

BOARD OF WATER SUPPLY

CITY AND COUNTY OF HONOLULU

630 SOUTH BERETANIA STREET

HONOLULU, HAWAII 96843



'93 NOV -5 112 22
October 29, 1993

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QUALITY CONTROL

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KAZU HAYASHIDA
Manager and Chief Engineer

Mr. Brian J. J. Choy, Director
Office of Environmental Quality Control
220 South King Street, 4th Floor
Honolulu, Hawaii 96813

Dear ^{from} Mr. Choy:

Subject: Negative Declaration Determination for the Proposed Waipahu III
Exploratory Well Project, TMK: 9-4-05: 74, Waipahu, Oahu

The Honolulu Board of Water Supply has reviewed the comments received during the 30-day public comment period which began on August 23, 1993. We have determined that the environmental impacts of this project have been adequately addressed as discussed in the Final Environmental Assessment (EA) and are issuing a negative declaration. Please publish notice of this action in the next Office of Environmental Quality Control (OEQC) Bulletin.

The completed OEQC bulletin Publication Form and four copies of the Final EA are enclosed.

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

Very truly yours,

KAZU HAYASHIDA
Manager and Chief Engineer

Enclosure

cc: Joseph K. Conant (Housing Finance and Development Corporation)
Keith W. Ahue (Department of Land and Natural Resources)

1993-11-23-0A-PEA-Waipahu III Exploratory Well

NOV 23 1993

FILE COPY

**ENVIRONMENTAL ASSESSMENT
FOR AN EXPLORATORY WELL AND ACCESS ROAD
AT WAIPAHU TEST WELL III, OAHU, HAWAII**

Proposing Agency

HONOLULU BOARD OF WATER SUPPLY
City and County of Honolulu
630 South Beretania Street
Honolulu, Hawaii 96843

Contact

Roy Doi, 527-5235

Prepared by:

MAGUIRE GROUP INC.
1600 Kapiolani Boulevard, Suite 601
Honolulu, Hawaii 96814

October 1993

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CHAPTER 1
INTRODUCTION AND SUMMARY

1.1 APPLICANT / PROPOSING AGENCY / APPROVING AGENCY

Board of Water Supply, City and County of Honolulu

1.2 AGENCIES CONSULTED IN MAKING THE ASSESSMENT

Office of Environmental Control

1.3 PROJECT OBJECTIVES AND BACKGROUND

In the fiscal year ending June 30, 1991, the Honolulu Board of Water Supply (BWS) system served a population of over 830,000. Average daily water demand on the island during this period was 156 million gallons (mg). According to BWS projections, average daily water demand in the year 2010 will be 191 mg, an increase of 23 percent.

To meet growing demands for water, BWS has initiated a comprehensive groundwater development program. As part of this program, BWS proposes to drill an exploratory well in Waipahu to determine the yield and quality of water supplies which may be withdrawn from this location.

1.4 PROJECT AND SITE DESCRIPTION

The proposed exploratory well will be located in an agricultural field on the west side of Kamehameha Highway (Route 99) opposite Waipio Uka. The site is on property owned by Castle and Cooke and used for the cultivation of pineapples.

The project proposes the drilling of three to five wells to develop approximately 3.0 MGD. Access to the well site is available directly from Kamehameha Highway. Each well will involve drilling a hole about 18 inches in diameter to a depth of about 420 feet. Once the drilling is completed, a 16 inch diameter steel casing will be grouted into place in the hole

and a pump will be installed. Test pumpings of each well will be conducted to determine the potential sustained yield and quality of water from the aquifer. Water from the test pumping will be routed via piping laid on the surface to a nearby drainage ditch which eventually discharges to Waikele stream.

Upon completion of the testing, the well driller will remove the pump, cap the well, and clean the area. The total project will require an estimated six to seven months to complete.

1.5 POTENTIAL IMPACTS, MITIGATION MEASURES, AND ALTERNATIVES

No significant adverse impacts are expected during the drilling and test pumping. Short-term impacts during construction of the well and testing will include localized soil disturbance and increases in noise resulting from site access and the operation of drilling equipment. No permanent impacts are anticipated. Mitigation measures will be carried out to minimize soil erosion and short-term impacts of equipment noise.

Three alternatives to the project have been considered; these are: no action, development of alternative sources, and delaying the project. Additionally, developing sources at other sites will be considered. None of these alternatives would enable the Board of Water Supply to successfully achieve its stated objectives.

1.6 GOVERNMENTAL PERMITS AND APPROVALS

The following permits and approvals will be required:

Well Construction Permit and Water Use Permit - Department of Land and Natural Resources

Grading Permit - Department of Public Works

**CHAPTER 2
PROJECT DESCRIPTION**

2.1 PROJECT SITE

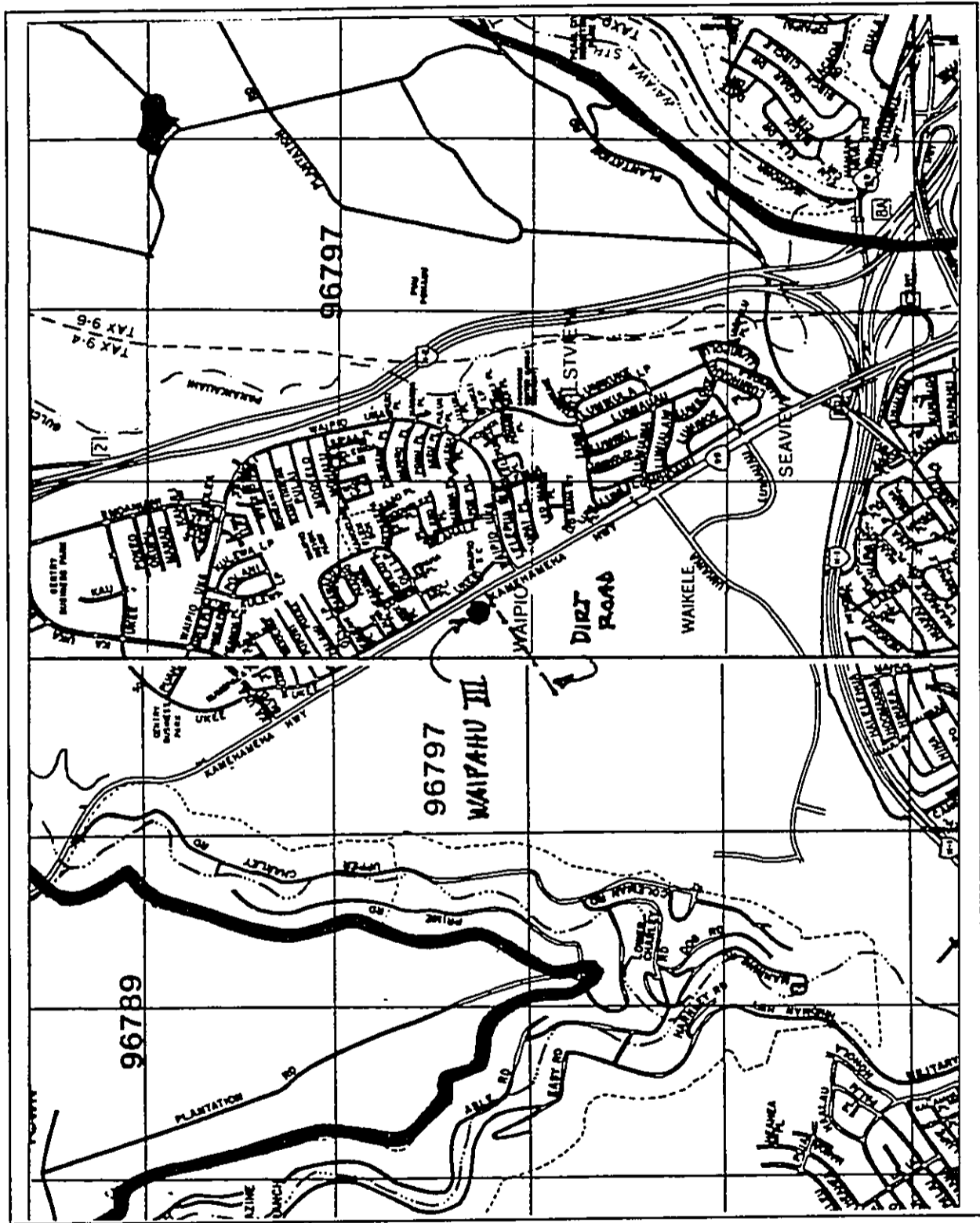
The site for the proposed exploratory wells is immediately adjacent to and west of Kamehameha Highway (Route 99) opposite its intersection with Waipio Uka. Figure 1 is a regional map indicating the general location of the proposed wells. Located at an elevation of about 280' above sea level, the site is on the eastern edge of an agricultural field. The field is cultivated and the proposed well site itself is barren land, devoid of vegetation. It slopes gently to the southward, toward the ditches which drain to the Waikele Stream and the West Loch of Pearl Harbor. It is accessible directly from Kamehameha Highway. Figure 2 provides photographs of the site location.

The well site [TMK 9-4-5:74] is owned by Castle and Cooke. The site and surrounding area is designated on the Central Oahu Development Plan Land Use Map as Agriculture. The City lists the planned use of the site as agricultural. Surrounding parcels are all in agricultural use for the cultivation of pineapples and/or sugar cane.

2.2 PROJECT FEATURES

The following table describes the features of this exploratory well site.

<u>Item</u>	<u>Waipahu Test Well III Site</u>
Tax Map Key (TMK)	9-4-5:74
Total Parcel Area (Acres)	269.454 acres
Flood Insurance Rate Map (FIRM)	Flood Zone D (Areas of undetermined, but possible, flood hazard)



