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**ENVIRONMENTAL IMPACT ASSESSMENT
FILE COPY
AND
NEGATIVE DECLARATION FOR THE
PUMP, CONTROLS AND PIPELINE
FOR PUHI WELL #3
PUHI DISTRICT
LIHUE WATER SYSTEM**

COUNTY OF KAUAI
DEPARTMENT OF WATER

ENVIRONMENTAL IMPACT ASSESSMENT
AND
NEGATIVE DECLARATION
FOR THE
PUMPS, CONTROLS AND PIPELINE
FOR THE PUHI WELL NO. 3
JOB NO. 87-12
LIHUE WATER SYSTEM

AT

LIHUE, KAUAI
STATE OF HAWAII

This Environmental Document was prepared pursuant to Chapter 343, Hawaii Revised Statutes.

PROPOSING AGENCY: Department of Water
County of Kauai
P. O. Box 1706
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ENVIRONMENTAL IMPACT ASSESSMENT

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I. **INTRODUCTION**

A. Project Description

The proposed project includes: The installation of a deep well pump, pump controls and appurtenances and a connection to the existing water distribution system at the Puhi Well. The project also includes the modification of existing pump control facilities, site improvements and fence installation.

B. Project Location

The project is located in the Lihue District of Kauai in an area which is primarily in sugar cane cultivation. The proposed work involves the development of the Puhi Well, located next to an existing cane haul road near Puhi Stream, approximately a half mile northwest of the Kauai Community College and within 150 feet of existing Puhi Well #2. Exhibits 1 and 2 show the location of the project sites. The property is owned by the University of Hawaii and easements will be required.

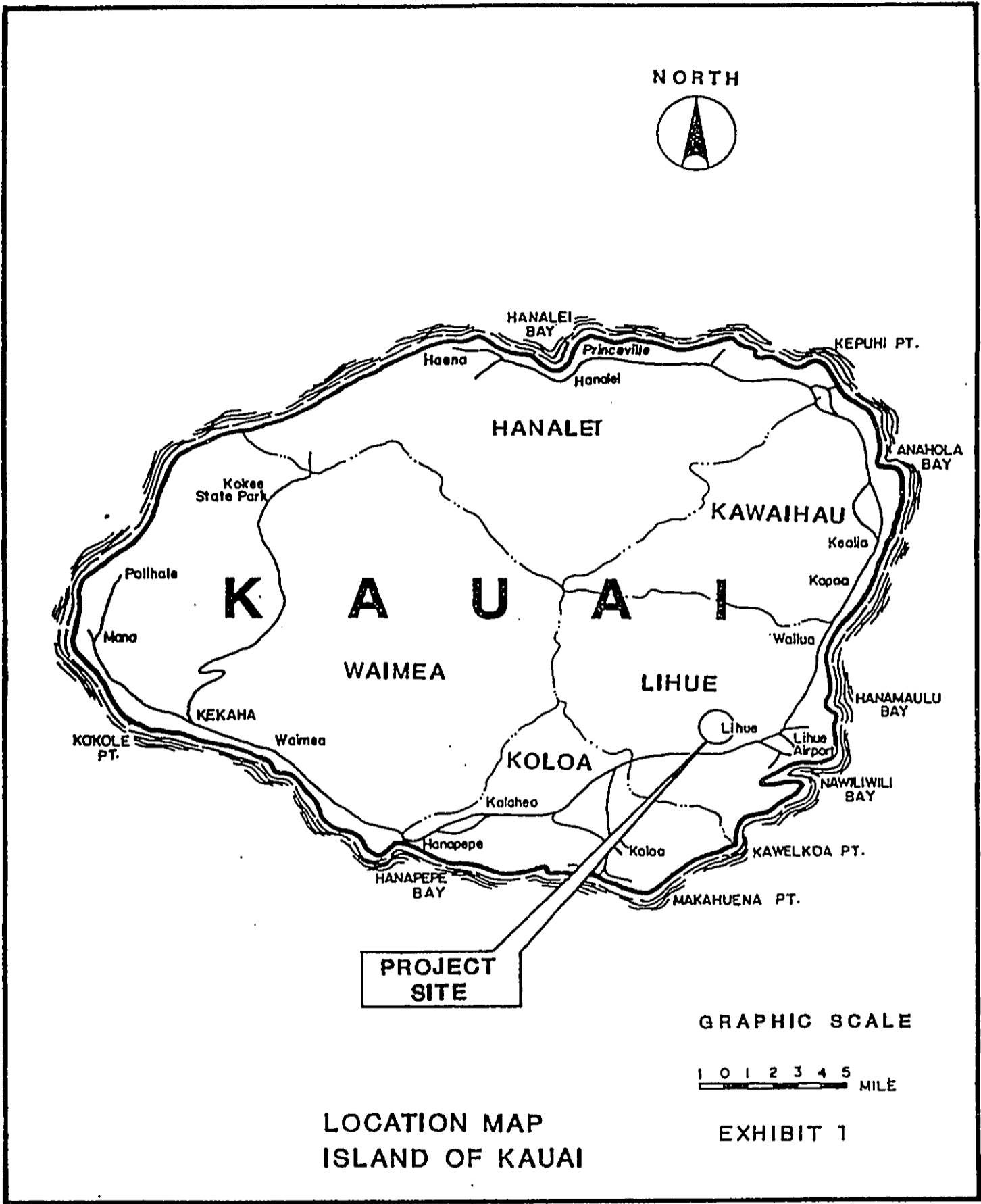
C. Required Permits

The Well Site is within County and State zoned agricultural district. The County of Kauai and State Department of Health require the following permits:

