, known as Aikahi, is adjacent to the Plant's eastern property line. Measurements of existing nighttime noise levels in Aikahi yielded average sound levels of 34 to 41 dBA. Insects, barking dogs and wind in foliage were noted as being the dominant audible noise sources during these measurements. Noise from Kailua RWWTP was not audibly identifiable, except at the nearest measurement location where the observer noted an audible, but low-level, "broad-band," steady noise that could possibly have originated at the Plant.
- 1.3** Measurements of existing nighttime noise levels at Aikahi Gardens, a townhome development southwest of the Plant, yielded average sound levels of 46 and 50 dBA. Audibly identifiable noise sources during these measurements were the Kailua RWWTP, occasional vehicles on Kaneohe Bay Drive, and wind-in-foliage.
- 1.4** Near-field noise measurements were recorded in close proximity to the Headworks Odor Control Fans, the Primary Odor Control Fans and the Effluent Pump Station to obtain characteristic noise "signature" data for these primary noise sources at the Plant.
- 1.5** Noise levels measured in nearby residential areas which could be attributed to the Kailua RWWTP did not exceed State or Federal noise standards, regulations or guidelines.
- 1.6** Certain climatic conditions, for example, no wind or Kona winds and a temperature inversion, could conceivably produce a "channeling" effect where noise levels from equipment at the Plant could be higher in the residential areas than normally expected from the typical attenuation of noise with distance. Although this condition was not observed during the measurements, noise mitigation for the three primary noise sources in the Plant are recommended. The recommended mitigation consists of noise barriers placed so as to block the line-of-sight propagation path between the equipment and the Aikahi area.
- 1.7** The Kailua RWWTP Administration Building's exterior air conditioning unit was identified as a secondary noise source that could potentially be a cause of nighttime noise complaints in the Aikahi residential area under certain climatic conditions. Noise mitigation is also recommended for this equipment.
- 1.8** Noise from construction activities for the planned ultra-violet disinfection treatment system and other proposed improvements at Kailua RWWTP should occur during daytime hours only and must comply with Hawaii Administrative Rules. Mitigation of pile driving noise is recommended.

## 2.0 PROJECT DESCRIPTION

The Kailua RWWTP is located at 95 Kaneohe Bay Drive in Kailua, Oahu, Hawaii. As shown in Figure 1, it is bordered on the north and northwest by the Marine Corps Base Hawaii Kaneohe Bay wetlands and Nuupia Fish Pond. On the East it is bordered by the Aikahi residential area, on the southeast by Aikahi Park, having athletic playing fields, basketball courts and restrooms, and on the southwest by Kaneohe Bay Drive. Aikahi Gardens, a townhouse complex, is located across Kaneohe Bay Drive southwest of the Plant. Residential properties are located on both sides of Kaneohe Bay Drive south and southeast of the Plant, and Aikahi Elementary School is located approximately 500 feet southeast of the Plant. Noise sources include stationary mechanical equipment (e.g., pumps, motors, odor control fans, blowers, etc.), as well as mobile equipment (e.g., maintenance vehicles).

Plans for future improvements at the Plant include the construction of ultraviolet disinfection treatment facilities and internal modifications to the Influent Pump Station, Headworks, and Primary and Secondary Clarifiers to improve hydraulic capacity. The proposed improvements are not expected to contribute to the Plant's future noise emissions; however, construction of these facilities may involve excavation, grading, trenching and pile driving.

## 3.0 NOISE STANDARDS AND GUIDELINES

Various local and federal agencies have established noise standards and guidelines as follows. Those that were used to determine the noise criteria for evaluating the noise impacts due to the project are summarized below. A brief description of common acoustic terminology used in these guidelines and standards is presented in Appendix A.

### 3.1 State of Hawaii Department of Health

- 3.1.1. Title 11, Hawaii Administrative Rules, Chapter 46, Community Noise Control - These rules, enforced by the State of Hawaii Department of Health (DOH), define three classes of zoning districts and specify corresponding maximum permissible sound levels due to stationary noise sources, such as air-conditioning units, exhaust systems, generators, compressors, pumps, etc., and equipment related agricultural, construction, and industrial activities [Reference 7.1]. These levels are applicable to any location at or beyond the property line, and they are not to be exceeded for more than 10% of the time during any 20-minute period. The maximum permissible sound levels are a function of the zoning and time of day as shown in Figure 2.
- 3.1.2. Title 11, Hawaii Administrative Rules, Chapter 42, Vehicular Noise Control Oahu - DOH's Chapter 42 specifies noise level limits for vehicles operated on traffic ways on the island of Oahu [Reference 7.2]. For vehicles which have a manufacturer's gross vehicular weight rating of ten thousand pounds or greater, also defined as "heavy vehicles," the following limits in dBA are specified in the

regulations:

<u>Posted Speed Limit</u>	<u>Time Periods When Applicable</u>	<u>Measurement Distances</u>		
		<u>20 ft.</u>	<u>25ft.</u>	<u>50 ft.</u>
35 mph or less	Daytime	92	90	84
	Evening	92	90	84
	Night, Holiday	81	79	73
	& Sunday	81	79	73
More than 35 mph Truck routes	All	92	90	84
	All	96	94	88

Vehicles that are not specifically identified as heavy vehicles are considered "light vehicles" and their noise level limits in dBA are as followed.

<u>Posted Speed Limit</u>	<u>Measurement Distance</u>		
	<u>20 ft.</u>	<u>25 ft.</u>	<u>50 ft.</u>
25 mph or less	77	75	69
30	79	77	71
35	81	79	73
40	83	81	75
45	85	83	77
50	87	85	79
55	89	87	81
60 mph or more	91	89	83

### 3.2 City and County of Honolulu Land Use Ordinance

The City and County of Honolulu's Land Use Ordinance (LUO) specifies maximum allowable levels at the property line [Reference 7.3]. The LUO criteria differ from those of the DOH in that they use octave band sound levels instead of A-weighted levels and no temporal factor is involved. LUO noise regulations are theoretically enforced by the Building Department, however, since this Department does not have noise measurement capability, noise complaints are usually handled by DOH.

### 3.3 U.S. Environmental Protection Agency

The U.S. Environmental Protection Agency (EPA) has identified a range of yearly day-night average sound levels,  $L_{dn}$ , sufficient to protect public health and welfare from the effects of environmental noise [Reference 7.4]. The EPA has established a goal to reduce exterior environmental noise to an  $L_{dn}$  not exceeding 65 dBA and a future goal to reduce exterior environmental noise to an  $L_{dn}$  not exceeding 55 dBA. Additionally, the EPA states that to protect against hearing damage, one's 24-hour equivalent sound level

exposure,  $L_{eq(24)}$ , at the ear should not exceed 70 dBA. The EPA emphasizes that these goals are not intended as regulations as it has no authority to regulate noise levels, but rather these goals are intended to be viewed as levels below which the general population will not be at risk from any of the identified effects of noise.

