

BOARD OF WATER SUPPLY

CITY AND COUNTY OF HONOLULU

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HONOLULU, HAWAII 96843



April 10, 1995

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RAYMOND H. SATO

Manager and Chief Engineer

Mr. Gary Gill, Director
Office of Environmental Quality Control
Central Pacific Plaza, 4th Floor
220 South King Street
Honolulu, Hawaii 96813

Dear Mr. Gill:

Subject: Negative Declaration for the Proposed Punaluu III Addition Exploratory Well,
Punaluu, Koolauloa, Oahu, TMK: 5-3-07: Por. 14

The Board of Water Supply has reviewed the comments received during the public comment period which began on November 8, 1994. We have determined that the environmental impacts of this project have been adequately addressed as discussed in the final environmental assessment (EA) and are, therefore, issuing a Negative Declaration. We request that our proposed well project be published in the next OEQC Bulletin as a Negative Declaration.

Attached are four copies of the EA for your review.

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

Very truly yours,


RAYMOND H. SATO
Manager and Chief Engineer

Attachment

1995-04-23-0A-FA-Punaluu III Addition ^{APR 23 1995} Exploratory Well

FINAL ENVIRONMENTAL ASSESSMENT

**PUNALUU III
WELL ADDITION**

PUNALUU, KOOLAULOA, OAHU, HAWAII
TAX MAP KEY: 5-3-07:PORTION 14

PROPOSING AGENCY
CITY AND COUNTY OF HONOLULU
BOARD OF WATER SUPPLY



Submitted pursuant to Chapter 343, Hawaii Revised Statutes

MARCH 1995

CH2M HILL

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A Archaeological Reconnaissance Survey of Punaluu Well III for Additional Installations, Punalu'u, Ko'olauloa, O'ahu, TMK 5-3-07-:14, Cultural Surveys of Hawaii, July 1994.
B Botanical Resources Assessment Survey, Punalu'u Well III, Ko'olauloa District, Island of Oahu, Char and Associates, May 1994.
C Avifaunal and Feral Mammal Survey for a Board of Water Supply Exploratory Well Site at Punaluu, Oahu, Phillip L. Bruner, April 1994.
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Chapter 1 Executive Summary

1.1 Proposing Agency and Proposed Action

The City and County of Honolulu Board of Water Supply (BWS) proposes to drill and case an additional water well at its Punaluu Wells III site in Punaluu, on the windward side of Oahu. This well addition will be drilled within an existing 1.97-acre BWS site. The proposed Punaluu III Well Addition is expected to be capable of yielding 0.5 million gallons per day (mgd) of potable water.

The drilling and casing of an exploratory well is the first step in a two-step process that the BWS uses to obtain hydrogeological data on the potential of new groundwater resources. After the exploratory well is drilled and cased, the second step will require that a well pump test will be performed to determine whether the quantity and quality of the water from this exploratory well is suitable for development. If the quantity and quality of the water is suitable for development, the BWS will incorporate the exploratory well into the permanent production facilities. However, if either the quantity or quality of the water proves to be unsuitable for a production well, the exploratory well will be sealed and abandoned.

This environmental assessment focuses on the drilling, casing, and testing of this exploratory well. The proposed action will also include the temporary installation of a test pump, piping, and appurtenances. If the exploratory well is developable, a permanent pump and pipelines will be installed together with the electrical and mechanical controls to the existing facility. All construction work will be within the BWS's existing 1.97-acre Punaluu III Wells site.

1.2 Purpose of this Environmental Assessment

This environmental assessment (EA) was prepared pursuant to Chapter 343, Hawaii Revised Statutes (HRS). Any project proposing the use of county lands or funds must comply with Chapter 343, HRS. Because this well addition will be on property that is under the jurisdiction and ownership of the BWS, and because the well will be constructed with BWS funds, environmental compliance pursuant to Chapter 343, HRS, is required.

A final environmental assessment and an accompanying Negative Declaration by the BWS determining that the impacts of this project are not sufficient to require the preparation of an environmental impact statement (EIS) will satisfy the Chapter 343, HRS, requirements.

1.3 Permits Required

A well construction, pump installation, and water use permit will be required from the Commission on Water Resource Management (CWRM).

A building permit will be required from the City and County of Honolulu, Building Department.

1.4 Benefits of this Project

The proposed well addition will furnish valuable data that will be added to Oahu's islandwide hydrogeological information base. The data will be valuable in estimating the quantity and quality of the groundwater resources available at this site, and—in combination with data from other wells—ultimately for the entire island. If the hydrogeological data shows that additional groundwater sources can be developed successfully at this site, this well may be converted to a permanent potable water well.

If the well is converted into a permanent production well, it would be part of a major water development project that will integrate new groundwater sources in Windward Oahu into the islandwide water system. The development of additional water sources is necessary to accommodate the growing demand for water within the City and County of Honolulu.

1.5 Alternatives Considered

The no-action alternative, the delayed action alternative, site alternatives, and source alternatives are discussed in this environmental assessment or were discussed in previous environmental analyses done by the BWS.

The no-action alternative was not pursued because it would be contrary to the BWS's legal mandate to provide for the water needs of a growing population. The delayed action alternative was not pursued because this alternative would delay the BWS's implementation schedule, and would have substantially similar environmental outcomes and higher development costs because of inflation.

This environmental assessment analyzes one of many possible potable groundwater source sites in the Windward Sector of Oahu, where, according to the Hawaii Water Plan, Oahu Water Management Plan (OWMP), there is a good potential for economic development of potable water supply sources. Additional sites within the Windward Sector were not pursued because the BWS had already conducted an analysis of 46 potential sites for additional potable wells in *Windward Oahu Regional Water System Improvements* (1988).

The 1988 study evaluated 17 sites for possible potable groundwater sources and a possible tunnel or inclined well site in the Koolauloa Aquifer; of these, six possible well sites and the possible tunnel or inclined well site were located within Punaluu Valley.

The BWS has also analyzed potable water source alternatives other than groundwater in its 1988 EIS; these alternatives included desalinization, the development of surface and brackish water sources, and the recycling of treated wastewater. Typically these alternative sources have considerably higher costs and technical challenges. For instance, the use of surface water such as from Punaluu Stream has a high potential for health and safety problems and would require installation of a costly water treatment plant. The development of these alternatives was not considered as feasible as the development of groundwater resources.

1.6 Potential Impacts of this Project and Mitigation Measures

Construction work, primarily the drilling of the well, will cause minor short-term noise and air pollution impacts to the surrounding environment. All government rules and regulations concerning noise and air pollution will be followed during construction to minimize these minor short-term noise and air pollution impacts. Mufflers will be used to reduce noise during the drilling. If a permanent pump is installed, mutes will be used to minimize pump noise, or a submersible pump, which will reduce operational noise to below the regulatory limit, will be utilized.

Water from the test pumping will be discharged into the existing drainage system on the Punaluu Wells III site. It is expected that the water that will be discharged will be clean, and therefore will not introduce any pollutants into the environment. The existing drainage system feeds into a culvert at the northeast corner of the site. Care will be taken in disposing of the test water to preclude the possibility of flushing debris or re-suspending sediments and other pollutants into the ditch.

Impacts on the stream flows within Punaluu Stream, and to the existing wells in the vicinity are not expected due to this proposed well. Punaluu Stream is located about 1,500 feet southeast of this proposed well site. There are already two wells on the 1.97-acre Punaluu Wells III site where the exploratory well is proposed.

Punaluu Stream in this vicinity is perched over horizontal layers of low-permeability alluvium. These horizontal layers of low-permeability alluvium serve to isolate the water flowing in Punaluu Stream from the underground alluvial groundwater found at considerably lower depths. The Punaluu III Well Addition is proposed to be cased to a depth of about 400 feet (about 335 feet below mean sea level [msl]) within the alluvium,

with the screened intake section of the well extending from about 85 feet below msl to the bottom of the well. The invert of Punaluu Stream in this vicinity is about 20 feet above msl. The water withdrawn from the alluvium from 85 feet below to 335 feet below msl due to the pumping of this well is not expected to affect the water flowing in Punaluu Stream because of the approximately 105 feet separating the screened intake section of the well from the stream's invert, and because of the intervening horizontal layers of low-permeability alluvium.

There is no potential for impacts to the Kahuku Wetlands (in the James Campbell National Wildlife Refuge in Kahuku) or to the Kahana Valley Wetlands because of the great distance separating the well site from both the Kahuku Wetlands and the Kahana Valley Wetlands. Further, there should be no potential for impact to the Kahana Valley Wetlands because these wetlands are not located in the same aquifer system as the exploratory well site.

The identified minor adverse impacts can be appropriately mitigated. There are substantial potential benefits that can be provided in terms of potable water supplies from the Punaluu III Well Addition, if it is able to be developed as a production well.

1.7 Determination

In accordance with Chapter 343 of the Hawaii Revised Statutes (HRS), the BWS has determined that no EIS is required for the construction, test pumping, and development of the Punaluu III Well Addition into a production well and the incorporation of this well into the existing Punaluu III Wells production facility.

This determination has been made because whatever minor adverse impacts that result from this project may be minimized to insignificant levels with the application of the recommended mitigation measures.

1.8 Agencies and Others Consulted in Making this Assessment

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

State of Hawaii agencies

- Department of Land and Natural Resources
 - Commission on Water Resources Management
- Department of Agriculture

- Department of Health
 - Environmental Mangement Division
 - Office of Environmental Quality Control

City and County of Honolulu agencies

- Planning Department
- Land Utilization Department

Fifteen government agencies and three groups or other individuals were provided a copy of the draft environmental assessment for this project and requested to provide comments.

The following is a list of those agencies and others who were provided a copy of the draft environmental assessment.

Federal agencies

- U.S. Department of Agriculture, Soil Conservation Service
- U.S. Army Corps of Engineers, Pacific Ocean Division
- U.S. Fish and Wildlife Service

State of Hawaii agencies

- Department of Agriculture
- Department of Business, Economic Development, and Tourism
- Department of Land and Natural Resources
 - Forestry and Wildlife Division
 - Historic Preservation Division
 - Commission on Water Resources Management
- Department of Health
 - Environmental Management Division
 - Office of Environmental Quality Control
- University of Hawaii
 - Environmental Center
 - Water Resources Research Center

City and County of Honolulu agencies

- Planning Department
- Land Utilization Department
- Public Works

Others

- City Council Member Steve Holmes
- Koolauloa Neighborhood Board No. 28
- Sierra Club, Hawaii Chapter

Chapter 2 Purpose and Need for the Proposed Action

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 its 1992 review draft of the *Hawaii Water Plan, Oahu Water Management Plan*, the CWRM of the Department of Land and Natural Resources (DLNR), 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. To meet the growing islandwide demand for water, the BWS plans to develop new sources of potable groundwater on Oahu where sufficient water sources exist. The use of groundwater remains the most effective means of increasing Oahu's potable water supply.

The Punaluu III Well Addition is a proposed BWS well project within the Koolauloa Aquifer portion of the Windward Oahu Sector (see Figure 2-1). If tests indicate that the Punaluu III Well Addition can yield groundwater of sufficient quantity and quality, the BWS intends to convert the well to a production well and integrate it into BWS's Windward Oahu water system. The Punaluu III Well Addition, if converted to a production well, is expected to be able to yield 0.5 mgd of potable water.

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

The state water code and a Commission on Water Resource Management was established in 1987 by the Hawaii State Legislature in Section 174-C, 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 the following 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 creates management boundaries for water management areas. Water management areas were designated by the CWRM for those areas where the CWRM decided, after conducting scientific investigation and research, that management of groundwater or surface water, or both, was necessary because the water resources for that area were threatened by existing or proposed withdrawal or diversion of water.

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

- (1) *Whether an increase in water use of 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, spacial 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 water management area 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 mitigative 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)*

The CWRM has administrative control over the withdrawal of groundwater and diversion of surface water within a water management area and is responsible for ensuring reasonable beneficial uses of the resources in the public interest.

2.3 Groundwater Sectors and Aquifers

The CWRM has established, for planning and administration purposes, six groundwater sectors that cover the entire island of Oahu (see Figure 2-1): Honolulu, Pearl Harbor, Waianae, Central, North, and Windward. Currently, all sectors except the Waianae Sector have been designated as "groundwater management areas." The Windward Sector, which became a groundwater management area in March 1993, is the last sector to be included as a "groundwater management area" (*Personal communications with Lenore Nakama, CWRM, May 12, 1994*).

Each groundwater sector is divided into aquifers. The Windward Sector covers an approximately 150-square-mile region that extends from Makapuu Point northwestward about 38 miles to Kawela. The Windward Sector is generally bounded at its southwest edge by the ridge line of the steep Koolau Mountains and extends northeastward for a few miles down to the shoreline. The Windward Sector is divided into the Koolauloa, Kahana, Koolaupoko, and Waimanalo aquifers.

The Koolauloa Aquifer is the most northwestern of the Windward Sector aquifers and extends from Kawela to Punaluu, a distance of about 12 miles. The location of the proposed Punaluu III Well Addition is in the most southeastern portion of the Koolauloa Aquifer, within Punaluu Valley.

2.4 Sustainable Yield and the Windward Water Management Area

In order to evaluate the impacts of developing an additional permanent potable groundwater source on this site, it may be necessary to estimate the sustainable yield of the underlying aquifer system. Sustainable yield is the amount of groundwater that can be removed from an aquifer over a period of many years without the development of 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 small amount of the groundwater is lost through mixing with the underlying salt water. Estimating sustainable yield for the island of Oahu and for its individual aquifers is complex because the amount of groundwater that is mixed with fresh water is dependent upon the degree of aquifer confinement, lens thickness, the amount of agricultural and urban development, and numerous other factors.

The Windward Water Management Area (WMA) has an estimated sustainable yield of 99 mgd. The *Hawaii Water Plan Oahu Water Management Plan (OWMP)* notes that the total sustainable yield of 99 mgd is distributed among the four aquifers that constitute the Windward sector as follows: Koolauloa Aquifer, 35 mgd; Kahana Aquifer, 13 mgd; Koolaupoko Aquifer, 43 mgd; and Waimanalo Aquifer, 8 mgd. In 1990, the CWRM reported that the total 28.3 mgd of groundwater withdrawn from the four aquifers in the Windward Sector were distributed as follows: Koolauloa Aquifer, 13.6 mgd; Kahana Aquifer, 0.1 mgd; Koolaupoko Aquifer, 13.7 mgd; and Waimanalo Aquifer, 0.9 mgd. The OWMP noted that for planning purposes, there exists a 21.33 mgd surplus of available sustainable yield in the Koolauloa Aquifer.

For the Windward WMA, the CWRM reported that in 1990 only 28.3 mgd of the 99 mgd sustainable yield was being withdrawn in the Windward WMA, but that not all of the remaining 70.7 mgd may be fully available, because groundwater withdrawals may have a direct effect on the stream flows. However, the direct effect upon stream flows does not apply to all wells in the Windward WMA. The effect of groundwater withdrawal on surface water must be determined on a case-by-case basis. Stream gauging may be warranted when water elevation levels in the well and the adjacent streams are similar, or if the well taps dike water which directly supplies stream flow in the upper reaches.

2.5 Potential for Source Development in the Windward Area

According to the OWMP report, the Windward area has a good potential for economic development of sources of potable water supply. The OWMP recommended that, given the current restrictions of the interim instream flow standards, the effort to establish permanent standards should be accelerated to determine the availability of the remaining sustainable

yields. Well development potential is continuing to be evaluated by the BWS in the Koolaupoko and Waimanalo aquifers.

If groundwater withdrawn from the Koolauloa Aquifer reduces the status quo instream flow standards, the BWS would be required to petition the CWRM for an amendment. However, the Punaluu III Well Addition is not expected to affect the flow in Punaluu Stream and it is not expected that the BWS will be required to petition the CWRM for an amendment.

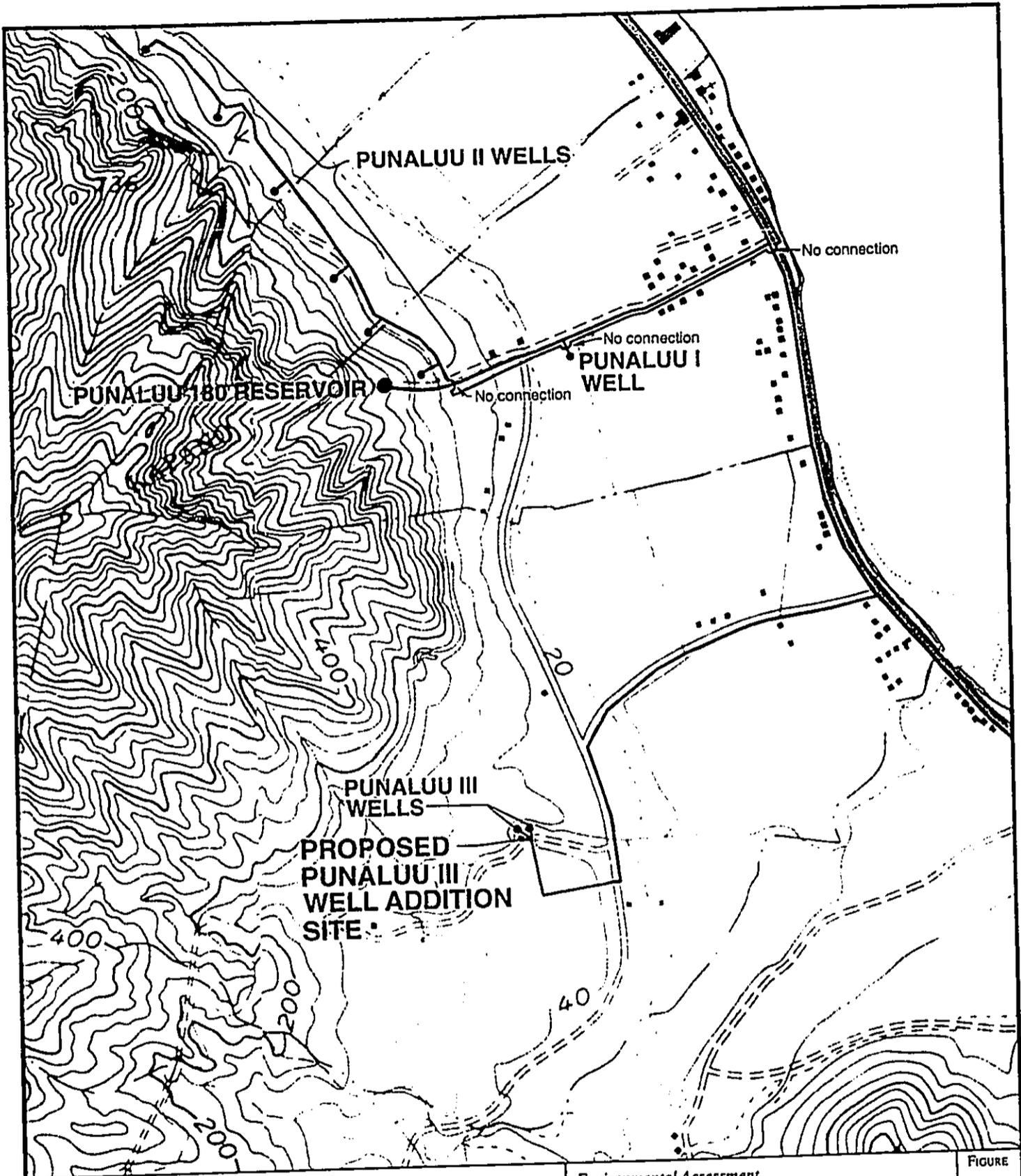
The impact of development of additional sources of potable groundwater in Windward Oahu was evaluated in a separate study entitled *Windward Oahu Regional Water System Improvements*, which was prepared for the BWS and published in 1988.

