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GOVERNOR OF HAWAII



STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
DIVISION OF WATER AND LAND DEVELOPMENT

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

Dear Mr. Choy:

Puukapu Deep Well Development
(Well No. 6337-01), Waimea, Hawaii

Pursuant to Section 11 of the Environmental Impact Statement Rules, transmitted for processing are four (4) copies of the Environmental Assessment and Notice of Determination (Negative Declaration) for the subject project. Also, attached is a completed OEQC Bulletin Publication Form.

If there are any questions on this matter, please have your staff contact Mr. Gordon Akita of the Planning Branch at extension 70227.

Sincerely,

A handwritten signature in black ink, appearing to read "Manabu Tagomori", written over a large, light-colored oval shape.

MANABU TAGOMORI
Manager-Chief Engineer

SY:lc

Enc.

1992-05-08-HI-PEA-Puukapu Deep Well Development Well
No. 6337-01

MAY 8 1992

ENVIRONMENTAL ASSESSMENT
AND
NEGATIVE DECLARATION

Job No. 48-HW-D
Puukapu Deep Well Pump Development
Well No. 6337-01
Waimea, Hawaii

State of Hawaii
Department of Land and Natural Resources
Division of Water and Land Development
March 1992

NOTICE OF DETERMINATION: Negative Declaration

FOR: Job No. 48-HW-D
Puukapu Deep Well Pump Development (Well No. 6337-01)
Waimea, Hawaii

BY: Division of Water and Land Development
Department of Land and Natural Resources

The proposed action will have no significant effect on the environment and therefore does not require the preparation of an Environmental Impact Statement. This Notice of Determination and Environmental Assessment are being filed as a Negative Declaration.

ENVIRONMENTAL ASSESSMENT
for
Job No. 48-HW-D
Puukapu Deep Well Pump Development
Well No. 6337-01
Waimea, Hawaii

1. INTRODUCTION AND SUMMARY

1.1 Applicant/Proposing Agency

Division of Water and Land Development
Department of Land and Natural Resources

1.2 Agencies Consulted

County of Hawaii:
Department of Water Supply

State of Hawaii:
Department of Health
Department of Land and Natural Resources
Division of Forestry and Wildlife

Federal Government:
Environmental Protection Agency

1.3 Project Background and Objectives

The proposed action is located on TMK: 6-3-01:04, within the Kohala Forest Reserve, the Kohala Watershed and in the Conservation District. (See Figure 1.) The action is located at the site of an exploratory well for which an Environmental Assessment was done in 1986 and a Notice of Determination of Negative Declaration was filed in June 1986. The exploratory well was successfully completed in 1987, and proven as a source of non-potable water.

The objective is to upgrade the exploratory well to a permanent, non-potable water well for use as an irrigation source during periods of drought in the Waimea area.

1.4 Project and Site Description

The Waimea Irrigation System presently uses the Upper Hamakua Ditch to serve the Hawaiian Home Lands agricultural subdivisions, Lalamilo Farm Lots and other homestead lands around Waimea. The Hamakua Ditch runs approximately 7.9 miles along the East Kohala Mountains and feeds the Waimea and Puukapu