County of Kauai: A use permit is required for all utility installations in agricultural and open space zoned land. These requirements are stipulated in the revised ordinances of the County of Kauai, Section 8-7.3 and Section 8-8.3. Additionally, a Class IV permit is required for the infrastructure to be developed on the agricultural land. This requirement appears in Section 8-7.7.

State Department of Health: A requirement of the State Department of Health is a report and engineer's certification for new potable water sources that the system: 1) complies with the State primary drinking water regulations contained within Public Health Regulation Title 11, Chapter 49, Potable Water Systems, and 2) meets the regulations of the County of Kauai Department of Water.

The Division of Water Resource Management, DLNR, requires a pump installation permit for the installation of the pump for Puhi Well #3.



4' W GRAVEL FILL

1" X 6" REDWOOD
HEADER

6' HIGH STANDARD
CHAIN LINK FENCE

4' W CONCRETE
SIDE WALK

STA.
1-6" 1/8 BEND
1- CONC. BLOCK

STA.
1-6" 1/8 BEND
1- CONC. BLOCK

STA.
CONNECT TO EXISTING
16" WATER MAIN
1-16" X 6" TAPPING SLEEVE
AND VALVE MUELLER OR
APPROVED EQUAL
1- VALVE BOX
1- CONCRETE BLOCK

