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DEPARTMENT OF LAND AND NATURAL RESOURCES  
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May 12, 1999

OFFICE OF ENVIRONMENTAL  
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LAND DIVISION  
STATE PARKS  
WATER RESOURCE MANAGEMENT

Ms. Genevieve Salmonson, Director  
Office of Environmental Quality Control  
Leiopapa A Kamehameha Building  
235 S. Beretania Street, Suite 702  
Honolulu, Hawaii

Dear Ms. Salmonson:

Subject: Environmental Determination for the Proposed  
Installation of a Production Well within Kapakahi  
Gulch; TMK: 3-5-24: 01, Waialae, Oahu

The Department of Land and Natural Resources has reviewed the comments received during the public comment period which ended on February 8, 1999. We hereby issue a Finding of No Significant Impact and request that you publish this notice in the May 23, 1999 issue of the Environmental Notice.

Enclosed are four copies of the final environmental assessment, a completed OEQC Bulletin Publication Form, and the project summary on disk. If you have any questions, please call Lauren Tanaka at 587-0385.

Aloha,

Dean Uchida, Administrator

Enclosures

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**FILE COPY**

*Final  
Environmental  
Assessment*

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**\*KAPAKAHI WELL\***

**AINA KOA, HONOLULU, OAHU, HAWAII**  
**TAX MAP KEY: 3-5-24:01**

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ACCEPTING AGENCY:  
STATE OF HAWAII  
DEPARTMENT OF LAND AND NATURAL RESOURCES

May 1999

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## Chapter 1 Summary and Introduction

### 1.1 Proposing Agency and Requested Government Action

The Department of Land and Natural Resources (DLNR), Land Division, Engineering Branch (formerly known as the Division of Water and Land Development), together with the Kamehameha Schools Bishop Estate (KSBE), are proposing to install a production well within Kapakahi Gulch at the end of Ainakoa Avenue. The proposed Kapakahi Well will be capable of producing up to 1.4 million gallons per day (mgd) of potable water. Following construction and installation of the well and accompanying facilities, the well will be integrated into the Board of Water Supply's (BWS's) water system. The development of additional water sources is necessary in order to accommodate the demand for water from State- and KSBE-sponsored projects.

The requested government action is the issuance of a Conservation District Use Permit (CDUP) to allow for the installation and operation of the proposed Kapakahi Well.

### 1.2 Purpose of this Environmental Assessment

This environmental assessment (EA) was prepared pursuant to Chapter 343 of the Hawaii Revised Statutes (HRS). Any project proposing the use of state lands or funds, or proposing any use within any lands classified as "Conservation District" by the State Land Use Commission under Chapter 205, HRS, must comply with the environmental reporting and disclosure requirements of Chapter 343, HRS. An EA is required for this proposed project because the site is located within the State Conservation District (General Subzone) and will be constructed with State funds by the DLNR. The DLNR will be the accepting authority for this EA.

A final environmental assessment and an accompanying negative declaration by the DLNR determining that the impacts of this project are not sufficient to require the preparation of an environmental impact statement will satisfy the Chapter 343, HRS, requirement.

### 1.3 Subsequent Permits and Approvals Required

Installation and operation of permanent well facilities on the project parcel will require the following permits and discretionary approvals:

1. A CDUP approved by the Board of Land and Natural Resources (BLNR). In 1992, the BLNR approved a CDUP for the drilling of an exploratory well on the project site. In addition to the exploratory well, subdivision of the parcel and construction of an access road were approved in the 1992 permit. A condition of that 1992 permit was that the conversion of the exploratory well into a production well would require a separate CDUP. A copy of the 1992 permit is included in Appendix A.

2. A Pump Installation Permit and a Water Use Permit from the DLNR, Commission on Water Resource Management (CWRM).
3. A Noise Permit (temporary variance) from the State Department of Health, Noise and Radiation Branch to allow for temporary increases in permitted noise levels during construction activities.
4. Placement of the facility on the Development Plan Public Facilities (DPPF) Map. Because this project uses government funds, this amendment can be processed independently of the annual Development Plan review process. Placement of the facility on the DPPF Map requires approval by City Council.
5. City and County of Honolulu construction-related permits, including grading, building, and street usage permits.

#### 1.4 Alternatives Considered

The following alternatives to the proposed production well were considered in this EA:

- No Action
- Deferred Action
- Alternative Sites

The no action alternative was not pursued because it would not meet BWS requirements that large landowners meet their potable water demand requirements by assisting the BWS with additional source development. If the BWS's water source development were curtailed, the BWS would be hampered in providing adequately for the water needs of the future population of the island, which may result in regional water shortages. Water from this well is required to fulfill additional demands from State developments, such as school renovations, as well as Hawaii Community Development Authority and KSBE projects in Kakaako.

The deferred action alternative was not pursued because this alternative would delay the implementation schedule and would incur higher development costs because of inflation. Delay in the proposed well would increase the risk that the projects identified as "end users" of this water would cause an undue strain on the existing water supply system or would not be able to proceed due to a lack of sufficient potable water.

This EA analyzes a possible potable groundwater source site in the Honolulu Sector, where surplus sustainable yields occur in the high level source areas. Prior to the consideration of this site, the BWS conducted an analysis of 21 other potential sites within the Honolulu Sector for additional potable wells in its *Regional Environmental Impact Assessment for Development of Wells, Reservoirs, Transmission Lines and Appurtenances at Honolulu*.

*Hawaii* (1986). Additional well sites were proposed in the vicinity of the Kapakahi Well, which were included along with the Kapakahi Well in the BWS study. Of the other sites, the Kalani Iki Well was identified as an alternative to the Kapakahi Well in the study, but is not being pursued at this time for two reasons: access to the site is through privately-owned land and its location is only approximately 200 feet from the interpreted Northeast Dike Alignment, a hydrologic barrier that might cause greater well drawdown and thus less well capacity. Additional sites were identified in the Waialae East Aquifer and have been drilled as exploratory wells, but have not been pursued by the BWS as production facilities.

Alternative source development was not pursued in this analysis since the BWS had also analyzed potential potable water source alternatives other than groundwater in its 1986 study, including desalinization, development of surface and brackish water sources, and recycling of treated wastewater. Typically, these alternative sources have considerably higher costs and technical challenges. For instance, the use of surface water has a high potential for health and safety problems and would require costly water treatment. The development of these alternatives was not considered as feasible as the development of groundwater resources.

### **1.5 Potential Impacts of this Project and Mitigation Measures**

Construction work, primarily site clearing, grading, and erection of the control building, will cause minor short-term noise and fugitive dust impacts to the surrounding environment. Noise and dust impacts from this project will not be noticeable to any residences since the area is located approximately 200 feet from the nearest home. All government rules and regulations concerning noise and fugitive dust emissions will be followed during construction to minimize minor short-term noise and air pollution impacts.

To mitigate the short-term noise impacts, contractors will comply with all of the conditions of the required noise permit. Mufflers will be required for all construction equipment. All noise-attenuating equipment will be maintained in proper operating condition and will be repaired or replaced as needed. Construction activities will be restricted to the hours of 7:30 AM to 4:30 PM on weekdays and will exclude state holidays. In order to reduce noise levels from the production pump, a submersible pump will be used.

To mitigate the short-term air pollution effects of the construction activities, dust control measures such as water sprinkling will be implemented by the contractor to reduce dust levels, as necessary. Further, the contractor will properly maintain its internal combustion equipment to minimize exhaust emissions and will comply with the State of Hawaii, Department of Health Rules Title 11, Chapter 59 and 60 regarding Air Pollution Control.

Traffic impacts to Ainakoa Avenue will be minimal. The contractor will schedule the movement of heavy trucks and vehicles to or from the site after 8:00 AM and before 3:30 PM to avoid the morning and afternoon peak traffic periods.



## **1.6 Determination**

In accordance with Chapter 343, HRS, the DLNR has determined that an Environmental Impact Statement (EIS) is not required for the Kapakahi Well installation and operation.

This determination has been made because of the absence of significant adverse impacts associated with the project and because identified impacts will be either short-term or mitigated to insignificant levels.

## **1.7 Agencies and Others Consulted in Making this Assessment**

The following agencies were consulted during the preparation of the environmental assessment for this project:

### **State of Hawaii agencies**

- Department of Land and Natural Resources, Commission on Water Resource Management
- Department of Land and Natural Resources, Land Division, Planning Branch
- Department of Land and Natural Resources, State Historic Preservation Division
- Office of Environmental Quality Control

### **City and County of Honolulu agencies**

- Department of Planning
- Department of Land Utilization
- Board of Water Supply

## Chapter 2 Purpose and Need

### 2.1 Project's Purpose and Need

In 1980, the average municipal water demand on the island of Oahu was 130 mgd. The BWS's 1982 *Oahu Water Plan* projected that the islandwide average municipal water demand would increase to 156 mgd in 1990, and to 181 mgd in the year 2000. Actual BWS water usage in 1990 averaged 158 mgd, of which 156 mgd was potable water. In 1992, the CWRM, DLNR, in its 1992 review draft of the "*Hawaii Water Plan, Oahu Water Management Plan*," projected that municipal water demand would be between 204 to 213 mgd by the year 2010, depending on whether the upper limit of the City and County of Honolulu's General Plan population projection for Oahu is attained. Thus, additional water requirements for the year 2010 are projected to be between 48 and 57 mgd.

In addition to the general overall municipal growth, several large-scale State of Hawaii and privately sponsored developments are either currently under construction or are planned to be built. These large projects will place even greater demands upon the BWS water supply system. Under current BWS policy, developers of large-scale developments must work to supply the additional requirements to the BWS system. To meet the demand for water represented by the State and KSBE developments, the DLNR and KSBE jointly plan to develop a new source of potable groundwater within Kapakahi Gulch in the Waialae area of Oahu, located within the Honolulu Sector's Waialae West Aquifer.

The Kapakahi Well will be able to pump up to 1.4 mgd of potable water and will be integrated into the BWS's potable water source, storage, and transmission system.

### 2.2 The State Water Code and the Commission on Water Resource Management

The State Water Code and the CWRM were established in 1987 by the Hawaii State Legislature in Section 174-C of the HRS. The CWRM was established to handle the administration of the new State Water Code.

The State Water Code established a Hawaii Water Plan consisting of four parts:

- A water resource protection plan prepared by the CWRM
- Water use and development plans prepared by each county
- A state water project plan prepared by state agencies
- A water quality plan prepared by the Department of Health

As part of the Hawaii Water Plan, a study was commissioned to determine the sustainable yields of surface and groundwater sources statewide.

Under the State Water Code, the CWRM created management boundaries for Water Management Areas (WMAs). WMAs were designated by the CWRM for those areas where it decided, after conducting scientific investigation and research, that management of ground or surface waters or both was necessary because the water resources for those areas were threatened by existing or proposed withdrawals or diversions of water. The CWRM has administrative control over the withdrawals and diversions of ground and surface waters, respectively, within a Water Management Area and is responsible for ensuring reasonable beneficial uses of the resources in the public interest.

In designating an area for groundwater use regulation, the CWRM must consider the following:

- (1) *Whether an increase in water use or authorized planned use may cause the maximum rate of withdrawal from the groundwater source to reach 90 percent of the sustainable yield of the proposed water management area;*
- (2) *There is an actual or threatened water quality degradation as determined by the Department of Health;*
- (3) *Whether regulation is necessary to preserve the diminishing groundwater for future needs, as evidenced by excessively declining groundwater levels;*
- (4) *Whether the rates, times, spatial patterns, or depths of existing withdrawals of groundwater are endangering the stability or optimum development of the groundwater body due to upconing or encroachment of salt water;*
- (5) *Whether the chloride contents of existing wells are increasing to levels which materially reduce the value of their existing uses;*
- (6) *Whether excessive preventable waste of water is occurring;*
- (7) *Serious disputes respecting the use of the groundwater resources are occurring;*  
*or*
- (8) *Whether water development projects that have received any federal, state, or county approval may result, in the opinion of the commission, in one of the above conditions.*

Notwithstanding an imminent designation of a WMA conditioned on a rise in the rate of groundwater withdrawal to a level of 90 percent of the area's sustainable yield, the CWRM, when such level reaches the 80 percent level of the sustainable yield, may invite the participation of water users in the affected area to an informational hearing for the purposes of assessing the groundwater situation and devising mitigation measures (Section 174C-44, HRS).

In designating an area for surface water use regulation, the CWRM must consider the following:

- (1) *Whether regulation is necessary to preserve the diminishing surface water for future needs, as evidenced by excessively declining surface water levels, not related to rainfall variations, or increasing or proposed diversions of surface waters to levels which may detrimentally affect existing instream uses or prior existing off stream uses;*
- (2) *Whether the diversions of stream waters are reducing the capacity of the stream to assimilate pollutants to an extent which adversely affects public health or existing instream uses; or*
- (3) *Serious disputes respecting the use of surface water resources are occurring. (Section 174C-45, HRS)*

### 2.3 Groundwater Sectors and Aquifers

The CWRM has established, for planning and administration purposes, six groundwater sectors that encompass the entire island of Oahu (see Figure 2-1). These sectors are Honolulu, Pearl Harbor, Waianae, Central, North, and Windward. Presently, all sectors except the Waianae Sector have been designated as Water Management Areas. The Windward Sector, which became a Water Management Area in July 1992, is the last sector to be included as a groundwater management area on Oahu.

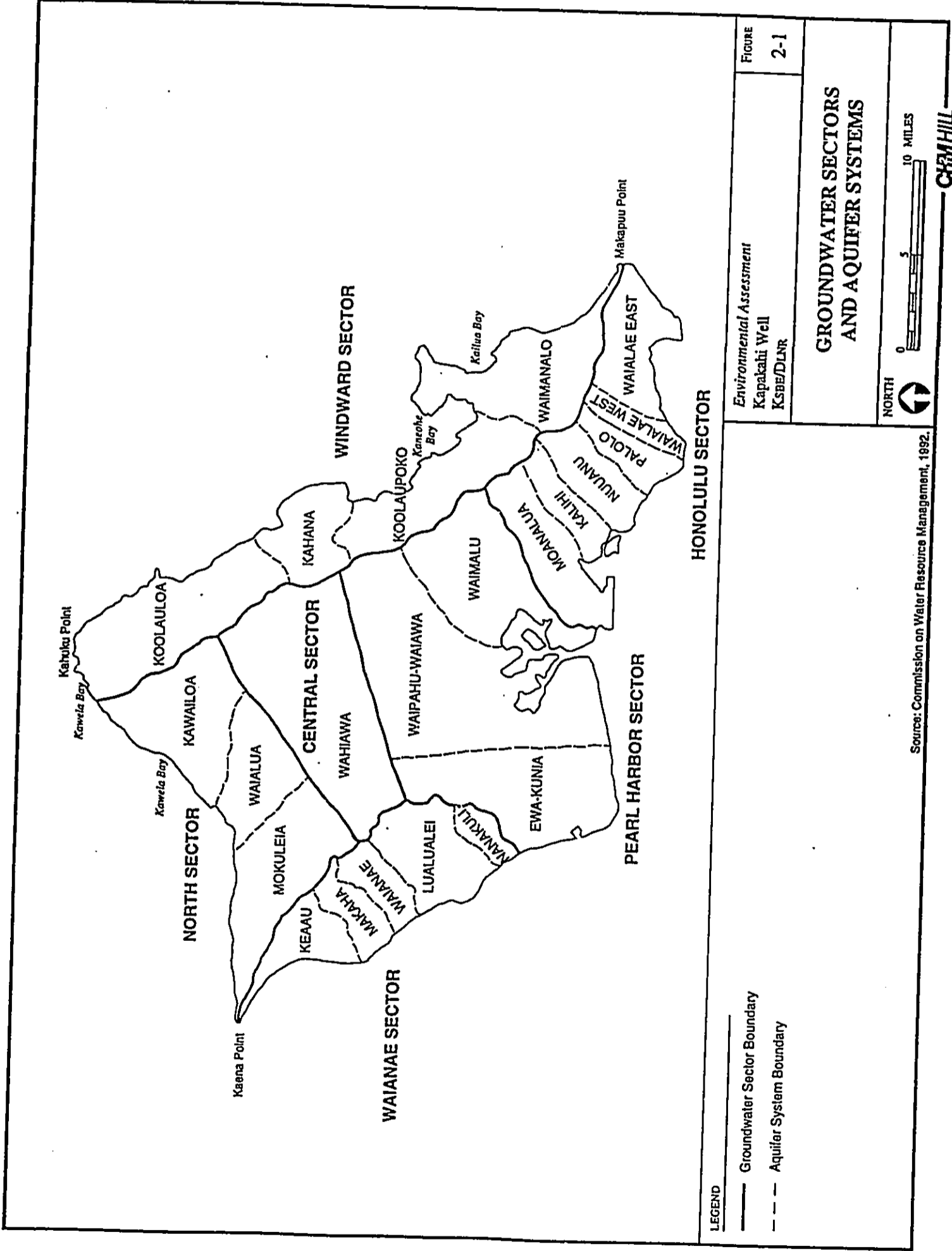
Each sector is divided into aquifers. The Honolulu Sector covers an approximately 84-square-mile region that extends from Makapuu Point northwestward about 18 miles to Moanalua. The Honolulu Sector is generally bounded at its northeast edge by the ridge of the Koolau Mountains, and extends in the southwestward direction for 2 to 8 miles down to the shoreline. From east to west, the Honolulu Sector is divided into the Waialae East, Waialae West, Palolo, Nuuanu, Kalihi, and Moanalua Aquifers.