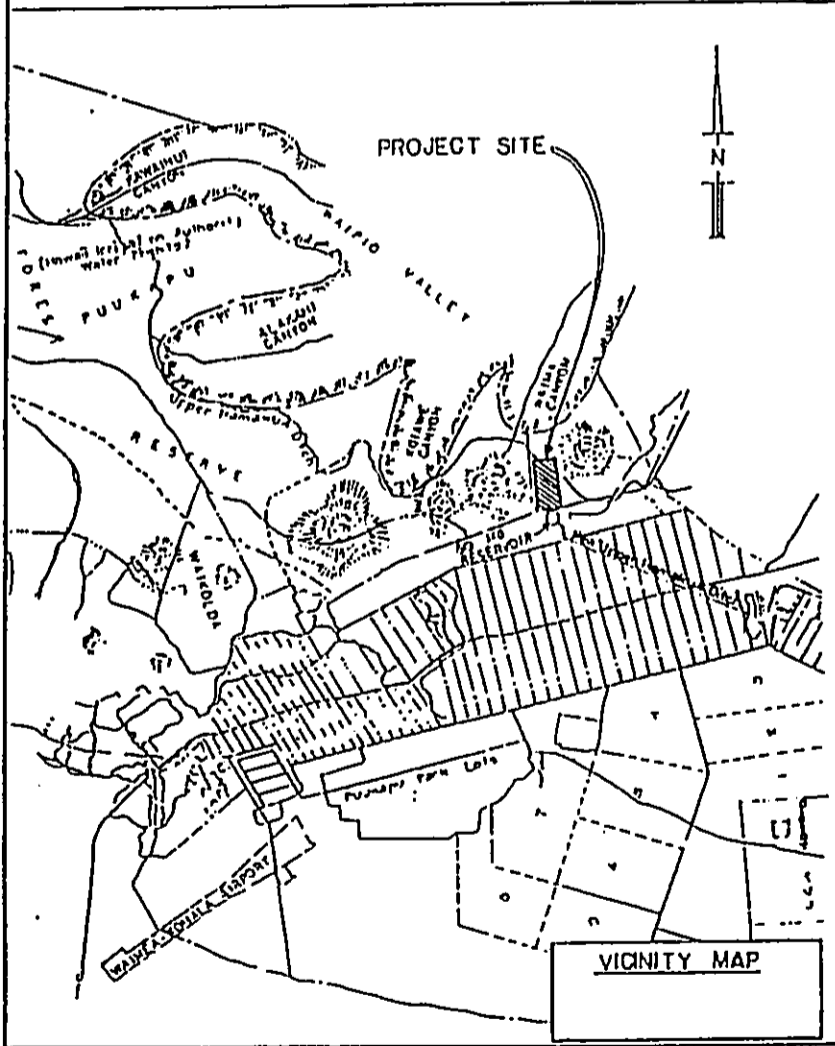
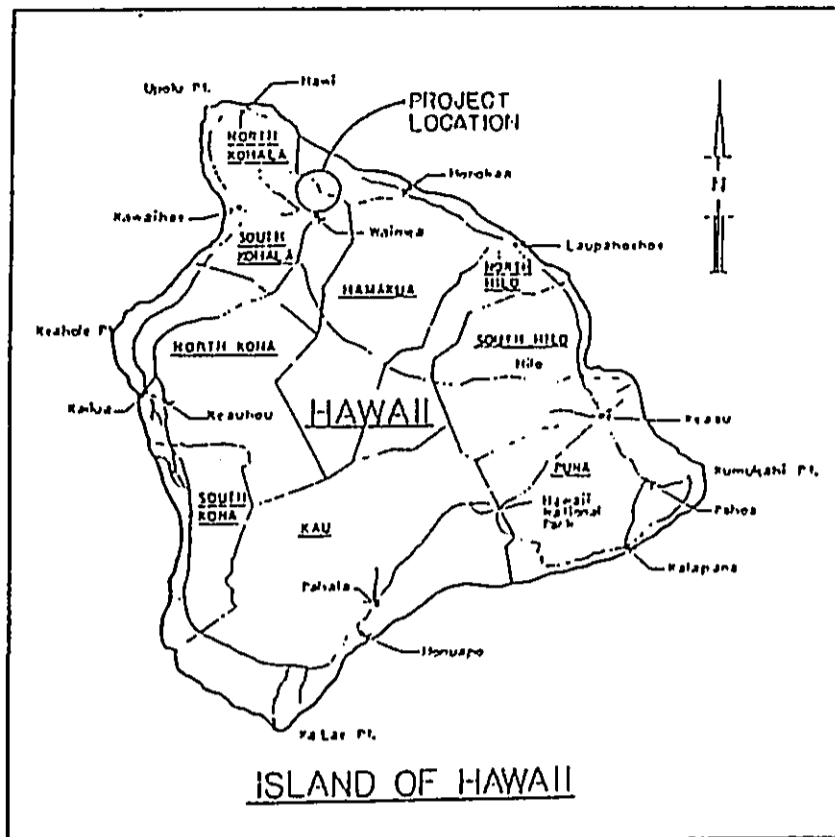


FIGURE 1

Reservoirs. The water flow drops during dry periods. Hence, a supplementary source of irrigation water is needed.

The site is located approximately one mile below the outfall of the Hamakua Ditch to the Waimea Reservoir in the Forest Reserve. (See Figure 2.)

1.5 Potential Impacts, Mitigation Measures, and Alternatives:

Establishing a permanent well at the Waimea site to augment the existing water supply for irrigation during periods of drought would likely result in temporary construction effects of traffic, noise, and dust, as well as permanent modification to the site by pump facilities.

Some erosion of soil due to lack of vegetative cover during the construction period is also expected. Impacts on the site are expected to occur during construction and to be temporary. Mitigation measures involve normal environmentally sensitive practices such as keeping dust levels down, and use of proper vehicular emission equipment.

Alternatives to the proposed action are not considered practical due to the nature of the irrigation need and the placement of the existing exploratory well.

1.6 Government Permits and Approvals

In addition to consultation with appropriate State and County agencies, an application for a Conservation District Use Permit is required. This environmental assessment has been developed to support that application.