CONTROL BUILDING
FIN FL =

CANE
FIELD

DEEP WELL
PUMP

1" CHLORINE
SOLUTION LINE IN
3" CONDUIT

MATCH EXISTING

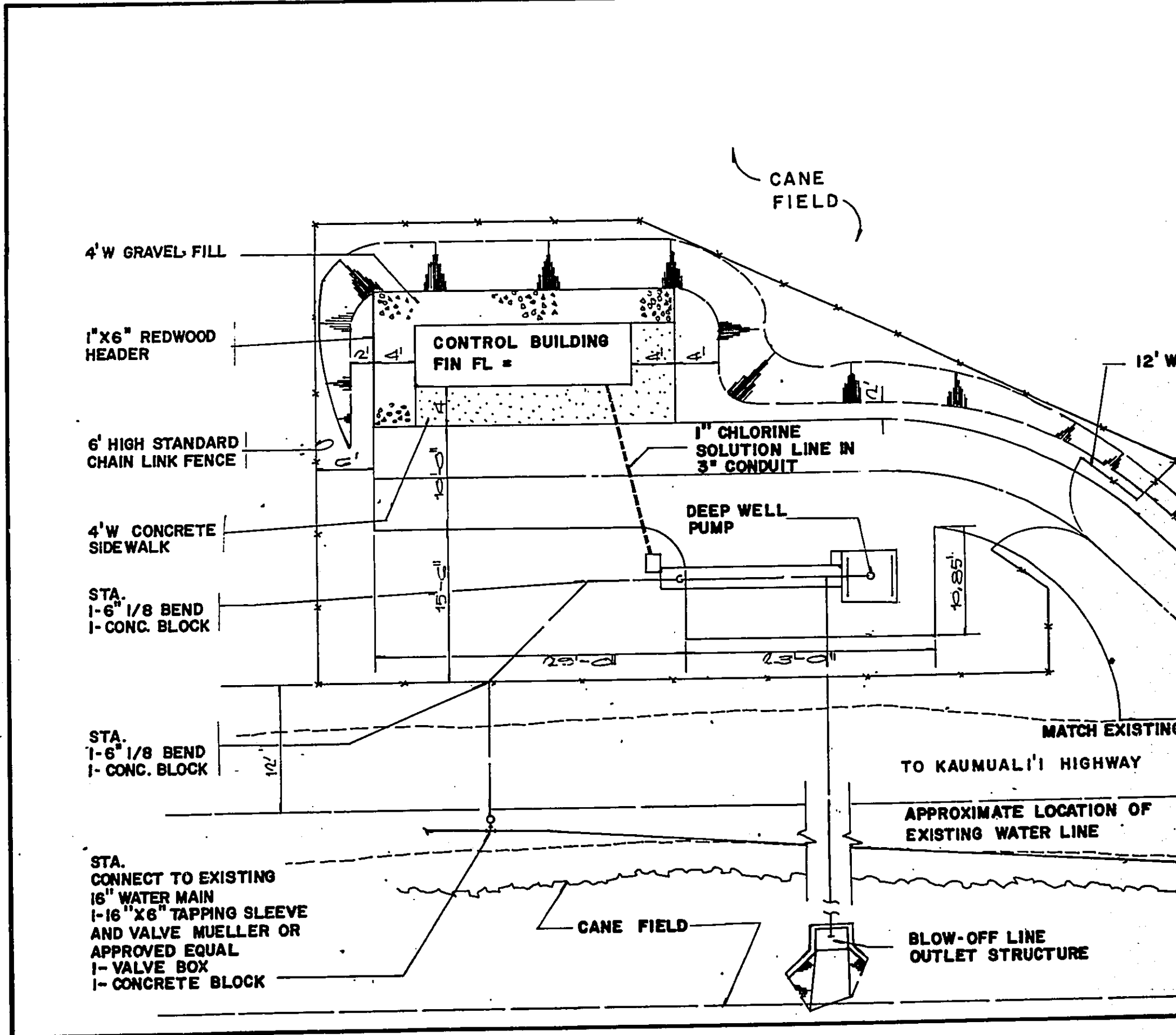
TO KAUMUALI'I HIGHWAY

APPROXIMATE LOCATION OF
EXISTING WATER LINE

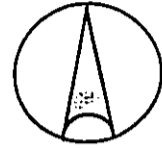
CANE FIELD

BLOW-OFF LINE
OUTLET STRUCTURE

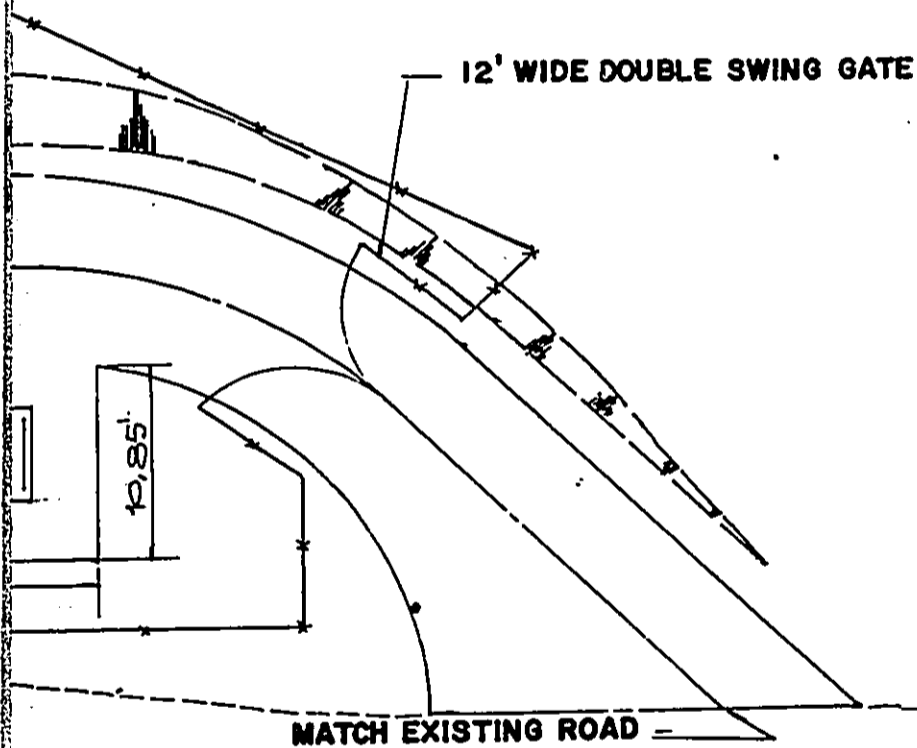
12' W



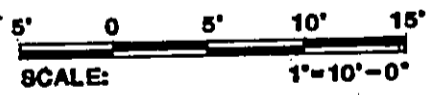
NORTH



12' WIDE DOUBLE SWING GATE



GRAPHIC SCALE



TO KAUMUALI'I HIGHWAY

APPROXIMATE LOCATION OF EXISTING WATER LINE

BLOW-OFF LINE
OUTLET STRUCTURE

PUHI WELL # 3 SITE

EXHIBIT 2

II. DESCRIPTION OF THE PROPOSED PROJECT

A. Background and Existing Conditions

The Lihue Municipal Water System services an area which includes the port complex at Nawiliwili and the adjoining Niimalu residences, Kauai Community College (KCC), the central commercial and surrounding residential, industrial and public use districts in Lihue, Lihue Airport, and the towns of Kapaia and Hanamaulu. Source facilities perched groundwater, and a tunnel which intercepts spring water in a tributary to Huleia Stream (Kokolau Tunnel). Other sources of water for this system are deep wells on the southeastern slopes of Kilohana Crater. Storage facilities consists of several concrete or steel reservoirs through the area. A filter plant and pump station near the KCC are also part of the system. A network of pipelines carries the water from sources to storage tanks and finally to the consumers.

The Puhi Well #3 is approximately midway between the KCC filter plant and the KCC 0.5 MG reservoir, in the vicinity of Well Site #2, above the town of Puhi. The site is relatively level and is next to an existing dirt road used by sugar cane plantation trucks.

The Well is 20-inch in diameter with a 12-inch diameter casing. The total depth of the well is 340 feet with bottom elevation a 72.6 feet MSL. Static water level is at elevation 350.6 feet MSL.