The Waialae West Aquifer covers about 6 square miles and extends from the Koolau Mountain ridge down to the coastline near Kahala. The Kapakahi Well is proposed to be located in the *mauka* portion of the aquifer approximately 1.1 miles inland from the coastline. The proposed site is located near the east wall of Kapakahi Gulch at the end of Ainakoa Avenue. The proposed site is about 3/4 mile above Kalaniana'ole Highway.

### 2.4 Sustainable Yield and Water Management Areas

In order to evaluate the impacts of developing an additional permanent potable groundwater source on this site, it is necessary to take into account the sustainable yield of the underlying aquifer system as estimated by DLNR. Sustainable yield is the amount of groundwater that can be removed from an aquifer over a period of many years without developing serious adverse impacts to the aquifer.

Within the Hawaiian Islands, the sustainable yield of basal aquifers for each island is always less than the average annual rate of recharge to the groundwater aquifer, because a certain amount of the groundwater is lost through mixing with the underlying salt water. Estimating



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Kaula Bay

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sustainable yield for the island of Oahu and for its individual aquifers is complex because the amount of fresh groundwater that is mixed with salt water is dependent upon the degree of aquifer confinement, lens thickness, the degree of agricultural and urban development, and numerous other factors that are not constant.

The Honolulu WMA has the second highest estimated sustainable yield of all of the Oahu aquifer systems at 53 mgd. The highest estimated sustainable yield of 184 mgd occurs in the Pearl Harbor WMA. The Honolulu WMA is also the second most heavily utilized WMA for municipal water use. In 1990, the authorized use of 40.66 mgd, or more than one-fourth of BWS's total usage of 156 mgd, was allocated from the Honolulu WMA.

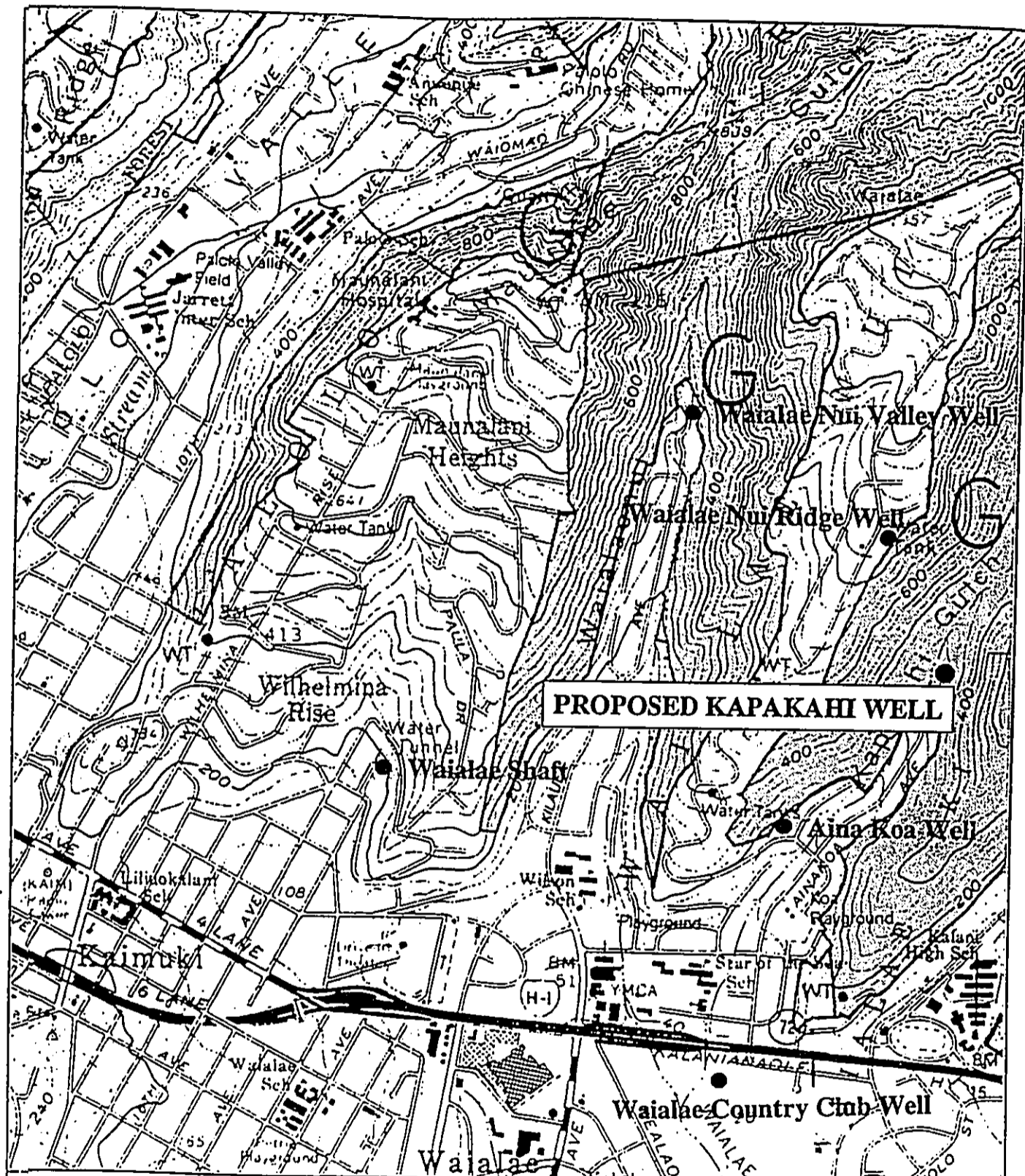
The *Oahu Water Management Plan* notes that the Honolulu WMA's total estimated sustainable yield of 53 mgd is distributed among the six aquifers that constitute the Honolulu sector as follows: Waialae East Aquifer, 2 mgd; Waialae West Aquifer, 4 mgd; Palolo Aquifer, 5 mgd; Nuuanu Aquifer, 15 mgd; Kalihi Aquifer, 9 mgd; and Moanalua Aquifer, 18 mgd.

In 1990, the groundwater withdrawal from the Honolulu WMA was reported by the CWRM to be 46.29 mgd, or about 87 percent of the sustainable yield of 53 mgd for this WMA. The 46.29 mgd of groundwater withdrawn in 1990 from the six aquifers in the Honolulu WMA was distributed as follows: Waialae East and Waialae West Aquifers, 0.78 mgd; Palolo Aquifer, 6.76 mgd; Nuuanu Aquifer, 16.77 mgd; Kalihi Aquifer, 9.91 mgd; and Moanalua Aquifer, 12.07 mgd.

## 2.5 Existing Water Sources

According to the *Oahu Water Management Plan* and CWRM records, the Waialae West Aquifer contains six wells. Three wells are operated by the BWS. These facilities include the Waialae Shaft (Well No. 1742-02), the Aina Koa Well (Well No. 1746-01), and the Waialae Nui Valley Well (Well No. 1747-03). The Waialae Nui Ridge Well (Well No. 1746-04) developed by the KSBE was allocated 0.997 mgd by CWRM. The remaining well within the aquifer is privately owned and operated by the Waialae Country Club (see Figure 2-2).

Records for the Waialae West Aquifer for 1996 indicate that the BWS withdrew a monthly average of 0.413 mgd from its wells, while the Waialae Country Club withdrew an average of 0.34 mgd for a total of about 0.75 mgd. Correspondence from CWRM, dated February 7, 1999, indicates that there are now six (6) production wells in the Waialae West Aquifer System, with well No 1746-04 being permitted an allocation of 0.997 mgd on May 20, 1998. The correspondence goes on to state that there is currently 1.013 mgd available for allocation from this aquifer system. This number may increase, if CWRM reallocates the existing allocations that are not being fully utilized.



**PROPOSED KAPAKAHI WELL**

Environmental Assessment  
 Kapakahi Well  
 KSBE/DLNR

FIGURE  
 2-2

**EXISTING WELLS AND  
 PROPOSED WELL SITE**

Scale: 1 in. = 650 ft.

CH2M HILL



## 2.6 Recommended Water System Improvements

The BWS's *Regional Assessment* addressed the impacts of developing proposed new basal groundwater, alluvial groundwater, and spring water sources in the Honolulu sector of Oahu. In the 1984 study, the BWS evaluated 21 proposed water development projects (including conventional groundwater wells, springs, or spring diversions), two proposed reservoirs, and two proposals for additional transmission pipelines totaling 11,500 linear feet (about 2.3 miles).

Within the Waialae West Aquifer, the *Regional Assessment* proposed the development of two wells, the Waialae Nui Ridge Well and the Kapakahi Well. The Kapakahi Well has been drilled and tested as an exploratory well and is capable of producing up to 1.4 mgd of potable water.



## Chapter 3 Preferred Action and Alternatives

### 3.1 Preferred Action

#### 3.1.1 Project Description

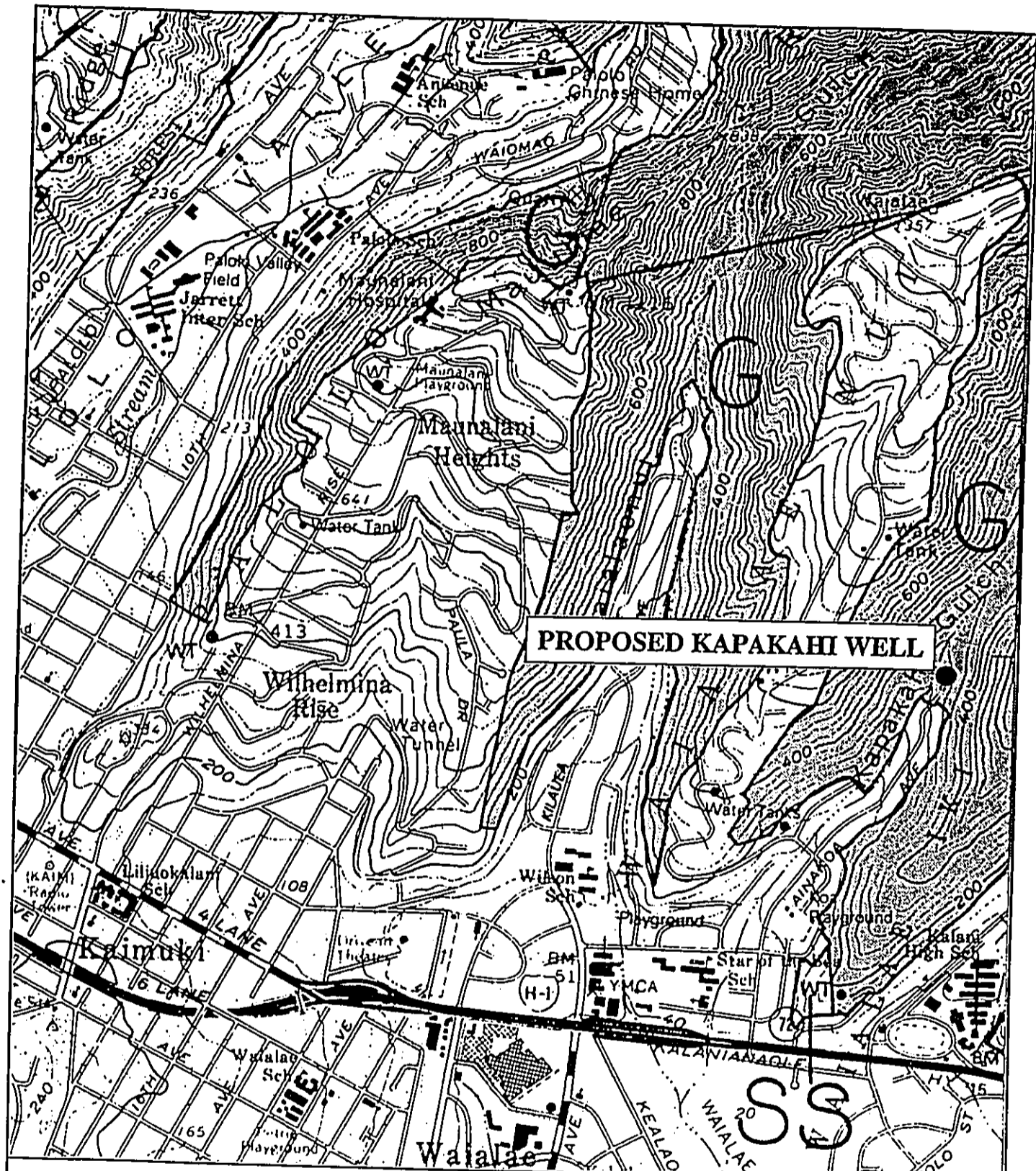
The State of Hawaii, Department of Land and Natural Resources and the Kamehameha Schools Bishop Estate are proposing to jointly construct and install a production well on KSBE-owned land located within the Conservation District in Kapakahi Gulch at the end of Ainakoa Avenue near Waialae, Oahu (see Figure 3-1). Site of the proposed project is designated as the *makai* portion of Tax Map Key 3-5-24:01 (see Figure 3-2). Once the Kapakahi Well is operational, it will be dedicated to the BWS and integrated into its water supply system.

An exploratory well was previously drilled and tested on the site in 1992. From these tests, the proposed Kapakahi Well is estimated to have a capacity of up to 1.4 mgd. Funding for the conversion of the exploratory well to the permanent Kapakahi Well is shared by the DLNR and KSBE. The BWS has approved the conceptual plan for the project. The purpose of the project is to provide water to meet additional water requirements resulting from general increases in municipal demands and from State- and KSBE-sponsored projects.

The proposed Kapakahi Well project will consist of the following elements:

- Installation of a variable frequency drive pump, with a peak pumping capacity of 1,000 gallons per minute (up to 1.4 mgd)
- Construction of a control building with Supervisory Control and Data Acquisition (SCADA) interface
- Connection to the BWS municipal water system and City sewer system
- Construction of a 12-inch pipeline along Ainakoa Avenue, between Malia Street and Kalaniana'ole Highway

The well will be approximately 320 feet deep with the upper 260 feet consisting of a 14-inch diameter steel casing. The lower 60 feet of the well will consist of a louvered casing surrounded by a 3-inch layer of silica pea gravel. The ground elevation of the proposed well is approximately 267 feet above mean sea level (msl). A cross section of the proposed well is shown in Figure 3-3. The pump will be submerged and pipes will be installed to hook up with the BWS 405-foot water system at the end of Ainakoa Avenue. The 12-inch pipeline to be constructed between Malia Street and Kalaniana'ole Highway will connect the BWS system. A site plan of the proposed project is shown in Figure 3-4.



