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Deputy Director
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EASSIE MILLER, P.E.
Wastewater Reclamation Division
RALPH NAGAMINE, P.E.
Engineering Division
BRIAN HASHIRO, P.E.
Solid Waste Division
MELVIN HIPOLITO
Highways Division

COUNTY OF MAUI
DEPARTMENT OF PUBLIC WORKS

200 SOUTH HIGH STREET
WAILUKU, MAUI, HAWAII 96793

July 14, 1992

Office of Environmental Quality Control
Central Pacific Plaza
220 South King Street, 4th Floor
Honolulu, HI 96813

Gentlemen:

SUBJECT: Kihei Wastewater Reclamation Facility Expansion

In accordance with the requirements of Chapter 343, Hawaii Revised Statutes, and Chapter 200 of Title 11, Administrative Rules, a draft Environmental Assessment has been prepared for the subject project.

As the proposing agency, we are forwarding herewith one copy of OEQC Form 91-1 and four copies of the draft Environmental Assessment. We believe that there will be no significant impact as a result of the project and anticipate the filing of a negative declaration. We respectfully request that notice of the draft Environmental Assessment be published in the July 23, 1992 OEQC Bulletin.

Should you have any questions, please feel free to call Michael Ratte at 243-7417.

Very truly yours,

for George N. Kaya
Director of Public Works

MR92012
encs.

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1992-09-23-MA-FEA- Kihei Wastewater Reclamation Facility Expansion - Phase II

SEP 2 3 1992

Kihei Wastewater Reclamation Facility Expansion - Phase II

FINAL ENVIRONMENTAL ASSESSMENT

Prepared for:

County of Maui
Department of Public Works

September 1992

Michael T. Munekiyo Consulting, Inc.

Kihei Wastewater Reclamation Facility Expansion - Phase II

FINAL ENVIRONMENTAL ASSESSMENT

Prepared for:

County of Maui
Department of Public Works

September 1992

Michael T. Munekiyo Consulting, Inc.

CONTENTS

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Preface

The County of Maui, Department of Public Works proposes to construct Phase II expansion improvements to the Kihei Wastewater Reclamation Facility at Kihei, Maui, Hawaii (TMK 2-2-24:10,11). Pursuant to Chapter 343, Hawaii Revised Statutes, and Chapter 200 of Title 11, Administrative Rules, Environmental Impact Statement Rules, this Environmental Assessment documents the project's technical characteristics and environmental impacts, and advances findings and conclusions relative to the significance of the project.

Summary

Applicant and Landowner

The Applicant for the proposed project is the County of Maui, Department of Public Works. The landowners of the affected property are the County of Maui and Haleakala Ranch.

Contact Person

For further information, contact Mr. George Kaya, Director, County of Maui, Department of Public Works, 200 South High Street, Wailuku, Hawaii 96793, or at telephone (808)243-7845.

Property Location and Description

The proposed project would take place within the boundaries of the existing Kihei Wastewater Reclamation Facility (WRF) which encompasses 23.943 acres and is located in Kihei, Maui, Hawaii (TMK 2-2-24:10, 11).

The project site is located mauka of the Piilani Highway - Welakahao Street intersection. To the immediate north of the project site is the Silversword Golf Course and Kihei Research and Technology Park. To the east are vacant lands containing low land dry vegetation which gradually slopes up to the Kula region. To the immediate south of the project is a construction baseyard and additional vacant lands. To the west of the project site makai of Piilani Highway are the Waiohuli Keokea Homestead and Kamaole Homestead residential areas.

Proposed Action

The proposed expansion of the Kihei WRF is intended to adequately serve ongoing and existing development in the Kihei-Wailea region. Additional odor controls are being proposed and alternatives for effluent reuse are also being developed.

The proposed project would increase the design flow capacity (based on peak month flow) of the Kihei WRF from 6.0 million gallons per day (MGD) to 8.0 MGD. Under the proposed improvements, the peak wet-weather capacity would be increased from 12.0 MGD to 16.0 MGD.

Headworks modifications are included in the project in order to control and mitigate odor emissions. A new caustic system will be housed in a new building near the plant's entrance. The headworks will also be enclosed to confine odors within the system. An activated carbon adsorption system will serve as an additional level of odor control for those instances when liquid-phase controls are not effective. A 40-foot high dispersion stack 15 inches in diameter is proposed to aid in dispersing emissions in the atmosphere. An approximately 30-foot high vegetation barrier will also be planted on the western boundary of the site near Piilani Highway in order to help in dispersing emissions.

A new 0.9 million gallon aeration basin and blower building is proposed in order to increase the capacity for treating organic loads. The new basin will be rectangular in shape, approximately 140-feet by 85-feet, and will contain a center wall to allow half of the basin to be taken out of service. During normal operation, flow to the new basin will be split to provide equal flow to each half of the basin. Fine bubble diffusers will also be installed in the two existing basins and the new basin in order to transfer oxygen into the wastewater more efficiently. The blower building is required for the diffused aeration system and would contain four 300-horsepower blowers and one 150-horsepower blower. The blower building would be constructed similar to the existing blower building which contains the agitation air and digester aeration blowers.

New effluent filters are being installed to provide low-turbidity effluent for proper disinfection of reclaimed water and to remove particulate matter to prevent clogging of injection wells.

Disinfection system improvements are being proposed in order to properly disinfect reclaimed water and to comply with 1988 Uniform Fire Code requirements. This includes

a new chlorine storage and handling facility. An ultraviolet (UV) system is being proposed as the primary method of disinfection of reclaimed effluent. The State Department of Health has recently given provisional approval of UV disinfection at the Lahaina WRF.

Step testing for each of the three injection wells will also be done to establish the rating of each well. This analysis would then determine whether additional injection wells would be required. Preliminary investigations show additional injection wells may not be required.

Determination

The expansion of the Kihei WRF is intended to adequately service ongoing and existing development in the Kihei-Wailea region. The proposed project involves increasing the reliability and efficiency of the facility and will help to meet the long-term wastewater reclamation demands of the Kihei-Wailea area.

The proposed project will involve earthwork, pipeline, mechanical, structural, and building construction activities. In the short-term, these activities may create temporary nuisances normally associated with construction activities. However, earthwork and construction activities involve a relatively small area within the existing Kihei WRF site. Impacts generated from construction activities are not considered adverse.

From a long-term perspective, the proposed project is not anticipated to result in adverse environmental impacts. There are no known surface archaeological features or rare/threatened species of flora and fauna at the project site.

Odor control improvements include the installation of permanent caustic and chlorine injection feed systems, enclosure of the headworks, and construction of a new 40-foot high dispersion stack which would be 15 inches in diameter. A vegetation barrier is being considered to aid in the vertical dispersion of residual odors. A carbon adsorption system is also planned for supplemental odor control. Implementation of these improvements would significantly reduce odor impacts upon the neighboring community.

Injection well capacity will be rated to determine whether additional injection wells would be required to service the increase in plant capacity. Although additional injection wells may be required, the primary disposal method at the Kihei WRF is anticipated to be water reuse. The emphasis on water reuse is considered a long-term mitigation measure and will likely result in decreased use or need for injection wells in the long-term, except during emergency conditions.

In the absence of scientific cause and effect analyses linking treated effluent from injection wells to algal blooms, the County proposes to embark on a study which may aid in the investigation of any such link. This study will supplement and augment other studies being carried out independently and may be viewed as a long-term mitigation measure to identify and define a possible cause. Currently, algal blooms do not persist along the Kihei shoreline and do not appear to be a problem.

The proposed improvements will result in no more than three additional employees assigned to the Kihei WRF. In this regard, the project is not considered significant in terms of its impacts to public services and other infrastructure systems.

In light of the foregoing findings, it is concluded that the proposed action will not result in any significant impacts.

Chapter 1

Introduction and Background

I. INTRODUCTION AND BACKGROUND

The County of Maui Department of Public Works (DPW) proposes to construct Phase II expansion improvements to the Kihei Wastewater Reclamation Facility (WRF) (TMK:2-2-24:10, 11). The proposed project is anticipated to increase the plant's treatment design capacity from 6.0 million gallons per day (MGD) to 8.0 MGD. To provide the context within which the proposed project is to be undertaken, this Chapter describes characteristics of the existing Kihei wastewater system and the existing Kihei WRF.

A. EXISTING WASTEWATER RECLAMATION SYSTEM

The Kihei WRF was designed in 1972 and constructed in 1975. Included in the design and construction were the attendant collection, transmission, and pumping systems. The service area planned in the early design extended from Maalaea to Makena. All wastewater generated within this area was intended to be collected and pumped to the Kihei WRF for treatment and disposal. To date, sewer service has not been extended to Maalaea which is currently served by a private system.

The Kihei Wastewater Reclamation System currently consists of a number of pump stations and force mains which collect wastewater from the Kihei and Wailea area. Pump Station Nos. 2, 3, 4, and 5 convey wastewater from North Kihei to Pump Station No. 6 which is located adjacent to the Kihei Fire Station. Pump Station No. 16 services the Makena Surf Hotel and conveys wastewater to Wailea. Pump Station Nos. 10 and 9 service the Wailea area and convey wastewater to South Kihei. Pump Station Nos. 8 and 7 convey wastewater from South Kihei to Pump Station No. 6. The combined North and South Kihei, Wailea and Makena flows are then sent from Pump Station No. 6 to the Kihei WRF via two 20-inch force mains. (See Figure 1).