#### 4.0 EXISTING ACOUSTICAL ENVIRONMENT

Noise level measurements at the Kailua RWWTP were conducted on July 1, 1999. These measurements, taken at the locations shown by Figure 3, were recorded on magnetic tape for later processing. The measurement locations were chosen in order to obtain "near-field" noise data for the three primary noise sources on the plant property, i.e., the Headworks Odor Control Fans, the Primary Odor Control Fans and the Effluent Pumps. The recorded A-weighted noise levels are given in Table 4.1. Additionally, the Administration Building's exterior air conditioning unit, an air-cooled condenser, was identified as a secondary noise source meriting attention because of its close proximity to the northeast property line and, thus, to homes in the Aikahi residential community.

**Table 4.1**  
**Near-field Noise Level Measurement Results at Kailua RWWTP**

<u>Measurement Location*</u>	<u>Primary Noise Source</u>	<u>Sound Level (in dBA)</u>
1	Headworks Odor Control Fans	78.5
2	Primary Odor Control Fans	78.0
3	Effluent Pump No. 6	55.0

\* See Figure 3.

Frequency analyses of the recorded noise levels were subsequently performed to determine "noise signatures" of the three primary noise sources which could help to identify them as the sources of noise at off-site locations, e.g., in the Aikahi residential area. Kailua RWWTP records show a total of six noise complaints were received through the first five months of 1999 from three different residents of the Aikahi residential area.

Noise level data was also recorded on magnetic tape at three locations in the Aikahi residential area between the hours of 3:00 and 4:00 A.M. on July 2, 1999. In addition, noise level measurements taken at the Aikahi Gardens complex between the hours of 3:00 and 4:00 A.M. on August 6, 1999. The measurement locations are shown in Figure 4. Measurement locations A and B were selected because they were in the general vicinity of sources of noise complaints. Location C was chosen because it was the closest, off-site, public-accessible location to the Effluent Pumps.

At the time of the July 2, 1999 measurements there were light trade winds (0 to 5 mph from the North-northeast) with occasional gusts to 10 mph, clear skies, and a temperature of approximately 70° F. During the measurements on August 6, 1999 there were light trade winds (0 to 5 mph from the East) and a temperature of approximately 70° F.

The measurement results are presented in Table 4.2 along with comments relative to audibly identifiable noise sources that contributed to the results. Noise from the Kailua RWWTP was not audibly detected by the observer during the measurements on July 2, 1999 in the Aikahi area, except possibly at location C, where the observer noted an audible, low-level, steady, broad-band noise. The observer was not certain of the source of this noise, and could not identify it as originating from the Plant. It was noted that the source could have been a nearby residential air-conditioning unit.

**Table 4.2**  
**Sound Level Measurement Results in Nearby Residential Areas**

Measurement Location*	Identifiable Noise Sources	Average Sound Level (in dBA)
A	Insects, wind-in-foliage, occasional distant motor vehicle, distant surf	41.0
B	Insects, wind-in-foliage	34.0
C	Insects, occasional barking dog, birds, low-level "broad-band" noise**	37.5
D	Plant noise, occasional nearby traffic, wind-in-foliage	45.9
E	Plant noise, occasional nearby traffic, wind-in-foliage	50.4

\* See Figure 4.

\*\*The observer noted this "low-level, broad-band" noise could possibly have been from the Plant or equally as likely from a nearby residential air conditioning unit. The source of the noise could not be specifically identified by the observer.

Frequency analyses were also performed on the sound level data recorded in the Aikahi residential community and comparisons of the results with those from the on-site near-field noise measurements were conducted. The characteristic "whine" of the Effluent Pumps was not identifiable in the noise data from any of the three locations in Aikahi.

Noise from Kailua RWWTP was audible during the measurements at locations D and E—more so at location E than at D. In the observer's opinion, the Plant noise at the Aikahi



Gardens measurement locations was subjectively characterized as that of one or more large fans which led the observer to conclude the noise was most likely emanating from the Headworks and Primary Odor Control Fans. The characteristic "whine" of pumps was not heard.

## **5.0 POTENTIAL NOISE IMPACTS DUE TO KAILUA RWWTP**

### **5.1 Plant Operations Noise**

The noise levels measured in the nearby residential communities during the nighttime (early morning) hours when the background sound levels--those due to all sources other than the Plant--are lowest do not exceed the noise levels of any State or Federal rules, standards or guidelines. It can, therefore, be concluded the noise levels produced by the current operations at the Plant do not significantly impact the nearby residential communities. Also, since proposed improvements to the Plant, i.e., the addition of an ultraviolet disinfection system and other internal modifications, are not expected to contribute to higher levels of noise from the Plant, the noise due to the Plant's future operations should not impact nearby residential areas. However, noise complaints have been received by the Plant, and, because of the conditions described in the Section 5.2, below, consideration should be given to further reducing the noise emanating from the Plant's primary and secondary noise sources--namely, the Odor Control Fans, the Effluent Pumps and the Administration Building's exterior air conditioning unit.

### **5.2 The Potential Effect of Adverse Climatic Conditions**

It should be noted that under certain climatic conditions, such as no wind or southwesterly (Kona) winds and temperature inversions, certain acoustic phenomena, known as "diffraction" and "channeling," can result in less attenuation of noise with distance than typical methods would predict. It is commonly accepted that the "channeling" condition, associated with a temperature inversion, may yield noise levels 10 to 20 dB higher than expected for the distance the noise has traveled. The "diffraction" phenomena can best be described as a bending of the noise in the direction of the wind, resulting in levels downwind from the source being 5 to 10 dB higher than expected, based on distance traveled. It is not known if these adverse conditions existed when the noise complaints were made by the residents of Aikahi, but two of those who have complained acknowledged the noise from the Plant is loudest under Kona conditions. The "channeling" effect is more likely to be experienced at distances much greater than those from the Kailua RWWTP to Aikahi or Aikahi Gardens, say, one-half mile or more; however, the "diffraction" or bending effect could conceivably be occurring when the residential areas are downwind of the Plant.

### **5.3 Future Construction Noise**

The construction of the ultraviolet disinfection system will involve excavation, trenching,

grading and pile driving, as well as the other typical construction phases. The various construction phases of the project may generate significant amounts of noise, which could impact nearby the residential communities of Aikahi and Aikahi Gardens, as well as other residential properties along Kaneohe Bay Drive southeast of the Plant and Aikahi Elementary School also located southeast of the Plant. The other proposed internal modifications are expected to have less noise impact on the nearby residential areas during construction. The actual noise levels produced will be a function of the methods employed during each stage of the construction process. Typical ranges of construction equipment noise are shown in Figure 5. Pile drivers and earthmoving equipment, e.g., bulldozers, backhoes, trenchers and diesel-powered trucks, will probably be the noisiest equipment used during construction.

## **6.0 RECOMMENDED NOISE MITIGATION**

### **6.1 Noise Mitigation for Primary Noise Sources**

While no noise impacts have been identified as being attributable to the Kailua RWWTP, noise complaints have been made by Aikahi residents and adverse climatic conditions could potentially produce annoying noise levels. For these reasons noise mitigation for the Headworks and Primary Odor Control Fans and the Effluent Pumps is recommended. Figure 6 shows the recommended locations for 10-foot high noise barrier walls for the Headworks and Primary Odor Control Fans. These walls should be constructed of a material having a minimum surface weight of two pounds per square foot, e.g., nominal 3/4-inch thick plywood or 18-gauge steel sheet, and the side facing the fans should be covered with a sound absorbing material, e.g., 2-inch thick, 3-pound per cubic foot fiberglass insulation. The walls should be as close to the fans as possible, allowing room for access to the fans for maintenance and repairs. For mitigating the noise from the Effluent Pumps, a limp-mass barrier material, e.g., 1.5-pound per square foot, loaded vinyl, with 2-inch thick fiberglass insulation on the side facing the pumps, should be hung from the eave of the roof over the pumps. Adjacent panels of this limp-mass material should be joined with velcro fasteners for easy removal for maintenance and/or repairs and the material should be long enough to block line-of-sight from the nearby residences to the pump motors.