**PROPOSED KAPAKAHI WELL**

- Conservation District
- Urban District



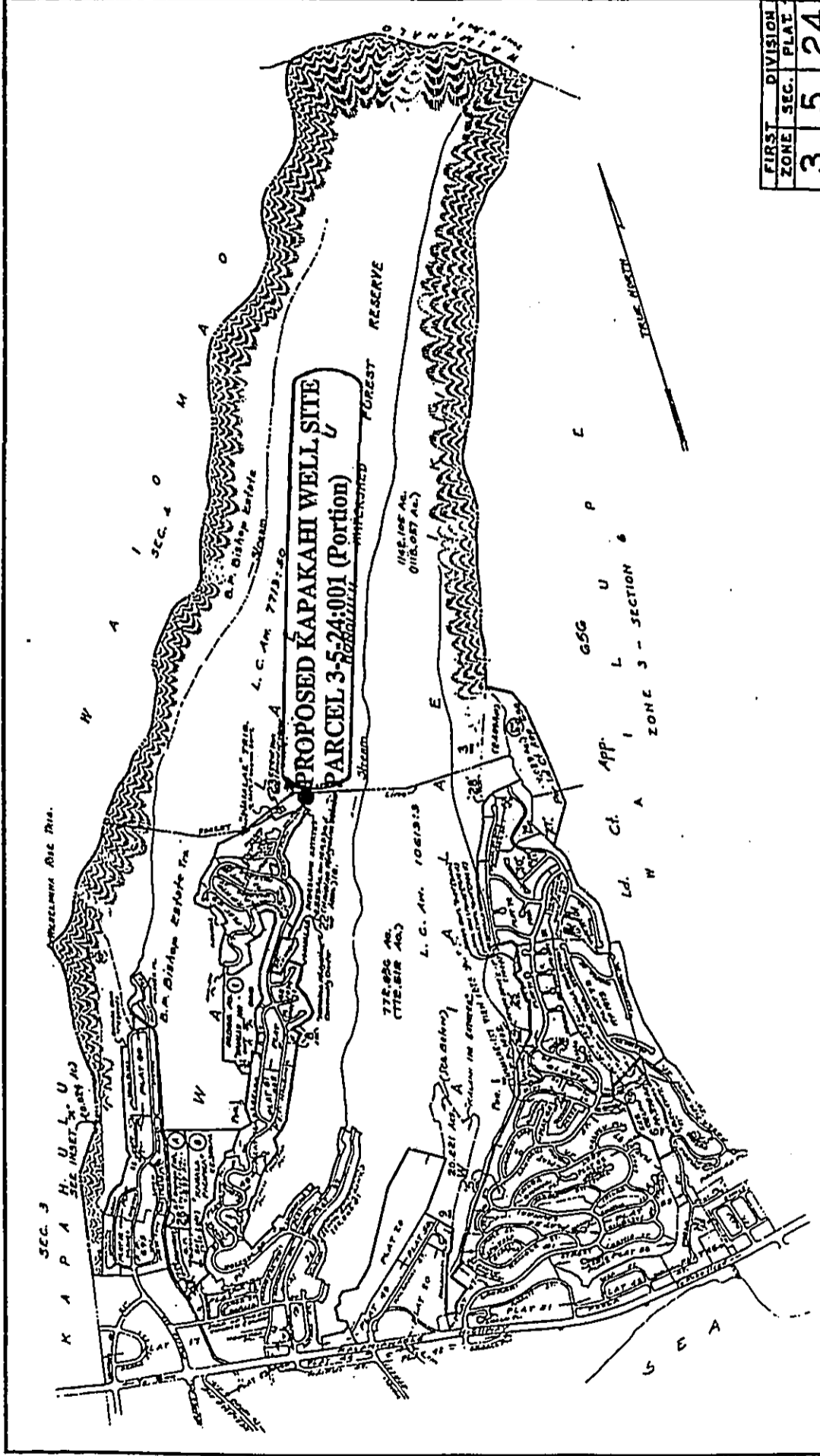
Environmental Assessment  
Kapakahi Well  
KSBE/DLNR

FIGURE  
3-1

**LOCATION MAP AND  
CONSERVATION DISTRICT**

Scale: 1 in. = 650 ft.

CH2M HILL



FIRST ZONE	DIVISION
3	5
SEC.	PLAT
24	

Environmental Assessment  
 Kapakahi Well  
 KSBE/DLNR

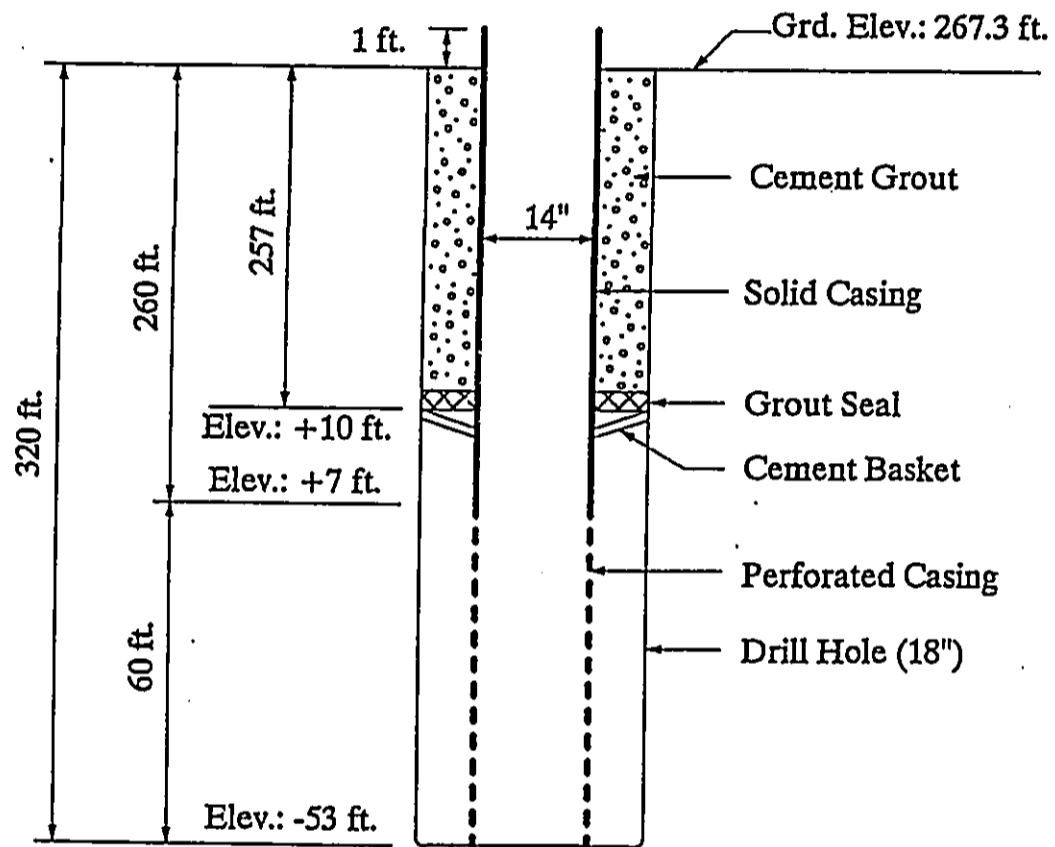
Figure  
 3-2

**TAX MAP KEY LOCATION**

Not to Scale

CS&MHILL

As-Built Section



Not to Scale

Source of Data: DOWALD

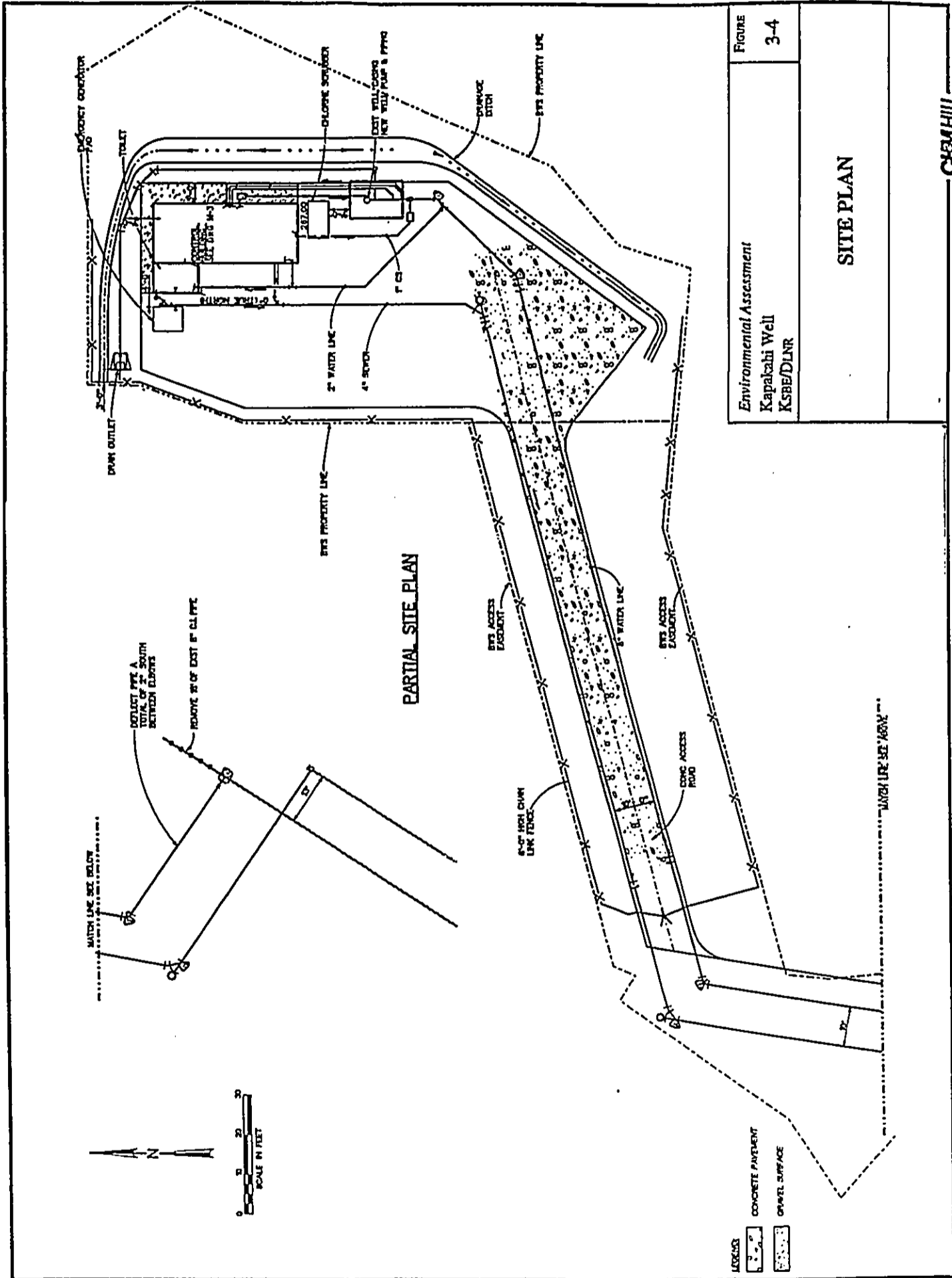
Environmental Assessment  
Kapakahi Well  
KSBE/DLNR

FIGURE  
3-3

**KAPAKAHI WELL  
CROSS SECTION**

Not to scale

CH2M HILL

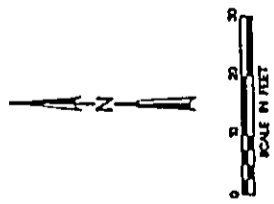


Environmental Assessment  
 Kapakahi Well  
 KSBE/DLNR

FIGURE  
 3-4

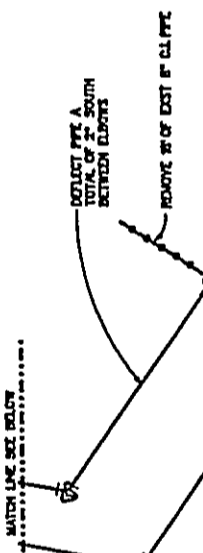
SITE PLAN

CH2M HILL



- LEGEND
- CONCRETE PAVEMENT
  - GRAVEL SURFACE

PARTIAL SITE PLAN



Construction activities will consist of clearing and grading of the site, pump and pipeline installation, and construction of the control house. The control house will be approximately 525 square feet and will contain an electrical/control room and a chlorination room with a gaseous chlorine system utilizing chlorine cylinders. A chlorine vapor scrubber system will be included adjacent to the control building. The site will be landscaped and replanted upon completion of the construction.

An access road to the parcel exists adjacent to an existing flood control catch basin. Construction of an access road was included in a 1992 Conservation District Use Permit approved by the Board of Land and Natural Resources for drilling of the exploratory well and subdivision of the parcel.

### **3.1.2 Project Schedule and Costs**

Installation and construction of the Kapakahi Well and associated facilities are anticipated to take approximately 24 months from acquisition of the CDUP. The project is anticipated to be operational by January 2001. Costs of the project are estimated at approximately \$2 million to be shared between the State of Hawaii and KSBE.

## **3.2 Alternatives Considered**

### **3.2.1 No Action**

The no action alternative would consist of not installing the Kapakahi Well. The exploratory well would remain capped and unused and the site would remain in its present state. The no action alternative was not pursued because it would not meet BWS requirements that large landowners meet their potable water demand requirements by assisting the BWS with additional source development.

The Kapakahi well was identified in 1984 as part of an overall groundwater development program intended to increase the municipal water supply to meet growing demand. If the BWS's water source development program were curtailed, the BWS would be hampered in providing adequately for the water needs of the future population of the island, which could result in regional water shortages. Water from the Kapakahi Well is required to fulfill additional demands from State developments, such as the Convention Center, the West Oahu Campus of the University of Hawaii, and the City of Kapolei, as well as Hawaii Community Development Authority and KSBE projects in Kakaako.

### **3.2.2 Deferred Action**

The deferred action alternative would consist of delaying implementation of this project until a later, yet unknown, date. This alternative was not pursued because it would delay the implementation schedule and would have substantially similar environmental outcomes and higher development costs because of inflation. Delay in the installation and operation of the

proposed Kapakahi Well would increase the risk that the projects identified as "end users" of this water would cause an undue strain on the existing water supply system, or would not be able to proceed due to a lack of sufficient potable water.

### **3.2.3 Alternative Sites**

This EA analyzes a possible potable groundwater source site in the Honolulu Sector, where surplus sustainable yields occur in the higher elevations. Prior to the consideration of this site, the BWS conducted an analysis of 21 other potential sites within the Honolulu Sector for additional potable wells in its *Regional Assessment* (1986). Of the original eight wells identified in the study, four remain as alternative sites to the Kapakahi Well. The locations of these four alternative sites are shown in Figure 3-5.

One well site, the Kalani Iki Well, is located in the vicinity of the Kapakahi Well and was identified as an alternative to the Kapakahi Well in the study. However, this well is not being pursued at this time for the following two reasons:

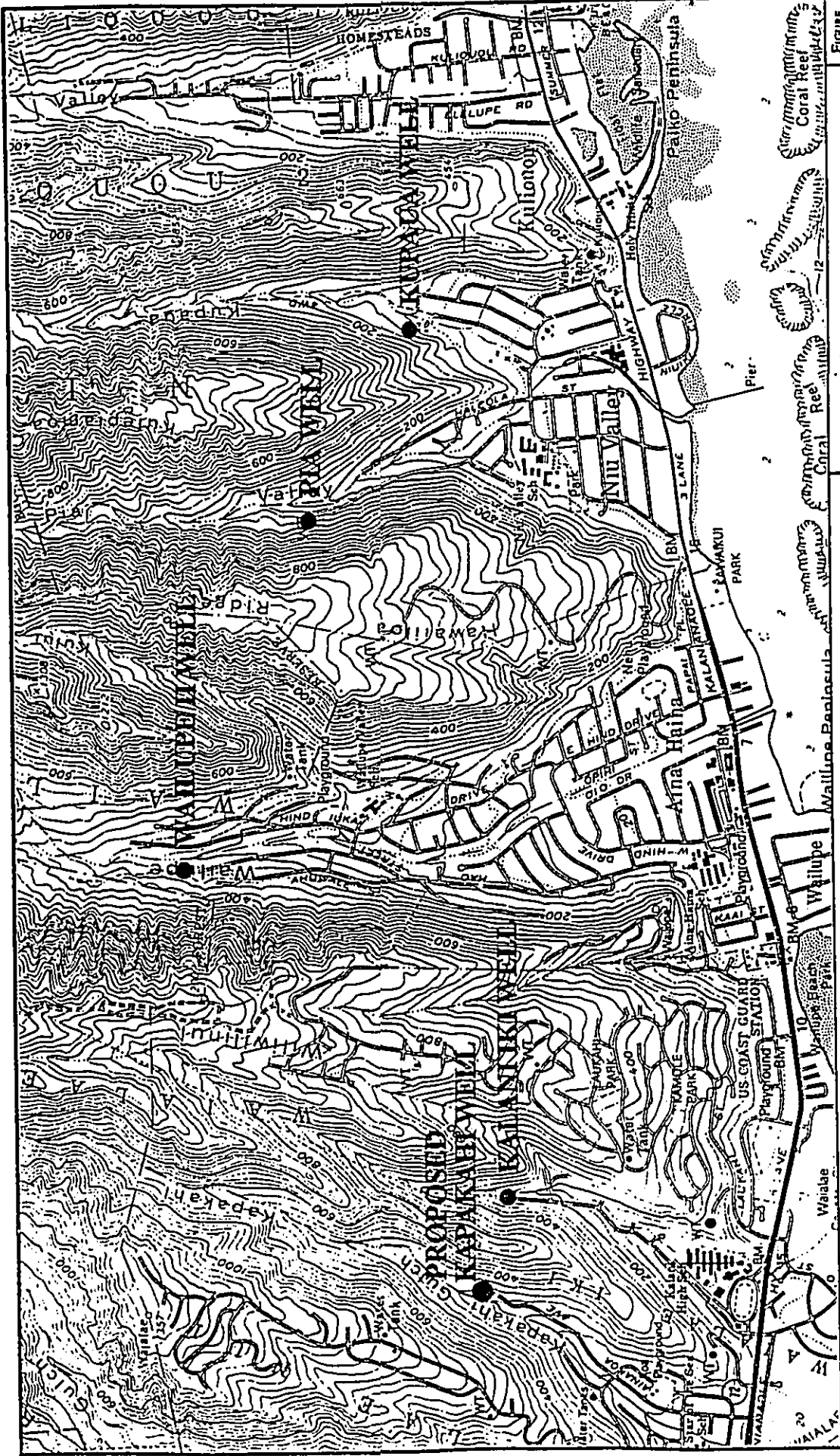
1. Access to the site is through the privately-owned Kalani Iki Subdivision, and
2. Its location is only approximately 200 feet from the interpreted Northeast Dike Alignment, a hydrologic barrier that might cause greater well drawdown and thus less well capacity.