Location of the Proposed Waipahu Test Well III



Photo 1: View looking westward toward the Waipahu Well Site III

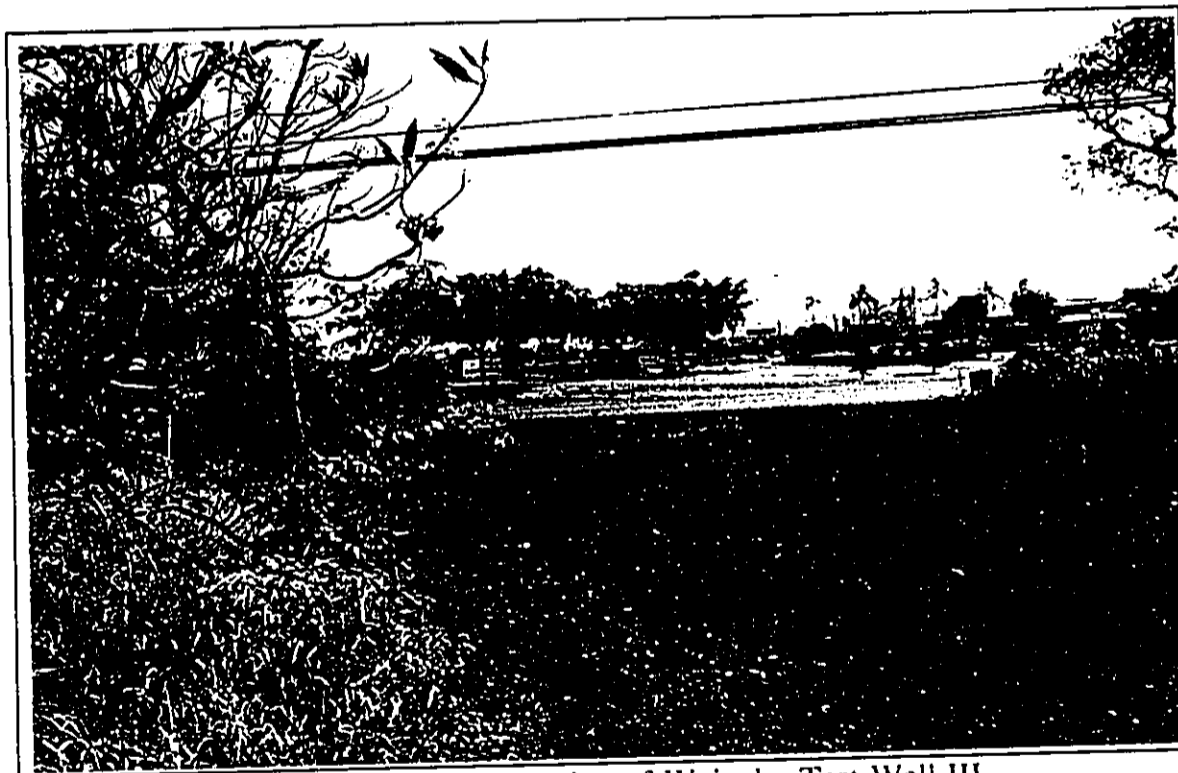


Photo 2: Proposed location of Waipahu Test Well III

DOCUMENT CAPTURED AS RECEIVED

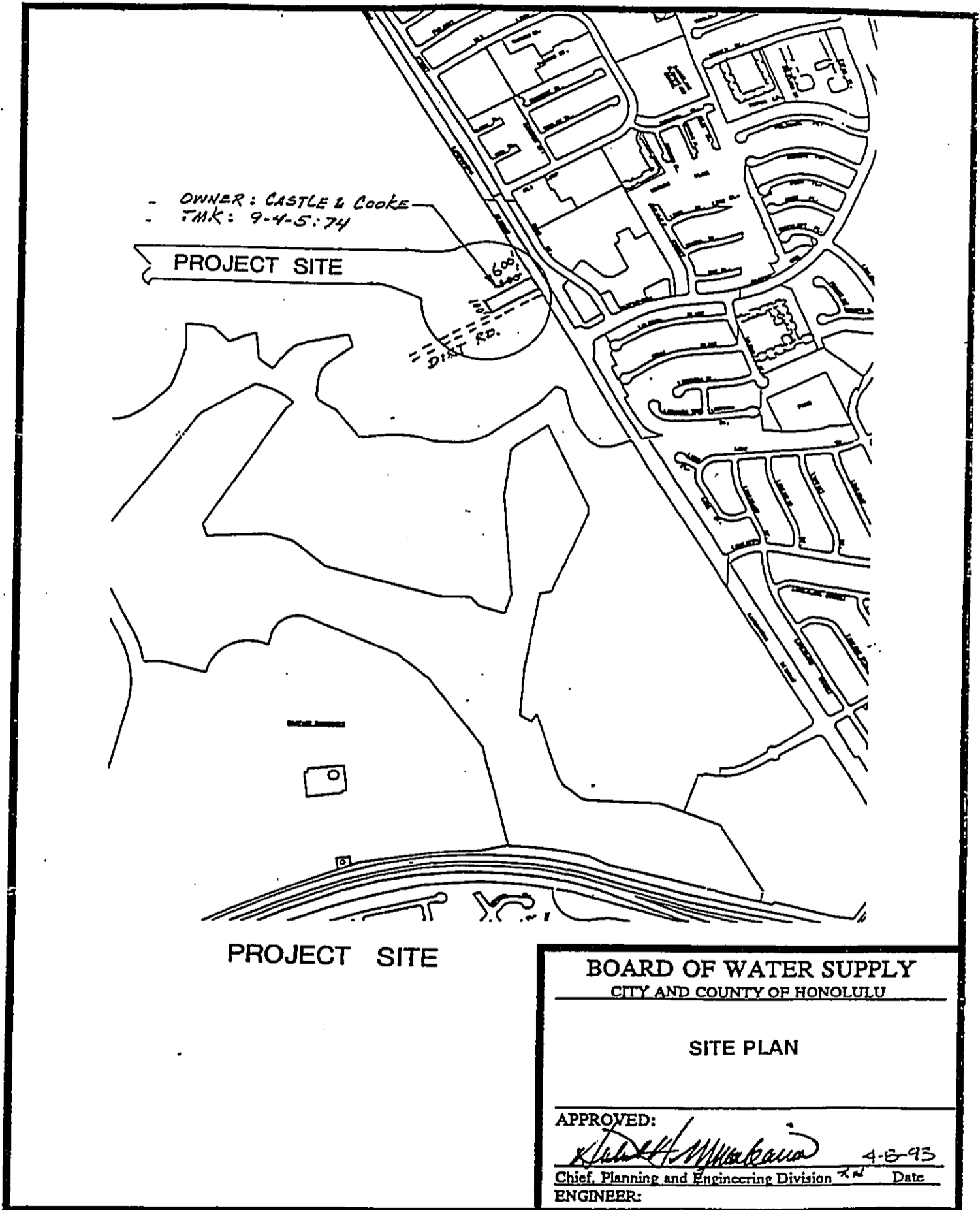
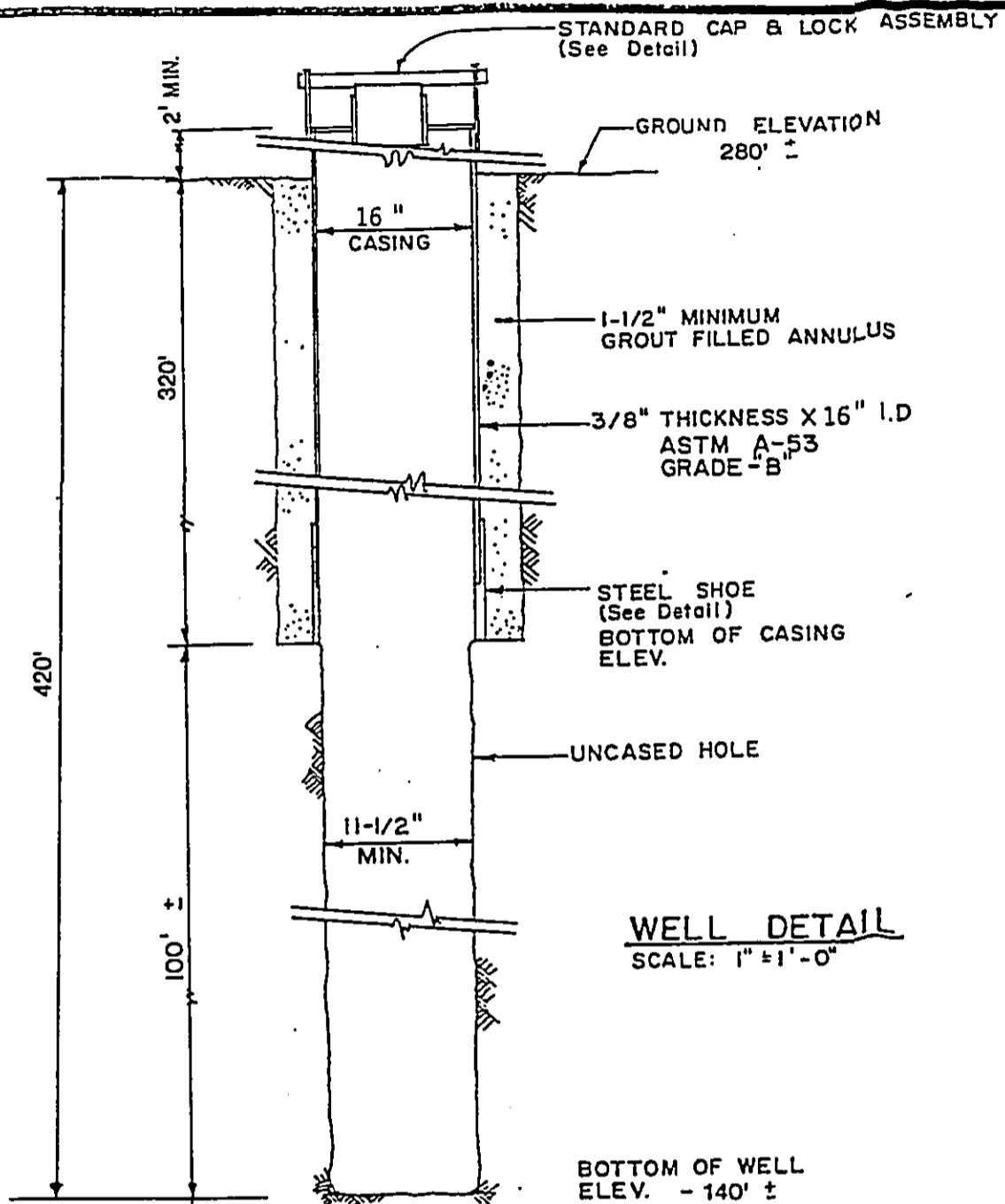


FIGURE NO. 3



BOARD OF WATER SUPPLY
CITY AND COUNTY OF HONOLULU

WELL DETAIL (1)

APPROVED:
Richard H. Micallef 4-8-93
Chief, Planning and Engineering Division
ENGINEER: _____ Date _____

FIGURE NO. 4

Project Features (cont'd)

<u>Item</u>	<u>Waipahu Test Well III Site</u>
State Land Use District	Agricultural
State Water Management Area	Pearl Harbor District
Central Oahu Development Plan Land Use Map	Agriculture
City & County of Honolulu Zoning	AG-1
Estimated Yield of Production Wells	3.0 MGD
Type of Aquifer	Pearl Harbor Basal Water Flow
Land Owner	Castle & Cooke
Nearest Access	Kamehameha Highway and Agricultural Road

2.3 PROPOSED FACILITIES AND ACTIVITIES

The project will involve well installation and test pumping. Well installation will require grading of a work area, for drilling and pumping equipment. Drilling equipment will be brought in to the site and used to drill a hole about 18 inches in diameter and approximately 420 feet deep with 320 feet of grout casing. The depth will be determined by the depth necessary to reach, unconfined basal water, in the Koolau aquifer.

Clearing and grading operations will be restricted to hours from 7:30 AM to 3:30 PM on weekdays to minimize disturbance. No activities will occur on the project during weekends and holidays.

Once the site has been cleared and secured, a truck or trailer-mounted well drilling rig and other support equipment will be brought to the project site for the exploratory drilling

operation. The truck engine or a self-contained engine will be used to provide power for the well drilling rig. A single well hole about 18 inches in diameter will be drilled at the project site to reach the groundwater source.

One of two existing types of drilling methods, either cable tool or rotary, will be used. The cable tool drilling method is performed by repeatedly raising and dropping a heavy drill bit until the desired depth has been reached.

All waste material from the cable tool drilling operation is bailed from the hole and collected in a pit constructed on the project site or discharged on the surface. In either case, the waste material will be disposed of in an approved manner. The waste material generated from this drilling method does not contain any contaminants. Depending on the depth and geologic formations encountered, the well drilling may require up to a maximum of six months to complete.

If the rotary method is used, a drill bit rotating at moderate speed will bore the well while drilling fluid is pumped down the drill stem to the bit at the bottom of the hole. The drilling fluid, bentonite, a fine clay material, is then forced back up the hole carrying drill cuttings to the surface where they are removed from the drilling mud by a screen. The mud is then collected in a mud tank mounted on the side of the drilling rig. The collected mud is recirculated from the mud tank and is not considered a hazardous material. No surface runoff of the drilling mud will be permitted. When the drilling complete, the drilling mud will be taken away from the project site and disposed in an approved manner. Some drilling contractors use air and foam to lift cuttings rather than drilling mud for the entire operation.

Once the water table is reached, instead of drilling fluid, an air compressor will be used to pump air or an air foam mixture down to the drill bit. This will ensure that drilling mud does not enter the aquifer. This rotary drill method of drilling may require three to four weeks to complete.

Upon completion of the drilling operation, a 16 inch diameter steel casing will be grouted into the drilled hole and a pump will be installed.

2.4 PUMP TEST

Two types of test pumping will be conducted after the drilling operation is completed. The initial test, a step-drawdown or yield-drawdown test, involves pumping water from the well at various pumping rates to estimate the specific capacity (number of gallons withdrawn per foot of drawdown) of the well. The drawdown will be measured for each pumping rate. Once the drawdown has stabilized, the pumping rate will be changed and a new drawdown measured. A step-drawdown test may last up to five hours, and will be performed from about 9:00 AM to 2:00 PM on a weekday.

After the step-drawdown test has been completed, a five-day sustained pumping test will be undertaken. The well will be pumped 5 hours the first day, and 8 hours per day for the next four days. This test is designed to determine the sustainable capacity of the well, monitor water quality, and to measure aquifer parameters. (The sustainable capacity of a well is the rate at which the well can be continuously pumped without adversely affecting nearby existing wells or water quality.)

In addition to monitoring the nearby well, Waikele Stream will be monitored to identify adverse effects from the pumping.

Water pumped during the pump test will be collected and tested for organic compounds as required by the U.S. Environmental Protection Agency (EPA); heavy metals, minerals, hazardous materials, coliform and standard plate count for bacteria. The tests are performed by the BWS and, in some cases, by the State of Hawaii Department of Health. The water pumped during the five-day test will be disposed into Waikele Stream.

Upon completion of the five-day pumping test, the well driller will then remove the pump, cap the well, and clean the area, removing all excess materials and wastewater withdrawn

during test pumping. The well will be capped after testing to prevent misuse of the well such as for disposal of hazardous wastes, sewage, or household garbage. According to the U.S. Environmental Protection Agency Underground Injection Control Section, unplugged or improperly abandoned water wells can easily become receptacles for the disposal of waste which may contaminate the groundwater aquifer.

If the results show that development of the water source is feasible, the Board of Water Supply expects to convert each successful well for long term production. This will require installation of a permanent pump, control station, breaker reservoir (approx. 0.1 MG) and pipelines. Production well development will be subject to the environmental review process as stipulated in Chapter 343, Hawaii Revised Statutes, and Chapter 200 of the State Department of Health Regulations.

2.5 PROJECT SCHEDULE AND COST

The project is expected to begin in late 1993. Drilling will begin after grading of the well site, estimated to take less than a week. Drilling will be completed in two to three months. Installation of the casing will take about a week and another two to three weeks will be required to install the pump and run the test pumping. Demobilization will also take about two weeks. Total project duration is six to seven months. The project will cost an estimated \$1.5 Million for up to 5 wells. Funds for the project are available in the BWS budget for the fiscal year ending June 30, 1994.

2.6 NEED FOR THE PROJECT

The Board of Water Supply currently serves a population of more than 830,000 persons (Board of Water Supply 1982). Island-wide water average daily water demand was about 156 million gallons per day (mgd). The Honolulu District, extending from Aliamanu to Hawaii Kai, is the most heavily populated of the water districts on Oahu and has the highest domestic water demand on the island. Water demand in the district is presently about 86 mgd. Over half of this amount was produced from sources within the district, while the

remainder had to be imported from the Pearl Harbor District and the Windward District. Pumpage from the Pearl Harbor aquifer cannot be further increased without risking serious encroachment of sea water into the basal water lens. The Department of Land and Natural Resources, Commission on Water Resource Management, currently limits the Honolulu District's total allowed draft imported from the Pearl Harbor aquifer to 38.14 mgd.

Demand for water in the Honolulu District is projected to continue to increase to 92 mgd by the year 2010. During this period, island wide water demand is projected to rise by nearly 23 percent. To meet growing demand, the Board of Water Supply is seeking to identify, test, and develop new groundwater sources. Some of these new sources will be used to meet demand in the districts within which the sources are developed, some will be transferred to meet the growing demand in Honolulu. If the Waipahu source is determined to be feasible for development, an estimated 3.0 mgd may be added to the BWS system. A portion of the developable water is planned to be allocated to the State's Housing Finance & Development Corporation for state housing projects.

The BWS has considered a number of alternatives for production of potable water. Water conservation programs are already in place to try and reduce per capita water demand. Alternatives to expanded-use of groundwater sources include desalination, development of surface systems, use of brackish sources with dilution, and recycling of treated wastewater. At present, each of these alternatives is presently considered unacceptable for technical, health, and/or cost reasons.

CHAPTER 3 EXISTING CONDITIONS

3.1 PHYSICAL ENVIRONMENT

3.1.1 Geology

Waipahu is located between the Waianae and Ko'olau ranges of Oahu. Land in the area was formed primarily after the quiescence of the Waianae volcanic activity. Later, lava flows from eruptions in the Ko'olau range banked against the Waianae volcano and flowed south in this area. The coastal plain consists of interbedded alluvial and marine sediments deposited as sea level rose and fell during inter-glacial and glacial periods.

The underlying Koolau basalt forms a massive aquifer which is capped by less permeable sediments that impede the seaward flows of fresh groundwater contained in the permeable basalt.

Rainfall not lost to evapotranspiration or surface runoff infiltrates into the highly porous basalt and is stored as groundwater.

Recharge from the high rainfall areas of the Koolaus and leakage and overflow of dike-impounded groundwater provide a large underflow to this area.