### **6.2 Noise Mitigation for Secondary Noise Source**

The air-cooled condensing unit of the Administration Building has been identified as a secondary noise source that could potentially be a source of noise complaints from Aikahi residents under adverse climatic conditions. Therefore, noise mitigation is recommended for this unit. This should consist of a three-sided, open-top noise enclosure constructed on the same materials as recommended for the Odor Control Fans. The enclosure walls should be located as close to the unit as allowed by the unit's manufacturer and their height should be three feet higher than the top of the unit.

### 6.3 Noise Mitigation for Construction Noise

In cases where construction noise exceeds, or is expected to exceed the "maximum permissible" noise levels of the Hawaii Administrative Rules [Reference 7.1] at the property line, a permit must be obtained from the DOH to allow the operation of vehicles, construction equipment, power tools, etc., which emit noise levels in excess of the "maximum permissible" levels. The terms and conditions of the "construction noise permit" must be complied with. These terms and conditions usually contain project-specific conditions, as well as those permit restrictions for construction activities which are stated in the Rules. These are:

"No permit shall allow any construction activities which emit noise in excess of the maximum permissible sound levels...before 7:00 am and after 6:00 p.m. of the same day, Monday through Friday."

"No permit shall allow any construction activities which emit noise in excess of the maximum permissible sound levels...before 9:00 am and after 6:00 p.m. on Saturday."

"No permit shall allow any construction activities which emit noise in excess of the maximum permissible sound levels on Sundays and on holidays."

Because of the close proximity of residential areas and a school, project-specific conditions imposed by DOH could include special noise mitigation measures, e.g., limiting the noisier construction activities to even more restrictive non-noise sensitive times, the use of quieter construction equipment, the use of noise barriers at the construction site boundary, etc. In addition, construction equipment and on-site vehicles or devices whose operations involve the exhausting of gas or air, excluding pile hammers and pneumatic hand tools weighing less than 15 pounds, must be equipped with mufflers, and construction vehicles using traffic-ways must satisfy the DOH's vehicular noise requirements [Reference 7.2].

At this site, the noise from pile driving is expected to be a source of many complaints. The use of a non-combustion type of pile driver, e.g., a computer-controlled, hydraulic pile driver, a portable noise barrier shroud, concrete rather than steel piles, etc., is recommended to mitigate this construction noise source.

### 7.0 REFERENCES

- 7.1 Title 11, Chapter 46, Department of Health, State of Hawaii, Administrative Rules, *Community Noise Control*, September 23, 1996.

- 7.2 Chapter 42, *Vehicular Noise Control for Oahu*, Department of Health, State of Hawaii, Administrative Rules, Title 11, September 24, 1981.
- 7.3 Section 3.11, Land Use Ordinance, *Noise Regulations*, City and County of Honolulu, Oahu, Hawaii, October 22, 1986.
- 7.4 *Toward a National Strategy for Noise Control*, U.S. Environmental Protection Agency, April 1977.

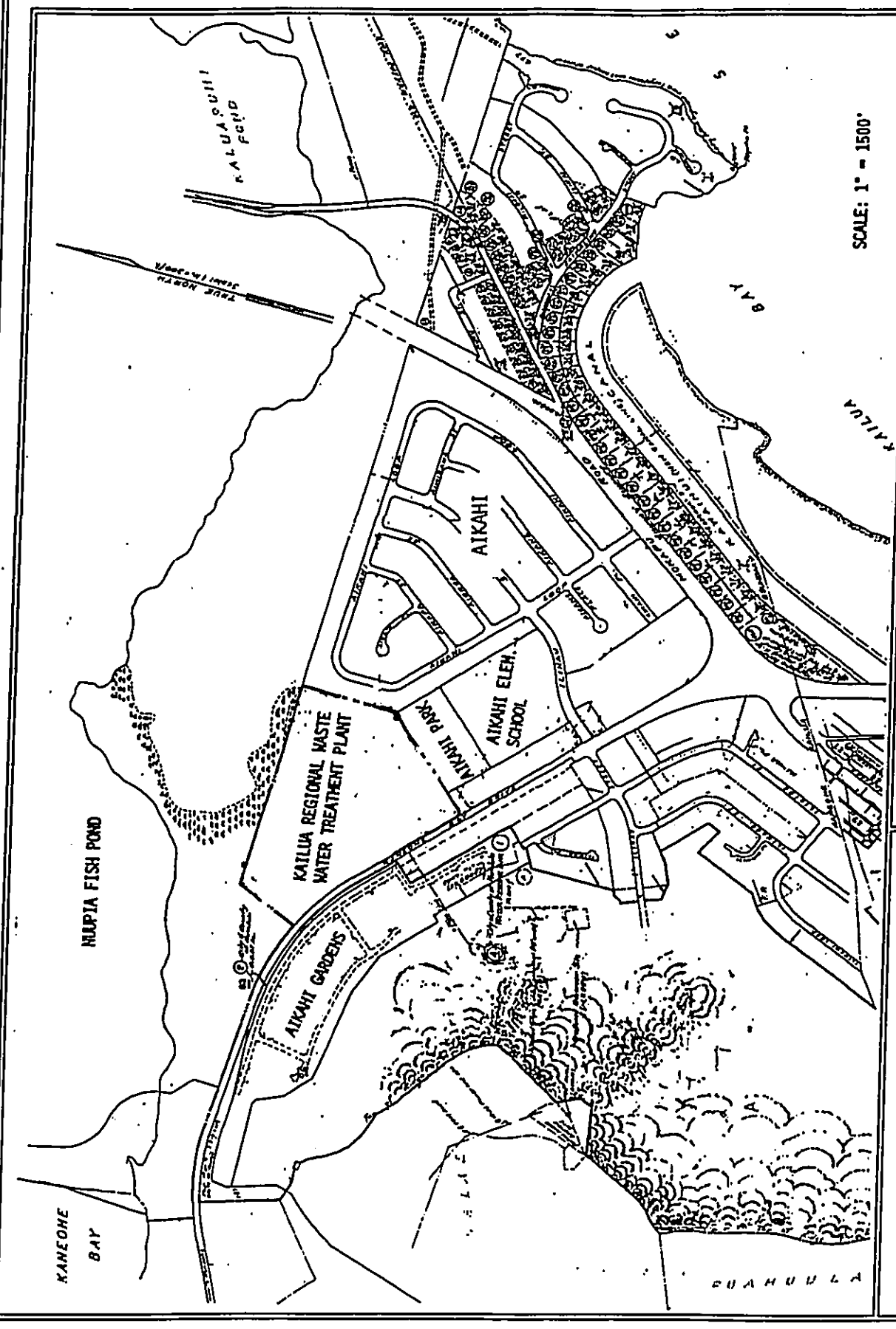
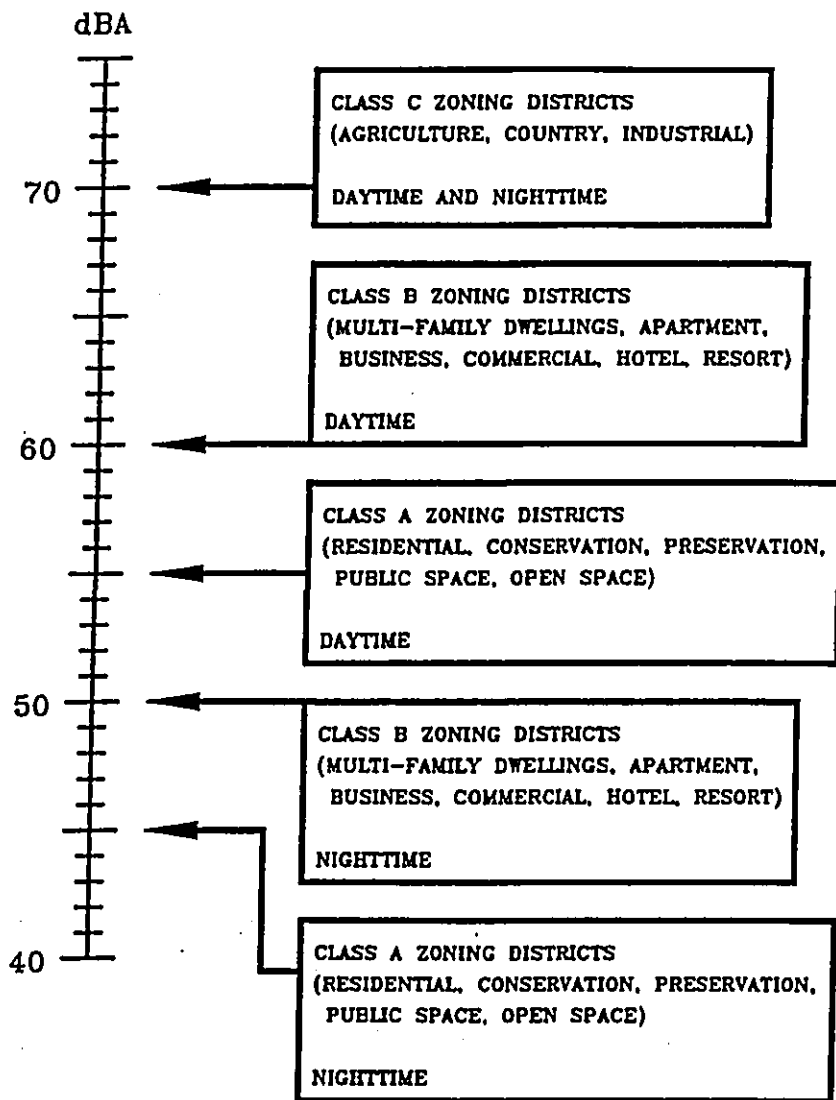


