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AUG 19 1996

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HISTORIC PRESERVATION
LAND DIVISION
ENGINEERING BRANCH
PLANNING BRANCH
TECHNICAL & SUPPORT BRANCH
STATE PARKS
WATER RESOURCE MANAGEMENT

REF: WL-EK

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

Dear Mr. Gill:

**Final Environmental Assessment, Job No. 17-HW-F
Hualalai Well Development
North Kona, Hawaii**

Pursuant to Section 2 of the Environmental Impact Statement Rules, transmitted for processing are four (4) copies of the Final Environmental Assessment and Notice of Determination (Negative Declaration) for the subject project. Also attached is a completed OEQC Bulletin Publication Form.

Should you have any questions on this matter, please have your staff contact Mr. Andrew Monden of the Engineering Branch, Land Division at 587-0227, or Ms. Cheryl Vann of Belt Collins Hawaii at 539-1460.

Aloha,

Gilbert S. Coloma-Agaran
for MICHAEL D. WILSON

Attachments

1996-09-08-HI-~~FEA~~-Hualalai Well Development SEP 8 1996

FILE COPY

**FINAL ENVIRONMENTAL ASSESSMENT
AND NEGATIVE DECLARATION**

FOR

HUALALAI WELL SITE DEVELOPMENT

ISLAND OF HAWAII

Prepared for:

**State of Hawaii
Department of Land and Natural Resources
Land Division**

Prepared by:

**Belt-Collins Hawaii
680 Ala Moana Boulevard
Honolulu, Hawaii 96813**

July 1996

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July 1996

NOTICE OF DETERMINATION

FOR: Job No. 17-HW-F
Hualalai Well Development
North Kona, Hawaii

BY: Land Division
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 final Environmental Assessment are being filed as a Negative Declaration.

EXECUTIVE SUMMARY

The proposed action is development of the Hualalai well site (state well number 4258-03) and installation of a permanent well pump. The exploratory well was installed at the site and tested in August 1993. The project will include installation of a permanent pump in the existing exploratory well and booster pump system, and the construction of a control building, a 300,000-gallon capacity reservoir, and approximately 950 linear feet of 12-inch diameter water line between the reservoir and an existing water line on Mamalahoa Highway.

Two alternative water supply sources, surface water impoundment systems and rainwater catchment systems, were considered, but groundwater wells were selected over these alternatives due to their much greater production capacity, reliability, and enhanced water quality.

Some short-term construction-related and long-term operational impacts are expected. Visual, acoustical, and traffic-related construction impacts will cause temporary inconveniences. Best management practices will be used to control dust generated by construction activities. Potential long-term impacts from natural hazards, drainage, groundwater contaminants, and operational noise will be mitigated through project design. No wetlands or endangered species were identified at the site, and the site development plan has been designed to avoid disturbance of identified archaeological features. The proposed action will have a positive socioeconomic impact.

The proposed action complies with State and County land use designations. No significant impacts are expected.

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1.0 INTRODUCTION AND SUMMARY

1.1 APPLICANT/PROPOSING AGENCY

The proposing agency is the Department of Land and Natural Resources (DLNR), Division of Land Management, State of Hawaii.

1.2 APPROVING AGENCY

The approving agency is the DLNR, Division of Land Management, State of Hawaii.

1.3 AGENCIES CONSULTED

State of Hawaii:

Department of Health
Historic Preservation Division, DLNR

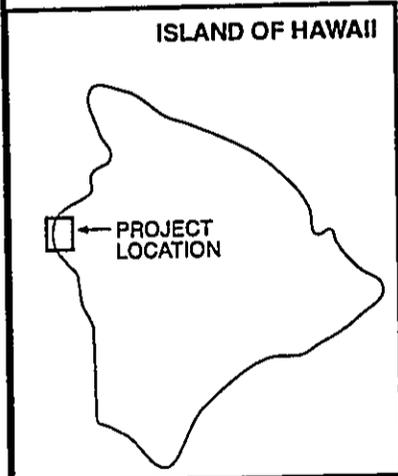
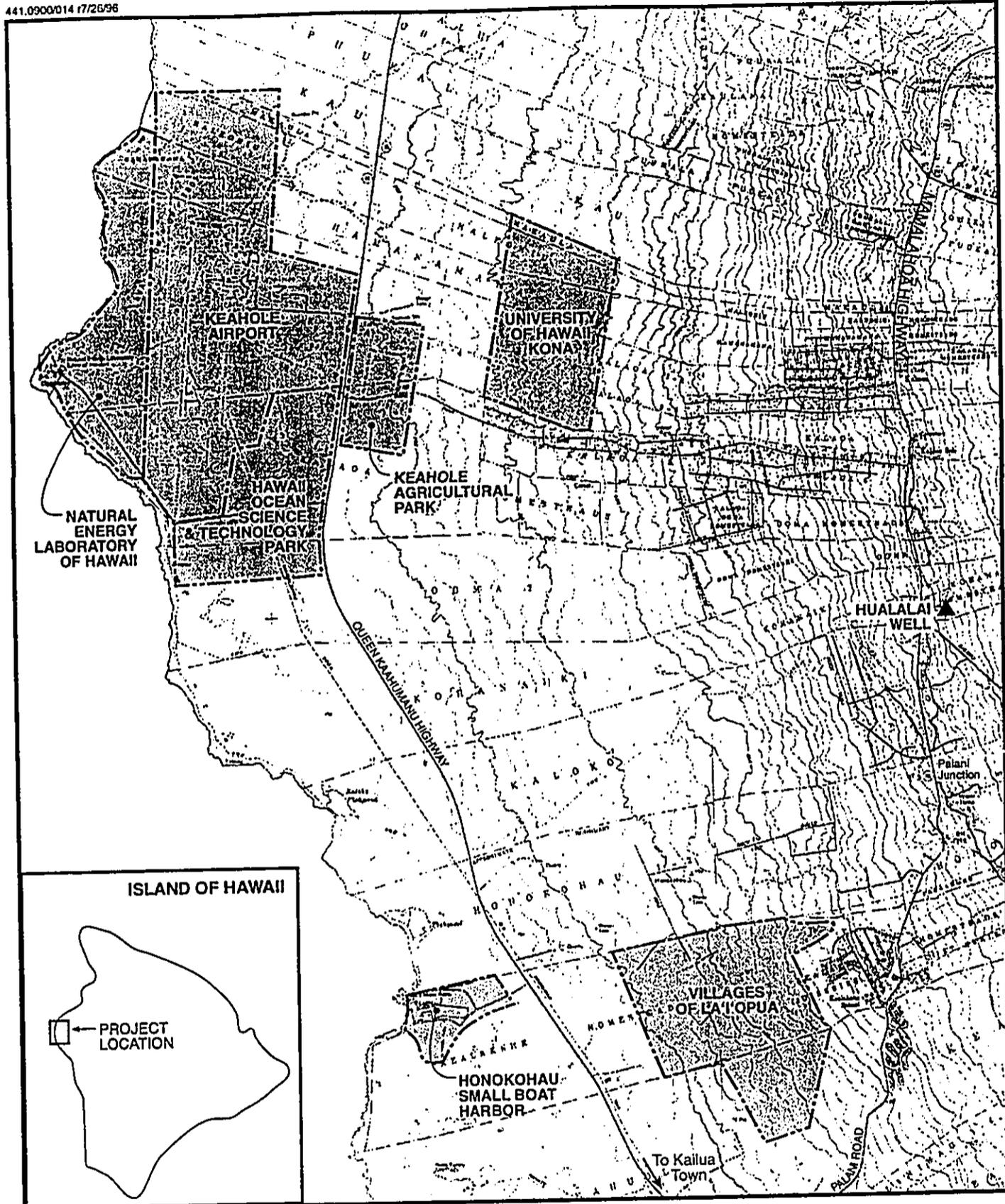
County of Hawaii:

Planning Department
Department of Water Supply

1.4 BACKGROUND INFORMATION

The State of Hawaii and County of Hawaii, recognizing a growing need for water in the North Kona region of the island of Hawaii, entered into a Memorandum of Understanding (MOU) in 1992 for the joint acquisition of water for new State projects in the region. The MOU was signed by six State agencies: Housing Finance and Development Corporation (HFDC), Department of Transportation (DOT), University of Hawaii (UH), Natural Energy Laboratory of Hawaii Authority (NELHA), Department of Agriculture (DOA), and DLNR. The DLNR's Division of Land Management is coordinating the joint effort.

The planned projects that require water include a new UH campus near Keahole Airport and the Village of La'i'opua (a planned residential community). The following projects also require water for expansion: Keahole Airport, the Natural Energy Laboratory of Hawaii (NELH) and Hawaii Ocean Science and Technology (HOST) Park, the Keahole Agricultural Park, and Honokohau Small Boat Harbor (Figure 1). These six projects will require a total of 6.47 million gallons per day (mgd) of water by the year 2015. A series



Source: Map based on Fukunaga & Associates,
North Kona Water Master Plan, 1995.



NORTH



SCALE IN FEET

LEGEND

State Project

Figure 1
LOCATION MAP
Environmental Assessment
Hualalai Well Site Development
Belt Collins Hawaii
July 1996

of new wells has been designed to meet this need. The proposed action is to develop the Hualalai well where an exploratory well was installed and tested in 1993.