Three additional alternative sites located in the Waialae East Aquifer remain from the BWS study. All three have been drilled as exploratory wells. However, the BWS has not yet elected to develop these wells into production facilities.

Because of the deficiencies in the Kalani Iki and other well sites in the Waialae East Aquifer, they have not been preferred over the site at Kapakahi Gulch. The Kapakahi Well is required in addition to the existing groundwater sources in the BWS system.

### **3.2.4 Alternative Source Development**

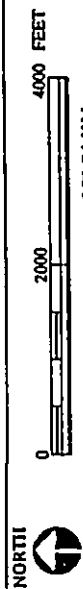
Alternative source development was not pursued in this analysis since the BWS had also analyzed potential potable water source alternatives other than groundwater in its 1986 study, including desalinization, development of surface and brackish water sources, and recycling of treated wastewater. Typically, these alternative sources have considerably higher costs and technical challenges. For instance, the use of surface water has a high potential for health and safety problems and would require costly water treatment. The development of these alternatives was not considered as feasible as the development of groundwater resources.



Environmental Assessment  
 Kapakahi Well  
 KSBE/DLNR

FIGURE  
 3-5

**ALTERNATIVE  
 WELL SITES**



CRMHILL



Chapter 4  
**Environmental Setting, Project Impacts,  
and Mitigation Measures**

**4.1 Land Use and Ownership**

**4.1.1 Existing Conditions**

The site of the Kapakahi Well is designated as Tax Map Key 3-5-24: portion of parcel 1, located in the area known as Aina Koa. The land is owned by KSBE. The site is currently undeveloped land within the State Conservation District General Subzone and zoned Preservation (P-1) by the City and County of Honolulu. The site is outside the City and County of Honolulu Special Management Area.

The site of the proposed well is adjacent to an older subdivision of conventional homes. Adjoining lots to the south of the site are zoned R-7.5, residential lots with a minimum size of 7500 square feet. The proposed well would be located approximately 200 feet away from the nearest residential unit.

Adjacent to the subject parcel to the east and downgradient from the proposed well site is a large concrete flood control basin maintained by the City and County of Honolulu.

**4.1.2 Project Impacts**

The portion of the parcel containing the proposed well will be subdivided from the remainder of the parcel and dedicated to the BWS. This subdivision received Conservation District Use approval in February 1992. Construction and operation of a well is an identified use within the General Subzone under Title 13-5-22, Hawaii Administrative Rules relating to P-6, "Public Purpose Uses." This use requires a Conservation District Use Permit approved by the Board of Land and Natural Resources.

Construction and operation of the proposed Kapakahi Well will not change any of the surrounding land uses or ownership patterns.

**4.1.3 Mitigation Measures**

No mitigation measures are proposed or required.

## **4.2 Climate and Rainfall**

### **4.2.1 Existing Conditions**

Kapakahi Gulch is located between Waialae Nui Ridge and Waialae Iki Ridge and extends in a northeasterly direction from Aina Koa to the base of the Koolau Mountains. The median annual rainfall in the upper reaches of the valley is in excess of 100 inches but diminishes to 25 inches in the vicinity of the proposed well site.

### **4.2.2 Project Impacts**

The proposed well will have no impact on conditions related to rainfall or climate.

### **4.2.3 Mitigation Measures**

No mitigation measures are proposed or required.

## **4.3 Topography**

### **4.3.1 Existing Conditions**

The site of the proposed well is located alongside the east wall of the Kapakahi Gulch on a graded terrace roughly 20 to 30 feet above and 100 feet away from the normally dry Kapakahi Stream. The well will be located approximately 267 feet above msl. The site slopes upward from the access road from an elevation of approximately 232 feet msl to approximately 270 feet msl at the back of the parcel, where the site contains a rock bluff between 9 and 15 feet in height. Figure 4-1 shows the topography of the site.

### **4.3.2 Project Impacts**

Installation of the proposed well and accompanying control house structure will occur on existing level areas of the site. Grading will occur to construct the access road, which was previously approved under the 1992 Conservation District Use Permit. Changes in the overall topography will be minimal and a grading plan will be prepared to prevent runoff downslope. No significant adverse impacts are anticipated to Kapakahi Stream from erosion.

### **4.3.3 Mitigation Measures**

A grading plan will be prepared prior to construction and appropriate engineering practices and mitigation measures will be utilized to minimize erosion and runoff during installation of the well and the accompanying control house and during their operation. With the existing downgradient flood control basin and mitigation measures incorporated in the project, there will be no adverse impact to either the surrounding area, surface water or to nearshore waters from surface water. No other mitigation measures are proposed or required.



## 4.4 Geology

### 4.4.1 Existing Conditions

Kapakahi Gulch is a narrow, straight V-shaped gulch that drains a small section of Oahu's southeastern slopes from the Koolau crest to the ocean. It is one of many dry gulches carved by erosion more or less parallel to the gentle dip of the flank flow basalt of Koolau volcano's southeastern slopes. The underlying geology of the site consists of approximately 10 feet of boulder-strewn alluvium over an approximately 310-foot sequence of unsaturated permeable *pahoehoe* and *a'a* basalt.

Soil on the site is described as extremely stony clay of the Lualualei Series (LPE). This soil occurs on the talus slopes on Oahu and Kauai with a slope ranging from 3 to 35 percent. Runoff is from medium to rapid and the erosion hazard is moderate to severe.

### 4.4.2 Project Impacts

The installation of the proposed well will have no impact on geophysical resources.

### 4.4.3 Mitigation Measures

No mitigation measures are proposed or required.

## 4.5 Groundwater Resources

### 4.5.1 Existing Conditions

The Kapakahi well taps a fresh semi-confined basal aquifer with a head of 8.0 feet in the Waialae West Aquifer System. This aquifer extends from the Kaau Rift zone (Maunalani Heights) to the Waialae Dike zone (Waialae Iki Ridge). The aquifer system includes high-level dike water near the Koolau crest and basal water near the coast.

The Waialae West Aquifer System embraces an area of about 6 square miles and its sustainable yield has been established by the CWRM at 4 mgd. Groundwater in the system probably flows in a southwesterly direction, parallel to numerous dikes that have been mapped with a southwest-northeast orientation in gulches at higher elevations. However, some groundwater possibly flows southeastward across the Waialae Dike Zone into the Waialae East Aquifer System. Results of pump tests in the aquifer indicate that it has a calculated hydraulic conductivity of between 1,540 and 1,650 feet per day, comparable to the high-yield Pearl Harbor Aquifer.

The Waialae West Aquifer contains six wells, three of which are operated by the BWS. Those wells include the Waialae Shaft (Well No. 1747-02), Waialae Nui Valley Well (Well No. 1747-03), and the Aina Koa Well (Well No. 1746-01). The Waialae Nui Ridge Well (Well No. 1746-04) is a KSBE-developed well that received an allocation of 0.997 mgd from

the Commission on Water Resource Management (CWRM). The Waialae Country Club operates the remaining well within the aquifer. The CWRM has set combined allocations for these wells at 1.8 mgd.

CWRM indicates that currently 1.013 mgd is available for allocation from this aquifer. This number may increase if CWRM reallocates the existing allocations that are not being fully utilized. The Kapakahi Well would utilize a variable speed pump to allow adjustment of pump rates to their optimum level.

#### **4.5.2 Project Impacts**

The Kapakahi Well was tested for 7 days at a constant rate of 840 gallons per minute (gpm) between November 30 and December 7, 1992. The drawdown in the well rapidly stabilized and held steady at 5.2 feet throughout the test, indicating high aquifer permeability and recharge. The well recovered to within 0.7 foot of its original level three minutes after pumping stopped and to within 0.2 foot after 60 minutes. All of the chemical parameters tested were well below the Environmental Protection Agency and State Department of Health drinking water standards. The aquifer's chloride content was measured at 40 milligrams per liter (mg/l), well below the 250 mg/l standard for drinking water. The Kapakahi Well showed no evidence of saltwater intrusion during the 7-day test.

During the pump test, the BWS Aina Koa Well, located 2,100 feet downgradient, was shut down and used to monitor water level in the aquifer. No related effect or downward trend in water levels was discernible and no evidence was found of saltwater intrusion. The pump test indications were that the Kapakahi Well would be capable of producing at a rate of up to 1.4 mgd on a long-term basis with no cumulative impact on the aquifer.

#### **4.5.3 Mitigation Measures**

No mitigation measures are proposed or required.

### **4.6 Surface Water Resources**

#### **4.6.1 Existing Conditions**

Kapakahi Stream is an intermittent stream that flows only during periods of heavy rains. The stream acts to drain the Kapakahi Gulch into retention and flood control basins constructed adjacent to the site of the proposed well. The stream was not identified as having aquatic or riparian resources associated with it by the CWRM in its 1990 *Hawaii Stream Assessment*.

#### **4.6.2 Project Impacts**

Kapakahi Stream is not fed by aquifer resources and will see no impact from groundwater withdrawal in the area. The proposed well will be located approximately 100 feet away from

the normally dry streambed. No work is proposed within the streambed and the well, located at the base of the gulch, will not affect the normal drainage patterns of the gulch.

#### **4.6.3 Mitigation Measures**

A grading plan will be prepared prior to construction and appropriate engineering practices and mitigation measures will be utilized to minimize erosion and runoff during installation of the well and the accompanying control house and during their operation. With the existing downgradient flood control basin and mitigation measures incorporated in the project, there will be no adverse impact to either the surrounding area, surface water or to nearshore waters from surface water. No other mitigation measures are proposed or required.

### **4.7 Natural Hazards**

#### **4.7.1 Flood Zones**

The proposed Kapakahi Well site is located approximately 267 feet above msl and approximately 100 feet from the Kapakahi Stream drainage channel. The area is listed on the Flood Insurance Rate Maps as outside the 500-year flood zone. Flood control and retention basins are located downgradient of the proposed well and adjacent to the project parcel. These basins serve to collect runoff from Kapakahi Gulch before it can impact the nearby residential area.

#### **4.7.2 Seismic Activity**

Under the Uniform Building Code (UBC), the island of Oahu is designated as Seismic Zone 1, which is the zone with the lowest potential for ground motion created by seismic events. The UBC establishes minimum design criteria for structures to resist the effects of seismic ground motion.

#### **4.7.3 Mitigation Measures**

Design of the facility will follow UBC criteria for Seismic Zone 1 or greater.

### **4.8 Biological Resources**

#### **4.8.1 Existing Conditions**

A biological survey and assessment were performed by Botanical Consultants in July 1996. A copy of their report is contained in Appendix B. The site has been cleared in the past and presently supports a dense growth of 6- to 9-foot-tall Guinea grass fringed by *koa haole* shrubs. Other landscape type plants were also found on the site, including octopus trees, bougainvillea, and *kolomona* trees. Of the 59 plant species found on the site, only *'ilima* and *wiliwili* trees are native to the Hawaiian Islands. A list of the plant species found on site and

their scientific names can be found in Appendix B. No proposed or listed, threatened or endangered plant species were found on the site.

Eight species of birds were observed on site, along with one cat. Of the birds observed on the site, all were non-native species and common to grassy areas. These included zebra doves, white-eyes, sparrows, starlings, cardinals, pigeons, and mynas. A list of the avifauna observed on or near the site and their scientific names can be found in Appendix B. Although no evidence of their existence was seen, it is probable, given the habitat type, that rats, field mice, and mongooses also use the site. No proposed or listed, threatened, or endangered avifaunal or mammal species were found on the site, nor is the site a habitat for any such species.

#### **4.8.2 Project Impacts**

Vegetation on the site will be cleared and replaced with landscaping features. The subject parcel contains biological resources common to previously graded and disturbed lands in that area and no loss of significant habitat will occur. No proposed or listed, threatened or endangered biological species were found on the site. No adverse impact to any significant biological resources is anticipated.

#### **4.8.3 Mitigation Measures**

No mitigation measures are required or proposed.

### **4.9 Cultural Resources**

#### **4.9.1 Existing Conditions**

The site of the proposed well is not currently listed on the Hawaii Register or the National Register of Historic Places, nor has it been determined eligible for inclusion on either of these lists. A site visit performed in 1995 by the DLNR, Division of Historic Preservation determined that the site had been previously disturbed by bulldozing, most probably when the neighboring residential subdivision was developed in the 1950s. The site was also previously cleared and graded for the construction of the exploratory well in 1992. No indications of the presence of archaeological resources were found.

#### **4.9.2 Project Impacts**

The DLNR, State Historic Preservation Division determined as a result of their site visit, that the development of the Kapakahi Well will have no effect upon significant historic sites. A copy of the letter relaying that determination to the DLNR, Division of Water and Land Development is included in Appendix C.

### **4.9.3 Mitigation Measures**

No mitigation measures are required or proposed.

## **4.10 Socioeconomic Environment**

### **4.10.1 Existing Conditions**

The site of the proposed Kapakahi Well is located in the area known as Aina Koa, within Census Tract No. 4.97. The neighborhood is in a small valley approximately 7 miles inland from the H-1 Freeway. The adjacent properties contain an older subdivision of conventional homes. The proximity of the area to downtown Honolulu and Kahala Mall, and to areas such as Waialae, have resulted in property values and rents somewhat higher than the county average. The 1990 census reported median home values in the area at \$450,800 and median rents of \$1000, both of which are higher than the County medians of \$283,600 and \$615 for home values and rents, respectively.

The area has a resident population of about 2,770 persons with a median age of 43 years. The area is stable with about 70 percent of the residents not moving between 1985 and the time of the 1990 Census. The workforce residing there consists of mostly managers and professionals with a per capita income of \$30,684, significantly higher than the \$21,300 per capita income for the City and County of Honolulu.

The nearest park, Aina Koa Playground, is located approximately 1/2 mile away from the project site and the nearest school is Star of the Sea, located adjacent to Waialae Avenue. Figure 4-2 shows the landowners adjacent to the project site.

### **4.10.2 Project Impacts**

The proposed well will have no impact upon the socioeconomic environment of the immediate neighborhood. A small number of temporary construction jobs will be created by the well installation; however, these jobs will likely involve people living on Oahu but outside this census tract.

The integration of the well into the BWS system will allow it to make up demand placed upon the system by State of Hawaii developments such as the Convention Center, the University of Hawaii's West Oahu Campus, and the Kapolei residential developments. In addition, the well will help to support Hawaii Community Development Authority and Bishop Estate developments in Kakaako. However, this well is not the catalyst for these developments, nor are these developments dependent upon this individual well's completion.

### **4.10.3 Mitigation Measures**

No mitigation measures are proposed or required.



## 4.11 Visual Resources

### 4.11.1 Existing Conditions

Access to the property is restricted at the end of Ainakoa Avenue due to the flood control project. The site itself is shielded from view from the end of Ainakoa Avenue and from the adjoining residences by trees and vegetation. The nearest home is approximately 200 feet from the site of the proposed well.

### 4.11.2 Project Impacts

There are no identified trails running either through or adjacent to the site and thus the project is not visible from recreational resources. Vegetation masking the site from the end of Ainakoa Avenue will not be removed.

### 4.11.3 Mitigation Measures

No mitigation measures are proposed or required.