2.6 Existing and Future Water Sources, Storage Facilities, and Transmission System

The BWS reported that in 1985 its Windward Oahu facilities included 16 wells, 8 tunnels, and 4 inclined wells, and 15 reservoirs. The Windward water system begins at the northwest end of the Windward Sector at Hauula, in the Koolauloa Aquifer, and continues southeast through the Kahana and Koolaupoko aquifers, and finally reaches Makapuu in the Waimanalo Aquifer. Water from developed Windward Oahu potable water sources that is not used to service BWS customers on the Windward side may be pumped around Makapuu to Hawaii Kai. BWS's Windward water system is described in detail in *Windward Oahu Regional Water System Improvements*, published in 1988.

Within the Koolauloa Aquifer, water from the BWS Hauula Well I pump station in Hauula and Punaluu I Well locally serves the Hauula/Punaluu area. Water from Kaluanui Wells, located northwest of Punaluu, enters into the Windward system and is pumped southeast toward Punaluu via a 20-inch transmission main in Kamehameha Highway. At Punaluu, water from the BWS's pump station sites—Punaluu II Wells and Punaluu III Wells—is added to the Windward system, with connections to the 30-inch transmission main in Kamehameha Highway (see Figure 2-2). Of the approximately 20 existing wells within Punaluu Valley, the BWS operates nine wells at its Punaluu I, Punaluu II, and Punaluu III pump station sites. Records from recent years indicate that the BWS withdraws an average of 5.63 mgd from the nine wells at these sites. Within Punaluu Valley, the BWS also maintains the Punaluu 180 Reservoir, which provides a water storage capacity of 0.5 million gallons (mg) to the Hauula/Punaluu area. Water is pumped via the transmission main in Kamehameha Highway toward Kaneohe, Kailua, and Waimanalo. Any excess water not used on the windward side will be available for other areas.

Future Windward water sources will include the Kaipapau and Maakua wells in Hauula.



Environmental Assessment
 Punaluu III Well Addition
 CITY AND COUNTY OF HONOLULU - BOARD OF WATER SUPPLY

FIGURE
 2-2

**EXISTING WELLS
 AND PROPOSED
 WELL ADDITION SITE**



2.7 Recommended Water System Improvements

The *Windward Oahu Regional Water System Improvements* study addressed the impacts of developing proposed new dike impounded groundwater, basal groundwater, or alluvial groundwater on the windward side of Oahu. In the study, the BWS evaluated 46 proposed water development projects (including tunnels, inclined wells, conventional groundwater wells, and one shaft), 19 proposed reservoirs, and proposals for 148,540 linear feet (about 28.1 miles) of additional transmission pipelines.

The BWS's *Windward Oahu Regional Water System Improvements* study proposed an additional 17 groundwater well station sites, an additional high-level inclined well or tunnel, and three additional reservoir sites within the Koolauloa Aquifer; of these, six possible well sites and the possible tunnel or inclined well site were located within Punaluu Valley. Beyond the proposed Punaluu III Well Addition, the BWS, at this time, has deferred further well development in the Punaluu and Kahana Valleys.

Chapter 3 Project Description

3.1 Location and Site Characteristics

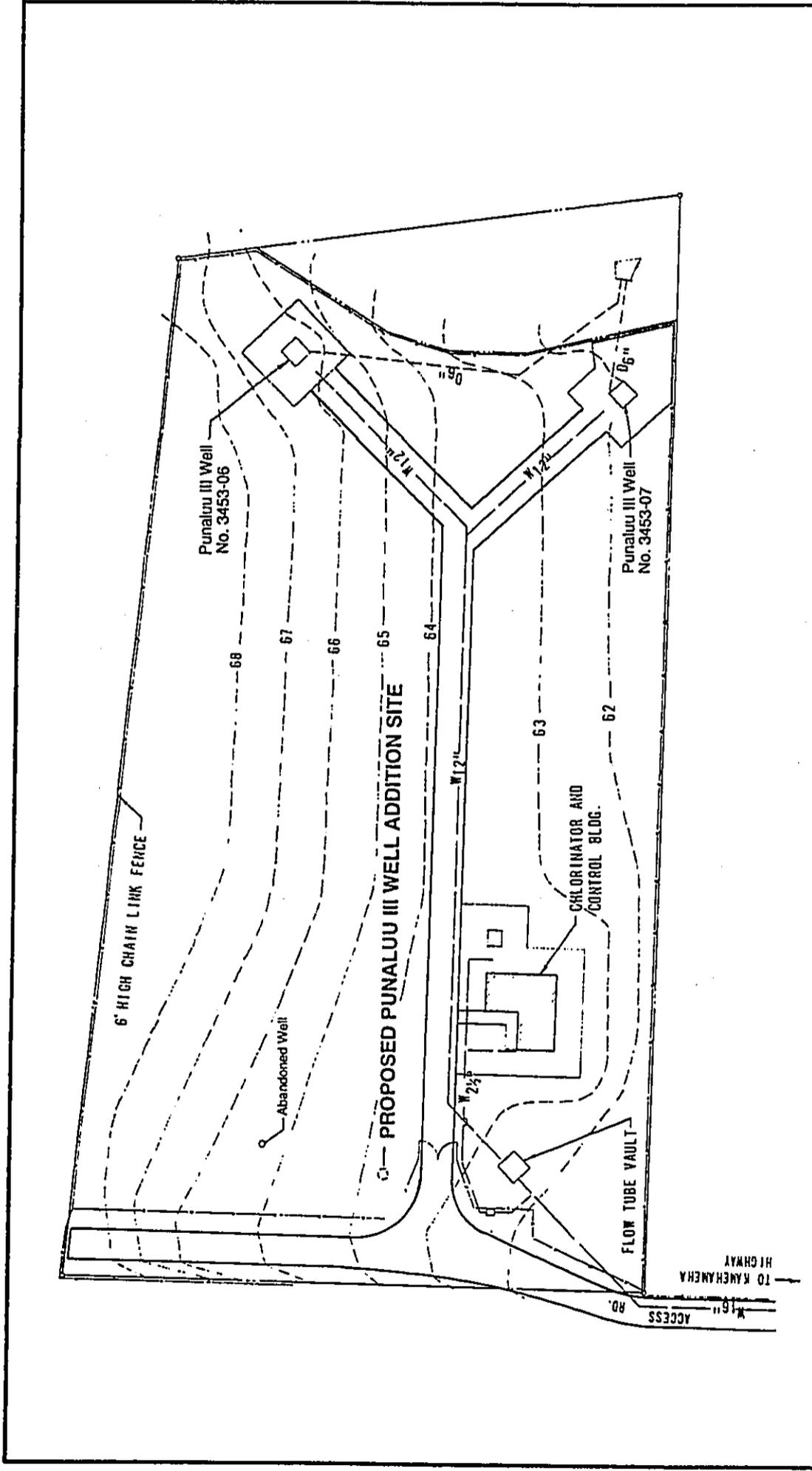
The proposed project is located in Punaluu Valley, on the windward coast of Oahu, and is located about 1/2 mile mauka of Kamehameha Highway at an elevation of between 60 and 70 feet mean sea level (msl). The proposed exploratory well is to be located within the BWS's existing 1.97-acre Punaluu Wells III site. Fully developed in 1977, the 1.97-acre site has a paved asphalt driveway running the entire length of the site, is landscaped with wedelia, and is surrounded by a 6-foot-high chain link fence. The site is secured with a 14-foot-wide double-swing chain link entry gate, chain, and padlocks (see Figure 3-1). The site is accessed by an unpaved 18-foot-wide entry road from Punaluu Valley Road, formerly known as Green Valley Road. A locked gate at Punaluu Valley Road controls access to the unpaved entry road.

Punaluu Valley Road, also unpaved, connects to Kamehameha Highway at a point about 700 feet northwest of the Punaluu Stream Bridge. From Kamehameha Highway inland, Punaluu Valley Road runs mauka for about 1/2 mile and then eastward toward Punaluu Stream for another 1/4 mile to the intersection with the 18-foot-wide entry road to the Punaluu Wells III site.

There are two producing BWS basal/alluvial groundwater wells at the northwest portion of site. Near the southeast edge of the site, a small one-story structure houses a chlorinator and control devices.

An underground pipe drainage system is used to dispose of water drawn during the periodic testing and water sampling that is done at the two existing well heads. The underground pipe drainage system terminates at a ditch.

Irrigation for the site's landscaping is maintained by an underground system of water pipes and surface sprinkler heads. Power for the control building is provided via electric lines from Punaluu Valley Road.



Environmental Assessment
 Punaluu III Well Addition
 CITY AND COUNTY OF HONOLULU - BOARD OF WATER SUPPLY

FIGURE
 3-1

SITE PLAN

NORTH

0 50 100 FEET

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3.2 Technical Characteristics

The Punaluu III Well Addition is proposed to be approximately 400 feet deep and will attempt to extract potable water from the alluvium (see Figure 3-2). The proposed Punaluu III Well Addition, if developed into a production well, is expected to be able to yield up to 0.5 mgd.

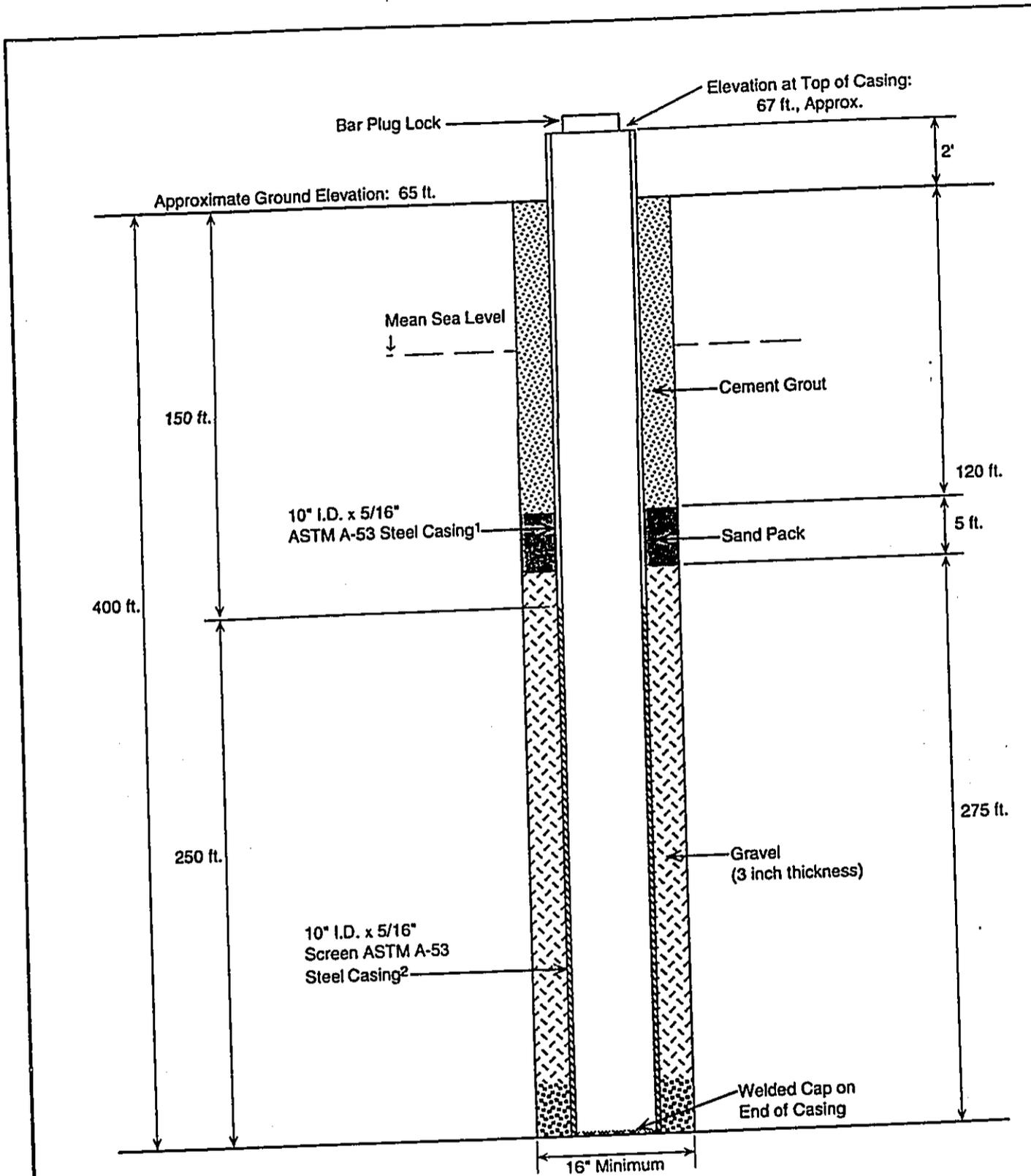
The two producing wells located near the northwest edge of the site are designated Punaluu Wells III, No. 3453-06 and No. 3453-07. Each of these wells has a yield of about 1.0 mgd each. They are connected to 12-inch-diameter pipes that feed into the BWS's 16-inch-diameter water main that leads to the Kamehameha Highway. A small one-story control building containing a chlorinator and control devices is located near the southeast edge of the site. The chlorinator is capable of adding chlorine to the water system through a 2.5-inch-diameter pipe system.

DLNR records indicate that Well No. 3453-06 is located at a ground elevation of 66 feet above msl and has a diameter of 16 inches, a depth of 464 feet below msl, and a solid well casing reaching to a depth of 367 feet below msl. Well No. 3453-07 has a diameter of 16 inches and a depth of 498 feet below msl, with the solid well casing, screen, and gravel pack reaching a depth of 118 feet below msl.

The proposed Punaluu III Well Addition discussed in this environmental assessment is similar to the previous exploratory well drilled on this site in 1981 that was subsequently sealed and abandoned. The abandoned exploratory well was approximately 400 feet in depth and was unsuccessful in extracting the needed quantity of water due to a cave-in during drilling. The proposed Punaluu III Well Addition is expected to be successful in yielding the necessary quantity and quality of groundwater because it will be extracting water at a depth of 400 feet, from an alluvial layer, where BWS hydrologists have predicted that there may be adequate yields of groundwater available.

3.3 Construction and Well Testing

The proposed well will be approximately 400 feet deep with the upper 150 feet consisting of a 10-inch-inside-diameter steel casing. The lower 250 feet of the well will consist of a 10-inch-diameter well-screened casing surrounded by a 3-inch layer of gravel. The ground elevation of the proposed well will be 65 feet above msl (see Figure 3-2).



NOTES:

¹ Solid Casing:		² Screen Casing:	
Material:	ASTM A-53 Steel	Material:	ASTM A-53 Steel
Length:	150 ft.	Length:	250 ft.
Inside Diameter:	10 in.	Inside Diameter:	10 in.
Wall thickness:	5/16 in.	Wall thickness:	5/16 in.

Environmental Assessment
Punaluu III Well Addition
CITY AND COUNTY OF HONOLULU - BOARD OF WATER SUPPLY

FIGURE
3-2

WELL CROSS-SECTION

Not to scale

CH2M HILL

* ASTM=American Society for Testing and Materials

3.2 Technical Characteristics

The Punaluu III Well Addition is proposed to be approximately 400 feet deep and will attempt to extract potable water from the alluvium (see Figure 3-2). The proposed Punaluu III Well Addition, if developed into a production well, is expected to be able to yield up to 0.5 mgd.