Results of pump drawdown test are given in Table 1.

TABLE 1 PUMP DRAWDOWN TEST

<u>Flow (gpm)</u>	<u>Drawdown (feet)</u>
100	17
200	45
300	87
350	115
400	135

B. Proposed Improvements

1. Proposed Pump and Facilities:

An electrically driven deep well turbine pump will be installed in the existing well. A 300 gpm pump will be used. Power will be provided via the existing power line from the KCC Filter Plant that connects to Well #2.

A Pump Control building will be constructed. The building will house: Electrical and telemetering facilities, including booster pump for injector; air compressor and recorder for well level system; and flowmeter recorder. The control building will be one story and constructed of hollow tile blocks. Pump controls will connect to the KCC 0.5 MG reservoir. The level controls at the reservoir will be modified to add the new control signals.

As a safety precaution, chlorination equipment will be installed and utilized to disinfect well water when required to protect against the transmission of pathogens.

2. Proposed Pipeline Connection:

A 12-inch pipeline will be installed between the Puhi Well #3 and the existing 16" transmission main connecting the KCC Filter Plant to the KCC 0.5 MG tank. The pipeline will be placed underground and have a minimum 4-foot earth cover above the pipeline.

3. Sitework:

The Puhi Well site is relatively flat and only minor grading will be required. The site will be graded so that stormwater will drain away from the well. An asphaltic cement (AC) driveway, extending from the existing dirt roadway, will be provided. The AC pavement will extend onto the site and allow vehicles to park between the pump control building and the well head piping. A 6-foot high chain link fence will be provided along the property line, with a double swing gate at the driveway.

C. Cost Estimate:

The preliminary construction cost estimate for this project, based on 1991 prices is \$230,000. Funding for this proposal project will be wholly provided by Kauai County, Department of Water. The project is JOB 87-12 entitled "Pumps, Controls and Pipeline for Puhi Well #3, Puhi, Kauai."

III. **RELATIONSHIP TO EXISTING LAND USE PLANS AND CONTROLS**

A. State Land Use Plans

The State Land Use Commission designates properties in four categories: Agriculture, Rural, Urban and Conservation. There is no rural designation in the vicinity of the project area. The proposed project lies entirely within land designated Agriculture. The pump is permissible under the rules of practice and procedure, State Land Use District Regulations, Part III Section 3-3 paragraph 7, which reads as follows:

"Public, private, and quasi-public utility lines, and roadways, transformer stations, solid waste transfer stations, etc., and appurtenant small buildings such as booster pumping stations, but not including offices or yards for equipment, material, vehicle storage, repair or maintenance, treatment plants and major storage tanks not ancillary to agricultural practices, or corporation yards or other like structures."

Puhi town to the southeast of the Puhi Well is partially within an urban designation and partially within the agricultural land use designation.

B. County of Kauai General Plan

The General Plan for the County of Kauai, dated March 1970, provides information on the surrounding communities and land use designations. Also provided are generalized statements regarding transportation, sewer and water systems, storm drainage, etc.

Lihue is the major commercial center on the island and Nawiliwili is the major harbor. Lihue town contains the major civic, governmental, commercial and financial offices. Lihue plantation mill is also located within the Urban Center. The General Plan states that the mill should be retained in its present location. Existing land use in Lihue includes residential, resort, commercial, public, mixed use, industrial, park, agriculture and open space. (See Exhibit 3.)

Puhi town, which is in close proximity to the project site, is primarily a residential subdivision with an old existing portion of the town developed as a plantation camp site. The Kauai Community College is also located in Puhi. Existing land use in Puhi includes residential, agriculture, industrial and public space districts. Puhi town itself is zoned R-6, with some industrial area (Puhi Sugar Mill).

Agricultural zoning is intended to protect the agricultural potential of lands within the County of Kauai to insure a resource base adequate to meet the needs and activities of the present and future. Agricultural lands are also intended to assure a reasonable relationship between the availability of agricultural lands for various agricultural uses, and the feasibility of these uses.

Permitted uses are those associated with agricultural production, i.e. forestry, grazing, agricultural, etc.

Open space districts are intended to preserve, maintain or improve the essential characteristics of land and water areas that are of significant value to the public as scenic or recreational resources, and preserve, maintain or improve the essential functions of physical and ecological systems, forms or forces, which significantly affect the general health, safety and welfare.

The project site falls within both County zoned agricultural and open space districts. In both zoning districts a use permit is required for utility installations.

