Hanapepe Well Development
~~Transmission~~

DEPARTMENT OF WATER

County of Kauai

"Water has no Substitute -- Conserve It!"

March 27, 1998

'98 MAR 27 P1:52

Mr. Gary Gill, Director
Office of Environmental Quality Control
235 South Beretania Street, Suite 702
Honolulu, Hawaii 96813

Dear Mr. Gill:

Subject: Finding of No Significant Impact Hanapepe Well Development, Transmission, and Appurtenances, TMK: 1-8-13: 36; 1-7-06: Por. 05 and 06; 1-8-06: Por. 02; 1-8-07: Por. 10, Hanapepe, Kauai

The County of Kauai, Department of Water has reviewed the comments received during the 30-day public comment period which began on January 23, 1998. We have determined that this project will not have significant environmental effect and have issued a Finding of No Significant Impact. Please publish notice of availability for this project in the OEQC Bulletin as soon as practicable.

We have enclosed a completed OEQC Bulletin Publication Form and four(4) copies of the Final Environmental Assessment. Please contact Gregg Fujikawa at (808) 245-5416 if you have any questions.

Sincerely,

Ernest Y. W. Lau
Manager and Chief Engineer

EL:rm
Enclosures
Letters10/OEQC:rm

-- 4398 Pua Loke Street, Lihue, Kauai, Hawaii or P. O. Box 1706, Lihue, HI 96766-5706 --
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1998-04-08-KA-FEA- Hanapepe Well Development

FINAL
ENVIRONMENTAL ASSESSMENT

HANAPEPE WELL DEVELOPMENT, TRANSMISSION AND APPURTENANCES

For the:
County of Kauai
DEPARTMENT OF WATER

MARCH 1998

FUKUNAGA & ASSOCIATES, INC.
Consulting Engineers
1388 Kapiolani Boulevard, Second Floor
Honolulu, Hawaii 96814
(808) 944-1821

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FINAL
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T.M.K. 1-8-13:36; 1-7-06: Por. 05 and 06;
1-8-06: Por. 02; and 1-8-07: Por. 10
Hanapepe, Kauai, Hawaii

PROPOSING AGENCY:

Department of Water
County of Kauai

Submitted Pursuant to Chapter 343, HRS

Responsible Official: E. Y. W. Lau Date: 3/27/98
Ernest Y. W. Lau, Manager & Chief Engineer

Prepared by:

Fukunaga & Associates, Inc.
1388 Kapiolani Boulevard, Second Floor
Honolulu, HI 96814

March 1998

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A. PURPOSE OF THE PROJECT

The Hanapepe-Eleele water system, owned and operated by the Kauai County, Department of Water (DOW), presently relies on three well sources located in the Hanapepe River Valley. Routine access to the existing well sites have often been hampered by flooding of the Hanapepe River, potentially leaving the system vulnerable to supply disruption and potential contamination. In addition, the current source capacity for the Hanapepe-Eleele Water System does not meet maximum day requirements based on the DOW Water System Standard. The development of Hanapepe Well No. 4 (which is at a higher elevation) will provide a more reliable ground water source and also provide more source capacity to meet maximum day demand requirements.

B. PROJECT LOCATION

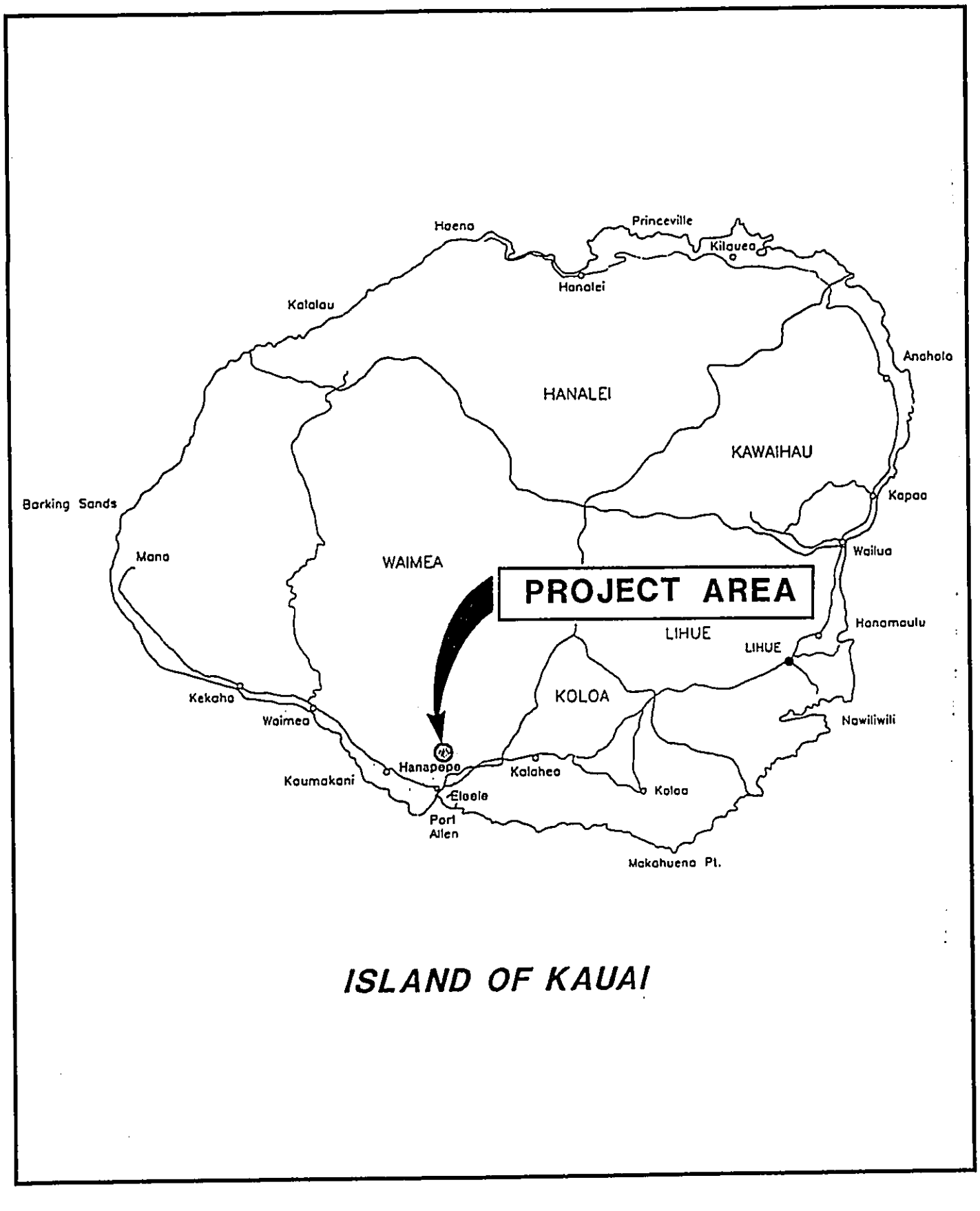
The main project area is located north of Hanapepe Town in the Waimea District of the island of Kauai (see **Figure 1**). The area is mauka (north) of the Cliffside at Hanapepe residential subdivision (a new subdivision above the Hanapepe Heights subdivision), between Kapahili Gulch and Papalu Gulch (see **Figure 2**). Vehicular access to the area is via Moi Road (the nearest improved County street) and cane haul roads owned by the Robinson Family and maintained by Gay and Robinson.

C. EXISTING HANAPEPE-ELEELE WATER SYSTEM

The Hanapepe-Eleele water system is owned and operated by DOW and is shown on **Figure 3**. The water system currently serves Hanapepe Town and the residential communities of Hanapepe and Eleele. Based on 1996 consumption records provided by the DOW, the total average day water consumption for the water system is approximately 0.80 million gallons per day (mgd).

The water system consists of three groundwater wells, three booster pump stations, and five storage reservoirs. The three groundwater wells, Hanapepe Wells A, B, and No. 25-1, are located in the Hanapepe River Valley. Groundwater from the wells is pumped directly into a 0.5 million gallon (MG) concrete reservoir which is located in the Hanapepe Heights subdivision at a spillway elevation of 212 feet, and is hereinafter referred to herein as "Reservoir 212".

Two booster pump stations pump water from Reservoir 212 to three higher reservoirs. One booster pump station is located at the Reservoir 212 site (referred as Cliffside Boosters) and pumps water to a 0.5 MG concrete tank situated above the Cliffside at Hanapepe subdivision, with a spillway elevation of 402 feet