3.1.2 Hydrology

The proposed well site is located in the watershed of the Waikele stream. The Waikele stream is a perennial stream which originates high in the Ko'olau range in the Ewa Forest Reserve. It flows generally southwestward through Waipio and southward to discharge into the West Loch of Pearl Harbor. It is fed by runoff, dike leakage and possibly dike overflow.

The well site is located about 3000 feet east of the stream and is expected to tap into the water bearing basalts of the Koolau basal aquifer of the Pearl Harbor area. Flows in the Waikele stream have been gaged at a point near the proposed well location and average about 25 million gallons per day.

3.1.3 Topography

The proposed well site is located at an elevation of about 280' above sea level. It is located on land which slopes very gently southward toward Waipahu and Pearl Harbor.

3.1.4 Climate

Average monthly temperature in the vicinity of the proposed well site is approximately 75°. It ranges from 72° in January to 78.5° in August (State of Hawaii Data Book, 1987). Lying at a relatively low elevation on the leeward side of the Koolau Range, the area receives relatively little rainfall. Rainfall originates from storms, which may bring heavy rains, particularly during Hawaii's winter season in the months of October through April when the trade winds are least continuous. The proposed well site is in an area which receives a mean annual rainfall of only about 30", inadequate to sustain vigorous plant growth in a tropical climate. (Atlas of Hawaii, 1973).

3.1.5 Soil

Soils in the vicinity of the proposed well site are classified by the U.S. Department of Agriculture Soil Conservation Service (SCS) as belonging to the Helemano-Wahiawa association (SCS 1972). These are deep, nearly level to moderately sloping, well-drained soils that have a fine-textured subsoil and are found on uplands. More specifically, the soils at the proposed site are classified as Molokai silty clay loam.

The Molokai series soils formed in material weathered from basic igneous rock. They are nearly level to moderately steep. The SCS describes a representative profile as follows:

"...the surface layer is dark reddish-brown silty clay loam about 15 inches thick. The subsoil, about 57 inches thick, is dark reddish-brown silty clay loam that has prismatic structure. The material at depths between 35 and 64 inches is moderately compact in place. The substratum is soft, weathered rock. The soil is slightly acid to neutral, except that areas used for pineapple are commonly very strongly acid or extremely acid in the surface layer."

Erosion hazard for the Molokai series soils varies from slight to severe depending upon the slope. Given the flat slope and at the well site, the erosion potential at the site is slight.

The soil capability classification also varies depending upon slope, with a rating of IIe applicable to the proposed well site with irrigation or IVe without irrigation. Class II soils have moderate limitations that reduce the choice of plants or that require moderate conservation practices. Subclass IIe soils are subject to moderate erosion if they are cultivated and not protected. Class IV soils have very severe limitations that reduce the choice of plants, require very careful management or both. Subclass IV soils are subject to severe erosion if they are cultivated and not protected.

It should be noted here that agricultural activity in the area within which the proposed well site is to be located has disturbed most of the topsoil and has left the topsoil exposed. Field visits to the site indicate that there has been no significant erosion on the site despite the fact that the soil is exposed. As a result, it is improbable that soils at the well site are subject to significant erosion.

The proposed well site is on land which is in active agricultural use. The U.S. Department of Agriculture Soil Conservation Service and the Hawaii Department of Agriculture classify Molokai silty clay loam soils at slopes of less than 15% as "prime" agricultural land (Dept. of Agriculture, 1977). Prime agricultural land is land with ideal characteristics for food production or other agricultural production.

3.1.6 Natural Hazards

According to the National Flood Insurance Program Flood Insurance Rate Map, the proposed well site is in zone D, an area in which flood hazards are undetermined (FEMA, 1987). This generally indicates that the risk of flooding within the area is not significant enough to warrant detailed study by FEMA. Given the site elevation and relationship to surface waters, the risk of flooding of the site is negligible.

Earthquake risk in the vicinity is also minimal. The island of Oahu is classified as a Seismic Zone 1 area, in which damage would be minor in the event of an earthquake (Uniform Building Code, 1991).

3.1.7 Flora and Fauna

As noted above, the Waipahu III site has been extensively disturbed for agricultural use. The entire area is essentially devoid of vegetation except for some sparse growth of grasses along the edges of the fields where cultivation has not been attempted. The well site itself is barren and contains no vegetation. As a result, it provides no habitat suitable for plant or animal species.

There are no species on the site which are listed or proposed for listing on the federal list of threatened or endangered species (USFWS, 1990) and none which are considered threatened, endangered or rare species at the state level (State of Hawaii, 1990).

3.1.8 Archaeological Resources

Grading of the site for agricultural use and disturbance of surface soils has had the effect of disturbing all strata which might have contained archaeological resources. As a result, there are no archaeological resources on the site or in the immediate vicinity.

3.2 Socio-economic Environment

Located east of Kamehameha Highway, the proposed well site is adjacent to the Waipio neighborhood. Land to the north, south and west is vacant, but land to the east, across the highway, has existing residential and commercial uses. A small restaurant and a gasoline station are located across the highway between the site and the nearest homes.

The socio-economic impact of the proposed test well is expected to be regional in nature. The population on the island of Oahu has been steadily increasing. The Pearl Harbor district is one of the locations within which continued growth has been forecasted to occur. City, County and State population projections indicate that the Pearl Harbor district population will reach 166,226 by the year 2000, with a predicted daily water usage of 26.3 million gallons (BWS 1982). The proposed Waipahu III test well is one of several sources of water proposed for development to meet the needs of expanding population within the Ewa & Pearl Harbor districts.

CHAPTER 4
POTENTIAL IMPACTS AND MITIGATION MEASURES

4.1 TEMPORARY IMPACTS

The development of a test well at the Waipahu III site will result in short-term impacts on the environment in the immediate vicinity of the project area. No significant adverse impacts are expected during the drilling and pump testing. Short-term impacts during construction of the well and testing will include localized soil disturbance causing fugitive dust and temporary increases in noise resulting from the operation of drilling equipment.

Localized soil disturbance will result in the immediate vicinity of the well head from installation of the well. Because the site has been graded flat and is unvegetated, the disturbance will not significantly alter existing conditions and will not significantly increase the potential for soil erosion. The contractor will obtain a grading permit which will include erosion control measures.

Noise will be produced by the drilling equipment and by the operation of the pumps. This minor increase in noise levels will not result in any significant adverse impacts. The proposed well site is sufficiently distant from the residences for noise attenuation to minimize the impact of drilling or pumping noise. The site is also buffered from the nearby residences by the commercial uses and by the Kamehameha Highway, a more significant source of noise than the proposed test well. All drilling and pumping activity will occur during daylight hours when noise impacts are minimal.

4.2 IMPACTS ON STREAM FLOW AND STREAM ENVIRONMENT

The well testing will require that water be withdrawn from the aquifer penetrated by the well. This water will be discharged to a drainage ditch which will carry it to the Waikele stream, resulting in a temporary increase in flow in the streambed. The increase in flow is expected to be within the range of peak flows normally experienced within the stream

system and will not result in any flooding or adverse impacts in downstream areas. Water from the test pumping will be routed to the drainage ditch via pipeline to prevent soil erosion by dissipating the flow velocity through baffles to minimize excessive turbidity into the stream which might otherwise occur.

Flows in the Waikele stream are fed by runoff and by groundwater spilling over or leaking out of the dike system in the upper elevations of the Ko'olau range. To the extent that the test pumping may lower the elevation of the groundwater table, reducing the hydraulic head, no effect should occur to the stream flow as the stream elevation is nearly 200 ft. above the water table. The existing Waipahu Wells I and II have not resulted in reduction of flows in the Waikele stream.

4.3 IMPACTS ON AGRICULTURAL SOILS

As noted in Chapter 3, the proposed well site is located in an area which has been designated as "prime farmland" by the Federal and State Departments of Agriculture. Prime farmland is farmland which is ideally suited to the production of food or other crops. However, the proposed test well will require an area of only about 900 square feet (30' x 30') an insignificant amount of agricultural land compared to the amount in the surrounding area. The proposed test well will also be installed in an area which is presently used for internal circulation within the agricultural fields and will not materially affect the agricultural production capability of the area.

4.4 IMPACT ON ARCHAEOLOGICAL RESOURCES

As noted in Chapter 3, there are no archaeological resources within the immediate vicinity of the site. The project will therefore not result in any adverse impacts to archaeological resources.

CHAPTER 5 ALTERNATIVES

5.1 NO ACTION

The no action alternative would not meet the objectives of the Board of water supply for this project. This project is part of an overall groundwater development program intended to increase the municipal water supply to meet growing demand. If the Board's new water sources program is curtailed it would not be able to provide adequately for the water needs of the population of the island in the future, which may result in cutbacks in new development as well as regional water shortages.

5.2 ALTERNATIVE SOURCES

The Board of Water Supply has considered a variety of other alternatives to the development of new groundwater sources. Alternatives considered include direct use of streamflow, blending and use of brackish water resources, demineralization of brackish water sources, desalinization of sea water and direct reuse of treated wastewater. None of these alternatives, at this time, offers the potential to economically or cost-effectively produce water supplies of the quality which can be obtained through the proposed program.

5.3 DELAYED PROJECT

Delay in the proposed well testing program would increase the risk that population growth will lead to increasing water demands in excess of the available supplies. Delay of the project will not materially alter the environmental impacts of the project and has the potential to increase project costs.

5.4 ALTERNATIVE WELL SITES

In addition to evaluating alternative water sources, the Board of Water Supply has plans to test a number of other potential sites for development of groundwater resources. These alternative sites also offer opportunities as groundwater supply sources, but are to be considered in addition to, rather than as alternatives to, the proposed well testing program. The Waipahu III test location has been selected by the Board of Water Supply because it offers the potential to supply a significant quantity of high quality water which may not be obtainable at alternative sites. Developing and testing a well at the Waipahu III site is the most reasonable alternative given the location of the site and the insignificant impacts associated with its development.

CHAPTER 6
DETERMINATION

In accordance with Chapter 343, Hawaii Revised Statutes, it has been determined that an Environmental Impact Statement is not required for the proposed Waipahu III exploratory well and test pumping program. This determination has been made based primarily on the short duration of the project and its minimal impacts on the environment. The project will result in some negative impacts, but these can be minimized or alleviated by the suggested mitigation measures. The identified impacts have been determined to be less significant in comparison to the potential benefits to be provided by the water supplies which may be obtainable from the Waipahu III well.

APPENDIX

References	i
Archaeological Report	ii
Botanist's Report	iii
Agencies' Reviews & Responses	iv

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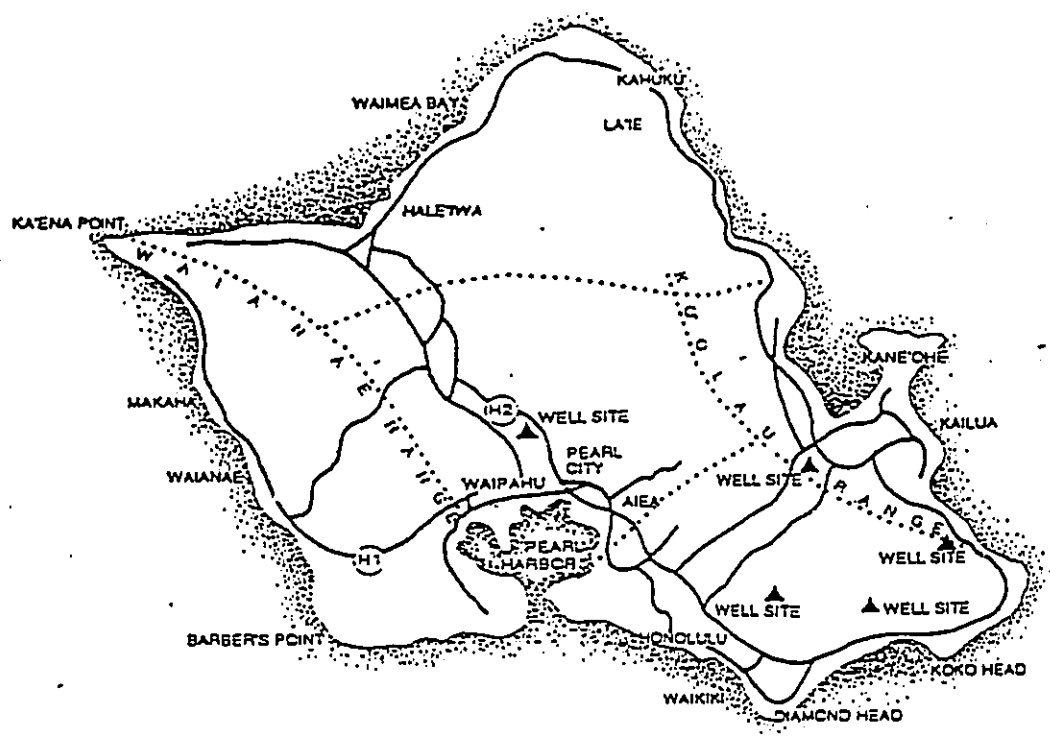
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ARCHAEOLOGICAL REPORT

DOCUMENT CAPTURED AS RECEIVED

AN ARCHAEOLOGICAL RECONNAISSANCE
OF FIVE BOARD OF WATER SUPPLY WELLS
ON O'AHU, HAWAI'I



Prepared by

Boyd Dixon, Ph.D.
Supervising Archaeologist

Prepared for

Maguire Group, Inc.
Architects/Engineers/Planners
1600 Kapi'olani Blvd.
Honolulu, HI 96814

October 27, 1992

Revised
October 15, 1993

Public Archaeology Section
Applied Research Group
Bishop Museum
Honolulu, Hawai'i

Project #503

MS #102792

**AN ARCHAEOLOGICAL RECONNAISSANCE
OF FIVE BOARD OF WATER SUPPLY WELLS
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Revised

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**Anthropology Department
Bishop Museum
Honolulu, Hawaii**

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ABSTRACT

During October 1992, the Applied Research Group of the Bishop Museum conducted an Archaeological Reconnaissance as part of an Environmental Impact Assessment for five (5) exploratory water wells proposed by the Board of Water Supply for the City and County of Honolulu, under contract to the Maguire Group, Inc. Four of these locations-- Waipahu, Kāne'ōhe, Waimānalo, and Mānoa failed to yield any cultural remains on the surface. The fifth location, in Kūpaua Valley, contained the remains of a culturally-modified bedrock terrace and one polished stone adze, on the surface, near the proposed well site on the east bank. Survey of the access road along the west bank also encountered possibly-modified bedrock terracing above the stream bed.