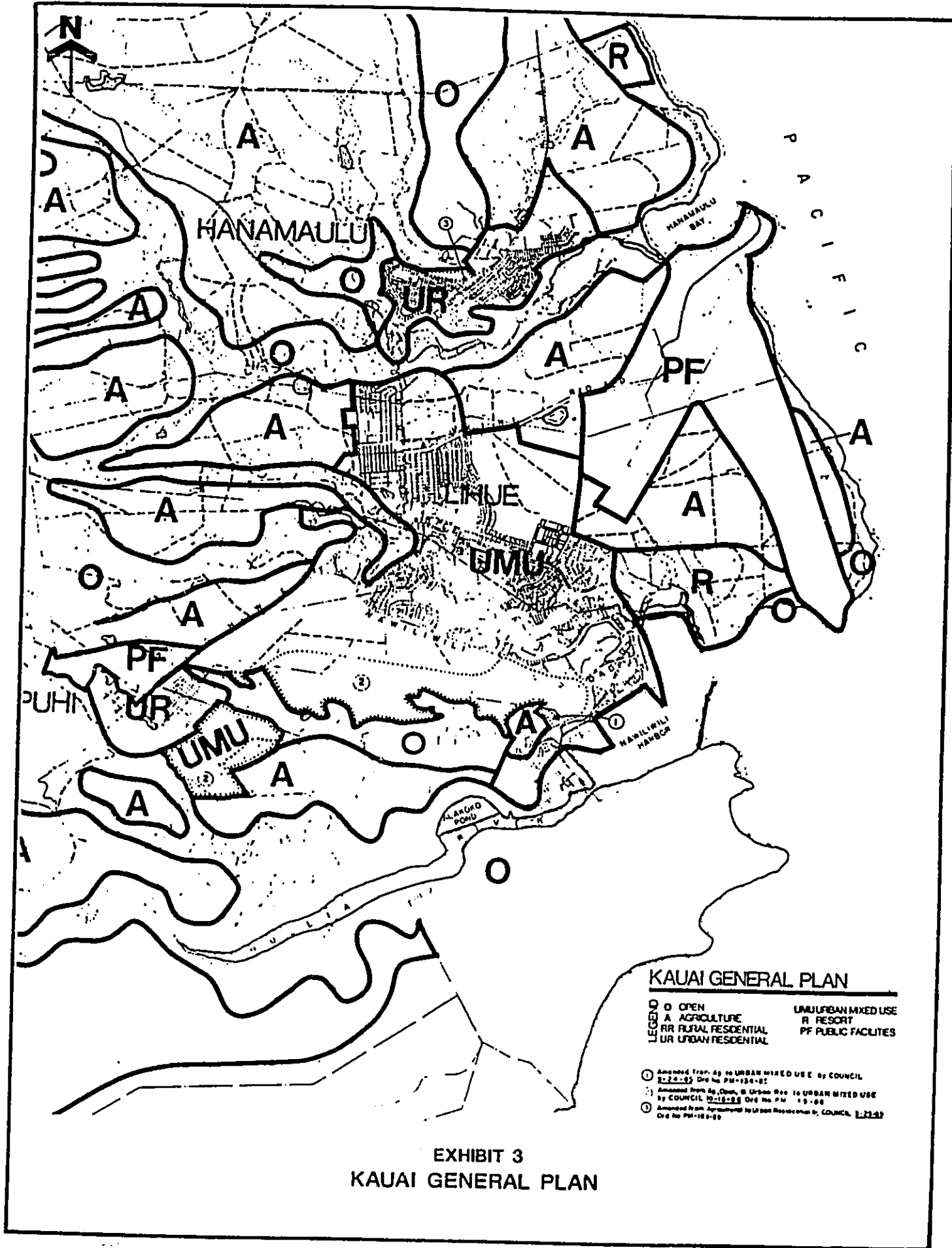


EXHIBIT 3
 KAUAI GENERAL PLAN

Additionally, within the agricultural district a Class IV zoning permit is required for construction of the proposed improvements. This is in conjunction with the use permit required by the County of Kauai.

The proposed project is in conformance with the General Plan of the County of Kauai and is implementing the objectives of Kauai's General Plan for Domestic Water.

C. Lihue Development Plan and Generalized Zoning of the Project Site Area

The lack of developed water supply, sewer, and power will continue to limit Lihue's growth. This finding from the Lihue Development Plan, dated August 1976, continues on to say that the development of public facilities, including water, sewer, and power, has not kept pace with demand on Kauai.

Recommendations from the Lihue Development Plan state that there must be an acceleration of the development of new water, sewer, and power facilities with special emphasis on the needs of Kauai's principal town, Lihue.

Section 10-5.1, paragraph C, Goal 5 of the Revised Ordinances of the County of Kauai, which implements the Lihue Development Plan, states that, to improve the health and safety of the community, there must be encouragement of more water sources to support present and planned activities.

IV. ENVIRONMENTAL SETTING

A. Topography

The project site is located on the slopes of Kilohana Crater. The Puhi Well is within a graded area which is level. The existing ground elevation at the site is 408 feet MSL.

B. Geology

The island of Kauai is the oldest of the major Hawaiian Islands. It is primarily a huge shield volcano. The rocks of this initial volcano are called the Waimea Canyon volcanic series. After completion of this Kauai shield, a long period of erosion and volcanic inactivity occurred. This was followed by renewed activity in the eastern two-thirds of the island. Rocks of this period are called the Koloa volcanic series.

Following the collapse of a large dome, which created the Lihue depression, a vent in the Koloa Volcanic Series was formed in the south-eastern portion of this depression. This small shield is called the Kilohana shield and culminates at Kilohana Crater. The project site is located on the southeastern slopes of this shield.