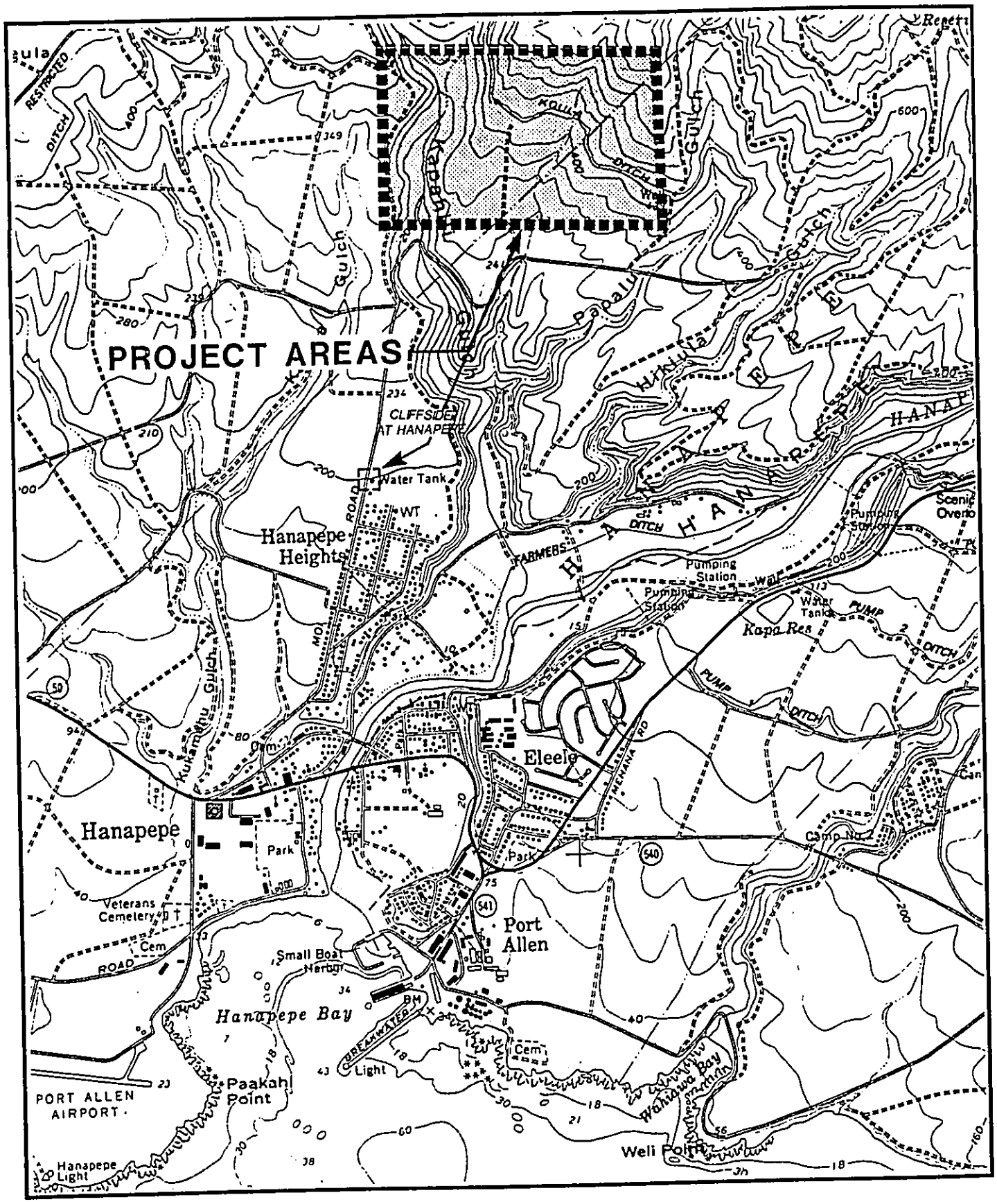


NORTH

NO SCALE

ISLAND MAP

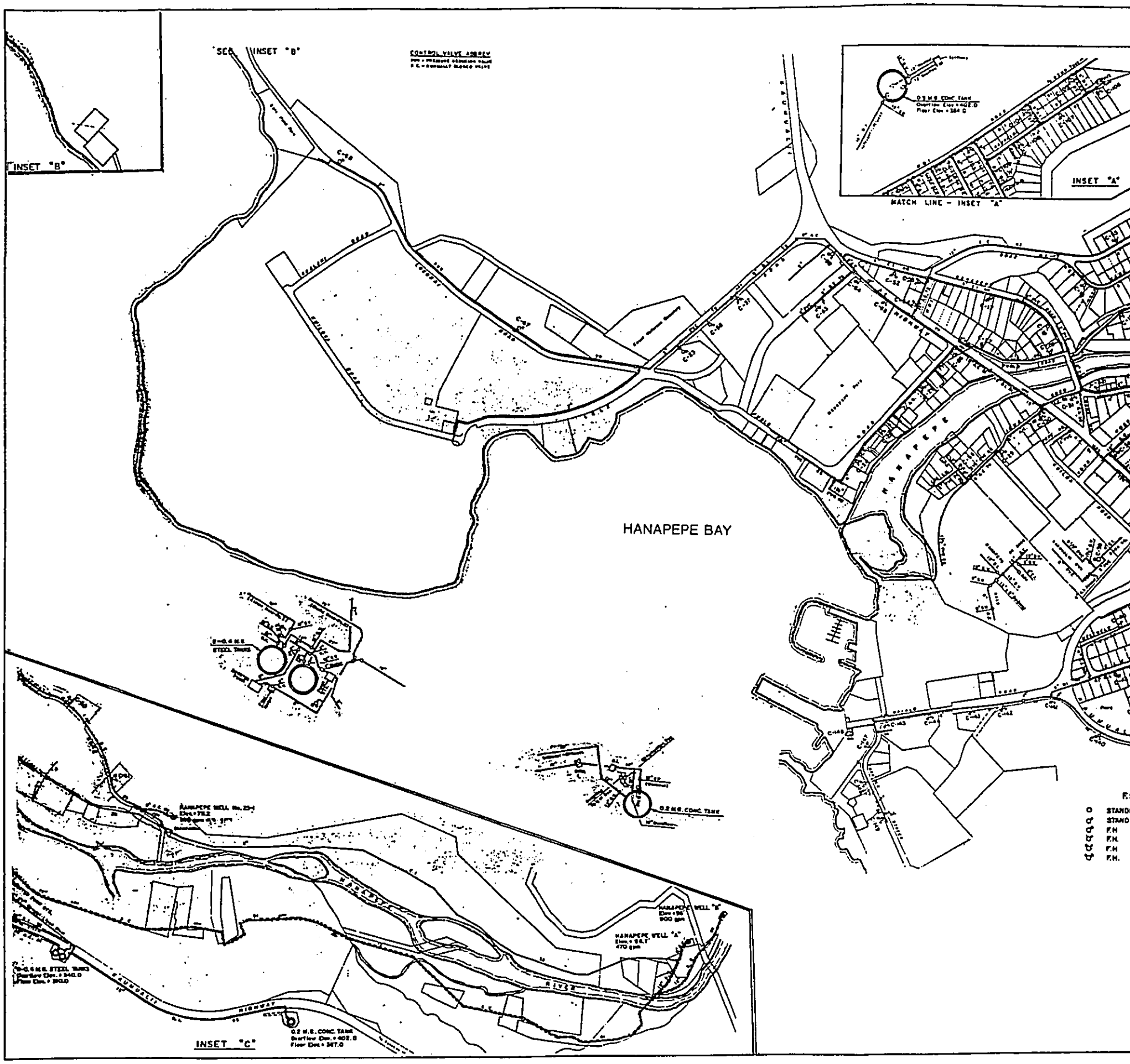
FIGURE 1



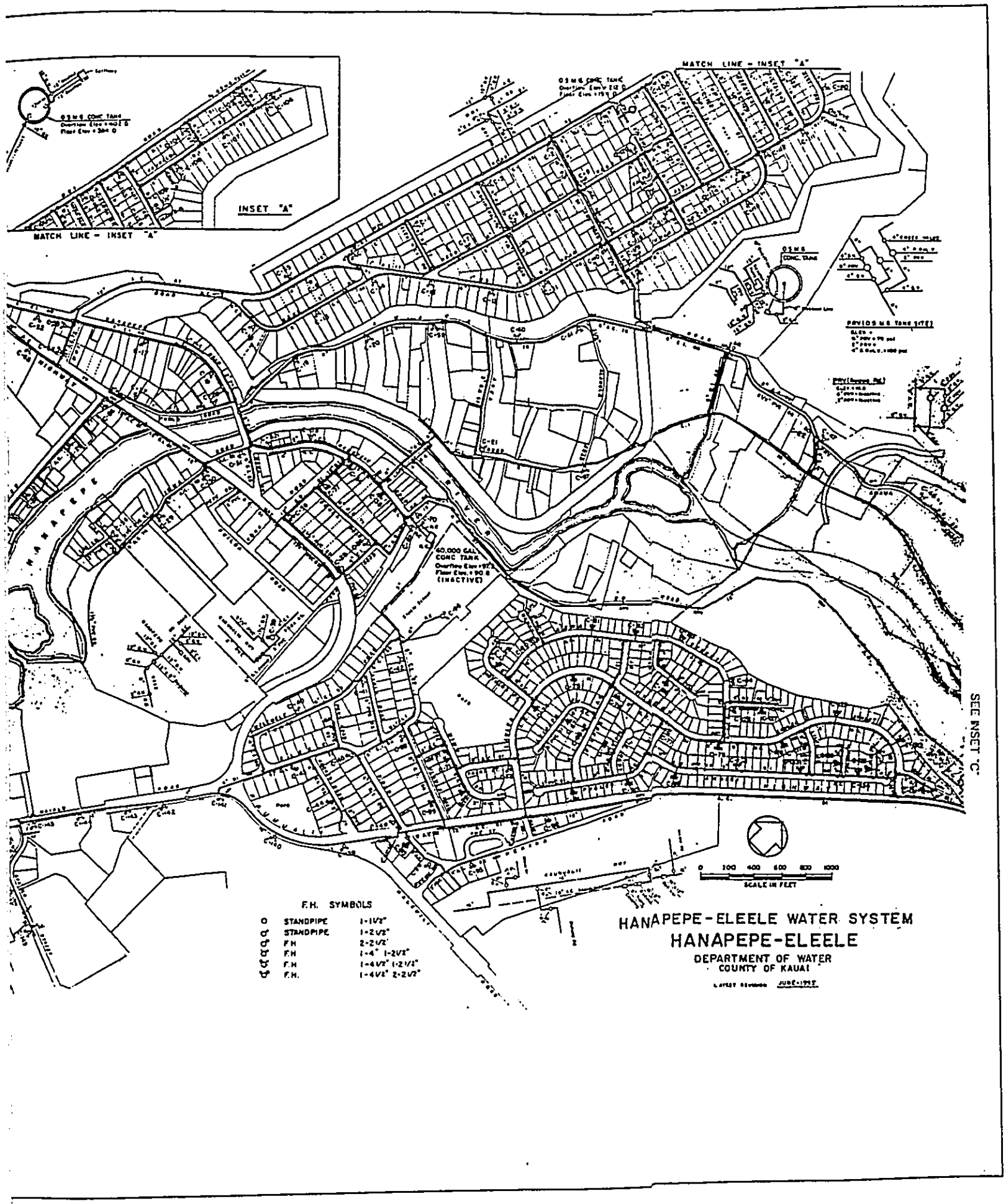
SCALE: 1"=2000'

VICINITY MAP

FIGURE 2



EXISTING HANAPEPE-ELEELE WATER SYS



ELEELE WATER SYSTEM

FIGURE 3

(referred to as "Reservoir 402"). Located in the Hanapepe River Valley, about a mile down the river from Hanapepe Wells A and B, the second booster pump station pumps water up to twin 0.4 MG steel reservoirs, which are situated above the Eleele Nani Subdivision at the 312 feet spillway elevation (referred to as "Lower Eleele Reservoir"). A third booster pump station at the 0.4 MG twin reservoirs site lifts water to a fifth reservoir (0.2 MG) located uphill from the twin reservoirs at a spillway elevation of 402 feet (referred to as "Upper Eleele Reservoir").

From the five reservoirs, water is distributed to six hydraulic service zones and sub-zones (see **Figure 4**) within the Hanapepe-Eleele water system via pipelines ranging in size from 1 1/2-inches to 12-inches.

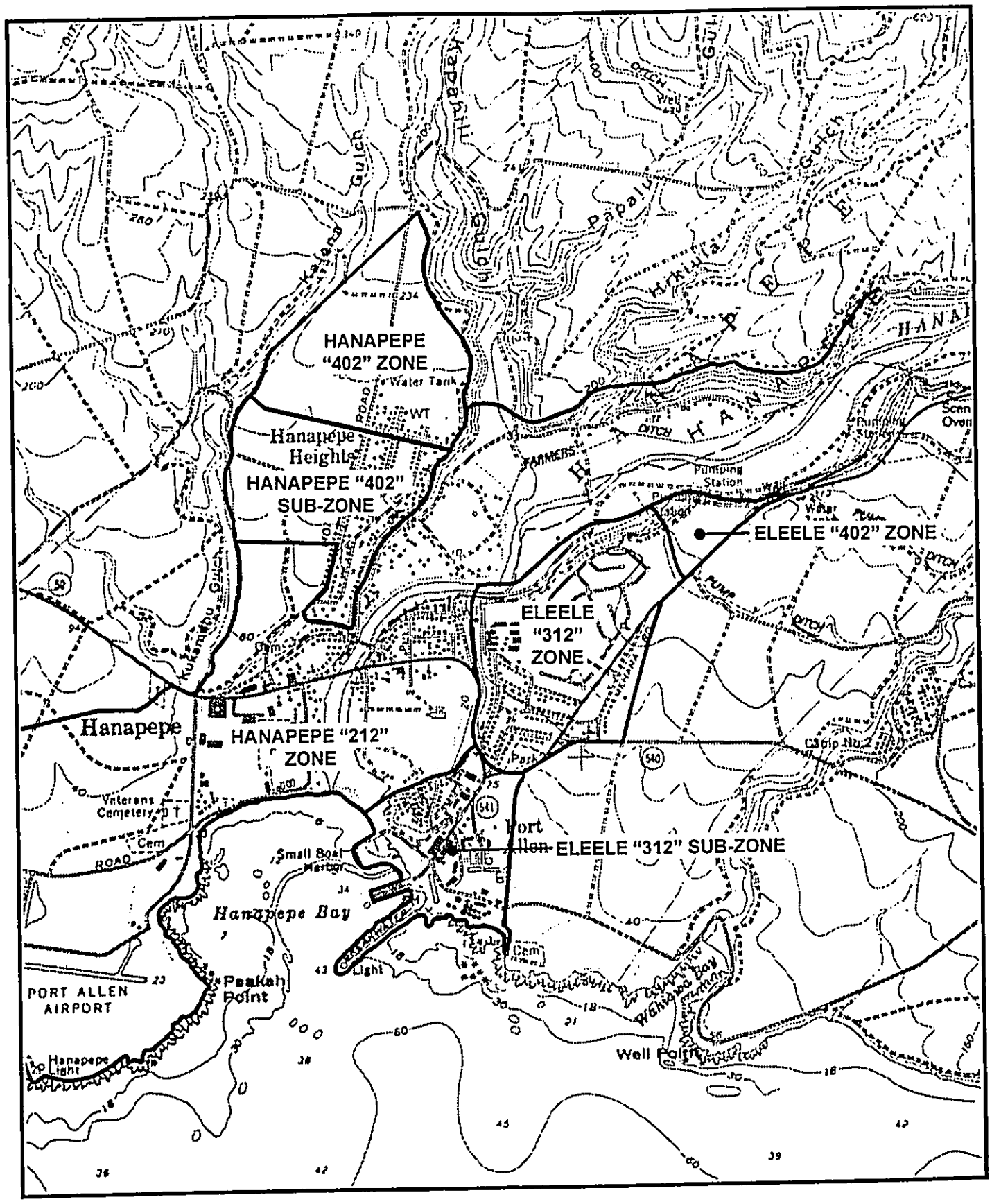
D. HANAPEPE WELL NO. 4

Hanapepe Well No. 4, to be developed as part of this project, has been designated as State Well No. 5634-02. The well was constructed in February 1993 by the DOW, and tested in May and April of 1993. A report titled, "Hanapepe Well No. 4, State Well No. 5634-02, As Built and Aquifer Report", dated February 1994 was completed after the test and is presented in Appendix A. According to the report, the aquifer can be readily pumped at a continuous rate of 600 gallons per minute (gpm) for a total yield of 864,000 gallons per day (gpd). This was based on the long-term pumping test conducted for 200 hours at 600 gpm. During the test, the drawdown stabilized at about three feet while the chlorides remained at about 105 to 110 mg/l. The report also states that the well did not show any sensitivity to pumping rate which resulted in the projection that the well may yield up to 1 million gallons per day (mgd) without significantly increasing the chloride levels.

E. PROPOSED PROJECT

The main components of the project, which are described below, include developing Hanapepe Well No. 4; constructing a 12-inch transmission main from Hanapepe Well No. 4 to the existing Reservoir 402; and constructing a bypass at the Reservoir 212 site to permit flow from Reservoir 402 to Reservoir 212 (see **Figure 5**).

1. Developing the Hanapepe Well No. 4 into a production well will involve the installation of a line shaft vertical turbine pump (pump rating at 700 gpm) with a water pre-lubrication system, a hydropneumatic system, pump discharge piping, the construction of a pump control building, pump controls and appurtenances, chlorination facilities and electrical work. Other improvements to the well site include a retaining wall, drainage system, fencing, and asphalt concrete paving.

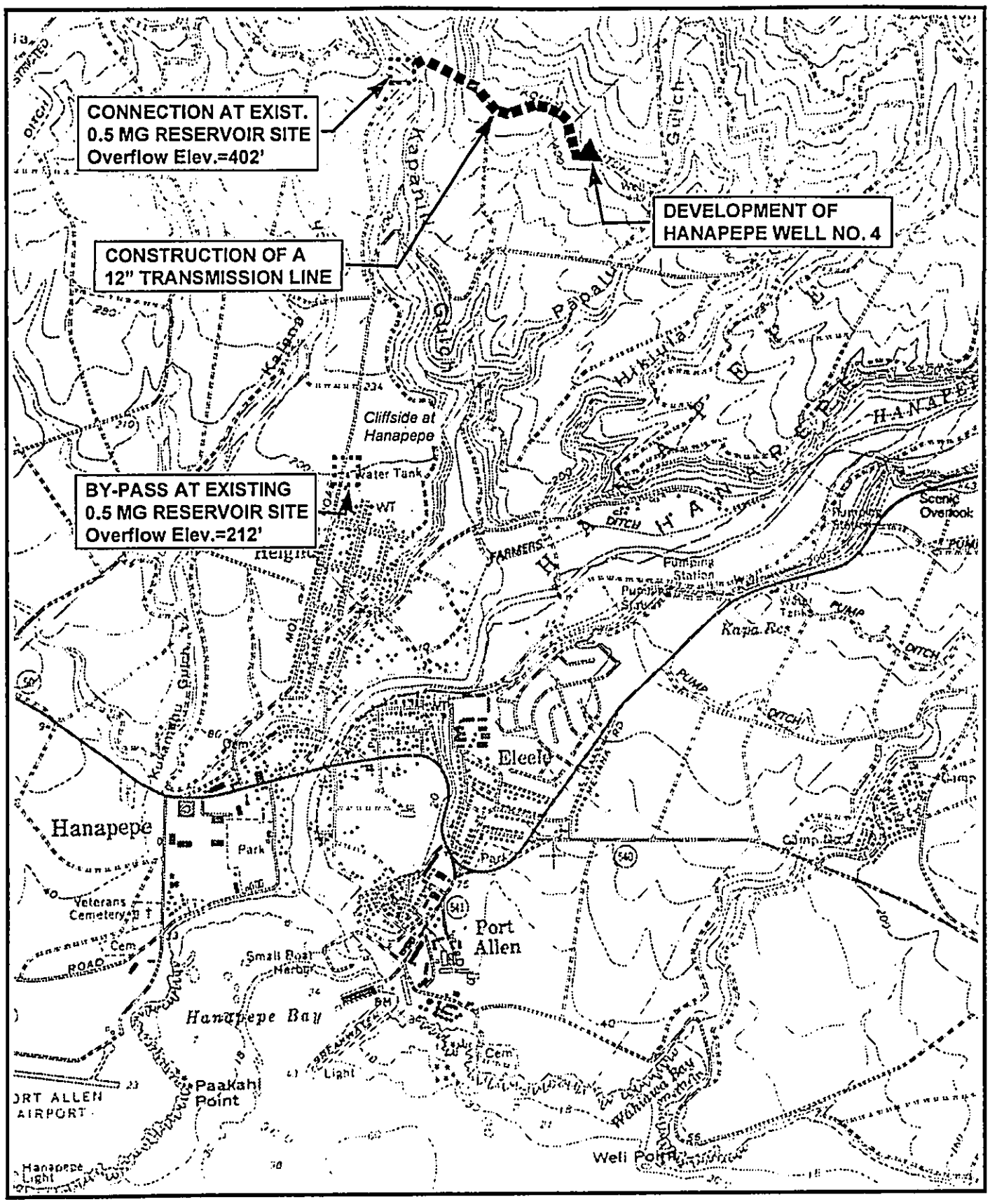


HANAPEPE-ELEELE WATER SYSTEM
HYDRAULIC SERVICE ZONES

NORTH

SCALE: 1"=2000'

FIGURE 4



NORTH

SCALE: 1"=2000'

PROJECT PLAN

FIGURE 5

2. The 12-inch transmission pipeline connecting Hanapepe Well No. 4 to the existing Hanapepe-Eleele Water System is approximately 3,600 lineal feet long. The pipeline will proceed underground from the well site along the existing cane haul road leading to Kapahili Gulch. Along the dirt road, the pipeline will cross under an existing ditch. Upon reaching Kapahili Gulch, the buried main will proceed down the eastern side of the gulch, to the bottom, and cross under a stream bed to the opposite side of the gulch. The pipeline will then proceed up the opposite side of the gulch (west side), where the pipeline will be constructed above ground on piers due to the steep terrain and rock formations encountered along the slope. At the top of the gulch, the pipeline will be placed underground until it connects to the Reservoir 402 12-inch influent/effluent line (see **Figure 6**).

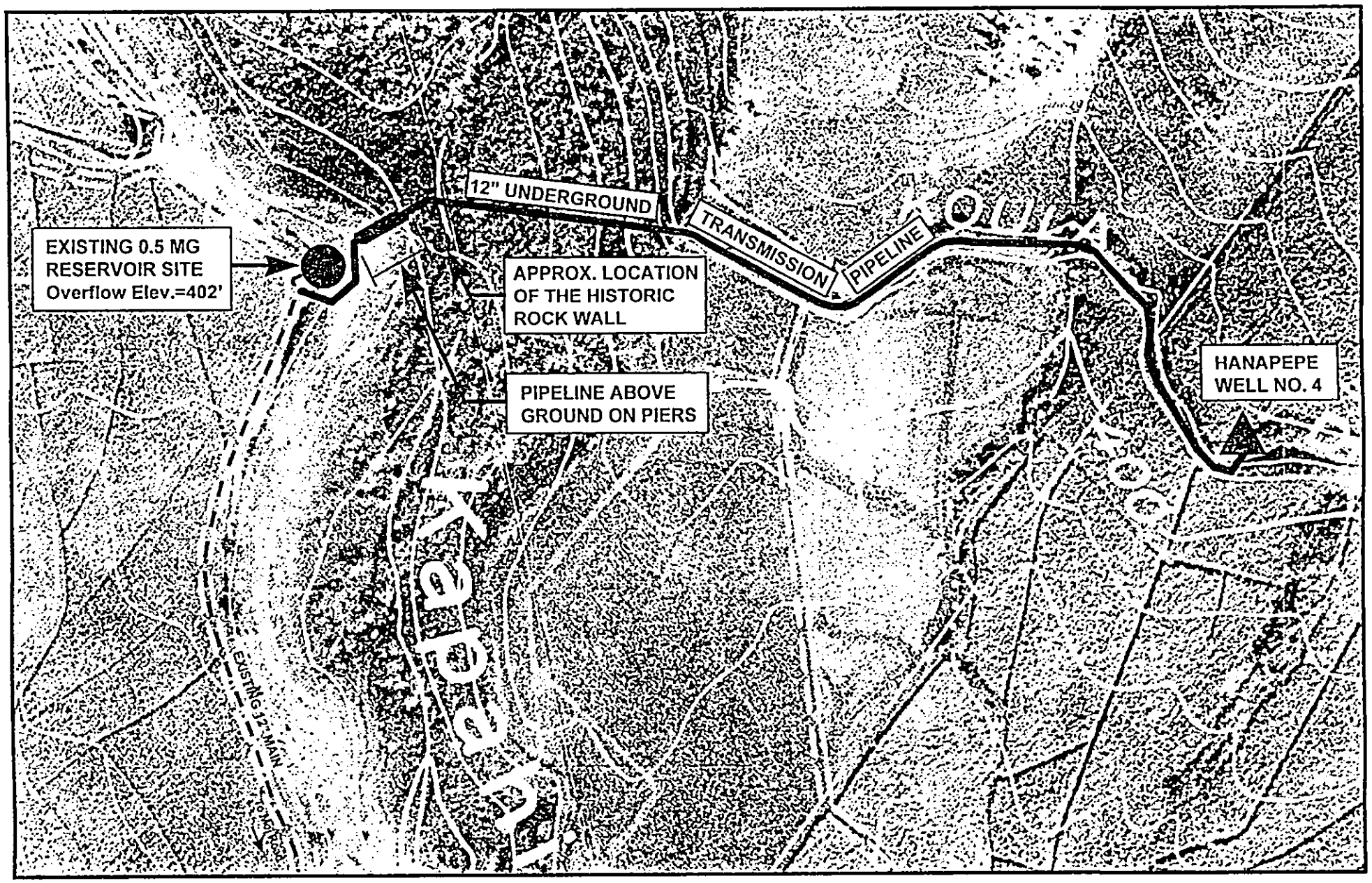
   A 10 to 15 foot wide cleared area will be provided along the segment of pipeline within Kapahili Gulch to facilitate maintenance of the pipeline. An existing overgrown jeep road leading into Kapahili Gulch will be cleared of surface obstructions to allow for vehicle travel. All clearing work will be kept to a minimum at the request of the land owner.