The project site is owned by the State, with DLNR acting as lead agency for development of the well facilities. Following installation of a pump and completion of storage, booster pump, transmission, and associated facilities, the site and project improvements will be dedicated to the County Department of Water Supply (DWS) for operation and maintenance. The well site will be deeded by executive order to the County for public purposes.

1.5 PROPOSED ACTION

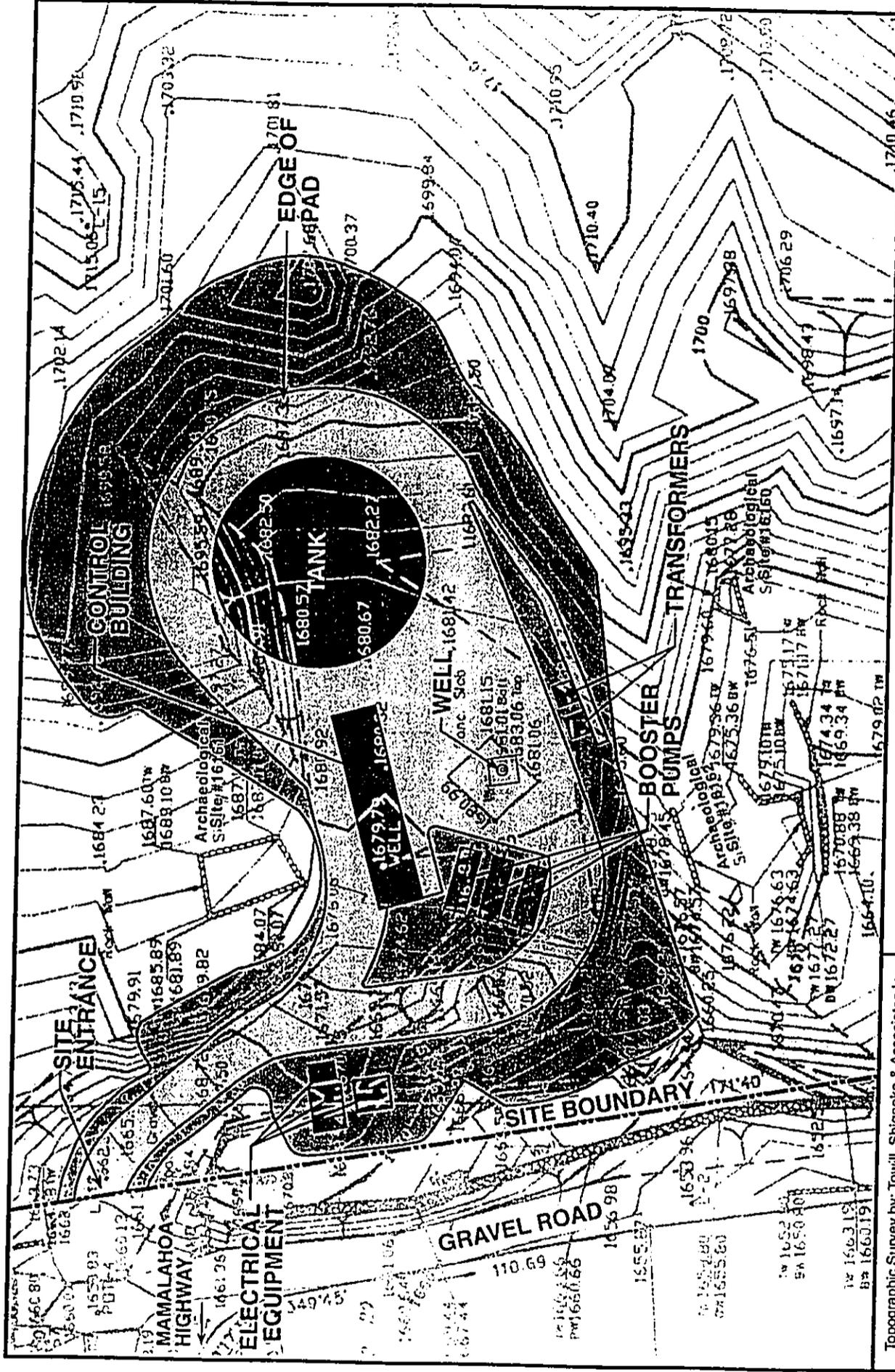
Development of the Hualalai well site (state well number 4258-03) will include the following actions:

- Installing a variable-frequency drive 700-1,000-gallons-per-minute (gpm) pump in the existing exploratory well
- Grading the site to accommodate a reservoir and other structures
- Constructing an all-weather access road
- Constructing a 0.3-million-gallon (mg) reservoir
- Constructing a control building
- Installing three 350 gpm booster pumps
- Enclosing the developed site with fencing
- Installing approximately 950 linear feet (lf) of 12-inch diameter water line along Lihau Street between the booster pumps and an existing DWS line on Mamalahoa Highway
- Installing transformers and switchgear for electrical power

The proposed site development is shown in Figure 2.

1.6 PURPOSE AND NEED FOR PROPOSED ACTION

Expansion and development of State facilities in the North Kona region are required to accommodate increasing needs of residents and tourists. The new UH campus will occupy about 500 acres of state-owned land near Keahole Airport. The Village of La'i'opua will provide approximately 4,270 housing units, parks, schools, and neighborhood commercial and shopping centers. Keahole Airport will be expanded to accommodate over 4 million passenger boardings and departures in the year 2005, approximately twice the number of passengers handled in 1991. The number of boat



Topographic Survey by: Towill, Shigeoka & Associates Inc.,
 September 22, 1994. Note: Contour intervals are 2 feet.



LEGEND

-  Structure
-  Graded Area
-  Pavement

Figure 2
PROPOSED SITE DEVELOPMENT
 Environmental Assessment
 Hualalai Well Site Development
 Bell Collins Hawaii
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slips in the 100-acre Honokohau Small Boat Harbor will be more than doubled, from 245 slips to 545 slips. Also, NELHA plans to expand its business and economic development projects, and the DOA plans to expand cultivation of diversified crops at Keahole Agricultural Park.

Together, these projects will increase water demand for State projects from 1.8 mgd in 1990 to 4.0 mgd by 1995, and to 6.47 mgd by the year 2015 (Hirai and Belt Collins, 1995). The North Kona system presently obtains water from four supply wells south of the well site in Kahalu'u, from the Holualoa Well, and from the Kalaoa Well mauka of Mamalahoa Highway (Figure 3). When developed, the Hualalai well is anticipated to contribute 1.0 mgd to the North Kona regional water supply system. Together with an estimated 1.0 mgd from the planned State Keopu A Exploratory Well and an uncommitted credit of 0.2 mgd from the existing 0.7 mgd Kalaoa Well, the supply from Hualalai will provide the additional water required by State projects in the North Kona region to meet 1995 average day water requirements.