ACKNOWLEDGMENTS

The author would like to thank Mr. Ken Rappolt of the Maguire Group for the cooperation and patience he has shown in dealing with the sometimes alien profession of archaeology. In particular, his willingness to accompany Bishop Museum staff on a preliminary tour of the five water well locations greatly facilitated our work in the field from a logistical standpoint.

Within the Applied Research Group at the Bishop Museum, fieldwork was shared equally by Steve Clark, Maurice Major, and Angela Steiner-Horton, who also assisted with the cataloging of documents, photos, and artifacts. Hemantha Jayatilleke prepared the illustrations for this report, while Lana Pigao, Jinni Mitchell, and Chris Alper produced the final draft report. Peggy Chee and Marie Paresa coordinated our field needs, while Alan Haines was a rock of support in much more than just contracts.

INTRODUCTION

Under contract to the Maguire Group, Inc., the Applied Research Group of Bishop Museum conducted an archaeological reconnaissance of five exploratory water well locations on the island of O'ahu during October 1992. All were surveyed as part of an Environmental Impact Assessment being submitted by the City and County of Honolulu Board of Water Supply in accordance with the State of Hawaii, Title 11, Department of Health, Chapter 200, Environmental Impact Statement Rules. Any subsequent implementation of the exploratory well plans should ensure compliance with State Historic Preservation Division draft guidelines which may require additional research at these properties.

PROJECT LOCATIONS

The five exploratory water well locations are scattered around the island of O'ahu (Figure 1), situated above the 200 ft above mean sea level (famsl) elevation at the base of the Ko'olau mountain range to access known aquifers, in most cases already providing drinking water for local populations.

Waimānalo Well III

This well is located at approximately 240 famsl on Waimanalo State Forest Reserve land (TMK 4-1-11) in the *ahupua'a* (traditional land division) of Waimanalo, Koo'au Poko District (Figure 2). Access to the project area crosses State land currently leased to Meadow Gold Dairies via trails starting at the end of Kulawai Street *mauka* from the beach park in Waimanalo. The well site and access road are on land presently forested with *Eucalyptus* as the dominant genus, although a nearby powerline has encouraged the invasion of a dense weedy understory.

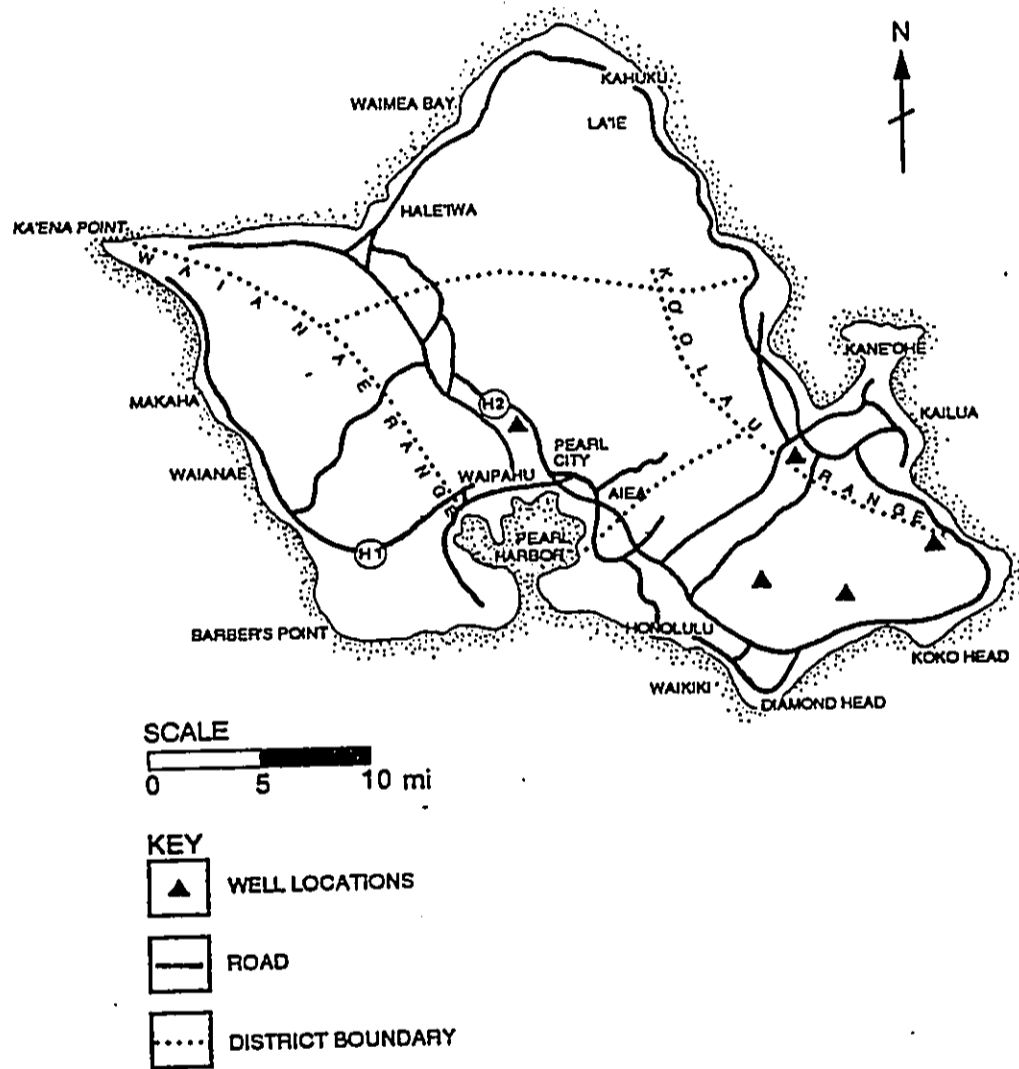


Figure 1. Location of the Five Water Wells on the Island of O'ahu.

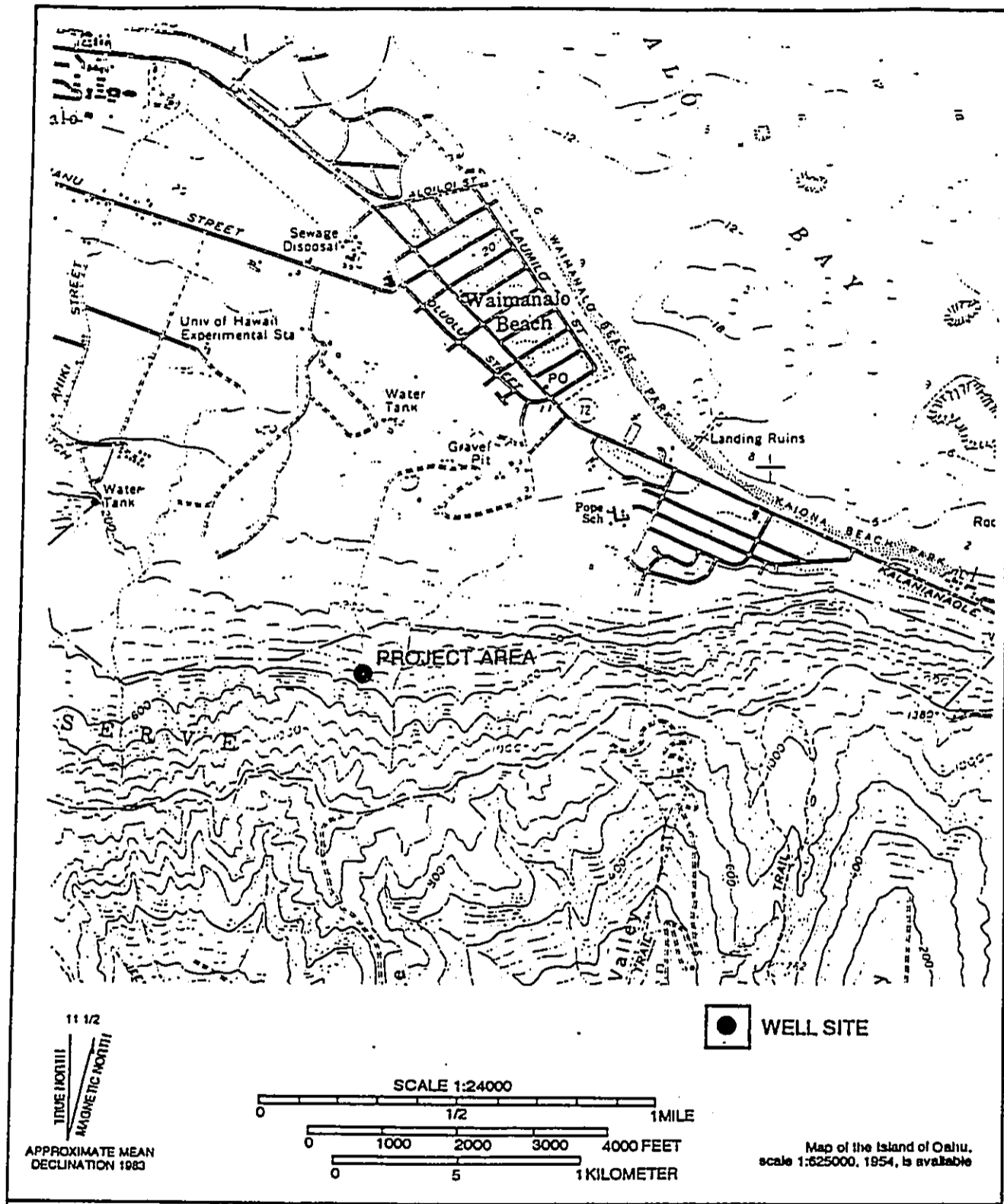


Figure 2. Location of the Waimānalo Well III.

Waipahu Well III

This well is located at approximately 280 fmsl on Castle and Cooke, Ltd. land (TMK 9-4-5:74) in the *ahupua'a* of Waipio, 'Ewa District (Figure 3). Access to the well site, located in a fallow pineapple field, is provided by Kamehameha Highway, which runs immediately adjacent (east) to the project area.

Kuou Well III

This well is located at approximately 280 fmsl within Ho'omaluhia Park (TMK 4-5-41) in the *ahupua'a* of Kāne'ohe, Ko'olau Poko District (Figure 4). Access to the well site is provided by a trail from the main park road, which is situated just *makai* of the H-3 Highway right-of-way and fenceline. The area is currently planted with banana trees that appears to have been there for some time.

Mānoa Well

This well is located at approximately 200 fmsl within Mānoa Valley Park on City and County of Honolulu land (TMK 2-9-36) in the *ahupua'a* of Mānoa, Kona District (Figure 5). Access off Mānoa Road is provided on the lawn between the tennis courts *mauka* of Mānoa School and a small gulley bordering residential housing. The proposed location of the well is currently covered in low grasses.

Kūpaua Wells

These two alternate wells are located at approximately 300 fmsl on land owned by Hawaiian Trust Co. Ltd. and the Hawaiian Humane Society (TMK 3-7-04:01) in the *ahupua'a* of Niu, Kona District (Figure 6). Access today is by a trail along the east bank of Kūpaua Stream although the route of a proposed access road up the opposite stream bank was surveyed in October. Two exploratory well locations were also surveyed, one on both sides of the stream. The entire project area is wooded with secondary regrowth of *koa haole*, *kiawe*, and various tall grasses although banyan, mango, and *wiliwili* trees were also observed.

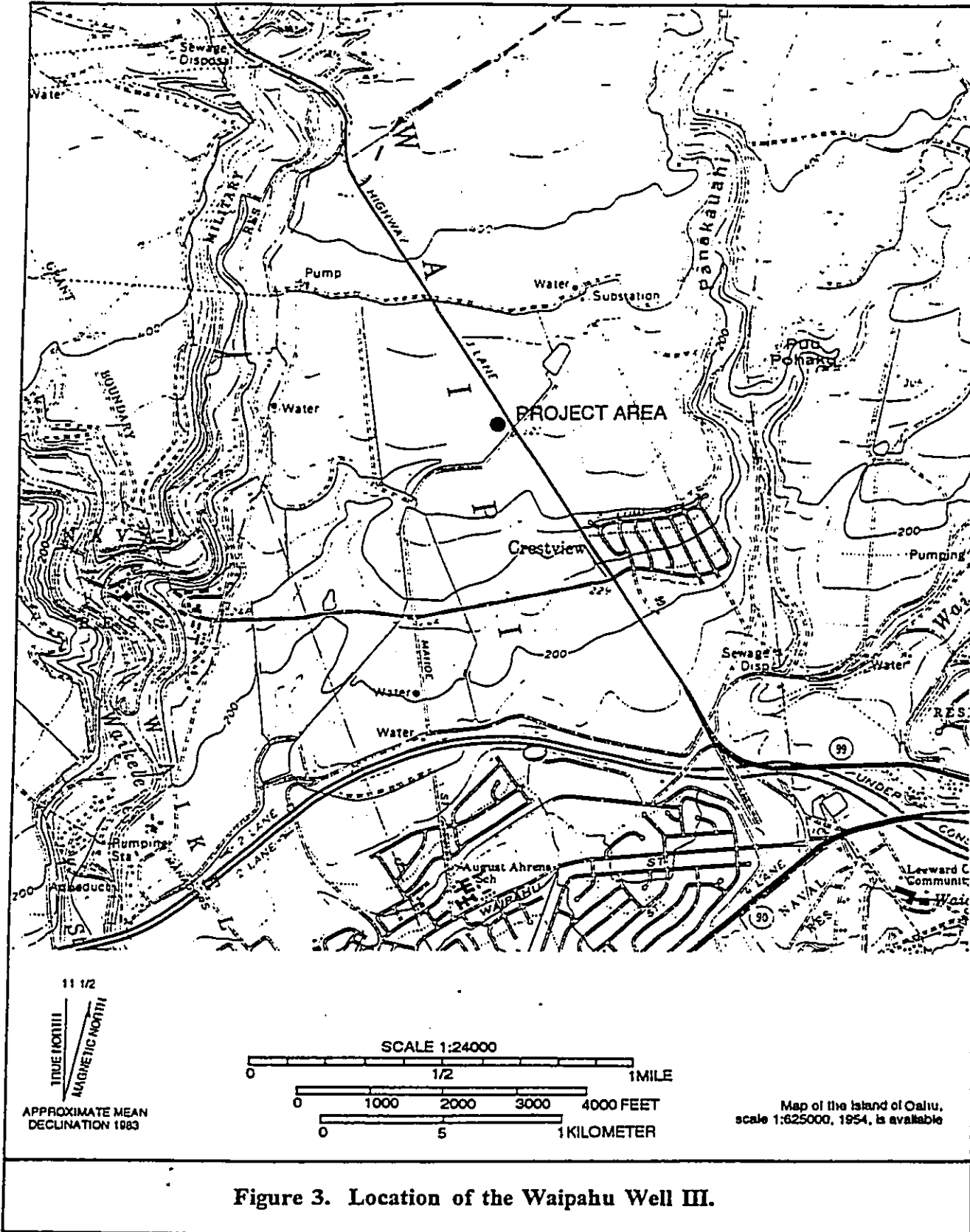


Figure 3. Location of the Waipahu Well III.