3. Modifying the existing water facilities to allow water to flow from Reservoir 402 to Reservoir 212. This will involve the construction of a by-pass line at the Reservoir 212 site. All work on the by-pass line will be confined to the existing reservoir site.

4. Providing power to the well site will involve upgrading the existing aerial single phase power lines from the Cliffside Subdivision to the Reservoir 402 site into a three phase line and extending the existing aerial line from the Reservoir 402 site to the well site. The aerial extension, consisting of four wires, will span the width of the gulch from the Reservoir 402 site to the other side of the gulch. At each end of the span, there will be wooden H-frame supports approximately 50 feet high. At the other side of the gulch, the aerial lines supported on single wooden poles will follow the same alignment of the 12-inch transmission main.

5. Radio telemetry links between the well site, Reservoir 402 site, and Reservoir 212 site will be provided to control and monitor the operations between the pump and reservoirs.

6. On the long-term, another well (location unknown at this time) may be planned in the vicinity of the existing Hanapepe Well No. 4, which will also use the 12-inch transmission main.



ALIGNMENT OF 12-INCH TRANSMISSION MAIN

SCALE: 1"=400'

FIGURE 6

II. DESCRIPTION OF THE ENVIRONMENT

A. PHYSICAL ENVIRONMENT

1. Land Ownership

The proposed project will be constructed on State of Hawaii and privately owned lands (see **Figure 7**). The portion of the project within State owned lands are: the Hanapepe Well No. 4 site, a portion of the 12-inch transmission main (about 500 lineal feet) between the well site and Kapahili Gulch, which is leased to Gay and Robinson; and the Reservoir 212 site. The State owned lands are designated as TMK: 1-8-06: 02, 1-8-07: 10, and 1-8-13: 36, respectively. The remaining portion of the 12-inch transmission main is within TMK: 1-7-06: 05 and 06, which are owned by the Robinson Family.

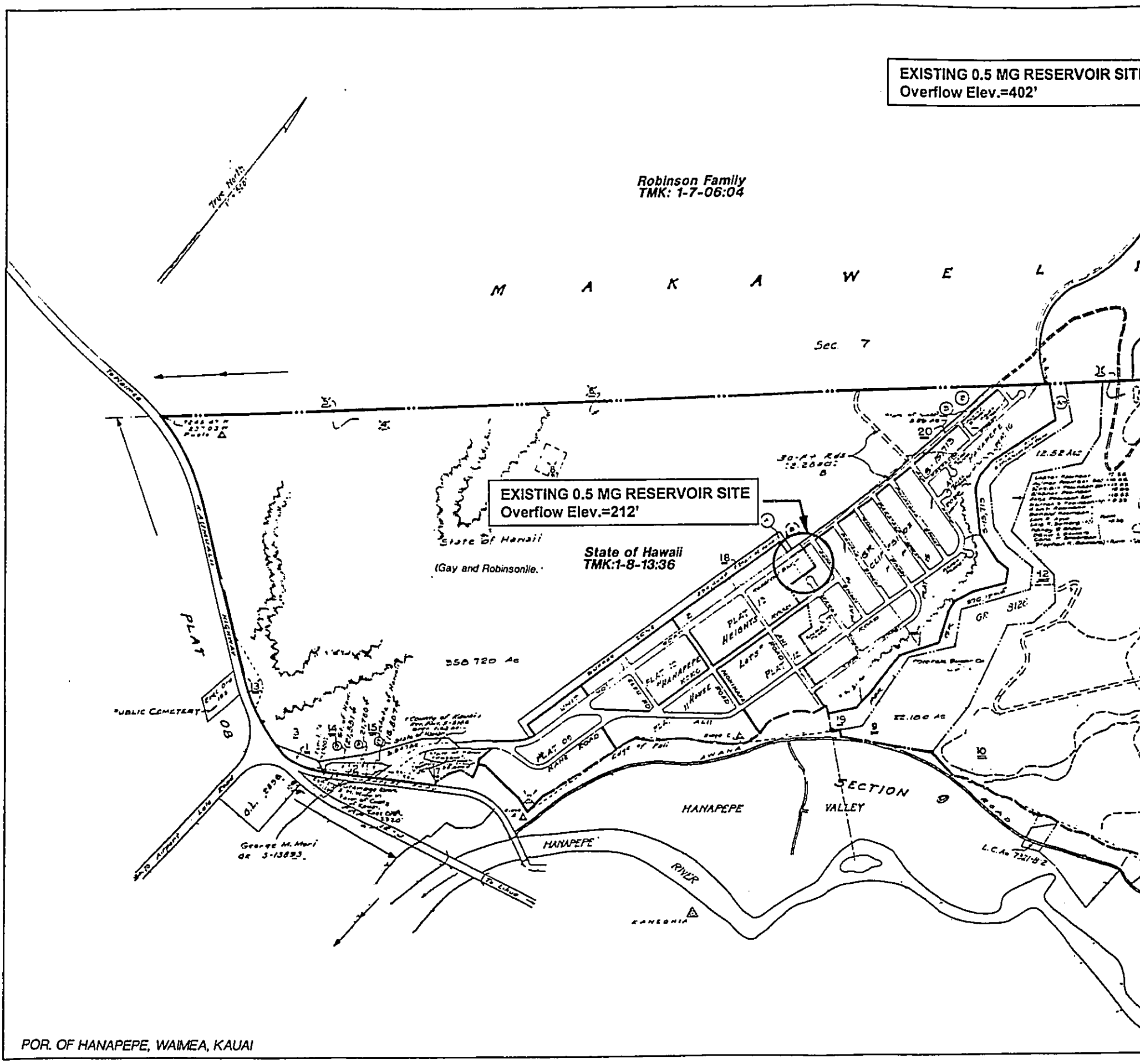
Except for the Reservoir 212 site, which is situated in a residential subdivision, the proposed project is surrounded by agricultural lands generally used for cultivating sugarcane. The portion of the project that crosses Kapahili Gulch is used for cattle grazing.

Access to the well site and transmission main will be through existing dirt roads that are on lands owned by the State and by the Robinson Family (see **Figure 7**).

A 15 to 20 foot wide pipeline easement along the 12-inch transmission line will be acquired from the State and the Robinson Family by the DOW for access and maintenance of the pipeline.

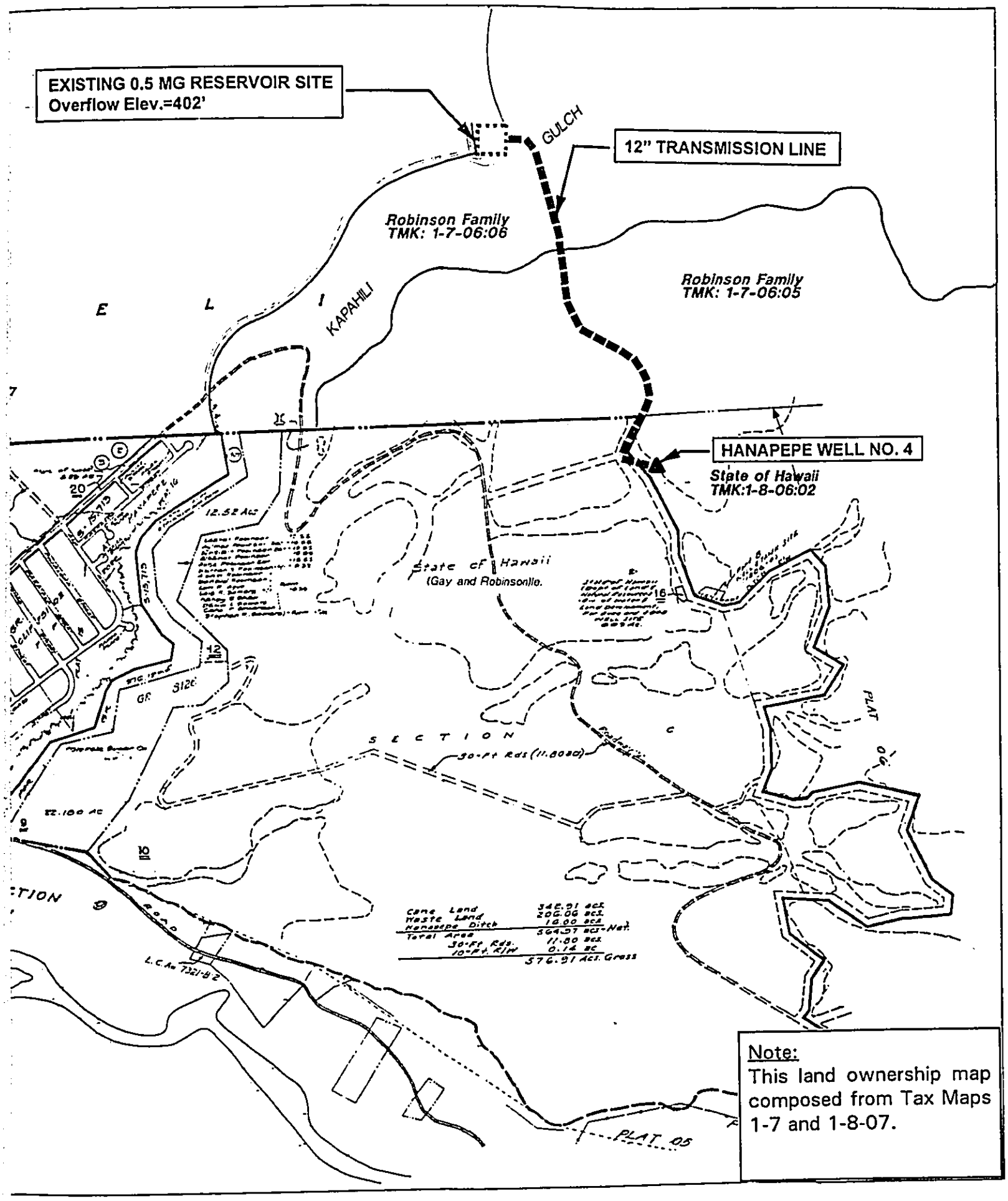
2. Land Classification and Zoning

For the different components of the project, **Table 1** lists the State Land Use (see **Figure 8**), Kauai County General Plan (see **Figure 9**) and Zoning designations.



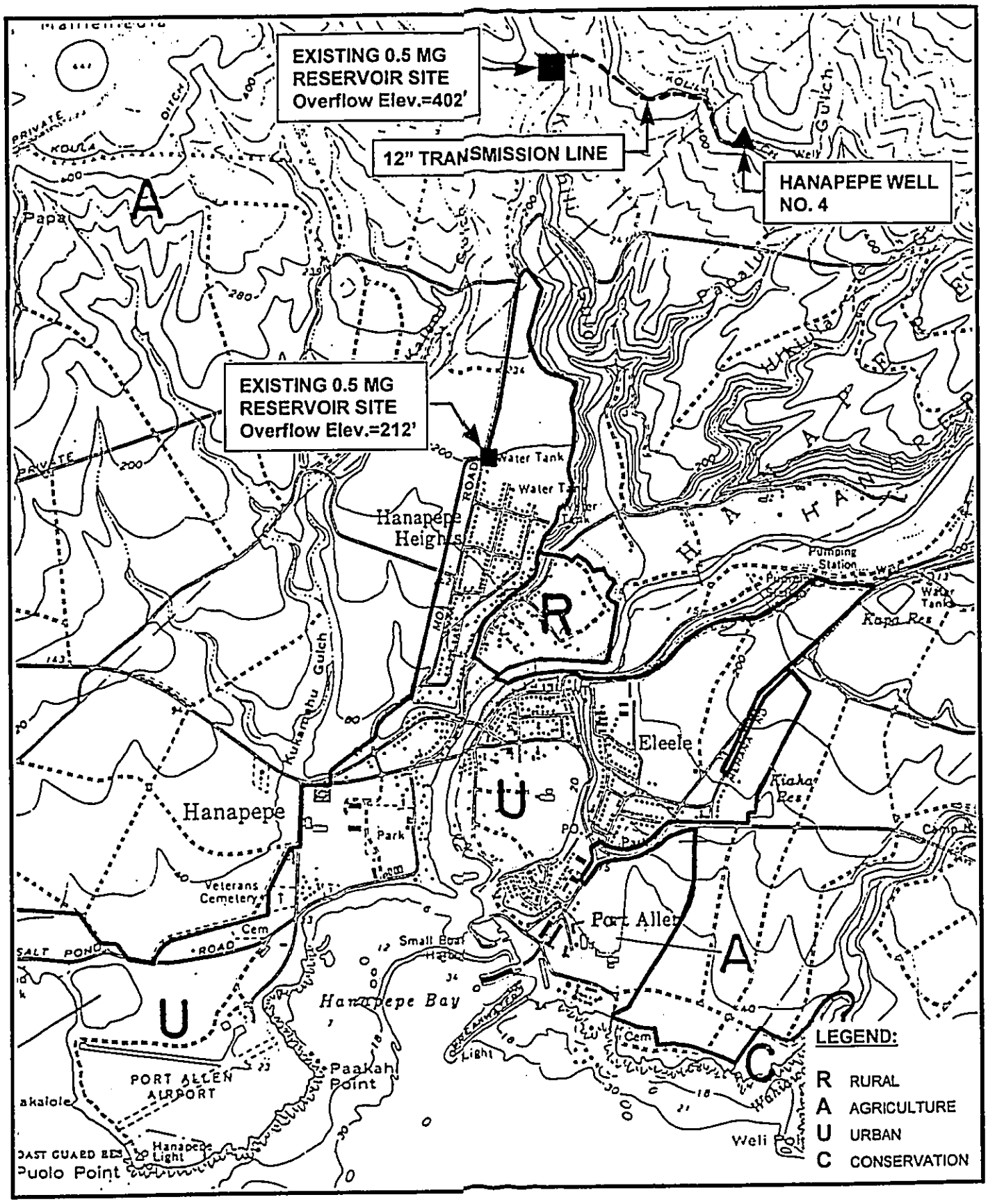
POR. OF HANAPEPE, WAIMEA, KAUAI

LAND OWNERSHIP



WNERSHIP

FIGURE 7

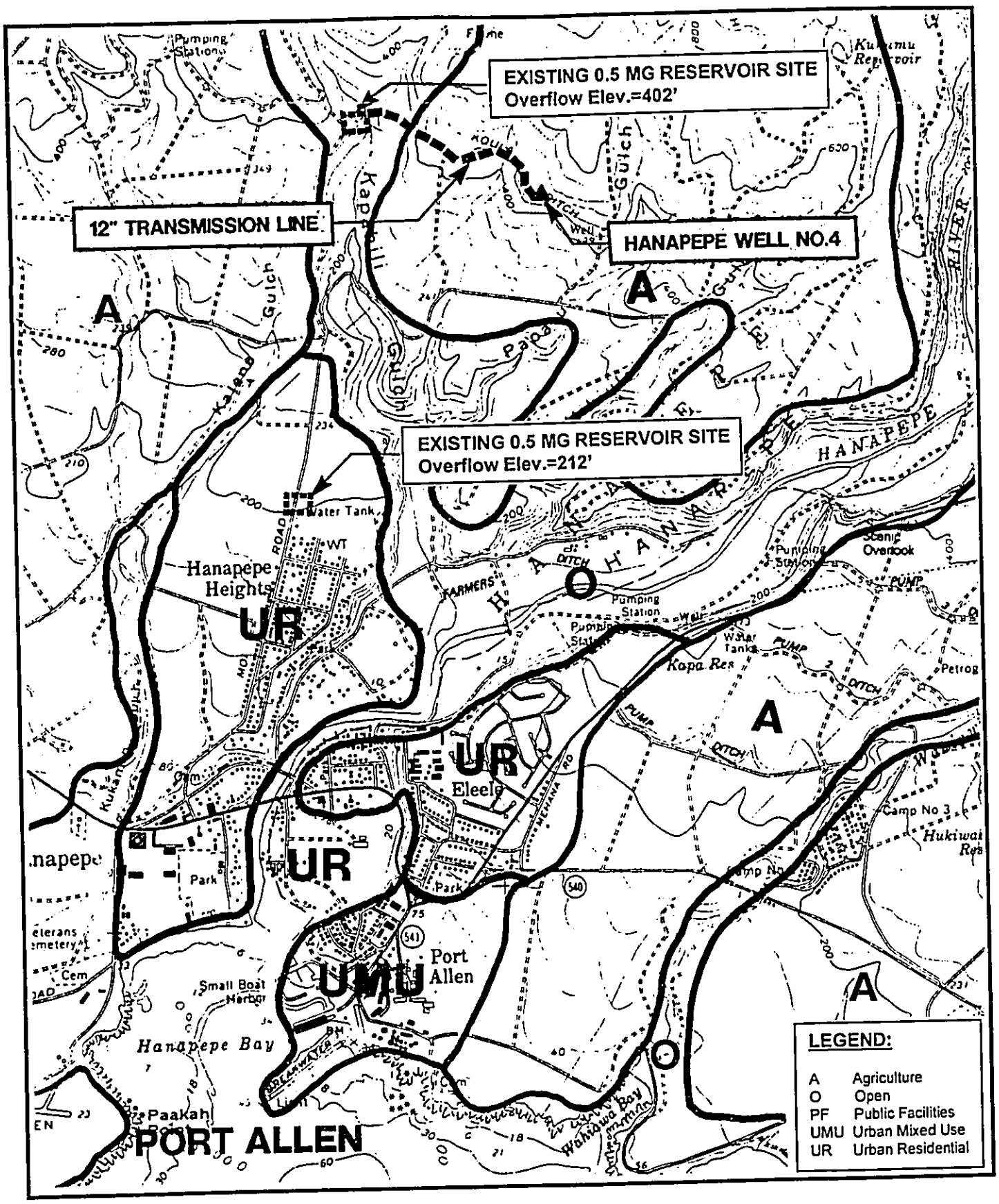


NORTH

SCALE: 1"=2000'