C. Climate

Kauai generally has a mild climate, characterized by uniform, comfortable temperatures and cooling tradewinds. In the coastal areas, temperatures average 75°F. Generally, the temperature drops 3°F for every 1,000 feet of elevation. The tradewinds, blowing from the northeast, usually occur 80 percent of the time. They are interrupted by cyclonic storms, or Kona winds, from October through April. Kona weather is typically humid and brings heavy rains to all parts of the island.

Because of the prevailing tradewinds, distinct windward and leeward sections of the island exist. Windward Kauai receives much rainfall due to the tradewinds bringing moist air from the sea that condenses as it moves up and over the mountain peaks. At Lihue, the annual average rainfall is 53-inches per year; at the project site, the annual rainfall is about 70-inches per year.

D. Hydrology

The principal sources of ground water for the island of Kauai are derived from lavas of the Napali formation of the Waieka Canyon Volcanic Series. These rocks are highly permeable and carry basal water over much of the island. This water yields readily to wells. The Koloa Volcanic Series, in contrast, are poor to moderately permeable and offer limited yield. In the Lihue area, which is within the Koloa Volcanic series, water is obtained primarily from wells or tunnels which tap perched aquifers. As evidenced by the relatively low capacity for the proposed pump, the project well appears to follow the pattern of low yields.

E. Flora and Fauna

1. Flora:

The indigenous species typical to the area are listed below. None of these are endangered species.

TABLE 2. FLORA OF THE SITE

<u>COMMON</u>	<u>BOTANICAL</u>
Sugar Cane	Saccharum officinarum
Hilograss	Paspalum conjugatum
Pengolagrass	Digitaria decumbens
Dallisgrass	Paspalum dilatatum
Ohia lehua	Metrosideros collina
Koa	Acacia koa
Guava	Psidium guajava

2. Fauna:

There are no endangered species in the area. The work involved on the proposed project should not endanger any of the fauna existing in the area. There may be some disruption of animal life during construction of the project facilities; however, this should return to normal at the completion of the project.

F. Soil

At the Puhi Well #3 Site, the soil is of the type referred to as Puhi silty clay loam. This soil is generally well-drained and medium-to-fine-textured. This soil is also derived from basic igneous rock. The Puhi soils tend to have a surface layer of brown to very dark-brown friable silty clay loam. The subsoil is reddish-brown to dark-brown, friable silty clay loam and silty clay. The substratum is soft, weathered basic igneous rock.

G. Air Quality

Although no information on air quality at the project site was obtained, it is generally assumed that the air is relatively clear and low in pollution. This is because of the elevation and distance from the major urban center of Lihue. However, during the period of sugar cane harvesting, the air quality degrades. This is due to the burning of cane and the dust created by the trucks and harvesting equipment.

H. Audio

No data on measured noise levels at the project site were obtained. Because of its location within the plantation area far from urban centers, it can be assumed that such levels are low. An exception would be occasional noise from passing trucks or other plantation equipment.

I. Historic Sites

There are no identified historic or archeologically significant locations at the well site. However, should any unanticipated sites, artifacts or remains, such as shell, bone or charcoal deposits, be discovered during construction, the work would be halted and the State Historic Preservation Office would be contacted.

V. **SOCIO-ECONOMIC SETTING**

The population of the island of Kauai as July 1, 1978 was 34,700. The population of the District of Lihue for this same ate was 7,700. These statistics are from the 1979 State of Hawaii Data Book. Population projections for the year 2000 indicate that Kauai County will increase from the present population to approximately 60,400.

The following table notes annual household income distribution for the island of Kauai as of August, 1974, based on data from the Kauai Socio-Economic Profile:

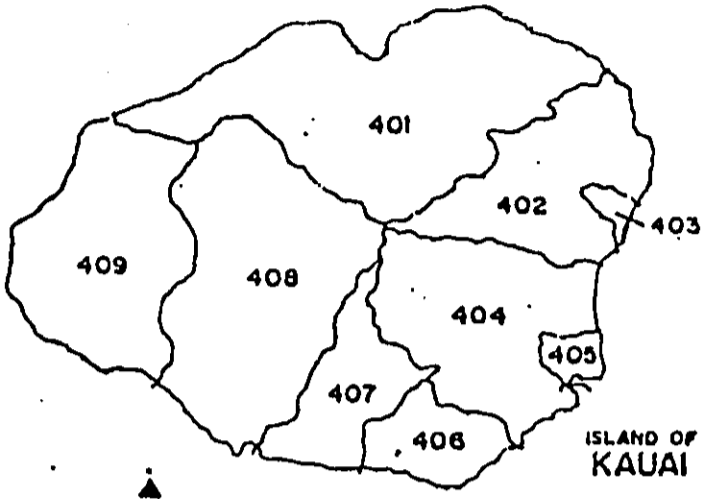
TABLE 3. INCOME DISTRIBUTION, KAUAI, 1974

<u>Income Level</u>	<u>Percent</u>
Less than \$ 5,000	15.2%
\$ 5,000 - 10,000	30.1%
10,000 - 15,000	18.0%
15,000 - 20,000	20.1%
Over \$20,000	16.7%

Grouping by ethnic background of Kauai's adults (18 years and older) was based on self-identification. The largest ethnic group was Japanese (30.4 percent), followed by Filipinos (21.9 percent). The remaining 47.7 percent consisted of Hawaiians, Caucasian, Portuguese and other ethnic groupings.