## 4.12 Air Quality and Noise

### 4.12.1 Existing Conditions

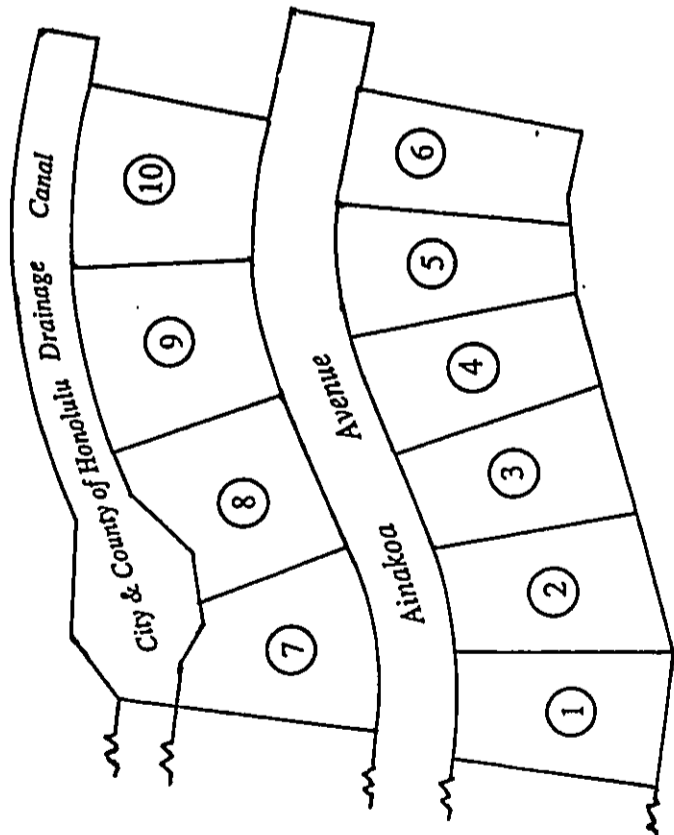
Air quality on Oahu is, in general, relatively clean and low in pollution, except where there are large numbers of motor vehicles or stationary sources. In the vicinity of the proposed Kapakahi well site at the upper end of Ainakoa Avenue, pollution contributed from vehicles traveling on Kalaniana'ole Highway is minimal because of the distance separating the highway from the proposed well site and the predominance of the northeast trade winds. The occasional vehicle on the upper portion of Ainakoa Avenue does not create a degradation of the air quality in the area. There also are no agricultural activities or stationary sources in the vicinity that may be a source of air pollutants.

Ambient noise at and around the project site is also very low, and results mainly from the sounds of residential activities in the nearby subdivision. The trees and the brush between the proposed well site and the nearest home, approximately 200 feet away, provide an effective noise barrier.

### 4.12.2 Project Impacts

Construction will involve heavy vehicle and equipment operations that will create a small amount of fugitive dust and pollutant emissions. There will be no long-term air quality impacts once construction is completed.

In the State of Hawaii, community noise controls have been set for analyzing noise impacts pursuant to Hawaii Department of Health Rules, Title 11, Chapter 46. Allowable daytime and



3-5-24:01  
 Kamehameha Schools Bishop Estate

Proposed Kapakahi Well

Note:  
 All lots owned by Kamehameha Schools Bishop Estate and leased by Thomas A. Sofas, DBA as Tasco Associated Contractors unless otherwise noted.

Landowner Key

- |    |                                     |     |                                     |
|----|-------------------------------------|-----|-------------------------------------|
| 1. | 3-5-37:60; William F. Ryan, leasee  | 6.  | 3-5-37:65; Paul Mamiya, leasee      |
| 2. | 3-5-37:61; Marco Yoshikami, owner   | 7.  | 3-5-37:66; Ryoetsu Naigama, owner   |
| 3. | 3-5-37:62; Edwin K. Nakasone, owner | 8.  | 3-5-37:67; Toko Nishikawa, owner    |
| 4. | 3-5-37:63; Wallace Nishikida, owner | 9.  | 3-5-37:68; Morris M. Masuda, leasee |
| 5. | 3-5-37:64; Tetsura Ushijima, leasee | 10. | 3-5-37:69; Kay Hall, leasee         |

Source: Realty Atlas, State of Hawaii, 1995

Environmental Assessment  
 Kapakahi Well  
 KSBE/DLNR

FIGURE  
 4-2

LAND OWNERSHIP



Scale: 1 in. = 50 ft.

CRMHILL

nighttime noise level standards for sensitive receptors in residential, preservation, hotel, apartment, and business districts have been set under these rules. The project site is in a Class A zoning district due to its zoning as preservation lands. For Class A districts, the maximum allowable daytime noise level from 7:00 AM to 10:00 PM is 55 dBA, and the maximum allowable nighttime noise level from 10:00 PM to 7:00 AM is 45 dBA.

The project will not have any long-term adverse noise impacts to any nearby sensitive noise receptors. Heavy-equipment moving, construction, and the installation of the production well will create short-term noise impacts. If additional well drilling is required, noise may result from the drill bit hitting rock. Noise will also result from the operation of the diesel engine driving the drill. There will be no long-term noise impacts after the construction is completed.

A noise permit will be required from the Noise and Radiation Branch of the State of Hawaii Department of Health to allow for construction-related noise.

#### **4.12.3 Mitigation Measures**

To mitigate the effects of construction activities, dust control measures such as water sprinkling will be implemented by the contractor to reduce dust levels, as necessary. Further, the contractor will properly maintain its internal combustion equipment to minimize exhaust emissions, and will comply with the State of Hawaii, Department of Health Rules Title 11, Chapters 59 and 60, regarding air pollution control.

Contractors will comply with all of the conditions of the required noise permit. Mufflers will be required for all construction equipment. All noise-attenuating equipment will be maintained in proper operating condition and will be repaired or replaced as needed. Construction activities will be restricted to the hours of 7:30 AM to 4:30 PM on weekdays and will exclude holidays. Noise levels from the permanent pump will be reduced to below regulatory levels by the use of a submersible pump.

### **4.13 Utilities and Infrastructure**

#### **4.13.1 Existing Conditions**

The proposed site is located at the end of Ainakoa Avenue, approximately 3/4 mile from Kalaniana'ole Highway. The site is currently accessed through a 44-foot non-exclusive paved roadway easement running between the project parcel and the existing flood control catch basins. Access to the flood control area is controlled by a locked gate.

No electrical, water, or sewer utilities exist on the project parcel. Nearest hookups for these utilities are located within Ainakoa Avenue, between 200 and 400 feet away from the proposed well site.

#### **4.13.2 Project Impacts**

The proposed project will create a temporary rise in construction-related traffic along Ainakoa Avenue. However, given the width of Ainakoa Avenue and its very low residential traffic volumes, no significant impact from construction traffic is anticipated.

The proposed project will consist of pump installation and construction of a control building onsite. The project will connect to the BWS municipal water system, the City sewer system, and the Hawaiian Electric Company distribution system at their nearest points along Ainakoa Avenue. No adverse impacts to residential site access are anticipated during installation of these connections.

#### **4.13.3 Mitigation Measures**

Connections to utilities off the project parcel will be coordinated with the appropriate utility and government agencies to ensure system integrity and minimal construction-related disruptions to the surrounding residents.

**Chapter 5**  
**Relationship to Land Use Designations and Controls**

**5.1 State Land Use Designations and Controls**

The subject property is located within the State Land Use Conservation District, General Subzone. According to State law, Chapter 205, HRS, principal land use controls in the Conservation Districts on the island of Oahu are under the jurisdiction of the DLNR. Under Title 13, Chapter 5 of the Hawaii Administrative Rules (HAR) governing the Conservation District, the objective of the General Subzone is to designate open space where specific conservation uses may not be defined, but where urban use would be premature. Under 13-5-25 HAR, permitted uses within the General Subzone include such public purpose uses as "transportation systems, transmission facilities for public utilities, *water systems*, energy generation facilities utilizing the renewable resources of the area and communication systems and other such land entities which benefit the public and are consistent with the purpose of the conservation district" (emphasis added).

A Conservation District Use Permit will be required from the BLNR. The proposed project meets the evaluation criteria as follows:

1. The proposed Kapakahi Well allows for the management of the island's water resources, consistent with the objectives of the Conservation District.
2. The proposed project is a permitted use within the General Subzone of the Conservation District and is consistent with the objective of the General Subzone. Only a small portion of the approximately 40,000-square-foot site will be developed with the remainder retaining its open space characteristics.
3. The proposed project does not impact coastal resources and complies with HRS 205A relating to Coastal Zone Management. The parcel is outside the county Special Management Area.

The purpose of the Hawaii Coastal Zone Management Program (HCZMP) is to establish guidelines for the use, protection, and development of resources in the coastal zone. Development activities in the coastal zone must conform to the HCZMP objectives and policies, as outlined in Hawaii Revised Statutes (HRS) Chapter 205A. As designated in HRS Chapter 205A, the coastal zone encompasses the entire State of Hawaii. The following discusses how the project will be consistent with and comply with HRS 205A:

- a) The subject property is located approximately 1.1 miles inland. The proposed project will have no impact on the public's access and use of the shoreline area.
- b) A grading plan will be prepared prior to construction and appropriate engineering practices will be utilized to minimize erosion and runoff during installation of the well and the accompanying control house. Adjacent to the subject parcel to the

east and downgradient from the proposed well site is a large concrete flood control basin maintained by the City and County of Honolulu. With the existing downgradient flood control basin and mitigation measures incorporated in the project, there will be no adverse impact to either the surrounding area, surface water or to nearshore waters from point and non-point sources of pollution. Because of its location and lack of coastal impacts, the project will conform with the objectives related to recreational resources, coastal ecosystems, beach protection, and marine resources.

- c) There are no known traditional gathering activities and/or cultural practices affecting the subject property. A memorandum dated February 3, 1999 from Dr. Don Hibbard, Ph. D., Administrator of the DLNR Historic Preservation Division, reiterates that due to previous grading in the project area, the project will have "no effect" on historic sites.
  - d) The location of the project site does not represent a significant adverse impact on scenic views or vistas of coastal areas. The site will be landscaped and replanted upon completion of the construction. The project will have no negative impact on the visual character of its immediate environs.
  - e) The project complies with the economic uses objective by situating a necessary facility away from coastal areas; the project will therefore meet and support continued economic growth on Oahu.
  - f) The proposed Kapakahi Well site is located approximately 267 feet above mean sea level (msl) and approximately 100 feet from the Kapakahi Stream drainage channel. The area is listed on the Flood Insurance Rate Maps as outside the 500-year flood zone. A flood control and retention basin is located downgradient of the proposed well and adjacent to the project parcel. These basins serve to collect runoff from Kapakahi Gulch before runoff can impact the nearby residential area.
  - g) The project's draft EA that has gone through public review and comment. In addition, a public hearing will be held for the project's Conservation District Use Permit.
4. No substantial adverse impacts have been identified through the environmental impact assessment process to existing natural resources within the surrounding area, community, or region as a result of the project.
  5. The proposed well and control house will be of a scale and use compatible with the adjacent land uses, which include residential units and a flood control catch basin.
  6. Only a small portion of the approximately 40,000-square-foot site will be developed with the remainder retaining its open space characteristics. Subdivision of the land will be performed to allow the transfer of the well to the BWS. The remaining portion of the parcel will continue to be owned by KSBE, which has no plans to develop the parcel.
  7. The proposed project is a water system constructed for a public purpose which will be transferred to the BWS. This project will benefit the public health and welfare by providing an additional needed source of potable water.

In addition to the CDUP, well construction, pump installation, and water use permits will be required from the CWRM and a noise permit will be required from the State of Hawaii Department of Health, Noise and Radiation Branch. A grading permit, building permit, street usage permit, and other construction-related permits will be required from the City and County of Honolulu.

## 5.2 City and County of Honolulu Land Use Designations and Controls

The subject parcel is designated Preservation on the City and County of Honolulu's Development Plan Land Use Map and is shown as P-1, Restricted Preservation Zone on the City and County of Honolulu's Zoning Map. According to the City and County of Honolulu's Land Use Ordinance (LUO), all land within the State designated Conservation District is zoned P-1, Restricted Preservation District by the City and County of Honolulu, and all uses, structures, and development standards in this P-1, Restricted Preservation District are governed by the appropriate State of Hawaii agencies.

Development of a potable water production facility will require an amendment to the City and County of Honolulu Development Plan Public Facilities Map to include the project area as a "site determined, well facility programmed for construction within 6 years." The amendment will require an application to the City and County of Honolulu, Planning Department and approval by the City and County of Honolulu, City Council.

## Chapter 6 List of Preparers

### CH2M HILL

Albert Lono Lyman	Senior Environmental Manager (final EA) with Master's degree in Business Administration and Bachelor's degree in Economics
Mark Willey, AICP	Environmental Manager (draft EA) with Master's degree in Urban and Regional Planning
Mara Soloway	Project Planner (draft EA) with Bachelor's degree in Communications
Ross Kaneko, P.E.	Project Engineer with Bachelor's degree in Civil Engineering
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Liz Tajima	Project Editor (draft EA)
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### SUBCONSULTANTS

Evangeline Funk, Botanical Consultants	Biologist with a Ph.D. in Endangered Species
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*Appendix A*

*1992 Conservation District Use  
Permit and Conditions*

KAPAKAHI WELL ENVIRONMENTAL ASSESSMENT

REF:OCEA:SKK

FEB 10 1992

FILE NO.: OA-1635  
DOC. ID.: 92

The Honorable Kazu Hayashida  
Manager and Chief Engineer  
Board of Water Supply  
City and County of Honolulu  
630 So. Beretania Street  
Honolulu, Hawaii 96843

Dear Mr. Hayashida:

Conservation District Use Application for  
Exploratory Well Drilling and Subdivision of the Well Site  
and Access Road at Kapakahi Gulch, Waialae-Nui, Oahu, Hawaii

We are pleased to inform you that the Board of Land and Natural Resources, at its meeting of January 24, 1992, approved your application for exploratory well drilling and subdivision of the well site and access road on TMK: 3-5-24: 01 at Kapakahi Gulch, Waialae-Nui, Oahu, subject to the following conditions:

1. The applicant shall comply with all applicable statutes, ordinances, rules and regulations of the Federal, State and County governments, and applicable parts of Section 13-2-21, Administrative Rules, as amended;
2. Other terms and conditions as prescribed by the Chairperson;
3. In the event any unanticipated sites or remains such as shell, bone or charcoal deposits, human burials, rock or coral alignments, pavings, or walls are encountered during construction, the applicant shall stop work and contact the Historic Preservation Office at 587-0045 or 587-0046;
4. The applicant shall comply with all applicable Public Health Regulations;

5. A fire contingency plan, acceptable to the Division of Forestry and Wildlife shall be implemented during and after the construction;
6. The construction, alteration, moving, demolition and repair of any building or other improvement on lands within the Conservation District, shall be subject to the building codes of the respective counties in which the lands are located; provided that prior to the commencement of any construction, alteration or repair of any building or other improvement, four (4) copies each of the final location map, plans and specifications shall be submitted to the Chairperson, or his authorized representative, for approval of which three (3) copies will be returned;
7. Any work or construction to be done on the land shall be initiated within one (1) year of the approval of such use, and all work and construction must be completed within three (3) years of the approval of such use;
8. That this approval is for exploratory drilling only, and that a separate Conservation District Use Application for production use will be filed prior to the well being developed; and,
9. That the drilling and pumping activities will be limited to weekdays between the hours of 9:00 a.m. to 5:30 p.m.

Should you have any questions on any of these conditions, please feel free to contact our Office of Conservation and Environmental Affairs staff at 587-0377.

Very truly yours,

John P. Keppeler II for  
WILLIAM W. PATY

cc: DOWRM

*Ch*  
CH:kk

*Appendix B*

*Biological Resources Survey*

KAPAKAHI WELL ENVIRONMENTAL ASSESSMENT

BIOLOGICAL SURVEY REPORT FOR THE PROPOSED  
KAPAKAHI WELL SITE

FOR  
CH2M HILL  
1585 KAPIOLANI BOULEVARD, SUITE 1420  
HONOLULU, HAWAII

BY  
EVANGELINE J. FUNK, PH.D.  
BOTANICAL CONSULTANTS  
HONOLULU, HAWAII  
1996

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## BOTANICAL SURVEY REPORT

### INTRODUCTION

The Proposed Kapakahi Well Site is located in an urbanized area just mauka or northeast of Ainakoa Street in what Ripperton and Hosaka termed the A zone or xerophytic (dry) scrub zone (Ripperton and Hosaka 1942). The xerophytic scrub zone is characterized as; found in the leeward area of the Hawaiian Islands below five hundred feet elevation, with annual precipitation of less than twenty inches, and summer deciduous vegetation.

A botanical survey of this site was conducted in July 1996 to ascertain what vegetation is found in the area, what vegetation types are present, and if any listed or candidate endangered species are present.

### METHODS

One circular transect and two cross site walk through transects were conducted to collect data for the botanical survey. All parts of this small, two acre site were visited and all plant species were recorded. All are included in the species list.