STATE LAND USE DISTRICT MAP

FIGURE 8



NORTH

SCALE: 1"=2000'

GENERAL PLAN - KAUAI COUNTY

FIGURE 9

Table 1
Project Land Classification and Zoning

Project Component	State Land Use	County General Plan	County Zoning Designation
Hanapepe Well No. 4 Site Development	Agriculture	Agriculture	Agriculture
12" Transmission line - Well Site to Kapahili Gulch	Agriculture	Agriculture	Agriculture
12" Transmission Line - Kapahili Gulch Crossing	Agriculture	Open	Agriculture
Reservoir 402 Site	Agriculture	Open	Agriculture
Reservoir 212 Site	Urban	Urban	Residential

3. Topography

Consisting of gently sloping hills and deep and narrow valleys, the topography of the Hanapepe-Eleele area is diverse. The project area is approximately 2.5 miles inland from the coast. Near the well site, where the ground elevation is about 460 feet, the land slopes downwards toward the south at 20 to 30 percent. The ground elevation of the transmission main varies from 460 feet near the well site to 280 feet at the bottom of Kapahili Gulch. The sides of Kapahili Gulch slope downward at 30 to 40 percent on the east (or well site) side and 40 to 50 percent on the west (or Reservoir 402) side.

The stream in Kapahili Gulch is classified as intermittent. Flow in the stream occurs from rainfall and when excess irrigation water is periodically released by Gay and Robinson from a reservoir located in the mountains. Water flowing through the gulch drains into the Hanapepe River.

4. Soils

The soil types present in the vicinity of the project area are shown in **Figure 10**. The soil types occurring at the well site are:

MhE - Makaweli stony silty clay loam, 20 to 35 percent slopes; low shrink-swell potential, low corrosivity, runoff is rapid and erosion hazard is severe, and;

rRR - Rough Broken Land, 40 to 70 percent slopes; runoff is rapid and geologic erosion is active.

SOURCE: Soil Survey of the Islands of Kauai, Oahu, Maui, Molokai, and Lanai, State of Hawaii, August 1972.

LEGEND:

BM	= BADLAND-MAHANA COMPLEX
HmA, HnA, HrB	= HANALEI SILTY CLAY; PEATY IN PLACES; SILTY LOAM
IoB, IoC, IoD2, IoE2	= IOLEAU SILTY CLAY LOAM AND SILTY CLAY
JkB	= JAUCAS SAND
KOYE	= KEKAHA SILTY CLAY OR CLAY; EXTREMELY STONY IN PLACES
LhC, LlB, LlC	= LIHUE SILTY CLAY; GRAVELLY IN PLACES
MaD, MaD3, MaE, MaE3	= MAHANA SILT LOAM AND SILTY CLAY LOAM
MgB, MgC, MgD, MgE2 MhB, MhC, MhD, MhE	= MAKAWELI SILTY CLAY LOAM AND SILT LOAM
NcC, NcD, NcE2	= NIU SILTY CLAY LOAM AND SILTY CLAY
NnC, NoC	= NONOPAHU CLAY AND SILTY CLAY
OlD	= OLI SILT LOAM; BEDROCK
PdA, PdC, PHXC	= PAKALA STRATIFIED CLAY LOAM, VERY FINE SANDY LOAM, SILT LOAM, AND SILTY CLAY LOAM; EXTREMELY STONY IN PLACES
PwC, PwD, PwE	= PUU OPAE SILTY CLAY LOAM AND SILTY CLAY
rRH	= RIVERWASH
rRR	= ROUGH BROKEN LAND
rRO	= ROCK OUTCROP
WJF	= WAIAWA CLAY; BEDROCK

NORTH

SCALE: 1"=2000'

SOIL SURVEY MAP

FIGURE 10

The soil types occurring along the portion of 12-inch transmission main within the dirt road include:

MhE - Makaweli stony silty clay loam, 20 to 35 percent slopes; low shrink-swell potential, low corrosivity, runoff is rapid and erosion hazard is severe;

MhC - Makaweli stony silty clay loam, 6 to 12 percent slopes; low shrink-swell potential, low corrosivity, runoff is medium and erosion hazard is moderate.

MgD - Makaweli silty clay loam, 12 to 20 percent slopes; low shrink-swell potential, low corrosivity, runoff is rapid and erosion hazard is severe.

NcC - Niu silty clay loam, 6 to 12 percent slopes; moderate permeability, runoff is medium, and erosion hazard is moderate.

NcD - Niu silty clay loam, 12 to 20 percent slopes; moderate permeability, runoff is rapid, and erosion hazard is severe.

NnC - Nonopahu clay, 2 to 10 percent slopes; high shrink-swell potential, low to moderate corrosivity, runoff is medium and erosion hazard is moderate.

The soil types occurring along the portion of 12-inch transmission crossing Kapahili Gulch and the Reservoir 402 site include:

PHXC - Pakala extremely stony sandy clay loam, 0 to 12 percent slopes; stones make-up about 30 percent, by volume, of the subsoil. Runoff is slow and erosion hazard is slight.

rRR - Rough Broken Land, 40 to 70 percent slopes; runoff is rapid and geologic erosion is active.

The soil types occurring at the Reservoir 212 Site are the MgB - Makaweli silty clay loam, 0 to 6 percent slope; runoff is slow and erosion hazard is slight.

5. Climate

The average temperature ranges from a low of 60 degrees to a high of 85 degrees Fahrenheit. The prevailing wind is from the East Northeast.

6. Flood/Tsunami Hazards

The Federal Emergency Management Agency's March 4, 1987 Flood Insurance Rate Map (FIRM) Panel 150002 0180 C for Kauai County designates the project area to be within Zone X, areas determined to be outside the 500-year flood plain.

Tsunami inundation areas are located in low-lying areas along the shoreline. This does not affect the project area which is on high ground and about 2.5 miles inland from the coast.

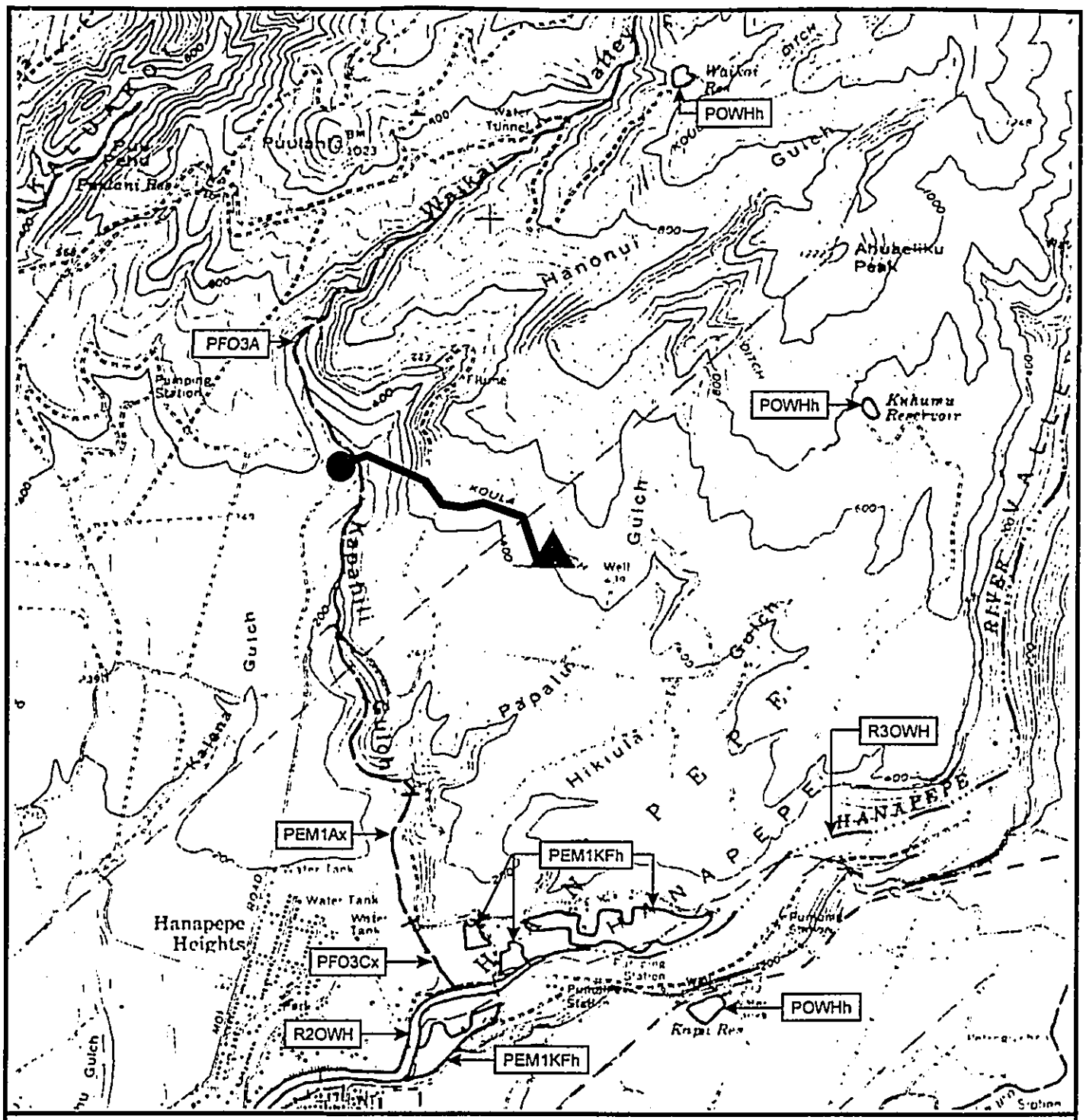
7. Flora and Fauna

According to the "Atlas of Hawaii, Second Edition", dated 1983, flora common to the area are Lantana (*Lantana camara*), Koa Hale (*Leucaena leucocephala*), Klu (*Acacia farnesiana*), Panini (*Opuntia ficus-indica*), Ilima (*Sida fallax*), Natal Redtop Grass (*Rhynchelytrum repens*).

Animals near the project area include cattle (*Bos taurus*), dog (*Canis familiaris*), and pig (*Sus scrota*). Birds in the vicinity of the project area include the cardinal (*Cardinalis cardinalis*), barred dove (*Geopelia striata*), spotted dove (*Streptopelia chinensis*), mockingbird (*Mimus polyglottos*), golden plover (*Pluvialis dominica fulva*), Pueo (*Aseo flammeus sandwichensis*), Ricebird (*Lonchura punctulata*) and White Eye (*Zosterop japonicus*). None of the above are considered threatened or endangered.

While the animals near the project area are not considered threatened or endangered, the U.S. Department of the Interior, Fish and Wildlife Service, has revealed a threatened species that is known to fly through this project site. The Newell's shearwater (Puffinus auricularis newelli), listed by the state and federal government as a threatened species, is known to breed inland of this site and is known to fly through the Hanapepe area when moving between the inland nesting and ocean foraging sites.

Generally, the proposed project is within lands already cleared of its original native landscape for agricultural use. Most of the project area is surrounded by sugarcane fields and pasture lands. Kapahili Gulch remains largely uncultivated but is used by Gay and Robinson for grazing cattle. There are existing jeep trails inside the gulch which are used by Gay and Robinson for their ranching operations. The intermittent stream in the Kapahili Gulch is classified as a Paulistine, Forested, Broad-leaved Evergreen, Temporary Non-tidal water regime by the National Wetlands Inventory, U.S. Department of the Interior (see **Figure 11**).



LEGEND:

PEM1Ax	=	Palustrine, Emergent, Persistent, Temporary Non-Tidal Water Regime, Excavated
PEM1KFh	=	Palustrine, Emergent, Persistent, Artificiall, Semi-Permanent Non-Tidal Water Regime, Diked Impounded
PFO3A	=	Palustrine, Forested, Broad-leaved Evergreen, Temporary Non-Tidal Water Regime
PFO3Cx	=	Palustrine, Forested, Broad-leaved Evergreen, Seasonal Non-Tidal Water Regime, Excavated
POWHh	=	Palustrine, Open Water (unknown bottom), Permanent Non-Tidal Water Regime, Diked Impounded
R2OWH	=	Riverine, Lower Perennial, Open Water (unknown bottom), Permanent Non-Tidal Water Regime
R3OWH	=	Riverine, Upper Perennial, Open Water (unknown bottom), Permanent Non-Tidal Water Regime

SOURCE: "National Wetlands Inventory" map, U.S. Department of the Interior, Fish and Wildlife Service, December 1978.

NORTH

WETLANDS INVENTORY MAP

SCALE: 1"=2000'

FIGURE 11

8. Archaeological Features

According to an archaeologist from the State Department of Land and Natural Resources, Historic Preservation Division, who conducted a field investigation of the project area on November 12, 1997, only one significant site was cited, a historic rock wall, near the project area. The rock wall was cited approximately 80 feet south from the pipeline corridor in Kapahili Gulch. The rock wall is built against the western face of the gulch wall and is approximately 35 feet long and 20 feet high (see **Figure 6**).

Because the area surrounding the well site and pipeline corridor has been previously cleared and the rock wall is away from the pipeline corridor, the project will have no effect on any significant sites.