Permits and approvals needed are:

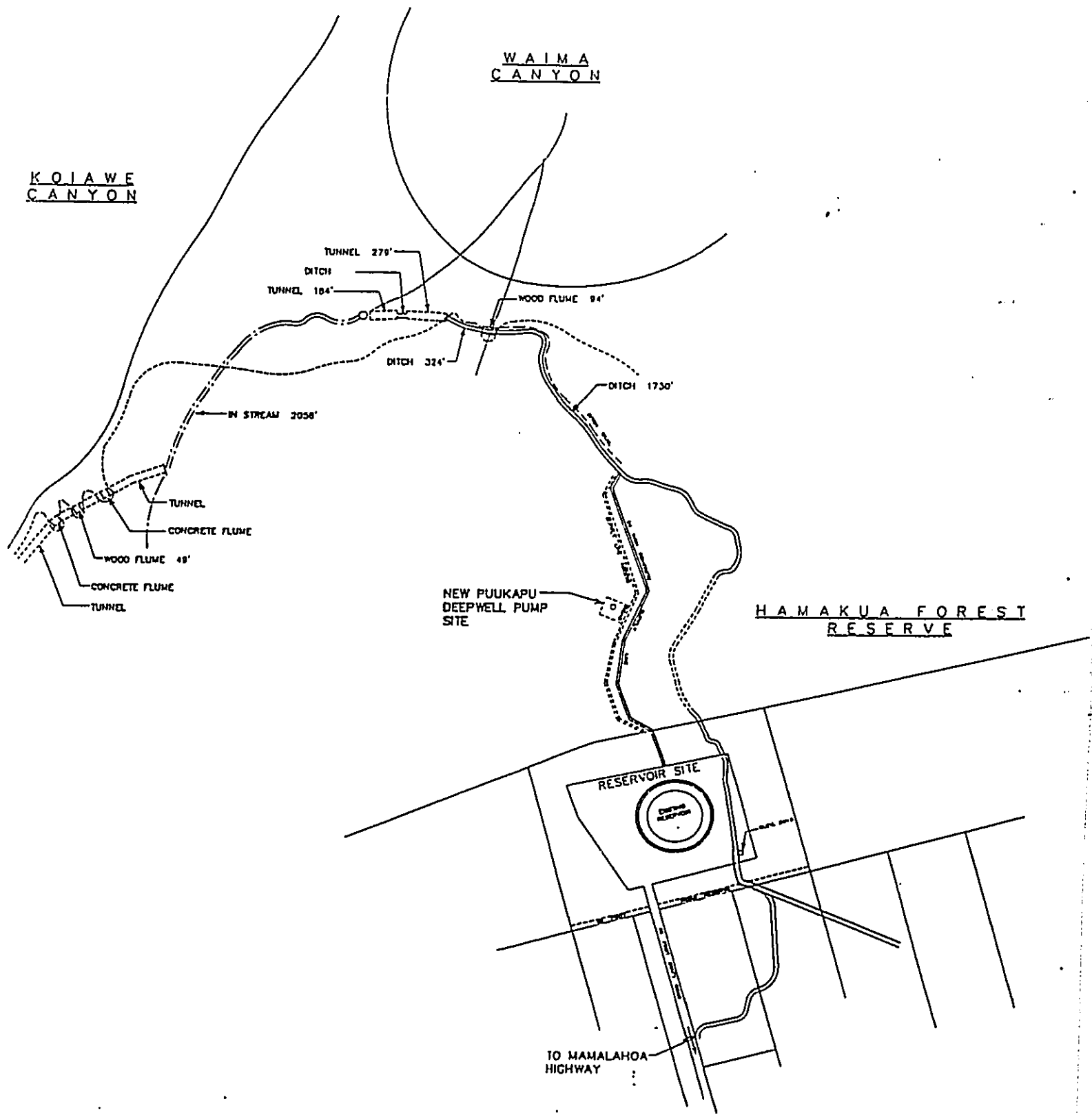
Conservation District Use Application, including:
Water Use Permit
Pump Installation Permit

2. PROJECT DESCRIPTION

2.1 Project Site

2.1.1 Location and Description

The proposed permanent well would be located at an elevation of 3,023.2 feet in the Kohala Mountains. The perched aquifer which supplies the well lies 1,737.2 feet above mean sea level (msl). The current exploratory well is about 1.2 miles from Mamalahoa Highway and about 4 miles northeast of Waimea. (See



LOCATION MAP
SCALE:

FIGURE 2

Figure 2.) It is situated approximately 2,100 feet mauka of the existing Waimea Reservoir. The reservoir is an open 60 million gallon (mg) storage facility which is connected to the Hamakua Ditch through a 24-inch pipeline. The permanent well installation (see Figure 3) would involve the following:

- Maintaining the current depth of the well at 1,744 feet, as shown in Figure 4, and placing a 10-inch discharge column inside a 16-inch well casing to a depth of 1,500 feet. A pump section will require an 11-foot section, and the motor section will be approximately 21 feet long. A 5-foot by 5-foot concrete pad will be installed at the surface of the well to carry the weight of the pump, motor and pipe.
- Installing a submersible pump, which would use a 600-horsepower motor. The pump would be lubricated by food-grade mineral oil. A control building, approximately 17 by 31 feet will be constructed next to the well to house the electrical facility needed to run the pump. The connection from the well to the 24-inch pipe that leads to the Waimea Reservoir will be a 24-inch flange through a concrete box that holds a spillway. The well water will be pumped directly into the reservoir line.
- Installing electrical transmission lines and 70-foot telephone poles from the main road to the well site.
- Installing a detection device for measuring the water level.