FIGURE 1 - KAILUA REGIONAL WASTE WATER PLANT AND VICINITY MAP

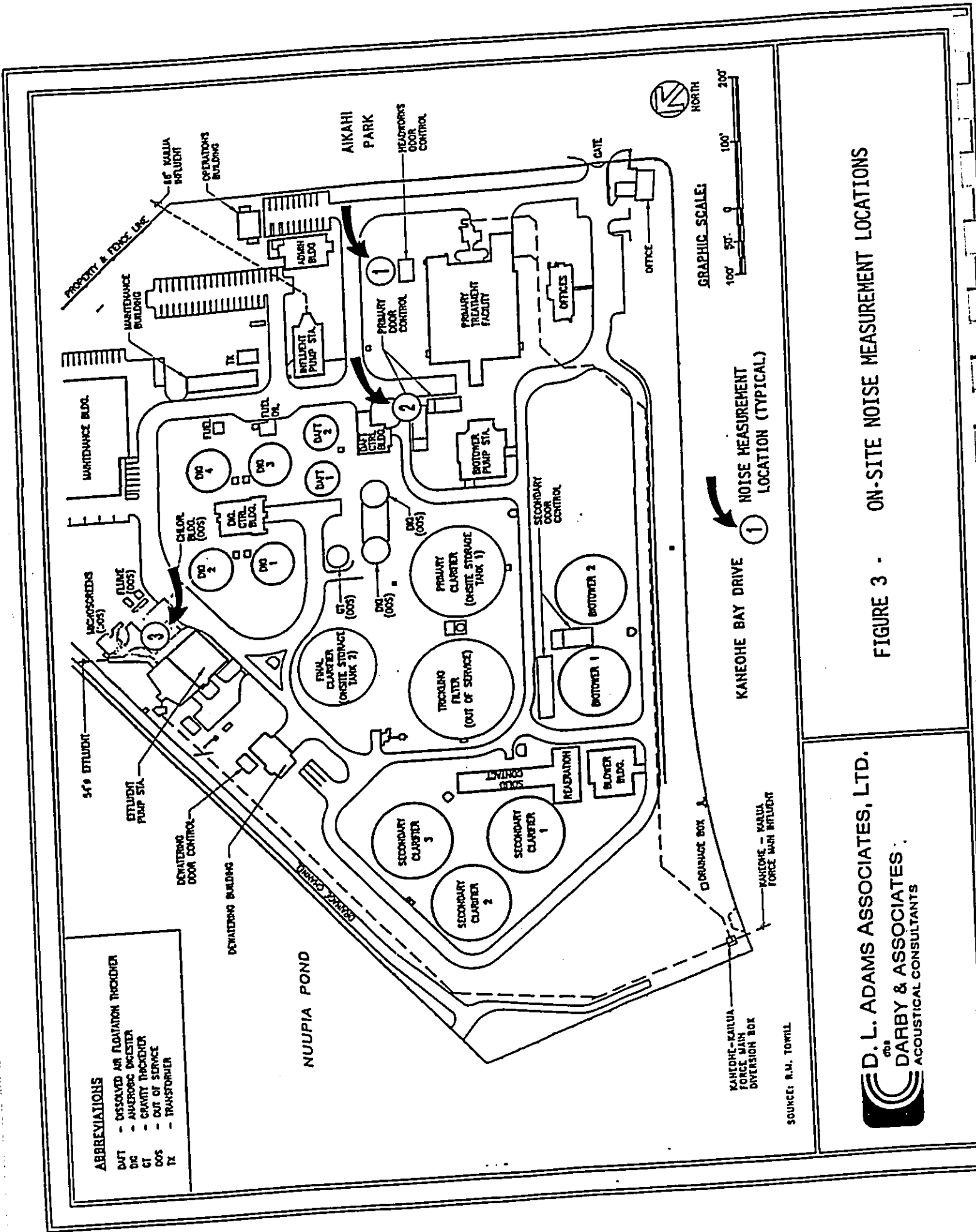
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NOTE: SOUND LEVELS INDICATED BY ZONING DISTRICT ARE THE "MAXIMUM PERMISSIBLE" SOUND LEVELS - DUE TO EXCESSIVE NOISE SOURCES SUCH AS STATIONARY MECHANICAL EQUIPMENT AND EQUIPMENT RELATED TO AGRICULTURAL, CONSTRUCTION AND INDUSTRIAL ACTIVITIES THAT SHALL NOT BE EXCEEDED FOR MORE THAN 10% OF THE TIME WITHIN ANY 20-MINUTE PERIOD DURING THE TIME PERIOD SHOWN (DAYTIME: 7:00 A.M. TO 10:00 P.M., NIGHTTIME: 10:00 P.M. TO 7:00 A.M.)