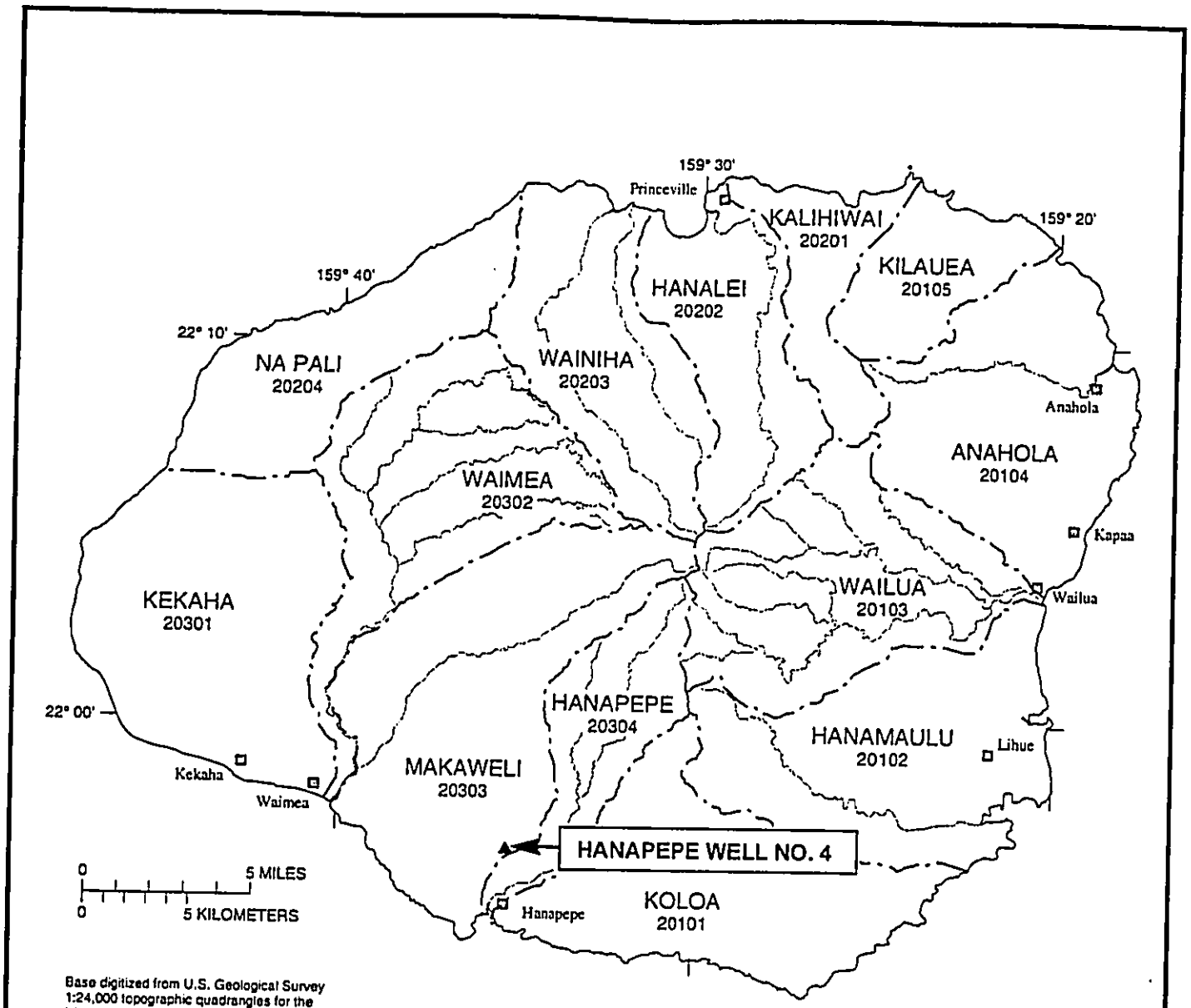
B. HYDROLOGY

1. Makaweli and Hanapepe Aquifer Systems

The Hanapepe Well No. 4 is located within the Makaweli Aquifer System near the boundary of the Makaweli and Hanapepe Aquifer Systems as designated by the Commission on Water Resource Management (CWRM, see **Figure 12**). The Makaweli Aquifer System encompasses the area west of the Hanapepe River all the way to the Waimea River. The principal geologic formation found in the Makaweli Aquifer is the Waimea Canyon volcanic series. On the eastern side of the Aquifer, where the Hanapepe Well No. 4 is located, exist the Napali member. Near the coastal areas exist the Koloa volcanic series, which extends five miles inland and covers the Makaweli and Napali members.

The Hanapepe Aquifer System encompasses the area from the Makaweli Aquifer's eastern boundary to just east of the Hanapepe River. The interior two thirds of the Hanapepe Aquifer is covered by the Napali member. The lower one third drains the Koloa terrain. A strip of alluvium extends approximately five miles into the Hanapepe Valley.

According to the Water Resources Protection Plan Volume I, dated March 1992, prepared for the CWRM, the Makaweli Aquifer and Hanapepe Aquifer have sustainable yields of 30 mgd and 26 mgd, respectively. The sustainable yield of an aquifer refers to the withdrawal of groundwater at a rate in which the aquifer can be sustained indefinitely without affecting the quality of the pumped groundwater.



SOURCE: Estimated Water Use In 1990, Island of Kauai, Hawaii; U.S.G.S. (Modified from George A.L. Yuen and Associates, 1990).

NORTH

KAUAI AQUIFER SYSTEMS

FIGURE 12

2. Geology of Project Area

Geologic formations underlying the project area are lavas from the Waimea Canyon Volcanic Series, Napali formation (Twn) generated during the late Tertiary period, and lavas from the Koloa Volcanic Series (Qkl) form during the Pleistocene epoch (see **Figure 13**). Also to be found are extensively eroded deposits from recent geologic activity (erosion/deposition).

The exploratory drilling and testing of Hanapepe Well No. 4 revealed that the well penetrated the highly permeable basalts of the Napali Volcanics which is known to be a basal source.

3. Rainfall

The mean annual rainfall in the project area is approximately 40 inches per year. About six miles inland the rainfall increases to 120 inches per year.

4. Surface Water

The major stream in the area near the project site is the Hanapepe River. Streams feeding into the Hanapepe River include the Manuahi Stream and Koula River. Hanapepe River has a mean daily discharge of approximately 55 mgd (measured at U.S.G.S. Stream Gage No. 0490). According to the CWRM Water Resources Protection Plan, dated 1992, 24 mgd is diverted from the stream for irrigation purposes at the Koula ditch intake, which is 3 miles upstream of the stream gage.

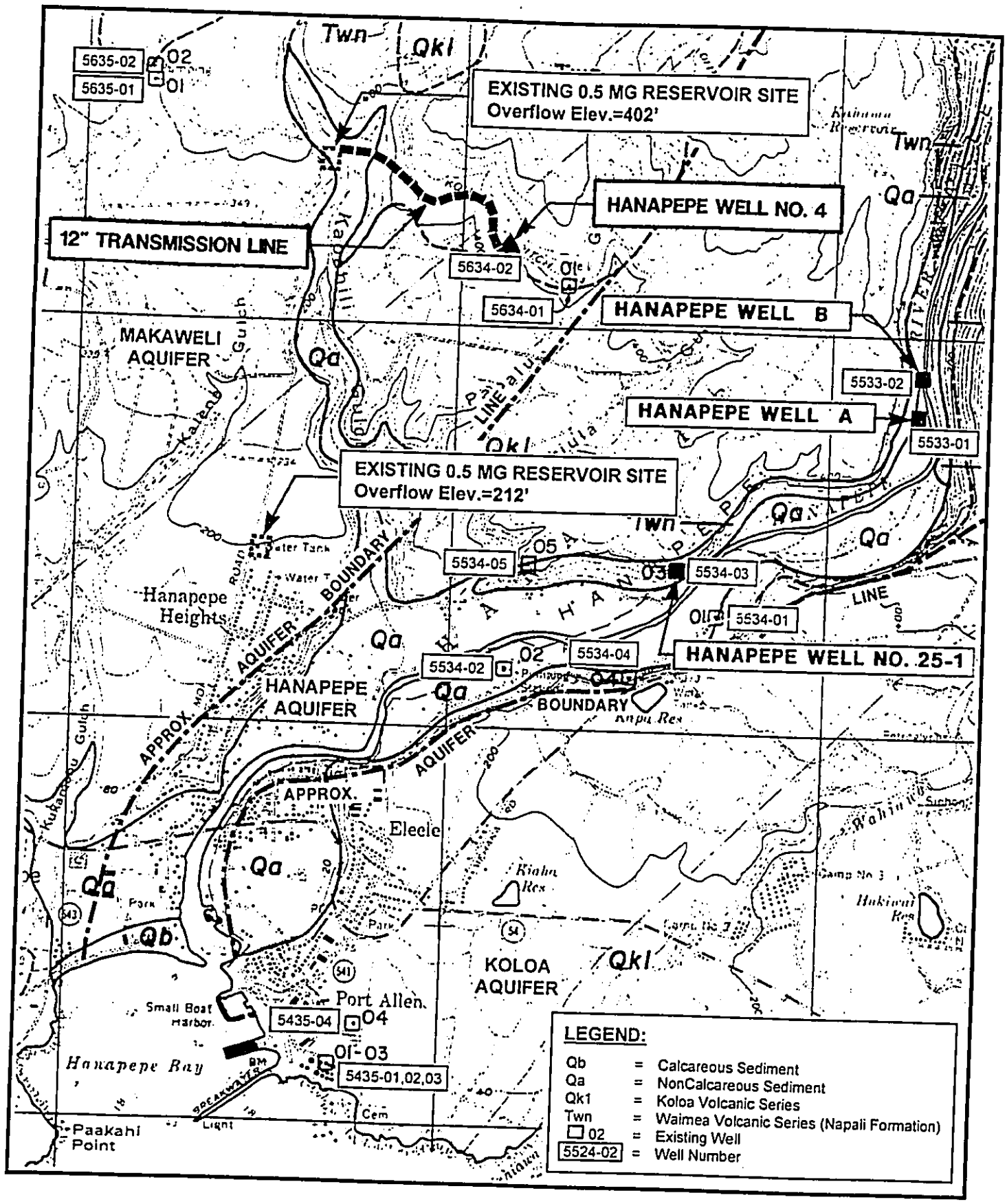
5. Groundwater

According to a letter dated December 24, 1997 from Stephen P. Bowles of Waimea Water Services (shown in Appendix D), the hydrologist on the drilling and testing of the Hanapepe Well No. 4 project, the direction of groundwater flow in the vicinity of the well site is uncertain at this time.

6. Existing Wells

According to the CWRM well data records, there are currently 11 existing wells and tunnels near Hanapepe Well No. 4. Three wells are situated within the Makaweli Aquifer and eight are within the Hanapepe Aquifer (see **Figure 13** and **Table 2**).

Based on the CWRM well records, only two wells are currently used within the Makaweli Aquifer: Well No. 5635-01 and Well No. 5635-02, both are approximately 6,000 feet west of the Hanapepe Well No. 4. Well 5635-01



NORTH

SCALE: 1"=2000'

GEOLOGY MAP AND EXISTING WELLS

FIGURE 13

is used as a private domestic water source and has a pump capacity of 1.5 mgd. Well 5635-02 is used for irrigation purposes. No pump capacity data is available for the well.

The CWRM records also show four wells are currently used within the Hanapepe Aquifer. Three of the four wells are: Hanapepe Wells A (5533-01), B (5533-02), and 25-1 (5534-03), each with pump rates of 470 gpm, 900 gpm, and 125 gpm, respectively (pump rates provided by the DOW). The three wells have a total installed pump capacity of 2.15 mgd.

Table 2
Existing Well Records

Name or Location	State Well No.	Year drilled	Gnd. Elev. (ft.)	Csg. Dia. (in.)	Csg. Depth (ft.(	Well Depth (ft.)	Static Head (ft.)	Chl. (mg/l)	Aq. Sys.	Use
Hanapepe Valley A	5533-01	1974	98	14	126	190	23.54	28	Ha	Mun
Hanapepe Valley B	5533-02	1980	99	12	270	401	22.5	34	Ha	Mun
Hanapepe Pump 3	5534-01	1899	28			78	5		Ha	Irr
Hanapepe Pump 1	5534-02	1899	21			40			Ha	Unu
Hanapepe Town	5534-03	1966	78	8	109	109	17.11	40	Ha	Mun
Hanapepe Pump 2	5534-04	1899	24			54			Ha	Unu
Hanapepe	5534-05	1988	570			570			Ha	Unu
Hanapepe Tunnel	5633-01	1957	138			138	18	17	Ha	Unu*
Hanapepe 4	5634-02	1993	462*	14	502	568	18.8	125	Ha	Unu
Hanapepe Ridge	5634-01	1961	440	8	508	508	16.5	180	Ma	Unu
Domestic Water	5635-01	1947	376			364	26		Ma	Dom
500 H.P. IRR	5635-02	1969	376	20	415	460	17.7	530	Ma	Irr

Source of Data: Commission on Water Resource Management (Mun - Municipal, Irr - irrigation, Unu - Unused, Dom - Domestic)
* Data updated based on recent information.

The fourth well, Hanapepe Pump 3 (5534-01, a tunnel source), is used for irrigation purposes. Hanapepe Pump 3, is owned and operated by Alexander and Baldwin and has a pump capacity of 35 mgd. Both groundwater from the tunnel (gravity fed) and water from Hanapepe River are pumped to ditches that irrigate coffee fields and other crops in areas east of Eleele town.

Per CWRM, there is only one well construction permit approved for the Makaweli Aquifer (Well No. 5639-01). The proposed withdrawal for the well is approximately 50 gpm or 72,000 gpd. There are no well construction permits for the Hanapepe Aquifer.

7. Water Use

Groundwater within the Makaweli Aquifer and Hanapepe Aquifer is used for domestic and irrigation purposes. Hanapepe Wells A, B, and 25-1, which withdraw groundwater from the Hanapepe Aquifer (sustainable yield of 26 mgd) provide water for domestic use to the entire Hanapepe-Eleele Water System. DOW consumption records show that in 1996 the Hanapepe-Eleele Water System had a total demand of 0.8 mgd. According to the CWRM Hawaii Water Plan, Kauai Water Use and Development Plan, Island of Kauai, dated February 1990, total groundwater used for irrigation within the Hanapepe Aquifer was 2.1 mgd. The report showed that no groundwater was used for irrigation within the Makaweli Aquifer. For surface water, the report indicated that 7.02 mgd was used for irrigation within the Makaweli Aquifer and 77.6 mgd was used within the Hanapepe Aquifer.

8. Water Quality

Water quality tests were performed on water samples collected from Hanapepe Well No. 4 on May 5, 1993 during the May-April pump test. The results of the water quality tests are presented in Appendix B. Since 1993, changes were made to the Department of Health (DOH) water quality testing procedures for new potable water sources. Consequently, the 1993 test results have been deemed outdated, and another water quality test is required to meet current DOH requirements. This will be done after the permanent pump is installed during the construction of the project and water samples from the well can be collected.

The 1993 test results show that the water is of good quality. The contaminants that were tested for were either not detected or below the minimum contaminant level established in current DOH Potable Water requirements.

9. Potential Sources of Contamination for Hanapepe Well No. 4

There has been no contamination of any of the municipal groundwater sources near the well site. The water quality test results performed on the two nearby wells, Hanapepe Wells A and 25-1 are provided in Appendix C. The results show no indication of contamination.

A potential source of contamination for the Hanapepe Well No. 4 would be from the surrounding sugarcane operation managed by Gay and Robinson. According to Gay and Robinson, they have used only one type of pesticide - Atrazine in their sugarcane operations. From the 1993 water quality test, no trace of Atrazine was detected in the Hanapepe Well No. 4 water.

There are no individual wastewater systems near the well site since the well is in a remote area surrounded by sugarcane fields. Most of the Hanapepe and Eleele area is sewered except for some small pockets where cesspools or septic tanks are used. These unsewered areas are over a mile away from Hanapepe Well No. 4.

C. SOCIO-ECONOMIC ENVIRONMENT

1. Population

The population of the County of Kauai grew 9.4 percent from 51,177 in 1990 to 55,177 in 1995 according to the State of Hawaii Data Book 1996. Detailed 1990 (latest year available) census population of the Hanapepe and Eleele areas were 1,395 and 1,489, respectively. Based on the population study conducted in the "Eleele Wastewater Treatment Plant Expansion Phase I" report, dated May 1993 and prepared by Fukunaga & Associates, Inc., the projected population of the Hanapepe-Eleele area in 2010 is 8,300. The full build-out population is expected to be 13,500 people (based on the County zoning).

2. Social and Economic Profile

The Hanapepe-Eleele area could be characterized as primarily rural residential communities. Most of the surrounding area is used for growing sugarcane and coffee. Most of the urban zoned lands have been developed into residential subdivisions. Commercial development is limited to the Hanapepe Town area, and a small neighborhood shopping center in Eleele. Many of the residents commute to Lihue, Poipu or other areas for employment.

D. PUBLIC FACILITIES AND SERVICES

1. Sanitary Sewage System

A municipal sewerage system owned and operated by the County of Kauai serves the Hanapepe-Eleele area. A system of collector gravity sewers, three sewage lift stations and force mains convey the sewage to the Eleele Wastewater Treatment Plant (WWTP) for treatment and disposal. There are some unsewered pockets in Hanapepe that rely on cesspool or septic tanks for wastewater disposal.

2. Drainage System

Storm water runoff generally flow overland and is intercepted by various intermittent streams, swales, ditches, and catch basins. Eventually, the storm runoff is conveyed via intermittent streams, pipes, culverts, and

ditches, and discharged into the ocean.

3. Electricity

Electricity is supplied by Kauai Electric, a Division of Citizen Utilities Company.

4. Solid Waste Disposal

Solid wastes generated from residential areas are collected by the County's refuse crews. Solid wastes from multi-family, industrial and commercial areas are collected by private haulers. Solid wastes collected from the Hanapepe-Eleele area are disposed of at the County's Kekaha Landfill.

5. Road System

The main roadway serving the Hanapepe-Eleele area is the State owned Kaumualii Highway. Various County roads branching off the main highway serve the residential town areas.

E. CONSTRUCTION FUNDING

Funding for this project will be provided by the State of Hawaii and the County of Kauai.

III. PROBABLE IMPACTS AND MITIGATIVE MEASURES

A. SHORT TERM CONSTRUCTION RELATED IMPACTS

1. Air Quality

There will be an increase in dust and vehicular exhaust emissions in the vicinity of the project area during construction. Dust control measures will be used to reduce dust if it becomes a problem. Exhaust emission should not have any significant affect on the area because prevailing winds should disperse any exhaust gas concentration.