2.1.2 Land Ownership

The project site is located in the Kohala Forest Reserve in the County of Hawaii. The Upper Hamakua Ditch is the source for the Waimea Irrigation System which is under the jurisdiction of the State Department of Agriculture; the forest reserve under the Forestry and Wildlife Division, State Department of Land and Natural Resources.

The State of Hawaii owns the land. The State Land Commission classifies the entire parcel as Conservation, and the County zones the project site as Forest Reserve.

2.1.3 Land Use Designations and Controls

The State Land Use Classification for the project site is Conservation, and a Conservation District Use Permit is needed for any work done within that designation. The site is zoned Forest Reserve by the County of Hawaii.

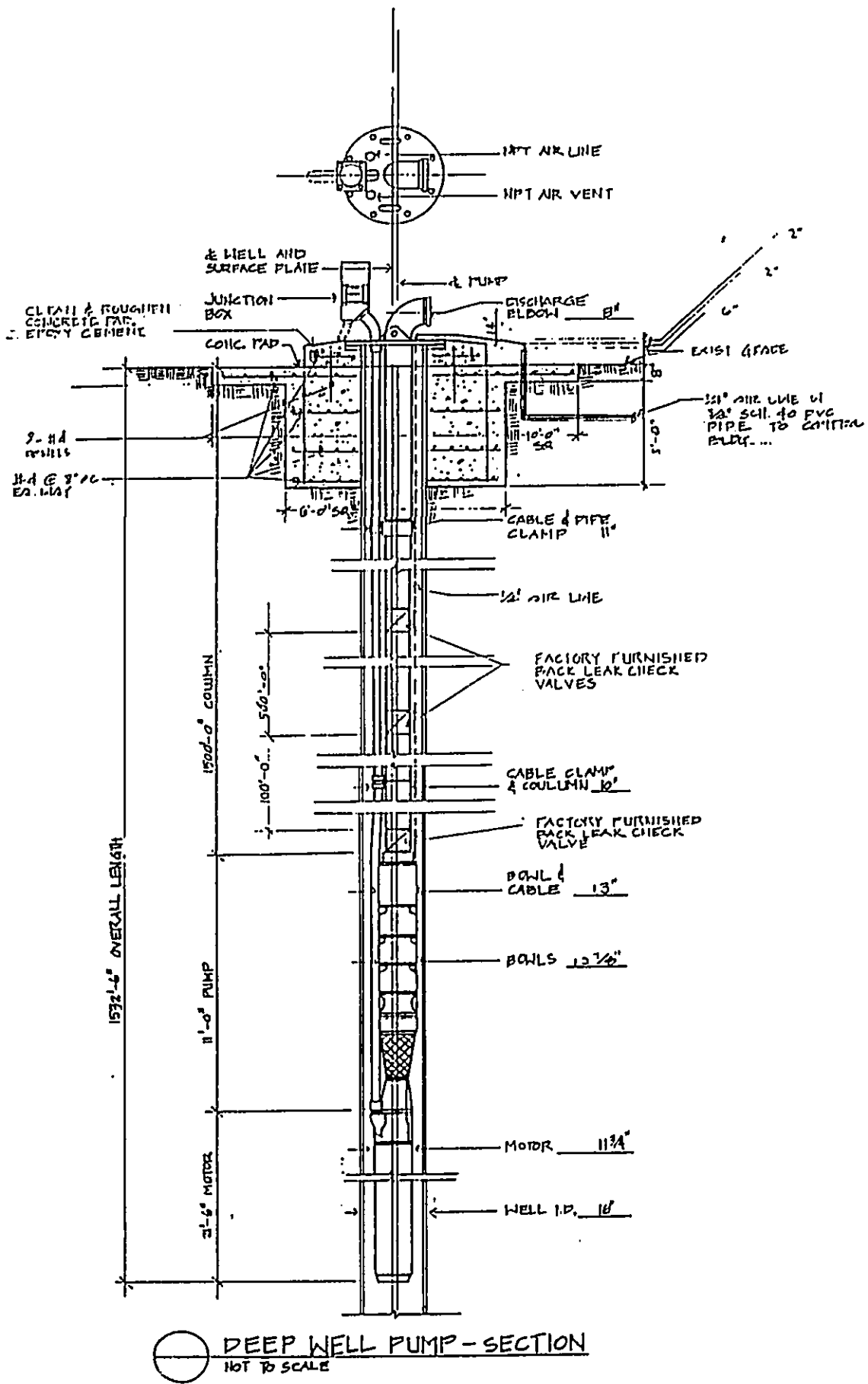


FIGURE 3

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
DIVISION OF WATER AND LAND DEVELOPMENT