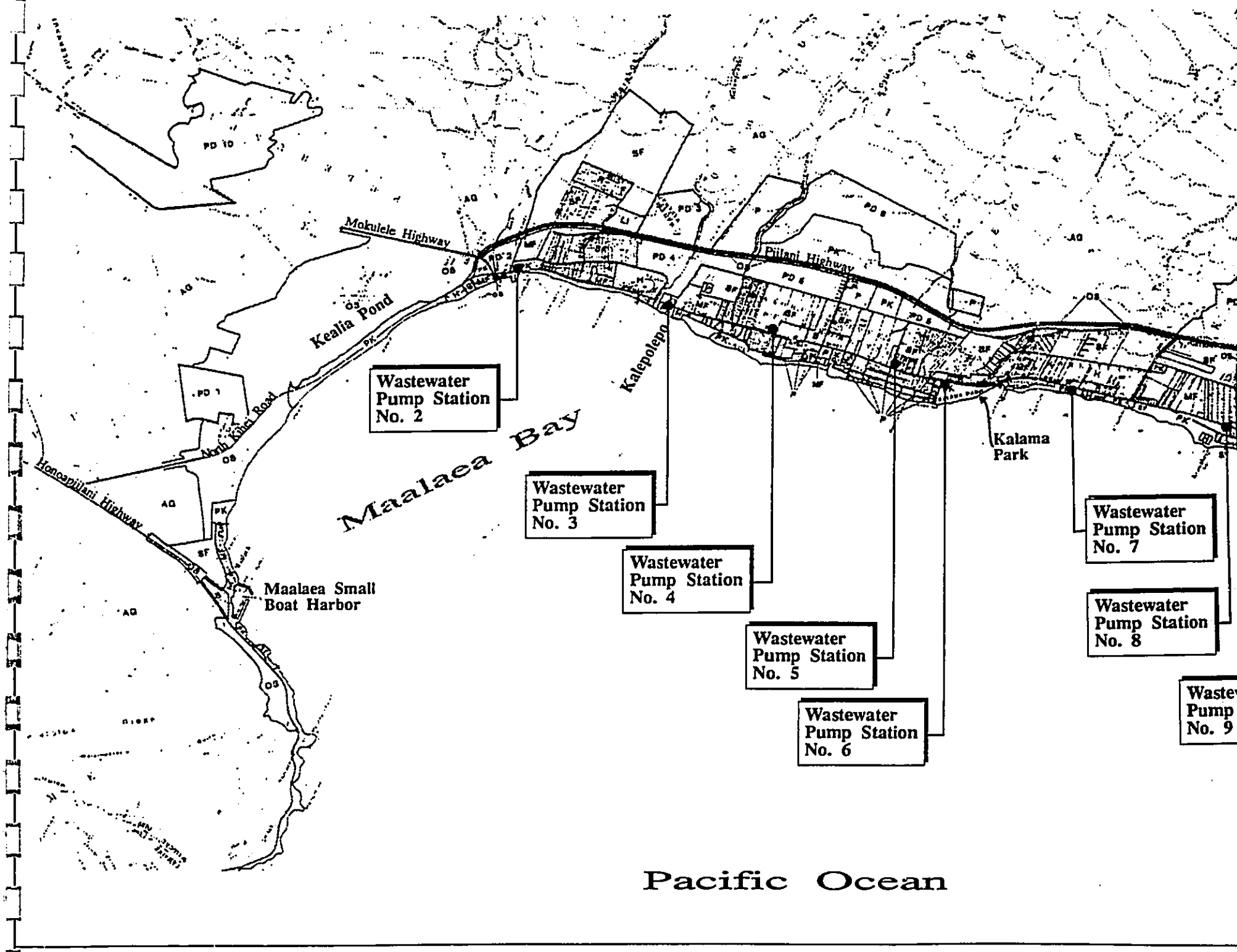
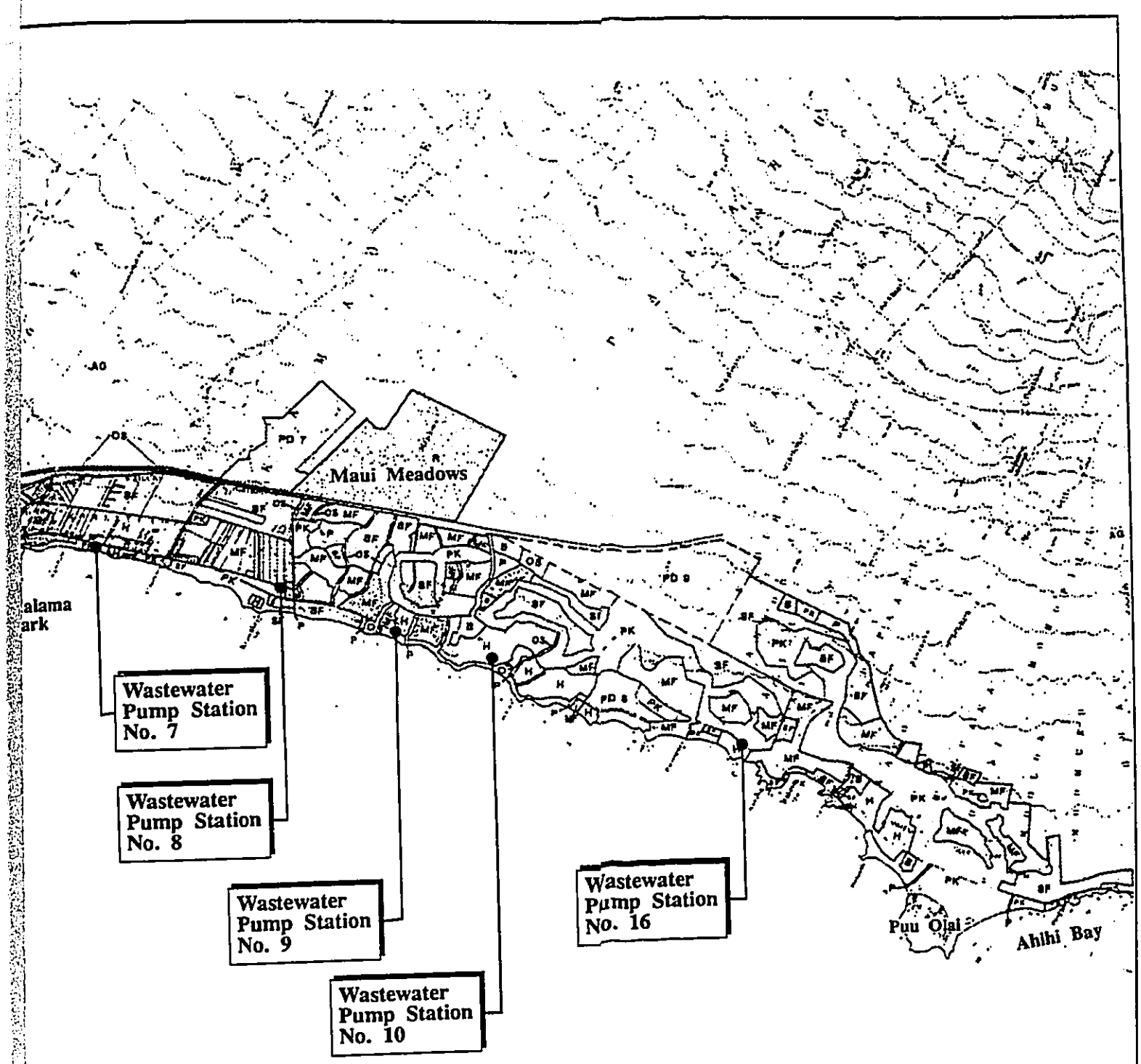


Figure 1

Kihei Wastewater Reclamation Facility

Location of Wastewater Pump Stations



ıation Facility Expansion

ıater Pump Stations

Michael T. Munekiyo Consulting, Inc.

Prepared for: County of Maui, Department of Public Works

The Kihei WRF is a secondary treatment plant located on 23.943 acres of land (TMK: 2-2-24:10, 11). It utilizes an activated sludge biological treatment process without primary sedimentation.

Influent wastewater first goes to the headworks portion of the facility which screens the influent to remove objects such as rocks, roots, rags, and grit. (See Figure 2.) The existing headworks is presently open allowing odors from the wastewater to escape. No odor control equipment is presently installed at the headworks. However, chlorine and sodium hydroxide are injected into the force mains at the Kihei WRF to control odor.

Wastewater is then routed to aeration basins. The Kihei facility contains two square basins, each side measuring 104 feet in length. Each basin holds approximately 860,000 gallons when the basins have a liquid depth of 11.4 feet. Each basin has 4 mechanical aerators which entrain air from the liquid surface and force coarse (large) bubbles into the wastewater. The aerators have good mixing characteristics for shallow basins but are relatively inefficient in the transfer of oxygen to the wastewater.

The wastewater is then routed from the aeration basins to the secondary clarifiers. The Kihei WRF has four secondary clarifiers, each of which is 75 feet in diameter. Two of the secondary clarifier tanks have a sidewater depth of approximately 13 feet with sludge scrapers combined with suction lifts. The other two secondary clarifiers are approximately 18 feet in depth and are equipped with flocculation wells and suction lifts for sludge removal from the tanks.

The sludge from the secondary clarifiers is routed to aerobic digesters to stabilize and reduce the pathogens in the sludge prior to disposal. This reduces solids from a sticky malodorous mixture to one that is relatively

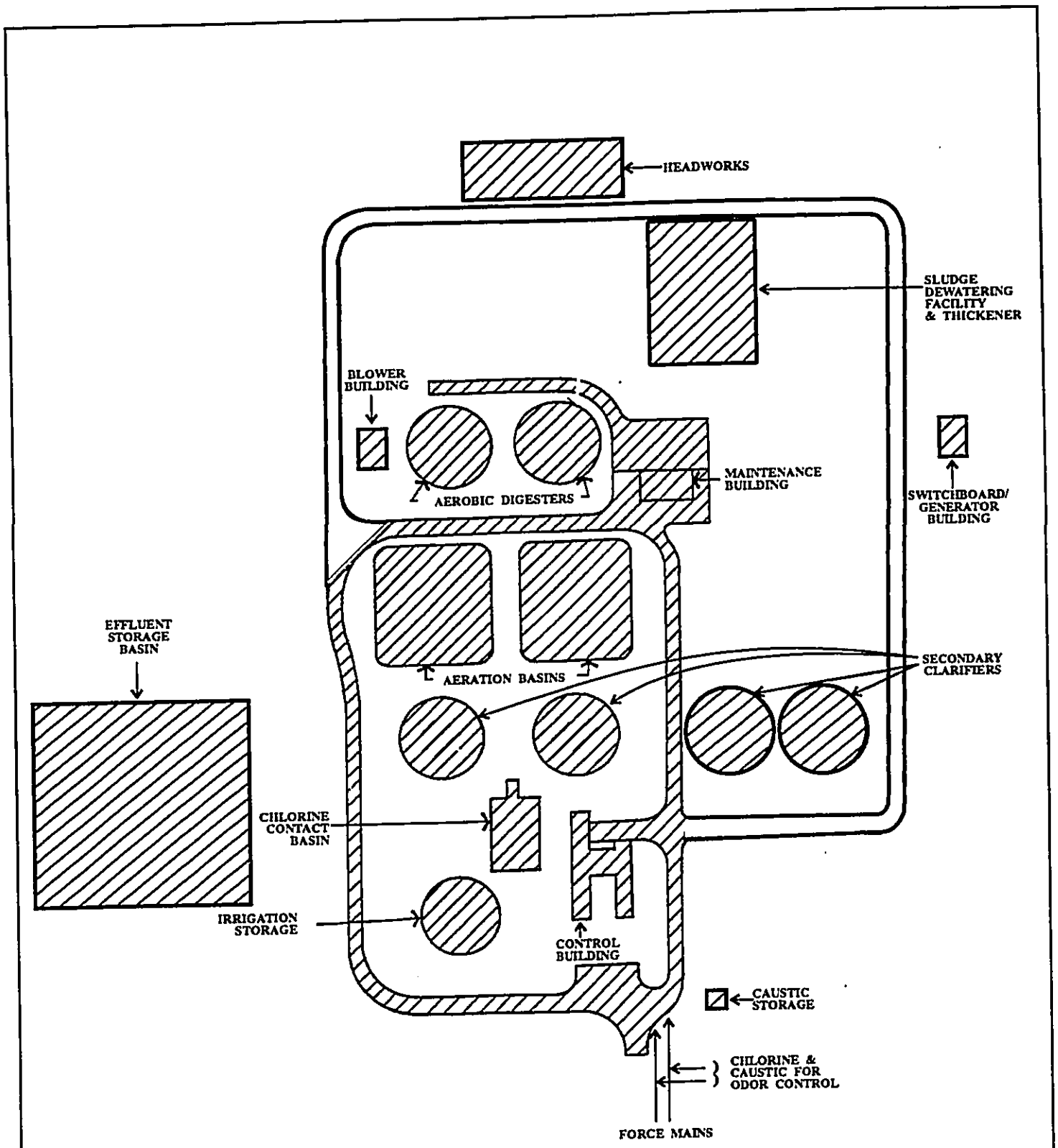


Figure 2 Kihei Wastewater Reclamation Facility Expansion

Schematic Representation of Existing Site Components

NOT TO SCALE

Michael T. Munekiyo Consulting, Inc.

Prepared for: County of Maui, Department of Public Works

odor free and readily dewatered. The Kihei facility presently has two aerobic digesters, each 75 feet in diameter with 12 feet sidewater depth.

Digested sludge from the aerobic digesters is then routed to the dewatering building. The Kihei WRF uses centrifuge technology to produce dewatered cake solids which are then transported to the Central Maui Landfill in accordance with applicable Federal regulations.

The effluent from the secondary clarifiers flows to the chlorine contact basin inlet chamber. The inlet chamber is equipped with a mechanical mixer for rapid dispersion of chlorine solution. Secondary effluent from the chlorine contact basin flows to an effluent holding basin or to the injection wells.

A portion of the secondary effluent is pumped to the Silversword Golf Course during the evening hours. The golf course, which is adjacent to the Kihei WRF, uses approximately 0.35 MGD during the winter and approximately 1.0 MGD during the summer season.

The remainder of the high quality effluent flows to injection wells. The Kihei facility presently has three injection wells. All three wells are approximately 300 feet deep with steel casing throughout their entire depth. The upper 200 feet is 18 to 20 inch diameter solid casing with the lower 100 feet consisting of 16 inch perforated casing.

The three injection wells reach into fractured volcanic rock approximately 200 feet below sea level. Because the plant site is approximately 100 feet above sea level, there is significant hydraulic pressure. The combination of fractured volcanic rock and significant hydraulic pressure results in a relatively high effluent intake capacity for each well.

Chapter II

Description of the Proposed Project

II. DESCRIPTION OF THE PROPOSED PROJECT

A. PROJECT NEED

The expansion of the Kihei WRF is necessary to adequately serve ongoing and existing development in the Kihei-Wailea region. The proposed improvements would increase capacity, reliability and efficiency of the facility, as well as improve effluent quality, thereby increasing opportunities for reclamation.

Additional odor controls are also being proposed which should aid in mitigation of any impact upon the community. Alternatives for reuse of high quality effluent for purposes such as golf course and park irrigation, which would minimize the use of injection wells, are also being developed.

The proposed project, in improving the facility's capacities and efficiency, will also help to meet the long-term wastewater treatment demands of the Kihei-Wailea area.