2. Erosion

The Contractor will be required to implement erosion and sediment control measures during construction. Grading and soil disturbance will be minimized, and areas that are disturbed will be properly graded and revegetated to prevent erosion. The Contractor will be instructed to minimize the time of construction, retain ground cover until the latest practicable date to complete construction, and construct drainage control features early in the

construction time schedule. Continued maintenance will be required for nine months from the accepted completion date of the planting period to ensure proper revegetation. There are three segments of the project which demand particular attention to erosion control measures which include the following: 1) Hanapepe Well No. 4 site development; 2) trenching for pipeline on the steep slopes of Kapahili Gulch; and 3) trenching for pipeline across the intermittent stream at the bottom of Kapahili Gulch.

The well site will be graded; disturbed areas will either be paved, grassed, or provided with erosion control matting. Runoff will be controlled and directed with paved swales. On-site runoff will be piped to an existing irrigation ditch.

Construction within the gulch on steep slopes will involve slope stabilization methods utilizing a cellular confinement system and erosion control/turf reinforcement mat. These materials will provide cover and stabilize the slopes while allowing growth of permanent vegetation.

Construction across the intermittent stream will be scheduled during periods when the stream is dry. Streamflow results from rainfall runoff or from irrigation water released by Gay and Robinson. The Contractor will schedule work in the intermittent stream according to weather forecasts and will coordinate with Gay and Robinson to schedule work around the release of irrigation water. After pipeline installation, the trenched area will be covered with geotextile and streambed stones (riprap) to prevent erosion of the trench during streamflow. In the event of unexpected streamflow during construction, the Contractor will be prepared to stop construction and protect exposed areas with plastic sheeting and steel plates.

3. Surface Water Quality

The installation of underground pipes through the streambed in Kapahili Gulch and the existing ditch along the dirt road may potentially affect water quality downstream of Kapahili Gulch. Both drainage ways are intermittent and construction will mostly be done when the streambed and ditch are dry. However, there is the potential of flow developing in the streambed during construction from rain water runoff, which would require the re-routing of flows around work areas. Flow from released irrigation water through the gulch can be controlled by Gay and Robinson during the construction of the pipeline across the streambed. To minimize adversely impacting downstream water quality, best-management practices and a water quality monitoring program conforming to Corps of Engineers and Department of Health requirements will be developed as part during the design of this project.

4. Excess Water Discharge

Disposal of excess water generated from the testing of the pump, hydrotesting and chlorination of the waterline, and storm water runoff will comply with all applicable National Pollutant Discharge Elimination System (NPDES) requirements.

5. Traffic

Traffic will increase due to the construction activities along the local streets near the project site and along the cane haul roads used primarily by Gay and Robinson. The increased traffic will be temporary only lasting the length of the construction period. Disruptions to Gay and Robinson operations by the traffic will be minimized through conscientious efforts by the contractor to confine the construction activities to a limited area.

6. Noise

There will be an increase in noise from the construction activity. However, the increased noise should not adversely affect the residences in the nearby subdivision since the construction area is approximately 4,000 feet away from the closest house in the subdivision. All noise generated by the construction activity shall conform to the noise regulations established by the State Department of Health.

B. LONG TERM IMPACTS

1. Lands

There will be the loss of useable agricultural lands from the construction of the project. The loss of lands will be limited to the development of the well site which includes the construction of a control building, pump discharge piping and pumping pad, electrical facilities, and improved access to the site. The transmission main will be primarily underground as it traverses through existing cane haul roads and crosses Kapahili gulch. All other work required for the project will be done within the existing reservoir sites.

2. Flora and Fauna

The project area has been previously cleared for sugarcane cultivation and ranching. There are no indications of rare or endangered flora or fauna in the project area. The stream in the Kapahili Gulch is normally dry, so it is unlikely that any endangered or native stream fauna exist within the gulch. However, the new power lines may have a possible impact on the Newell's shearwater which is known to fly through the area. There have

been documented occurrences of this bird colliding with human structures, especially power lines. Consequently, mitigative measures will be taken to prevent these collisions. Mitigative measures used by the Kauai Electric Company will be followed which involve the use of High Visibility Marker Balls on the power lines to alert the shearwater of the above ground power lines.

Impacts on the stream in the Kapahili Gulch will be minimal. Work will be limited to the width of the trench, and erosion control measures will be implemented as described in Section III, A., 2. Erosion. In addition to the erosion control measures, the stream in Kapahili Gulch is classified as intermittent so it is not constantly exposed to the eroding effect of water. Flow in the gulch occurs when there is runoff from heavy rainfall and when excess irrigation water is periodically released by Gay and Robinson from a reservoir located in the mountains.

3. Archeological Features

Because the area surrounding the well site and the pipeline corridor has been previously cleared and the historic rock wall is away from the pipeline corridor, the project will have no effect on any significant archeological sites. To protect the rock wall site during construction, the Contractor will be required to limit construction work in the immediate vicinity and to take careful precautions to protect the rock wall.

4. Surface Water

There are inadequate data to state conclusively that the development of Hanapepe Well No. 4 will have any measurable impact on the flow of Hanapepe River (letter from Waimea Water Service, Inc.; Appendix D).

5. Existing Wells.

Based on the data collected during the aquifer test of April and May of 1993, it can be concluded that there will be very little impact from the sustained pumping of Hanapepe Well No. 4 (letter from Waimea Water Services, Inc.; Appendix D). During the pump test, the observation well (Well No. 5634-01), which is approximately 1000 feet east of the Hanapepe Well No. 4, not only showed no measurable influence from the pumping of the well but reflected regional downward trends before and after the testing period. Thus, any direct influence from the Hanapepe Well No. 4 with other nearby wells is too small too be significant.

6. Water Quality

The results of the 1993 water quality tests for Hanapepe Well No. 4 show that the water is of good quality. There were no indications of contamination from the nearby agricultural operations. No mitigation measures are required.

7. Public Funds, Energy and Construction Materials

The project will involve the irretrievable commitment of public funds, electrical energy, and construction materials.

IV. ALTERNATIVES TO THE PROPOSED PROJECT

A. No Project Alternative

One alternative to the proposed project is the "no project" alternative. This would result in no change of existing conditions. The Hanapepe-Eleele Water System would remain dependent on the existing sources and thus be vulnerable to water outages and potential source contamination. In addition, the water system source requirements will continue to be deficient to meet maximum day demand.

B. Alternative Well Sites

Other well sites were considered for exploratory drilling in the Hanapepe area. The Hanapepe Well No. 4 site was selected since the well would tap into the Napali Volcanics which was considered an excellent basal water source. The 1993 pump test and subsequent water quality test showed that Hanapepe Well No. 4 is a high yielding well with good quality water and very suitable for development.

C. Alternate Transmission Main Alignment

An alternative transmission main alignment was considered for this project. The alternate alignment followed existing cane hauls which provided vehicle access to the well site from Moi Road, the nearest improved County street. At Moi Road the transmission line would connect into an existing 12-inch water main within Moi Road that serves as the influent-effluent line for Reservoir 402. This alignment was not selected because it would interfere with Gay and Robinson's current and long-term agricultural operations.

D. Water Conservation

Water conservation programs can be used to better meet future water demands, and are typically implemented when a water shortage is likely. Conservation programs generally fall into two major categories: Water System Conservation and

Consumer Conservation.

Water system conservation is the responsibility of the water purveyor, and entails careful monitoring of all water in the transmission and distribution systems. County water uses such as for firefighting and street and sewer flushing could be targeted for more efficient use. Additionally, detection and repair of leaks in the transmission and distribution system would be effective in reducing water losses.

Consumer conservation is the responsibility of the consumer, and could reduce the per capita consumption. Consumers are encouraged to use water saving practices, detect and repair leaks within their property, and in general, to minimize wasteful water use.

Water conservation is a beneficial practice regardless of the water supply situation. However, Kauai experiences a very wet climate and has an abundant groundwater and surface water supply. The water sources for the Hanapepe-Eleele Water System are located in the Makaweli, Hanapepe, and Koloa Aquifers, which have a combined sustainable yield of 86 mgd. The average water use in this water system in 1996 was approximately 0.80 mgd, less than one (1) percent of the estimated sustainable yield. Even with further development of well water sources, the water use will be a mere fraction of the aquifer yield. Although it is a practice that should be observed by all consumers, water conservation alone will not provide the quantity of water required to meet demands. The DOW is initiating a water conservation program to reduce demands; however, the anticipated savings will not affect the need for this project.

E. Rainfall Catchment

Rainfall catchment involves the construction of a series of ditches and reservoirs to intercept rainfall runoff from large areas of land, and is an ideal source for agricultural use. According to the Kauai Water Use and Development Plan, February 1992, over 80 percent of the water used on Kauai is by sugarcane plantations which rely on rainfall catchment (surface waters) as the primary water source. However, if surface water is used to supply municipal drinking water systems, it is subject to the DOH Surface Water Treatment Rule which requires costly and cumbersome treatment, monitoring and reporting. Consequently, the immense cost of constructing, operating, and maintaining a water treatment facility renders this alternative infeasible, especially when there is an ample supply of potable groundwater.

F. Wastewater Reuse and Nonpotable Water Supplies

Wastewater reuse and nonpotable water supplies are potentially viable alternative water sources for applications such as irrigation. However, the relative cost to construct, maintain and operate facilities to properly treat wastewater and nonpotable water is relatively higher than the cost to provide water from a potable

groundwater source. Irrigation water is not in critically short supply in this area; therefore, the relative value of and demand for treated sewage effluent and nonpotable water supplies is considered to be low.

The treatment plant in the area is the Eleele Wastewater Treatment Plant, and it produces about 0.35 mgd of treated effluent which could potentially be used by the large agricultural acreage nearby, operated by Mcbryde Sugar Company. However, concern was expressed that irrigating with treated sewage effluent might detract from the company's marketing of "high quality" coffee beans to Hills Brothers. Accordingly, reclamation and re-use of the effluent was deemed, by Mcbryde Sugar Co., to be not viable. The costs to construct, operate, and monitor the facilities necessary to treat wastewater and nonpotable water in an area where potable groundwater is readily available, render this alternative infeasible and undesirable.

V. LIST OF NECESSARY PERMITS AND APPROVALS

The required approvals and permits for the project are:

1. Use Permit, County of Kauai, Planning Department

2. Well Construction Permit, State of Hawaii, Commission on Water Resource Management

3. National Pollutant Discharge Elimination System Permit, State of Hawaii, Department of Health

4. General GP95-002 Permit for Utility Lines In, Under, or Above Waters of the United States, Including Navigable Waters, in the State of Hawaii, U.S. Army Corps of Engineers, Honolulu District

5. Approval of a satisfactory Engineering Report complying with requirements set forth in Hawaii Administrative Rules, Title 11, Chapter 20, Section 11-20-29 by the Director of the Department of Health.

VI. AGENCIES AND ORGANIZATIONS CONSULTED

A. FEDERAL GOVERNMENT

U.S. Army Corps of Engineers, Pacific Division,
Honolulu District Engineer
U.S. Department of the Interior
Fish and Wildlife Services

B. STATE GOVERNMENT

Department of Land and Natural Resources
State Historic Preservation
Commission on Water Resource Management
Department of Health
Safe Drinking Water Branch, Environmental Management Division

C. PRIVATE

Gay and Robinson

VII. ANTICIPATED DETERMINATION

After completing this final environmental assessment of the potential environmental affects of the proposed project, it is believed that an Environmental Impact Statement is not required and a Negative Declaration is anticipated.

VIII. FINDINGS AND REASONS SUPPORTING THE ANTICIPATED DETERMINATION

Findings and reasons supporting the Negative Declaration determination are as follows, using the criteria, policies, guidelines and provision of Title 11, Chapter 200, Environmental Impact Statement Rules and Chapter 343, HRS. The Rules list several "significance criteria" that are to be used to check if an action will have a significant effect on the environment. The criteria are as follows:

A. Involves an irrevocable commitment to loss or destruction of any natural or cultural resource:

The proposed project will not cause any loss or destruction of a natural or cultural resource. As described in this report, the proposed project area has been researched extensively with no findings of significant impacts. Any discovery of archaeologically significant resources uncovered during the construction will be handled in compliance with the requirements of the State of Hawaii, Department of Land and Natural Resources.

B. Curtail the range of beneficial uses of the environment:

This project is enhancing the beneficial use of the environment, as it is drawing upon the naturally occurring groundwater supply in the area to serve a growing demand for drinking water by the community. The project area is limited to the well site and waterline. As described in this report, the majority of the waterline is to be buried along an existing dirt road. The well site will be on land that could

be used for agriculture. However, this area is a small fraction of the total area that is available for agriculture in the area, and the well site is providing valuable groundwater for the Hanapepe-Eleele water system.

C. Conflict with the State's long-term environmental policies or goals and guidelines as expressed in Chapter 344, Hawaii Revised Statutes, and revisions thereof and amendments thereto, court decisions or executive orders;

The proposed project is in accordance with the guidelines set forth in the State Environmental Policy Chapter 344, Hawaii Revised Statutes.

D. Substantially affects the economic or social welfare of the community or State;

The proposed project will serve to increase the amount of potable water available for the Hanapepe-Eleele water system that cannot meet the current maximum daily demand. It will enhance the welfare of the community by providing ample supplies of potable water to all users.

E. Substantially affect public health;

The proposed project will not substantially affect public health in a negative way.

F. Involves a substantial secondary impact, such as population changes or effects on public facilities;

The proposed project will be tied in to the existing Hanapepe-Eleele water system to serve the current maximum daily demand for the existing population. It will not involve any substantial secondary impacts.

G. Involves a substantial degradation of environmental quality;

The proposed project will not involve any substantial degradation of environmental quality. As described in this report, the impacts on the quality of the environment are minimal.

H. Is individually limited but cumulatively has considerable effect upon the environment or involve a commitment for larger actions;

As described in this report, the proposed project does not have any significant impacts or effects upon the environment or involve any commitment for larger actions.

I. Substantially affect a rare threatened or endangered species, or its habitat;

As discussed in this report, the only threatened species that may be affected by this project is the Newell's shearwater bird which is known to fly through the area.

This bird has been known to collide with power lines, so mitigative measures will be taken to prevent these collisions. The mitigative measure is one used by the Kauai Electric Company, and involves placing High Visibility Marker Balls on the power lines to alert the birds of the above ground power lines. With this mitigative measure, impacts are anticipated to be minimal.

J. Detrimentally affect air or water quality or ambient noise levels;

The proposed project provides potable groundwater for human use and consumption. It will not detrimentally affect air or water quality, or ambient noise levels.

K. Affects or is likely to suffer damage by being located in an environmentally sensitive area, such as a flood plain, tsunami zone, beach, erosion-prone area, geologically hazardous land, estuary, freshwater, or coastal waters;

As discussed in detail in this report, the proposed project does not detrimentally affect any environmentally sensitive areas.

L. Substantially affects scenic vistas and view planes identified in county or state plans or studies;

The proposed project does not affect any scenic vistas or view planes identified in county or state plans or studies.

M. Requires substantial energy consumption.

As described in this report, the proposed project will require energy to pump water from Hanapepe Well No. 4 to the existing reservoir. The amount of energy to construct, operate, and maintain the proposed project would be a small fraction of the total amount of energy currently being used in the area. The proposed project will not require substantial energy consumption.

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APPENDIX A

Hanapepe Well No. 4
State Well No. 5634-02
As-Builts and Aquifer Report

February 1994

Prepared by:
Waimea Water Services and Island Resources Ltd.

Hanapepe Well #4

State Well No. 5634-02

AS BUILT AND

AQUIFER REPORT

February 1994

Prepared by

WAIMEA WATER SERVICES

and

ISLAND RESOURCES LTD.

Hanapepe Well #4

State Well No. 5634-02

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Hanapepe Well #4
State Well No. 5634-02

AS BUILT AND
AQUIFER REPORT

DRILLING/AQUIFER REPORT

The Hanapepe Well #4 (location noted on map in Figure #1) is intended to supply up to 720,000 gallons per day (gpd) (500 GPM) for purposes of potable use. The well was funded by the State of Hawaii and the owner is Kauai Department of Water. The well permit was applied for on 20 Feb 92. The permit was approved by the State of Hawaii, Department of Land and Natural Resources; Commission on Water Resource Management on 27 April 92. The State Well Number assigned was.5634-02. Roscoe Moss Hawaii was the drilling contractor.

The Notice to Proceed was issued on 10 Aug 92. After site grading by Olokele Sugar Plantation, drilling of the 20 inch hole commenced 28 Aug 92. Hurricane Iniki hit the site in September 1992 and delayed the job. Drilling commenced again on 9 Oct 92. 28 days were added to the Contract. Water was first struck at a depth of about 443 feet (+19' elev.). As the hole was deepened to (-40' elev.) the water level remained at +19' elevation. The well was cased by 12 Feb 93 and grouting of the annulus completed by 24 Feb 93. Drilling of the 13" open hole went to 66' (-106' elev). At a depth of 530' to 568' porous and permeable lavas were penetrated and water samples showed an increase in chlorides from about 125 to 155 mg/l and drilling ceased.