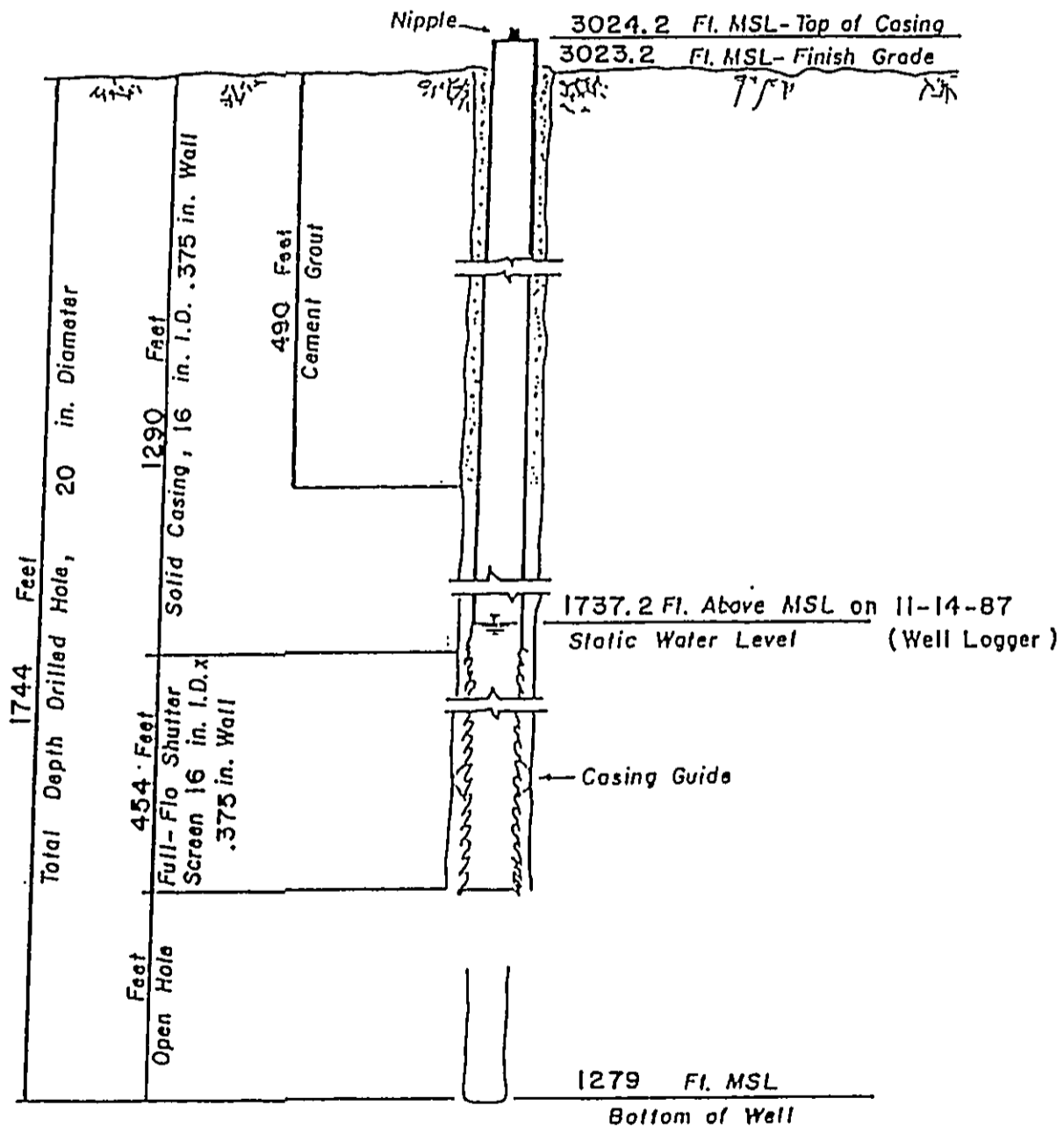
PUUKAPU DEEPWELL 6337-01

Puukapu, Waimea, Hawaii

AS BUILT SECTION

Drilled: June 1987

Driller: Water Resources Intl.



NOT TO SCALE

FIGURE 4

2.2 Proposed Facilities and Activities

New facilities include transmission lines and poles, a 17-foot by 31-foot control building for housing the necessary electrical works for the pump, a water level measurement device, a 5-foot by 5-foot concrete pad on the ground surface around the well, a 4-inch basecourse driveway, 8-inch and 24-inch discharge line to connect to the existing 24-inch pipeline, and 482 linear feet of chain link fence.

The well test showed a sustainable yield of water -- 1.5 million gallons per day (mgd). Use of the aquifer will occur to augment the existing gravity pipeline to the Waimea Reservoir during dry periods (Puukapu Deepwell Pump Test No. 4, Kawabata; March 23, 1988).

2.3 Project Schedule and Construction Cost

The construction work is expected to be completed within 360 days from the date of written notice to commence. The cost is expected to be approximately \$1.2 million dollars.

2.4 Need for Project

New water sources are needed in Waimea to augment and enhance the dependability of the water supply in the South Kohala community. The proposed project would supplement the Waimea Irrigation System which presently provides water to the Lalamilo Farm lots, Hawaiian Home Lands agricultural subdivisions, and other homestead lands. Waimea is an area which is heavily dependent on agricultural activity. More truck farmers are now operating in the area, and there is greater demand for irrigation water.