B. PROPOSED IMPROVEMENTS

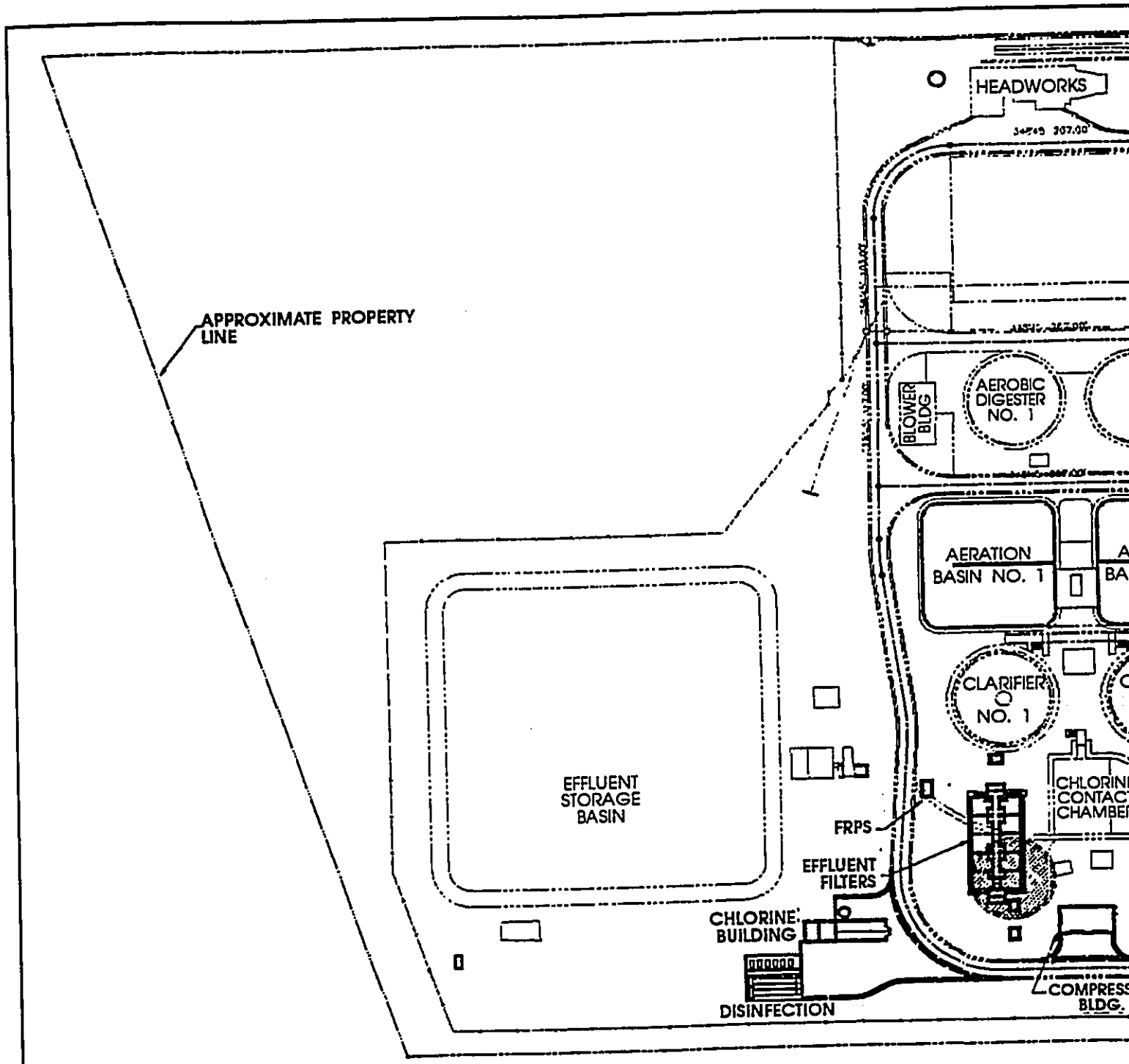
The proposed project would increase the design flow capacity (based on peak month flow) of the Kihei WRF from 6.0 MGD to 8.0 MGD. Under the proposed improvements, the peak wet-weather capacity would be increased from 12.0 MGD to 16.0 MGD.

Headworks modifications are included in the project in order to control and mitigate odor emissions. A new caustic system will be housed at a new building near the plant's entrance. Sodium hydroxide (caustic) will be injected into the force mains prior to entering the headworks in order to raise the pH level of the influent sewage. The addition of caustic, along with prechlorination, will aid in controlling hydrogen sulfide (H_2S) emissions

which is probably the major source of odor complaints (Brown and Caldwell, March, 1992).

The headworks will also be enclosed to confine odors within the system. An activated carbon adsorption system will serve as an additional level of odor control for those instances when liquid-phase controls are not effective. A 40-foot high dispersion stack 15 inches in diameter, is proposed to aid in dispersing emissions into the atmosphere. Finally, planting of an approximately 30-foot high vegetation barrier is being considered on the western boundary of the site near Piilani Highway in order to achieve vertical dispersion of residual odors, especially from the aeration basins and aerobic digesters. It would also aid in ensuring dispersion of stack emissions and other emissions at the headworks area. (See Figure 3.)

A new 0.9 million gallon aeration basin with anoxic zones and a new blower building are proposed. The new aeration basin with anoxic selector would increase the capacity for treating organic loads, remove nitrogen, reduce oxygen requirements, reduce the need for supplementing alkalinity, and provide additional operational flexibility. The new basin will be rectangular in shape, approximately 140-feet by 85-feet, and will contain a center wall to allow half of the basin to be taken out of service. During normal operation, flow to the new basin will be split to provide equal flow to each half of the basin. Fine bubble diffusers will also be installed in the two existing basins and the new basin in order to save energy by transferring oxygen into the wastewater more efficiently. The blower building is required for the diffused aeration system and would contain four 300-horsepower and one 150-horsepower blowers. The blower building would be constructed similar to the existing blower building which contains the agitation air and digester aeration blowers.



Source: Brown & Caldwell Consultants

Figure 3

Kihei Wastewater Reclamation

General Site Plan with Propose

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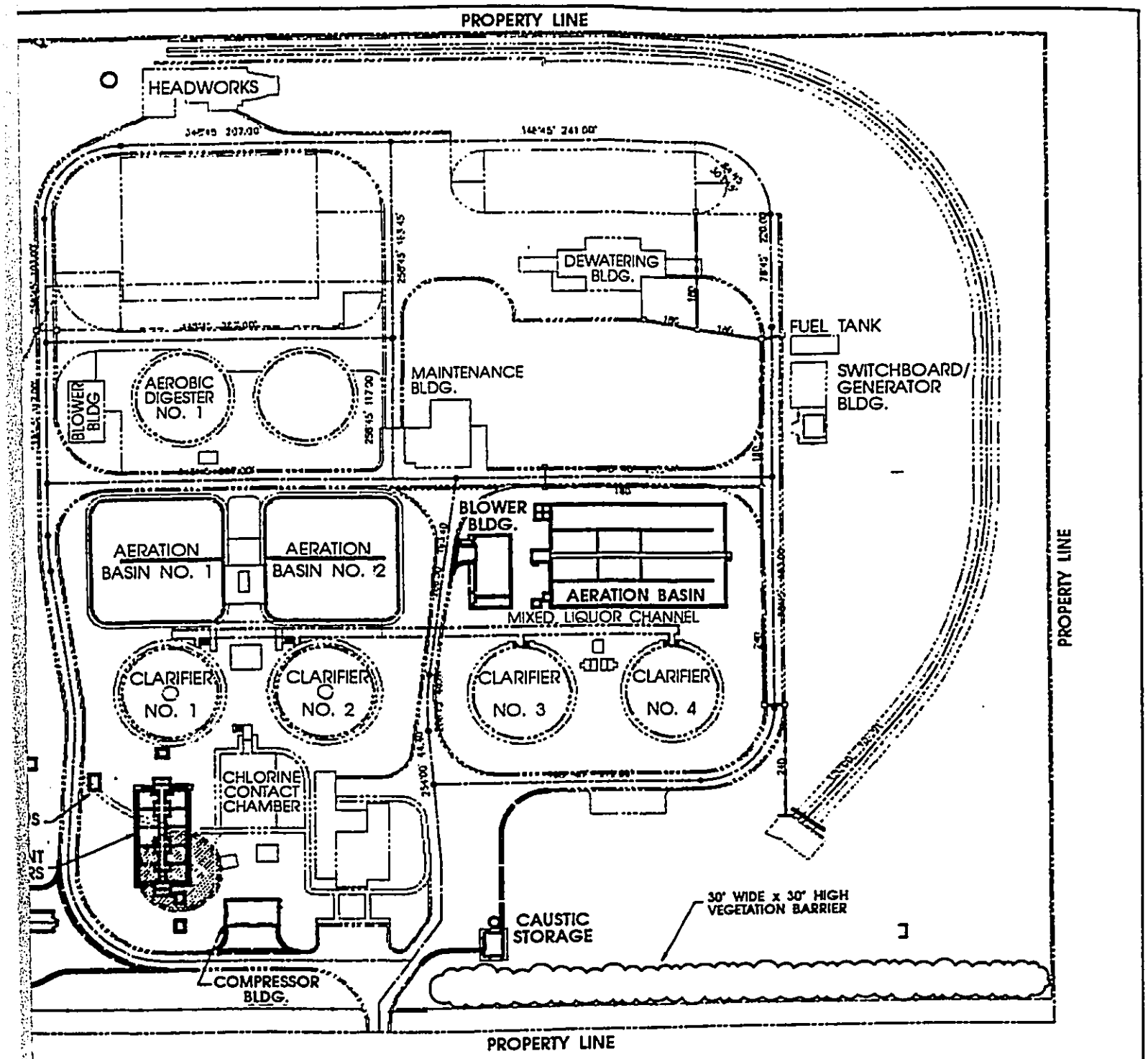


Reclamation Facility Expansion

Plan with Proposed Improvements

Michael T. Munekiyo Consulting, Inc.

Prepared for: County of Maui, Department of Public Works

New effluent filters are being installed to provide low-turbidity effluent for proper disinfection of reclaimed water and to remove particulate matter to prevent clogging of injection wells. The filters would produce a water turbidity less than 2 NTU to facilitate downstream disinfection to produce Class A or Class B water under the proposed Guidelines for the Use of Reclaimed Water in Hawaii.

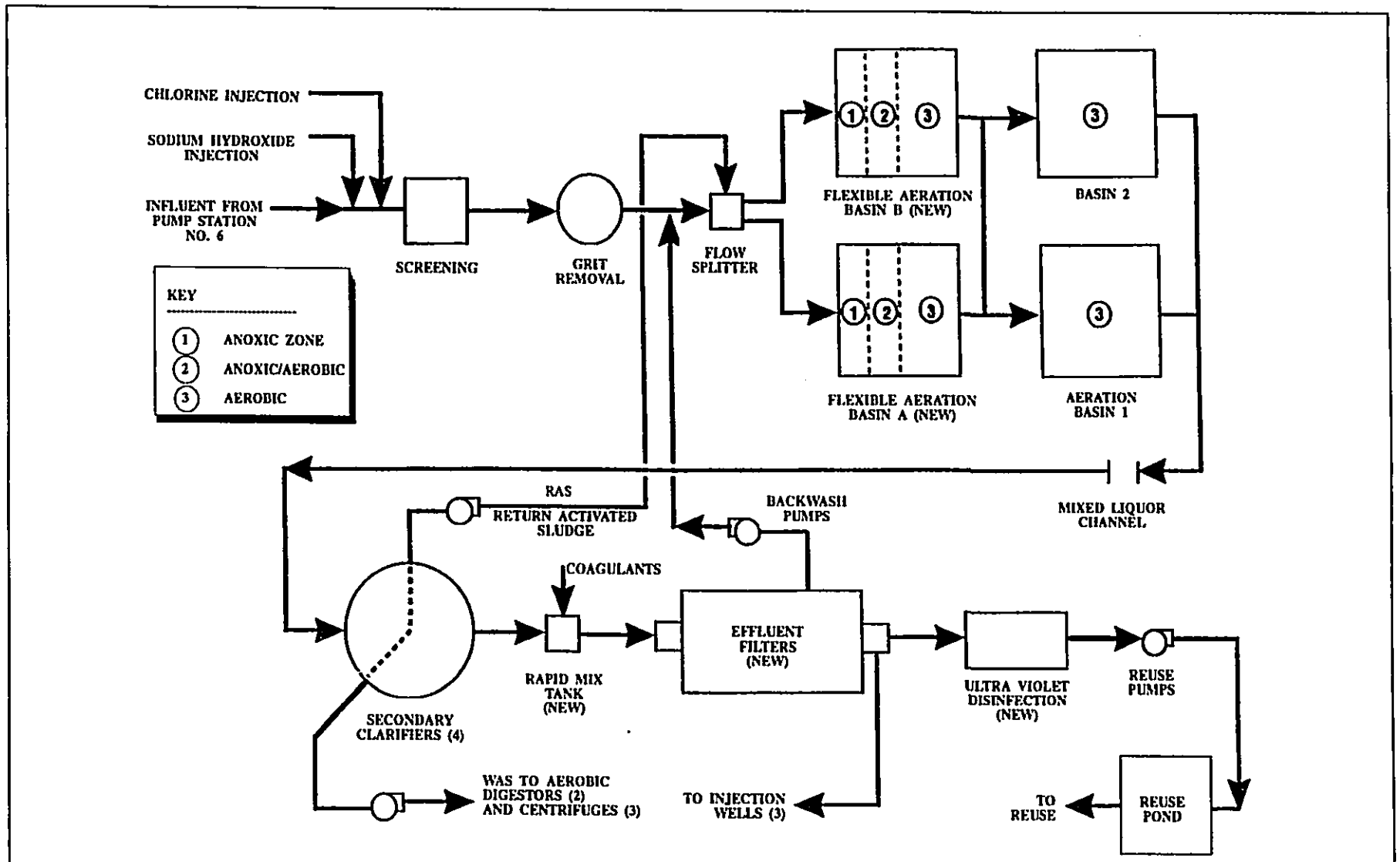
Disinfection system improvements are needed in order to properly disinfect reclaimed water and to comply with 1988 Uniform Fire Code requirements. This includes a new chlorine storage and handling facility. An ultraviolet (UV) disinfection system is proposed as the primary method of disinfection of reclaimed effluent. The State Department of Health has given provisional approval to UV disinfection in Lahaina and is expected to approve the Kihei system as well.