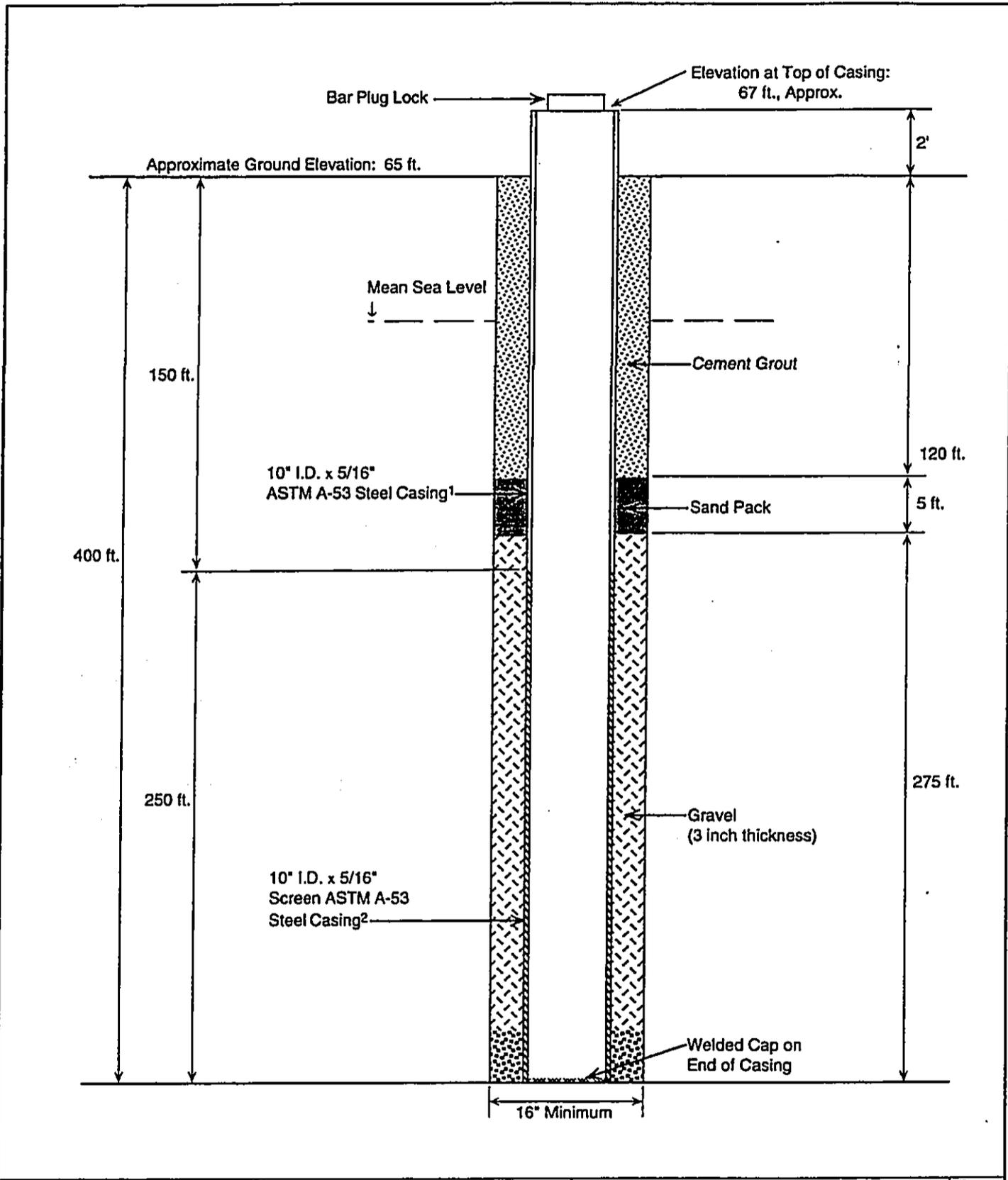
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The proposed Punaluu III Well Addition discussed in this environmental assessment is similar to the previous exploratory well drilled on this site in 1981 that was subsequently sealed and abandoned. The abandoned exploratory well was approximately 400 feet in depth and was unsuccessful in extracting the needed quantity of water due to a cave-in during drilling. The proposed Punaluu III Well Addition is expected to be successful in yielding the necessary quantity and quality of groundwater because it will be extracting water at a depth of 400 feet, from an alluvial layer, where BWS hydrologists have predicted that there may be adequate yields of groundwater available.

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The proposed well will be approximately 400 feet deep with the upper 150 feet consisting of a 10-inch-inside-diameter steel casing. The lower 250 feet of the well will consist of a 10-inch-diameter well-screened casing surrounded by a 3-inch layer of gravel. The ground elevation of the proposed well will be 65 feet above msl (see Figure 3-2).



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Environmental Assessment
Punaluu III Well Addition
CITY AND COUNTY OF HONOLULU - BOARD OF WATER SUPPLY

FIGURE
3-2

WELL CROSS-SECTION

Not to scale

*ASTM=American Society for Testing and Materials

Drainage from the two existing wells for testing or flushing is provided through the existing 6-inch-diameter drain lines that lead to a ditch at the north corner of the site. This existing drainage system will be used to dispose of water extracted during the yield drawdown test and the pump test.

The yield drawdown test will be conducted after the proposed well is drilled and temporary diesel or electric pumps and pipelines are connected. The yield drawdown test will be performed at a rate of 200 to 700 gallons per minute. Following the yield drawdown test, a long-term constant rate pump test will be conducted for a period of several days at the rate determined from the yield drawdown test. Water table drawdown rates will be measured and the quality of water will be tested.

Should the quantity and quality of the water prove to be satisfactory, the proposed well will be temporarily capped. Subsequent to the completion of satisfactory tests, a permanent pump with the necessary pipelines and the electrical and mechanical controls will be added to the existing Punaluu III Wells pump station facilities. If the pump tests prove to be unsatisfactory, the well will be sealed and/or capped. In either case, when the yield drawdown and long-term constant rate pump tests are completed, the temporary pumps and pipelines will be removed from the site and all surplus excavation material and construction debris will be removed and disposed of offsite in compliance with applicable City and County of Honolulu regulations.

3.4 Project Schedule, Cost, and Work Force

The construction and testing of the proposed Punaluu III Well Addition is expected to begin in late 1994. The capital cost for the exploratory well construction and testing portion of this project is estimated at \$225,000.00. Drilling will be completed in about 6 months. Installation of the casing will take about a week and another 2 to 3 weeks will be required to install the temporary pump and run the test pumping. Demobilization may take up to 2 weeks. The duration of the exploratory well construction and testing portion of this project is therefore estimated to be about 8 months. If the well testing is successful, the well will be added as the third production well to this existing Punaluu III Wells facility. The addition of this third production well to the existing facility is expected to take up to one additional year to complete at an additional estimated cost of \$1.2 million. Work crews will probably involve no more than 12 workers at any one time

Chapter 4
Environmental Setting, Potential Impacts, and Mitigation

4.1 Land Use and Ownership

4.1.1 Existing Environment

Land use in this area is predominantly agricultural. Open lands, pasture, and small fields of banana and guava surround the site. A small horse stable is located adjacent to the access road leading to the site. The BWS site, as well as the surrounding area, was formerly sugar cane land cultivated by the Punaluu Sugar Company. The area has been heavily modified, first by the commercial cane cultivation around or before the turn of the century, and subsequently by diversified agriculture after the closing of the sugar company.

The 1.97-acre site, located within Punaluu Valley, is identified on Tax Map Key 5-3-07: 14, and was transferred to the BWS by Executive Order No. 02711 from the State of Hawaii. The access road from Punaluu Valley Road to the site is located on an easement in favor of the BWS, on privately-owned property identified by Tax Map Key 5-3-07:16. Many of the local farmers within Punaluu Valley lease land from the Bernice Pauahi Bishop Estate. The lands surrounding the BWS site are privately owned.

4.1.2 Project Impacts

Installation of the Punaluu III Well Addition will not change any of the surrounding land uses and ownership patterns.

4.1.3 Mitigation Measures

No mitigation measures are proposed or required.

4.2 Topography, Climate, and Rainfall

4.2.1 Existing Environment

The site is nearly flat, with a slope of less than 4 percent, and is located near the base of Punaluu Valley about 1/2 mile from the shoreline.

The temperature ranges from 74 to 75 degrees Fahrenheit in March and from 79 to 80 degrees Fahrenheit in September. A northeasterly trade wind is prevalent throughout most of the year. In Hawaii, the term "windward" generally refers to the normal direction of this

prevailing trade wind, and not the direction of the wind at a specific time. The northeast trade wind occurs with higher frequency in the summer, about 90 percent of the time, as compared to winter, when it occurs only about 50 percent of the time.

Rainfall averages more than 250 inches per year at the top of the Punaluu Valley near the upper ridge line of the Koolau Mountain range (at an elevation of about 2,700 feet), making the upland portion of this valley the wettest spot on the island of Oahu. The high rainfall at this elevation is the result of mountain-caused or "orographic" rains that form as the moist trade wind air moves in from the sea along the floor of the valley and up the steep mountain slopes (see Figure 4-1). Rainfall distribution closely follows the topographic contours, with higher rainfall at the upper slopes and lower rainfall at lower elevations. The site is located near the foot of the valley at an elevation of approximately 60 to 70 feet above msl and has an average rainfall of about 75 inches per year.

4.2.2 Project Impacts

Installation of the well addition would not have any significant effect on the topography, climate, or rainfall in the area.

4.2.3 Mitigation Measures

No mitigation measures are proposed or required.

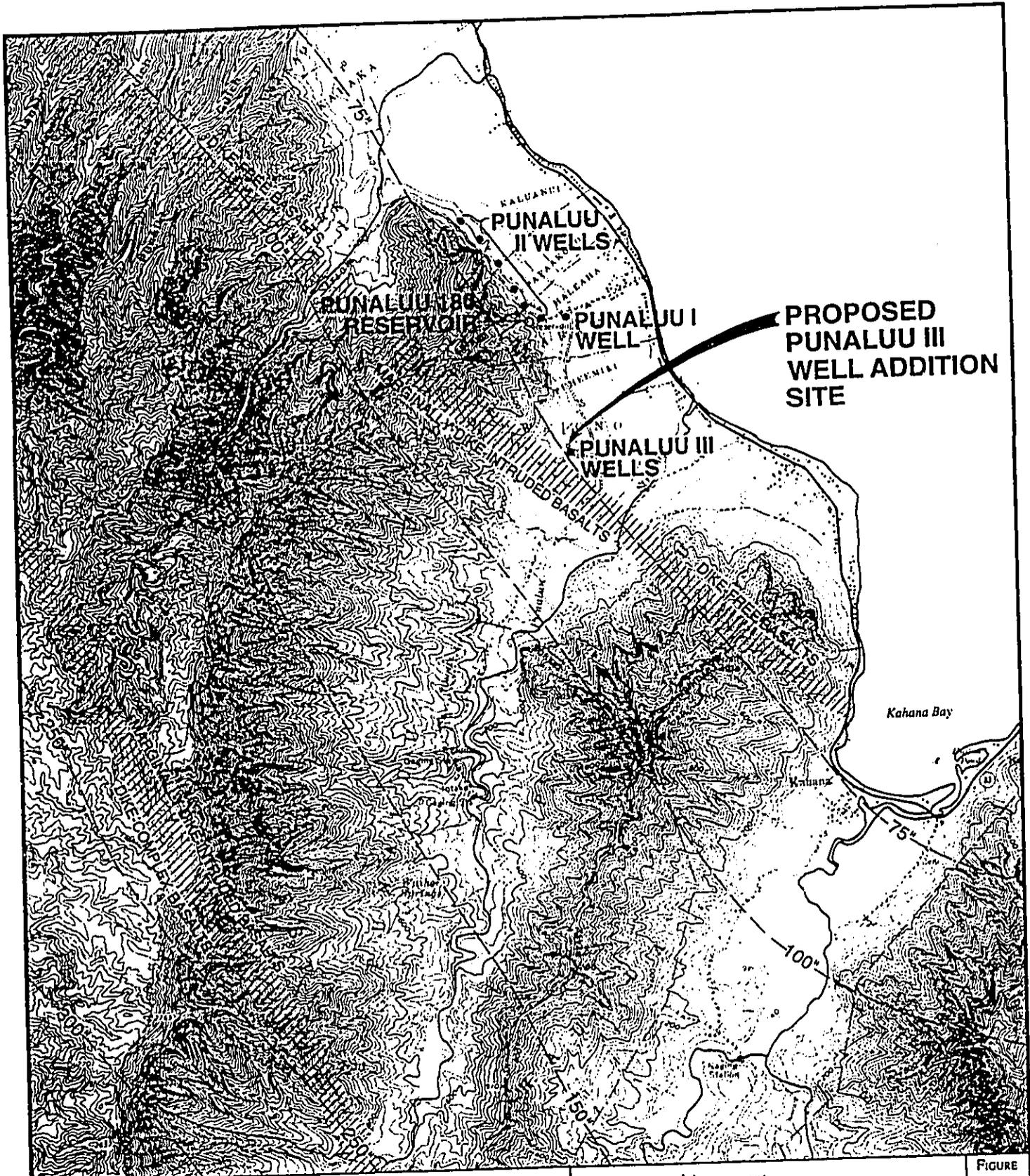
4.3 Geology and Hydrology

4.3.1 Geology

The proposed Punaluu III Well Addition site is located within Punaluu Valley and overlies the Koolauloa Aquifer system. The Koolauloa Aquifer system is generally composed of a major basal aquifer in highly permeable geologic formations and high-level, dike-confined aquifers in the mountainous areas.

Geological studies of Punaluu Valley indicate that the mauka portions of the valley consist of dike-complex basalts of the Koolau volcanic series. The vast midsection of Punaluu Valley consists of marginally dike-intruded basalts. The makai portion of the valley consists of dike-free basalts.

The soil at the surface of the proposed Punaluu III Well Addition site is classified as Waialua stony silty clay (WIB) by the U.S. Soil Conservation Service and is characterized as having moderate shrink-swell potential, moderate permeability, low shear strength, slow runoff, and slight erosion hazard.



LEGEND <ul style="list-style-type: none"> ● Existing Well --- Mean Annual Rainfall (in inches) //// Hydrologic Boundary 	<i>Environmental Assessment</i> Punaluu III Well Addition CITY AND COUNTY OF HONOLULU - BOARD OF WATER SUPPLY	FIGURE 4-1
	LOCATION PLAN	
NORTH		
CH2M HILL		

4.3.2 Groundwater Hydrology

The highest yields of basal groundwater are expected in the makai areas where there are unconfined or confined basaltic aquifers. In the areas closer to the shoreline where there are confined dike-free basalts, the caprock, which is formed of alluvial deposits, is the barrier that retards the seaward flow of basal groundwater (see Figure 4-1). Moderate yields of basal groundwater may be expected in those areas further upland where marginally dike-intruded basalts predominate. Lower yields of basal groundwater may be expected further up slope in the those areas where dike-complex basalts become more and more predominant.

Throughout the upper and middle section of Punaluu Valley, dikes trend in a northwest to southeast direction, transverse to the axis of the valley. In much the same way, groundwater flows from Punaluu Valley toward the northwest and southeast. Groundwater also spills from higher dike compartments to progressively lower dike compartments in the northeasterly direction, which is more or less in line with the axis of the valley, and results in a groundwater flow toward the shoreline that recharges the basal aquifer near the coast.

Aquifers may also occur within alluvial deposits and could consist of pervious layers of rock sandwiched between layers of relatively less pervious sediment. Alluvial groundwater is derived from percolated rainfall and surface water and small amounts of basal water that have leaked through the caprock. In 1981, the BWS drilled a 400-foot-deep exploratory well in the Punaluu III Wells site in an attempt to draw water from the alluvium, but this was unsuccessful because a cave-in during drilling caused the quantity of groundwater to be inadequate for development of a production well.

Within the Punaluu area, there are approximately 20 wells, nine of which are operated by the BWS. The nine BWS wells are distributed among three pump stations: Punaluu I, Punaluu II, and Punaluu III. Records from recent years indicate that the BWS withdraws an average of 5.63 mgd from these three pump stations.

Both Well No. 3453-06 and Well No. 3453-07, located within the Punaluu III pump station, are located over a basaltic aquifer confined by an overlying alluvium layer. Well No. 3453-06 draws groundwater from the basaltic bedrock while Well No. 3453-07 draws water both from the basaltic bedrock and from the alluvium. Records from the drilling of Well No. 3453-06 and Well No. 3453-07 showed that a 413-foot layer of alluvium overlies the basaltic bedrock layer.

The proposed Punaluu III Well Addition will be drilled to a depth of 400 feet and will attempt to develop water from the alluvium.

If the pump test results indicate that the quality or quantity of the water is unsatisfactory, the exploratory well will be permanently capped and/or sealed to prevent malicious or accidental contamination of the underlying groundwater aquifers.

4.3.3 Surface Water Hydrology

The Punaluu Valley drainage basin flows into Punaluu Stream, a perennial waterway approaching 70 feet in width in the upper reaches and with an average channel depth of 10 feet. Punaluu Stream is a "gaining stream," meaning that, as it progresses downgradient from the head of the valley toward the coastline, the stream's flow gradually increases as it successively cuts through and drains high-level, dike-confined groundwater.

Impacts on Punaluu Stream are not expected during the test pumping or production pumpage of proposed Punaluu III Well Addition. Punaluu Stream is located about 1,500 feet southeast of the project area. The U.S. Geological Survey operates a stream flow gauge within the Punaluu Ditch (No. 302000) and a gauge within Punaluu Stream (No. 303000) makai of the stream diversion. Both gauges are located about 2 miles upstream from the mouth of the stream. The mean flow for the Punaluu Ditch diversion was 7.03 cubic feet per second (cfs) (4.5 mgd) for the period from 1953 to 1991. For the same period, the mean flow for the Punaluu Stream downstream from the diversion was 17.70 cfs (11.4 mgd).

Punaluu Stream in this vicinity has an invert of about 20 feet above msl and is perched over horizontal layers of low-permeability alluvium. These horizontal layers of low-permeability alluvium serve to isolate the water flowing in Punaluu Stream from the underground alluvial groundwater found at considerably lower depths. The Punaluu III Well Addition is proposed to be cased to a depth of about 400 feet (about 335 feet below msl) within the alluvium, with the screened intake section of the well extending from about 85 feet below msl to the bottom of the well. The water withdrawn from the alluvium from 85 feet below to 335 feet below msl due to the pumping of this well is not expected to affect the water flowing in Punaluu Stream because of the approximately 105 feet separating the screened intake section of the well from the stream's invert, and because of the intervening layers of low-permeability alluvium.

There is no potential for impacts upon the Kahuku Wetlands and the Kahana Valley Wetlands. The Kahuku Wetlands in the James Campbell National Wildlife Refuge in Kahuku and the Kahana Valley Wetlands in Kahana Bay are the nearest significant wetlands to the proposed exploratory well site (*An Ornithological Survey of Hawaiian Wetlands*, U.S. Army, 1977). There is no potential for impact because the Kahuku Wetlands are located about 8 miles northeast of the project site along the shoreline, and the Kahana Valley Wetlands are located about 2 miles southeast of the project site, also along the shoreline. These wetlands are mostly brackish because caprock springs are their source of fresh water.

(the springs are fed by leakage of confined basal groundwater from below), and because they are adjacent to the shoreline (*Windward Oahu Regional Water System Improvements*, 1988). The Punaluu III Well Addition site and the Kahuku Wetlands are both located within the Koolauloa Aquifer system.