The well was built as described in the as-built drawing in Figure #2.

A long term pumping test was conducted from 26 April 93 to 4 May 93 for 200 hours at 600 gpm. The test information is found in Figure #3.

The USGS well located 1100 feet away was used as an observation well during the test. Graphic results from the observation well are shown in Figure #4.

A geologic log of the well done by Glenn Bauer on the staff of the Division of Water and Land Development is contained in Figure #5.

Rain fall data was provided by the State DLNR for 1991, 1992 and 1993 to determine any influence rainfall may have on the USGS well water level variations. These are found in Figure #6.

RESULTS

Based on the data enclosed and described above it was noted that the USGS well water level records corresponded directly with rain fall data from the Alexander Reservoir gage and the Eleele gage over the past 3 years. The water level in the USGS well varied up to 1.58 feet over the 3 year period. In both 1992 and 1993 the first 5 to 6 months showed a steadily declining water level. The pumping test occurred in April of 1993 during one of these declines (see chart in Figure #4)

The water level in the USGS well was on a decline when the pumping test for the Hanapepe Well #4 was conducted and showed that the basic pattern of the water level trend did not significantly change during the pumping test.

The Hanapepe Well #4 had an immediate (5 minutes) drawdown of 3 feet and after 200 hours (12,000 minutes) of pumping full recovery occurred within 3 minutes indicating that the water level in the aquifer did not significantly change due to the volume of water withdrawn (7,221,000 gallons) during the pumping test.

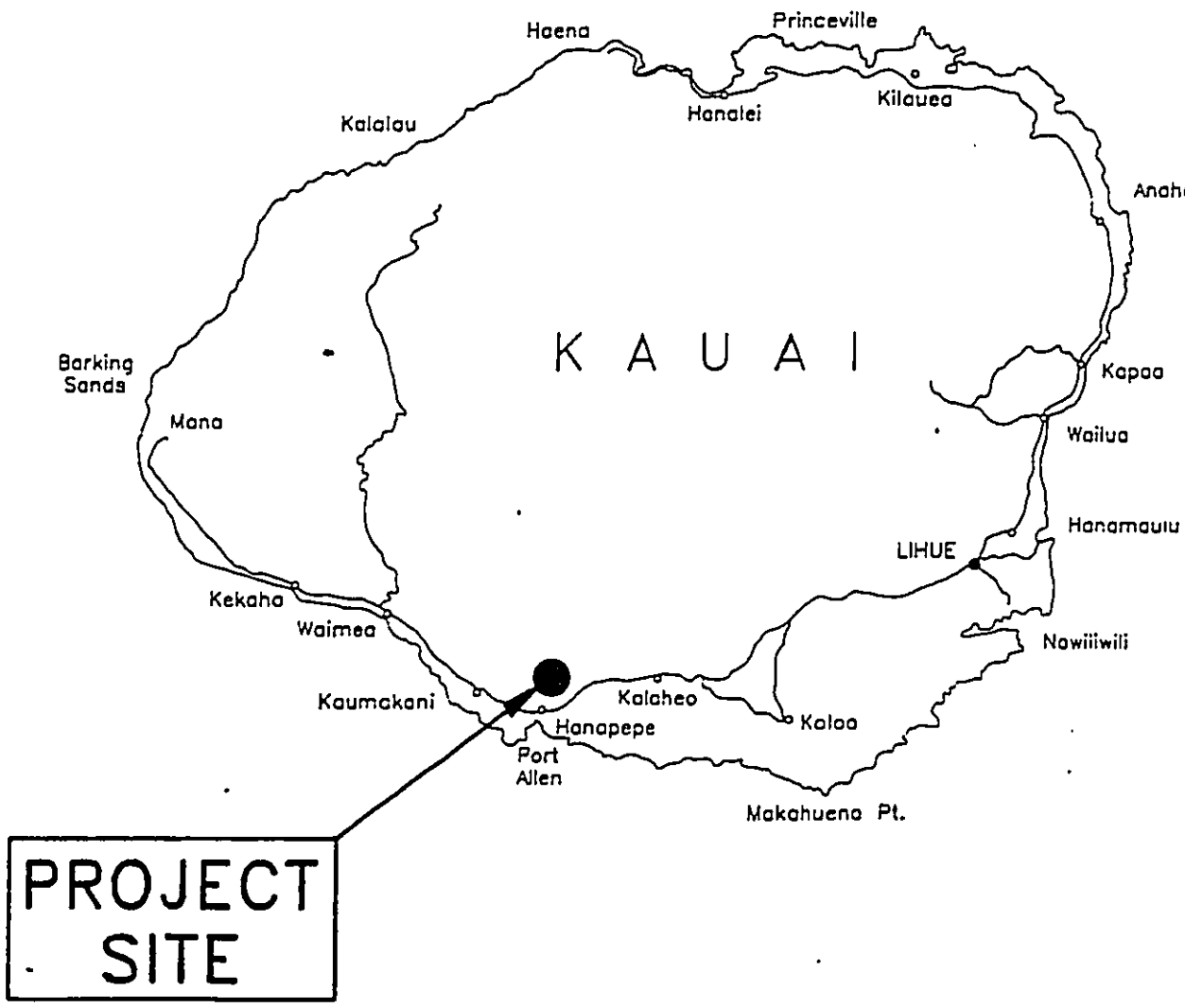
The data available from the USGS well is not adequate to perform more aquifer test calculations and analysis. The declining water level and the fact that the data was not detailed enough to identify any influence in the decline and the time the influence may have impacted the USGS well restricts other analysis.

Based on the results it can be safely concluded that the aquifer can readily be pumped at a continuous rate of 600 gpm for extended periods with little or no change in water level or quality. Chlorides during the pumping test remained consistently at about 105 to 110 mg/l. During the specific capacity test the well did not exhibit a sensitivity to pumping rate.

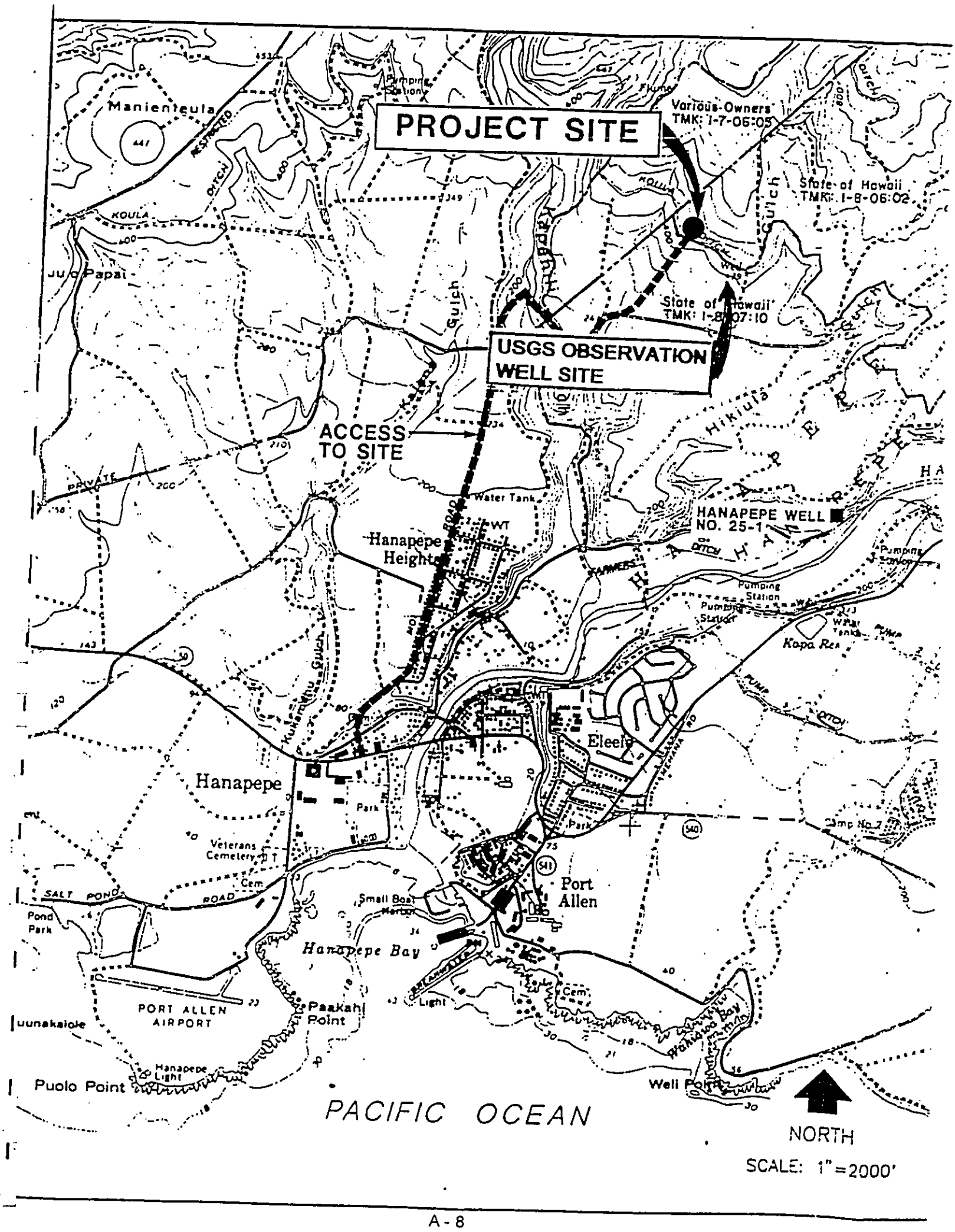
Assuming that the 24 hour pumping volume during the aquifer test was 864,000 gallons per day (gpd) and that there was no sensitivity to pumping rates during the specific capacity test, it would be reasonable to expect a yield of about 1 million gallons per day (MGD) without experiencing a significant raise in salinity. Should the well be pumped for 16 hours at a rate of 1000 gpm, the total would be equivalent to 0.96 MGD. This should prove to be an acceptable pumping rate, providing that an aquifer test of about 170 hours is conducted upon the installation of the permanent pump. This would result in the final operating schedule for the pump.

LOCATION MAP
#1

LOCATION MAP



DOCUMENT CAPTURED AS RECEIVED



AS-BUILT OF WELL
#2

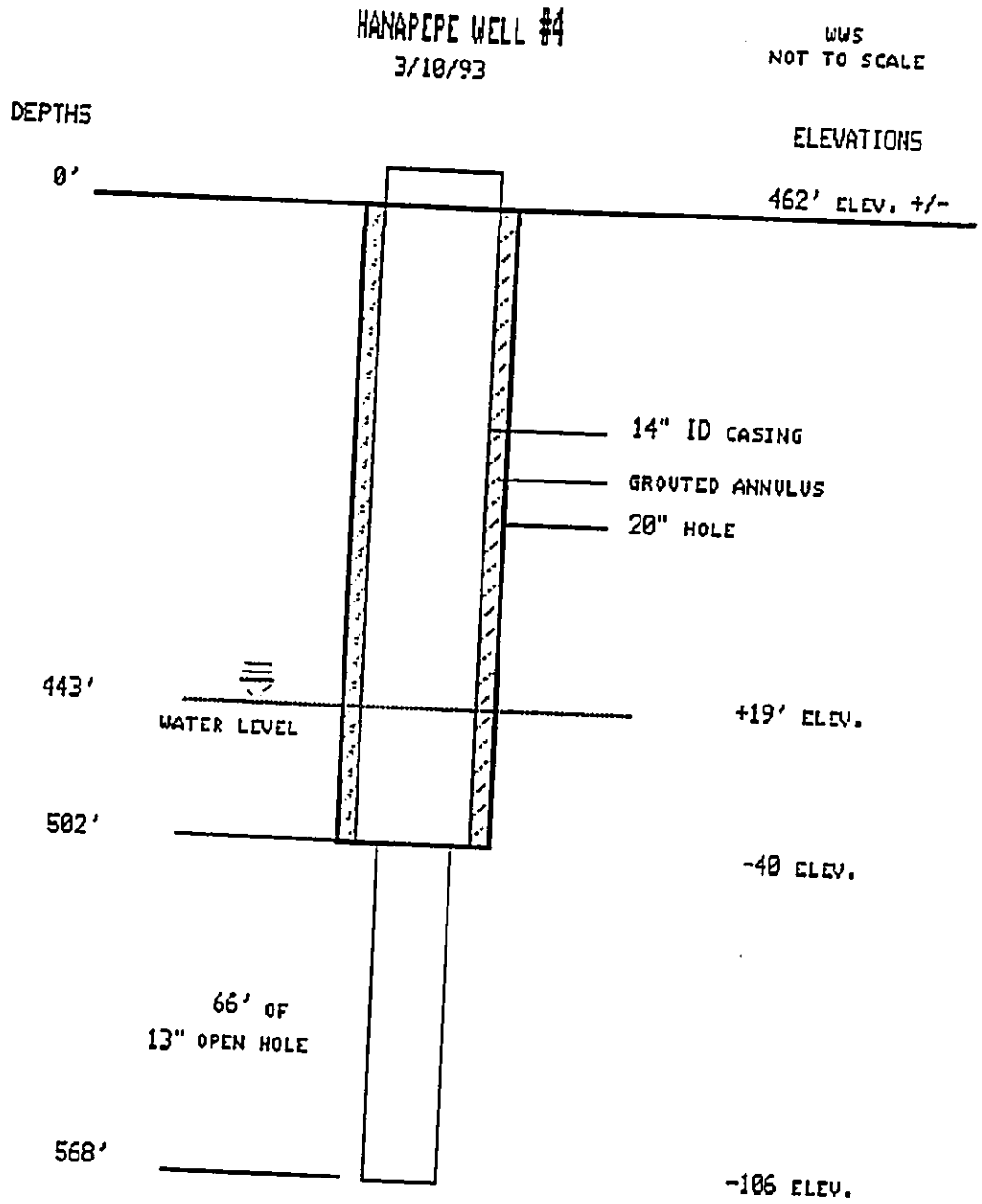

HANAPEPE WELL #4
3/10/93
WWS
NOT TO SCALE
DEPTHS
ELEVATIONS
0'
462' ELEV. +/-
14" ID CASING
GROUTED ANNULUS
20" HOLE
443'
WATER LEVEL
+19' ELEV.
502'
-40 ELEV.
66' OF
13" OPEN HOLE
568'
-106 ELEV.

FIGURE 2

PUMPING TEST DATA
#3

waimea water services inc.

To: Raymond Sato
Keith Fujimoto
Mel Matsumura
Greg Fujikawa

Fr: John Stubbart

Re: Hanapepe Well #4
Pumping Test Information

Date: 10 May 93

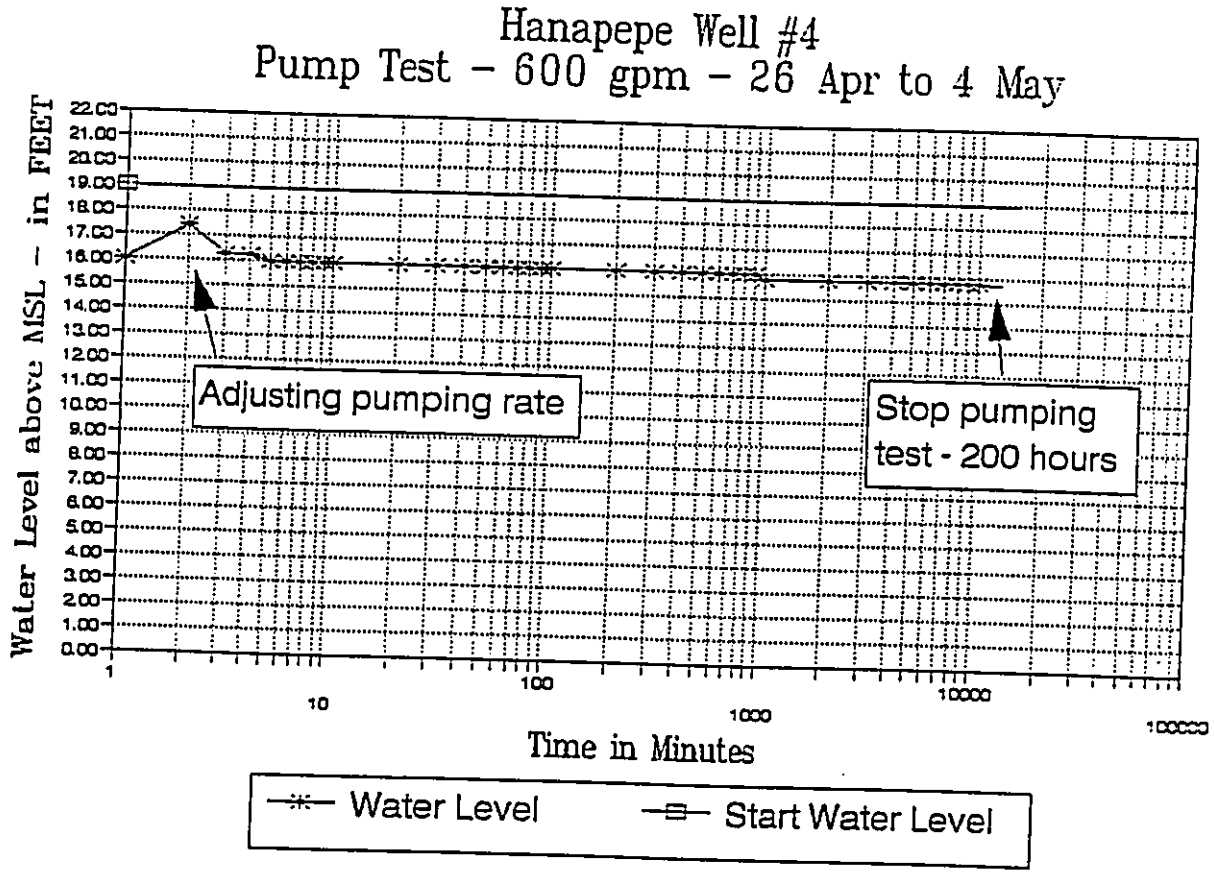
The Hanapepe Well #4 was pump tested to gather data on the quality and quantity performance of the resource. It was determined, based on the data, that the well could be completed to pump a minimum of 864,000 gallons per day of potable quality water.