Step testing for each of the three injection wells will also be done to establish the rating of each well. The flow capacity requirements of each well would be established, in coordination with the Department of Health. This analysis will determine whether additional injection wells are required.

Figure 4 presents a schematic flow diagram of the Kihei WRF process.

The estimated construction cost of the improvements is $17-$18 million.

Construction of the proposed improvements is anticipated to begin in mid-1993, with completion in mid-1995.



Source: Brown & Caldwell Consultants

Figure 4 Kihei Wastewater Reclamation Facility Expansion
Flow Diagram

NOT TO SCALE

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Prepared for: County of Maui, Department of Public Works

Chapter III

Description of the Existing Environment

III. DESCRIPTION OF THE EXISTING ENVIRONMENT

A. PHYSICAL SETTING

1. Surrounding Environment

The project site is located in Kihei, Maui, mauka of Piilani Highway. Proposed improvements to the Kihei WRF will be contained within the existing boundaries of the site.

To the immediate north of the project site is the Silversword Golf Course and Kihei Research and Technology Park. To the east are vacant lands containing low land dry vegetation which gradually slopes up to the Kula region. To the immediate south of the project is a construction baseyard and additional vacant lands. To the west of the project site makai of Piilani Highway are the Waiohuli Keokea Homestead and Kamaole Homestead residential areas.

2. Climate

The Kihei Coast is generally sunny, warm and dry during the entire year. In Kihei Town, the average annual high temperature is 86 degrees Fahrenheit with the average low temperature being 63 degrees Fahrenheit (Environment Impact Study Corporation, 1982). June through August are historically the warmer months of the year while the cooler months are January to March.

Average rainfall distribution in the Kihei-Makena region varies from under 10 inches per year to 20 inches per year in the higher elevations. Rainfall in the Kihei-Makena region is highly seasonal, with most of the precipitation occurring in the winter months.

Northeast tradewinds prevail approximately 80 to 85 percent of the time. Winds average 10 to 15 miles per hour during afternoons with lighter winds during mornings and nights.

The Ma'alaea-Kihei-Makena region is subject to unique wind conditions due to specific terrain. The Ma'alaea area, which lies at the base of the central isthmus flanked by two mountain masses, is subject to a wind tunnel effect. As the wind squeezes between the mountain masses, its force becomes compressed, at times increasing in velocity to more than 50 percent above the normal velocity in the Wailuku area. The wind fans out over Ma'alaea Bay, retaining the added velocity, with the inshore segment blowing parallel to the Kihei Coast. Along the shore, it meets the eddy current of the trades deflected along the southeast slopes of Haleakala. This results in unpredictable local winds from Kalama Park to Cape Kina'u.

Between about October and April, the southerly winds of Kona storms may be felt. These storm winds, as well as the trades, are occasionally strong enough to damage vegetation and structures.

In the absence of tradewinds and of nearby storms, winds may become light and variable. Then diurnal heating and cooling of the land mass gives rise to onshore sea breezes during the day and offshore land breezes at night.

3. ***Topography and Soils***

The site is located on gently sloping land at approximately 100-feet in elevation. Throughout the region, slopes average 0.5 to 8 percent from the coastline to the 120-foot elevation and increases to

approximately 12 percent at the 250-foot elevation. Slopes in excess of 25 percent are encountered farther up the side of Haleakala at about the 800-foot elevation (Environment Impact Study Corp. and Muroda and Associates, Inc., 1982).

Underlying the proposed site is the Waiakoa-Keahua-Molokai soil association (See Figure 5.) This series consists of well-drained soils developed in material weathered from basic igneous rock.

The soil type at the project site consists of Waiakoa extremely stony silty clay loam (WID2) (See Figure 6.) This soil is characterized by stones which cover 3 to 15 percent of the surface with much of the surface layer removed by erosion. Runoff is medium and the erosion hazard is severe. (U.S. Department of Agriculture, Soil Conservation Service, 1972).

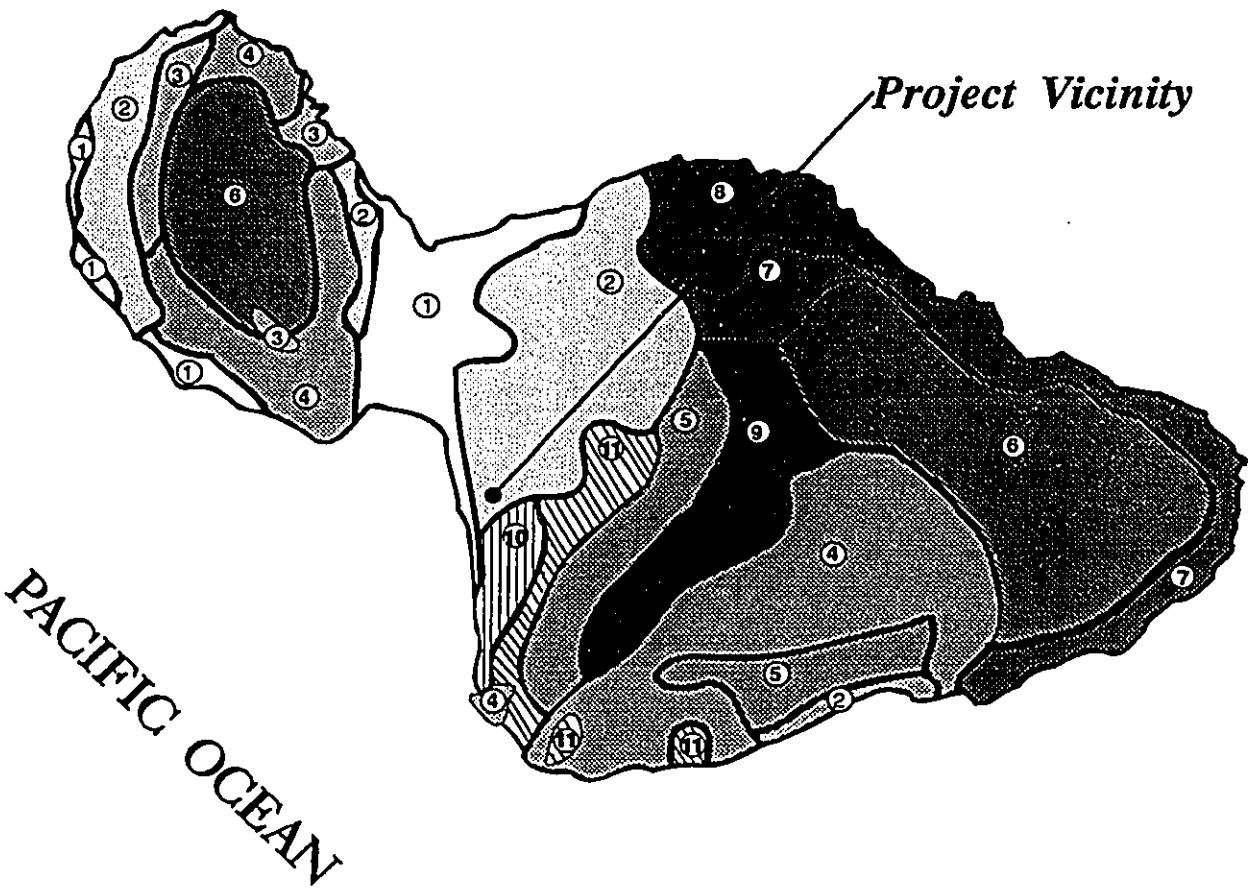
Lands underlying the project site are designated "E" by the University of Hawaii Land Study Bureau. This classification system rates lands on a scale of "A" to "E", reflecting land productivity characteristics. Lands designated "A" are considered to be of highest productivity, with "E" rated lands ranked lowest.

4. ***Flood and Tsunami Hazard***

The property site lies in an area of minimal flood and tsunami hazard as determined by the Flood Insurance Rate Map for this region. In particular, the site is located mauka of Piilani Highway, well beyond the coastal tsunami inundation areas. Moreover, the elevation and local terrain of the site provides for adequate drainage to preclude flooding from storm runoff.

LEGEND

- ① Pulehu-Ewa-Jaucas association
- ② Waiakoa-Keahua-Molokai association
- ③ Honolua-Olelo association
- ④ Rock land-Rough mountainous land association
- ⑤ Puu Pa-Kula-Pane association
- ⑥ Hydrandepts-Tropaquods association
- ⑦ Hana-Makaalae-Kailua association
- ⑧ Pauwela-Haiku association
- ⑨ Laumaia-Kaipoipoi-Olinda association
- ⑩ Keawakapu-Makena association
- ⑪ Kamaole-Oanapuka association



Map Source: USDA Soil Conservation Service

Figure 5 Kihei Wastewater Reclamation Facility Expansion
Soil Association Map

Michael T. Munekiyo Consulting, Inc.
Prepared for: County of Maui, Department of Public Works

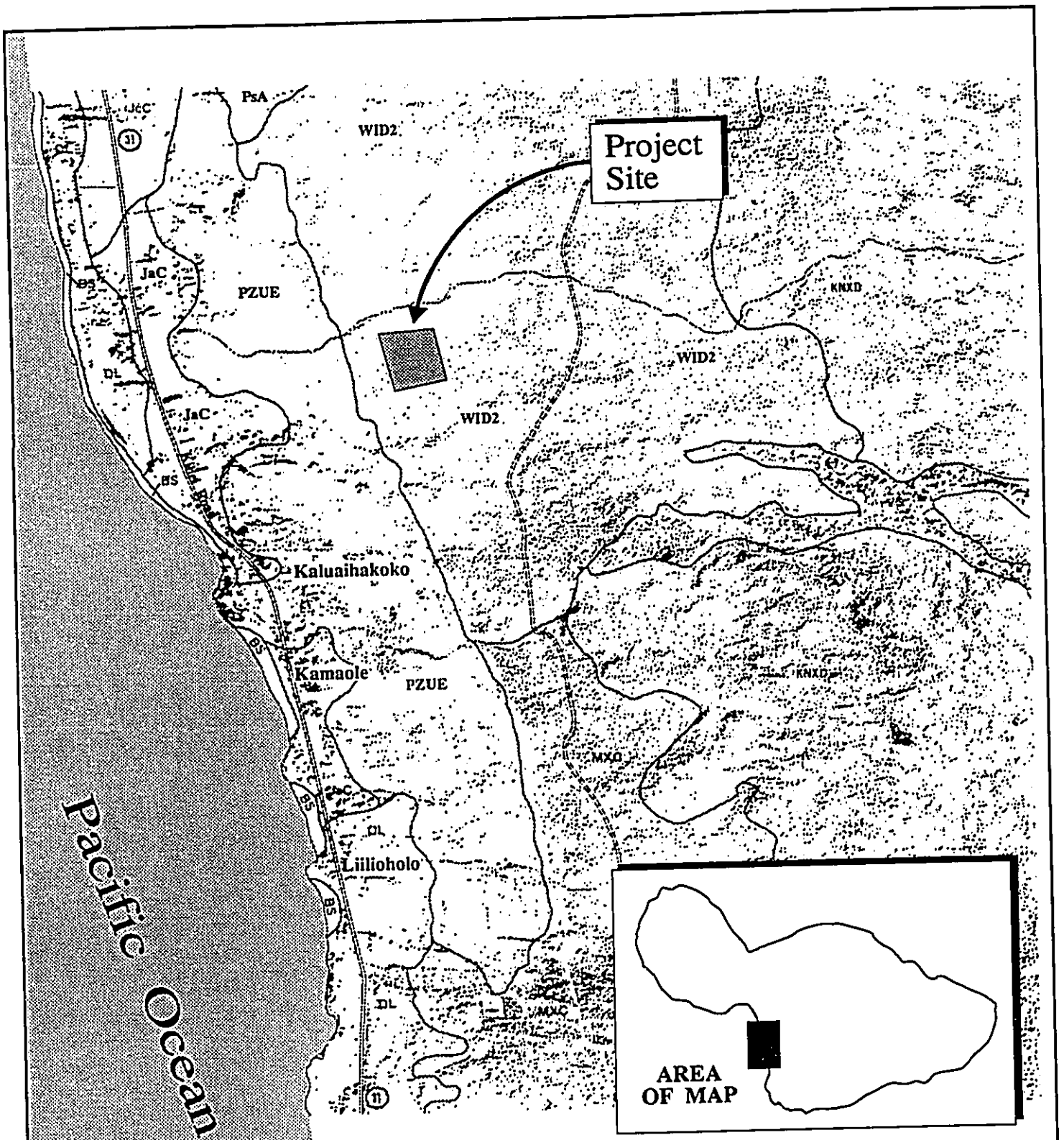


Figure 6 Kihei Wastewater Reclamation Facility Expansion

Soils Classification

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Prepared for: County of Maui, Department of Public Works