Further, there is no potential for impact to the Kahana Valley Wetlands because the wetlands are not located in the same aquifer system as the proposed Punaluu III Well Addition. The proposed Punaluu III Well Addition is located in the Koolauloa Aquifer system, and the Kahana Valley Wetlands are located in the Kahana Aquifer system. The Koolauloa Aquifer and the Kahana Aquifer have been designated as distinctly separate and independent aquifers by the CWRM (Appendix C of the OWMP).

Water from the test pumping will be discharged into the existing drainage system on the Punaluu Wells III site. It is expected that the water that will be discharged will be clean, and therefore will not introduce any pollutants into the environment. The existing drainage system feeds into a culvert at the northeast corner of the site. Care will be taken in disposing of the test water to preclude the possibility of flushing debris into the ditch or re-suspending sediments and other pollutants in the ditch.

4.3.4 Project Impacts

No adverse impacts to the geological formations underlying the drilling site for the exploratory well or to the soils at the surface of the site are expected. Impacts to the groundwater and surface water flows are expected to be insignificant.

4.3.5 Mitigation Measures

During the test pumping, care would be taken in disposal of the test water to preclude the possibility of flushing debris into the ditch or resuspending sediments and other pollutants into the ditch. Best Management Practice (BMP) will be implemented and therefore a National Pollutant Discharge Elimination System (NPDES) Permit will not be required.

If the pump tests results indicate that the quality or quantity of the water is unsatisfactory, the exploratory well would be capped and/or sealed to prevent malicious or accidental contamination of the underlying groundwater aquifer.

No monitoring of Punaluu Stream is needed since pumpage of this well will not affect stream flows within Punaluu Stream. There will be no effects because there will be a large elevation difference separating the water in the well from the invert of the stream, because there are intervening layers of low permeability alluvium, and because the stream is located 1,500 feet away.

4.4 Natural Hazards

4.4.1 Flood Zones

The proposed Punaluu III Well Addition site is located northeast of Punaluu Stream. The Flood Insurance Rate Map (FIRM) shows that detailed studies for flood hazards have been made for the lower reach of Punaluu Stream for the approximately 1,500-foot portion nearest the mouth of the stream. These detailed flood hazard studies show the floodway, and the special flood hazard areas that would be inundated by a 500-year (0.2 percent probability) flood extend out from the center of the stream for a distance of 300 to 1,600 feet near the mouth of the stream and for 600 to 800 feet at the upper limit of the study area.

At approximately the ground elevation where the FIRM study shows that the 500-year flood hazard area extends out from Punaluu Stream to a distance of 800 feet, the proposed Punaluu III Well Addition site is more than 1,500 feet northeast of Punaluu Stream. Thus, the proposed Punaluu III Well Addition site is not located within the FIRM-designated 500-year flood hazard area extending from Punaluu Stream and is more than 700 feet away from the edge of the 500-year flood hazard area.

In the Punaluu area, FIRM-designated coastal flooding areas extend about 300 to 600 feet inland from the shoreline. The proposed Punaluu III Well Addition is about 1/2 mile inland from the shoreline and is not located in any FIRM zone identified as being susceptible to coastal (tsunami) flooding.

4.4.2 Seismic Activity

Under the Uniform Building Code (UBC), the island of Oahu is designated as Seismic Zone 1; in a scale from 1 to 4, this is the zone with the least potential for ground motion from seismic events. The UBC establishes minimum design criteria for structures to resist the effects of seismic ground motion, in accordance with the standards for the seismic zone in which the structure is to be built. In the interest of public health and safety, the BWS has adopted the standards for Seismic Zone 3 for all of its structures. All structures that will be built as part of this project will be designed and built in accordance with the UBC standards for Seismic Zone 3.

4.4.3 Project Impacts

The proposed project would not affect and would not be affected by flooding. Seismic risk at the project site is minimal. The proposed project would not affect seismic activity and would not likely be affected by seismic activity.

4.4.4 Mitigation Measures

As a public health and safety measure, the BWS has adopted the standards for Seismic Zone 3 for the design and construction of all the structures that would be a part of this project.

No other mitigation measures are proposed or required.

4.5 Demographics

4.5.1 Population, Housing, and Employment

The project area is located in Census Tract 102.01, which extends from Hauula to Kaaawa. According to U.S. Census reports, the population in this tract increased 17 percent from 1980 to 1990, from 3,952 to 4,608. In 1990, the U.S. Census reports showed that there were 1,826 housing units in this tract. The resident population of Punaluu, which comprises a portion of this tract, was reported to be 672 in 1990. Many of the jobs in Punaluu are agricultural.

4.5.2 Project Impacts

Existing and future population, housing, and employment in the Punaluu area would not be affected by this project. The proposed Punaluu III Well Addition project would involve a limited amount of new construction work entirely within the BWS property; however, this work would be temporary and would probably be conducted by contractors from outside the Punaluu area.

4.5.3 Mitigation Measures

No mitigation measures are proposed or required.

4.6 Roadways and Traffic

4.6.1 Roadways and Traffic

Punaluu Valley Road, a private roadway, is the only access from Kamehameha Highway to the proposed project site. Kamehameha Highway is a two-lane state highway with a speed limit of 35 miles per hour (mph). According to the Hawaii Department of Transportation, average daily traffic on Kamehameha Highway in 1991 amounted to 10,713 in the section

from Hauula to Kaaawa. Kamehameha Highway traffic consists of a mix of automobiles, trucks, and buses. Because there are relatively few residents and farmers living and working in the area accessed by Punaluu Valley Road, traffic on this unpaved roadway is expected to continue to be very light.

4.6.2 Project Impacts

The project would cause a slight and temporary increase in heavy truck traffic. No significant or long-term impacts to either Kamehameha Highway or Punaluu Valley Road are expected as a result of this project.

4.6.3 Mitigation Measures

To minimize traffic impacts, the contractor would schedule heavy truck activity between the hours of 8:30 am to 3:00 pm, Monday through Friday, excluding state holidays.

4.7 Visual and Recreational Resources

4.7.1 Visual Resources and Recreational Resources

The City and County of Honolulu's *Coastal View Study* (1987) notes that the proposed project is located in the Laie/Kaaawa viewshed. In the vicinity of the project area, Kamehameha Highway, located about 1/2 mile makai of the project site, is identified as a coastal roadway with a significant coastal view. The public recreational area closest to the proposed project site is Punaluu Beach Park, which is located on the shoreline and about 3/4 mile away. The *Coastal View Study* also identifies significant stationary ocean views at Punaluu Beach Park.

4.7.2 Project Impacts

The proposed project site is not visible from Kamehameha Highway or Punaluu Beach Park. The significant coastal views identified in the *Coastal View Study* from Kamehameha Highway and Punaluu Beach Park would not be affected.

Because the project site and Punaluu Beach Park are separated by a distance of about 3/4 mile, the Punaluu Beach Park recreational area would not be affected by this proposed project.

4.7.3 Mitigation Measures

No mitigation measures are proposed or required.

4.8 Cultural Resources

4.8.1 Cultural Resources

An archaeological reconnaissance survey was conducted by Cultural Surveys of Hawaii on April 7, 1994. The results of the archaeological reconnaissance survey and related research are found in Appendix A of this report.

The property, as well as the surrounding area, is all former sugar cane land of the Punaluu Sugar Company. The site was heavily modified, first by the commercial cane cultivation around or at the turn of the century and then following the closing of the sugar company, by diversified agriculture. *Sites of Oahu* lists five *heiau* and one fishpond within the *ahupuaa* of Punaluu. None of these sites are located in the vicinity of the project site. The closest site, Site 291, is known as *Maka Heiau* and is shown in *Sites of Oahu* as being at the base of a ridge northeast of the proposed project site; Site 291 was partially destroyed by sugar cane cultivation.

Because of the extensive modification done to the proposed project site by grading, and because of the existence of farm lots consisting of pasture on the mauka side of the site, guava orchards on the makai side, a banana patch on the south side, and secondary tree growth on the north side, it is probable that the proposed project site was agricultural land before its development in 1977.

4.8.2 Project Impacts

The results of the fieldwork show that this project area is devoid of archaeological potential. The proposed development of this site would not result in any impact on archaeological resources.

4.8.3 Mitigation Measures

No mitigation measures are proposed or required.

4.9 Biological Resources

4.9.1 Botanical Resources

A botanical reconnaissance survey was conducted by Char and Associates on April 7, 1994. The results of the botanical reconnaissance survey and related research are found in Appendix B of this report.

The proposed project site is fenced, and the area within the fence is periodically mowed. The "lawn" is made up primarily of wedelia, a low-growing ground cover species with yellow, daisy-like flowers, and Spanish clover of *ka'imi*, a common pasture legume. Scattered through the wedelia and Spanish clover ground cover are patches of sensitive plant or *puahilahila*, and yellow foxtail grass. A number of weedy species have encroached onto the perimeter of the site from the surrounding guava orchard and pasture land. These include California grass, cow pea, *honohono*, pluchea, virgate mimosa, and oriental hawkbeard. A few small mowed specimens of *koa-haole* about 6 inches tall are found throughout the site.

Coarse gravel has been spread around the two existing wells and a brown-colored hollow tile building. These gravel areas are largely barren with only a few scattered patches of weeds, which consist mainly of buttonweed, niruri, and fir-leaved celery.

The adjacent properties support a guava orchard and pasture land used for grazing cattle and horses. Historically, the proposed project site was cultivated with sugar cane.

None of the plants found on the site are candidates for threatened or endangered species status, and none are listed or proposed as threatened and endangered species (U.S. Fish and Wildlife Service, 1989, 1990, 1994).

None of the plants are considered rare or vulnerable (Wagner et al., 1990). The only native plant observed on the site is ricegrass, which is questionably indigenous—that is, it is a species for which a date of introduction or other information does not firmly support that it was dispersed to Hawaii by natural or human-related mechanisms but for which the weight of evidence suggests that it is probably indigenous (Wagner et al., 1990). Ricegrass can be found in similar habitats throughout the Hawaiian islands.

4.9.2 Faunal Resources

Faunal (bird and mammal) reconnaissance surveys were conducted by Philip L. Bruner, environmental consultant, on April 7 and 12, 1994. The results of this bird and mammal reconnaissance surveys and related research are found in Appendix C of this report.

No native resident land birds were observed during the surveys. The only native resident land bird that may occasionally occur in this area and at this elevation is the short-eared owl or *Pueo*. *Pueo* is listed as an endangered species on the island of Oahu by the Hawaii Division of Forestry and Wildlife. No *pueo* were recorded on the surveys. The number of *pueo* on Oahu is probably quite low, and their present abundance in the areas covered in this survey is unknown.

One resident waterbird, a black-crowned night heron, was seen flying over the property. This waterbird is not listed as endangered. Habitat suitable for waterbirds does not occur at the proposed project site, but nearby lands consisting of taro patches, flooded pasture, and stream drainages do contain some wetland habitat suitable for waterbirds. The nearest wetlands that provide significant wetland habitat for waterbirds are the Kahuku Wetlands in the James Campbell National Wildlife Refuge in Kahuku and the Kahana Valley Wetlands in Kahana Bay (*An Ornithological Survey of Hawaiian Wetlands*, 1977). The Kahuku Wetlands are located about 8 miles northeast of the project site along the shoreline, and the Kahana Valley Wetlands are located about 2 miles southeast of the project site, also along the shoreline.

No seabirds were observed during the surveys of the site. The site is unsuitable for seabirds because of predator access and human disturbance.

One migratory indigenous bird species, the Pacific golden plover, which is the most abundant of the migratory species seen in Hawaii, was recorded on the proposed project site. Plovers establish territory on lawns and other habitats, and studies have shown that they return to the same territory each year. Plovers arrive in Hawaii from arctic breeding grounds in August and remain until spring migration in late April.

A total of 12 exotic bird species were recorded on the site during the survey. This variety of exotic bird species was expected for this area. Four other species of exotic bird species were not observed but are also known to be in this region.

One feral mammal, the introduced small Indian mongoose, was observed near the site. Other small mammals such as rats, mice, and feral cats are undoubtedly common in this area.

Oahu records of the endemic and endangered Hawaiian hoary bat are limited. Data on the bat's distribution and behavior are extremely limited. They are known to roost solitarily in trees and occur in upland forests as well as in coastal habitats. This species is insectivorous and forages at dusk. No hoary bats were observed at the proposed project site.

4.9.3 Project Impacts

There are no sensitive native plants communities on the project site. The proposed project would not have any affect on any significant biological resources.

There were no sensitive bird or mammal resources observed on or near the project site. The proposed project would have no impact on any significant bird or mammal resources.

4.9.4 Mitigation Measures

For both botanical and faunal resources, no mitigation measures are proposed or required.

4.10 Air Quality and Noise

4.10.1 Air Quality and Noise

The air on Oahu is, in general, relatively clean and low in pollution, except where there are large numbers of motor vehicles or stationary pollution sources. In the Punaluu area near the project site, air pollution is minimal as a result of the low traffic volumes, absence of stationary pollution sources, and predominance of the northeast trade winds. Ambient noise at and around the project site is also very low and comes mainly from nearby farming operations.

4.10.2 Project Impacts

The project would not have any significant impacts to air quality. Construction would involve heavy vehicle and equipment operations that would create a small amount of fugitive dust and pollutant emissions. The effects on air quality would be short-term, with the pollutants generated by the construction and other activities quickly dispersed by the predominantly northeast trade winds. There would be no long-term air quality impacts once construction is completed.

The project would not have any significant noise impacts that would affect sensitive noise receptors. Construction, including heavy equipment moving, and the drilling of the exploratory well, would create a small amount of noise; however, because all of the surrounding land uses are agricultural, there are no significant sensitive noise receptors near the project site. To reduce pump noise, temporary surface pumps may be installed with mutes which will reduce pump noise. Submersible pumps, which will reduce pump noise even further, may also be used. If the pump tests are successful, permanent surface pumps with mutes or submersible pumps may be installed to reduce noise levels to less than the regulatory limit. There would be no noise impacts after the construction is completed.

On the island of Oahu, community noise controls have been set for analyzing noise impacts pursuant to Hawaii Department of Health Rules, Title 11, Chapter 43. Allowable daytime and nighttime noise level standards for residential, preservation, hotel, apartment, and business, agricultural, and industrial districts have been set under these rules. For agricultural zones, the maximum allowable daytime and nighttime noise level is 70 dBA at the property line. The project site is located in and is surrounded by lands in the AG-2, General Agricultural zone and is thus limited to a maximum allowable noise level of 70 dBA at the property boundary. While operating, permanent pumps generate a limited amount of noise.

4.10.3 Mitigation Measures

To minimize adverse air quality impacts, the contractor would properly maintain its internal combustion equipment to minimize exhaust emissions and would comply with the Hawaii Department of Health Rules Title 11, Chapter 59 and 60, regarding air pollution control.

For noise impacts, the contractor would properly maintain the noise mufflers on its internal combustion equipment to reduce noise during drilling operations, and would comply with the Hawaii Department of Health Rules, Title 11, Chapter 43, regarding noise control for the island of Oahu. To reduce pump noise, temporary surface pumps may be installed with mutes which will reduce pump noise. Submersible pumps, which will reduce pump noise even further, may also be used. If the pump tests are successful, permanent surface pumps with mutes or submersible pumps may be installed to reduce noise levels to less than the regulatory limit.

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 Agricultural District. Land use controls for the development of wells in the agricultural districts on the island of Oahu are under the jurisdiction of the City and County of Honolulu.

A well construction pump installation and water use permit will be required from the Commission on Water Resource Management (CWRM).

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

The subject parcel is designated Agriculture on the City and County of Honolulu's Development Plan Land Use Map (Ordinance No. 83-9, as amended) and is consistently shown as AG-2, General Agricultural, on the City and County of Honolulu's zoning map (Ordinance 86-121, as amended). According to the City and County of Honolulu's Land Use Ordinance (LUO), the proposed project is considered a Utility Installation, Type A, and is a principal permitted use in this zoning district.

Projects funded by the City and County of Honolulu must be consistent with the City and County of Honolulu's Development Plan Public Facilities Map. Exploratory wells are considered minor and are not required to be shown on the Development Plan Public Facilities Map. The proposed Punaluu III Well Addition, if it is converted to a production well, will be consistent with the City and County of Honolulu's Development Plan Public Facilities Map (Ordinance No. 83-9, as amended) since the site shown as a "site determined water well facility programmed for construction within 6 years."

A building permit will be required from the City & County of Honolulu Building Department.

Chapter 6 Possible Alternatives

The no-action alternative, the delayed action alternative, alternative sites, and alternative sources were considered either in this environmental assessment or in previous environmental analyses done by the BWS.

6.1 No-Action Alternative

The no-action alternative was considered but not pursued because it would be contrary to the BWS's legal mandate to provide for the water needs of a growing population.

This project is part of an overall groundwater development program intended to increase the municipal water supply to meet the growing demands of an increasing population. If the BWS's program to develop new water sources is curtailed, the BWS would not be able to provide adequately for the future water needs of Oahu's population. Inadequate municipal water supplies could result in future restrictions to development on Oahu as well as regional water shortages within the existing developed areas.

6.2 Delayed Action

The delayed action alternative was considered but not pursued because this alternative would delay the BWS's implementation schedule and would have substantially similar environmental outcomes and higher development costs because of inflation.

Delay in the proposed well testing program would increase the risk that population growth on Oahu will lead to increasing water demands in excess of the available supplies.

6.3 Alternative Sites

This environmental assessment analyzes one of many possible potable groundwater source sites in the Windward Sector of Oahu, where, according to the OWMP, there is good potential for economic development of potable water supply sources.

Alternative sites were considered in a 1988 *Windward Oahu Regional Water System Improvements Study*, the BWS conducted an analysis of 46 potential sites for wells, tunnels, or inclined tunnels on the windward side of Oahu that could be used for developing

additional potable water sources. In this 1988 analysis, the BWS evaluated six possible wells sites and one possible tunnel or inclined well site within Punaluu Valley.

These sites have the potential to serve as groundwater supply sources but are considered by the BWS to be additional rather than alternative sites for its well testing program.