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FIGURE 2 - TITLE 11, CHAPTER 46, HAWAII ADMINISTRATIVE RULES, COMMUNITY NOISE CONTROL, MAXIMUM PERMISSIBLE SOUND LEVELS



**ABBREVIATIONS**

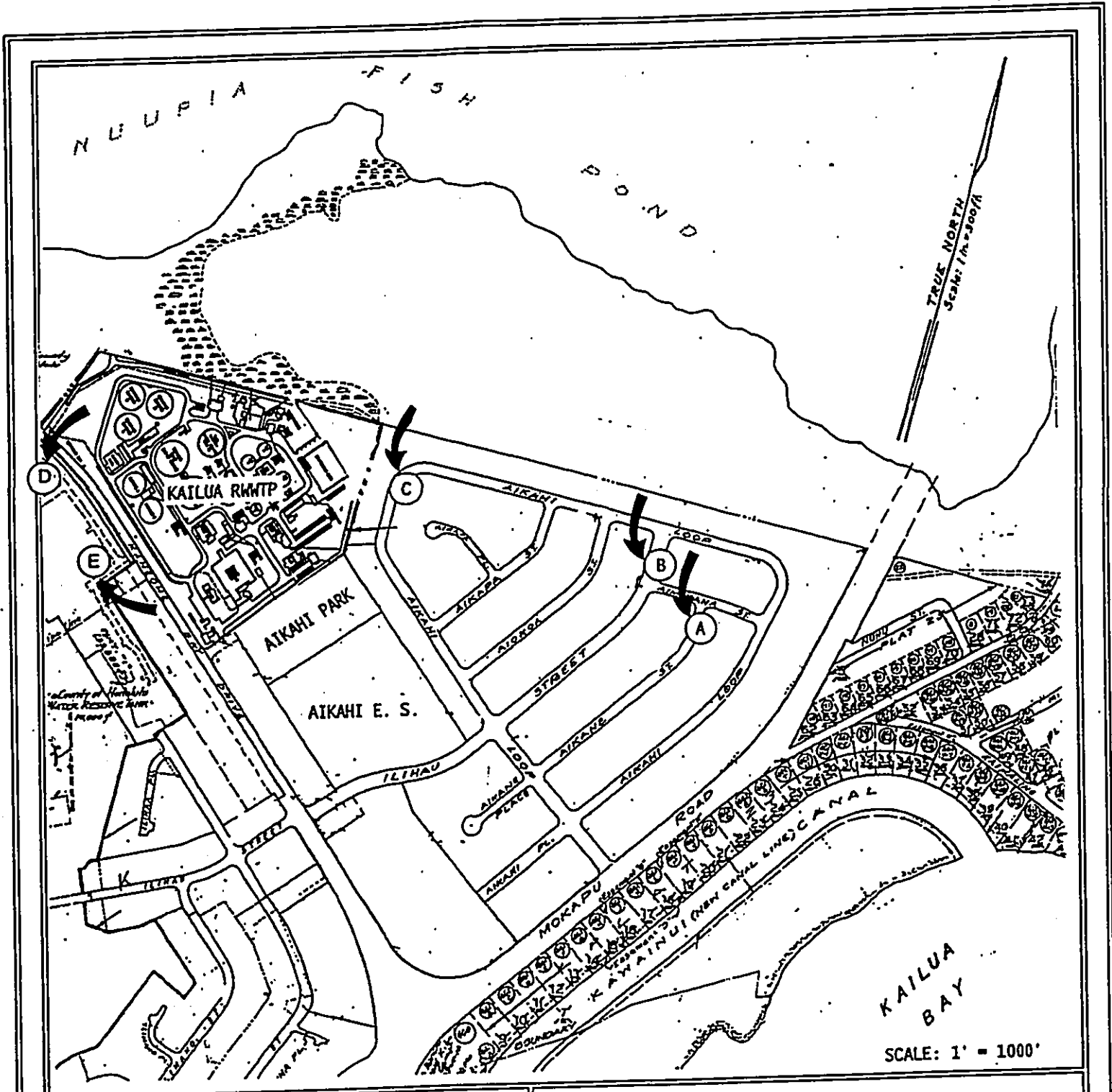
- DISSOLVED AIR FLUATION THICKENER
- AERATION DIGESTER
- GRABIT THICKENER
- OUT OF SERVICE
- TRANSFORMER



**FIGURE 3 - ON-SITE NOISE MEASUREMENT LOCATIONS**

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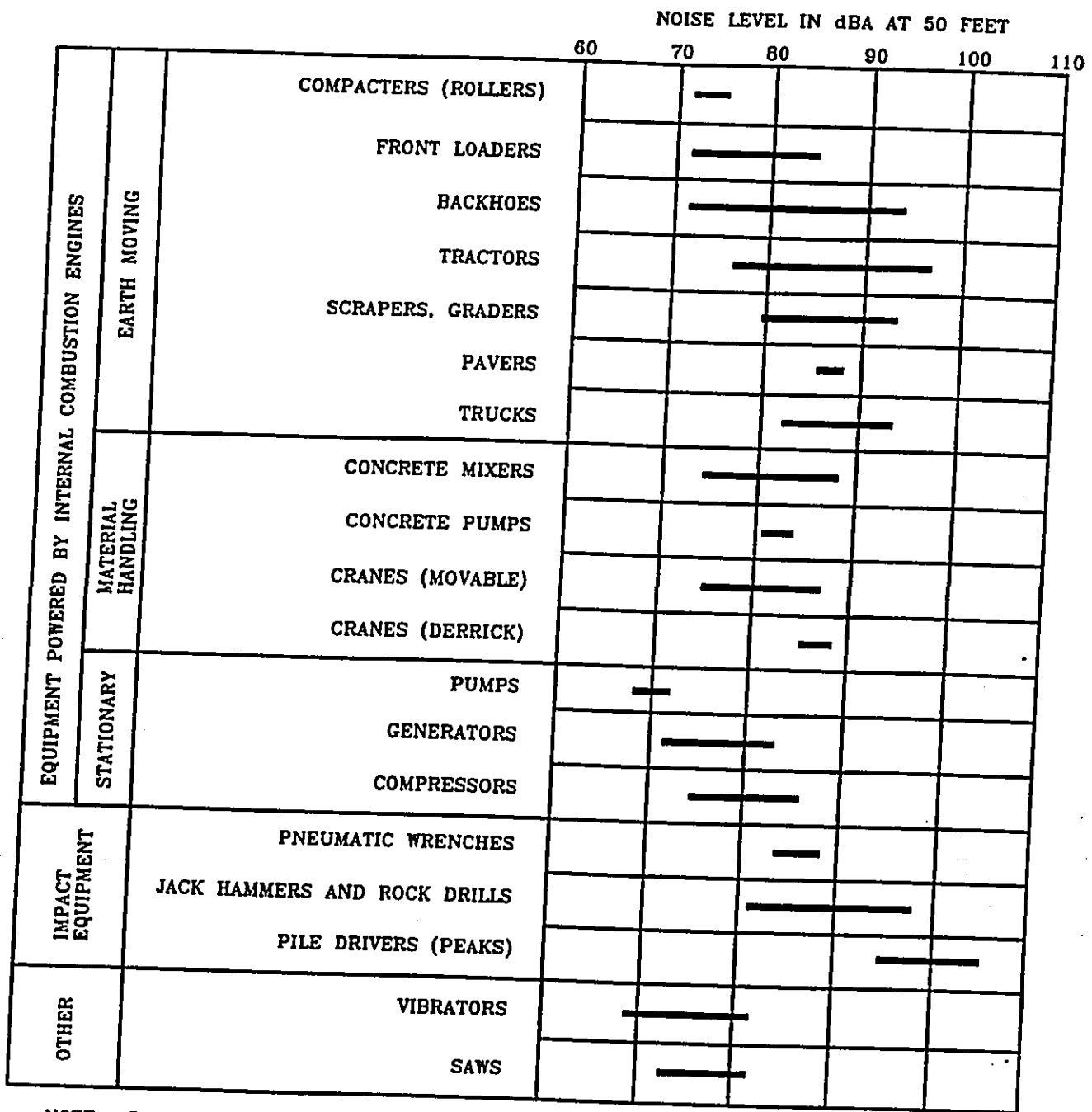
SOURCE: R.M. TOWILL