5. Geology

The project site is situated near the southwestern rift zone of Haleakala and contains volcanic rocks and substrate of the Kula and Hana Volcanic Series. Lava flows of the Kula Series consist mostly of basaltic andesite, andesite, basalt, and picritic basalt. This series is at least 2,500 feet thick near the summit of Haleakala and 50 to 200 feet thick near the coast (Environment Impact Study Corp. and Muroda and Associates, Inc., 1982). The Hana Series overlies the Kula Series in and around the southwest rift zone. The lavas of the Hana Series consist primarily of olivine and picritic basalt, basaltic andesite, and andesite. In general, lava flows of the Hana Series are 100 to 200 feet thick except in canyons, where they are at least 1,000 feet thick.

Calcareous dune sands and alluvium deposits compose most of the surface area along the shore between Kihei and Makena. The dunes probably were formed when sea level stood at about 40 feet above the present level.

6. Hydrology

In the coastal area between Kihei and Makena, recharge to ground water is too small to sustain any fresh basal water bodies. Well data shows that the basal lens a mile inland from the coast between Kihei and Makena is brackish (500-600 parts per million of chloride), very thin (1-3 feet), and chloride-sensitive to pumping. The chances of developing fresh basal water sources between Kihei and Makena are slim for distances less than 2 miles inland from shore (less than 1200 feet elevation). High level, dike-confined ground water is not known to occur and probably does not, for lack of heavy rainfall

(Environment Impact Study Corp. and Muroda and Associates, Inc., 1982).

7. Flora and Fauna

Vegetation in the vicinity of the project site is typical of the Kihei area. This includes kiawe trees, common grasses and weeds. There are no known rare, threatened or endangered plant species in the vicinity of the project site.

Avifauna and mammals common to the project site and surrounding areas are also typical of species found in the urbanized Kihei area. Exotic species of birds commonly found in this area include the Northern Cardinal, House Finch and Gray and Black Francolin. Feral mammals typically found in the area include cats, rats, mice and mongoose. There are no known endangered or threatened wildlife species in the vicinity of the site.

8. Archaeological Resources

The project site has been fully cleared and graded to accommodate subsurface and above-ground improvements for the Kihei WRF. As such, surface archaeological resources will not be encountered at the project site.

9. Air Quality

The Kihei-Makena region is not exposed to adverse air quality conditions. Available ambient air quality data for the Kihei region indicates that particulate matter concentrations and sulfur dioxide concentrations meet Federal and State air quality standards. There are no fixed sources of emission in the region although sugar cane harvesting activities to the north may affect levels of carbon

monoxide and suspended particulate matter. These conditions are intermittent and of temporary duration. Motor vehicle and construction activities are the primary source of indirect emissions in the region.

There have been intermittent complaints regarding odor from the Kihei WRF. Much of the objectionable odor occurs in the evening hours when on-shore sea breezes subside. The off-shore land breezes which occur during the evenings then bring plant odors downslope into residential areas.

Odor complaints primarily stem from hydrogen sulfide emissions. The primary source of objectionable odor is the headworks area of the Kihei WRF (Brown and Caldwell, March, 1992). This is the area where the Kihei WRF first receives influent wastewater from Kihei Wastewater Pump Station No. 6. However, there have been a number of ongoing actions which have aided in the control of odors. Since April 1991, chlorine has been injected near the treatment plant entrance into the facility's force mains. Aeration has also been stopped at the headworks portion of the facility since April 1991. Since December 1991, sodium hydroxide (caustic) has also been injected into the facility's influent force mains. A dedicated chlorination system for odor control has been operating at the facility since April 1992.

10. Noise Characteristics

There are no fixed noise generators in the vicinity of the project site. Background noise in this locale can be attributed to traffic traveling along Piilani Highway.

B. COMMUNITY SETTING

1. Land Use and Community Character

From a regional standpoint, the subject parcel is part of the Kihei-Makena Community Plan region which stretches from Maalaea to La Perouse Bay. The region includes a diverse range of physical and socio-economic environments. With its dry and mild climate and proximity to recreation-oriented shoreline resources, the visitor-based economy has grown steadily over the past few years. The town of Kihei serves as the commercial and residential center of the region with the master-planned communities of Wailea and Makena serving as the focal point for visitor activities.

The project site is located adjacent to the Silversword Golf Course mauka of Piilani Highway and the residential and commercial uses of Kihei.

2. Population

The population of the County of Maui has exhibited relatively strong growth over the past decade, with the 1990 population estimated to be 100,374, a 41.7 percent increase over the 1980 population of 70,847. Growth in the County is expected to continue, with resident population projections to the year 2000 and 2010, estimated to be 123,900 and 145,200, respectively (DBED, 1990).

Just as the County's population has grown, the resident population of the region surrounding the project site has increased dramatically in the last two decades. Population gains were especially pronounced in the 1970s as the rapidly developing visitor industry attracted many new residents. The current resident population of the Kihei-Makena region is estimated at 15,365. A projection of the

resident population for the years 2000 and 2010 are 19,885 and 24,514, respectively (Community Resources, Inc., 1992).

3. *Economy*

The economy of Maui is heavily dependent upon the visitor industry. In 1989, for example, total visitor expenditures equalled $2.3 billion. The dependency on the visitor industry is especially evident in Kihei-Makena, which is one of the State's major resort destination areas. The openings of the Four Seasons Hotel, the Grand Hyatt and Kea Lani Hotel will boost the region's significance as a resort destination.

Support for the visitor industry is found in Kihei, where numerous retail commercial centers are found. New commercial centers in Kihei, such as Azeka's and the Longs Drugs complexes, will lend further support to the regional economy.

4. *Police and Fire Protection*

The County of Maui's Police Department is headquartered at its Wailuku Station. The Department consists of several patrol, investigative and administrative divisions. The Department's Kihei Patrol covers the Kihei-Makena region.

Fire prevention, suppression and protection services are offered by the County's Department of Fire Control. The Kihei Station, which services the Kihei-Makena region is located on South Kihei Road, approximately 0.6 mile from the project site.

5. *Medical Facilities*

Maui Memorial Hospital, the only major medical facility on the island, services the Kihei-Makena region. Acute, general and emergency care services are provided by the 145-bed facility. Medical/dental offices are located in the Kihei area to serve the region's residents.

6. *Recreational Facilities*

Diverse recreational opportunities are available in the Kihei-Makena region. Recreational facilities in close proximity to the project site include the Silversword Golf Course, Kalama Park, Kamaole Beach Park, and numerous other beach parks along the Kihei coastline. Shoreline recreation includes swimming, fishing, picnicking and snorkeling.

The Wailea-Makena resort areas to the south of the project site offers additional opportunities for golf, tennis and ocean-related activities.

7. *Schools*

The State Department of Education operates two schools in the Kihei area. Kihei Elementary School covers grades K to 6, while Lokelani Intermediate School includes grades 7 and 8. Public school students in grades 9 through 12 attend H.P. Baldwin High School in Wailuku.

C. *INFRASTRUCTURE*

1. *Roadway System*

Piilani Highway and South Kihei Road are the two major routes serving the Kihei region.

An existing access road leads to the project site from its intersection with Piilani Highway. Welakahao Road also intersects with Piilani Highway in this vicinity, and provides a direct connection with South Kihei Road.

2. ***Water***

The Kihei-Makena region is served by the Central Maui Water System. Source wells located in upper Waiehu provide water for the region. The distribution system in the vicinity of the project sites include a series of 6-inch, 8-inch and 12-inch waterlines.

3. ***Drainage***

There are no drainage improvements within the project site. Surface runoff from the site sheet flows largely to Piilani Highway. There are one 24-inch and three 60-inch storm drain pipes which cross Piilani Highway. Runoff is conveyed through drainlines through the Waimahaihai Subdivision to South Kihei Road and the ocean.

4. ***Electrical System***

Electrical service to the sites will be provided by Maui Electric Company.

Chapter IV

Potential Impacts and Mitigation Measures

IV. POTENTIAL IMPACTS AND MITIGATION MEASURES

A. IMPACTS TO THE PHYSICAL ENVIRONMENT

1. Topography/Landform

Excavation and filling will be required for construction of the aeration basin and blower building, the chlorine storage and handling facility, effluent filters, caustic storage and compressor building.

In general, however, finished contours will follow existing grades to minimize earthwork cost and maintain existing drainage patterns which tie into the immediate surrounding lands.

While terrain within the site will be locally modified to meet design requirements, overall site development will not disturb the smooth and uniform east to west slopes characteristic of the South Maui foothills.

2. Drainage Control

The proposed project involves several improvements which add impermeable surface within an existing 23.9-acre wastewater reclamation facility site. A new blower building of approximately 1,800 square feet is the largest improvement in terms of land area. Other smaller improvements such as the effluent filters structure would occupy approximately an additional 1,600 square feet. New caustic storage, compressor, chlorine, and disinfection structures each would not occupy more than 1,500 square feet. The construction of the new aeration basin would result in approximately 11,900 square feet of existing "hard" surface being removed and replaced with an open treatment process tank which would accept and contain rainfall.

It is anticipated that runoff from the project site will cause no adverse impacts to adjacent and downstream properties.

3. ***Flora and Fauna***

The proposed project would take place entirely within the boundaries of the existing Kihei WRF site. The site was fully cleared, graded and grubbed at the time of the original facility's construction in 1975. There are no known rare, endangered or threatened species of flora within the project site. The removal of any existing vegetation is not considered an adverse impact to this component of the environment.

Similarly, there are no known rare, endangered or threatened species of avifauna and wildlife in the project site. Construction of improvements within the existing site is not anticipated to adversely impact the area's fauna and avifauna population.

4. ***Air Quality and Noise***

Air quality and noise parameters in the immediate vicinity of the project are anticipated to be affected by short-term construction activities. Earthwork operations, for example, will result in fugitive dust being generated. Similarly, noise will be generated from construction equipment. However, earthwork and construction activities involve a relatively small area within the existing Kihei Wastewater Reclamation Facility site. The site is located adjacent to a golf course and Research and Technology Park to the north, vacant lands to the east, a construction baseyard to the south and approximately 700 feet away from a future Project District to the west. Dust and noise impacts generated from construction activities are not considered adverse. On a long term basis, the project will not generate adverse noise conditions.

Air quality is also not anticipated to be adversely affected by the project. Regarding odor concerns, the proposed project is anticipated to further reduce odors from the facility. Permanent caustic and chlorine feed systems will be installed to aid in the control of hydrogen sulfide levels which would reduce odors. Chlorine will continue to be injected at the force mains near entrance into the Kihei WRF. Caustic will also be injected into the force mains at the Kihei WRF to raise the pH level of the influent sewage.

The proposed project would include enclosure of the headworks to confine odors. An activated carbon adsorption system will serve as an additional means of odor control for those instances when liquid-phase controls are not effective.

The headworks will be ventilated by a dispersion stack, which is approximately 15-inches in diameter and 40 feet high. This stack will help disperse the discharge into the atmosphere. Finally, a vegetation barrier is also being considered at the makai Kihei WRF boundary line to help achieve vertical dispersion of residual odors.

5. ***Scenic and Open Space Resources***

The proposed project will be contained within the existing facility site. Improvements pertaining to the aeration basin and its appurtenant blower building involve improvements at and below grade. Similarly, other new structures such as the chlorine storage and handling facility, effluent filters, caustic storage and compressor building are single story structures. The tallest structure is the 40-foot dispersion stack.