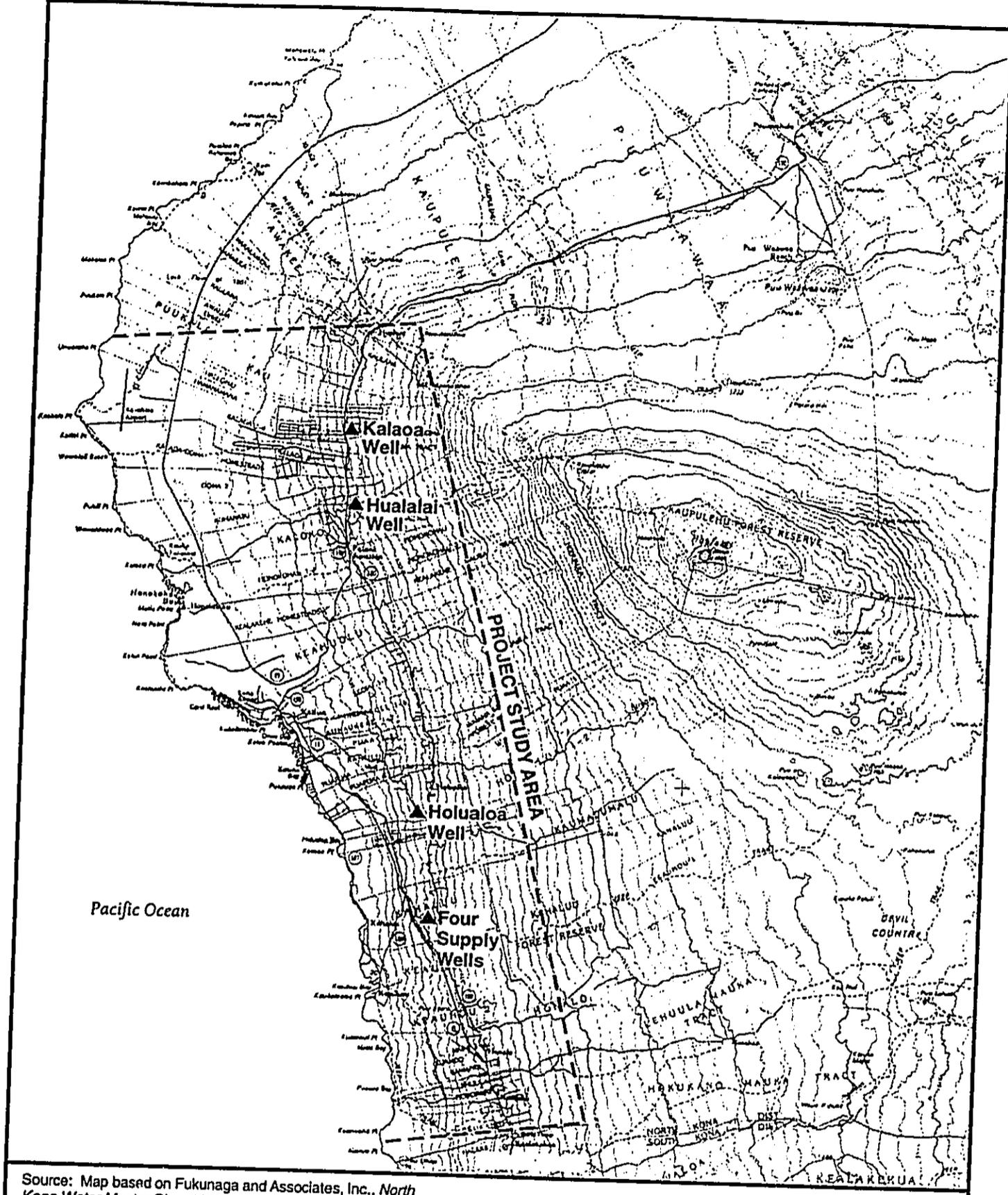
1.7 SUMMARY OF IMPACTS AND MITIGATIONS

There will be both short-term construction-related impacts and long-term operational impacts. None of the impacts is expected to be significant and all short-term and long-term impacts can be mitigated. There will be no cumulative adverse impacts.

Short-term air quality impacts will require mitigation. Ambient dust generated by construction activities will be mitigated using best management practices, such as spraying the site with water during dry weather to settle dust. No mitigation is required for traffic caused by site construction or for visual impacts from trench excavation along Lihau Street. Noise impacts from construction along Lihau Street will be mitigated by compliance with State law and County noise ordinance.

Potential long-term impacts from natural hazards, drainage, groundwater contaminants, operational noise, and inadequate telephone and electric power line capacity can be mitigated through project design. The reservoir and control building will be designed and constructed in accordance with building codes to prevent adverse impacts from possible seismic activity. Seepage wells and drainage channels will be constructed to direct runoff away from the new facilities and prevent increases in storm runoff to off-site areas. Sand cement grout is incorporated into the well design to prevent contamination from domestic cesspools. A noise shielding wall will be constructed around the booster pumps. Telephone and electric power lines will be extended to the site.

The proposed action will have a positive impact on the existing potable water supply, thereby having positive socioeconomic effects.



Source: Map based on Fukunaga and Associates, Inc., North Kona Water Master Plan, 1995.

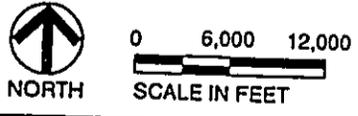


Figure 3
VICINITY MAP
Environmental Assessment
Hualalai Well Site Development
Belt Collins Hawaii
July 1996

The site development plan has been designed to avoid disturbance of identified archaeological features. No wetlands or endangered species were identified at the site and no mitigation is required.

1.8 GOVERNMENT ACTION

The Hualalai Well will be constructed on State lands using State funds. Under Section 343-5, HRS, an environmental assessment must be prepared for actions involving the use of State lands or the expenditure of State funds.

2.0 PROPOSED ACTION AND ALTERNATIVES

2.1 PROJECT SETTING

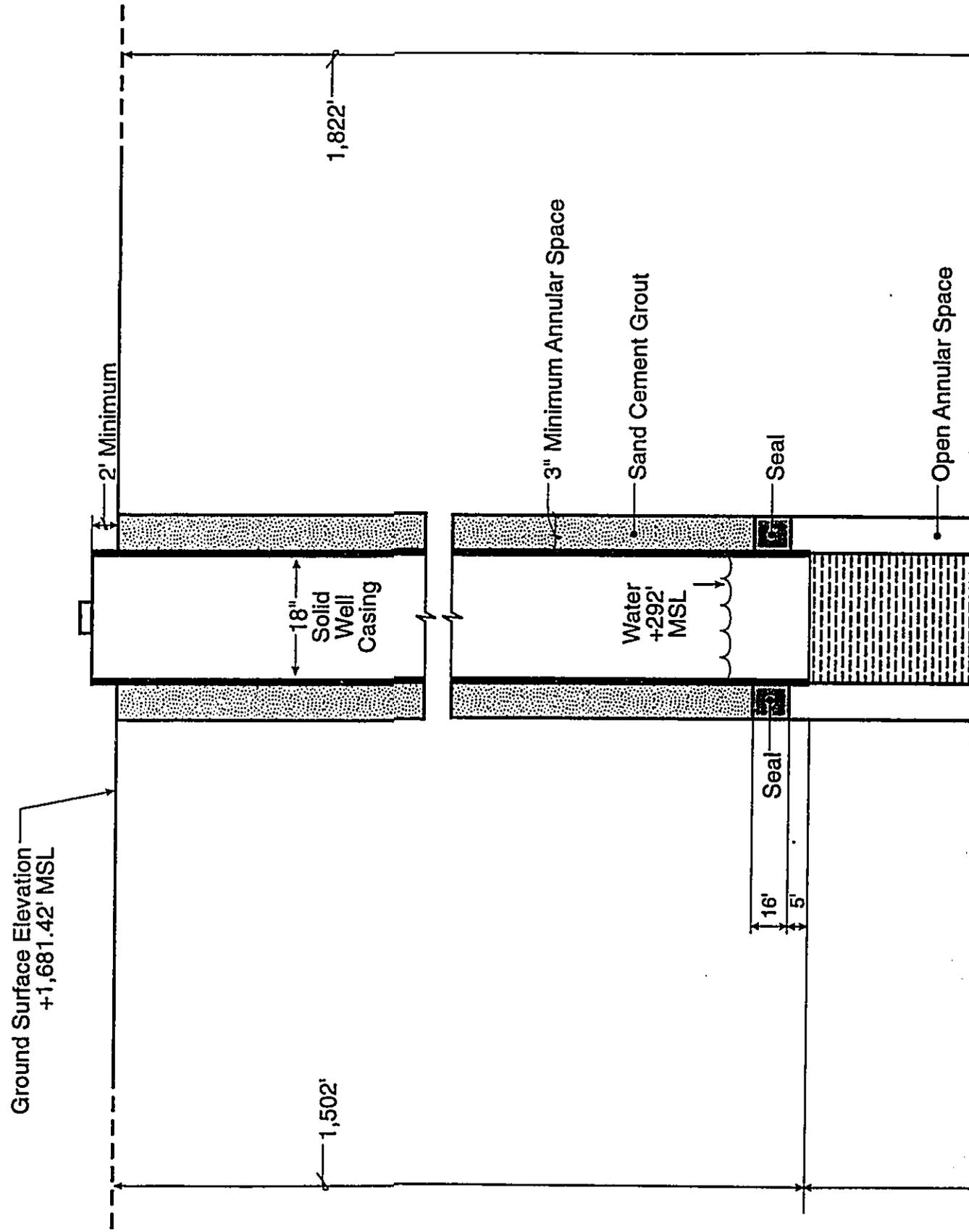
The site is Tax Map Key: 7-3-06:3, located about four miles southeast of Keahole Airport on the North Kona coast on the island of Hawaii (see Figure 1). It is situated at approximately 19°42'30" North latitude, 155°58'10" West longitude and covers 5.29 acres in the Kohanaiki Homesteads. The property sits at elevations ranging from about +1,655 msl (feet above mean sea level) to +1,750 msl. The wellhead is at an elevation of +1,681 msl and lies approximately 900 feet mauka of Mamalahoa Highway and approximately 5,500 feet north of Palani Junction. Site structures will be located at elevations between +1,679 and +1,681 msl.

The surrounding area is zoned agricultural. The average parcel size is approximately three acres. Makai of the site is a five- to six-acre residential subdivision (Imamura, personal communication, September 1995).

2.2 DESCRIPTION OF PROPOSED ACTION

The proposed action is development of the Hualalai well site and installation of a permanent well pump. The exploratory well was drilled and installed in 1993. It has a ground surface elevation of +1,681.42 msl and extends 1,822 feet below ground surface to -140.58 msl (Figure 4). The well is cased with 1,502 feet of 18-inch steel well casing, which extends 113.48 feet below the water table (+292.9 msl in October 1993). Below the casing are 180 feet of full flow screen and 140 feet of uncased boring.