Table 4 gives various demographic and economic data for census tracts on Kauai. The census tract map (See Exhibit 4) shows that locations of towns and Census tract numbers for the island.

DOCUMENT CAPTURED AS RECEIVED



- 401 - Hanalei
- 402 - Waimea-Anahola
- 403 - Kapaa
- 404 - Puhi Hanamaulu
- 405 - Lihue
- 406 - Koloa Poipu
- 407 - Eleele-Kalaheo
- 408 - Kaunakani-Hanapepe
- 409 - Kekaha-Waimea

EXHIBIT

TABLE 4

RESIDENT POPULATION, 1970 AND 1980, AND AREA DENSITY, AND HOUSEHOLDS, 1980, FOR COUNTIES, ISLANDS AND CENSUS TRACTS

County, island and census tract 1/	Land area (acres)	Resident Population			Population per acre, 1980	Households, 1980
		1980	1970	Percent change		
Kauai County	396,224	39,082	29,761	31.3	0.10	12,020
Kauai	351,168	38,856	29,524	31.6	0.11	11,979
401	2,668	1,182	125.7	...	902
402	6,030	3,599	67.5	...	1,829
403	4,467	3,794	17.7	...	1,425
404	4,590	3,642	26.0	...	1,181
405	4,000	3,124	28.0	...	1,389
406	3,879	3,141	23.5	...	1,240
407	4,855	3,660	32.7	...	1,523
407.99 3/	50	-100.0
408	3,111	3,173	-2.0	...	947
409	5,256	4,159	26.4	...	1,543

1/ Most tract boundaries either remained unchanged between 1970 and 1980 or underwent only minor changes. In cases where the 1970 tracts were split or merged for 1980, however, the 1980 tract designation is followed in parentheses by the 1970 designations.

3/ The ".99" census tracts consist of vessels anchored off the indicated tract; for example, persons living aboard ships in Kewalo Basin, adjacent to tract 38, are assigned to tract 38.99.

Source: U.S. Bureau of the Census, Census of Population and Housing, 1980: Summary Tape File 1A, Hawaii (1981) and 1970 Census of Population and Housing, Census Tracts, Honolulu SMSA, PHC(1)-88 (1972); acreage data by islands in the The State of Hawaii Data Book, 1981, Table 102; acreage for Oahu census tracts from the Honolulu Department of General Planning, unpublished estimates, June 1981. The 1970 population of census tracts split between 1970 and 1980 was approximated from 1970 data for blocks and enumeration districts.

EXHIBIT 4

Kauai's economy is primarily geared around agriculture and tourism as the two most important economic industries.

The pineapple industry has essentially disappeared since 1960, while the sugar industry has reduced its work force by about one-fourth. However, the acreage and tonnage figure for sugar production have not appreciably declined, suggesting that the cutback on employment was caused by a rise in efficiency of labor rather than a decline in production.

In contrast to the decline in agricultural employment, employment in the services sector (dominated by tourism) grew from 9 to 27 percent of total employment since 1960.

Government employment accounts for 19 percent of the total employment on Kauai. Of the 19 percent, State and County employment accounts for 57 percent and 28 percent respectively. Federal employees and the military account for the other 15 percent.

The statistics on labor, population, and demographics will continue to change with development and economic growth on Kauai. The increase in water supplied may increase the potential for new development.

VI. PROBABLE IMPACTS OF THE PROPOSED ACTION ON THE ENVIRONMENT

A. Short Term Impacts

The clearing and grading work at the Puhi Well #3 Site and the trenching operations for the installation of the connecting pipeline will create dust, noise and vehicle exhaust emissions. However, no significant inconvenience or impacts should result to the nearby communities since the project site is located at least a half mile away in cane fields.

The only access to the project site is the cane haul road located on KCC land. If the work is not carefully coordinated, there may be conflicts between the construction of the improvements and the harvesting and cultivating of the sugar cane.

The new pump is ran for several minutes to clear the well of turbidity before pumping into the water supply system. During this time, several hundred gallons of water will be emptied via a drainage pipe to an area designed to properly channel runoff into the existing drainage course. This should be a minor problem as it is of short duration and small volume.

A positive result of this project will be the employment of local trades and laborers needed for the construction and installation of the pumps, controls, piping and appurtenances.

B. Long Term Impacts

Since the well is in an agricultural area and not visible from major roadways in Lihue or Puhi, the visual impact will be minimal. No changes in air quality are expected. Although the electric motor used to drive the pump creates some noise, it will not be a problem because the project site is isolated from residential areas. Also, there are no endangered species in the area which might be affected by the increase in noise.