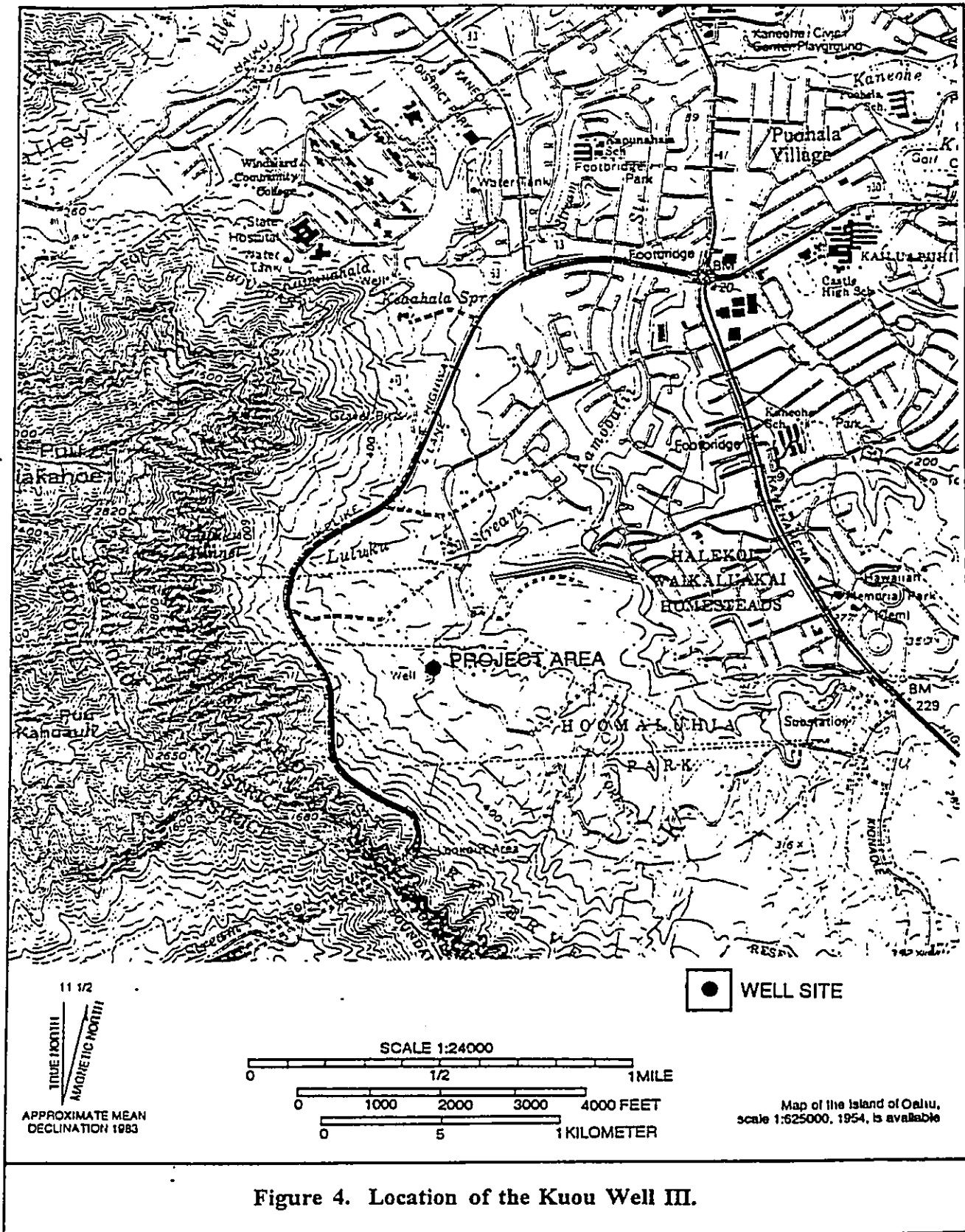
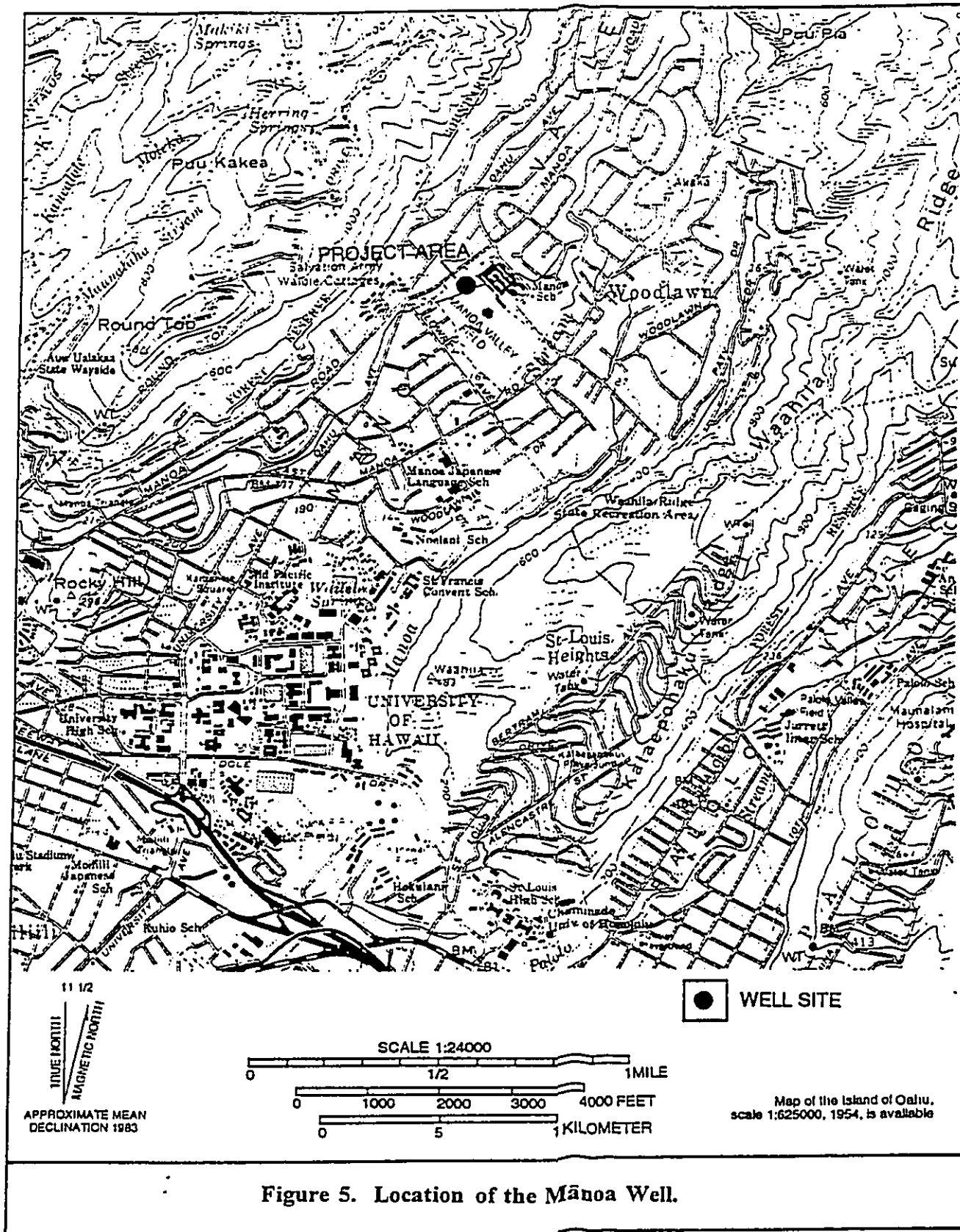


Figure 4. Location of the Kuou Well III.



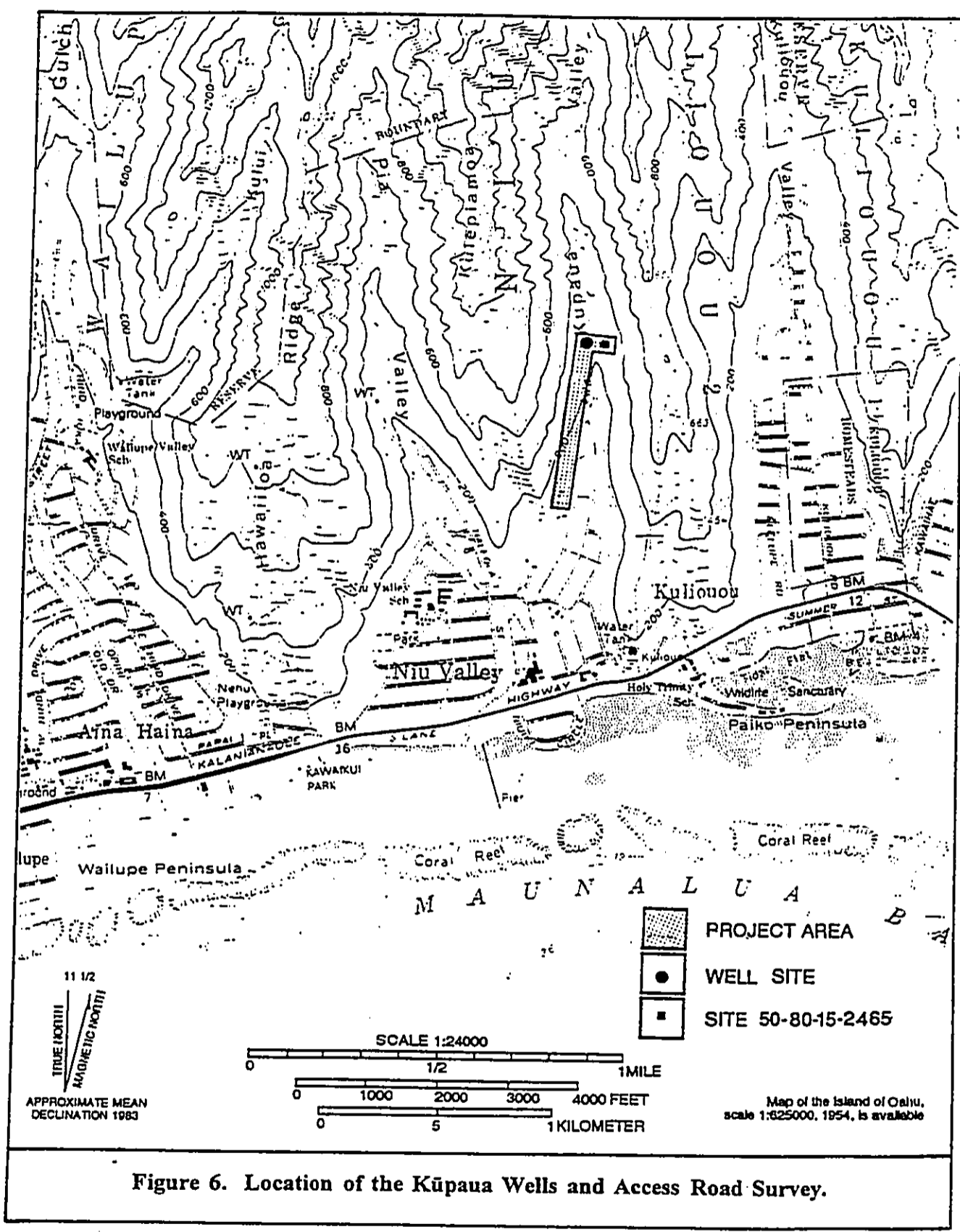


Figure 6. Location of the Kūpaua Wells and Access Road Survey.

PREVIOUS ARCHAEOLOGY

A thorough review of the previous archaeology for each *ahupua'a* containing a proposed exploratory water well location is not required for an Environmental Assessment reconnaissance prior to an Inventory level-survey (SHPD 1989). Nevertheless, a cursory search of traditional sources in the archaeological literature on the island of O'ahu (McAllister 1933; Sterling and Summers 1978; James 1992) was conducted in advance of the field survey of all five proposed well locations. In no instance was a known archaeological site located within the immediate vicinity of these project areas, although none of these areas has ever been subject to a systematic archaeological survey, according to a search of Bishop Museum Anthropology Department files. Future research in any of the five well sites should include a review of State Historic Preservation Division files as well.

Archaeological remains expected for the five areas varied with the setting, influenced as much by environmental factors as by proximity to larger coastal population centers in pre- and early post-Contact periods. On the slopes behind Waimānalo, terracing of the windward soils might be expected, as was the case *mauka* of the Kuou Well III site along Lulukū Stream in Kāne'ohe (Allen 1987). In Waipahu, just above the 'Ewa Plain, leeward agricultural utilization of the slopes might have produced minimal modification of the landscape similar to that encountered *makai* of the project area (Davis 1988). But a recent survey just *mauka* of the well location revealed severe disturbances due to Historical Period agriculture (Goodman and Nees 1991). The upper valley of Mānoa was famed for its taro ponds and Historical Period royal residences (Sterling and Summers 1978:281-290; McAllister 1933:78-80) while the lower Niu Valley supported a more leeward agricultural regime (Handy 1940:155) with a *heiau* (temple) situated at the foot of the middle ridge between both streams (McMahon 1988:3).

FIELD METHODS

Methods employed during the archaeological reconnaissance varied with the degree of impact already found at each proposed water well location, but were restricted to pedestrian survey with no subsurface testing. At the Waipahu III and Mānoa well sites, only a cursory examination by the author was required, due to the extreme destruction of the previous landscape by agricultural and residential activities respectively. At the Kuou, Waimānalo, and Kūpaua well sites and access roads, a field crew of four ARG archaeologists conducted a pedestrian survey at 10-m-wide intervals across the entire length of the project areas. Bedrock outcrops were inspected for cultural modification and eroded gulleys, and surfaces were inspected to look for cultural materials.