6.4 Alternative Sources

Alternative source development has been and is being pursued by the BWS. The BWS has already analyzed potential potable water source alternatives other than groundwater in its 1988 study; these alternatives included desalinization, the development of surface and brackish groundwater sources, and the recycling of treated wastewater.

However, there are a number of problems associated with the development of alternative potable water sources. Typically, these alternative sources have comparatively high development costs and greater technical challenges. For instance, the use of surface water such as from Punaluu Stream has a high potential for health and safety problems and would require installation of a costly water treatment plant. The BWS, although pursuing alternative source development, does not consider the development of these alternative sources to be as feasible or as practical as the development of groundwater resources. Thus, BWS's emphasis for obtaining potable water for municipal use will continue to focus primarily on the development of groundwater resources.

Chapter 7
List of Preparers

CH2M HILL

Robert Chuck, P.E.
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Bennett Mark, P.E., A.I.C.P.
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Cartographer
Project Manager
Editor
Project Assistant

SUBCONSULTANTS

Phillip L. Bruner
Char and Associates
Cultural Surveys Hawaii

Faunal (Bird and Mammal) Resources
Botanical Resources
Archaeological and Cultural Resources

Chapter 8
Agencies Consulted in
Making this Assessment

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

State of Hawaii agencies

- Department of Land and Natural Resources
 - Commission on Water Resources Management
- Department of Agriculture
- Department of Health
 - Environmental Management Division
 - Office of Environmental Quality Control

City and County of Honolulu agencies

- Planning Department
- Land Utilization Department

Chapter 9 Works Cited

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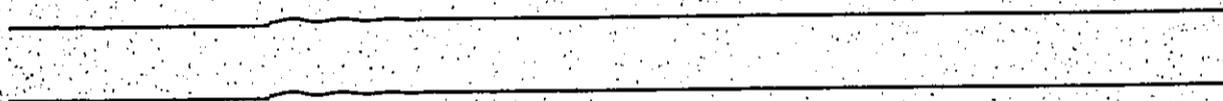
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Appendix A



**Archaeological Reconnaissance Survey of
Punaluu Well III for Additional Installations,
Punalu'u, Ko'olaupia, O'ahu TMK 5-3-07:14**

by

Hallett H. Hammatt, Ph.D.

for

CH2M Hill

Cultural Surveys Hawaii
July 1994

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I. INTRODUCTION

Introduction

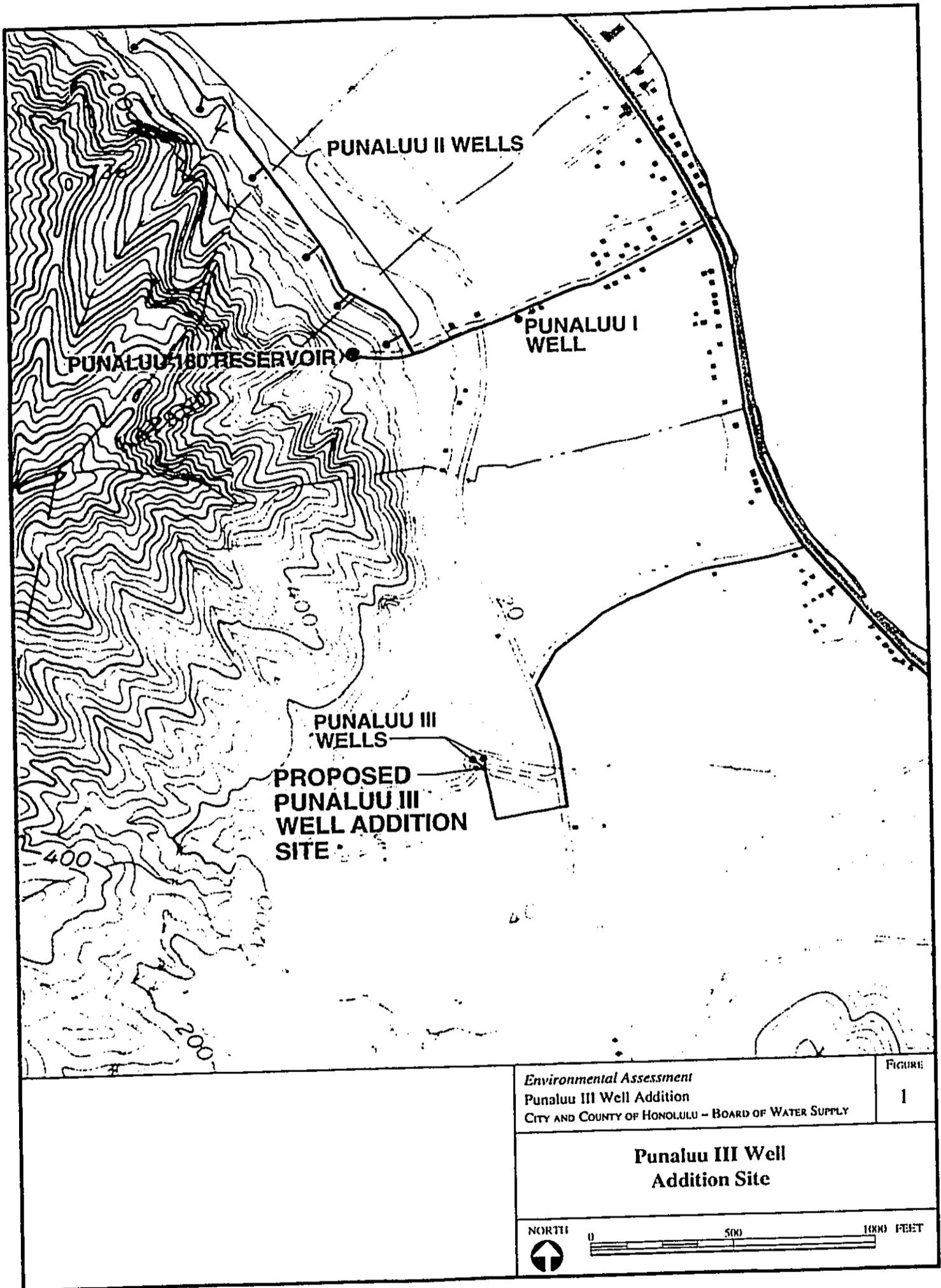
The purpose of this report is to describe the results of an archaeological reconnaissance survey conducted at Punaluu Well No. 3. The Board of Water supply is proposing to expand the facility at this well site to include an additional well, a pump, transmission main, and other equipment. This will add an additional .5 million gallons per day to the production of the well.

Description of the Property

The property was located next to Punaluu Valley Road (Fig. 1), formerly known as Green Valley Road at the 40 ft. elevation, approximately 1,000 ft. from Punaluu Stream. The well site is a fully developed facility with an entry road from Punaluu Valley Road and a graded and fenced lawn area of approximately 2 acres (Fig. 2). There is an existing building in the *makai* center portion of the property (Fig. 3). The well site was developed in 1977. The address is 53-320 Punaluu Valley Road. The name of the property is "Keolanui's Acres."

History of the Property

The property, as well as the surrounding area, is all former sugar cane land of Punaluu Sugar Co. and was heavily modified, first for commercial cane cultivation around or before the turn of the century, and since the closing of the sugar company, has been used for diversified agriculture. Many of the local farmers lease land from the Bishop Estate. An inspection of *Sites of O'ahu* by Sterling and Summers, list 5 heiau and one fishpond within the *ahupua'a* of Punaluu. None of these sites are in the vicinity of the project area. The closest site, Site -291, is known as Maka Heiau and is shown on Sterling and Summers's map as being at the base of a ridge northeast of the subject property and was partially destroyed by sugar cane cultivation (Sterling and Summers 1978:166).



II. ARCHAEOLOGICAL FINDINGS

Archaeological Fieldwork

Archaeological fieldwork was conducted on April 7, 1994 and consisted of an inspection of the existing well site by Hallett H. Hammatt, accompanied by other consultants and associates of the Board of Water Supply and CH2M Hill. Through inspection of the access road as well as of the well site it was very clear that the entire area has been previously graded. Surrounding the fenced property are farm lots consisting of pasture on the *mauka* side, guava orchard on the *makai* side, a banana patch on the south side and secondary tree growth on the north side. It is highly probable that the well site itself was agricultural land before its development in 1977.

Conclusions

It is clear from the results of the fieldwork, that this project area is devoid of archaeological potential. The proposal for additional development of this site, will not impact archaeological resources. For these reasons, no further archaeological investigation should be required for this project.



Figure 2 Project Area View to Northwest, Showing Perimeter Fence and Surrounding Terrain



Figure 3 Project Area, View *Makai* (Northeast) Showing Existing Building within The Well Site Property

Appendix B

CHAR & ASSOCIATES

Botanical/Environmental Consultants

4471 Puu Panini Ave.
Honolulu, Hawaii 96816
(808) 734-7828

May 1994

BOTANICAL RESOURCES ASSESSMENT SURVEY PUNALU'U WELL III KO'OLAU LOA DISTRICT, ISLAND OF O'AHU

INTRODUCTION

An assessment-level survey of the botanical resources found on the Punalu'u Well III project site was conducted by Char & Associates on 07 April 1994. The primary objectives of the field studies were to: 1) provide a general description of the vegetation; 2) search for threatened and endangered species as well as rare and vulnerable plants; and 3) identify areas of potential environmental problems or concerns and propose appropriate mitigation measures. The information from the botanical studies will be used the preparation of an Environmental Assessment (EA) document.

The Punalu'u Well III addition is located in Punalu'u Valley at about the 40 foot elevation contour on an existing Board of Water Supply site. The proposed work for the project will involve installation of one pump, piping, transmission main, electrical equipment, and appurtenances. The addition is needed to meet future demands.

DESCRIPTION OF THE VEGETATION

A walk-through survey method was used. Notes were made on plant associations and distribution, substrate types, topography,

drainage, exposure, etc. Plant identifications were made in the field; plants which could not be positively determined were collected for later identification in the herbarium, and for comparison with the taxonomic literature. The plant names used in the following discussion are in accordance with the most recent treatment of the Hawaiian flora by Wagner et al. (1990).

The Board of Water Supply site is fenced and the area within the fence periodically mowed. The "lawn" is composed primarily of wedelia (Wedelia trilobata), a low-growing ground cover species with yellow, daisy-like flowers, and Spanish clover or ka'imi, a common pasture legume. Scattered through the wedelia/Spanish clover ground cover are patches of sensitive plant or puahilahila (Mimosa pudica), and yellow foxtail grass (Setaria gracilis). Around the perimeter of the property, a number of weedy species have encroached onto the site from the surrounding guava orchard and pasture land. These include California grass (Brachiaria mutica), cow pea (Macroptilium lathyroides), honohono (Commelina diffusa), pluchea (Pluchea symphytifolia), virgate mimosa (Desmanthus virgatus), and oriental hawkbeard (Youngia japonica). A few small mowed specimens of koa-haole (Leucaena leucocephala), about 6 inches tall, are found throughout the well site.

A paved road (asphalt) runs the length of the property to the two wells. Along this road is a narrow band of vegetation, 3 to 6 ft. wide, which consists of mixed grasses and herbs. Bermuda grass or manienie (Cynodon dactylon) along with fimbriate paspalum (Paspalum fimbriatum) are common here. Other species include sensitive plant, Spanish clover, yellow foxtail, Henry's crabgrass (Digitaria ciliaris), Hilo grass (Paspalum conjugatum), false daisy (Eclipta alba), artillery plant (Pilea microphylla), and Indian dropseed (Sporobolus indicus).

Course gravel has been spread around the two wells and a brown-

colored concrete building. These gravel areas are largely barren with only a few scattered patches of weeds which consist mainly of buttonweed (Spermacoce assurgens), niruri (Phyllanthus debilis), and fir-leaved celery (Ciclospermum leptophylla).

DISCUSSION AND RECOMMENDATIONS

A weedy "lawn" composed primarily of wedelia and Spanish clover is found on the fenced Punalu'u Well III site. The vegetation is periodically maintained. The adjacent properties support a guava orchard and pasture land used for grazing cattle and horses. Historically, the area was under sugar cane cultivation (H. Hammett, pers. comm.).

Because the project site as well as the surrounding areas are disturbed there are no sensitive native plant communities on the project site. None of the plants found on the site are listed, proposed or candidate threatened and endangered species (U.S. Fish and Wildlife Service 1989, 1990, 1994). None of the plants are considered rare or vulnerable (Wagner et al. 1990). The only native plant observed on the site is ricegrass (Paspalum scrobiculatum), which is questionably indigenous, that is, it is a species for which a date of introduction or other information does not make for a clear argument for its dispersal to Hawai'i by natural or human-related mechanisms, but for which the weight of evidence suggests that it is probably indigenous (Wagner et al. 1990). It can be found in similar environmental habitats throughout the Hawaiian Islands.

Given the findings above, the proposed additions to the Punalu'u Well III site are not expected to have a significant negative impact on the botanical resources. There are no botanical reasons to impose any restrictions or conditions to these additions. No recommendations concerning the botanical resources are proposed at this time.

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Appendix C

AVIFAUNAL AND FERAL MAMMAL SURVEY FOR A BOARD OF
WATER SUPPLY EXPLORATORY WELL SITE AT PUNALUU, OAHU

Prepared for
CH2M Hill
by

Phillip L. Bruner
Assistant Professor of Biology
Director, Museum of Natural History
BYU-Hawaii
Environmental Consultant - faunal (Bird & Mammal) Surveys

19 April 1994

INTRODUCTION

The purpose of this report is to summarize the findings of a bird and mammal field survey of a proposed well site conducted on 7, 12 April 1994 at Punaluu, Oahu (Fig. 1). Also included are references to pertinent literature.

The objectives of the field survey were to:

- 1- Document what bird and mammal species occur on and near the property, or may likely be found there given the type of habitats available.
- 2- Determine the presence or likely occurrence of any native fauna, particularly any that are considered "Endangered" or "Threatened".
- 3- Evaluate the quality of the habitats for native wildlife and note any special or unique resources.

GENERAL SITE DESCRIPTION

Figure One indicates the location of the area surveyed for birds and mammals. The actual site proposed for the exploratory well is an open area that is regularly mowed. A fence surrounds

the property. Nearby lands are planted in guava and banana. The habitat at this elevation is a mixture of agriculture and second growth exotic forest.

Weather during the field survey was cloudy. Winds were from the east at 15-20 mph.

STUDY METHODS

Field observations were made with binoculars and by listening for vocalizations. The survey was conducted during mid-morning on 7 April and early morning on 12 April. Counts were made of all birds seen or heard (Table 1). Published accounts of birds known from similar habitat were also consulted in order to acquire a more complete picture of the possible species that might be expected in this area (Pratt et al. 1987), Hawaii Audubon Society 1993). Data on feral mammals were limited to visual observations.

Scientific names used in this report follow those given in Hawaii's Birds (Hawaii Audubon Society 1993); Field Guide to the Birds of Hawaii and the Tropical Pacific (Pratt et al. 1987) and Mammal Species of the World (Honacki et al. 1982).

RESULTS

Resident Endemic (Native) Land Birds:

No native resident land birds were observed on the survey. The only species in this category which may occasionally occur in this area and at this elevation is the Short-eared Owl or Pueo (Asio flammeus sandwichensis). Pueo are listed as an endangered species on Oahu by the State of Hawaii Division of Forestry and Wildlife. None were recorded on the survey. The number of Pueo on Oahu is probably quite low and their present abundance in the areas covered by this survey is unknown.

Resident Waterbirds:

One Black-crowned Night Heron (Nycticorax nycticorax) was seen flying over the property. This is the only native waterbird in Hawaii that is not listed as endangered. Habitat suitable for waterbirds does not occur on the proposed well site property. Nearby lands, however, do contain some wetland habitat in the form of taro patches, flooded pasture and stream drainages.

Seabirds:

No seabirds were observed on the survey. This site is unsuitable for seabirds due to predator access and human disturbance. There are only a few locations on Oahu where seabirds are nesting.

Migratory Indigenous (Native) Birds:

Three Pacific Golden-Plover (Pluvialis fulva) were recorded on the site. This species establishes a territory on lawns and other open habitats while in Hawaii and studies have shown that they return each year to the same territory (Johnson et al. 1981). Plover arrive in Hawaii from their arctic breeding grounds on the tundra in August and remain here until the spring migration in late April. They are the most abundant migratory bird in Hawaii. One other migratory species which also utilizes lawns and open fields is the Ruddy Turnstone (Arenaria interpres). No turnstone were seen on the survey.

Exotic (Introduced) Birds:

A total of 12 species of exotic birds were recorded during the field survey (Table 1). Pratt et al. 1987; Hawaii Audubon Society 1993 confirm that this assortment of introduced birds would be expected in this area. In addition the Barn Owl (Tyto alba), Japanese Bush-warbler (Cettia diphone), Java Sparrow (Padda oryzivora) and Nutmeg Mannikin (Lonchura malacca) are also known from this region.

Feral Mammals:

The introduced Small Indian Mongoose (Herpestes auropunctatus) was seen near the property. No trapping was conducted in order to assess the relative abundance of feral mammals. In addition rats, mice and feral cats undoubtedly also are common in this area.