The project will include installation of a permanent pump in the existing exploratory well and construction of a control building, a 300,000-gallon capacity reservoir, a booster pump system, and approximately 950 feet of 12-inch diameter water line



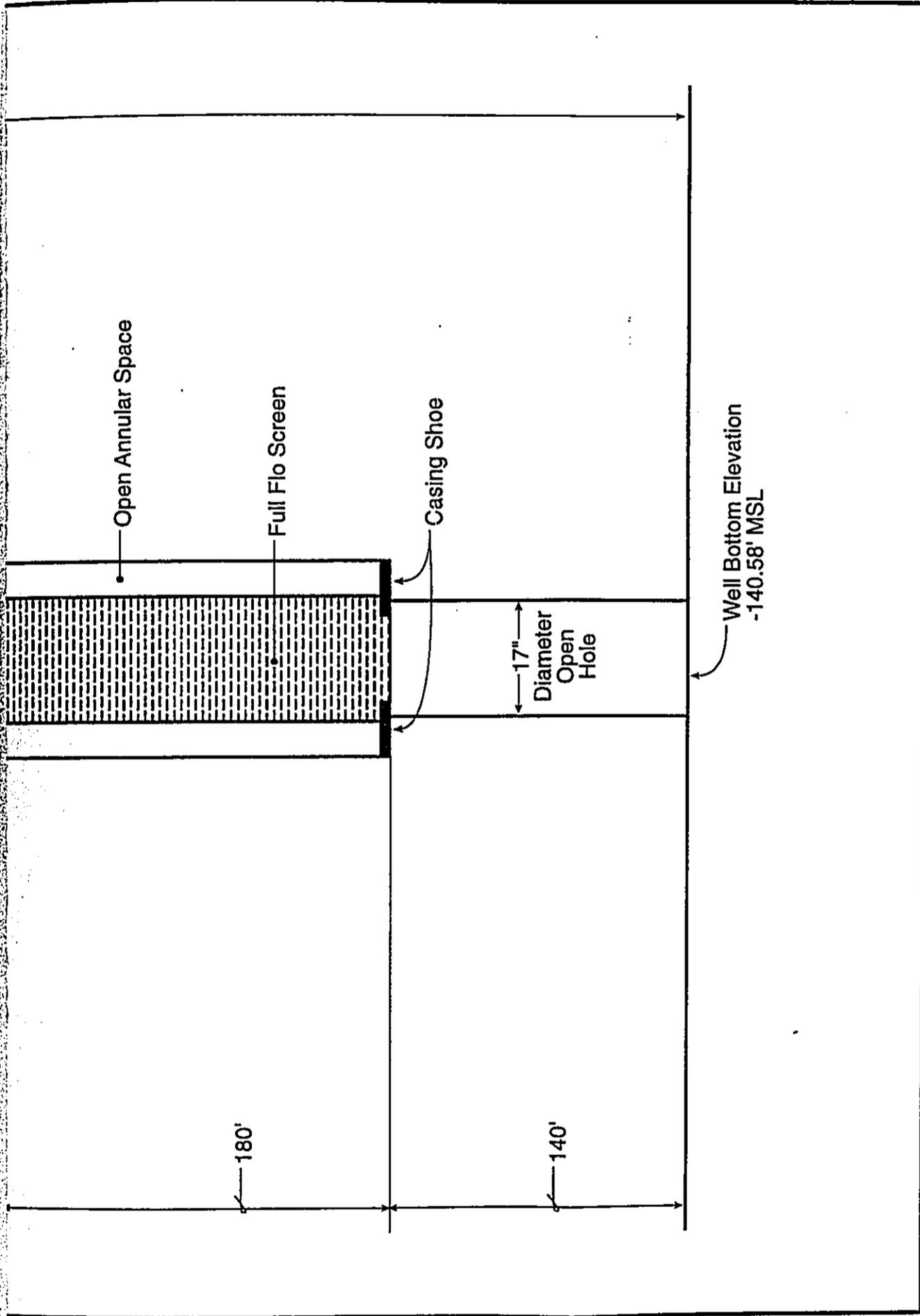


Figure 4
WELL INSTALLATION DETAILS
 Environmental Assessment
 Hualalai Well Site Development
 Belt Collins Hawaii
 July 1996

NOT TO SCALE

between the reservoir and an existing water line on Mamalahoa Highway. The control building will house the pump motor controls and chlorination system. An all-weather access road will be provided. All facilities will be constructed in accordance with DWS standards and will be completed under a single construction package. Construction will start in October 1996 and will be completed in October 1997. Construction plans and specifications are presently being finalized. The project will be advertised in June 1995 and bids will be opened in July 1996. Future developments on the system will be performed as needed.

2.2.1 Pumps, Reservoir, and Water Lines

The proposed well pump will be a submersible multi-stage vertical turbine pump with motor, having a variable frequency drive motor control. The pump will lift water from a head of +292 msl to the 300,000 gallon on-site reservoir, via a 10-inch-diameter pipe. The well pump will be started and stopped automatically by a float level sensor in the reservoir, which will have an overflow elevation of +1,698.3 msl.

The reservoir will be designed and built in accordance with the requirements of Part III, Section 2 of the "Water System Standards" of the Department of Water Supply (County of Hawaii, et al. Volume 1, 1985). The reservoir will be constructed of reinforced concrete, with influent, effluent, overflow, and washout lines. Paint materials and application shall conform to the requirements of Part III, Section 2.26 of the DWS Standards.

From the reservoir, three 350-gpm booster pumps will discharge into a 950-foot-long, 12-inch pipeline along Lihau Street that connects to an existing 12-inch line in Mamalahoa Highway and thence to the Kalaoa reservoir. The booster pumps will raise the pressure of water leaving the Hualalai reservoir to match that of the higher Kalaoa reservoir, which has an overflow elevation of +1,815 msl. (Water in the 12-inch Mamalahoa Highway line is at the pressure of the Kalaoa reservoir.) The booster pumps will be controlled by a water level sensor in the Kalaoa reservoir.

Pipe alignments will follow the well site access road and Lihau Street. Materials, valves, and other appurtenances will be specified, designed, and located according to DWS Standards. The pipeline plan and profiles will also be designed according to DWS Standards.

2.2.2 Control Building and Water Treatment

Well water will be treated with chlorine. The chlorination system and pump motor control center will be housed in the control building (see Figure 2). Although surface waters and groundwater are required to be treated for use as potable supply, additional treatment of groundwater from the well is not required since the groundwater table is

approximately 1,400 feet below ground surface and not under the direct influence of surface waters.

The treatment facility will be designed, operated, and maintained in accordance with the DWS standards and procedures. The chlorination system will be designed to comply with Department of Health (DOH) rules. Chlorine from a 150 pound gas cylinder will be injected into the line between the well and the reservoir. The design rate for pumping and chlorination is 700 to 1,050 gpm, depending on pump speed. The disinfection system will have reserve capacity, so that it can be expanded as required. The chlorination feed rate can be a manually-adjusted or automatic injection system. Maintenance of the system will include periodic inspection of components and replacement of chlorine gas cylinders by DWS operators.

2.3 ALTERNATIVES TO THE PROPOSED ACTION

2.3.1 No Action

The proposed project is part of an overall groundwater development program designed to meet the anticipated water needs of State projects in the North Kona region until the year 2015. The immediate objective is to develop the Hualalai well site and install a permanent well pump. Under the "no action" alternative, neither of these objectives would be achieved, and water supply deficiencies would potentially limit anticipated development.

2.3.2 Alternate Water Supply Sources

The two alternative water supply sources considered were surface water impoundment systems and rainwater catchment systems. Groundwater wells were selected over these alternatives because of their much greater production capacity, reliability, and enhanced water quality. Land requirements for water production facilities are also much reduced by using groundwater.

2.3.3 Construction Alternative

Approximately 3,900 cubic yards (cy) of material will need to be excavated by blasting or by using a hoe ram (a large back hoe with a jackhammer-like attachment). Blasting is faster and cheaper than a hoe ram, but blasting may produce more shock and noise. If blasting is the preferred alternative, construction specifications will require the contractor to perform particle velocity tests to determine the maximum charge allowable consistent with noise and shock levels that meet standards for work occurring near residences. Adjacent residents will be notified of the blasting schedule and there will

be adequate opportunity for schedule adjustment. The contractor will be liable for all damages.

3.0 AFFECTED ENVIRONMENT, POTENTIAL IMPACTS, AND PROPOSED MITIGATION

3.1 PHYSIOGRAPHY

3.1.1 Climate and Air Quality

3.1.1.1 Existing Conditions

The climate of the project area is generally mild with relatively small daily and seasonal variations in temperature. Coastal temperatures in North Kona average approximately 75 degrees Fahrenheit (°F). Temperatures in Hawaii generally decrease by about 3°F for every 1,000 feet of elevation and, consequently, temperatures at the well site could be expected to be four to five degrees cooler than at the coast (Fukunaga, 1995). At the Honokohau Ranch gaging station, the gaging station nearest the well site, median rainfall is approximately 49.9 inches per year (State of Hawaii, 1988).

Airflow has a distinct diurnal rhythm, flowing onshore from mid-morning until just before sunset and offshore from early evening until the following morning. There are no major sources of air or surface water pollution in the areas surrounding the project, which are residential and agricultural. On the Island of Hawaii, the worst air pollutant episodes have been due to volcanic eruptions, which affect visibility and can result in substantial increases in the ambient concentrations of mercury and sulfur dioxide.

3.1.1.2 Potential Impacts and Proposed Mitigation Measures

Air quality is not anticipated to be affected by the project except for short-term particulates caused during construction. This will be mitigated by standard best management practices, including spraying the site with water during dry weather to keep dust settled during site preparation work. The nearest potential receptors of fugitive dust are 22 residential homes located about 100 to 1,200 feet west of the project site.