### RESULTS

The proposed Kapakahi Well Site has been cleared in the past and presently supports a dense growth of two to three meter tall Guinea grass (*Panicum maximum* Jacq.) fringed by koa haole shrubs (*Leucaena leucocephala* (Lam. de Wit) two to five meters in height. Within this vegetation type, Guinea grass/Koa haole, can be found a variety of landscape type plants that have escaped from local gardens. Among these, the most common are kolomona trees (*Senna surattensis* Irving and Barney), octopus trees (*Schefflera actinophylla* (Endl.) Harms), and some bougainvillea vines.



#### RECOMMENDATIONS

Of the fifty-nine plant species found on this site, two are native to the Hawaiian Islands, 'ilima (*Sida fallax* Walp.) and wiliwili trees (*Erythrina sandwicensis* Degener). 'Ilima is common, however, one of the four wiliwili trees found on the site is extraordinary. It is twelve to fifteen meters in height and produces an abundance of cream colored flowers. All of the wiliwili trees are located near the eastern boundary of the site and although not endangered, every effort should be made to save these trees.

#### ENDANGERED SPECIES

During this survey no proposed or listed, threatened or endangered species were found on the proposed Kapakahi Well Site (USFWS 1993).

LIST OF PLANT SPECIES FOUND ON THE PROPOSED  
KAPAKAHI WELL 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 St. John (1973) and 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.
3. The Hawaiian name and or the most widely used common name.
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 to 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 hot, dry summer season (July 1996) and it reflects the vegetative 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.

CHECKLIST		
Scientific Name	Common Name	Abundance
MONOCOTYLEDONES		
COMMELINACEAE - Spiderwort Family		
* <i>Commelina benghalensis</i> L.	Hairy honohono	Occasional
POACEAE - Grass Family		
* <i>Chloris divaricata</i> R. Br.	Star grass	Common
* <i>Cynodon dactylon</i> (L.) Pers.	Bermuda grass	Common
* <i>Digitaria adscendens</i> (HBK) Henr.	Henry's crabgrass	Occasional
* <i>Eleusine indica</i> (L.) Gaertn.	Wiregrass	Common
* <i>Paspalum</i> sp.		Uncommon
* <i>Panicum maximum</i> Jacq.	Guinea grass	Common
* <i>Rhynchelytrum repens</i> C.E.Hubb	Natal redtop	Common
* <i>Setaria verticillata</i> (L. P.Beauv.	Bristly Foxtail	Locally abundant
DICOTYLEDONES		
ACANTHACEAE - Acanthus Family		
* <i>Asystasia gangetica</i> (L.) T. Anders	Chinese violet	Common
* <i>Ruellia prostrata</i> Poir.		Occasional
AIZOACEAE - Fig-marigold Family		
* <i>Trianthema portulacastrum</i> L.		Common
AMARANTHACEAE - Amaranth Family		
* <i>Achyranthes aspera</i> L.		Occasional
* <i>Amaranthus spinosus</i> L.	Spiny amaranth	Common
ANACARDIACEAE - Mango Family		
* <i>Schinus terebinthifolius</i> Raddi	Christmas berry	Uncommon
ARALIACEAE - Gingseng Family		
* <i>Schefflera actinophylla</i> (Endl.) Harms	Octopus tree	Occasional
ASTERACEAE - Sunflower Family		
* <i>Bidens cynapiifolia</i> Kunth	Spanish needle	Common
* <i>Pluchea symphytifolia</i> (L.) Cass.	Sourbush	Occasional
* <i>Sonchus olerarceus</i> L.	Sow thistle	Occasional
* <i>Synedrella nodiflora</i> (L.) Gaertn.	Synedrella	Locally abundant

Scientific Name	Common Name	Abundance
<b>COMBRETACEAE - Indian Almond Family</b>		
* <i>Terminalia catappa</i> L.	Tropical almond	Rare
<b>CONVOLVULACEAE - Morningglory Family</b>		
* <i>Ipomoea obscura</i> (L.) Ker-Gawl	Little Bell	Occasional
* <i>Ipomoea triloba</i> L.		Occasional
<b>CRASSULACEAE - Orpine Family</b>		
<i>Kalanchoe pinnata</i> (Lam.) Pers.	Air plant	Common
<b>CUCURBITACEAE - Cucumber Family</b>		
* <i>Coccinia grandis</i> (L.) Voight	Ivory gourd	Common
<b>CUSCUTACEAE - Dodder Family</b>		
* <i>Cuscuta campestris</i> Yuncker	Western field dodder	Occasional
<b>EUPHORBIACEAE - Spurge Family</b>		
* <i>Euphorbia cyathophora</i> Murr.	Mexican fire plant	Locally abundant
* <i>Chamaesyce glomerifera</i> L. Wheeler	Graceful spurge	Locally abundant
* <i>Chamaesyce hirta</i> L.	Hairy spurge	Common
* <i>Phyllanthus debilis</i> Klein ex Willd.	Niruri	Common
* <i>Ricinus communis</i> L.	Castor bean	Common
<b>FABACEAE - Bean Family</b>		
* <i>Crotalaria incana</i> L.	Fuzzy rattle-pod	Occasional
* <i>Desmanthus virgatus</i> Willd.	Virgate mimosa	Occasional
<i>Erythrina sandwicensis</i> Deg.	Wiliwili	Occasional
* <i>Indigofera suffruticosa</i> Mill.	Indigo	Occasional
* <i>Leucaena leucocephala</i> Lam deWit	Koa-haole	Common
* <i>Macropitium atropurpureum</i> (DC) Urb.		Locally abundant.
* <i>Prosopis pallida</i> HBK	Kiawe	Occasional
* <i>Senna surattensis</i> Irwin & Barn.	Kolomona	Common
<b>LAMIACEAE - Mint Family</b>		
* <i>Ocimum gratissimum</i> L.	Wild basil	Uncommon
<b>MALVACEAE - Hibiscus Family</b>		
* <i>Abutilon grandifolium</i> Sweet	Hairy abutilon	Uncommon
* <i>Malvastrum coromandelianum</i> Garcke	False marrow	Common
* <i>Sida fallax</i> Walp.	'Ilima	Common
* <i>Sida rhombifolia</i> L.	Cuba jute	Occasional
* <i>Sida spinosa</i> L.	Prickly sida	Occasional

<u>Scientific Name</u>	<u>Common Name</u>	<u>Abundance</u>
NYCTAGINACEAE - Four o'clock Family		
* <i>Bougainvillea spectabilis</i> Willd.	Bougainvillea	Rare
PORTULACACEAE - Portulaca Family		
* <i>Portulaca oleracea</i> L.	Pigweed	Common
SOLANACEAE - Tomato Family		
* <i>Solanum seaforthianum</i> Andr.		Rare
STERCULIACEAE - Stink tree Family		
* <i>Waltheria indica</i> L.	'Uha-loa	Locally abundant

#### FAUNA OF THE PROPOSED KAPAKAHI WELL SITE

##### Introduction

A single vegetation type, Guinea grass/Koa haole is found on the Proposed Kapakahi Well Site. It offers a food resources which can be utilized by a variety of common birds. Overall, one pet cat and eight species of birds were found on this small area. There was no evidence of rats, field mice or mongoose, although they are probably all found in this area. Direct observations of these mammals are lacking.

##### METHODS

To document the presence of avifauna and mammals, a walk through survey was conducted. One circular plot transect and two twenty minute fixed station observation points (20 minutes at each station) were carried out. One at the upper rim of the site and one above a standing water pond near the lower, southwestern corner of the area. Observations were made during early morning hours in order to take advantage of the higher activity levels of both birds and mammals during cooler parts of the day.

## RESULTS

The one vegetation type or habitat found on the proposed Kapakahi Well Site was Guinea grass/Koa haole. This vegetation type does not provide suitable habitat for most native Hawaiian birds. However this vegetation type is inhabited by a diverse avian fauna made up of introduced, commensal, seed-eating birds. The most commonly seen species were zebra doves, common mynas, and bulbuls.

Although no rats, house mice, or mongoose were seen, it is fair to assume they are present on the site due to some dumping of household rubbish and garden clippings in the area. The one cat that was present was clearly a pet.

### LIST OF AVIFAUNA FOUND ON THE PROPOSED KAPAKAHI WELL SITE

AVIFAUNA-As mentioned earlier the entire site has been extensively modified from its original state and today it has almost no value as native bird habitat. However, it does support a variety of non-native species. The grasses which are so common in the area provide a rich source of food for seed eating birds. The most abundant species were the small, seed-eating zebra doves.

Seven species of birds were found on and around the study site. No threatened or endangered species were found. The annotated checklist follows the nomenclature of Pratt, Bruner and Berrett (1987).

#### Family Zosteropidae: White-eyes

##### *Zosterops japonicus*

White-eyes are one of the most widespread introduced bird species in Hawaii. The white-eyes seemed well adapted to this area. They were seen in low numbers in all parts of the site.

#### Family Passeridae: Old World Sparrows

##### *Passer domesticus* (House sparrow)

House sparrows are sometimes called feathered mice. These streaky brown and gray

birds are a familiar commensal species and were most common around the houses.

Family Pycnonotidae: Bulbuls

*Pycnonotus cafer* (Red-vented bulbul)

Many of these large, raucous birds inhabit the study site. They were common on power lines and in the large trees. Bulbuls are conspicuous for their noisy call and the bright red feathers beneath their tails. They are fruit eaters that frequent urban areas.

Family Emberizidae: Emberizine Finches

*Cardinalis cardinalis* (Northern cardinal)

Northern cardinals inhabit the koa haole bushes at the edges of the the site. The bright red coloring of the male bird make him easily recognizeable. The call of these birds is very distinctive.

Family Columbidae: Pigeons and Doves

*Streptopelia chinensis* (Spotted Dove)

The spotted dove is a large bird which is grayish brown with rosy blushed breast feathers. At the sides and back of the neck is a patch of black with white spots. The low, repetitive cooing of the spotted dove was heard throughout the site. Many pairs and individuals were seen feeding on the ground or perched on the power lines.

*Geopelia striata* (Zebra Dove)

This ground dwelling, seed eating dove is smaller and even more abundant than the spotted dove. Zebra doves were seen in large flocks on the study site.

Family Sturnidae: Starlings and Mynas

*Acridotheres tristis* (Common Myna)

The ubiquitous myna is a plump brown bird with a black head and tail. It has a white belly, tail tip and wing patches, and bright yellow legs, feet, bill, and eye liners. Mynas were the most commonly seen in the big trees on the site.

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**PROPOSED KAPAKAHI WELL**



*Appendix C*

*Archaeological/Cultural  
Resources "No-Effect"  
Determination Letter*

KAPAKAHI WELL ENVIRONMENTAL ASSESSMENT

BENJAMIN J. CAYETANO  
GOVERNOR OF HAWAII



STATE OF HAWAII  
DEPARTMENT OF LAND AND NATURAL RESOURCES

STATE HISTORIC PRESERVATION DIVISION  
33 SOUTH KING STREET, 6TH FLOOR  
HONOLULU, HAWAII 96813

August 14, 1995

MICHAEL D. WILSON, CHAIRPERSON  
BOARD OF LAND AND NATURAL RESOURCES

DEPUTIES

JOHN P. KEPPELER II

AQUACULTURE DEVELOPMENT  
PROGRAM

AQUATIC RESOURCES  
CONSERVATION AND

ENVIRONMENTAL AFFAIRS  
CONSERVATION AND  
RESOURCES ENFORCEMENT

CONVEYANCES

FORESTRY AND WILDLIFE  
HISTORIC PRESERVATION  
DIVISION


LAND MANAGEMENT  
STATE PARKS

WATER AND LAND DEVELOPMENT

MEMORANDUM

LOG NO: 15250 ✓  
DOC NO: 9508CK01

TO: Manabu Tagamori, Manager-Chief Engineer  
Division of Water and Land Development

FROM: Don Hibbard, Administrator  
State Historic Preservation Division 

SUBJECT: Kapakahi Gulch Well Project (1746-03)  
Job No. 4-OW-22  
Wai'alaie, O'ahu  
TMK: 3-5-24:01

Per Manuel Emeliano of the Division of Water and Land Development, Carol Kawachi, Inter-Agency archaeologist with the Division of Historic Preservation, was asked to do a background search in preparation for the Kapakahi Gulch well development project. The proposed project is to be at the end of Ainakoa Avenue on the east side of Kapakahi Stream on the talus slope.

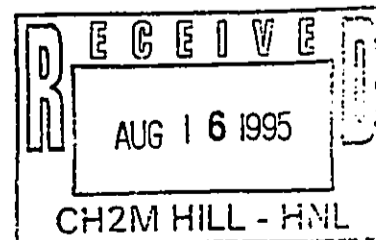
On Friday, July 14, 1995, Joe Menor (DOWALD) took Ms Kawachi to the project site. The site area was found to have been previously graded and cleared when the exploratory well was put in 1992. Further investigation west and north of the project site showed evidence of even earlier bulldozing, probably when the original housing development went in during the 1950s.

The proposed development of the Kapakahi well will have no effect upon significant historic sites. The area has been disturbed by previous grading and clearing.

Please call Ms Kawachi at 587-0047 if you have any questions regarding the above.

CK:jk

cc: Andy Monden, DOWALD  
✓ Ross Kancko, CH2M Hill



*Appendix D*

*Draft EA Comments and Responses*

KAPAKAHI WELL ENVIRONMENTAL ASSESSMENT

State of Hawaii  
Department of Land and Natural Resources  
Division of Conservation and Resources Enforcement

February 10, 1999

RECEIVED  
DIVISION OF  
LAND MANAGEMENT  
FEB 11 1 22 PM '99

MEMORANDUM

TO: Dean Uchida, Administrator  
Land Division

FROM: Patricia Edwards, Acting Investigator  
Division of Conservation and Resources Enforcement

SUBJECT: Site Visit/Field Inspection Report 2914-OA

1. CASE DATA

- a. FILE NO: 2914-OA
- b. INITIATOR: KAMEHAMEHA SCHOOLS BERNICE PAUHI BISHOP ESTATE/LAND DIVISION
- c. LOCATION: TMK:(1)3-5-24:01 End of Ainakoa Ave, Waialae, Oahu
- d. SUMMARY: INSTALLATION OF PRODUCTION WELL AND ASSOCIATED FACILITIES

2. FINDINGS

- a. Site visit/inspection conducted on 02/09/99 by DOCARE Officer Eric Wong. There was no indication that any project work had been undertaken as of this date.
- b. There was no indication of any discrepancy in the applicant's description of the site conditions/situation.
- c. Nothing was noted that might be a bar to approval of the applicant's proposal.

3. GENERAL COMMENTS

Officer Wong noted that the pipe utilized for the test drill was left in place and covered only with duct tape. He questions the security/safety of this practice.

STATE OF HAWAII  
Department of Land and Natural Resources  
Land Division  
Planning Branch  
Honolulu, Hawaii

JAN 27 12:00

JAN 26 1999

REF:PB:LT

In reply, please refer to:  
File No.: OA-2914

180-Day Exp. Date: 6/25/99  
Suspense Date: 21 days from  
stamped date

MEMORANDUM

To: DOCARE/DOFAW/HPD/CWRM  
Department of Land and Natural Resources

From: Dean Uchida, Administrator  
Land Division *Uchida*

Subject: REQUEST FOR COMMENTS  
Conservation District Use Permit (CDUP)  
Application (Board Permit)

Applicant: Engineering Branch, Land Division with Kamehameha  
Schools Bishop Estate

Request: Installation of a Production Well and Associated  
Facilities

TMK: 3-5-24: por. 01

Location: End of Ainakoa Avenue, Waialae, Oahu

Public Hearing: YES \_\_\_ NO X \_\_\_

We would appreciate your review and comments at your earliest convenience. If no response is received by the suspense date, we will assume there are no comments.

DOCARE: Please perform a field inspection on the proposed project.

Should you need additional information or time, please call Lauren Tanaka, Planning Branch, at 587-0385.

Attachment

*Fig. 3-2 memo*



**CH2MHILL**

CH2M HILL  
1585 Kapiolani Blvd  
Suite 1420  
Honolulu, HI  
96814-4530  
Tel 808.943.1133  
Fax 808.941.8225

May 7, 1999

Mr. Timothy E. Johns, Chairperson  
Department of Land and Natural Resources  
P. O. Box 621  
Honolulu, Hawaii 96809

Attention: Mr. Dean Uchida, Administrator  
Land Division, Department of Land and Natural Resources

Subject: Response to Comments on the *Draft Environmental Assessment, Kapakahi Well, Aina Koa, Honolulu, Oahu, Hawaii, TMK 3-5-24:01*

Dear Mr. Johns:

This is in response to the comment memorandum dated February 10, 1999 from Patricia Edwards, acting Investigator, Division of Conservation Resources Enforcement, Department of Land and Natural Resources, regarding the *Draft Environmental Assessment (EA), Kapakahi Well, Aina Koa, Honolulu, Oahu, Hawaii, TMK 3-5-24:01*.