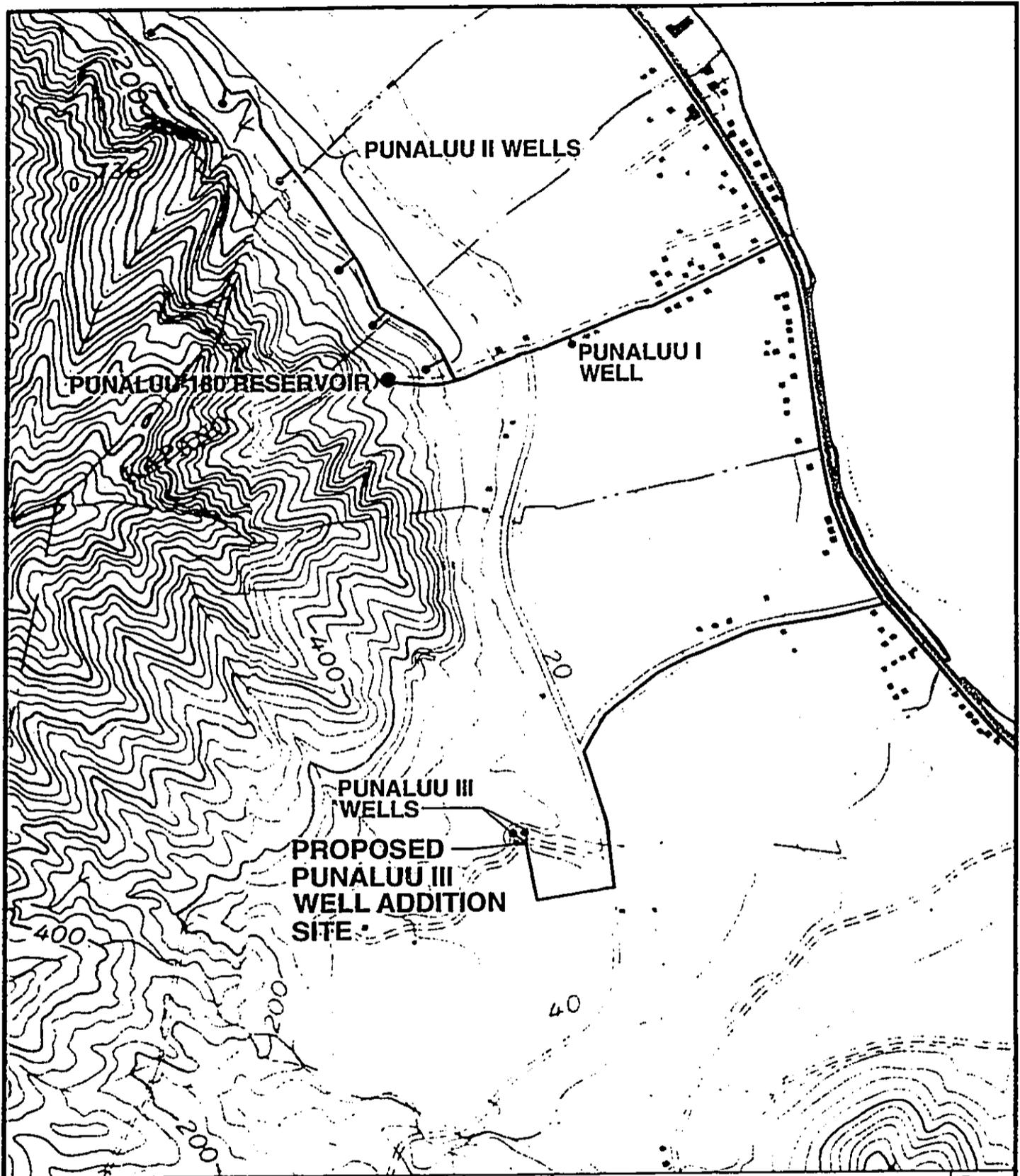
Oahu records of the endemic and endangered Hawaiian Hoary Bat (Lasiurus cinereus semotus) are limited (Tomich 1986; Kepler and Scott 1990). Data

on the bat's distribution and behavior are extremely limited. They are known to roost solitarily in trees and occur in upland forests as well as in coastal habitats. This species is insectivorous and forages at dusk.

DISCUSSION AND CONCLUSIONS

This field survey was necessarily brief and thus can provide only a limited perspective of the wildlife which utilize the area. The number and relative abundance of each species may vary throughout the year due to available food resources and reproductive success. Exotic species sometimes prosper only to later disappear or become a less significant part of the ecosystem (Williams 1987; Moulton et al. 1990). Long term studies could provide a more comprehensive view of the bird and mammal populations in a particular area. Nevertheless, some general conclusions related to birds and mammals at this site are provided. The following comments summarize the findings of this survey.

- 1- The site was traversed on foot. Counts of birds were used to make conclusions about estimated abundance at this location (Table 1).
- 2- The open, homogenous habitat on this property limits its value for all but a few species. Birds like Pacific Golden-Plover, Zebra Dove (Geopelia striata), Spotted Dove (Streptopelia chinensis), Common Myna (Acridotheres tristis) and finches such as Common Waxbill (Estrilda astrild) are most likely to utilize this site.
- 3- The proposed well should have no effect on bird and mammal populations in this area. No endangered or threatened species were recorded on the survey.



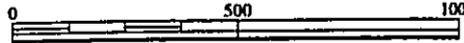
<i>Environmental Assessment</i> Punaluu III Well Addition CITY AND COUNTY OF HONOLULU - BOARD OF WATER SUPPLY	FIGURE 1
Location of Faunal (Bird and Mammal) Survey Punaluu, Oahu, Hawaii	
NORTH  	

TABLE 1

Introduced birds recorded at a proposed well site in Punaluu, Oahu. Number represents an average of the totals from the two visits to the site. These data provide an estimate of relative abundance.

COMMON NAME	SCIENTIFIC NAME	Average Number Recorded
Cattle Egret	<u>Bubulcus ibis</u>	1
Ring-necked Pheasant	<u>Phasianus colchicus</u>	3
Spotted Dove	<u>Streptopelia chinensis</u>	4
Zebra Dove	<u>Geopelia striata</u>	16
Common Myna	<u>Acridotheres tristis</u>	10
Red-vented Bulbul	<u>Pycnonotus cafer</u>	19
Northern Cardinal	<u>Cardinalis cardinalis</u>	2
Red-crested Cardinal	<u>Paroaria coronata</u>	3
Japanese White-eye	<u>Zosterops japonicus</u>	3
House Finch	<u>Carpodacus mexicanus</u>	6
Common Waxbill	<u>Estrilda astrild</u>	35
White-rumped Shama	<u>Copsychus malabaricus</u>	2

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Appendix D

Appendix D
Agencies and Others Provided a Copy of
the Draft Environmental Assessment

In the process of preparing an environmental assessment (EA), a draft EA is provided to government agencies and other groups or individuals. The comments of the governmental agencies and the other groups or individuals to the draft EA and the responses to these comments are included in the final EA submitted to the Office of Environmental Quality Control (OEQC). In the final EA for this project, the letters and comments are included in Appendix E.

Fifteen governmental agencies and three other groups or individuals were provided a copy of the draft EA for this project and were requested to provide comments. The following is a list of those agencies and others that were requested to provide comments.

Federal agencies

- U.S. Department of Agriculture, Soil Conservation Service
- U.S. Army Corps of Engineers, Pacific Ocean Division
- U.S. Fish and Wildlife Service

State of Hawaii agencies

- Department of Agriculture
- Department of Business, Economic Development, and Tourism
- Department of Land and Natural Resources
 - Forestry and Wildlife Division
 - Historic Preservation Division
 - Commission on Water Resources Management
- Department of Health
 - Environmental Management Division
 - Office of Environmental Quality Control
- University of Hawaii
 - Environmental Center
 - Water Resources Research Center

City and County of Honolulu agencies

- Planning Department ✓
- Land Utilization Department
- Public Works

Others

- City Council Member Steve Holmes
- Koolauloa Neighborhood Board No. 28
- Sierra Club, Hawaii Chapter

Appendix E

Appendix E
Comments and Responses to the
Draft Environmental Assessment

942919

RECEIVED
DEPARTMENT OF PUBLIC WORKS
COUNTY OF HONOLULU
400 SOUTH KING STREET
HONOLULU, HAWAII 96813

Nov 2 11 20 AM '94



KENNETH E. SPRAGUE
DIRECTOR AND CHIEF ENGINEER
DEPARTMENT OF PUBLIC WORKS
ENV 94-282

January 12, 1995

November 1, 1994

MEMORANDUM

TO: KAZU HAYASHIDA, MANAGER AND CHIEF ENGINEER
BOARD OF WATER SUPPLY

FROM: *KS* KENNETH E. SPRAGUE
DIRECTOR AND CHIEF ENGINEER

SUBJECT: DRAFT ENVIRONMENTAL ASSESSMENT (DEA)
PUNALUU III WELL ADDITION
TAX MAP KEY: 5-3-071 POR. 14

We have reviewed the subject DEA and have the following comment:
Best management practices (BMPs) should be applied to control drilling water discharge.

Should you have any questions, please contact Mr. Alex Ho, Environmental Engineer, at Local 4150.

TO: KENNETH E. SPRAGUE
DIRECTOR AND CHIEF ENGINEER
DEPARTMENT OF PUBLIC WORKS

FROM: *Raymond H. Sato*
RAYMOND H. SATO, ACTING MANAGER AND CHIEF ENGINEER
BOARD OF WATER SUPPLY

SUBJECT: YOUR MEMORANDUM OF NOVEMBER 1, 1994 ON THE DRAFT
ENVIRONMENTAL ASSESSMENT (EA) FOR THE PROPOSED
PUNALUU III WELL ADDITION. TMK: 5-3-071 POR. 14

Thank you for reviewing the Draft EA for the Punaluu III Well Addition project.

Best management practices will be implemented during the test pumping of the exploratory well to minimize potential pollution of receiving waters. Care will be taken in the disposal of the test water to preclude the possibility of flushing debris into the drainage ditch. Flow velocities will be dissipated to reduce any scouring effects.

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

cc: Mr. Bennett Mark, CH2M Hill

SM/BU:rk
cc: R. Sato
B. Usagawa

94-2949 (1/12)

JOHN WALKER
Acting Director of Natural Resources



STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
DIVISION OF FORESTRY AND WILDLIFE
1151 PUNCHBOWL STREET
HONOLULU, HAWAII 96813

KEITH W. JAMES, CHIEF ENGINEER
State of Land and Natural Resources

RECEIVED
JOHN WALKER'S
OFFICE

AQUACULTURE DEVELOPMENT
PROGRAM

AQUATIC RESOURCES
BOATING AND OCEAN
RECREATION AND
CONSERVATION AND
ENVIRONMENTAL AFFAIRS
CONSERVATION AND
RESOURCES ENFORCEMENT
CONSERVATION
FORESTRY AND WILDLIFE
HAWAIIAN FORESTRY
LAND MANAGEMENT
STATE PARKS
WATER AND LAND DEVELOPMENT

Mr. Barry Usagawa
Board of Water Supply
City & County of Honolulu
630 S. Beretania Street
Honolulu, HI 96843

November 2, 1994

Dear Mr. Usagawa:

RE: Request for Comments...Draft EA for Punaluu III Well Addition

We have reviewed the draft Environmental Assessment for the Punaluu III Well Addition and have no objections or comments regarding the subject matter. Thank you for the opportunity to comment.

Very truly yours,

Carl T. Masaki

Carl T. Masaki
Acting Administrator

cc: Cījāi ĩiil

January 6, 1995

Mr. Carl T. Masaki, Acting Administrator
Division of Forestry and Wildlife
Department of Land and Natural Resources
State of Hawaii
1151 Punchbowl Street
Honolulu, Hawaii 96813

Dear Mr. Masaki:

Subject: Your Memorandum of November 2, 1994 on the Draft Environmental Assessment (EA) for the Proposed Punaluu III Well Addition, TMK: S-3-07: Portion 14

Thank you for reviewing the Draft EA for the proposed Punaluu III Well Addition project.

We acknowledge that you have no objections or comments on the proposed project.

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

Very truly yours,

Raymond H. Sato

RAYMOND H. SATO
Acting Manager and Chief Engineer

cc: Mr. Bennett Mark, CH2M HILL

SM:rk
cc: R. Sato
B. Usagawa (1/12)

P-486/94

JOHN WARREN
GOVERNOR OF HAWAII



STATE OF HAWAII
DEPARTMENT OF HEALTH
P.O. BOX 3378
HONOLULU, HAWAII 96841

PETER A. STODOLSKY, PH.D.
DIRECTOR OF HEALTH

Interoffice Memorandum
EMOI

November 2, 1994

Board of Water Supply
City and County of Honolulu
630 South Beretania Street
Honolulu, Hawaii 96843

Attention: Mr. Barry Usagawa

Dear Mr. Usagawa: *Barry*

SUBJECT: PUNALUU III WELL ADDITION, DRAFT ENVIRONMENTAL ASSESSMENT

Thank you for the opportunity to review and comment on the subject document. We have examined the draft Environmental Assessment (EA) for the subject project and have the following comments to offer:

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. The draft EA indicates that the project will include the development of new sources of potable water. Section 11-20-29 of Chapter 20 requires that all new sources of potable water serving a public water system be approved by the 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.
3. 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 upon his review of the information submitted.

Mr. Barry Usagawa
November 3, 1994
Page 2

4. In an effort to clarify what is needed in the engineering reports and to minimize unnecessary delays in the review process, the following information is being provided to CH2M Hill:

- a. Safe Drinking Water Branch New Source Approval Process.
- SDWB New Source Approval Flowchart
- b. Guidelines for Preparation of Preliminary Engineering Reports for New Potable Water Sources.
- List of Minimum Required Contaminants to be Sampled and Analyzed
- Professional Engineer's Certification (sample form)
- c. Drinking Water Testing Laboratories Certified by the Hawaii Department of Health, State Laboratories Division.

Copies of the above guidelines have been previously sent to the Board of Water Supply.

5. Section 11-20-30 requires that new or substantially modified distribution systems for public water systems be approved by the Director. However, if the water system is under the jurisdiction of the City and County of Honolulu, the Board of Water Supply will be responsible for the review and approval of the plans.

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

Sincerely,

William Wong
WILLIAM WONG, P.E., Chief
Safe Drinking Water Branch

QT:la

c: CH2M HILL
Attn: Mr. Bennett Mark
1585 Kapiolani Blvd., Suite 1420
Honolulu, Hawaii 96814-4530
(with enclosures)

January 6, 1995

Mr. William Wong, P.E., Chief
Safe Drinking Water Branch
Department of Health
State of Hawaii
P. O. Box 3378
Honolulu, Hawaii 96801

Dear Mr. Wong:

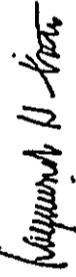
Subject: Your Letter of November 2, 1994 on the Draft Environmental Assessment (EA) for
the Proposed Punaluu III Well Addition. TMK: 5-3-07; Portion 14

Thank you for reviewing the Draft EA for the Punaluu III Well Addition project and for providing the requirements for an acceptable engineering report. We have the following response to your concerns:

1. We understand our proposed project is required to comply with the Hawaii Administrative Rules (HAR), Section 11-20-29, Rules Relating to Potable Water Systems. We shall comply with all Department of Health requirements, including the submission of an engineering report to obtain certification of the well if test pumping is successful.
2. Regarding HAR, Section 11-20-30, the water system to which the Punaluu III Well Addition will be interconnected is under the jurisdiction of the Board of Water Supply (BWS). Therefore, BWS will be responsible for the review and approval of the construction plans for the project.

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

Very truly yours,



RAYMOND H. SATO
Acting Manager and Chief Engineer

cc: Mr. Bennett Mark, CIZM HII

SM:rk
cc: R. Sato (1/12)
B. Usagawa



STATE OF HAWAII

DEPARTMENT OF LAND AND NATURAL RESOURCES

STATE HISTORIC PRESERVATION DIVISION
33 SOUTH KING STREET, 8TH FLOOR
HONOLULU, HAWAII 96813

November 3, 1994

Mr. Bennett Mark
CH2M HILL
1585 Kapiolani Blvd, Suite 1420
Honolulu, Hawaii 96814-4530

Dear Mr. Mark:

SUBJECT: Historic Preservation Review: Draft Environmental Assessment (DEA), Punaluu III Well Addition Punaluu, Ko'olaupua, O'ahu
TRK: 5-3-07: POF. 14

LOG NO: 13025
DOC NO: 9410EJ13

- ELIZABETH CHAIKELSON
BOARD OF LAND AND NATURAL RESOURCES
- DEPUTIES
- JOHN P. LUMPLER
- DOMA L. MANUKE
- AQUACULTURE DEVELOPMENT PROGRAM
- AQUATIC RESOURCES CONSERVATION AND RESTORATION
- ENVIRONMENTAL AFFAIRS
- CONSERVATION AND RESTORATION
- RESOURCES IMPROVEMENT CONTRACTS
- FORESTRY AND WILDLIFE RESTORATION
- LAND MANAGEMENT
- STATE PARKS
- PLANNING
- WATER AND LAND DEVELOPMENT

January 6, 1995

Mr. Don Hibbard, Administrator
State Historic Preservation Division
Department of Land and Natural Resources
State of Hawaii
33 South King Street
Honolulu, Hawaii 96813

Dear Mr. Hibbard:

Subject: Your Letter of November 3, 1994 on the Draft Environmental Assessment (EA) for the Proposed Punaluu III Well Addition. TRK: 5-3-07: Portion 14

Thank you for reviewing the Draft EA for the proposed Punaluu III Well Addition project.

We acknowledge your determination that the proposed project will have no effect on any historic sites because past agricultural operations have significantly disturbed this area.

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

Very truly yours,

RAYMOND H. SATO
Acting Manager and Chief Engineer

cc: Mr. Bennett Mark, CH2M HILL

SM:rk
cc: R. Sato
B. Usagawa (1/12)

Thank you for the opportunity to review the DEA for the Punaluu Well III Addition. A review of our records shows that there are no known historic sites at this parcel. Aerial photos taken in the 1970s show that this area has been cleared and graded and used for commercial agriculture. Because past cultivation and development would have destroyed any historic sites that might have been present we believe that the well addition will have "no effect" on historic sites.

The DEA incorporates the findings of an archaeological reconnaissance survey report which agrees with our assessment that historic sites are unlikely to be found at the project location. The documents has been added to our library, where it will be useful for information purposes.

Sincerely,

Don Hibbard, Administrator
Historic Preservation Division

EJ:jk

DEPARTMENT OF LAND UTILIZATION
CITY AND COUNTY OF HONOLULU
430 SOUTH KING STREET
HONOLULU, HAWAII 96813 • PHONE 533-4432



IRENE HARRIS
MAYOR

DONALD A. CLEGG
DIRECTOR
LOKETALEC CHASE
94-07859 (DF)

JANUARY 11, 1995

November 7, 1994

MEMORANDUM

TO: KAZU HAYASHIDA, MANAGER AND CHIEF ENGINEER
BOARD OF WATER SUPPLY

FROM: DONALD A. CLEGG, DIRECTOR
DEPARTMENT OF LAND UTILIZATION

SUBJECT: SPECIAL MANAGEMENT AREA REVIEW

Tax Map Key : 5-3-7: por. 14
Type of Project: Punaluu III Well Addition

The above proposed project has been reviewed. We find that it:

- [X] Is not within the Special Management Area.
- [] Is within the Special Management Area, but is not defined as "development" and is therefore, exempt (Section 25-1.3 [2], Chapter 25, Revised Ordinances of Honolulu).