3.1.2 Topography and Surface Water

3.1.2.1 Existing Conditions

The project site is located on the western slope of Hualalai mountain, a dormant volcano with relatively unweathered, steep slopes formed by basaltic lava flows erupted

from the rifts and summit. At the site, the existing topography slopes towards the ocean at approximately a 15 percent gradient.

There are no streams, lakes, or other surface water bodies in the project area. Storms in the Kona region are typically localized and intense. Storm runoff generally sheet flows down the relatively steep slopes with limited soil moisture recharge experienced outside level areas.

3.1.2.2 Potential Impacts and Proposed Mitigation Measures

Site development requires excavation of about 3,900 cy of soil and rock. About 1,200 cy of processed rock will be used as fill for a depression at the west side of the property. The processing is required to reduce the rock particle size to approximately three inches and smaller for compacted landfill. Processing will be done either on-site using a portable rock crusher or off-site at a permitted crushing facility. Crushing operations will require obtaining air quality permits and operating and maintaining the equipment in accordance with the permit requirements. The remaining 2,700 cy will be placed unprocessed elsewhere on the project site for use by the construction contractor for processing or directly used as fill material.

Seepage wells and drainage channels will be constructed as part of the site improvements to direct runoff away from the new facilities and to prevent increasing storm flows to off-site areas. Site soil and drainage are not expected to be adversely impacted, and no further mitigation is required.

3.1.3 Geology, Soils, and Groundwater

3.1.3.1 Existing Conditions

Hualalai is the third oldest of the five shield volcanoes making up the island of Hawaii. Studies indicate that seismic activity within Hualalai is minimal, and there is no evidence of ongoing magma movement within the volcano. The most recent activity on Hualalai was in 1800-1801, when lava erupted onto the northern slopes from vents along the northwest rift zone. Aside from some local gulying in areas of older flows, the volcano's slopes are essentially undissected by erosion (Fukunaga, 1995).

The US Soil Conservation Service classifies soil at the site as a thin layer (less than 12 inches) of organic peat overlying fragmental 'a'a lava. It is an extremely stony soil, with high permeability, slow runoff, and light erosion hazard (SCS, 1973). During recent site exploration, a silty gravel fill layer was observed, with thicknesses ranging from 9 inches to 4 feet under the area of the proposed well facilities. Weathered, vesicular basalt underlies the fill layer at all boring locations (Hirata, 1995).

Groundwater at the site occurs in a recently-discovered, high-level aquifer that is part of the Keauhou aquifer system along the Kona Coast (Mink and Lau, 1993). The aquifer may occur on top of or within an ancient buried dike complex that has been interpreted from geophysical surveys. Pump tests and water level measurements suggest that some parts of the aquifer may be comprised of compartments similar to a dike-confined system (Fukunaga, 1995).

A low-permeability hydrologic discontinuity roughly following Mamalahoa Highway separates the high-level aquifer from basal groundwater (Figure 5). Insufficient information exists to construct a realistic groundwater contour map or to establish flow directions and gradients in the high-level aquifer. However, the principal gradient appears to be towards the ocean, with possible lateral distortions in movement caused by local changes in permeability (Fukunaga, 1995).

The water table occurs approximately 1,400 feet below the ground surface (+292 msl) at the site. Water is fresh, with chloride content ranging from 5 milligrams per liter (mg/l) to 10 mg/l. Analyses for metals completed by the United States Geological Survey (USGS) on samples collected on August 18, 1993 and October 14, 1993 indicate that the site ground water is typical of that in the region. Although unknown, the recharge/catchment area for the high-level aquifer is assumed to be greater than 1,000 acres (Fukunaga, 1995).

Since 1990, high-level groundwater (potentiometric head of +42 to +490 msl) has been found in 13 wells drilled mauka of Mamalahoa Highway in the Kona area. These wells are located between +1350 and +1800 msl between Kalaoa and Ke'ei, a distance of approximately 19 miles. Only a few extreme seaward portions of the aquifer system have been explored. Figure 5 shows the extent of the aquifer and the location of wells that have been completed in the Keauhou aquifer. Based on preliminary aquifer information and a water-budget calculation derived for thick aquifers on Oahu, Fukunaga and Associates have estimated the sustainable yield at 73 mgd in the 15 miles between Kau and Kainaliu (Fukunaga, 1995). Only one well pumps from the aquifer at this time—the 0.7 mgd Kalaoa well, about 1.5 miles north of the Hualalai site (Shimabukuro, personal communication, March 1995). Fukunaga and Associates estimate that the aquifer can be developed without adversely impacting the potable water sources drawing from the basal aquifer at Kahalu'u and Holualoa, except in the vicinity of Kahalu'u (Fukunaga, 1995).

3.1.3.2 Potential Impacts and Proposed Mitigation Measures

Potential impacts on groundwater include depletion of the existing high-level and basal aquifers and contamination of the aquifers by saltwater intrusion or materials spilled during site development.

No problems affecting either the quantity or the quality of groundwater during either normal or high-stress periods are expected. The *North Kona Water Master Plan* (NKWMP) prepared for the State (Fukunaga, 1995) indicates that the high-level aquifer from which the Hualalai well draws is sizable, and it proposes future well locations designed not to overpump the aquifer during either normal or high stress periods. Since the high-level aquifer also appears to be the primary source of recharge for the lower basal aquifer (now the primary regional potable water source), wells were located so as not to threaten either the quantity or quality of water in the lower aquifer. The Commission on Water Resources Management, which acts as the reviewing and permitting agency for all potential well projects has reviewed the NKWMP and is responsible for managing the water resources so that the aquifers are protected (Suzuki, personal communication, October 1995). No new wells in the area can be drilled without a permit from the Commission.

The high-level aquifer is not expected to be subject to saltwater intrusion or saltwater upconing during either extended normal use or high stress periods. According to preliminary indications, the high-level aquifer is not underlain by saltwater. It is separated from saltwater under the makai basal aquifer by a hydrogeologic discontinuity paralleling Mamalahoa Highway (Fukunaga, 1995).

The well is protected from potential contamination from domestic wastewater in individual residential treatment systems by isolation and sealing with 1,449 feet of grout (see Figure 4). In addition, DOH regulations prohibit construction of new cesspools within 1,000 feet hydraulically upgradient of the wellhead, and existing nearby cesspools are all downgradient of the well. Contamination due to construction activities will be mitigated by requiring that fueling and other such operations be conducted down-gradient of the well head. Best management practices will be employed to prevent and handle spills and releases of contaminants on site.