These facilities will not adversely impact the scenic and visual character of the surrounding lands. The proposed project is approximately 500 feet mauka of Piilani Highway and approximately 3,000 feet mauka of South Kihei Road. The proposed single-story improvements at or below grade will not be visible from either of these primary arterials. At 15 inches in diameter, the proposed dispersion stack will not be a significant view object. The project site is located mauka of existing urbanized areas and does not encroach into scenic coastal view corridors.

6. ***Archaeological Resources***

The site has been in its present use for a number of years and the surface character has been altered during original construction of the wastewater reclamation facility and laying of transmission lines. Accordingly, the proposed project is not anticipated to have adverse impacts to archaeological resources.

7. ***Water Quality***

There is presently substantial conjecture that nutrients from land-based sources, including treated effluent pumped into injection wells, may be causing algal blooms in Maui's nearshore waters. However, there are no data which identifies specific causal factors. Although treated effluent may be a potential contributor to increased algal abundance, there are also other nonpoint possibilities from agricultural and urban activities, as well as channelized stream discharge to be investigated.

The Kihei WRF has 3 existing effluent injection wells, all of which are approximately 300 feet deep. Steel casings extend throughout their entire depth. The upper 200 feet is 18- to 20-inch diameter concrete

grouted solid casing with the lower 100 feet 16- to 18-inch perforated casing.

The 3 injection wells are drilled in fractured volcanic rock approximately 200 feet below sea level. Because the elevation of the Kihei WRF is approximately 100 feet above sea level, there is significant hydraulic pressure available.

Based on preliminary testing by Brown and Caldwell and Water Resources, Inc., one of the existing injection wells was projected to accept as much as 8.9 MGD (Brown and Caldwell, March, 1992). This capacity is significantly greater than that of injection wells at other Maui plants.

Since the proposed project involves the provision of additional effluent disposal capacity, injection well capacity will be evaluated to determine if any additional wells will be required. The proposed project would increase design flow capacity (based on peak month flow) to 8.0 MGD and peak wet-weather capacity to 16 MGD. The peak dry weather flow is projected to be approximately 11 MGD. The State DOH normally requires total injection well capacity to be twice the projected peak dry-weather flows. Thus, additional injection wells may be required.

However, it should be emphasized that in the long-term, the primary disposal method at the Kihei WRF is anticipated to be water reuse. Presently, the Kihei WRF discharges between 1.8 MGD to 2.4 MGD of high quality effluent into its 3 injection wells. An additional .6 MGD to 1.2 MGD of treated effluent is pumped to the Silversword Golf Course for its irrigation needs.

The Kihei-Makena region has significant potential for water reuse. Potential users of reclaimed water for irrigation purposes include the Wailea Resort golf courses, the Makena Resort golf courses, the golf courses at the proposed Wailea 670 project, and Kalama and Kama'ole Beach Parks. The peak summer flow required to service the foregoing courses (including the Silversword course) and parks would be 9.1 MGD which exceeds the proposed 8.0 MGD design flow capacity of the Kihei WRF (Brown and Caldwell, April 1992).

Since the potential of implementing water reuse projects in the Kihei-Makena region is quite favorable, there will likely be decreased long-term use or need for injection wells, except during emergency conditions.

In the absence of scientific analyses linking treated effluent from injection wells to algal blooms, the County is considering embarking on a study which may aid in the investigation of any such link. This study will supplement and augment other studies being carried out independently and can be viewed as a long-term mitigation measure to identify and define possible causes of the algal blooms. Through the introduction of tracer dyes into injection wells, it may be possible to detect where such effluent is entering the ocean, and the degree of dilution of effluent with seawater. With such testing, it may be possible to effectively manage the role which injection wells play in the wastewater reclamation system.

B. IMPACTS TO COMMUNITY SETTING

1. Population and Local Economy

The proposed improvements will increase the plant's treatment design capacity from 6.0 MGD to 8.0 MGD. The increase in

treatment capacity will provide for wastewater treatment needs in the Kihei-Wailea region.

In this regard, the proposed improvements will help to preserve the long-term economic vitality of the region by ensuring the integrity of the wastewater reclamation system. Additionally, improved odor control measures and exploration of alternatives for reducing or eliminating primary use of injection wells will promote the public health and welfare of the residents of Kihei-Wailea.

2. ***Public Services***

The proposed improvements will require no more than three additional persons to handle operations and maintenance. Thus, the employment-related impacts of the project upon public service needs, such as police and fire protection, medical facilities, recreational facilities and schools are considered negligible.

Presently, sludge is aerobically digested and dewatered to produce 13% cake solid material. With the increase in treatment design capacity, the dry solids could increase by about 2,900 pounds per day. The cake solids will be disposed in accordance with all applicable federal regulations.

3. ***Impacts to Wastewater Reclamation System***

The proposed project represents an upgrading of the Kihei Wastewater Reclamation System by providing additional treatment capacity and providing improvements which enhance public health and welfare. Specifically, the proposed project allows greater assurance to other proposed developments in the Kihei-Wailea area that sewer capacity allocation will be available. Odor improvements

are also proposed along with an increased emphasis on water reuse. The proposed project also would result in a decreased likelihood that overcapacity and resultant sewage spills would occur. Over the long-term, the proposed improvements will support the economic and social vitality of the Kihei-Wailea region.

4. *Impacts to Other Infrastructure Systems*

a. *Roadways*

Access to the site will continue to be via unnamed access road which intersects with Piilani Highway.

With no more than three additional employees assigned to the Kihei WRF, the proposed project's impacts upon the public roadway system is expected to be negligible.

b. *Water*

Additional potable water utilized by no more than three employees is expected to have a negligible impact on water supply.

However, a significant benefit of the proposed project deals with its water reuse aspects. To the extent that reclaimed water may be used for purposes such as golf course and park irrigation, it conserves potable water supply for higher uses such as human consumption. With the increasing cost and difficulty associated with development of new potable water supplies, the public benefits are anticipated to be substantial.

Chapter V

Relationship to Land Use Plans, Policies and Controls

V. RELATIONSHIP TO LAND USE PLANS, POLICIES AND CONTROLS

A. STATE LAND USE DISTRICTS

Chapter 205, Hawaii Revised Statutes, relating to the Land Use Commission, establishes the four major land use districts in which all lands in the State are placed "Urban", "Rural", "Agricultural", and "Conservation". The subject property is located in the "Agricultural District". (See Figure 7.)

Wastewater reclamation facilities are not a permitted use within the "Agricultural District". A Special Use Permit was obtained by the County Department of Public Works from the Land Use Commission on August 30, 1973, in accordance with Section 15-15-95 of the Hawaii Land Use Commission Rules. The LUC Rules provide that certain "unusual and reasonable" uses may be permitted within the "Agricultural District".

Since the proposed project does not extend beyond the existing boundary of the Kihei WRF, it falls within the purview of the existing Special Use Permit.

B. GENERAL PLAN OF THE COUNTY OF MAUI

The General Plan of the County of Maui (1990 Update) provides long-term goals, objectives and policies directed toward the betterment of living conditions in the County. Addressed are social, environmental and economic issues which influence both the quantity and quality of growth in Maui County.

Implementation of the General Plan would be facilitated by the proposed wastewater reclamation plant improvements. The following General Plan objective and policy are addressed by this project:

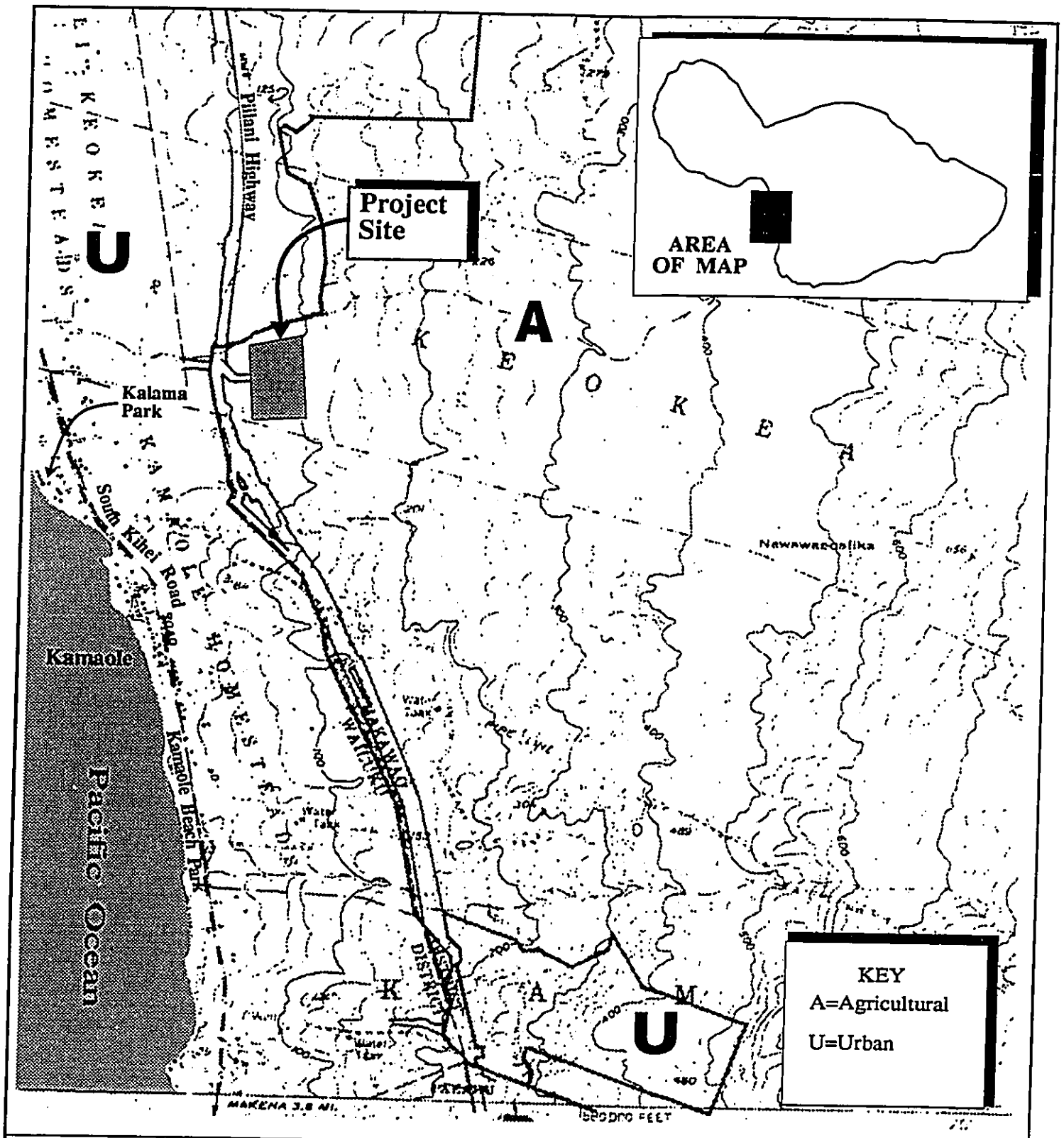


Figure 7 Kihei Wastewater Reclamation Facility Expansion

State Land Use Classification

Michael T. Munekiyo Consulting, Inc.

Prepared for: County of Maui, Department of Public Works

Objective:

To provide efficient, safe and environmentally sound systems for the disposal and reuse of liquid and solid wastes.

Policy:

Establish programs for the development of waste disposal systems which anticipate planned growth.

C. *KIHEI-MAKENA COMMUNITY PLAN*

Nine (9) community plan regions have been established in Maui County. Each region's growth and development is guided by a Community Plan, which contain objectives and policies drafted in accordance with the County General Plan. The purpose of the Community Plan is to outline a relatively detailed agenda for carrying out these objectives.

The proposed project falls within the jurisdiction of the Kihei-Makena Community Plan. The proposed project would facilitate implementation of the Kihei-Makena Community Plan by addressing the objective to "coordinate improvements to existing sewage transmission lines and the central treatment plant to meet the needs of future population growth".

Maps are included within each Community Plan in order to capture spatially the intent of the plan. The project site is designated Public/Quasi-Public by the Kihei-Makena Community Plan Land Use map. (See Figure 8.)