The installation of the pump at the Puhi Well #3 will allow additional water to be available to the Lihue Municipal Water System. This will increase the system's capacity and reliability against pump failures or other problems with the existing source. Although the proposed action, by providing additional water, may enhance the climate for development, it will not in itself result in immediate or sudden development in the Lihue area. The primary benefactors would be KCC and Grove Farm's Affordable Housing Project. Other factors which the developers in the area need to consider are zoning restrictions, capacities of the other *Infrastructure* systems and public facilities, and the public's attitude toward development in general. Recent opposition to development in other areas on Kauai, although differing greatly in character from the situation in Lihue, may create a residual effect throughout other areas of the island, including Lihue. In the long run, these factors and problems may be rectified through improvements of the utilities and public facilities and changes in public attitudes. Should these occur, land values in Lihue would increase as development in this principal commercial and residential center of Kauai occurs.

VII. ADVERSE IMPACTS WHICH CANNOT BE AVOIDED

Grading of the Puhl Well #3 Site and trenching for the connecting pipeline cannot be avoided. Storm runoff from the site will generally remain unchanged as the overland drainage pattern now existing will be maintained.

The pump control building will be constructed within the predominantly agricultural setting of sugar cane fields. The impact on the visual aesthetics of the area, however, is minimal due to the building's small scale and its location outside of urban areas and major roads. Any future expansion plans of KCC should take into account the visual impacts of the Well site.

VIII. ALTERNATIVE TO THE PROPOSED ACTION

The continuing increase in the area's population would eventually lead to the deterioration of the present water supply as the demand exceeds capacity. Poor supply will be evidenced by low flows and pressures in service connections at higher elevations and at the ends of the distribution system. The safety of residents may also be in jeopardy since emergency fire flows could not be accommodated. The no action alternative is not viable.

IX. RELATIONSHIP BETWEEN SHORT TERM USES AND MAINTENANCE AND ENHANCEMENT OF LONG TERM PRODUCTIVITY

The need for the water supplied by this proposed system will be as great, if not greater, in the future as it is at present. The short term use of the system is the same as its long term use - supplying water for domestic consumption.

The water which will be withdrawn from this well is coming from the Koloa Volcanic Series of the Kilauea Crater. Although no data are available on the aquifer, it is hoped that this well can maintain its long term productivity. The withdrawal of water should be closely monitored to assure that over pumping does not occur.

X. MITIGATING MEASURES TO MINIMIZE ADVERSE IMPACTS

The short term impacts occurring during the construction work will be minimized by applying current techniques and methods. Dust created by site grading will be controlled by dampening the area should the amount of dust generated be excessive. Disruption of the sugar cane harvesting and cultivating operations may be minimized by advance scheduling and coordination between the plantation and the contractor. Erosion hazards during the grading operations can be minimized by observance of the County's grading ordinances. If the grading or trenching operations reveal any archeological artifacts or remnants, construction work will be halted and the State *Historic Preservation Office* notified.

Once the project has been constructed, the visual impact can be further minimized by periodic maintenance of the buildings and the sites.

Careful monitoring of the water withdrawal rate is necessary to prevent over pumping of the aquifer.

The potential social, economic and political problems brought on by increased development will need to be addressed by the elected legislators and councilmen and the appropriate County and State agencies.

XI. IRREVERSIBLE AND IRRETRIEVABLE COMMITMENTS OF RESOURCES

The construction of the proposed improvements to the water system would involve the commitment of materials, manpower, and land. Puhi Well occurs only a small portion of the land (approximately 5,000 sq. ft.) currently under cultivation; however, any plans to expanse KCC will have to take the well site into account.

The groundwater withdrawn from the aquifer is a replenishable resource, recharged by rainfall which will be committed to the domestic water system.

XII. DETERMINATION AND REASONS SUPPORTING RECOMMENDED DETERMINATION

It is anticipated that the proposed action will result in no significant adverse impacts other than those described in this assessment. Consequently, a Negative Declaration is recommended and therefore, an Environmental Impact Statement would not be required.

The determination of a Negative Declaration is based on the findings that the proposed development of the Puhi Well and Installation of pump controls and appurtenance does NOT:

1. involve an irrevocable commitment to loss or destruction of any natural or cultural resources;
2. conflict with the State's and County's long term environmental policies, goals and guidelines;
3. substantially affect the economic or social welfare of the community or the State;
4. involve substantial secondary impacts, a degradation of environmental quality, or a commitment for larger actions;
5. affect a rare, threatened or endangered species of animal or plant, or habitat;
6. detrimentally affect long term air or water quality or ambient noise level; or
7. affect an environmentally sensitive area.

XIII. ORGANIZATIONS AND PERSONS CONTACTED

The following agencies provided information in the preparation of the Environmental Impact Assessment on the subject project.

- 1) State Department of Health
Environmental Protection and
Health Services Division
645 Halekauwila Street
Honolulu, Hawaii 96813
- 2) State Department of Planning and
Economic Development
Land Use Commission
P. O. Box 2359
Honolulu, Hawaii 96804
- 3) State Department of Land and
Natural Resources
Division of Water and Land Development
P. O. Box 373
Honolulu, Hawaii 96809

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