We will review with our client the general comment about DOCARE Officer Eric Wong's observation regarding duct tape on the well "pipe utilized for the test drill."

A copy of the memorandum and this response letter will be included in the *Final Environmental Assessment* for the Kapakahi Well.

Sincerely,

CH2M HILL

Al Lono Lyman  
Senior Project Manager

cc: Hiram Young, Engineer, DLNR  
Lauren Tanaka, Planner, DLNR

LD

BENJAMIN J. CAYETERO  
GOVERNOR OF HAWAII

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30 FEB 3 12:44

DEPT. OF LAND  
& NATURAL RESOURCES  
STATE OF HAWAII



RECEIVED  
DIVISION OF  
LAND MANAGEMENT  
FEB 3 1 08 PM '99

28076  
BRUCE S. ANDERSON, Ph.D., M.P.H.  
DIRECTOR OF HEALTH

STATE OF HAWAII  
DEPARTMENT OF HEALTH  
P.O. BOX 3378  
HONOLULU, HAWAII 96801


In reply, please refer to:

February 1, 1999

91-384A/epo

TO: The Honorable Timothy E. Johns, Chairperson  
Department of Land and Natural Resources

Attention: Dean Uchida, Administrator  
Land Division

FROM:  Bruce S. Anderson, Ph.D., M.P.H.  
Director of Health

SUBJECT: CONSERVATION DISTRICT USE APPLICATION

Applicant: Engineering Branch, Land Division with  
Kamehameha Schools Bishop Estate  
(KSBE)  
File No.: OA-2914  
Request: Installation of a Production Well and  
Associated Facilities  
Location: End of Ainakoa Avenue, Waiialae, Oahu  
TMK: 3-5-24: por. 01

Thank you for allowing us to review and comment on the subject request. We have the following comments to offer:

Drinking Water

1. Federal and state regulations define a public water system as a system that serves 25 or more individuals at least 60 days per year or has at least 15 service connections. All public water system owners and operators are required to comply with Hawaii Administrative Rules, Title 11, Chapter 20, "Rules Relating to Potable Water Systems."
2. Section 11-20-30 requires that new or substantially modified distribution systems for public water systems be approved by the Director of Health. However, if the water system is under the jurisdiction of the County of Honolulu, the Honolulu Board of Water Supply will be responsible for the review and approval of the plans.
3. Section 11-20-29 requires that all new sources of potable water serving a public water system be approved by the

The Honorable Timothy E. Johns  
February 1, 1999  
Page 2

91-384A/epo

Director of Health prior to its use. Such an approval is based primarily upon the submission of a satisfactory engineering report which addresses the requirements set in Section 11-20-29.

4. The engineering report must identify all potential sources of contamination and evaluate alternative control measures which could be implemented to reduce or eliminate the potential for contamination, including treatment of the water source. In addition, water quality analyses, performed by a laboratory certified in the State of Hawaii, must be submitted as part of the report to demonstrate compliance with all drinking water standards. Additional tests may be required by the Director of Health upon his review of the information submitted.

If you should have any questions, please contact Ms. Queenie Komori of the Safe Drinking Water Branch, Engineering Section, at 586-4258.

c: SDWB





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1585 Kapiolani Blvd  
Suite 1420  
Honolulu, HI  
96814-4530  
Tel 808.943.1133  
Fax 808.941.8225

May 7, 1999

Dr. Bruce S. Anderson, Ph. D, M. P. H.  
Director of Health,  
State Department of Health  
P. O. Box 3378  
Honolulu, Hawaii 96801

Attention: Mr. Gary Gill, Deputy Director  
State Department of Health

Subject: Response to Comments on the *Draft Environmental Assessment, Kapakahi Well, Aina Koa, Honolulu, Oahu, Hawaii, TMK 3-5-24:01*

Dear Dr. Anderson:

This is in response to the comment memorandum dated February 1, 1999 regarding the *Draft Environmental Assessment (EA), Kapakahi Well, Aina Koa, Honolulu, Oahu, Hawaii, TMK 3-5-24:01*.

The Kapakahi Well will be designed and constructed in a manner that complies with all applicable Federal, State, and County regulatory requirements. Pursuant to Hawaii Administrative Rules, Title 11-20-30, the appropriate agency will review and approve the construction plans for the well. The engineering report for the well will be prepared in a manner to comply with all applicable regulatory requirements.

A copy of your memorandum and this response letter will be included in the *Final Environmental Assessment* for the Kapakahi Well.

Sincerely,

CH2M HILL

Al Lono Lyman  
Senior Project Manager

cc: Mr. Dean Uchida, Administrator, Land Division, DLNR  
Mr. Hiram Young, Engineer, DLNR  
Ms. Lauren Tanaka, Planner, DLNR

BENJAMIN J. CAYEANO  
GOVERNOR OF HAWAII

RECEIVED  
DIVISION OF  
LAND MANAGEMENT  
FEB 12 11 31 AM '99



STATE OF HAWAII

DEPARTMENT OF LAND AND NATURAL RESOURCES

HISTORIC PRESERVATION DIVISION  
Kakuhikewe Building, Room 555  
601 Kamehaha Boulevard  
Kapolei, Hawaii 98707

February 3, 1999

MICHAEL D. WILSON, CHAIRPERSON  
BOARD OF LAND AND NATURAL RESOURCES


DEPUTIES  
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TIMOTHY E. JOHNS

AQUATIC RESOURCES  
BOATING AND OCEAN RECREATION  
CONSERVATION AND RESOURCES  
ENFORCEMENT  
CONVEYANCES  
FORESTRY AND WILDLIFE  
HISTORIC PRESERVATION  
LAND  
STATE PARKS  
WATER RESOURCE MANAGEMENT

MEMORANDUM

LOG NO: 22961 ✓  
DOC NO: 9901EJ30

TO: Dean Uchida, Administrator  
Land Division

FROM: Don Hibbard, Administrator  
Historic Preservation Division 

SUBJECT: Chapter 6E-8 Historic Preservation Review -- Environmental Assessment,  
Kapakahi Well (File No. OA-2914)  
Ainakoa (Honolulu), Kona, O'ahu  
TMK: 3-5-24:01

Our earlier correspondence stating that this project will have "no effect" on historic sites because of previous grading in the project area is included as Appendix C.

Should you have any questions, please feel free to call Elaine Jourdane at 692-8027.

EJ:jk



**CH2MHILL**

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Honolulu, HI  
96814-4530  
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Fax 808.941.8225

May 7, 1999

Dr. Don Hibbard Ph. D  
Administrator, Historic Preservation Division  
Department of Land and Natural Resources  
P. O. Box 3378  
Honolulu, Hawaii 96801

Subject: Response to Comments on the *Draft Environmental Assessment, Kapakahi Well, Aina Koa, Honolulu, Oahu, Hawaii, TMK 3-5-24:01*

Dear Dr. Hibbard:

Thank you for your comment memorandum dated February 3, 1999 regarding the *Draft Environmental Assessment (EA), Kapakahi Well, Aina Koa, Honolulu, Oahu, Hawaii, TMK 3-5-24:01*. We appreciate your reiterating that the project will have "no effect" on historic sites because of previous grading in the project area.

A copy of your memorandum and this response letter will be included in the *Final Environmental Assessment* for the Kapakahi Well.

Sincerely,

CH2M HILL

Al Lono Lyman  
Senior Project Manager

cc: Mr. Dean Uchida, Administrator, Land Division, DLNR  
Mr. Hiram Young, Engineer, DLNR  
Ms. Lauren Tanaka, Planner, DLNR

BENJAMIN J. CAYETANO  
GOVERNOR OF HAWAII



TIMOTHY E. JOHNS  
CHAIRPERSON

BRUCE S. ANDERSON  
RICHARD H. COX  
ROBERT G. GIRALDO  
DAVID A. NOBRIGA  
HERBERT M. RICHARDS, JR.

EDWIN T. SAKODA  
ACTING DEPUTY DIRECTOR

STATE OF HAWAII  
DEPARTMENT OF LAND AND NATURAL RESOURCES  
COMMISSION ON WATER RESOURCE MANAGEMENT  
P.O. BOX 621  
HONOLULU, HAWAII 96809

February 17, 1999

RECEIVED  
DIVISION OF  
LAND MANAGEMENT  
FEB 19 10 26 AM '99

TO: Mr. Dean Uchida, Administrator  
Land Division

FROM: Edwin T. Sakoda, Acting Deputy Director  
Commission on Water Resource Management (CWRM)

SUBJECT: Environmental Assessment, Kapakahi Well, Aina Koa, Oahu, TMK 3-5-24:01

FILE NO.: OA-2914

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 20-year Water Use and Development Plan, which is subject to regular updates.
- We recommend coordination with the Land Division of the State Department of Land and Natural Resources to incorporate this project into the 20-year State Water Projects Plan, which is subject to regular updates.
- We are concerned about the potential for ground or surface water degradation/contamination 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 would be required before this well is constructed and/or a Pump Installation Permit would be required before ground water is pumped from the well(s) indicated for this project.
- The proposed water supply source for the project is located in a designated water management area, and a Water Use Permit from the CWRM would be required prior to use of this source.
- Groundwater withdrawals from this project may affect streamflows. This may require an instream flow standard amendment.
- If the proposed project diverts additional water from streams or if new or modified stream diversions are planned, the project may need to obtain a stream diversion works permit and petition to amend the interim instream flow standard for the affected stream(s).
- If the proposed project performs any work within the bed and banks of a stream channel, the project may need to obtain a stream channel alteration permit and a petition to amend the interim instream flow standard for the affected stream(s).
- OTHER:

For your information, there are now six (6) production wells in the Waialae West Aquifer System. Well No. 1746-04, identified as an exploratory well in the report (Section 2.5, page 2-5; Section 4.5, page 4-4), was permitted an allocation of 0.997 mgd on May 20, 1998. There is currently 1.013 mgd available for allocation from this aquifer system at this time.

If there are any questions, please contact the Commission staff at 587-0218.



**CH2MHILL**

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Honolulu, HI  
96814-4530  
Tel 808.943.1133  
Fax 808.941.8225

May 7, 1999

Mr. Edwin T. Sakoda, Acting Deputy Director  
Commission on Water Resource Management  
Department of Land and Natural Resources  
P. O. Box 621  
Honolulu, Hawaii 96809

Subject: Response to Comments on the *Draft Environmental Assessment, Kapakahi Well, Aina Koa, Honolulu, Oahu, Hawaii, TMK 3-5-24:01*

Dear Mr. Sakoda:

Thank you for your comment memorandum dated February 17, 1999 regarding the *Draft Environmental Assessment (EA), Kapakahi Well, Aina Koa, Honolulu, Oahu, Hawaii, TMK 3-5-24:01*. The following are our responses to your comments:

1. The applicant for the subject project will coordinate with appropriate State and County agencies relative to the State's 20-year State Water Projects Plan and the County's 20-year Water Use and Development plan.
2. As noted in section 1.3 of the EA, a Pump Installation Permit and a Water Use Permit would be obtained from the Commission on Water Resource Management (CWRM).
3. The proposed project will not divert additional water from streams and will not modify any stream diversions.
4. The proposed project is not located within a stream channel.
5. The final EA has been modified to reflect that there are now six production wells in the Waialae West Aquifer system, with well No. 1746-04 having been permitted an allocation of 0.997 mgd on May 20, 1998. Your comment memorandum goes on to state that there is currently 1.013 mgd available for allocation from this aquifer. This number may increase if CWRM reallocates the existing allocations that are not being fully utilized.

Mr. Edwin T. Sakoda  
May 7, 1999  
Page 5

A copy of your memorandum and this response letter will be included in the final EA for the Kapakahi Well.

Sincerely,  
CH2M HILL



~~Al Lono Lyman~~  
Senior Project Manager

cc: Mr. Dean Uchida, Administrator, Land Division, DLNR  
Mr. Hiram Young, Engineer, DLNR  
Ms. Lauren Tanaka, Planner, DLNR

PHONE (808) 594-1888

FAX (808) 594-1885



STATE OF HAWAII  
OFFICE OF HAWAIIAN AFFAIRS  
711 KAPI'OLANI BOULEVARD, SUITE 500  
HONOLULU, HAWAII 96813

February 24, 1999

Mr. Dean Uchida, Administrator  
Land Division'  
State of Hawai'i  
Department of Land and Natural Resources  
P.O. Box 621  
Honolulu, Hawai'i 96809

PC#34

Re: Conservation District Use Application for the Installation of a Production Well and Associated Facilities by the Department of Land and Natural Resources and Kamehameha Schools Bishop Estate, Ainakoa Avenue, Waialae, O'ahu, TMK: 3-5-24: por. 01.

Dear Mr. Uchida:

Thank you for the opportunity to review the Conservation District Use Application (CDUA) for the installation of a production well and associated facilities by the Department of Land and Natural Resources and Kamehameha Schools Bishop Estate, Ainakoa Avenue, Waialae, O'ahu,

The well will be capable of producing 1.4 million gallons per day of potable water. According to the applicant, the development of additional water sources is necessary in order to accommodate the growing demand for water within the City and County of Honolulu.

According to the documentation provided in the application, no impacts to native or endangered plants is anticipated. In addition, no cultural or archaeological remains exist on the property. Therefore, the Office of Hawaiian Affairs has no concerns with this project at this time.

If you have any questions, or need to forward any additional information, please contact Lynn Lee, EIS Planner at 594-1936.

Sincerely

Handwritten signature of Colin Kippen.

Colin Kippen  
Deputy Administrator

Handwritten signature of C. Sebastian Aloit.

C. Sebastian Aloit  
Land and Natural Resources Division Officer

cc: Board of Trustees



**CH2MHILL**

CH2M HILL  
1585 Kapiolani Blvd  
Suite 1420  
Honolulu, HI  
96814-4530  
Tel 808.943.1133  
Fax 808.941.8225

May 7, 1999

Mr. Colin Kippen, Deputy Administrator  
Mr. C. Sebastian Aloit, Land and Natural Resource Division Officer  
Office of Hawaiian Affairs  
711 Kapiolani Boulevard, Suite 500  
Honolulu, Hawaii 96813

Subject: Response to Comments on the *Draft Environmental Assessment, Kapakahi Well, Aina Koa, Honolulu, Oahu, Hawaii, TMK 3-5-24:01*

Dear Mr. Kippen and Mr. Aloit:

Thank you for your comment memorandum dated February 24, 1999 regarding the *Draft Environmental Assessment (EA), Kapakahi Well, Aina Koa, Honolulu, Oahu, Hawaii, TMK 3-5-24:01*.

A copy of your memorandum and this response letter will be included in the *Final Environmental Assessment (EA)* for the Kapakahi Well.

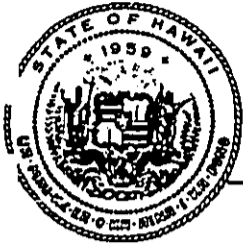
Sincerely,

CH2M HILL

Al Lono Lyman  
Senior Project Manager

cc: Mr. Dean Uchida, Administrator, Land Division, DLNR  
Mr. Hiram Young, Engineer, DLNR  
Ms. Lauren Tanaka, Planner, DLNR





LD

28315

**DEPARTMENT OF BUSINESS,  
ECONOMIC DEVELOPMENT & TOURISM**

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BENJAMIN J. CAYETANO  
GOVERNOR  
SEIJI F. NAYA  
DIRECTOR  
BRADLEY J. MOSSMAN  
DEPUTY DIRECTOR  
DAVID W. BLANE  
DIRECTOR, OFFICE OF PLANNING

99 FEB 25 AIO: 45

**OFFICE OF PLANNING**  
235 South Beretania Street, 6th Flr., Honolulu, Hawaii 96813  
Mailing Address: P.O. Box 2359, Honolulu, Hawaii 96804

Tel.: (808) 587-2846  
Fax: (808) 587-2824

Ref. No. P-7943

February 19, 1999

DEPARTMENT OF LAND AND NATURAL RESOURCES  
STATE OF HAWAII

MEMORANDUM

**TO:** Timothy Johns, Chairperson  
Department of Land and Natural Resources

**ATTN:** Dean Uchida, Administrator  
Land Division

**FROM:** David W. Blane  
Director, Office of Planning

**SUBJECT:** Conservation District Use Permit (CDUP), File No. OA-2914  
Draft Environmental Assessment (EA) for Kapakahi Well, Oahu

RECEIVED  
DIVISION OF  
LAND MANAGEMENT  
FEB 25 3 03 PM '99

We have the following comments to offer on the draft environmental assessment for the Kapakahi Well project.