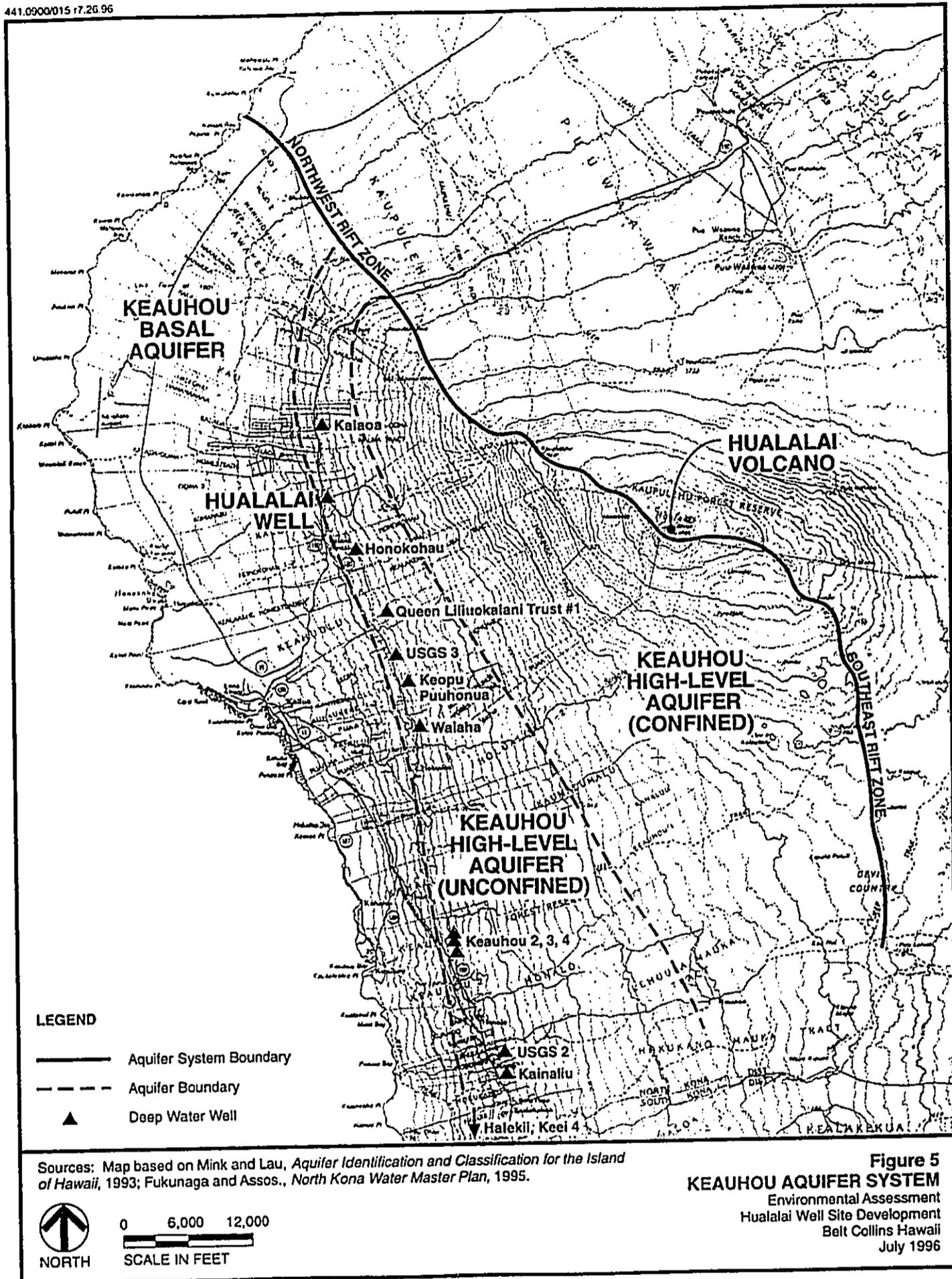
3.1.4 Natural Hazards

3.1.4.1 Existing Conditions

The 1991 Uniform Building Code designates the Island of Hawaii as Seismic Zone 3. Seismic Zone 3 indicates an area with a high likelihood of seismic activity where buildings are susceptible to major earthquake damage.

Since the project site is approximately 4 miles inland from the ocean and the wellhead elevation is +1,681 msl, tsunamis would not impact the site.

The project site and surrounding area are all in flood Zone X, outside of the 500-year flood plain (FEMA, 1994). This means that the area is considered as a low flood risk.



Sources: Map based on Mink and Lau, *Aquifer Identification and Classification for the Island of Hawaii*, 1993; Fukunaga and Assos., *North Kona Water Master Plan*, 1995.

Figure 5
KEAUHOU AQUIFER SYSTEM
 Environmental Assessment
 Hualalai Well Site Development
 Belt Collins Hawaii
 July 1996

3.1.4.2 Potential Impacts and Proposed Mitigation Measures

There is a potential for the site to be adversely impacted by seismic activity. The reservoir and control building will be designed and constructed in accordance with building codes for Seismic Zone 3. No impacts are expected due to flooding or tsunami inundation, and no mitigation is required.

3.2 FLORA AND FAUNA

3.2.1 Existing Conditions

The Hualalai well site contains native flora and fauna, mostly in the southeast corner. Among these native flora is the dominant rose apple (*Eugenia jambos*), moa (*Psilotum nudum*), o'hi'a lehua (*Metrosideros polymorpha*), alani (*Pelea clusiifolia*), kukui (*Aleurites moluccana*), hapu'u (*Cibotium spp.*), ti (*Cordyline fructicosa*), and 'ie'ie (*Freycinetia arborea*) (Kawachi, 1992). No endangered species have been identified at the site (Kawachi, personal communication, August 1994; Kawachi, personal communication, May 1995).

Introduced vegetation identified at the site includes coffee (*Coffea arabica*), guava (*Psidium guajava*), Christmas berry (*Schinus terebinthifolius*), silver oak (*Grevillea robusta*), and mango (*Mangifera indica*). There is very little ground cover except for 'ie'ie, a begonia, a square stemmed mint, and some grasses in the northeastern area (Kawachi, 1992).

No wetlands have been identified at the site or in its vicinity (Elliott and Hall, 1977). None of the identified flora and fauna are species which indicate and define the presence of a wetland.

No wildlife survey has been performed at the site. However, the presence of pigs was evidenced by their rootings among the guava and rose apple saplings and by their odor (Kawachi, 1992). Birds commonly found in this type of vegetation at this elevation include the house sparrow (*Passer domesticus*), common mina (*Acridotheres tristis*), rock dove (*Columba livia*), zebra dove (*Geopelia striata*), house finch (*Carpodacus mexicanus*), grey francolin (*Francolinus pondicerianus*), and nutmeg mannikin (*Lonchura punctulata*). Other birds that may also occur in the area include the common pheasant (*Phasianus colchicus*), quail (*Coturnix spp.*), Hawaiian short-eared owl or pueo (*Asio flammeus sandwichensis*), and the Hawaiian hawk or io (*Buteo solitarius*).

3.2.2 Potential Impacts and Proposed Mitigation Measures

Site development will involve uprooting and displacing site flora and any wildlife using the site as habitat. Operation of the well pump and associated facilities will involve very little human activity and is unlikely to generate adverse impacts to flora or fauna.

No wetlands or endangered species have been identified at the site and no impacts are expected. No mitigation is required.

3.3 HISTORICAL AND ARCHAEOLOGICAL RESOURCES

3.3.1 Existing Conditions

The project site contains archaeological resources and is listed as state site 50-10-28-16,159. Investigations by the State Historic Preservation Division (HPD), which included excavations of small areas to a depth of 15cm, indicate that the site was used primarily for cultivation (Kawachi, 1992). Resources identified include a house site (with retaining walls and terrace), cultivated depressions, various stone walls, an empty crypt, and an enclosure. The enclosure with paved floor is on the ridge to the north, somewhat separated from the rest of the site. Its function is unknown. The stone wall on the southern boundary is an *ahupua'a* boundary wall separating Kohanaiki and Kaloko.

When the site was initially entered and the exploratory well was drilled, the HPD was not aware of archaeological resources in this area. As a result, the site was disturbed prior to the initial archaeological survey. It is not known whether other features may have been present at the site prior to that time.

3.3.2 Potential Impacts and Proposed Mitigation Measures

Site development has the potential to disturb archaeological resources. Site operation is unlikely to impact resources.

Clearance to proceed with the proposed action has been received from the HPD (Appendix A), under the condition that archaeological sites, in particular sites 16160, 16161, and 16162, are avoided (see Figure 2). These sites will be avoided by maintaining buffer zones between the project area and archaeological sites, and by avoiding extensive grading near these sites. The site development plan has been designed to avoid disturbance of identified archaeological features. The well, pumps, control building, and reservoir will be placed in areas already cleared. The construction specifications must require that the contractor be briefed both on requirements to avoid disturbing existing archaeological features and on requirements for notification in the event additional features are located. If additional archaeological features are discovered

during site development, the HPD will be notified and work in the area will continue only when an archaeologist is present to monitor for archaeological resources.

3.4 BUILT ENVIRONMENT

3.4.1 Visual Setting

3.4.1.1 Existing Conditions

The area surrounding the residences on Lihau Street is undeveloped, with tall, thick vegetation. The site itself is a heavily overgrown area and has little visibility, with the exception of the portion that has already been cleared for well drilling and pump testing.

3.4.1.2 Potential Impacts and Proposed Mitigation Measures

The proposed action has the potential to impact views uphill from the nearby neighborhood on Lihua Road. The gravel road at the entrance to the site will be paved and there will be minimal grading along the road alignment that will be visible to these residents. No significant public viewing points are affected.

No significant visual impact is anticipated on the neighborhood during construction, as vegetation is thick in the area and construction materials and vehicles will remain shrouded from the nearby houses and the old Government Mauka Road. However, trench excavation to lay pipe for the new water main along Lihau Street will affect local views for about three weeks. Work crews will provide traffic control and will remove construction materials and excavated soils from the street after pipe-laying is complete. No permanent impact is expected, and no further mitigation is required.

Some of the completed structures may be tall enough to be visible above surrounding vegetation. However, much of the thick overgrowth will remain along the borders of the property, thus leaving the visual setting little changed. No long-term impact is expected, and no mitigation is required.

3.4.2 Acoustical Environment

3.4.2.1 Existing Conditions

The properties surrounding the proposed project area are rural residences. The ambient noise level is primarily natural, due to the lack of urban or industrial activities.

3.4.2.2 Potential Impacts and Proposed Mitigation Measures

Site development and water main excavation along Lihau Street will generate noise impacts from use of construction equipment. In addition, construction vehicles traveling to and from the site will generate traffic noise. Upon completion, the well pumps will create a humming sound that may be audible from the nearest residential area, located about 200 feet to the west.

Noise impacts from construction at the site are anticipated to be somewhat muffled by existing vegetation. Construction noise (sound pressure level) typically could be as high as 80 dBA from pneumatic drills used during excavation. If blasting is used, there will also be an impact from vibration. Particle velocity testing prior to blasting will be required to determine the size of charge allowable to prevent damaging vibration or harmful noise from occurring. Noise generated during construction will be a short-term impact and will only occur during daylight hours. The booster pumps are expected to generate approximately 68 dBA at a distance of 3 feet. Construction of a hollow-core CMU wall with 1-inch-thick perimeter isolation board around the booster pumps will reduce noise levels to 42 dBA or less.

DOH has indicated that new noise regulations for the Neighbor Islands may be finalized by the end of 1995. The State Legislature has passed a law which requires statewide community noise regulations to be in place by the middle of 1996. The draft regulations were modeled on those applicable to Oahu, but they provide more flexibility in terms of where to apply the criteria (Haruno, personal communication, May 1995). If new regulations govern activities at the site after development, the site will be brought into conformance with applicable State regulations.