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FIGURE 4 - COMMUNITY NOISE MEASUREMENT LOCATIONS

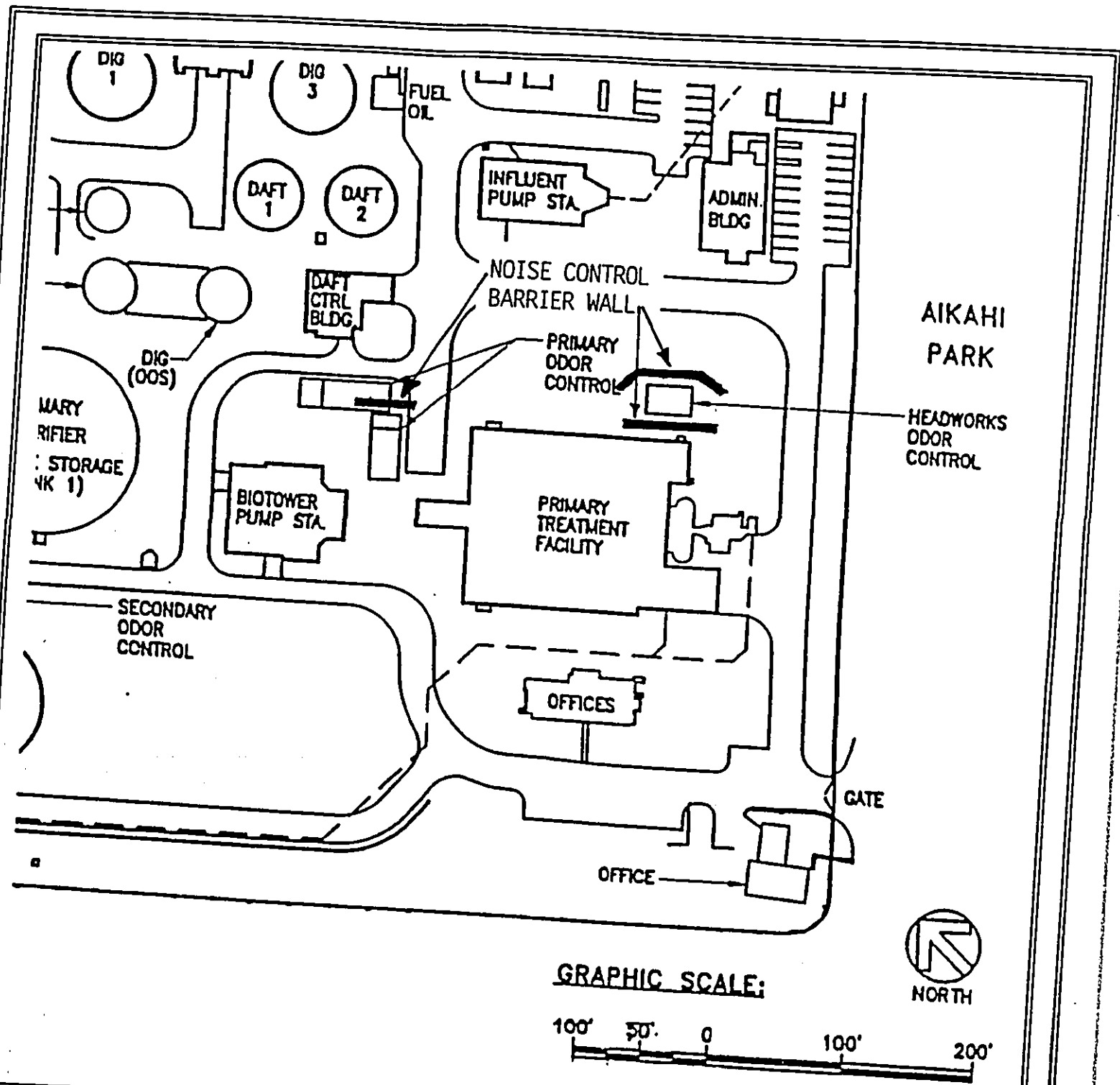




NOTE: BASED ON LIMITED AVAILABLE DATA SAMPLES

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FIGURE 5 - TYPICAL CONSTRUCTION EQUIPMENT NOISE LEVELS AT 50 FEET




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FIGURE 6 - NOISE MITIGATION RECOMMENDATIONS FOR ODOR CONTROL FANS

APPENDIX A  
ACOUSTICAL TERMINOLOGY

Sound Pressure Level

Sound or noise consists of minute fluctuations in atmospheric pressure capable of evoking the sense of hearing. It is measured in terms of decibels (dB) using precision instruments known as sound level meters. Noise is defined as "unwanted" sound.

Technically, sound pressure level (SPL) is defined as:

$$\text{SPL} = 20 \log (P/\text{Pref}) \text{ dB}$$

where P is the sound pressure fluctuation (above or below atmospheric pressure) and Pref is the reference pressure, 20 micropascals, which is approximately the lowest sound pressure that can be detected by the human ear. For example, if P is 20 micropascals, then SPL = 0 dB, or if P is 200 micropascals, then SPL = 20 dB. The relation between sound pressure in micropascals and sound pressure level in decibels (dB) is shown in Figure A-1.

The sound pressure level that results from a combination of noise sources is not the arithmetic sum of the individual sound levels, but rather the logarithmic sum. For example; two sound levels of 50 dB produce a combined level of 53 dB, not 100 dB; two sound levels of 40 and 50 dB produce a combined level of 50.4 dB.