Should you have any questions, please contact the Environmental Review Branch at 523-4077.

Very truly yours,

Donald Clegg
DONALD A. CLEGG
Director of Land Utilization

DAC:dt
G194-07859.djt

cc: / CH2M Hill (Bennett Mark)

TO: PATRICK ONISHI, DIRECTOR
DEPARTMENT OF LAND UTILIZATION

FROM: *Raymond H. Sato*
RAYMOND H. SATO, ACTING MANAGER AND CHIEF ENGINEER
BOARD OF WATER SUPPLY

SUBJECT: YOUR MEMORANDUM OF NOVEMBER 7, 1994 ON THE DRAFT ENVIRONMENTAL ASSESSMENT (EA) FOR THE PROPOSED PUNALUU III WELL ADDITION. TMK. 5-3-07: POR. 14

Thank you for reviewing the Draft EA for the proposed Punaluu III Well Addition project.

We acknowledge your determination that the proposed project is not within the Special Management Area.

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

cc: Mr. Bennett Mark, CH2M Hill

SMrk
cc: R. Sato
B. Usagawa (1/12)
94-3010

PLANNING DEPARTMENT
CITY AND COUNTY OF HONOLULU
550 SOUTH KING STREET
HONOLULU, HAWAII 96813



IDENTY MARKED
5-110

CHERYL D. SOON
ACTING CHIEF PLANNING OFFICER
CAROLL TAKAHASHI
DEPUTY CHIEF PLANNING OFFICER

December 2, 1994

MH 10/94-4516

January 6, 1995

MEMORANDUM

TO: KAZU HAYASHIDA, MANAGER AND CHIEF ENGINEER
BOARD OF WATER SUPPLY

FROM: CAROLL TAKAHASHI, ACTING CHIEF PLANNING OFFICER
PLANNING DEPARTMENT

SUBJECT: DRAFT ENVIRONMENTAL ASSESSMENT (DEA) FOR PUNALUU III
WELL ADDITION, PUNALUU, KOOLAULOAA, OAHU, HAWAII.
TAX MAP KEY: 5-3-07: PORTION 14

TO: CHERYL D. SOON, CHIEF PLANNING OFFICER
PLANNING DEPARTMENT

FROM: RAYMOND H. SATO, ACTING MANAGER AND CHIEF ENGINEER
BOARD OF WATER SUPPLY

SUBJECT: YOUR MEMORANDUM OF DECEMBER 2, 1994 ON THE DRAFT
ENVIRONMENTAL ASSESSMENT (EA) FOR THE PROPOSED
PUNALUU III WELL ADDITION PROJECT. IMK. 5-3-07: POR. 14

We have reviewed the subject DEA and have the following comments to offer:

1. The subject site is currently designated for Agriculture use on the Koolauloa Development Plan Land Use Map.
2. The Koolauloa Development Plan Public Facilities Map (DPPFM) shows a symbol for a publicly funded well, site determined, within six years, in the general vicinity of the subject site.
3. We have no objections to the proposed exploratory well which is considered to be consistent with the Koolauloa DPPFM.

Should you have any questions, please contact Matthew Higashida of our staff at 527-6056.

Caroll Takahashi

CAROLL TAKAHASHI
Acting Chief Planning Officer

CT:ft

cc: CH2M HILL
OEQC

Thank you for reviewing the Draft EA for the proposed Punaluu III Well Addition project.

We understand that the subject site is currently designated for agricultural use on the Koolauloa Development Plan Land Use Map. We acknowledge that you have no objections to the proposed project which is consistent with the Koolauloa Development Plan Public Facilities Map.

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

cc: Mr. Bennett Mark, CH2M HILL

SM:rk

cc: R. Sato

B. Usagawa

P-515/94



KOOLAULOA NEIGHBORHOOD BOARD NO. 28
(Kohala, Lele, Hauula, Punaluu, Keolu-Kahala)

40 HAUULA SATELLITE CITY HALL • 64-010 KUKUNA ROAD • HAUULA, HAWAII 96717

December 18, 1994

Mr. Barry Usagawa
Board of Water Supply
630 South King Street
Honolulu, HI 96813

Dear Mr. Usagawa:

Having reviewed the Draft Environmental Assessment for Punaluu Well III Addition, the Ko'olauloa Neighborhood Board would like to offer the following comment:

Ko'olauloa Neighborhood Board #28 contends that it is imperative that there be sufficient water reserved for agricultural and residential uses in Ko'olauloa. The Board opposes all proposals to transport water from the Ko'olauloa district until the district's present and future needs have been determined.

Thank you for the opportunity to offer this input. Please keep us informed of all dispositions of this matter.

Sincerely yours,

MaryAnne Long
MaryAnne Long
Water Committee, Chair

cc: CH2M Hill
Councilmember Steve Holmes
Office of Environmental Quality Control

January 6, 1995

Mr. Mary Anne Long
Water Committee, Chair
Ko'olauloa Neighborhood Board No. 28
c/o Hauula Satellite City Hall
54-010 Kukuna Road
Hauula, Hawaii 96717

Dear Mr. Long:

Subject: Your Letter of December 18, 1994 On the Draft Environmental Assessment (EA) for the Proposed Punaluu III Well Addition. TMK: 5-3-07; Por. 14

Thank you for reviewing the Draft EA for the proposed Punaluu III Well Addition Project. We have the following response to your concerns:

1. Water pumped from the Punaluu III Well Addition would first be used to meet the domestic needs of consumers within the Ko'olauloa district. Water in excess of this need should be available for customers in other areas.
2. The Board of Water Supply also provides agricultural water to small agricultural water users but requires nonpotable water be used for large landscaped areas whenever an adequate nonpotable water source is or becomes available. The availability of potable water will be confirmed when formalized plans are submitted for our review and approval.

We will keep you informed of progress of this project.

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

Very truly yours,

Raymond H. Sato
RAYMOND SATO
Acting Manager and Chief Engineer

cc: Bennett Meek, CH2M Hill

SM/TUJ
cc: R. Sato
B. Usagawa (1/p)





United States Department of the Interior

FISH AND WILDLIFE SERVICE

Pacific Islands Ecoregion
300 Ala Moana Blvd, Room 6307
P.O. Box 50167

Honolulu, Hawaii 96850

DEC 19 1994

DEA
Punaluu III Well Addition
Punaluu, Koolauloa, Oahu, Hawaii

The Service appreciates the opportunity to provide these comments. If you have any questions regarding our comments, please contact Fish and Wildlife Biologist Arlene Pangeliman at 808/541-3441.

In Reply Refer To: AAP

Mr. Barry Usagawa
Board of Water Supply
City and County of Honolulu
630 South Beretania Street
Honolulu, Hawaii 96843

Sincerely,

Brooks Harper
Field Supervisor
Ecological Services

Re: October 1994 Draft Environmental Assessment (DEA) for the Punaluu III Well Addition, Punaluu, Koolauloa, Oahu, Hawaii TMK: 5-3-07; portion of 14

cc: CWB, Hawaii

Dear Mr. Usagawa:

The U.S. Fish and Wildlife Service (Service) has reviewed the above-referenced document for the development of an additional water well at the Punaluu Well III site in Punaluu, Oahu, Hawaii. The proposing agency is the City and County of Honolulu's Board of Water Supply (BWS). The Service offers the following comments for your consideration.

The proposed action involves the drilling and casing of an exploratory water well on 0.8 hectare (1.97 acres) of BWS property in order to obtain hydrogeological data for potential new groundwater resources. A well pump test will be conducted to determine whether the quantity and quality of the water from the exploratory well is suitable for development. Positive results from the pump test may result with the incorporation of the well into the BWS's permanent production facilities. The water well is expected to yield 0.5 million gallons per day (MGD) of potable water.

The Service does not anticipate significant adverse impacts to fish and wildlife resources from implementation of the proposed action. The affected site lacks federally threatened or endangered species, rare species, and wetland areas. Therefore, the Service does not object to the proposed action provided that all necessary local and state permits are secured.

January 6, 1995

Mr. Brooks Harper, Field Supervisor
Fish and Wildlife Service
United States Department of the Interior
300 Ala Moana Boulevard, Room 6307
P. O. Box 50167
Honolulu, Hawaii 96850

Dear Mr. Harper:

Subject: Your Letter of December 19, 1994 on the Draft Environmental Assessment
(EA) for the Proposed Punaluu III Well Addition. TMK: 5-3-07: Portion 14.

Thank you for reviewing the Draft EA for the proposed Punaluu III Well Addition project.

We acknowledge your determination that there are no anticipated significant adverse impacts to fish and wildlife resources from the proposed project because the affected site lacks federally threatened or endangered species, rare species and wetland areas. All necessary local and state permits will be obtained prior to any construction.

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

Very truly yours,



RAYMOND H. SATO
Acting Manager and Chief Engineer

cc: Mr. Bennett Mark, CH2M Hill

SM/BU:rk

cc: R. Sato

B. Usagawa (1/12)

PLA-124/94

The Hawai'i — Lā'ieikawai Association, Inc.

P.O. Box 720, Keolu, Hawaii 96720 • Phone (808) 237-7015/(808) 237-7339 • Fax (808) 237-8962

December 15, 1994

By Fax Transmission. Hard Copy by Certified U.S. Mail

Office of Environmental Quality Control
220 South King Street, 4th Floor
Honolulu, Hawaii 96813

Mr. Barry Usagawa
Board of Water Supply
630 South Heretania Street
Honolulu, Hawaii 96843

Gentlemen:

We have reviewed the Draft Environmental Assessment ("EA") entitled "Punaluu (SIG) III Well Addition," located at Punaluu (SIG), Koolauloa (SIG), Oahu (SIG), Hawaii (SIG) TMK: 5-3-07: Portion 14. The proposing agency is City and County of Honolulu, Board of Water Supply.

A draft EA is no less an instrument of disclosure than an Environmental Impact Statement is. We submit, further, that a draft EA which seeks a negative declaration ought particularly to be an instrument of full disclosure - its premises must be such as to withstand prudent, carefully crafted, even hostile scrutiny. The range of issues covered in an EA which seeks a negative declaration ought to be "wide and deep" rather than being "narrow and shallow." If it errs anywhere it ought to err on the side of caution for only then can potential impact assessment be gaged in any meaningful way. **THIS DRAFT EA IS SERIOUSLY FLAWED.** A full EIS must be required.

In particular your attention is drawn to the following specific issues:

Section of Draft EA Comment

- 1.4 Public trust implication not considered. See Constitution, State of Hawaii, Article XI, Sections 2 & 9.
- 1.5 Costs of alternatives not specified. Speculation only.
- 1.6 Stream impact inadequately addressed. Cumulative impact not addressed. No empirical evidence adduced to support bold assertions with no empirical data provided to substantiate. Does not

The Hawai'i — Lā'ieikawai Association, Inc. is a non-profit corporation whose activities include research and education related to Hawaiian cultural issues and the environment

address impact of this and other wells on estuarine water quality. Impact on wetlands: Again assertions are speculation. No supporting empirical data.

1.7 Disclosure is completely inadequate. EIS is required, therefore, under Chapter 343.

2.3 The alleged compartmentalization of aquifers is not conclusive by any means.

2.4 Sustainable Yield is a concept of dubious utility. Professional literature not reviewed adequately - See Bredehoeft, J. D., Papadopoulos, S. S. and H. H. Cooper, Jr. "Groundwater: The Water-Budget Myth" in Scientific Basis of Water-Resource Management, National Academy Press, Washington, D.C., 1982.

2.6 The 16 Board of Water Supply ("BWS") wells, 8 tunnels, 4 inclined wells and 15 reservoirs: Cumulative impact on surface water. No disclosure, assessment or empirical data provided. The cumulative impact of groundwater taking on underflow to near shore waters is not assessed, not even mentioned. This is a serious omission.

4.1.1 Does not mention Kuleana lands in Punaluu with correlative, appurtenant or riparian rights and how these rights might be impacted by further unconstitutional taking of water. Kuleana landowners' water rights are property rights.

¹ Some scientists also refer to this as "submarine discharge."

² See in particular footnote 1, p.2 letter re Punaluu wells to Keith Ahue, Chair, Commission on Water Resource Management, July 22, 1994. Text of letter attached hereto and made a part hereof. Another letter on the same subject dated July 23, 1994 is attached hereto and made a part hereof. We hasten to point out that the issues raised in both these letters have not yet been addressed by the Commission; neither has our application for a Contested Case Hearing.

4.3.2

20 wells cumulative impact on surface water, underflow into estuaries not addressed. Inadequate disclosure. This, to repeat, is a serious omission. Again, wetlands impact assessment is cursory and amounts to inadequate disclosure re impact. No empirical data to support conclusions.

6.1

BWS legal mandate is constrained and limited by public trust and other considerations. Cumulative impact of wells on surface water and underflow to nearshore waters and the Hawai'i State Water Code (particularly, in this case, §174C-71 (1) (c) and §174C-71 (4) - all are relevant. None of these issues are addressed.

Chapter 9

Works cited shows paucity of reliance on professional literature - for example Bredehoeft et al (1982.)

In addition we have grave doubts about the quite cursory archaeological findings. By either default or design the map facing page 2-6 showing existing wells and proposed well addition site (Figure 2-2) does not show streams and their relationship to the location of wells.

Moreover, we notice with some alarm and not a small amount of suspicion, that NOAA (which has coastal zone impact responsibilities), USGS (which has an abundance of expertise in many complex areas ever so lightly traversed in the draft EA) and the State Division of Aquatic Resources (which has a vital interest in streams and near shore water quality and whose staff spoke out in quite clear terms on Makua well drilling) have all been bypassed in the consultation process and so also has the Coastal Zone Management Program in OSP. Comments from these agencies are vital to any reasonable determination of impact and the consequent necessity for an EIS.

The draft EA ought to answer all of the foregoing questions and comments. It is the applicant, not the public, I stress most strongly, who has the obligation to show, on the basis scientifically derived procedures that there is "no significant impact" on streams, estuaries, marine and stream life, as well as ecosystem impacts. Mere assertions are not science.

In summary, this groundwater development EA is essentially based on a groundwater balance of the Punalu'u

Can Mattson

area. Although providing some hydrologic information, the water balance cannot be used to determine or assess the sustainable yield of the aquifer system. No ground water modelling has been done. The EA also assumes that surface and groundwater are essentially independent despite brief, tattered and rather casual statements interspersed throughout the report. Additional groundwater development can be expected to influence and affect surface water. The magnitude and location of these impacts remain unknown. The applicants' EA is, as already mentioned, fatally flawed.

Sincerely

J. M. Anthony, Ph.D., Executive Director,
Hawai'i-La'ieikawai Association

Creighton U. Mattson

Creighton U. Mattson, President
Punalu'u Community Association

Encl.

water\punalu'u\ea12115.1st

The Hawai'i — Lā'ieikawai Association, Inc.

P.O. Box 720, Kā'ala, Hawai'i 96730 • Phone (808) 237-7015/(808) 237-7339 • Fax (808) 237-8962

July 22, 1994

Mr. Keith Ahue, Chair
Commission on Water Resource Management
Department of Land and Natural Resources
Kalanimoku Building
1151 Punchbowl Street
Honolulu, Hawai'i 96813

Dear Mr. Ahue

Koolau (sic) Agricultural Co., Ltd., Application for Well Construction Permits, Makali'i (sic) Exploratory Wells I, II, and III, (Well Nos. 3452-02, 3453-12 & 13), Punahoa (sic), Oahu (sic)

We hereby confirm in writing our intention to seek a contested case hearing notice of which we gave you verbally at the commencement of the Commission's meeting on Wednesday, July 13, 1994 when I met to discuss the aforementioned matter. This notice in writing is being provided to you consistent with the requirements of Chapter 13-167, Hawai'i Administrative Rules, entitled "Rules of Practice and Procedure for the Commission on Water Resource Management". This application is based specifically on HAR 13-167-51 & 52 which gives the Commission the specific authority/jurisdiction to deal with the contested case hearing requested herein.

The bases for this request for a contested case hearing are as follows:

(1) The application is incomplete and does not meet the requirements of Chapter 174C, specifically, Section 174C-84 (a). The well construction application permit must be made by the well driller who will construct the well. We can find no evidence in the record that the application currently before the Commission was in fact made by the well driller. Furthermore, Section 174C-84 (c) calls for a review of the well construction and pump installation permit by the Dept. of Health for "compliance with their rules and standards concerning, among other things, the appropriateness of the well location." We can find no record of this having been done.

Further, this application is not based on empirical findings derived from ground water modelling studies. What 'soft' data are provided lurk in the files of the Commission. These files have apparently not been recently examined by the Commission's staff. The Mink and Yuen unpublished paper, Kahana Aquifer System Water Balance and Sustainable Yield (March 26, 1992) is a text book example of sloppy science which gives this entire application, to quote John Mink's prose back to him, a "vaporious" quality, "drifting with the breeze of ambition"---and, if I may add, Mink and

Yuen's fortunes. The material from Mink and Yuen attached to Matsubara, Lee and Kotake's letter of February 26, 1993, and marked as Attachments "A" and "B", are "vaporious" in as much as they are unsupported by any empirical evidence whatsoever thus rendering this application incomplete.