3.4.3 Potable Water Supply

3.4.3.1 Existing Conditions

The North Kona Water System (NKWS) is one of 20 systems maintained and operated by the DWS on the Island of Hawaii. It extends from Kainaliu Town in the south to Huehue Ranch in the north (see Figure 3). The system provides water to resort, industrial, residential, commercial, and agricultural users in the area. The NKWS currently obtains its water from four supply wells south of Kahalu'u, the Holulualoa Well, and the Kalaoa well about 1.5 miles north of the project site. These sources have a combined pump capacity of 13.22 mgd. The average daily water demand is currently 7.6 mgd. The future water demand for the area is projected to increase to 37.51 mgd under maximum development. Of this, a total of 6.47 mgd will be required for State projects (Fukunaga, 1995).

Based upon the overflow elevations of reservoirs along Palani Road, the DWS has set three pressure zones with associated service areas: the 325-foot elevation (service area from 0 to +225 msl), 595-foot elevation (service area from +225 to +495 msl), and 935-foot elevation (service area from +495 to +935 msl). The State projects for which additional water is needed will all be north of Kailua town and makai of Mamalahoa Highway. Most are within the 325-foot and 595-foot pressure zones.

As of January 1993, the NKWS consisted of 48 reservoirs with a capacity of 15.6 MG and 55 booster pumps (Figure 6). Scattered throughout the system are pressure regulating valves that separate high and low pressure systems. Water is transported north from the Kahaluu wells (presently the major source of water in North Kona) to upper elevation service areas via 8-inch and 12-inch pipelines along Mamalahoa Highway and a system of booster pumps and reservoirs. Water is transported north to lower elevation areas via 24-inch and 20-inch gravity pipes along Kuakini and Queen Kaahumanu Highways. Various additions to the transmission system are underway and are shown in Figure 6.

There is currently no water main along Lihau Street; the houses are served by one-inch and smaller diameter laterals connecting to the 12-inch water main on Mamalahoa Highway.

3.4.3.2 Potential Impacts and Proposed Mitigation Measures

The proposed action will have a positive impact on the existing potable water supply system. Together with other planned development of the high-level aquifer, the proposed action will provide a high-elevation source of potable water for future State development projects. Water from the well will be sampled for contaminants in accordance with DOH regulations before being brought into production and at regular intervals thereafter. Water that does not comply with State and federal primary drinking water standards will not be allowed into the DWS system without first being chlorinated to meet applicable standards.

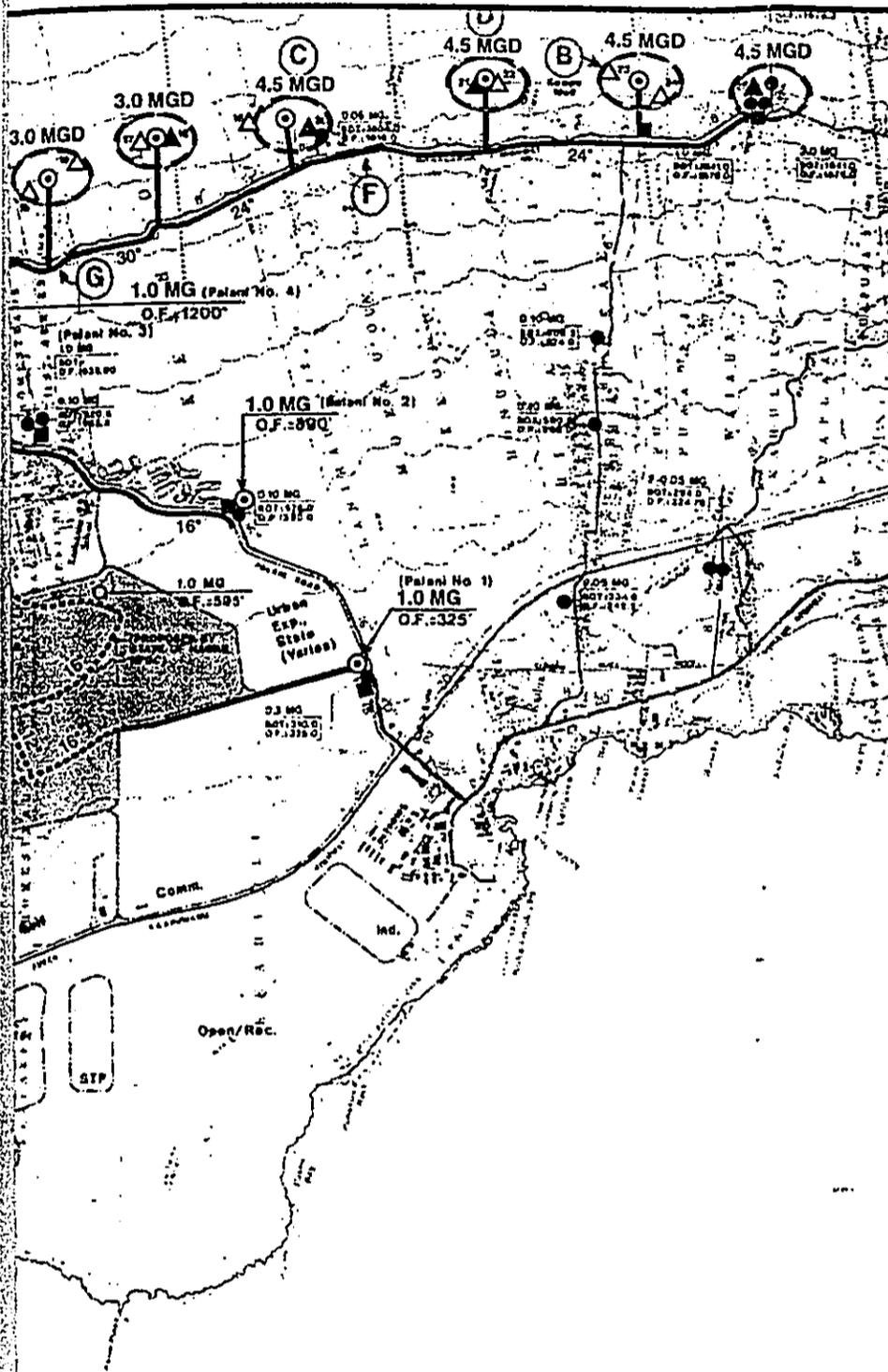
3.4.4 Other Infrastructure

3.4.4.1 Existing Conditions

There is no wastewater disposal system present at the site. The houses along Lihau Road are not served by a sanitary sewage system. Based on DOH records, these houses dispose wastewater to the ground via cesspools or septic tanks with absorption fields.

The site does not currently generate solid or hazardous waste. Solid waste from the Lihau Road area is disposed at the County's West Hawaii Landfill in Puu Waawaa.





LEGEND

- Existing**
- Waterline
- ▲ Well
- Reservoir
- Booster Pump
- DWS Programmed**
- Waterline
- Reservoir
- Booster Pump
- Planned**
- Waterline
- △ Well
- Reservoir
- Conceptual**
- Waterline
- ⊙ Reservoir
- 3.0 MGD Wellfield and Pump Capacity
- State Projects



NORTH

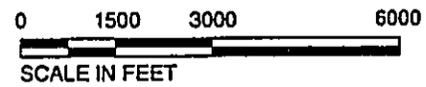


Figure 6
EXISTING AND PROPOSED
NORTH KONA WATER SYSTEM
 Environmental Assessment
 Hualalai Well Site Development
 Belt Collins Hawaii, July 1996

Source: Fukunaga & Associates, *North Kona Water Master Plan*, 1995.

Waste is removed by private refuse haulers who are contracted by the individual resident.

The site is not currently provided with electricity or telephone. The neighborhood nearby is serviced by the Hawaii Electric & Light Company (HELCo) system and GTE Hawaiian Tel. The only traffic in the vicinity is generated by residents of Lihau Street entering and leaving their homes. Lihau Street is a narrow, approximately one-lane street in a low-density rural neighborhood. The old Government Mauka Road is a one-lane gravel road that is not a major thoroughfare.

Police and fire protection are provided by the County police and fire departments in Kailua.

3.4.4.2 Potential Impacts and Proposed Mitigation Measures

No wastewater disposal system is needed at the site because it will not be inhabited. Existing cesspools in the area are located downhill from the project site and will therefore not contaminate the proposed well. Undeveloped lots already subdivided within 1,000 feet of the north and east of the wellhead will, in accordance with the existing law, require septic systems rather than cesspools.

The proposed action will not directly generate wastewater, solid waste, or hazardous waste requiring disposal. No waste from water treatment will be generated. However, potable water generated by the proposed action will ultimately be disposed as wastewater throughout the sector served by the well. As there is no existing treatment plant serving the water supply facilities in the area, no plant modifications will be required as a result of this project. Infrastructure is expected to be improved to handle the increase in wastewater corresponding to higher water use, as necessary.

Site operation will require connecting the site to a source of electricity. The existing HELCo overhead pole line system on Mamalahoa Highway and Lihau Street will be improved as required by HELCo to provide power for the well pumping system. HELCo will extend the improved overhead electric lines to the project site. A pad mounted transformer will be provided on site, and power distribution throughout the site will be underground. No backup power is required at the site, since the Hualalai well will be part of the larger DWS North Kona system (Miyasato, personal communication, September 1995).