The present source of water is the Hamakua Ditch. However, during dry periods the water flow drops and a supplemental source of water is needed. To solve this problem, an exploratory well was drilled in 1987 and non-potable water from a perched aquifer was found. Consequently, a permanent well is proposed to replace the exploratory well and supplement the irrigation water supply.

3. EXISTING CONDITIONS

3.1 Physical Environment

Access to the project site is via the Mamalahoa Highway and a two-lane rural road which is paved in most places. There are a few rural homes and agricultural properties adjoining the road, which continues to the reservoir site and further on to the exploratory well site. The road to the reservoir is located on Hawaiian Home Lands property and is sited within an easement.

A portion of the remaining road to the pump site is located in the Forest Reserve.

3.1.1 Geology

The site is located on a 5 percent slope at the foot of Kaala, a 900-foot-high hill on the eastern flank of the Kohala Mountains. Underlying the ground cover is a late stage, volcanic alkalic basalt base, originating from the Kohala Volcano. The northeastern side has been deeply dissected and eroded. This erosion led to the formation of the rich agricultural soils in the area.

3.1.2 Hydrology

The project site receives over 100 inches of rain per year. Due to the high amount of rainfall, the danger of erosion is high on areas which are not covered by vegetation or drained improperly. Small and deep natural drainage ways and gullies cut through the project area. There are various culverts and pipes used to provide drainage for the existing road.

Beneath the project site lies a perched aquifer. This is ground water found on perched, dense, impermeable lava flows and weathered ash. This aquifer is the water source for the well.

3.1.3 Topography

The well site has a mild 5 percent slope. However, the slope increases to approximately 10 percent up to the Hamakua Ditch and slopes down to the Waimea Reservoir at about a 7 percent grade.

3.1.4 Climate

In addition to the approximately 100 inches of rain received per year, another climatic variable is average temperature. Due to the 1,700+ foot elevation of the site, the average annual temperature is 64 to 74 F.

3.1.5 Soil

Soil on the property is classified as Maile silt loam. This soil consists of well-drained silt loams which formed in volcanic ash. A representative profile shows a surface layer of dark reddish-brown and very dark brown silt loam which is about 14 inches thick.

The subsoil, which is normally about 46 inches thick, is

constituted of dark yellowish brown and very dark brown silty clay loam. The deeper subsoil then becomes a fine, sand sized aggregate.

The permeability of silt loam is generally moderately rapid with slow runoff, and erosion hazard is considered slight. However, the runoff and erosion potential is highest when ground cover enhances the permeability and the slope is mild.

3.1.6 Natural Hazards

Volcanic eruption, earthquakes and flash flooding due to heavy rainfall are the natural hazards that may affect the site. The well is located far from steep gullies and on a mild slope which reduces the chances of flooding.

3.1.7 Fauna and Flora

The area of the well site was initially cleared for the purpose of drilling an exploratory well. The site is currently overgrown by various grasses, forbs and sedges, as well as Kahili Ginger (Hedycium gardneruanum). The overgrown parcel is about 200 square feet. Most of the species are introduced and exotic.

The native species found in the area are primarily in the forest of 'ohi'a (Metrosideros polymorpha) and olapa (Cheirodendron trigynum) surrounding the cleared site. There are a few banyan trees planted at the side of the road. The native species are found in scattered patches. Among those found are hapu'u, hapu'u'i'i, lau-kahi, manono, pilo, pakahakaha and 'ama'u. (See Appendix A for a complete list of both introduced and native species found on the site and in the area.)

Although several rare and endangered botanical species are known to occur in the nearby Pu'u O 'Umi Natural Area Reserve, no species designated as rare or endangered were found during the botanical survey of January 19, 1990; either on the well site or along the proposed road/power corridor.

The area is known to have feral pigs and various exotic species of avifauna. Upgrading the existing pump is not expected to have adverse impact on fauna due to the small area of the site and the temporary nature of the work.

3.1.8 Archaeology

The well site was previously graded for the drilling of an exploratory well. It is unlikely that any archaeological or historical features exist within the site. However, if any unanticipated sites or artifacts are discovered during construction, the work will be halted and the State Historic

Preservation Office will be contacted.

3.2 Socio-economic Environment

Due to the concentration of agricultural activities in the Waimea area, support for that industry is important. The largest private landowner and employer is the Parker Ranch, and the second largest source of employment are the small farms which engage in diversified agriculture.

A wide variety of vegetable, fruit, floral and forage crops supplement the ranching activity. On State-owned and homestead lands, an increasing number of residents would like to place their lands in production.

The proposed County redesignation of Waimea Homesteads from Low Density Urban to Intensive Agriculture supports this trend (County of Hawaii, 1989). With the expansion of agriculture, there is a need for a dependable supply of irrigation water.