RECONNAISSANCE RESULTS

Archaeological reconnaissance of the five exploratory water well locations on the island of O'ahu revealed four of these to have been impacted sufficiently in the Historic to recent past to effectively erase any traces of Native Hawaiian utilization of the landscape on the surface. Inspection of the exposed surfaces, moreover, failed to yield any evidence of subsurface features or activity areas. It therefore seems likely that these four well locations (Waimānalo III, Waipahu III, Kuou III, and Mānoa) were never subject to any intensive habitation or agricultural use that would have produced obvious archaeological residues, probably due to the somewhat peripheral setting of these locations in relation to water resources and traditional or historic population centers.

This assessment does not negate the possibility of subsurface remains (i.e. firepits, *imu*, or human burials) being present at all these locales, however. Downslope erosion in the case of Waimānalo and Kūpaua, agricultural soil modification at the Waipahu and Kuo locations, and urban landscaping in Mānoa may well have buried pre-Contact period deposits once visible.

KŪPAUA WELL ACCESS ROAD

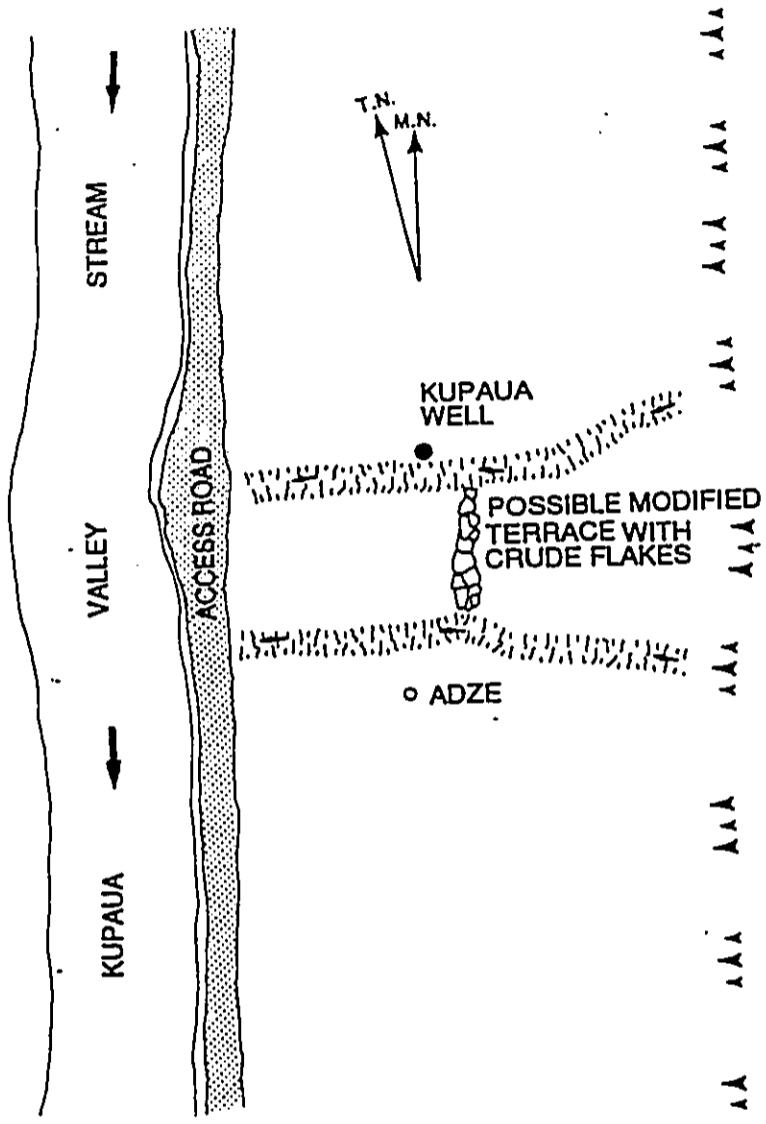
Surface reconnaissance of the proposed access road alignment to the well site on the west bank of the Kūpaua Stream was conducted with four ARG archaeologists traversing dense underbrush over extremely rough exposed bedrock in many places. While these field methods were found adequate to cover the first four well locations, it was felt that a more intensive form of surface survey with clearing of vegetation and subsurface testing would be necessary along this access road to ascertain the true nature of several possibly modified bedrock outcrops encountered during the pedestrian reconnaissance.

Especially in the lower reaches of the project area just above the spillway (Figure 7), large boulder alignments paralleling the stream bed were found to contain many smaller cobbles creating a somewhat clear area immediately behind these probably natural terraces. The actual location of the proposed exploratory well on the west bank of the stream, however, appears to be free of this type of modification.

Given the setting of these potential features immediately above a permanent stream bed less than 1 km *mauka* of a substantial Native Hawaiian fishpond and *heiau* (McAllister 1933:70), the likelihood that the landscape was utilized in the past is quite high. The identification of more convincing cultural remains on the other side of the stream during this surface reconnaissance demonstrates the validity of this hypothesis.

STATE SITE 50-80-15-2465

This site consists of at least one modified cobble terrace wall located on the east bank of the Kūpaua Stream approximately 5 m *makai* of an alternate well location proposed to avoid crossing the stream drainage (Figure 7). The terrace itself is roughly 10 m long, and only stands some 30 cm tall, being a modification of a natural alignment of bedrock, probably to impede soil loss from downslope erosion.



SCALE
 0 5 10m



 GULLY
 SLOPE [STEEP]

Figure 7. Sketch Map of State Site 50-80-15-2465.

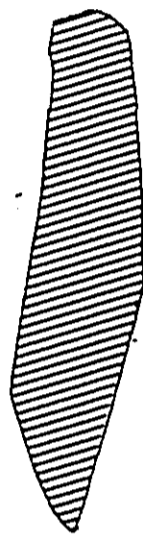
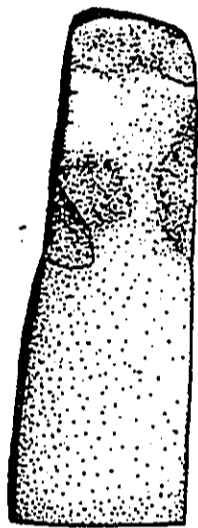
Several large primary flakes of reasonable quality basalt are also located within and around the feature, although a cursory inspection of the surface (admittedly overgrown and covered with sheetwashed soil) failed to yield any smaller flakes to indicate traditional tool manufacture. This possibility was strengthened, however, by the recovery of a small polished stone adze (Figure 8) on the surface approximately 5 m *makai* of the terrace wall (Figure 7).

The issue of whether this artifact represents local use of a raw material resource would have to be resolved by basalt sourcing analysis, although the nature of the Kūpaua Valley lithic material has yet to be established (Kevin Johnson, personal communication 1992). Regardless of these analyses, however, the presence of a small polished adze, more commonly associated with wood-working, rather than forest clearing, is interesting, given its association with probable agricultural terracing. It appears likely therefore, that evidence of domestic habitation may be present in the vicinity, but more likely further up the slopes above seasonal flash floods for which the Niu Valley is known today.

CONCLUSIONS

Archaeological reconnaissance of five proposed exploratory water well locations on the island of O'ahu found four of these to contain no evidence of previous cultural remains or activities. The Waipahu III well site has been completely impacted by pineapple road construction and mechanized agriculture, as is the case for the Kuou III well site which is under banana production. The Mānoa well site, in turn, has been completely modified by landscaping associated with the construction of tennis courts adjacent to the Mānoa Elementary School. The Waimānalo III well site, on the other hand, has not been impacted by urban or commercial agricultural development, but does appear to have deforested and partially graded, both by historic ranching and more recent powerline construction.

The fifth location in the Kūpaua Valley, however, did contain artifactual and architectural evidence to suggest Native Hawaiian utilization of the area in the pre-



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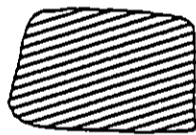


Figure 8. Stone Adze Recovered from State Site 50-80-15-2465.

or early post-Contact era. Recommended efforts to assess the nature of this occupation in Kūpaua Valley and the potential for subsurface deposits at the other four locations, are outlined below.

RECOMMENDATIONS

Given the absence of cultural remains in four of the proposed water well locations and access roads, it is recommended that an archaeological monitor be present during construction at the Waimānalo Well III, Waipahu Well III, Kuou Well III, and the Mānoa Well, if surface disturbances are minimal. This assessment can also be recommended for the well site located on the west bank of the Kūpaua Stream, if access is provided from the east bank.

The presence of positively identified cultural remains at the location of the proposed Kūpaua Well on the east bank of the stream, however, make archaeological Site 50-80-15-2465 potentially eligible to the National Register of Historic Places under Criterion D, due to its potential contribution to knowledge of past history and lifeways. The same assessment may also be the case for possible agricultural terracing located along the access road to the Kūpaua well location on the west bank of the stream. It is therefore recommended that two courses of action be undertaken to avoid negative impact to these cultural resources:

- 1 Access the west bank exploratory well location from across the stream bed, via the existing jeep trail.
- 2 Perform an Archaeological Inventory level survey of the west bank access road corridor before the route is more firmly established, to ascertain the true nature of the possible cultural remains located during the reconnaissance survey.

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BOTANIST'S REPORT

by

**Dr. Loyal A. Mehrhoff
Department of Botany
Bishop Museum**

Detailed Observations of Vegetation

Summary. Construction of water wells and attendant road systems does not appear to impact on any endangered or rare plant populations. The Hawaii Heritage Program's data base on the location of rare or endangered plants was searched in order to determine historical distributions of rare species. Only the Kupaua and Waimanalo Well Sites were located near known locations of rare plants. Field surveys of all sites were conducted to determine the present status of vegetation at the sites. None of the five proposed well sites have intact or high quality native ecosystems. In fact, the vegetation at four of the sites is composed entirely of alien plants. Only the Kupaua Well site has any native vegetation and this is composed entirely of scattered individual plants. Of the five native species found at this site, only two are endemic and neither of these are considered rare or endangered.

1. **Proposed Manoa Well [TMK 2-9-36]** is located entirely on a grassy lawn in a residential area of Manoa Valley. THERE ARE NO NATIVE PLANT COMMUNITIES WHICH COULD BE NEGATIVELY IMPACTED BY WELL CONSTRUCTION.
2. **Proposed Waimanalo Well III [TMK 4-1-11]** is located in a forest of alien weed trees. The dominant species are *Eucalyptus* sp., *Leucaena leucephala*, and *Rivina humilis*. Two species or rare plants are known from the vicinity of this well site; *Nesoluma polynesianum* and *Vigna o-wahuensis*. Neither species was observed in the area. THERE ARE NO NATIVE PLANT COMMUNITIES WHICH COULD BE NEGATIVELY IMPACTED BY WELL CONSTRUCTION.
3. **Proposed Waipahu Well III** is located in an existing agricultural field. No native plants were observed and there are no rare plants known from the area. THERE ARE NO NATIVE PLANT COMMUNITIES WHICH COULD BE NEGATIVELY IMPACTED BY WELL CONSTRUCTION.
4. **Proposed Kuou Well III [TMK 4-5-41]** is located in an existing banana plantation. No native plants were observed and there are no rare plants known from the area. THERE ARE NO NATIVE PLANT COMMUNITIES WHICH COULD BE NEGATIVELY IMPACTED BY WELL CONSTRUCTION.
5. **Proposed Kupaua Well [TMK 3-7-04:01]** is located in Niu Valley above existing residential areas. Niu Valley is one of the most famous collecting localities on Oahu. Many of the early Hawaiian botanists visited this valley so there is a good record of the vegetation present in the 1800's. The Hawaii Heritage Program data base has records from Niu Valley for 14 rare plants; *Bonamia menziesii*, *Cyanea grimesiana* ssp. *grimesiana*, *Eurya sandwicensis*, *Ctenitis squamigera*, *Tetraplasandra gymnocarpa*, *Delissea subcordata*, *Exocarpos gaudichaudii*, *Chamaesyce celastroides* var. *kaenana*, *Joinvillea ascendens* ssp. *ascendens*, *Lobelia monostachya*, *Phyllostegia parviflora* var. *parviflora*, *Rollandia lanceolata* ssp. *calycina*, *Melicope saint-johnii*, and *Schiedea nuttallii*. However, the current vegetation has only a few native plants, with the site dominated by alien weeds such as; *Leucaena leucephala*, *Schinus terebinthifolius*, *Asystasia gangetica*, and *Panicum maximum*. Four native species were observed; *Dodonaea viscosa* (a few scattered plants), *Sida fallax* (a small area with 20 to 30 plants), *Lipochaeta lobata* ssp. *lobata* (25 to 50 plants at the base of the cliffs), and *Erythrina sandwicensis* (several plants along the existing road on the east side of the creek). None of these species is considered rare or endangered and only the *Erythrina sandwicensis* should have special consideration (destruction of individual trees should be avoided). IT DOES NOT APPEAR THAT WELL CONSTRUCTION WOULD NEGATIVELY IMPACTED ON EITHER RARE PLANTS OR NATIVE PLANT COMMUNITIES.