D. *COASTAL ZONE MANAGEMENT (CZM) PROGRAM*

The Coastal Zone Management Program (HRS, Chapter 205A) is a comprehensive statement describing the objectives and policies for regulating public and private uses in the coastal zone management area. The CZM area is defined as "the waters from the shoreline to the seaward

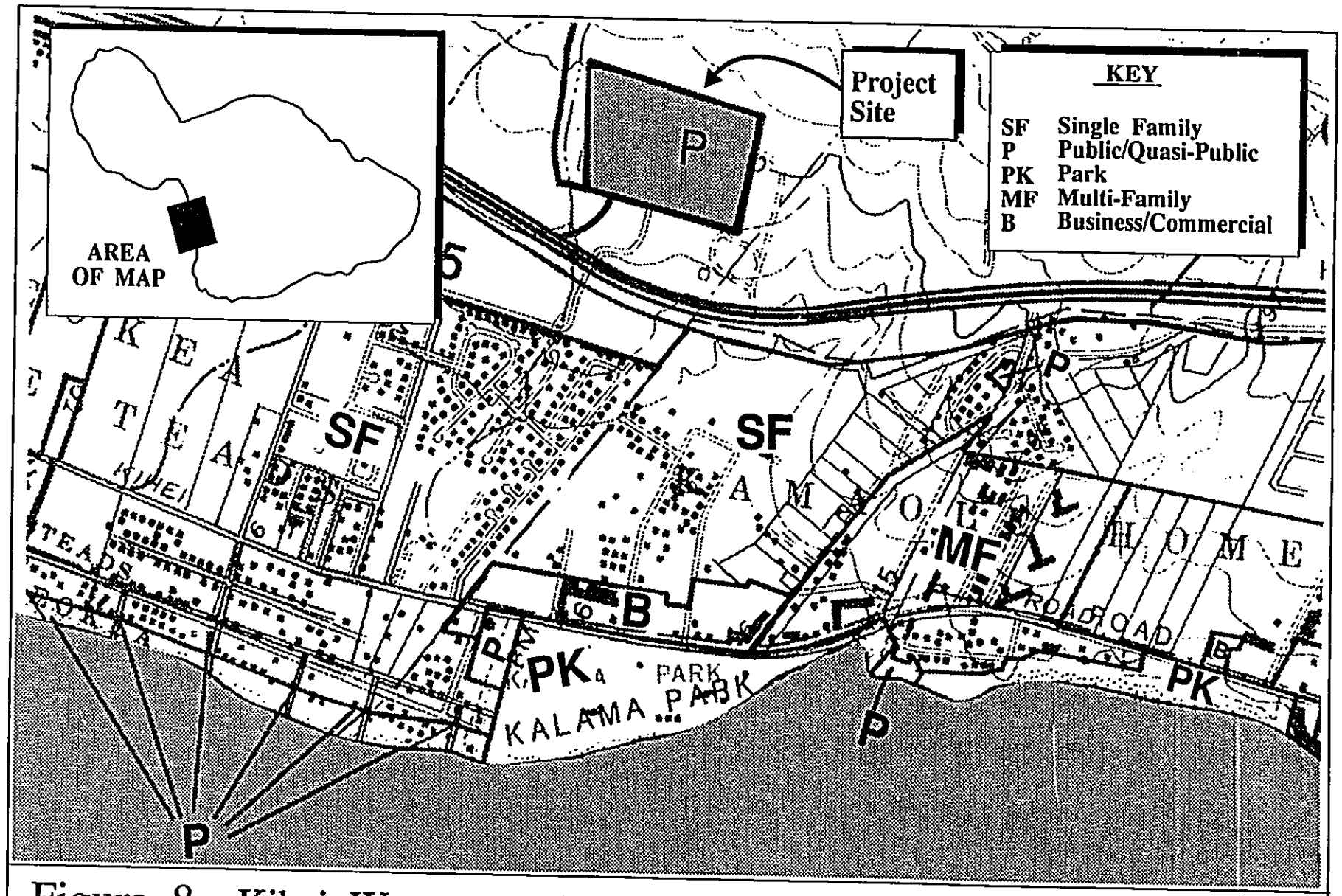


Figure 8 Kihei Wastewater Reclamation Facility Expansion
Community Plan Land Use Designation

Michael T. Munekiyo Consulting, Inc.
Prepared for: County of Maui, Department of Public Works

limit of the state's jurisdiction and all land areas excluding those lands designated as state forest reserves" (HRS Supp., Section 205A-1). The Hawaii CZM program is approved by the Federal government pursuant to Public Law No. 92-583.

The objectives of the Hawaii CZM program are as follows:

A. Provide coastal recreational opportunities accessible to the public;

B. Protect, preserve, and where desirable, restore those natural and manmade historic and prehistoric resources in the coastal zone management area that are significant in Hawaiian and American history and culture;

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

D. Protect valuable coastal ecosystems from disruption and minimize adverse impacts on all coastal ecosystems;

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

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

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

The proposed project is in keeping with the foregoing objectives.

The County of Maui's Special Management Area (SMA) permit procedures have been established within the framework of the CZM program. The subject parcel is not within the County SMA boundaries.

Chapter VI

Findings and Conclusion

VI. FINDINGS AND CONCLUSION

The proposed project would increase the Kihei WRF's design capacity from 6.0 MGD to 8.0 MGD. Aging and outdated equipment is being replaced and odor control improvements are being proposed. Facilities for reuse of high quality effluent are also being developed.

The proposed project will involve earthwork, pipeline, mechanical, structural, and building construction activities. In the short-term, these activities may create temporary nuisances normally associated with construction activities. However, earthwork and construction activities involve a relatively small area within the existing Kihei WRF site. Impacts generated from construction activities are not considered adverse.

From a long-term perspective, the proposed project is not anticipated to result in adverse environmental impacts. There are no known surface archaeological features or rare/threatened species of flora and fauna at the project site.

Odor control improvements include the installation of permanent caustic and chlorine feed systems, enclosure of the headworks, and construction of a new 40 foot high dispersion stack which would be 15 inches in diameter. A vegetation barrier is being considered to aid in the vertical dispersion of residual odors. A carbon adsorption system is also planned for supplemental odor control. Implementation of these improvements would significantly reduce odor impacts upon the neighboring community.

Injection well capacity will be evaluated to determine whether additional injection wells are required to service the increase in plant capacity. Although additional injection wells may be required, the primary disposal method at the Kihei WRF is anticipated to be water reuse. The emphasis on water reuse is considered a long-

term mitigation measure and will likely result in decreased long-term use or need for injection wells.

In the absence of scientific cause and effect analyses linking treated effluent from injection wells to algal blooms, the County is considering embarking on a study which may aid in the investigation of any such link. This study will supplement and augment other studies being carried out independently and may be viewed as a long-term mitigation measure to identify and define a possible cause.

The proposed improvements will result in no more than three additional employees assigned to the Kihei WRF. In this regard, the project is not considered significant in terms of its impacts to public services and other infrastructure systems.

In light of the foregoing findings, it is concluded that the proposed action will not result in any significant impacts.

Chapter VII

Agencies Contacted in the Preparation of the Environmental Assessment and Responses Received

VII. AGENCIES CONTACTED IN THE PREPARATION OF THE ENVIRONMENTAL ASSESSMENT AND RESPONSES RECEIVED

The following agencies were contacted during the preparation of the Environmental Assessment:

1. U.S. Army
   Corps of Engineers
   Pacific Ocean Division
   Building 230
   Fort Shafter, HI 96858

2. U.S. Department of the Interior
   Fish and Wildlife Service
   Pacific Division
   P. O. Box 50167
   Honolulu, HI 96850

3. Dr. John Lewin
   Department of Health
   1250 Punchbowl
   Honolulu, HI 96813

4. Mr. David Nakagawa
   Chief Sanitarian
   Department of Health
   54 High Street
   Wailuku, HI 96793

5. Mr. William Paty
   Department of Land and Natural Resources
   1151 Punchbowl St.
   Honolulu, HI 96813

6. Mr. Brian Miskae
   Department of Planning
   250 S. High Street
   Wailuku, HI 96793

7. Mr. Michael J. Banfield
Executive Vice-President
Haleakala Ranch
529 Kealaloa Avenue
Makawao, HI 96768

8. Mr. Gene Thompson
Kihei Community Association
P. O. Box 662
Kihei, HI 96753

9. Mr. Ronald Gammie
Maalaea Community Association
RR1 Box 388, #301
Wailuku, HI 96793

10. Ms. Tanya Every
Wailea Community Association
3750 Wailea Ala Nui, Suite F21
Wailea, HI 96753

APR 30 1992

DEPARTMENT OF THE ARMY

U. S. ARMY ENGINEER DISTRICT, HONOLULU
BUILDING 230
FT. SHAFTER, HAWAII 96858-5440

April 23, 1992

'92 APR 24 P1:27

REPLY TO
ATTENTION OF:

Planning Division

Mr. George N. Kaya, Director
County of Maui Department of Public Works
200 South High Street
Wailuku, Maui, Hawaii 96793

Dear Mr. Kaya:

Thank you for the opportunity to review and comment on the environmental assessment preparation notice for proposed expansion of the Kihei Wastewater Reclamation Facility, Phase II, at Kihei, Maui (TMK 2-2-24: 10, por. 11). The following comments are provided pursuant to Corps of Engineers authorities to disseminate flood hazard information under the Flood Control Act ~~of 1960~~ and to issue Department of the Army (DA) permits under the Clean Water Act; the Rivers and Harbors Act of 1899; and the Marine Protection, Research and Sanctuaries Act.

a. Provided that no fill is placed in the adjacent stream, a DA permit is not required for the proposed project.

b. According to the Federal Emergency Management Agency's Flood Insurance Rate Map, Panel 150003-0265-C, dated September 6, 1989 (copy enclosed), the project site is in Zone C (areas of minimal flooding).

Sincerely,

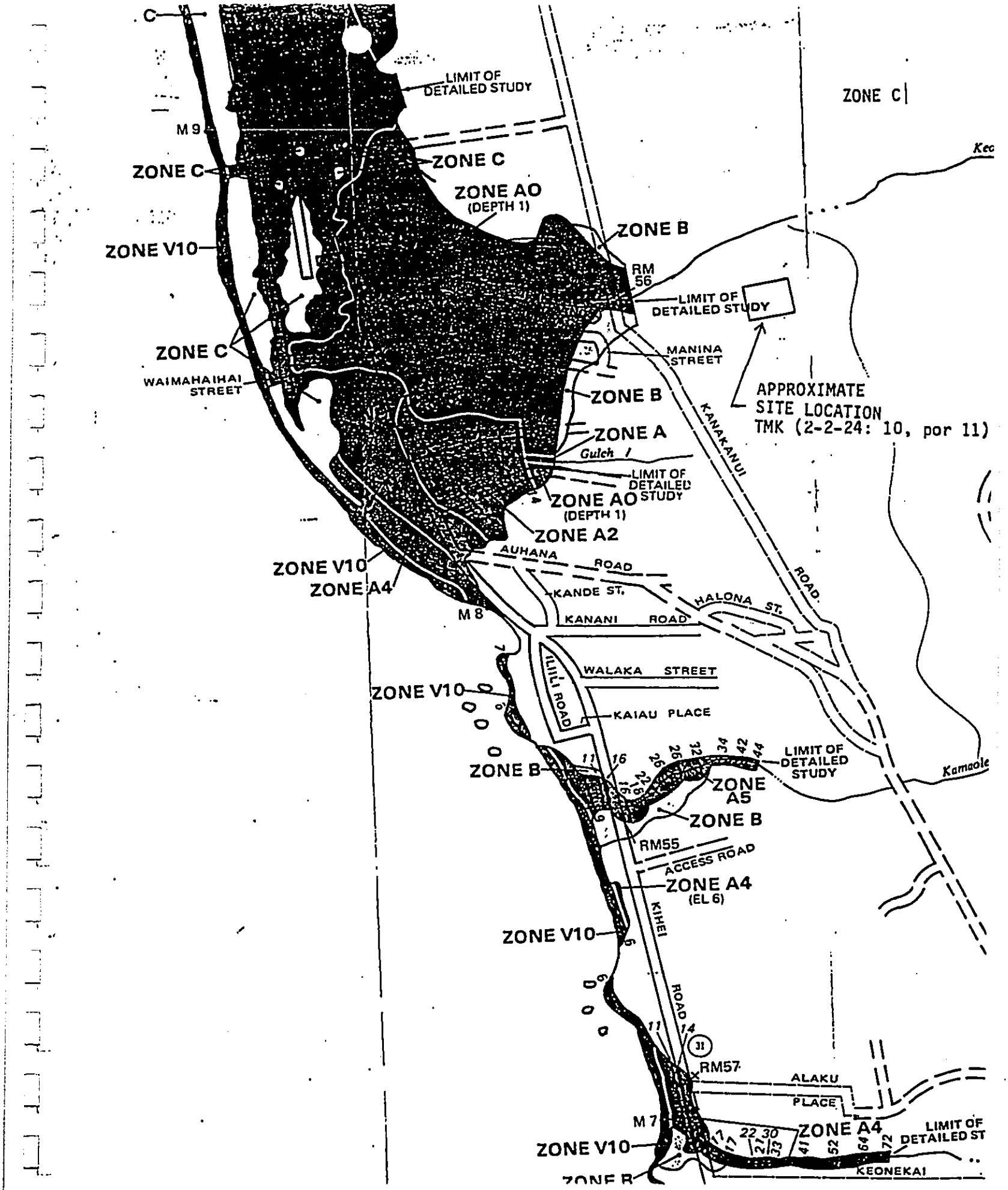
Kisuk Cheung, P.E.
Director of Engineering