The third criterion on page 5.1 states that "The proposed project does not impact coastal resources and complies with HRS 205A relating to Coastal Zone Management. The parcel is outside the county Special Management Area." The Coastal Zone Management (CZM) area encompasses all lands and waters of the State. Therefore, the project is situated in the CZM area and is required to comply with the CZM objectives and policies. A detailed assessment of the project's consistency and compliance with the CZM objectives and policies of Chapter 205A, Hawaii Revised Statutes, should be included in the EA. This assessment is required by the Office of Environmental Quality Control's administrative rules.

In addition, the project is situated in a gulch created by erosion with erosion hazards ranging from moderate to severe, and is in proximity to a streambed. The EA should include a discussion of the mitigation measures that will be used to control polluted runoff from the project site during and after construction. Recommended mitigation measures can be found in the Coastal Nonpoint Pollution Control Program Management Plan.

If there are any questions, please contact Lynn Nakagawa of our CZM Program at 587-2898.

cc: Andrew Monden, Land Division



**CH2MHILL**

CH2M HILL  
1585 Kapiolani Blvd  
Suite 1420  
Honolulu, HI  
96814-4530  
Tel 808.943.1133  
Fax 808.941.8225

May 7, 1999

David W. Blane, Director  
Office of Planning  
P. O. Box 2359  
Honolulu, Hawaii 96804

Subject: Response to Comments on the *Draft Environmental Assessment, Kapakahi Well, Aina Koa, Honolulu, Oahu, Hawaii, TMK 3-5-24:01*

Dear Mr. Blane:

Thank you for your comment memorandum dated February 19, 1999 regarding the *Draft Environmental Assessment (EA), Kapakahi Well, Aina Koa, Honolulu, Oahu, Hawaii, TMK 3-5-24:01*. The following are our responses to your comments:

1. Compliance with Coastal Zone Management Objectives and Policies

Section 5.1 of the final EA has been modified to include the following discussion of the project's consistency with HRS 205A:

"The purpose of the Hawaii Coastal Zone Management Program (HCZMP) is to establish guidelines for the use, protection, and development of resources in the coastal zone. Development activities in the coastal zone must conform to the HCZMP objectives and policies, as outlined in Hawaii Revised Statute (HRS) Chapter 205A. As designated in HRS Chapter 205A, the coastal zone encompasses the entire State of Hawaii. The following discusses how the project will be consistent with and comply with HRS 205A:

- a) "The subject property is located approximately 1.1 miles inland. The proposed project will have no impact on the public's access and use of the shoreline area.
- b) "A grading plan will be prepared prior to construction and appropriate engineering practices will be utilized to minimize erosion and runoff during installation of the well and the accompanying control house. Adjacent to the subject parcel to the east and downgradient from the proposed well site is a large concrete flood control basin maintained by the City and County of Honolulu. With the existing downgradient flood control basin and mitigation measures incorporated in the project, there will be no adverse impact to either the surrounding area, surface water or to nearshore waters from point and non-point sources of pollution. Because of its location and lack of coastal impacts, the project will conform with the objectives related to recreational resources, coastal ecosystems, beach protection, and marine resources.

Mr. David W. Blane

May 7, 1999

Page 2

- c) "There are no known traditional gathering activities and/or cultural practices affecting the subject property. A memorandum dated February 3, 1999 from Dr. Don Hibbard Ph. D., Administrator of the Historic Preservation Division, reiterates that due to previous grading in the project area, the project will have "no effect" on historic sites.
- d) "The location of the project site does not represent a significant adverse impact on scenic views or vistas of coastal areas. The site will be landscaped and replanted upon completion of the construction. The project will have no negative impact on the visual character of its immediate environs.
- e) "The project complies with the economic uses objective by situating a necessary facility away from coastal areas; the project will therefore meet and support continued economic growth on Oahu.
- f) "The proposed Kapakahi Well site is located approximately 267 feet above mean sea level (msl) and approximately 100 feet from the Kapakahi Stream drainage channel. The area is listed on the Flood Insurance Rate Maps as outside the 500-year flood zone. A flood control and retention basin is located downgradient of the proposed well and adjacent to the project parcel. These basins serve to collect runoff from Kapakahi Gulch before runoff can impact the nearby residential area.
- g) "The project's draft EA that has gone through public review and comment. In addition, a public hearing will be held for the project's Conservation District Use Permit."

## 2. Coastal Nonpoint Pollution Control Program Management Plan

A grading plan will be prepared prior to construction and appropriate engineering practices and mitigation measures will be utilized to minimize erosion and runoff during installation of the well and the accompanying control house.

Mitigation measures that will be considered include those cited in Hawaii's Coastal Nonpoint Pollution Control Program Management Plan. With appropriate engineering practices and mitigation measures incorporated in the project, there will be no adverse impact to nearshore waters from point and non-point sources of pollution.

In addition, a flood control channel and retention basin is located downgradient of the proposed well and adjacent to the project parcel. The channel and basin collects runoff from Kapakahi Gulch before runoff can impact the nearby residential area.

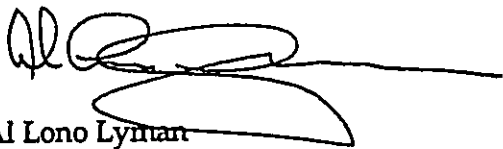
With the existing downgradient flood control basin and appropriate engineering practices and mitigation measures incorporated in the project, there will be no adverse impact to nearshore waters from point and non-point sources of pollution.

Mr. David W. Blane  
May 7, 1999  
Page 3

A copy of your memorandum and this response letter will be included in the *Final Environmental Assessment (EA)* for the Kapakahi Well.

Sincerely,

CH2M HILL

A handwritten signature in black ink, appearing to read 'Al Lono Lyman', with a long horizontal line extending to the right.

Al Lono Lyman  
Senior Project Manager

cc: Mr. Dean Uchida, Administrator, Land Division, DLNR  
Mr. Hiram Young, Engineer, DLNR  
Ms. Lauren Tanaka, Planner, DLNR

**BOARD OF WATER SUPPLY**

CITY AND COUNTY OF HONOLULU  
830 SOUTH BERETANIA STREET  
HONOLULU, HAWAII 96843  
PHONE (808) 527-6180  
FAX (808) 533-2714



March 8, 1999

JEREMY HARRIS, Mayor

EDDIE FLORES, JR., Chairman  
FORREST C. MURPHY, Vice Chairman  
KAZU HAYASHIDA  
JAN M.L.Y. AMII  
BARBARA KIM STANTON  
CHARLES A. STED

CLIFFORD S. JAMILE  
Manager and Chief Engineer

Mr. Dean Uchida, Administrator  
Department of Land and Natural Resources  
State of Hawaii  
P. O. Box 621  
Honolulu, Hawaii 96809

Dear Mr. Uchida:

Subject: Conservation District Use Permit Application for the Proposed  
Kapakahi Well, Aina Koa, Oahu, Hawaii, TMK: 3-5-024: 001

RECEIVED  
DIVISION OF  
LAND MANAGEMENT  
MAR 12 9 07 AM '99

Thank you for the opportunity to review and comment on the Conservation District Use Permit Application for the proposed Kapakahi Well.

We have the following comments:

1. The Draft Environmental Assessment should include a discussion of how waters from the well will be used (i.e., project's water demands).
2. A discussion and map should be provided on the connecting pipelines and pressure reducing valve required to utilize the well water in the Board of Water Supply's transmission system.
3. Figure 3-2 should be revised to indicate that the proposed Kapakahi Well is located within Kapakahi Gulch at the end of Ainakoa Avenue.
4. We are concerned with the expected impacts of the proposed well upon other wells and sources in the vicinity such as our Aina Koa Well and Waialae Shaft and the Waialae Country Club's Irrigation Well. The combined withdrawals from the proposed Waialae West aquifer wells (Kapakahi Well, Waialae Nui Ridge Well and the Waialae Nui Valley Well) may adversely affect the water quality of the existing downgradient wells. To determine the sustainable yields of each well, all the wells should be pumped over the long term and their pumpages and permitted uses adjusted accordingly. Variable speed pumps should allow the pumpages to be adjusted to their optimum levels. A discussion of the potential impacts of pumping the proposed Kapakahi Well upon the existing downgradient wells should be included.

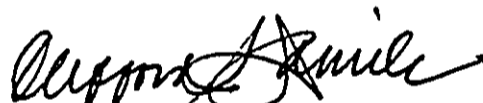


Mr. Dean Uchida  
March 8, 1999  
Page 2

5. Pumpage, permitted use and water credits may be reduced if the proposed Kapakahi Well adversely impacts any of our existing downgradient wells. We will work with the State to reach an acceptable process by which the Waialae West aquifer wells are optimized.

If you have any questions, please contact Barry Usagawa at 527-5235.

Very truly yours,

  
CLIFFORD S. JAMILE  
Manager and Chief Engineer



**CH2MHILL**

CH2M HILL  
1585 Kapiolani Blvd  
Suite 1420  
Honolulu, HI  
96814-4530  
Tel 808.943.1133  
Fax 808.941.8225

May 7, 1999

Mr. Clifford S. Jamile  
Manager and Chief Engineer  
Board of Water Supply  
830 South Beretania Street  
Honolulu, Hawaii 96843

Subject: Response to Comments on the *Draft Environmental Assessment, Kapakahi Well, Aina Koa, Honolulu, Oahu, Hawaii, TMK 3-5-24:01*

Dear Mr. Jamile:

Thank you for your comment memorandum dated March 8, 1999 regarding the *Draft Environmental Assessment (EA), Kapakahi Well, Aina Koa, Honolulu, Oahu, Hawaii, TMK 3-5-24:01*. The following are our responses to your comments:

1. Section 10.2 of the EA states the intended use for the water from the well. It states:

"The integration of the well into the BWS [Board of Water Supply] system will allow it to make up demand placed upon the system by State of Hawaii developments such as the Convention Center, West Oahu Campus, and the Kapolei residential developments. In addition, the well will help to support Hawaii Community Development Authority and Bishop Estate developments in Kakaako. However, this well is not the catalyst for these developments, nor are these developments dependent upon this individual well's completion."

2. The well water would be used to satisfy potable water requirements associated with projects developed by the State of Hawaii and the Kamehameha Schools/Bishop Estate.
3. Accompanying this letter is a preliminary transmission pipeline "Plan and Profile" for the Aina Koa Well III Development. The detailed design for the pipelines and pressure-reducing valves will be prepared after the approval of the Conservation District Use Permit (CDUP), and the plans will be subject to review and approval by the Board of Water Supply.
4. Figure 3-2 includes a note that it is not drawn to scale. Figure 3-1 on the preceding page is derived from a United States Geological Service (USGS) base map, and clearly indicates that the well site is within Kapakahi Gulch.

Mr. Clifford S. Jamile  
May 7, 1999  
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5. As noted in section 1.3 of the EA, at a future date a Pump Installation Permit and a Water Use Permit would be obtained from the Commission on Water Resource Management (CWRM). The allocation for the Kapakahi well would be determined through the Water Use Permit. The final EA has been modified to reflect that there are now six production wells in the Waialae West Aquifer System, with well No. 1746-04 having been permitted an allocation of 0.997 mgd on May 20, 1998, and that there is currently 1.013 mgd available for allocation from this aquifer. This number may increase if CWRM reallocates the existing allocations that are not being fully utilized. The Kapakahi Well would utilize a variable speed pump to allow adjustment of pump rates to their optimum level.
6. We appreciate your comment that the Board of Water Supply will work with the State to reach an acceptable process by which the Waialae West aquifer wells are optimized.

A copy of your memorandum and this response letter will be included in the final EA for the Kapakahi Well.

Sincerely,

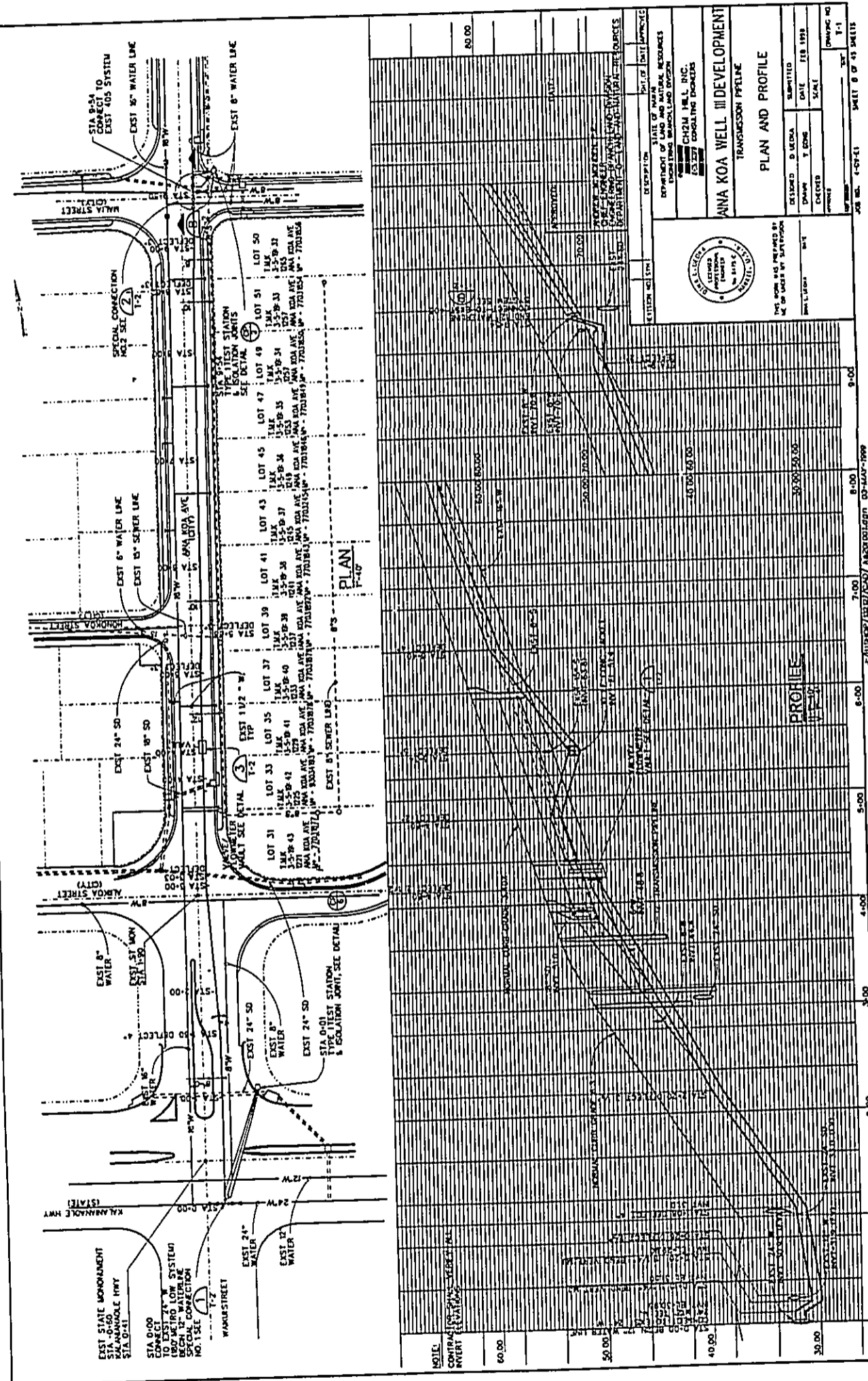
CH2M HILL



Al Lono Lyman  
Senior Project Manager

cc: Mr. Dean Uchida, Administrator, Land Division, DLNR  
Mr. Hiram Young, Engineer, DLNR  
Ms. Lauren Tanaka, Planner, DLNR





EXIST STATE MONUMENT  
STA. 0+00  
WATER MAIN  
KALANIKUOLE HWY

STA. 0+00  
CONNECTION  
TO EXIST 24" W  
SEWER LINE  
NO. 1 SEE  
SPECIAL CONNECTION  
NO. 1 SEE

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NOTE:  
CONTRACTOR TO VERIFY  
ELEVATIONS

60.00  
50.00  
40.00  
30.00

PLAN  
1"=40'

PROFILE  
1"=40'

DEPARTMENT OF PUBLIC WORKS  
DIVISION OF WATER RESOURCES  
WATER SUPPLY DIVISION  
WATER TREATMENT DIVISION  
WATER CONSTRUCTION DIVISION  
WATER UTILITIES DIVISION

CH2M HILL, INC.  
PROJECT NO. 1999-001  
PROJECT NAME: ANA KOA WELL III DEVELOPMENT  
TRANSMISSION PIPELINE

DESIGNED BY: D. LEONARD  
CHECKED BY: J. COOK  
DATE: 11/18/1998  
SCALE: AS SHOWN

PROJECT NO. 1999-001  
SHEET 8 OF 43 SHEETS