AGENCIES' REVIEWS & RESPONSES

Agencies' Reviews and Responses

<i>(Agency)</i> State of Hawaii Office of Environmental Quality Control	August 12, 1993
<i>(Response)</i> Board of Water Supply Office of Environmental Quality Control Brian J. J. Choy, Director	September 3, 1993
<i>(Agency)</i> City & County of Honolulu Dept. of Public Works	August 11, 1993
<i>(Response)</i> Board of Water Supply Dept. of Public Works C. Michael Street, Director & Chief Engineer	September 1, 1993
<i>(Agency)</i> City & County of Honolulu Planning Dept.	August 31, 1993
<i>(Response)</i> Board of Water Supply Planning Dept. Robin Foster, Chief Planning Officer	September 17, 1993
<i>(Agency)</i> United States Dept. of Agriculture Soil Conservation Service	September 7, 1993
<i>(Response)</i> Board of Water Supply U.S. Dept. of Agriculture Nathaniel R. Conner, State Conservationist	September 20, 1993
Castle & Cooke Land Company	September 13, 1993
<i>(Response)</i> Board of Water Supply Castle & Cooke Land Company George Yim, President	September 23, 1993
<i>(Agency)</i> State of Hawaii Dept. of Budget & Finance Housing Finance & Development Corporation	September 8, 1993
<i>(Response)</i> Board of Water Supply Housing Finance & Development Corporation Joseph K. Conant, Executive Director	October 1, 1993

Agencies' Reviews and Responses (cont'd)

<i>(Agency)</i> State of Hawaii Dept. of Land & Natural Resources	September 20, 1993
<i>(Response)</i> Board of Water Supply Dept. of Land & Natural Resources Keith W. Ahue, Chairperson	October 5, 1993
<i>(Agency)</i> State of Hawaii Dept. of Land & Natural Resources	August 26, 1993
<i>(Response)</i> Board of Water Supply Dept. of Land & Natural Resources State Historic Preservation Division Don Hibbard, Administrator	September 15, 1993
<i>(Agency)</i> State of Hawaii Dept. of Health	September 13, 1993
<i>(Response)</i> Board of Water Supply Dept. of Health John C. Lewin, M.D., Director	October 7, 1993

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RECEIVED
BOARD OF WATER SUPPLY



JOHN WAIHEE
GOVERNOR

BRIAN J. J. CHOY
Director

AUG 13 11 57 AM '93

STATE OF HAWAII
OFFICE OF ENVIRONMENTAL QUALITY CONTROL
220 SOUTH KING STREET
FOURTH FLOOR
HONOLULU, HAWAII 96813
TELEPHONE (808) 586-4185

August 12, 1993

932278

AUG 16 1993

Handwritten initials: DJ, DE

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

Attention: Mr. Roy Doi

Dear Mr Hayashida:

Subject: Draft Environmental Assessment for the Proposed Waipahu
III Exploratory Well Project, TMK: 9-4-5:74, Waipahu,
Oahu

Thank you for the opportunity to review and comment on the subject
document. We have the following comment.

In the assessment process, the proposing agency must consult with
other agencies having jurisdiction or expertise as well as citizen
groups and individuals. Therefore, we recommend that you consult
with the parties listed below:

1. State of Hawaii, Department of Land and Natural Resources,
Commission on Water Resources Management;
2. City and County of Honolulu, Department of Public Works; and
3. Castle and Cooke.

If you have any questions, please call Jeyan Thirugnanam at
586-4185. Thank you.

Sincerely,

Handwritten signature: Brian J. J. Choy

Brian J. J. Choy
Director

Handwritten mark: a stylized symbol or signature

BOARD OF WATER SUPPLY

CITY AND COUNTY OF HONOLULU

630 SOUTH BERETANIA STREET

HONOLULU, HAWAII 96843

COPY



September 3, 1993

FRANK F. FASI, Mayor

WALTER O. WATSON, JR., Chairman
MAURICE H. YAMASATO, Vice Chairman
SISTER M. DAVILYN AH CHICK, O.S.F.
JOHN W. ANDERSON, JR.
REX D. JOHNSON
MELISSA Y.J. LUM
C. MICHAEL STREET

KAZU HAYASHIDA
Manager and Chief Engineer

Mr. Brian J. J. Choy, Director
Office of Environmental Quality Control
State of Hawaii
220 South King Street, Fourth Floor
Honolulu, Hawaii 96813

Dear Mr. Choy:

Subject: Your Letter of August 12, 1993 Regarding the Draft Environmental Assessment (EA) for the Proposed Waipahu III Exploratory Well Project, TMK: 9-4-5: 74, Waipahu, Oahu

Thank you for reviewing the Draft EA for our proposed project. The document is currently being reviewed by the State Department of Land and Natural Resources, City Department of Public Works and Dole Food Company (formerly Castle and Cooke). Their comments will be included in the Final EA.

If you have any questions, please contact Roy Doi at 527-5235.

Very truly yours,

KAZU HAYASHIDA
Manager and Chief Engineer

JKL

P

DEPARTMENT OF PUBLIC WORKS
CITY AND COUNTY OF HONOLULU

650 SOUTH KING STREET
HONOLULU, HAWAII 96813

Dep ~~PE~~
AUG 13 1993 PE

FRANK F. FASI
MAYOR



C. MICHAEL STREET
DIRECTOR AND CHIEF ENGINEER

KENNETH E. SPRAGUE
DEPUTY DIRECTOR

ENV 93-173

August 11, 1993

MEMORANDUM

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


FROM: C. MICHAEL STREET, DIRECTOR AND CHIEF ENGINEER

SUBJECT: DRAFT ENVIRONMENTAL ASSESSMENT (DEA)
WAIPAHA III EXPLORATORY WELL PROJECT
TMK:9-4-5:74

We have reviewed the subject DEA and have the following comment:

Since the water from test pumping is considered non-storm water, we suggest that you contact the State Department of Health to see whether a storm water NPDES permit is required.

Should you have any questions, please contact Mr. Alex Ho, Environmental Engineer, at 523-4150.


C. MICHAEL STREET
Director and Chief Engineer

CS

BOARD OF WATER SUPPLY

CITY AND COUNTY OF HONOLULU

630 SOUTH BERETANIA STREET

HONOLULU HAWAII 96843

COPY



September 1, 1993

FRANK F. FASI Mayor

WALTER O. WATSON JR. Chairman
MAURICE H. YAMASATO Vice Chairman
SISTER M. DAVILYN AH CHICK, O.S.F.
JOHN W. ANDERSON, JR.
REX D. JOHNSON
MELISSA Y.J. LUM
C. MICHAEL STREET

KAZU HAYASHIDA
Manager and Chief Engineer

TO: C. MICHAEL STREET, DIRECTOR AND CHIEF ENGINEER
DEPARTMENT OF PUBLIC WORKS

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

SUBJECT: YOUR MEMORANDUM OF AUGUST 11, 1993 ON THE DRAFT
ENVIRONMENTAL ASSESSMENT (EA) FOR THE PROPOSED WAIPAHU
III EXPLORATORY WELL PROJECT, TMK: 9-4-5: 74, WAIPAHU

Thank you for reviewing the Draft EA for our proposed project. The State Department of Health has indicated that the discharge associated with exploratory well test pumping is not regulated and a National Pollutant Discharge Elimination System permit is not required. Water pumped during the testing will be discharged into Waikele Stream. Appropriate mitigative measures will be implemented to dissipate flows to minimize erosion damage.

If you have any questions, please contact Roy Doi at 527-6122.

P

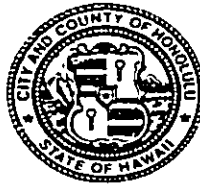
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PLANNING DEPARTMENT
CITY AND COUNTY OF HONOLULU
650 SOUTH KING STREET
HONOLULU, HAWAII 96813

PE

FRANK F. FASI
MAYOR



ROBIN FOSTER
CHIEF PLANNING OFFICER
ROLAND D. LIBBY, JR.
DEPUTY CHIEF PLANNING OFFICER
LW 8/93-1901

August 31, 1993

MEMORANDUM

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

FROM: ROBIN FOSTER, CHIEF PLANNING OFFICER
PLANNING DEPARTMENT

SUBJECT: DRAFT ENVIRONMENTAL ASSESSMENT FOR THE
PROPOSED WAIPAHA III EXPLORATORY WELL PROJECT,
TAX MAP KEY: 9-4-05: 74, WAIPAHA, CENTRAL OAHU

We have reviewed the subject Draft Environmental Assessment (DEA) and offer the following comments.

The site of the proposed project is designated on the Central Oahu Development Plan Land Use Map as Agriculture, not AG-1 (a zoning designation) as indicated on pages 3 and 4 of the DEA.

The proposed project is currently being proposed as an amendment to the Central Oahu Development Plan Public Facilities Map (93/CO-1002(IC)). The Planning Commission held a public hearing on the matter and voted its approval of the project on August 25, 1993.

Should you have any questions, please contact Lin Wong of our staff at extension 4485.

Robin Foster
ROBIN FOSTER
Chief Planning Officer

RF:lh

/

Ⓟ

BOARD OF WATER SUPPLY
CITY AND COUNTY OF HONOLULU
630 SOUTH BERETANIA STREET
HONOLULU, HAWAII 96843

COPY



September 17, 1993

FRANK F. FAS: Mayor

WALTER O. WATSON, JR.: Chairman
MAURICE H. YAMASATO: Vice Chairman
SISTER M. DAVILYN AH CHICK, O.S.F.
JOHN W. ANDERSON, JR.
REX D. JOHNSON
MELISSA Y.J. LUM
C. MICHAEL STREET

KAZU HAYASHIDA
Manager and Chief Engineer

TO: ROBIN FOSTER, CHIEF PLANNING OFFICER
PLANNING DEPARTMENT

FROM: KAZU HAYASHIDA, MANAGER AND CHIEF ENGINEER
BOARD OF WATER SUPPLY *Kazu Hayashida*

SUBJECT: YOUR MEMORANDUM OF AUGUST 31, 1993 REGARDING THE DRAFT
ENVIRONMENTAL ASSESSMENT (EA) FOR THE PROPOSED
WAIPAHU III EXPLORATORY WELL PROJECT, TMK: 9-4-05: 74,
WAIPAHU

Thank you for reviewing the Draft EA for our proposed project. We will indicate in the Final EA that the project site is designated for agriculture use on the Central Oahu Development Plan Land Use Map.

If you have any questions, please contact Roy Doi at 527-5235.

P-443/93

United States
Department of
Agriculture

Soil
Conservation
Service

P. O. Box 50004
Honolulu, HI
96850-0001

September 7, 1993

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

Dear Mr. Doi:

Subject: Draft Environmental Assessment for the proposed
Waipahu III Exploratory Well Project, Waipahu, Oahu

We have completed our review of the Draft Environmental Assessment for the proposed Waipahu III Exploratory Well Project and have no major concerns. Mr. Warren M. Lee is no longer stationed in Hawaii, please correct your mailing list of reviewers to reflect the change. Thank you for the opportunity to provide comment.

Sincerely,



NATHANIEL R. CONNER
State Conservationist

cc: Michael Baginting, D.C., Honolulu Field Office, Honolulu, Hawaii
State of Hawaii, Office of Environmental Quality Control

PLANNING BRANCH
SEP 10 10 02 AM '93



BOARD OF WATER SUPPLY

CITY AND COUNTY OF HONOLULU

630 SOUTH BERETANIA STREET

HONOLULU, HAWAII 96843

COPY



September 20, 1993

FRANK F. FASI, Mayor

WALTER O. WATSON, JR., Chairman
MAURICE H. YAMASATO, Vice Chairman
SISTER M. DAVILYN AH CHICK, O.S.F.
JOHN W. ANDERSON, JR.
REX D. JOHNSON
MELISSA Y.J. LUM
C. MICHAEL STREET

KAZU HAYASHIDA
Manager and Chief Engineer

Mr. Nathaniel R. Conner
State Conservationist
Soil Conservation Service
U. S. Department of Agriculture
P. O. Box 50004
Honolulu, Hawaii 96850-0001

Dear Mr. Conner:

Subject: Your Letter of September 7, 1993 Regarding the Draft Environmental Assessment (EA) for the Proposed Waipahu III Exploratory Well Project, TMK: 9-4-5: 74, Waipahu, Oahu

Thank you for reviewing the Draft EA for our proposed project. We acknowledge that you have no major concerns at this time. We will correct our mailing list of reviewers to reflect the replacement of Mr. Warren M. Lee.

If you have any questions, please contact Roy Doi at 527-5235.

Very truly yours,

KAZU HAYASHIDA
Manager and Chief Engineer

P

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RECEIVED
EO OF HONOLULU

CASTLE & COOKE LAND COMPANY

P.O. BOX 2990 • HONOLULU, HAWAII 96802
TELEPHONE: (808) 548-6611
FAX NO.: (808) 548-6690

SEP 14 9 17 AM '93

September 13, 1993

SEP 14 1993
PE

Mr Kazu Hayashida
Manager and Chief Engineer
Board of Water Supply
City and County of Honolulu
630 South Beretania Street
Honolulu, Hawaii 96843

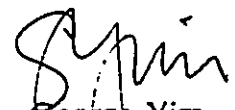
Dear Mr. Hayashida:

Subject: Draft Environmental Assessment for the Proposed Waipahu III Exploratory Well Project, TMK: 9-4-05: 74, Waipahu, Oahu

The subject Assessment was reviewed by Wallace Miyahira of Castle & Cooke Homes also and we have no comments.

We appreciate your referring the report to us.

Very truly yours,


George Yim
President

cc: Wallace Miyahira



BOARD OF WATER SUPPLY

CITY AND COUNTY OF HONOLULU

630 SOUTH BERETANIA STREET

HONOLULU, HAWAII 96843

COPY



September 23, 1993

FRANK F. FASI, Mayor

WALTER O. WATSON, JR., Chairman
MAURICE H. YAMASATO, Vice Chairman
SISTER M. DAVILYN AH CHICK, O.S.F.
JOHN W. ANDERSON, JR.
REX D. JOHNSON
MELISSA Y.J. LUM
C. MICHAEL STREET

KAZU HAYASHIDA
Manager and Chief Engineer

Mr. George Yim, President
Castle & Cooke Land Company
P. O. Box 2990
Honolulu, Hawaii 96802

Dear Mr. Yim:

Subject: YOUR LETTER OF SEPTEMBER 13, 1993 REGARDING THE DRAFT ENVIRONMENTAL ASSESSMENT (EA) FOR THE PROPOSED WAIPAHA III EXPLORATORY WELL PROJECT - TMK: 9-4-5: 74, WAIPAHA, OAHU

Thank you for reviewing the Draft EA for our proposed project. We acknowledge that you have no comments at this time.

If you have any questions, please contact Roy Doi at 527-5235.

Very truly yours,

KAZU HAYASHIDA
Manager and Chief Engineer

ED 09 11
JOHN WAINEE
GOVERNOR

SEP 10 9 16 AM '93



932664

JOSEPH K. CONANT
EXECUTIVE DIRECTOR

STATE OF HAWAII
DEPARTMENT OF BUDGET AND FINANCE
HOUSING FINANCE AND DEVELOPMENT CORPORATION
677 QUEEN STREET, SUITE 300
HONOLULU, HAWAII 96813
FAX (808) 587-0600

IN REPLY REFER TO:

93:DSS/4324

September 8, 1993

SEP 1 1993
[Handwritten initials]

Mr. Kazu Hayashida
Manager and Chief Engineer
Board of Water Supply
City and County of Honolulu
630 South Beretania Street
Honolulu, Hawaii 96813

Dear Mr. Hayashida:

SUBJECT: Draft Environmental Assessment for the Proposed
Waipahu Exploratory Well Project, TMK: 9-4-5--74,
Waipahu, Oahu

We have received the Draft Environmental Assessment report for the proposed Waipahu III Exploratory Well project and find that the report is well written and comprehensive. However, some of the numbers and durations used are not consistent throughout the report. The discrepancies noted are summarized below.