Human sensitivity to changes in sound pressure level is highly individualized. Sensitivity to sound depends on frequency content, time of occurrence, duration, and psychological factors such as emotions and expectations. However, in general, a change of 1 or 2 dB in the level of a sound is difficult for most people to detect. A 3 dB change is commonly taken as the smallest perceptible change and a 5 dB change corresponds to a noticeable change in loudness. A 10 dB increase or decrease in sound level corresponds to an approximate doubling or halving of loudness, respectively.

A-Weighted Sound Level

The human ear is more sensitive to sound in the frequency range of 250 Hertz (Hz) and higher, than in frequencies below 250 Hz. Due to this type of frequency response, a frequency weighting system, was developed to emulate the frequency response of the human ear. This system expresses sound levels in units of A-weighted decibels (dBA). A-weighted sound levels de-emphasizes the low frequency portion of the spectrum of a signal. The A-weighted level of a sound is a good measure of the loudness of that sound. Different sounds having the same A-weighted sound level are perceived as being about equally loud. Typical values of the A-weighted sound level of various noise sources are shown in Figure A-1.

Appendix A  
Acoustical Terminology (Continued)

Statistical Sound Levels

The sound levels of long-term noise producing activities, such as traffic movement, aircraft operations, etc., can vary considerably with time. In order to obtain a single number rating of such a noise source, a statistically-based method of expressing sound or noise levels developed. It is known as the Exceedence Level,  $L_n$ . The Exceedence Level,  $L_n$ , represents the sound level which is exceeded for  $n\%$  of the measurement time period. For example,  $L_{10} = 60$  dBA indicates that for the duration at the measurement period, the sound level exceeded 60 dBA 10% of the time. Commonly used Exceedence Levels include  $L_1$ ,  $L_{10}$ ,  $L_{50}$ , and  $L_{90}$ , which are widely used to assess community and environmental noise. Figure A-2 illustrates the relationship between selected statistical noise levels.

Equivalent Sound Level

The Equivalent Sound Level,  $L_{eq}$ , represents a constant level of sound having the same total acoustic energy as that contained in the actual time-varying sound being measured over a specific time period.  $L_{eq}$  is commonly used to describe community noise, traffic noise, and hearing damage potential. It has units of dBA and is illustrated in Figure A-2.

Day-Night Equivalent Sound Level

The Day-Night Equivalent Sound Level,  $L_{dn}$ , is the Equivalent Sound Level,  $L_{eq}$ , measured over a 24-hour period. However, a 10 dB penalty is added to the noise levels recorded between 10 pm and 7 am to account for people's higher sensitivity to noise at night when the background noise level is typically lower. The  $L_{dn}$  is a commonly used noise descriptor in assessing land use compatibility, and is widely used by federal and local agencies and standards organizations. Qualitative descriptions, as well as local examples of  $L_{dn}$ , are shown in Figure A-3.

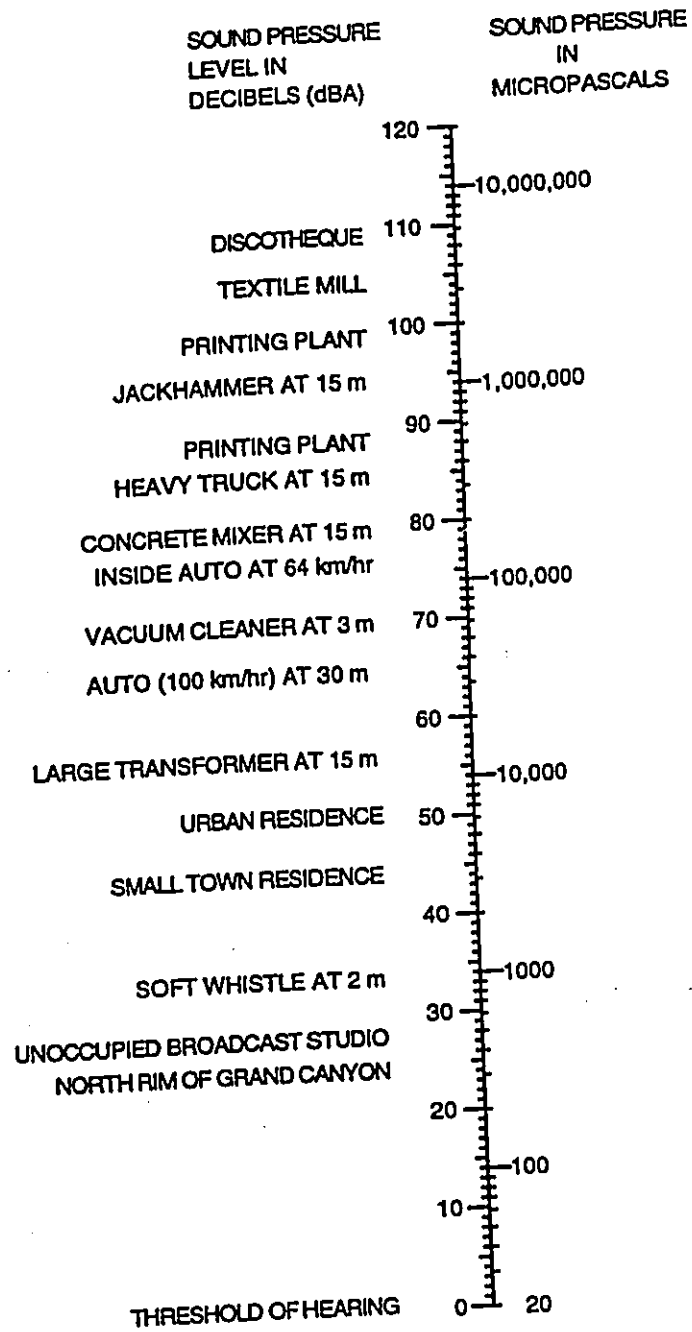
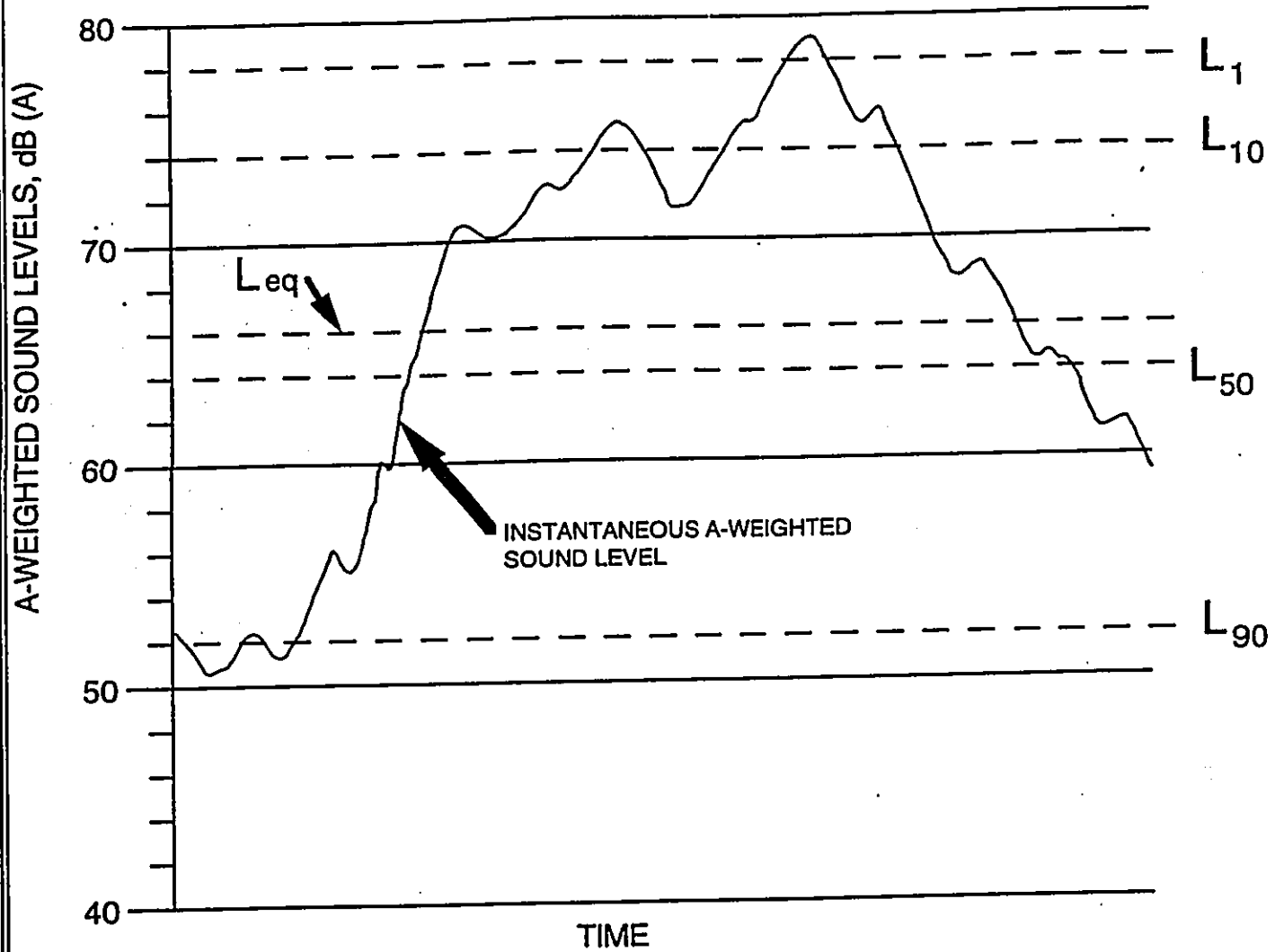