4. SUMMARY OF POTENTIAL IMPACTS AND MITIGATION MEASURES

4.1 Temporary Impacts

Noise and possible erosion due to freshly exposed soil would be the primary impact during construction and installation of the pump facility. Noise would be limited to daylight hours, and the impact is expected to be slight since the closest residence is over a mile away.

Construction of the project will be scheduled during the dry period of the year, which should minimize the erosion potential. Keeping vehicles on the existing paved portions of the road and limiting unnecessary heavy equipment trips will also assist in protection of the soil layer.

The proposed project is not expected to have a significant impact on the botanical resources due to the existing composition of introduced species. Regrowth of disturbed vegetation is expected to be rapid due to the wet climate. Transmission poles should be sited to avoid clumps of native trees and tree ferns along the road/powerline corridor.

Other impacts, such as dust and vehicle emissions, are expected to be insignificant. All operations will be conducted in conformance with the State Department of Health regulations regarding noise and vehicle emissions.

The contractor will use proper mufflers and other emission control devices on vehicles. Water trucks would be used to maintain low levels of dust.

No adverse impacts on faunal populations are expected due to the temporary nature of the work proposed.

4.2 Impacts on the Waimea Reservoir

The primary impact on Waimea Reservoir will be having the additional water supply source.

4.3 Other Impacts

Additional impacts will include a more dependable water supply for the agricultural community of Waimea, along with greater crop yields. These are viewed as positive impacts of the project.

5. POSSIBLE ALTERNATIVES

5.1 No Action

No action would result in water shortages for the agricultural community during periods of drought. This would negatively impact the economic base of the community by decreasing yields.

5.2 Delayed Project

Delaying the project would initially have the same effect as the "no action" alternative. There is the possibility that delaying the project would increase the costs due to inflation.

The decade of the 1980s recorded some of the highest average temperatures of the 20th century. A prolonged drought period occurred in the Waimea area during this time. The drought experience prompted the drilling of the exploratory well which this project would make permanent. Should increasing periods of drought occur, the agricultural community of Waimea would be negatively affected by delays in this project.

5.3 Alternative Sites

The exploratory well site was specifically chosen for its benign impact on environmental concerns. The well is a proven source of needed irrigation water, and it is close to the storage provided by the Waimea Reservoir. To drill at alternative sites would increase the expense of providing a dependable irrigation water source.

6. DETERMINATION

In accordance with Chapter 343, Hawaii Revised Statutes, it is requested that a negative declaration be given to the Puukapu Well project. It has been determined that there would be minimal impact on the environment. Some potentially negative impacts have been identified, but they would be minimized or alleviated by the suggested mitigation measures.

7. REFERENCES

1977; Heezen, B. and Tharp, M.; Volcanism in Hawaii; U.S. Navy, Office of Naval Research; South Nyack, New York

1983; Department of Geography, University of Hawaii; Atlas of Hawaii; University of Hawaii Press, Honolulu, Hawaii

1986; Division of Water and Land Development; Drilling South Kohala Exploratory Well (6337-01); Department of Land and Natural Resources

1989; County of Hawaii; Hawaii County General Plan: Draft; Hilo, Hawaii

1989; Char and Associates; Botanical Assessment Survey: Waimea Well Site and Road/Powerline Corridor, South Kohala District, Hawaii; Honolulu, Hawaii

APPENDIX A

CHAR & ASSOCIATES

Botanical/Environmental Consultants

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

BOTANICAL ASSESSMENT SURVEY WAIMEA WELL SITE AND ROAD/POWERLINE CORRIDOR SOUTH KOHALA DISTRICT, HAWAI'I

Field studies to provide a general description of the vegetation found on the proposed well site and along the road/powerline corridor were conducted on 19 January 1990. In addition, a search was made for any threatened and endangered species, protected by Federal and/or State laws, on the study area.

A walk-through survey method was used. Species were identified 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. Species names used in this report follow Wagner et al. (in press) for the flowering plants and Lamoureux (1984) for the ferns and fern allies. Common English and/or Hawaiian names used are in accordance with St. John (1973) and Porter (1972).

DESCRIPTION OF THE VEGETATION

The area proposed for the well site has been cleared sometime in the past and is now largely overgrown by Kahili ginger (Hedychium gardnerianum) and various grasses, sedges, and forbs. This overgrown parcel is roughly 200 ft. in length and width. The portion abutting the access road, about one-third of the parcel, is gravel-lined and supports only scattered patches of vegetation. The well site proposed to be developed on this parcel will cover an area approximately 100 ft. in length and width.