The existing HCo overhead pole line system on Mamalahoa Highway and Lihau Street will be improved to provide telephone and telemetering lines for the well pumping system. These lines will extend to the project site, at which point the telephone distribution system will terminate, via underground lines, to a telephone cabinet within the control building (Miyasato, personal communication, September 1995).

Site construction will generate traffic (primarily of construction vehicles and equipment) along Lihau Street and Mamalahoa Highway, which may inconvenience residents or generate safety hazards. The construction impacts will be short term and will be addressed by standard construction site safety procedures, including providing traffic control personnel as required in the Federal Highway Administration's "Manual on Uniform Traffic Control Devices for Streets and Highways". Site operation is expected to generate minimal traffic, mostly associated with site maintenance.

3.5 SOCIOECONOMICS

3.5.1 Existing Conditions

The Kailua-Kona region has a tourism-oriented economy centered around the numerous hotel and resort settlements along the west Hawaii coastline. North Kona is one of the County's major visitor destinations. There is also steady development of agribusiness and small farmers growing such crops as papaya, bananas, avocados, and ginger root, as well as floriculture. Hawaii Island is also a major producer of coffee in the State.

The low-density residences near the well site are located in an agricultural zoning district, with little or no industry or commercial activities in the surrounding neighborhood.

3.5.2 Potential Impacts and Proposed Mitigation Measures

The proposed action, in addition to other wells to be developed in the NKWS, will expand and improve the existing potable water system. The additional water supplied by the proposed action will facilitate development of the State projects identified in Chapter 1. These projects will substantially alter the North Kona Coast between Kailua and Keahole, developing vacant land for residential, agricultural, commercial, industrial, and institutional use. The development will attract new residents, create new jobs, and in the case of the airport expansion, bring substantially more visitors to the Kona Coast. These projects expand economic activity and development in the region. The proposed well, facilities, and pump station help prevent a lack of potable water from constraining this development.

The proposed action will cost the State approximately \$3.9 million. The projected cost for all improvements to the NKWS between the present and the year 2015 is \$84.7 million in 1994 dollars, of which the state will pay \$44.5 million (Fukunaga, 1995). The remainder of the cost will be borne by other users and the DWS.

4.0 CONSISTENCY WITH LAND USE PLANS, POLICIES, AND CONTROLS

4.1 STATE LAND USE DESIGNATION

The State Land Use Commission regulates the classification and uses of land to accommodate growth and development, and to retain the natural resources of the area. All lands in the State are classified by the State Land Use Commission as either Urban, Rural, Agricultural, or Conservation. The site of the proposed action land is designated Agricultural. The proposed action is a permitted use of Agricultural land.

4.2 HAWAII COUNTY GENERAL PLAN

The Hawaii County General Plan is the policy document for the long-range comprehensive development of the island of Hawaii. The General Plan is adopted by ordinance and provides the direction for the future growth of the County. The proposed action complies with the site designation of Urban Expansion or Extensive Agriculture.

4.3 HAWAII COUNTY ZONING

County Zoning districts include Residential, Resort, Commercial, Industrial, Agricultural, Open, and Unplanned Districts. Zoning for the project site is Agricultural.

4.4 STATE WATER RESOURCES DEVELOPMENT FUNCTIONAL PLAN

The State Water Resources Development Functional Plan delineates specific water-related policies, objectives, and high priority actions to be addressed in seeking to achieve the ideals expressed in The Hawaii State Plan. The proposed action is consistent with the Plan guidelines for regulation of the development and use of water to meet municipal needs and to preserve the quality of water resources.

4.5 NORTH KONA WATER MASTER PLAN

The purpose of the North Kona Water Master Plan is to provide the State with a comprehensive water development plan to support State projects in the North Kona region. Development of the Hualalai Well is consistent with this purpose.

4.6 WEST HAWAII REGIONAL PLAN

The purpose of this plan is to coordinate State activities in the region, address areas of State concern, coordinate the Capital Improvements Program within a regional planning framework, and provide guidance in State land use decision-making processes. It is intended to complement the County of Hawaii's General Plan and Community Development Plans. The proposed action is consistent with the plan's goal to ensure that existing and proposed developments can be adequately accommodated without adversely impacting the quality of the aquifer.

5.0 DETERMINATION

In accordance with Chapter 343, Hawaii Revised Statutes, it is determined that the proposed project would not have any significant adverse effects on the environment. Any potentially negative impacts resulting from the development of Hualalai Well No. 4258-03 at North Kona, Hawaii should be insignificant and temporary. Based on the findings of this Environmental Assessment (EA), an Environmental Impact Statement is not required and this EA is hereby being filed as a Negative Declaration.

REFERENCES

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Appendix A

Comments and Responses to the Draft Environmental Assessment

SUMMARY OF RESPONSES
TO THE DRAFT ENVIRONMENTAL ASSESSMENT

<u>Date of Letter</u>	<u>From/Agency</u>	<u>Date of Response</u>
12/23/94	DLNR-State Historic Preservation Division	7/26/96
4/22/94	State Department of Health	7/26/96



STATE OF HAWAII

DEPARTMENT OF LAND AND NATURAL RESOURCES

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

716 191-0166 EC-3

DEPARTMENT OF LAND AND NATURAL RESOURCES

DEPUTY
JOHN P. KETVELER

- ADMINISTRATIVE DEVELOPMENT
- AGRICULTURE
- ADULT SERVICES
- CONSERVATION AND
- ENVIRONMENTAL AFFAIRS
- CONSTRUCTION AND
- RECREATION DEVELOPMENT
- PLANNING AND DESIGN
- PLANNING AND DESIGN
- HISTORIC PRESERVATION
- INVESTMENT
- LAND MANAGEMENT
- PLANNING AND DESIGN
- WATER AND LAND DEVELOPMENT

December 23, 1994

LOG NO: 13552
DOC NO: 94126k02

MEMORANDUM

TO: Belt Collins Hawaii
Attention: Esme Corbett-Suzuki
680 Ala Moana Blvd., 1st Flr.
Honolulu, Hawaii 96813

FROM: Don Hibbard, Administrator
State Historic Preservation Division

SUBJECT: State of Hawaii Department of Water Resource Management
Job No. 17-HW-L, Hualalai Well
Kohalaiki, North Kona, Hawaii Island
TMK: 7-3-06: 03

This is in response to your transmittal dated December 21, 1994 regarding the sketch map of the proposed site layout and grading of Hualalai Well. The initial map received from DOWALD in December 1993 showed an impact area of approximately 0.5 acre (0.2ha). The present expansion will increase the impact area to 1.35 acres (0.5ha).

The entire parcel has been archaeologically surveyed and the expansion eastward will not impact any archaeological sites. There is just a bare minimum of buffer area between site 16161 and the project area. Site 16162 is on the knoll to the south and site 16160 eastward of that. Please caution your contractors regarding the need to avoid these sites. As long as the project remains north of the knoll and does not extensively grade the slope of the knoll, there should be "no effect" to the historic sites.

If you have any questions, please contact Carol Kawachi, one of our inter-agency archaeologists, at 587-0016.

c: Perry Manthos, DOWALD
Morris Ohta, DOWALD, Kona
Marc Smith, SHPD Hilo

BELT COLLINS
HAWAII

July 26, 1996
96EP-146/441.0900

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

Dear Dr. Hibbard:

Final Environmental Assessment, Job No. 17-HW-F
Hualalai Well Development
North Kona, Hawaii

Thank you for your letter dated December 23, 1994 in response to the above project. Your comments regarding the need for contractors to avoid archaeological sites located near the project area have been incorporated in the text.

Sincerely yours,

BELT COLLINS HAWAII LTD.

Cheryl Vann
Cheryl Vann

CV:if

cc: Perry Manthos, DLNR-LD
Morris Ohta, DLNR-LD, Kona
Marc Smith, SHPO Hilo

BENJAMIN J. CAVETANO
GOVERNOR OF HAWAII



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

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In reply, please refer to

April 22, 1996

96-037/epo

Belt Collins Hawaii
680 Ala Moana Boulevard
Honolulu, HI 96813

Dear Sirs:

Subject: Draft Environmental Assessment (DEA)
Hualalai Well Site Development
North Kona, Hawaii
TMK: 7-3-06: 3

Thank you for allowing us to review and comment on the subject project. We do not have any comments to offer at this time.

Sincerely,


BRUCE S. ANDERSON, Ph.D.
Deputy Director for
Environmental Health

BELT COLLINS
H A W A I I

July 26, 1996
96EP-145/441.0900

Bruce Anderson, Ph.D.
Deputy Director
Department of Health
State of Hawaii
P. O. Box 3378
Honolulu, Hawaii 96801

Dear Dr. Anderson:

Final Environmental Assessment, Job No. 17-HW-F
Hualalai Well Development
North Kona, Hawaii

Thank you for your letter dated April 22, 1996 regarding the above project. We appreciate your review.

Sincerely yours,

BELT COLLINS HAWAII LTD.


Cheryl Vann

CV:lf

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