FIGURE A-1

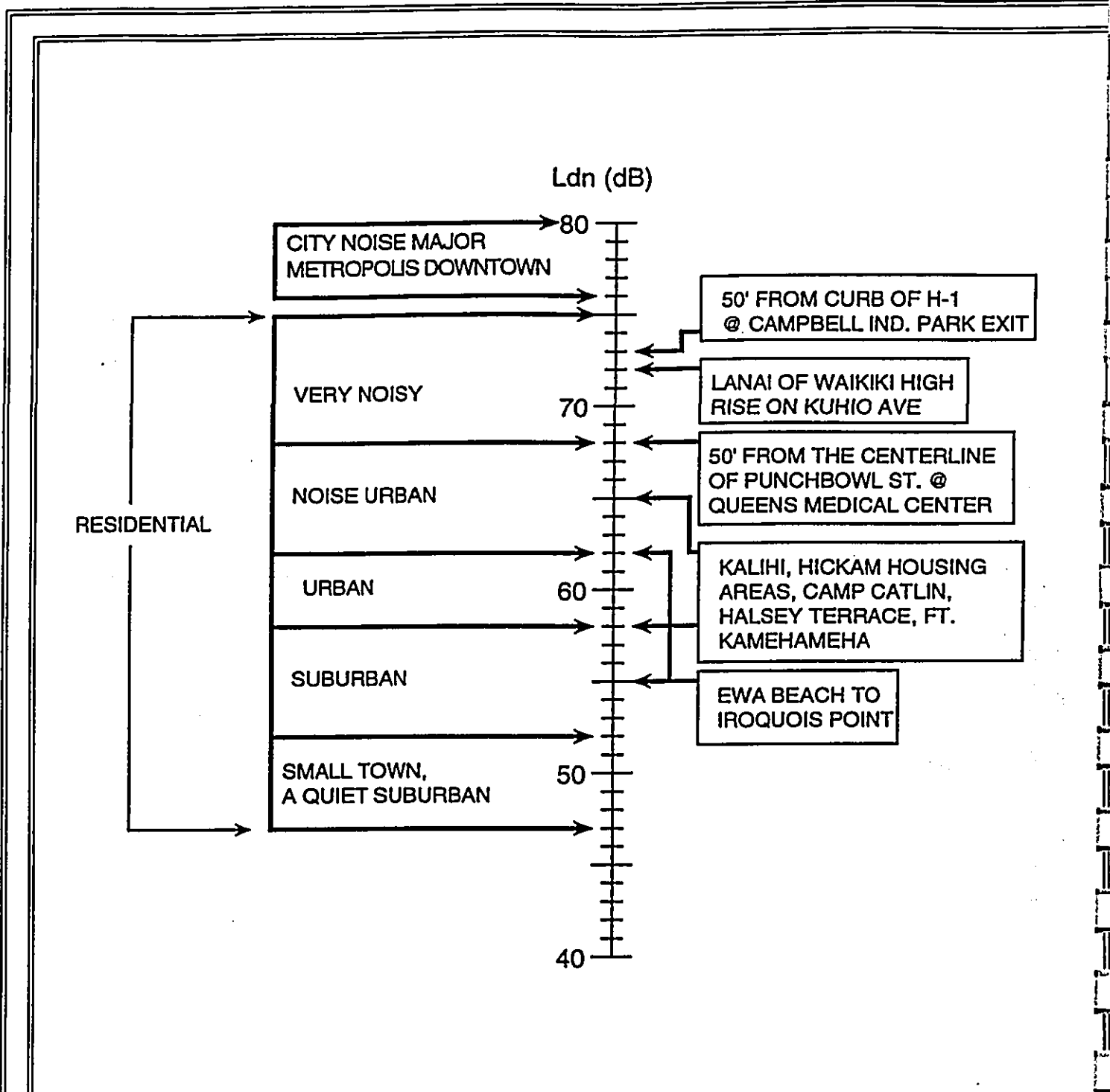
THE RELATION BETWEEN SOUND PRESSURE, P, AND SOUND PRESSURE LEVEL, SPL. ALSO SHOWN ARE TYPICAL VALUES OF A-WEIGHTED SOUND LEVELS OF VARIOUS NOISE SOURCES.

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FIGURE A-2  
 COMPARISON OF AN INSTANTANEOUS  
 SOUND LEVEL AND THE CORRESPONDING  
 STATISTICAL SOUND LEVELS



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**FIGURE A-3**  
 QUALITATIVE DESCRIPTION OF THE  
 DAY-NIGHT EQUIVALENT SOUND LEVELS  
 (Ldn) AND EXAMPLE Ldn's AT SELECTED  
 LOCATIONS ON OAHU