(2) The petitioners' interests that may be affected:

Petitioners and/or their members and affiliates live either in the ahupua'a of Punalu'u or within the larger Ko'olauloa area which is a designated water management area. Specifically, the following members/affiliates of the petitioners have property interests within the ahupua'a of Punalu'u in very close proximity to where it is proposed that these three wells will be drilled:

1. Eli Keolanui (TMK 5-3-007:016);
2. Glennon Trevenen (TMK 5-3-007:013);
3. Didi Herron representative for Elsa and Charles Mai (TMK 5-3-005:003);
4. Cathleen Mattoon (TMK 5-3-005:035);
5. Catalpa Kong (TMK 5-3-007:001);
6. Dalores A. Welling and Balfour Financial (TMK 5-3-005:007). This 50 acre property includes the following Kuleaha parcels:
LC AW 6955 Apana 1 to Kaunooana
LC AW 4350 Apana 1 to Kaunooana
LC AW 3752 Apana 6 to Ukaele
LC AW 10771 Apana 1 to Piliama
LC AW 6954 Apana 1 to Kabaa
LC AW 4437 Apana 2 to Kaiti
LC AW 6954 Apana 3 to Kabaa

The petitioners are prepared to argue on behalf of these property owners, who will themselves testify in their own behalf, that they have already been adversely impacted by the illegal taking of water (the property interests/rights at issue here) by the subject applicants. Taking into account the very substantial sum (approximately \$240,000) which the applicants say they are likely to spend on the drilling of three so called exploratory wells the property owners and we, their petitioner representatives, have very little doubt that applicants will argue that by the expenditure of this very substantial amount of money their rights to transfer

The property interests to which reference is made here and which the petitioners and property owners seek to protect are "property" within the meaning of the due process clauses of the Federal and State Constitutions--see Aguilar, 55 Haw. at 495, 522 P.2d at 1266; Sandy Beach Defense Fund v. City Council, 70 Haw. 361, 377, 773 P.2d 250, 260 (1989) (quoting Board of Regents v. Roth, 408 U.S. 564, 577, 92 S.Ct. 2701, 2709, 33 L.Ed.2d 548, 561 (1972)).

water outside of the aquifer of origin (which attorney for the applicants has already admitted on the record is for the sole purpose of out of watershed transfer) will have been vested. The granting of any so called exploratory well drilling permit thus plays into the hands of the applicants and immediately further imperils the property interests of the property owners listed above.

So, in sum, what is at issue here? In substance, the transfer of millions of gallons of water which the applicants already know is in this so called "self contained" aquifer (see "A" attached hereto). The granting of any well drilling permit adds thrust to the illegal taking of property rights along an already established trajectory (the metaphor, "seamless web", better describes reality). This process exacerbates the illegal taking of property interests and rights of the aforementioned property owners who have riparian, appurtenant and correlative water rights ("property rights" as herein defined--see footnote 1 hereof). Some of them also have hunting and gathering rights which are intimately and systemically connected with the well being of the entire watershed ecosystem and the nearshore marine ecosystem all of which have been damaged by the transference of millions of gallons of water into the public integrated water supply system as well as by illegal actions taken by the applicants--for example, the 18" pipe diversion of water from around Tunnel No. 10 in the Punalu'u flume system. This is a matter that has been brought to the attention of the Commission on several occasions to no effect.

As argued here we make explicit that the taking of more water will continue in a seamless web with the granting of any exploratory well permit. We further submit to you that in the circumstances of this particular application that as soon as any well construction permit is granted the unconstitutional and illegal taking of property rights of property owners listed herein, and others in a similar situation, will proceed along the seamless web of taking that is already in place. We seek deliberately to disabuse you of the view that seemed to be implicit in the tenor and substance of some of your questions at the public hearing on July 13 when you may have been trying to intimate that the granting of exploratory well permits may only open up the possibility of property rights being infringed. We strongly reject such a notion as being paltry and quite without foundation. Any exploratory well permit in these circumstances is in fact a water use within the meaning of the State of Hawai'i Water Code, Chapter 174-C.

(3) With respect to "the disagreement, denial, or grievance which is being contested by the petitioner(s)" we hereby point out, in

These rights include, but are not limited, to those that derive from the Kuleana Act of 1850 also known as Haw. Rev. Stat. Section 7-1.

addition to what has already been set out above and has become part of the fabric of this petition, that the Commission in its wisdom chose not to make any decision on this matter. It is our belief that we are entitled as a matter of law to have this matter decided in another "domain"--that of the contested case hearing. The disagreement or grievance which we have with the Commission, in part, is that since the application is incomplete in several respects, it should not even have been heard.

(4) The basic facts and issues are those set out in testimony presented to the Commission by the petitioners and their hydrologist/geologist consultant, Mr. Freeman. All of that testimony has already been presented in writing and verbally to the Commission on the record and it is all incorporated herein and made a part hereof.

(5) Some basic facts:

(i) Exploratory well drilling has already been accomplished in this so called "stand alone" aquifer. See Attachment "A" appended hereto. The application for exploratory wells now being made is redundant.

(ii) No less an authority than John Mink says: "The Makalii (sic) basal aquifer has not been utilized for three decades even though it is easily accessible and is a proven water resource (emphasis added). If it is indeed a proven water resource exploratory wells are unnecessary. Apparently, the applicants should be filing a water use permit application since they assert that it is a proven water source."

(6) The relief to which the party or petitioner seeks or deems itself entitled:

Petitioner/s on behalf of property owners listed herein, as well as others, seek full protection of their statutory and other rights specifically delineated herein. They seek the resolution of existing disputes of which notice has been given to the Commission. They seek restoration of their water rights. They seek, especially, to prevent further illegal taking of their property interests which the granting of exploratory well permits (a water use within the meaning of the State Water Code) will trigger. They seek protection for Punalu'u stream already damaged, illegally realigned and deepened. They seek protection of estuaries and

Mink and Yuen, Inc., March 26, 1992 unpublished paper, "Kahana Aquifer System Water Balance and Sustainable Yield," P. 6. This paper as well as another by John Mink, "Windward Designation Commentary," December 1992 are both attached hereto and marked "B" and "C" respectively.

estuarine water quality from further adverse impacts which may now, or in the future, diminish or lessen stream life or marine life. The only way for these issues to be fully and fairly addressed is to permit the petitioners and the impacted property owners listed herein (as well as others who may wish to join them) to present their respective cases at a contested case hearing where they can exercise all of the rights that they have to adduce evidence and to conduct relevant discovery, that is, the exercise of their due process rights.

The foregoing constitute all of the areas that call for concise statements required by Section 13-167-51 to 54. We wish further to emphasize that the Commission's jurisdiction to hear this petition is based upon the State Water Code, Chapter 174C of the Hawaii Revised Statutes. It provides for contested case hearings under HRS, Section 174C-60 and Haw. Admin. Rules Section 13-167-51 to 54. Further, by what we see as necessary repetition, HRS, Section 174C-82 sets forth the Commission's authority to regulate well construction in the State of Hawaii.

Sincerely yours

Augustine M. Mattoon
Augustine M. Mattoon, President
for Punalu'u Community Association

John Mink
John Mink, Executive Director
The Hawaii'i-Lā'ieikawai Association, Inc.

Attachments: A, B, & C

cc: Keolanui
Trevenen
Herron
Mattoon
Kong
Welling

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The Hawaii'i — Lā'ieikawai Association, Inc.

P.O. Box 720, Kalaheo, Hawaii'i 96740 • Phone (808) 237-7015, (808) 237-7239 • Fax (808) 237-8962

July 23, 1994

By Fax (507-0219) & Certified U.S. Mail

Mr. Keith Ahue, Chair
Commission on Water Resource Management
Department of Land and Natural Resources
Kalanimoku Building
1151 Punchbowl Street
Honolulu, Hawaii'i 96813

Dear Mr. Ahue

Supplementary submission¹ for Contested Case Hearing

Ko'olau Agricultural Company's application to drill three exploratory wells in Punalu'u

The following additional points would be raised by the undersigned petitioners at the contested case hearing and are here set out in outline only to demonstrate to the Commission that these are substantive issues not so far addressed:

1. The so called "stand alone" aquifer which John Mink christened "Makali'i Isici" and the rather extravagant claims that he makes for its being separate, distinct and without any connection to any other aquifer appear not to be supported by research derived data. Mink's claims may in fact be defective and in need of revision. The Commission, in the interests of prudence should call on the USGS to comment on this matter on the record and in public.
2. The Commission should not pay as much attention to the measurable effect of each well on surface water but to the cumulative effect of several wells which are drilled as exploratory wells and continue on to become production wells. When ground water is taken via a number of wells there is an accretion factor that appears to escape the Commission's attention. Measuring the impact of one well at a time on surface water ignores, underplays and misstates the cumulative impact of several wells on surface water. Here again, the USGS should be invited by the Commission to comment on this apparently important factor in public and on the

¹A formal application for a contested case hearing in the matter which is the subject of this supplementary memorandum was filed with the Commission on Water Resource Management at 11.50 a.m. on July 22, 1994.

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record. The failure of the Commission to do so is a serious omission.

3. The argument which has been made, I believe, and which may or may not be in the Commission's records, is that because there is allegedly 700 feet of alluvium under Punalu'u Stream that this provides an impervious barrier and therefore negates the possibility of there being any groundwater/surface water relationship, may well be another one of those "vaporous" theories unsubstantiated by any replicable empirical evidence. If this is indeed being said by anyone you should insist that it be put in writing and that the data that support this claim be subject to examination by all parties which have an interest in this matter.

4. There are other aspects of wells and their relationship to surface water--some rather subtle but important--which may have been underplayed by the applicants and their spokesmen, including John Mink. The Commission is urged, in the interests of the wise management of the resource as well as ensuring that we as petitioners get administrative due process, to secure competent second opinions. We suggest, with respect, that the USGS is a competent kindred government agency which can provide such necessary independent second opinions in the public interest.

We formally request that these supplementary points be included in the formal petition submitted on July 22 to the Commission and hand delivered to it on that day. We give notice that at a contested case hearing we will invite the USGS, since the Commission itself has not gone so yet, to testify on the record on the foregoing issues and matters related to them.

Sincerely yours

Creighton U. Mattoon
Creighton U. Mattoon, President
Punaluu Community Association

John Anthony
John Anthony, Executive Director
The Hawaii Laieikawai Association, Inc.

xc: Keolanui
Trevenen
Herron
Mattoon
Kong
Welling

clp/10/95/41

Dr. J. M. Anthony
The Hawaii Laieikawai Association, Inc.
Mr. Creighton U. Mattoon
Punaluu Community Association
P. O. Box 720
Kaunawa, Hawaii 96730

Dear Dr. Anthony and Mr. Mattoon:

Subject: Your Letter of December 15, 1994 on the Draft Environmental Assessment (EA) for the Punalu'u III Well Addition

Thank you for your letter dated December 15, 1994. Although your letter was received after the December 8, 1994 regulatory deadline for comments on the Draft EA, we will incorporate your comments in the Final EA document.

The Environmental Disclosure Process:

We do not agree with your statement that an EA is no less a disclosure instrument than an Environmental Impact Statement (EIS). The State of Hawaii EA process does not require the same intensity of analysis as is required for an EIS. The procedures for preparing an EA and an EIS are specified by statute, and by rules and regulations, which have been followed in the preparation and processing of the Draft EA document.

State law provides that a Draft EA be prepared to determine if certain classes of action may have an environmental effect, and if that environmental effect is determined to be significant enough to warrant the preparation of an EIS, that an EIS be prepared. There are considerable differences in the level of analysis, the procedures for agency and public review, and the regulatory requirements for an EA as compared to the much greater effort required for an EIS. Both EA's and EIS's must be prepared in accordance with the requirements set forth in Chapter 343 HRS and in Title 11, Chapter 200 HAR, relating to the preparation of environmental reports.

Additionally, we do not agree with your characterization that the consultation and the agency and public review process used for this Draft EA were suspicious or flawed. The consultation and the agency and public review process used for the Draft EA are consistent with the applicable requirements relating to the preparation of environmental assessments. All agencies that were consulted are listed in Chapter 8. All agencies, individuals and organizations that were sent copies of the Draft EA are listed in Appendix D.



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The official notice of availability of the draft EA was published in the November 8, 1994 Office of Environmental Quality Control (OEQC) Bulletin. The OEQC Bulletin has wide distribution to agencies and to others interested in the environmental review process. The agencies that were consulted, and the agencies and others that were sent copies of the Draft EA were determined to be those agencies that had appropriate jurisdiction and expertise to assist in the preparation of the EA. After publication, other agencies and individuals interested in making comments could have reviewed the Draft EA at OEQC or could have easily, upon request, obtained a copy from us.

We are satisfied that the level of analysis, consultation and disclosure in the Draft EA is appropriate for this type of environmental document. The comments and responses on the Draft EA, further address all of the critical environmental concerns that are germane to this project.

Project Benefits, Section 1.4:

The drilling and test pumping of the exploratory well will provide geologic and hydrologic data that will be used to determine the feasibility of a permanent production well. Additional water supply capacity that this well may provide will benefit the windward district first and any excess should be then available to other areas. However, if adverse environmental impacts are discovered that cannot be mitigated or if the sustainable capacity is minimal, well production plans will be cancelled.

Cost Alternatives, Section 1.5:

The discussion of environmental costs and benefits, i.e., the impacts, of the various alternatives is consistent with the applicable rules for preparing EA's. It is not necessary to estimate the dollar cost of the no-action alternative or of discarded alternatives that were unfeasible because of health, safety and environmental problems. These alternatives were unacceptable and would not fulfill the Board of Water Supply (BWS) mandate to support the City development plan and were therefore, discarded very early in the evaluation process.

Impacts to Streams, Wetlands and Coastal Waters:

Section 4.3 of the Draft EA adequately describes the surface water hydrology of the area and properly substantiates the conclusion that the impacts of the proposed alluvial well on surface water at Punaluu Stream and the nearest wetlands, will likely be insignificant. Unlike other locations where geological strata data are not readily available, the boring logs of the two existing wells and a core hole at this site, provide substantial evidence that a 413-foot layer of

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interbedded alluvium of variable permeability overlies a basaltic bedrock layer at this location. Since the water well is proposed to be drilled to a depth of 400 feet, with the upper 150 feet of low permeability alluvium cased, and the lower 250 feet of the well in moderately permeable older alluvium with a screened intake, we know with certainty, from previous drilling and testing that the water drawn will be from the lower portion of this alluvial layer.

Our experience with wells pumping between 200 and 700 gallons per minute at similar depths, indicates that the resultant cone of depression that extends outward from the bottom of the well during pumping and the typical radius of influence of this cone at the surface is, at most, only a few hundred feet horizontally. The funnel-shaped volume within the radius of influence emanating from the bottom of the well within this cone of depression is the part of the overlying area that would normally be dewatered by the pumping.

As explained in section 4.3.3 of the Draft EA, the impacts to stream flow in Punaluu Stream are expected to be insignificant because Punaluu Stream's location in the vicinity of the proposed well is 1,500 linear feet away from the well site. This 1,500 foot distance is far beyond the typical few hundred feet of a radius of influence. Further, the impacts to Punaluu Stream are expected to be insignificant because Punaluu Stream, in the vicinity of the proposed well, has an invert elevation of about 20 feet above mean sea level (msl), and is perched over layers of low permeability alluvium. The groundwater from the proposed well will be drawn from an elevation of about 85 feet below msl, significantly lower than the invert of the stream, and separated by layers of low permeability alluvium which serve to isolate the stream flow from the much deeper groundwater drawn by the proposed well. The conclusion that the withdrawal of water from the proposed well will not have any significant adverse impact on the flow in Punaluu Stream flow is a sound conclusion based on field data and the professional judgement of our hydro-geologists and engineers. For similar reasons, as stated in section 4.3.3 of the Draft EA, there will be no impacts to the nearest wetland at Kahana Valley because it is two miles away.

Impacts from well pumpage on groundwater underflow into the near shore water are expected to be minimal and unmeasurable because the coastal plain sediments have low vertical conductivity in the range of 0.01 gal/day/sq.ft. Reduction in the groundwater flux from limited well pumpage is not expected and is not significant when compared with the large quantity of surface water flowing into the near coastal waters from the Punaluu Valley drainage basin.

There is an adequate consensus among hydrologists and geologists that these groundwater flows into near coastal waters are unlikely to be altered to any significant degree from this project.



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The possible cumulative impacts of the other BWS projects in the Windward area were discussed in various sections of the Windward Oahu Regional Water Systems Improvements (1988) Study and is noted on page iii of the Summary Section.

Sustainable Yield and Aquifer Compartmentalization:

The concept of sustainable yield has utility and is basic to water resources planning and management. The concept of sustainable yield provides the Commission on Water Resource Management (CWRM) with a guide to base decisions on whether to allow or not to allow new groundwater development projects or surface water uses in the various aquifers on Oahu, depending on each groundwater sector's or aquifer's estimated surplus or deficit of available groundwater.

The hydrologic model segmenting the island into groundwater sectors and aquifers is a theoretical representation accepted and utilized by the CWRM, which is responsible for administering the State Water Code. It is also accepted and utilized by the Department of Land and Natural Resources (DLNR), United States Geological Survey, BWS and the professional community and is therefore, appropriate for use in the EA.

Water Rights to Kuleana Lands:

As was indicated above, the proposed Punaluu III Addition alluvial well is not expected to have any measurable impacts on the flow (or diversion) of surface water. Thus, it is expected that the claims of adverse impacts to any Kuleana lands with correlative, appurtenant, or riparian water rights will be non-substantive.

Claims of adverse impacts to water rights and Kuleana lands are legal issues that should be addressed by the Hawaii courts and by the CWRM, rather than in the EA for this project.

Archaeological Analysis:

The archaeological analysis was conducted by Cultural Surveys Hawaii and consisted of a historical literature search and field work. The scope of the work performed by Cultural Surveys Hawaii is consistent with the requirements of the Historic Preservation Division of DLNR. The complete report by Cultural Surveys Hawaii is found in Appendix A. Since the Historic Preservation Division found that the project would have no effects on historic sites, and because all work will be done within the existing pump station site, we are satisfied that the archaeological research and analysis done for this project are appropriate for this EA.



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Location Maps:

The figure you noted, Figure 2-2, was intended to show primarily the existing wells, the proposed well site, and the basic water distribution system. In Chapter 4, which is the section analyzing the potential impacts of this project, Figure 4-1 shows the location of the existing wells, the proposed Punaluu III Well Addition, and the streams.

References:

We do not agree with your assertion that the literature cited was inadequate. The works cited were sufficient and appropriate for this EA.

Summary:

We feel the environmental issues have been adequately disclosed in the EA to an acceptable level of analysis and that environmental impacts are minimal based on existing hydrologic and geologic data and professional knowledge. Mitigative measures have been proposed and will be implemented to minimize any adverse impacts. We, therefore, conclude that an EIS is not necessary for this project.

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

Very truly yours,

RAYMOND H. SATO
Manager and Chief Engineer

cc: Department of Land and Natural Resources
Commission on Water Resource Management
CH2M Hill