1. Project Completion Time

- Six to seven months: Page 2, last line of Section 1.4
- Four months: Page 7, 5th line of Section s.5

2. Drilling Time

- Three to four weeks: Page 5, second to the last line of Section 2.3
- Two to three months: Page 7, second line of Section 2.5

3. Elevation

- 280 feet: Page 3, 4th line of Section 2.1
- 280 feet: Figure No. 4
- 320 feet: Page 10, 1st line of Section 3.1.3

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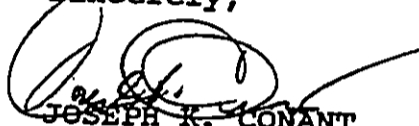
Mr. Kazu Hayashida
September 8, 1993
Page 2

4. Grouting

- 320 feet: Figure No. 4
- 370 feet: Page 4, 4th line of Section s.3

Thank you for giving us the opportunity to review the Draft Environmental Assessment report. Should you have any questions, please call my Development Support Section Chief, Ernie Yuasa, At 587-0555.

Sincerely,



JOSEPH K. CONANT
Executive Director

BOARD OF WATER SUPPLY

CITY AND COUNTY OF HONOLULU

630 SOUTH BERETANIA STREET

HONOLULU, HAWAII 96843

COPY



October 1, 1993

FRANK F. FASI Mayor

WALTER O. WATSON JR. Chairman
MAURICE H. YAMASATO Vice Chairman
SISTER M. DAVILYN AH CHICK, O.S.F.
JOHN W. ANDERSON, JR.
REX D. JOHNSON
MELISSA Y.J. LUM
C. MICHAEL STREET

KAZU HAYASHIDA
Manager and Chief Engineer

Mr. Joseph K. Conant
Executive Director
Housing Finance and
Development Corporation
Department of Budget and Finance
State of Hawaii
677 Queen Street, Suite 300
Honolulu, Hawaii 96813

Dear Mr. Conant:

Subject: Your Letter of September 8, 1993 Regarding the Draft Environmental Assessment (EA) for the Proposed Waipahu III Exploratory Well Project, TMK: 9-4-5: 74, Waipahu, Oahu

Thank you for reviewing the Draft EA for our proposed project. The noted discrepancies will be corrected in the Final EA. The exploratory well project will require an estimated six to seven months to complete. Drilling will require approximately two to three months. The proposed well site is located at an elevation of 280 feet above sea level and grout casing will be installed to a depth of 320 feet.

If you have any questions, please contact Roy Doi at 527-5235.

Very truly yours,

KAZU HAYASHIDA
Manager and Chief Engineer

JL MN WAHEE
GOVERNOR OF HAWAII



KEITH WAHUE CHAIRPERSON
BOARD OF LAND AND NATURAL RESOURCES

932728

DEPUTIES
JOHN P. KEPPELER, II
DONAL L. MANAIKE

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES

P. O. BOX 621
HONOLULU, HAWAII 96809

AQUACULTURE DEVELOPMENT
PROGRAM
AQUATIC RESOURCES
BOATING AND OCEAN RECREATION
CONSERVATION AND
ENVIRONMENTAL AFFAIRS
CONSERVATION AND
RESOURCES ENFORCEMENT
CONVEYANCES
FORESTRY AND WILDLIFE
HISTORIC PRESERVATION
LAND MANAGEMENT
STATE PARKS
WATER AND LAND DEVELOPMENT

REF:OCEA:SKK

SEP 20 1993

File No.: 94-087
DOC. ID.: 3471

The Honorable Kazu Hayashida
Manager and Chief Engineer
Board of Water Supply
City and County of Honolulu
630 South Beretania St.
Honolulu, Hawaii 96813

SEP 23 1993
PE
PE

Dear Mr. Hayashida:

Subject: Draft Environmental Assessment (DEA) for the Proposed Waipahu
III Exploratory Well Project, Waipahu, Oahu, TMK: 9-4-05: 74

We have reviewed the DEA information for the proposed exploratory well project transmitted by your letter dated August 6, 1993, and have the following comments:

Commission on Water Resource Management

The Commission on Water Resource Management's (CWRM) staff comments that the Board of Water Supply (BWS) has submitted applications for a Water Use Permit and Well Construction Permits for the subject project. On July 28, 1993, CWRM granted a Water Use Permit for 3.825 million gallons per day with a condition that the final location of the subject wells will be worked out by U.S. Geological Survey, CWRM staff, and BWS. The Well Construction Permit applications are still pending at this time, as CWRM is waiting for comments from USGS on the well site location.

Division of Land Management

The Division of Land Management comments that they have no objections to the proposed well.

Q

Mr. K. Hayashida

-2-

File No.: 94-087

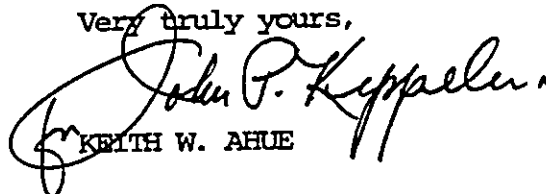
Historic Preservation Division

The Historic Preservation Division (HPD) comments that a review of their records shows that there are no known historic sites in the vicinity of the proposed well. These lands are fallow pineapple fields, where it is unlikely that historic sites will be found. Therefore, HPD believes that this project will have "no effect" on historic sites.

We have no other comments to offer at this time. Thank you for the opportunity to comment on this matter.

Please feel free to call Steve Tagawa at our Office of Conservation and Environmental Affairs, at 587-0377, should you have any questions.

Very truly yours,


for KEITH W. AHUE

BOARD OF WATER SUPPLY
CITY AND COUNTY OF HONOLULU
630 SOUTH BERETANIA STREET
HONOLULU, HAWAII 96843

COPY



October 5, 1993

FRANK F. FASI, Mayor

WALTER O. WATSON, JR., Chairman
MAURICE H. YAMASATO, Vice Chairman
SISTER M. DAVILYN AH CHICK, O.S.F.
JOHN W. ANDERSON, JR.
REX D. JOHNSON
MELISSA Y. J. LUM
C. MICHAEL STREET

KAZU HAYASHIDA
Manager and Chief Engineer

Mr. Keith W. Ahue, Chairperson
Department of Land and Natural Resources
State of Hawaii
P. O. Box 621
Honolulu, Hawaii 96809

Dear Mr. Ahue:

Subject: YOUR LETTER OF SEPTEMBER 20, 1993 REGARDING THE DRAFT ENVIRONMENTAL ASSESSMENT (DEA) FOR THE PROPOSED WAIPAHU III EXPLORATORY WELL PROJECT, WAIPAHU, OAHU - TMK: 9-4-5: 74

Thank you for reviewing the DEA for our proposed project. We acknowledge the following:

1. The Commission on Water Resource Management (CWRM) has granted a Water Use Permit for the project with the condition that the final location of the exploratory wells will be worked out by the United States Geological Survey (USGS), CWRM staff and the Board of Water Supply. The Well Construction Permit applications are still pending as CWRM is waiting for comments from USGS on the well site location.
2. The Division of Land Management has no objections to the proposed well.
3. A review of the records of the Historic Preservation Division shows no known historic sites in the vicinity of the proposed wells. The Historic Preservation Division believes that the proposed project will have "no effect" on historic sites.

If you have any questions, please contact Roy Doi at 527-5235.

Very truly yours,

KAZU HAYASHIDA
Manager and Chief Engineer

JOHN WAIHEE
GOVERNOR OF HAWAII

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STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
STATE HISTORIC PRESERVATION DIVISION
33 SOUTH KING STREET, 8TH FLOOR
HONOLULU, HAWAII 96813

August 26, 1993

Kazu Hayashida
Manager and Chief Engineer
Board of Water Supply
City and County of Honolulu
630 South Beretania Street
Honolulu, Hawaii 96843

Dear Mr. Hayashida:

SUBJECT: **Draft Environmental Assessment for the Proposed Waipahu III
Exploratory Well Project
Waipi'o, Ewa, O'ahu
TMK: 9-4-5: 74**

Thank you for the opportunity to review this project. A review of our records shows that there are no known historic sites in the vicinity of the proposed well. These lands are fallow pineapple fields, where it is unlikely that historic sites will be found. Therefore, we believe that this project will have "no effect" on historic sites.

Sincerely,

DON HIBBARD, Administrator
State Historic Preservation Division

TD:jt

KEITH AHUE, CHAIRPERSON
BOARD OF LAND AND NATURAL RESOURCES

DEPUTIES

JOHN P. KEPPELER II
DONA L. HANAKE

AQUACULTURE DEVELOPMENT
PROGRAM

AQUATIC RESOURCES
CONSERVATION AND
ENVIRONMENTAL AFFAIRS
CONSERVATION AND
RESOURCES ENFORCEMENT
CONVEYANCES

FORESTRY AND WILDLIFE
HISTORIC PRESERVATION
DIVISION
LAND MANAGEMENT
STATE PARKS
WATER AND LAND DEVELOPMENT

LOG NO: 9158
DOC NO: 9308td29

Keith Ahue
AUG 30 1993 *Dep't*
AUG 31 1993 *PE*

BOARD OF WATER SUPPLY

CITY AND COUNTY OF HONOLULU

630 SOUTH BERETANIA STREET

HONOLULU, HAWAII 96843

COPY



September 15, 1993

FRANK F. FASI, Mayor

WALTER O. WATSON, JR., Chairman
MAURICE H. YAMASATO, Vice Chairman
SISTER M. DAVILYN AH CHICK, O.S.F.
JOHN W. ANDERSON, JR.
REX D. JOHNSON
MELISSA Y.J. LUM
C. MICHAEL STREET

KAZU HAYASHIDA
Manager and Chief Engineer

Mr. Don Hibbard
Administrator
State Historic Preservation Division
Department of Land and Natural Resources
State of Hawaii
33 South King Street, 6th Floor
Honolulu, Hawaii 96813

Dear Mr. Hibbard:

Subject: Your Letter of August 26, 1993 Regarding the Draft Environmental Assessment (EA) for the Proposed Waipahu III Exploratory Well Project, TMK: 9-4-5: 74, Waipahu, Oahu

Thank you for reviewing the Draft EA for our proposed project. We note that a review of your records shows no known historic sites in the project vicinity. Your comments support the EA conclusion that the project will not result in any adverse impacts to archaeological resources.

If you have any questions, please contact Roy Doi at 527-5235.

Very truly yours,

KAZU HAYASHIDA
Manager and Chief Engineer

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JOHN WAIHEE
GOVERNOR
BOARD OF WATER SUPPLY
SEP 16 4 07 PM '93



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

932673

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

PE

In reply, please refer to:

September 13, 1993

93-239/epo

Mr. Kazu Hayashida
Manager & Chief Engineer
Board of Water Supply
City & County of Honolulu
630 South Beretania Street
Honolulu, Hawaii 96843

Dear Mr. Hayashida:

Subject: Draft Environmental Assessment for the Proposed Waipahu III
Exploratory Well Project
Waipahu, Oahu
TMK: 9-4-5: 74

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

Presently, the Department of Health is not regulating these types of discharges, therefore, an NPDES permit is not required. The Honolulu Board of Water Supply must, however, demonstrate that the discharges are essentially free of pollutants and will not adversely impact the receiving water.

The Department does encourage the discharger to take mitigative measures to prevent erosion by controlling the flow rate and path to the receiving water. This type of discharge has the ability to cause significant erosion damage. However, the well pump test itself should not violate the Basic Water Quality Standards of Chapter 11-54-04, Hawaii Administrative Rules. Also, the Department encourages the implementation of a Best Management Practices (BMP) Plan for this type of activity.


A storm water National Pollutant Discharge Elimination System (NPDES) permit application is required for construction activities which involve the clearing, grading, and excavation of equal to or greater than five (5) acres of total land area. This application should be submitted to the Director of Health at least 90 days before the date on which construction is to commence.

✓

Mr. Kazu Hayashida
September 13, 1993
Page 2

If you should have any questions or wish to discuss this matter further,
please contact Mr. Devender Narala, Engineering Section of the Clean Water
Branch, at 586-4309.

Very truly yours,



JOHN C. LEWIN, M.D.
Director of Health

c: Clean Water Branch

BOARD OF WATER SUPPLY

CITY AND COUNTY OF HONOLULU

630 SOUTH BERETANIA STREET

HONOLULU, HAWAII 96843

COPY



October 7, 1993

FRANK F. FASI, Mayor

WALTER O. WATSON, JR., Chairman
MAURICE H. YAMASATO, Vice Chairman
SISTER M. DAVILYN AH CHICK, O.S.F.
JOHN W. ANDERSON, JR.
REX D. JOHNSON
MELISSA Y.J. LUM
C. MICHAEL STREET

KAZU HAYASHIDA
Manager and Chief Engineer

John C. Lewin, M.D.
Director
Department of Health
State of Hawaii
P. O. Box 3378
Honolulu, Hawaii 96801

Dear Dr. Lewin:

Subject: Your Letter of September 13, 1993 Regarding the Draft Environmental Assessment (EA) for the Proposed Waipahu III Exploratory Well Project, TMK: 9-4-5: 74, Waipahu, Oahu

Thank you for reviewing the Draft EA for our proposed project. We have the following response:

1. Thank you for informing us that your department is not regulating the discharge associated with exploratory well test pumping and a National Pollutant Discharge Elimination System (NPDES) permit is not required.
2. The contractor will implement a Best Management Practices Plan to prevent erosion damage caused by the test pumping discharge. Appropriate measures will be implemented to dissipate flows and control the path of the discharge to Waikele Stream.
3. Localized soil disturbance will be limited to 900 square feet, and therefore, neither a storm water NPDES permit nor Erosion Control Plan is required. The contractor will obtain a County grading permit and implement erosion control measures such as swales and berms to retain storm water runoff on the project site.

If you have any questions, please contact Roy Doi at 527-5235.

Very truly yours,

KAZU HAYASHIDA
Manager and Chief Engineer