Kahili ginger and kikuyu grass (Pennisetum clandestinum) are the most abundant species. Locally common in fair-sized patches are Glenwood grass (Sacciolepis indica), white clover (Trifolium repens), Wainaku grass (Panicum repens), Hilo grass (Paspalum conjugatum), California grass (Brachiaria mutica), Pycnæus polystachyus, a native species, and three members of the rush family -- Juncus planifolius, Juncus tenuis, and bog rush or Japanese mat rush (Juncus effusus). Other species occasionally encountered include broomsedge (Andropogon virginicus), foxtail grass (Setaria gracilis), cuphea or puakamoli (Cuphea carthagenensis), St. Johnswort (Hypericum mutilum), paspalum grass (Paspalum scrobiculatum), carpet grass (Axonopus fissifolius), pluchea (Pluchea symphytifolia), and yellow trefoil (Lotus subbiflorus). One sapling each of ironwood (Casuarina sp.) and Nepal alder (Alnus nepalensis), about 1.5 ft. tall, are found on the site.

Native species are found primarily in the 'ohi'a (Metrosideros polymorpha)/olapa (Cheirodendron trigynum) forest surrounding the 200 ft. square parcel. A few, however, have invaded the parcel and occur as scattered individuals; tree and shrub species are less than 3 ft. tall. These are 'ohi'a, hapu'u (Cibotium glaucum), wawae-'iole (Lycopodium cernuum), 'ohelo (Vaccinium calycinum), uluhe (Dicranopteris linearis), pala'a (Sphenomeris chinensis), and Hawaiian sedge (Carex alligata).

An existing gravel-lined road borders the proposed well site and continues on to a nearby gaging station. The powerline which will provide electricity to the well site pumps will follow along the east side of this road. Like the well site, the band of vegetation bordering the road has been previously disturbed and is dominated by introduced or alien species.

Kahili ginger is abundant in places, while grasses and forbs are the common components in other areas. Among the most frequently

observed species are Vasey grass (Paspalum urvillei), Kikuyu grass, honohono (Commelina diffusa), palm grass (Setaria palmifolia), Glenwood grass, and Pycreus. Rocky areas alongside the road support such plants as cranesbill (Geranium homeanum), creeping buttercup (Ranunculus repens), drymaria (Drymaria cordata var. pacifica), blue-eyed grass (Sisyrinchium micranthum), water smartweed (Polygonum punctatum), milkwort (Polygala paniculata), pluchea, etc. A few large banyan trees (Ficus sp.) are found planted alongside the road.

Native species occur as scattered individuals or small clumps of plants in the strip of vegetation bordering the road. Among the natives found here are 'ohi'a, olapa, hapu'u, hapu'u 'i'i (Cibotium chamissoi), shuttlecock fern or lau-kahi (Dryopteris wallichiana), manono (Hedyotis hillebrandii), Clermontia parviflora, pilo (Coprosma pubens), pakahakaha (Pleopeltis thunbergiana), and 'ama'u (Sadleria cyatheoides).

THREATENED AND ENDANGERED SPECIES

Several rare or candidate endangered plant species are known from the nearby Pu'u O 'Umi Natural Area Reserve. These include the lo'ulu palm (Pritchardia lanigera), two native mints (Phyllostegia floribunda, P. vestita), ho'awa (Pittosporum hawaiiensis), manena (Pelea hawaiiensis), kahi-'ai-kamo'o-wahie (Lobelia hypoleuca), pilokea (Platydesma remyi), and Doodia lyoni. None of these species were encountered during this survey.

No officially listed threatened and endangered plants nor any proposed or candidate for such status (U. S. Fish and Wildlife Service 1985; Herbst 1987) occur on the proposed well site and the road/powerline corridor.

DISCUSSION AND RECOMMENDATIONS

The area proposed for the well site and the road/powerline corridor have been previously disturbed and are dominated by introduced or alien species, principally Kahili ginger and various grass species. Native plants occur as scattered individuals or small clumps of plants; none are considered threatened or endangered species.

The proposed project is not expected to have a significant impact on the botanical resources as it is composed largely of introduced species. Although some vegetation will be removed during construction, given the wet conditions of the area, regrowth and recovery of the plant cover is expected to be fairly rapid. While the native plants found along the road/powerline corridor occur throughout the surrounding forest, if possible, poles should be sited to avoid clumps of native trees and tree ferns along the powerline corridor.

REFERENCES

- Herbst, D. 1987. Status of endangered Hawaiian plants. Hawaiian Botanical Society Newsletter 26(2): 44-45.
- Lamoureux, C. H. 1984. Checklist of the Hawaiian Pteridophytes. Manuscript.
- Porter, J. R. 1972. Hawaiian names for vascular plants. Coll. of Tropical Agriculture, Univ. of Hawaii, Manoa, Dept. Paper No. 1.
- St. John, H. 1973. List and summary of the flowering plants in the Hawaiian Islands. Pacific Tropical Botanical Gardens Mem. No. 1, Lawai, Kauai.

U. S. Fish and Wildlife Service. 1985. Endangered and threatened wildlife and plants; Review of plant taxa for listing as Endangered and Threatened Species; Notice of review. Federal Register 50(188): 39526-39527 plus 57-page table of species.

Wagner, W. L., D. Herbst, and S. H. Sohmer. In press. Manual of the flowering plants of Hawai'i. Univ. of Hawaii Press and B. P. Bishop Museum, Honolulu.