Enclosure

DEPT OF PUBLIC WORKS

4/25

RECEIVED
'92 APR 27 10:33


C
LIMIT OF DETAILED STUDY
ZONE C
M 9
ZONE C
ZONE C
ZONE AO (DEPTH 1)
ZONE B
ZONE V10
RM 56
LIMIT OF DETAILED STUDY
ZONE C
MANINA STREET
WAIMAHAIHAI STREET
ZONE B
APPROXIMATE SITE LOCATION TMK (2-2-24: 10, por 11)
ZONE A
KANAKANUI
Gulch
LIMIT OF DETAILED STUDY
ZONE AO (DEPTH 1)
ZONE A2
AUHANA ROAD
ZONE V10
ZONE A4
KANDE ST.
HALONA ST.
ROAD
M 8
KANANI ROAD
WALAKA STREET
ILIILI ROAD
KAIAU PLACE
ZONE V10
LIMIT OF DETAILED STUDY
ZONE B
ZONE A5
ZONE B
RM55
ACCESS ROAD
ZONE A4 (EL 6)
KIHEI
ZONE V10
ROAD
RM57
ALAKU PLACE
M 7
ZONE A4
LIMIT OF DETAILED ST
ZONE V10
KEONEKAI
ZONE B

NATIONAL FLOOD INSURANCE PROGRAM

FIRM
FLOOD INSURANCE RATE MAP

MAUI COUNTY, HAWAII

PANEL 265 OF 400
(SEE MAP INDEX FOR PANELS NOT PRINTED)

COMMUNITY-PANEL NUMBER
150003 0265 C

MAP REVISED:
SEPTEMBER 6, 1989

Federal Emergency Management Agency

Gulch

5 PANEL 0270

KEY TO MAP

500-Year Flood Boundary

100-Year Flood Boundary

Zone Designations — ZONE B / ZONE B

100-Year Flood Boundary

500-Year Flood Boundary

Base Flood Elevation Line With Elevation In Feet** — 513

Base Flood Elevation in Feet Where Uniform Within Zone** — (EL 987)

Elevation Reference Mark — RM7x

Zone D Boundary

River Mile — •M1.5

**Referenced to the National Geodetic Vertical Datum of 1929

EXPLANATION OF ZONE DESIGNATIONS

ZONE	EXPLANATION
A	Areas of 100-year flood; base flood elevations and flood hazard factors not determined.
A0	Areas of 100-year shallow flooding where depths are between one (1) and three (3) feet; average depths of inundation are shown, but no flood hazard factors are determined.
AH	Areas of 100-year shallow flooding where depths are between one (1) and three (3) feet; base flood elevations are shown, but no flood hazard factors are determined.
A1-A30	Areas of 100-year flood; base flood elevations and flood hazard factors determined.
A99	Areas of 100-year flood to be protected by flood protection system under construction; base flood elevations and flood hazard factors not determined.
B	Areas between limits of the 100-year flood and 500-year flood; or certain areas subject to 100-year flooding with average depths less than one (1) foot or where the contributing drainage area is less than one square mile; or areas protected by levees from the base flood. (Medium shading)
C	Areas of minimal flooding. (No shading)
D	Areas of undetermined, but possible, flood hazards.
V	Areas of 100-year coastal flood with velocity (wave action); base flood elevations and flood hazard factors not determined.
V1-V30	Areas of 100-year coastal flood with velocity (wave action); base flood elevations and flood hazard factors determined.

NOTES TO USER

This map is for use in administering the National Flood Insurance Program; it does not necessarily identify all areas subject to flooding, particularly from local drainage sources of small size, or all planimetric features outside Special Flood Hazard Areas.

Areas of special flood hazard (100-year flood) include Zones A, A1-30, AE, AH, AO, A99, V, V1-30 AND VE.

Certain areas not in the Special Flood Hazard Areas (zones A and V) may be protected by flood control structures.

Coastal base flood elevations apply only landward of the shoreline shown on this map.

For adjoining map panels, see separately printed Index to Map Panels.

INITIAL IDENTIFICATION:

DECEMBER 6, 1977

FLOOD HAZARD BOUNDARY MAP REVISIONS:

ENCLOSURE

JOHN WAIHEE
GOVERNOR OF HAWAII

RECEIVED
1992 MAY -5 PM 2:02
WASTEWATER
RECLAMATION DIVISION
COUNTY OF MAUI

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

'92 MAY -1 P3:37

JOHN C. LEWIN, M.D.
DIRECTOR OF HEALTH

PAUL E. HOFFMAN, M.D., M.P.H.
DISTRICT HEALTH SERVICES ADMINISTRATOR (M.D.)

DEPT OF PUBLIC WORKS

	info	Action	Reply	Comment	File	Return to	Copy
DIRECTOR							
DEP. DIR.							
PERS.							
STAFF OFF.							
LUCA							
WW RECL.							
SOLID W.							
ENGR.							
HWYS.							
SECTY.							

Return to: _____
By: _____ Date: 5/4

May 1, 1992

Mr. George N. Kaya
Director
Department of Public Works
County of Maui
200 S. High Street
Wailuku, Hawaii 96793

Dear Mr. Kaya:

Subject: Proposed Expansion of Kihei Wastewater Reclamation Facility, Phase II

We have reviewed the document on the subject project submitted by your office. We concur with the plans of expanding the design capacity from 6.0 million gallons per day (MGD) to 8.0 MGD for the wastewater facilities in accordance with all applicable local standards and regulations for wastewater service.

All wastewater plans must conform to applicable provisions of the Department of Health's Administrative Rules Chapter 11-62, "Wastewater Systems." However, we do reserve the right to review the detailed wastewater plans for conformance to applicable rules.

Should you have any questions, please contact Ms. Lori Kajiwara of the Wastewater Branch at 586-4290.

Sincerely,

David H. Nakagawa

DAVID H. NAKAGAWA
Chief Sanitarian

	Info	Action	Reply	Comment	File	Return to	Copy
	/				/		

APR 30 1992

DEPARTMENT OF THE ARMY
U. S. ARMY ENGINEER DISTRICT, HONOLULU
BUILDING 230
FT. SHAFTER, HAWAII 96858-5440

REPLY TO
ATTENTION OF:

April 23, 1992

'92 APR 24

Planning Division

Mr. George N. Kaya, Director
County of Maui Department of Public Works
200 South High Street
Wailuku, Maui, Hawaii 96793

DEPT OF PUBLIC WORKS

Dear Mr. Kaya:

Thank you for the opportunity to review and comment on the environmental assessment preparation notice for proposed expansion of the Kihei Wastewater Reclamation Facility, Phase II, at Kihei, Maui (TMK 2-2-24: 10, por. 11). The following comments are provided pursuant to Corps of Engineers authorities to disseminate flood hazard information under the Flood Control Act ~~of 1960~~ and to issue Department of the Army (DA) permits under the Clean Water Act; the Rivers and Harbors Act of 1899; and the Marine Protection, Research and Sanctuaries Act.

a. Provided that no fill is placed in the adjacent stream, a DA permit is not required for the proposed project.

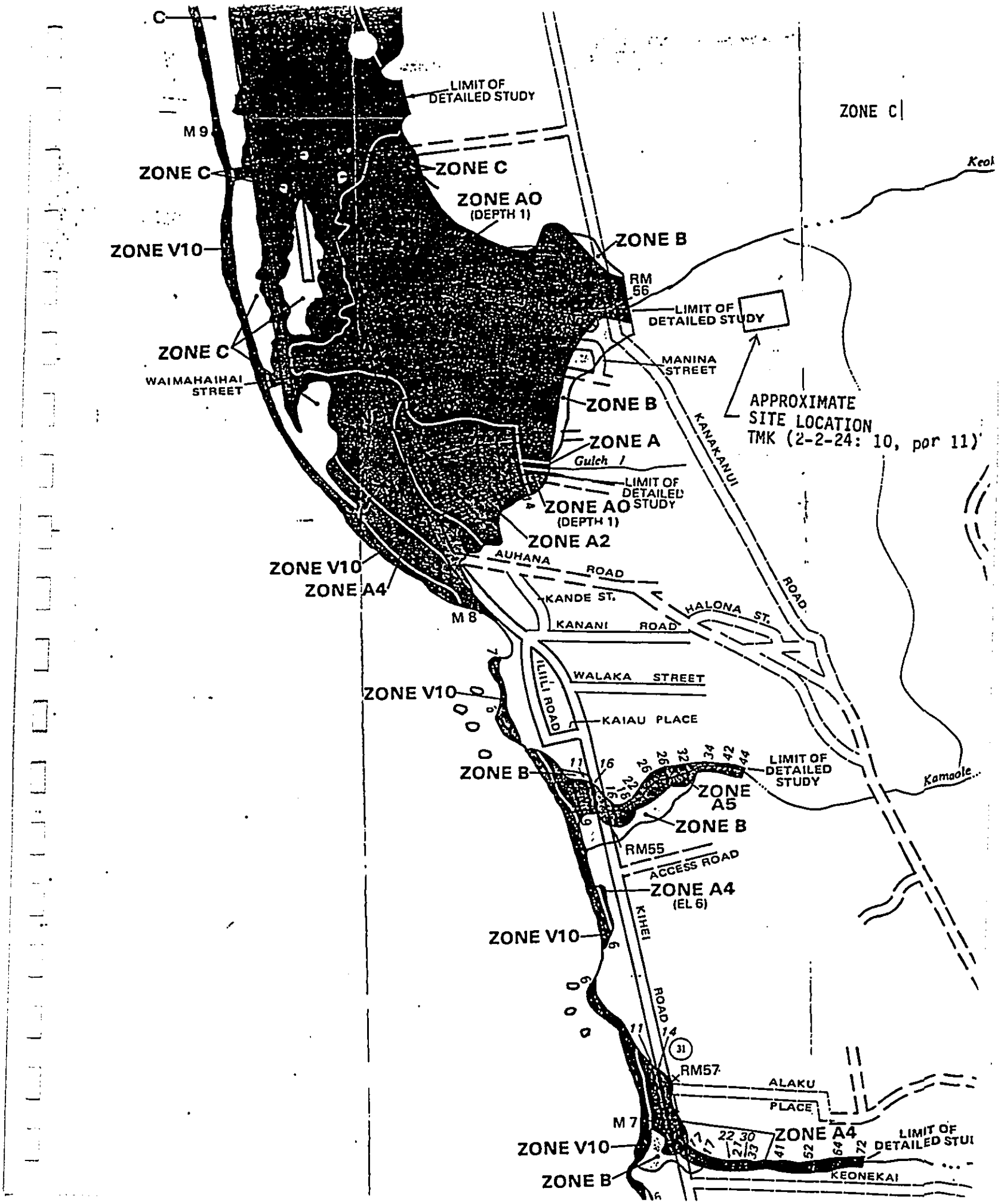
b. According to the Federal Emergency Management Agency's Flood Insurance Rate Map, Panel 150003-0265-C, dated September 6, 1989 (copy enclosed), the project site is in Zone C (areas of minimal flooding).

Sincerely,

Kisuk Cheung, P.E.
Director of Engineering

Enclosure

RECEIVED


C
LIMIT OF DETAILED STUDY
M 9
ZONE C
ZONE C
ZONE AO (DEPTH 1)
ZONE V10
ZONE B
RM 56
LIMIT OF DETAILED STUDY
ZONE C
WAIMAHAIHAI STREET
MANINA STREET
ZONE B
ZONE A
Gulch I
LIMIT OF DETAILED STUDY
ZONE AO (DEPTH 1)
ZONE A2
ZONE V10
ZONE A4
AUHANA ROAD
KANDE ST.
KANANI ROAD
HALONA ST.
ROAD
M 8
KANAKANUI
ZONE C
Keol
APPROXIMATE SITE LOCATION TMK (2-2-24: 10, por 11)
ILILI ROAD
WALAKA STREET
KAIAU PLACE
ZONE V10
ZONE B
LIMIT OF DETAILED STUDY
Kamaole
ZONE A5
ZONE B
RM55
ACCESS ROAD
ZONE A4 (EL 6)
KIHEI
ROAD
ZONE V10
31
RM57
ALAKU PLACE
M 7
ZONE V10
ZONE A4
LIMIT OF DETAILED STUDY
ZONE B
KEONEKAI

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