Water level above sea level	19'	
Airline - static water level	16	psi
Drawdown (max)	3.46	feet
Pump gpm (ave)	600	gpm
Total gallons pumped (approx.)	7,221,000	gallons
Electrical conductance	729 to 582	microsiemans
Temperature	23.5 to 26.5	C
Chlorides	125 to 100	mg/l
(the above are field measurements)		

Pumping of well was started at 6:00 am, 26 Apr 93, and was concluded at 2:00 pm, 4 May 93. This was a total of 200 hours or 12,000 minutes. The total pumped was 7,221,000 gallons. This equals an average pump rate of 601.75 gallons per minute.

cc: Nishimura, Bauer, Runnells, DC

FIGURE 4


Hanapepe Well #4
Pump Test – 600 gpm – 26 Apr to 4 May
Water Level above MSL – in FEET
22.00
21.00
20.00
19.00
18.00
17.00
16.00
15.00
14.00
13.00
12.00
11.00
10.00
9.00
8.00
7.00
6.00
5.00
4.00
3.00
2.00
1.00
0.00
1
10
100
1000
10000
100000
Time in Minutes
Adjusting pumping rate
Stop pumping test - 200 hours
Water Level
Start Water Level

Hanapepe Well 14 Well Pumping Test P.1

WELL GRAPHS

HANAPEPE #4
PUMP SUMMARY
4/26/93 TO 5/4/93

STATIC WATER LEVEL = + 19' ELEV.
PUMP INLET = -26' ELEV.
0 = 16.0 PSI
GROUND ELEV. = 462' ELEV.
AIRLINE = -21' ELEV.

TIME OF DAY MIN	GPM	DRAWDOWN FEET 0	ELEV. DRAWDOWN FEET 19	DRAWDOWN PSI 16	USGS DEPTHS FEET 0	USGS D.D Elev.453' 0
1	420	3.0	16.0	14.7	0	0
2	420	1.6	17.4	15.3		
3	550	2.8	16.2	14.8		
4	550	2.8	16.2	14.8		
5	580	3.0	16.0	14.7		
6	600	3.0	16.0	14.7		
7	600	3.0	16.0	14.7		
8	600	3.0	16.0	14.7		
9	600	3.0	16.0	14.7		
10	600	3.0	16.0	14.7		
20	600	3.0	16.0	14.7		
30	600	3.0	16.0	14.7		
40	600	3.0	16.0	14.7		
50	600	3.0	16.0	14.7		
60	600	3.0	16.0	14.7		
70	600	3.0	16.0	14.7		
80	600	3.0	16.0	14.7		
90	600	3.0	16.0	14.7		
100	600	3.0	16.0	14.7		
200	600	3.0	16.0	14.7		
300	600	3.0	16.0	14.7		
400	600	3.0	16.0	14.7		
500	600	3.0	16.0	14.7		
600	600	3.0	16.0	14.7		
700	600	3.0	16.0	14.7		
800	600	3.0	16.0	14.7		
900	600	3.0	16.0	14.7		
1000	600	3.2	15.8	14.6		
2000	600	3.2	15.8	14.6		
3000	600	3.2	15.8	14.6		
4000	600	3.2	15.8	14.6		
5000	600	3.2	15.8	14.6		
6000	600	3.2	15.8	14.6		
7000	600	3.2	15.8	14.6		
8000	600	3.2	15.8	14.6		
9000	600	3.2	15.8	14.6		
10000	600	3.2	15.8	14.6		

WELL TESTING DATA FORM PAGE 1

WAIMEA WATER SERVICES INC.

WELL NAME HANAPEPE #4

DATE 4/26/93

TIME	ELAPSED TIME-MIN.	DRAWDOWN PSI	DRAWDOWN FT.	METER READING	FLOW GPM	EC.	CHL.	TEMP.	REMARKS
7:00 AM	0	16.0		7,100,000	START				CLEAR DAY
	1	14.7							
	2	15.3			420				WATER CLEAR
	3	14.8			550				
	4	14.8							
	5	14.7			580	729		22.7	
	6	14.7	3.0		600	724		23.3	
	7	14.7			600			23.3	
	8	14.7				724		23.3	
	9	14.7							
	10	14.7			600	724		23.3	
	15	14.7			600	721	24 125	23.3	
	20	14.7			600	719		23.0	
	25								
	30	14.7			600	720		22.7	
	35								
	40								
	45	14.7							
	50	14.7			600	712		22.7	
HOURS	55								
1	60	14.7	3.0	7,135,000	600	709		23.2	
	65								
	70								
	75								
	80	14.7			600	705		23.3	
	85								
	90	14.7			600	704		23.4	
	95								
	100	14.7	3.0		600	700	24 120	23.4	
8:00 AM 2	120	14.7			600	697	24 120	23.5	
9:00 3	180	14.7			600	688	24 120	24.4	
10:00 4	240	14.7			600	699	24 120	24.3	
11:00 5	300	14.7			600	674	25 123	25.2	
12:00 6 PM	360	14.7			600	668	25 125	25.9	
1:00 7	420	14.7			600	664	25 125	26.6	

TAKE (1) GAL (N Ew) SAMPLE EACH HOUR

01432100
0577100.000
7,221,000 pumped

WELL TESTING DATA FORM PAGE 2

WAIMEA WATER SERVICES INC.

WELL NAME HANAPEPE #4

DATE 4/26/93 — 4/27/93

TIME	ELAPSED TIME-MIN.		DRAWDOWN PSI	DRAWDOWN FT.	METER READING	FLOW GPM	EC.	CHL.	TEMP.	REMARKS
2:00	8	480	14.7			600	665	25 / 125	25.3	
3:00	9	540	14.7			600	660	25 / 125	25.6	
4:00	10	600	14.7			600	651	24 / 120	26.0	
5:00	11	660	14.7			600	656	24 / 120	25.1	
6:00	12	720	14.7			600	653		25.5	
7:00	13	780	14.7			600	658		24.1	
8:00	14	840	14.65			600	658		24.3	
9:00	15	900	14.6			600	659		23.7	
10:00	16	960	14.6			600	656		23.7	
11:00	17	1020	14.6			600	651		25.4	
12:00	18	1080	14.6			600	654		24.2	
1:00	19	1140	14.6			600	650		23.8	
2:00	20	1200	14.6			600	651		23.7	
3:00	21	1260	14.6			600	650		23.7	
4:00	22	1320	14.6			600	649		23.6	
5:00	23	1380	14.6			600	648		23.7	
TEST DAY 1	(24) 6:00 PM	1440	14.6			600	649		23.8	
7:00	25	1500	14.6			600	642		23.7	
8:00	26	1560	14.6			600	641		24.5	
9:00	27	1620	14.6			600	640		24.4	
10:00	28	1680	14.6			600	642		24.5	

WELL TESTING DATA FORM PAGE 3

WAIMEA WATER SERVICES INC.

WELL NAME HANAPEPE

DATE

TIME	ELAPSED TIME-MIN.	DRAWDOWN PSI	DRAWDOWN FT.	METER READING	FLOW GPM	EC.	CHL.	TEMP.	REMARKS
11:00	29	1740	14.6		600	636	22/10	24.5	
12:00 PM	30	1800	14.6		600	637	22	24.5	
1:00	31	1860	14.6		600	628	21/05	25.7	
2:00	32	1920	14.6		600	630	21	25.1	
3:00	33	1980	14.6		600	632	21	25.3	
4:00	34	2040	14.6		600	623	21	26.2	
5:00	35	2100	14.6		600	630	21	25.6	
6:00	36	2160	14.6		600	627	21	25.5	
7:00	37	2220	14.6		600	629	22 (10)	25.2	
8:00	38	2280	14.6		600	630	22	24.3	
9:00	39	2340	14.6		600	635	22	23.5	
10:00	40	2400	14.6		600	631	22	23.5	
11:00	41	2460	14.6		600	633	22	23.4	
12:00 AM	42	2520	14.6		600	630	22	23.2	
1:00	43	2580	14.6		600	631	22	23.4	
2:00	44	2640	14.6		600	634	22	23.6	
3:00	45	2700	14.6		600	634	22	23.4	
4:00	46	2760	14.6		600	630	22	23.5	
5:00	47	2820	14.6		600	632	22	23.5	
WELL 2 6:00	48	2880	14.6		600	629	22	23.0	

WELL TESTING DATA FORM PAGE 4

WAIMEA WATER SERVICES INC.

WELL NAME HANAPEPE

DATE

TIME	ELAPSED TIME-MIN.	DRAWDOWN PSI	DRAWDOWN FT.	METER READING	FLOW GPM	EC.	CHL.	TEMP.	REMARKS
7:00	49	2940	14.6			600	626	22	23.4	
8.00	50	3000	14.6			600	628	22	23.8	
9:00	51	3060	14.6			600	623	22	23.9	
10:00	52	3120	14.6			600	620	22	24.6	
11:00	53	3180	14.6			600	614	22	25.6	
12:00 PM	54	3240	14.6			600	614	22	25.7	
1:00	55	3300	14.6			600	615	22	25.5	
2:00	56	3360	14.6			600	614	22	25.6	
3:00	57	3420	14.6			600	614	22	25.6	
4:00	58	3480	14.6			600	614	22	25.6	
5:00	59	3540	14.6			600	615	22	25.9	
6:00	60	3600	14.6			600	614	22	25.5	
7:00	61	3660	14.6			600	616	22	24.8	
8:00	62	3720	14.6			600	619	22	24.2	
9:00	63	3780	14.6			600	616	22	24.1	
10:00	64	3840	14.6			600	617	22	24.2	
11:00	65	3900	14.6			600	619	22	23.9	
12:00	66 AM	3960	14.6			600	614	22	23.6	
1:00	67	4020	14.6			600	617	22	23.5	
2:00	68	4080	14.6			600	618	22	23.7	
3:00	69	4140	14.6			600	616	22	23.4	

WELL TESTING DATA FORM PAGE 5

5

WAIMEA WATER SERVICES INC.

WELL NAME Hanapepe

DATE

TIME	ELAPSED TIME-MIN.	DRAWDOWN PSI	DRAWDOWN FT.	METER READING	FLOW GPM	EC.	CHL.	TEMP.	REMARKS
4:00	70	4200	14.6			600	616	22	23.7	
5:00	71	4260	14.6			600	618	22	23.6	
THURS. 3	(72)	4320	14.6			600	617	22	23.8	
7:00	73	4380	14.6			600	616	22	23.8	
8:00	74	4440	14.6			600	616	22	23.7	
9:00	75	4500	14.6			600	613	22	24.3	
10:00	76	4560	14.6			600	609	22	25.0	
11:00	77	4620	14.6			600	610	22	25.2	
12:00	78	4680	14.6			600	610	22	25.1	
1:00	79	4740	14.6			600	603	22	25.5	
2:00	80	4800	14.6			600	603	22	25.6	
3:00	81	4860	14.7			600	604	22	25.6	
4:00	82	4920	14.6			600	604	22	25.8	
5:00	83	4980	14.6			600	605	22	25.1	
6:00	84	5040	14.6			600	608	22	24.9	
7:00	85	5100	14.6			600	612	22	24.5	
8:00	86	5160	14.6			600	610	22	24.3	
9:00	87	5220	14.6			600	607	22	24.4	
10:00	88	5280	14.6			600	608	22	24.2	
11:00	89	5340	14.6			600	609	22	24.1	

WELL TESTING DATA FORM PAGE 6

6

WAIMEA WATER SERVICES INC.

WELL NAME HANAPEPE

DATE

TIME	ELAPSED TIME-MIN.	DRAWDOWN PSI	DRAWDOWN FT.	METER READING	FLOW GPM	EC.	CHL.	TEMP.	REMARKS
12:00 90	5400	14.6			600	610	22	24.1	
1:00 91	5460	14.6			600	609	22	24.2	
2:00 92	5520	14.6			600	610	22	24.1	
3:00 93	5580	14.6			600	611	22	24.3	
4:00 94	5640	14.6			600	609	22	24.2	
5:00 95	5700	14.6			600	608	22	24.4	
FROM 4 (96)	5760	14.6			600	611	22	24.3	
7:00 97	5820	14.6			600	614	22	24.0	
8:00 98	5880	14.5			600	609	22	23.7	
9:00 99	5940	14.5			600	~~604~~ 609	22	24.7	
10:00 100	6000	14.6			600	603	22	24.6	
11:00 101	6060	14.6			600	603	22	25.3	
12:00 102	6120	14.6			600	602	22	25.4	
1:00 103	6180	14.6			600	604	22	24.3	
2:00 104	6240	14.6			600	599	22	25.6	
3:00 105	6300	14.6			600	594	22	25.9	
4:00 106	6360	14.6			600	597	22	25.7	
5:00 107	6420	14.6			600	600	22	24.9	
6:00 108	6480	14.6			600	597	22	25.3	
7:00 109	6540	14.6			600	602	22	24.5	
8:00 110	6600	14.6			600	604	22	24.0	

WELL TESTING DATA FORM PAGE 7

WAIMEA WATER SERVICES INC.

WELL NAME Hawapepe

DATE

TIME	ELAPSED TIME-MIN.	DRAWDOWN PSI	DRAWDOWN FT.	METER READING	FLOW GPM	EC.	CHL.	TEMP.	REMARKS
9:00 111	6660	14.6			600	603	22	23.9	
10:00 112	6720	14.6			600	601	22	23.7	
11:00 113	6780	14.6			600	602	22	23.5	
12:00 114	6840	14.6			600	604	22	23.6	
1:00 115	6900	14.6			600	606	22	23.5	
2:00 116	6960	14.6			600	609	22	23.7	
3:00 117	7020	14.6			600	605	22	23.9	
4:00 118	7080	14.6			600	610	22	23.6	
5:00 119	7140	14.6			600	607	22	23.8	
SHT. 5 (120)	7200	14.6			600	611	22	24.1	
7:00 121	7260	14.6			600	600	22	23.7	
8:00 122	7320	14.6			600	596	22	24.3	
9:00 123	7380	14.6			600	599	22	23.8	
10:00 124	7440	14.6			600	595	22	24.5	
11:00 125	7500	14.6			600	596	22	24.8	
12:00 126	7560	14.6			600	590	22	25.6	
1:00 127	7620	14.6			600	593	22	25.3	
2:00 128	7680	14.6			600	592	22	25.8	
3:00 129	7740	14.6			600	586	22	26.0	
4:00 130	7800	14.6			600	598	22	25.2	

WELL TESTING DATA FORM PAGE 8

8

WAIMEA WATER SERVICES INC.

WELL NAME Hanapepe

DATE

TIME	ELAPSED TIME-MIN.	DRAWDOWN PSI	DRAWDOWN FT.	METER READING	FLOW GPM	EC.	CHL.	TEMP.	REMARKS
5:00	131	7860	14.6			600	596	22	24.6	
6:00	132	7920	14.6			600	598	22	24.3	
7:00	133	7980	14.6			600	598	22	24.6	
8:00	134	8040	14.6			600	599	22	24.3	
9:00	135	8100	14.6			600	600	105 21	23.9	
10:00	136	8160	14.6			600	597	21	23.8	
11:00	137	8220	14.6			600	596	21	23.7	
12:00	138	8280	14.6			600	595	21	23.6	
1:00	139	8340	14.6			600	597	21	23.9	
2:00	140	8400	14.6			600	599	21	23.8	
3:00	141	8460	14.6			600	599	21	23.	
4:00	142	8520	14.6			600	597	21	23.8	
5:00	143	8580	14.6			600	601	21	23.6	
SAMPLE	144	8640	14.6			600	604	21	23.9	
7:00	145	8700	14.6			600	598	21	23.4	
8:00	146	8760	14.5			600	597	21	23.9	
9:00	147	8820	14.5			600	596	21	24.0	
10:00	148	8880	14.5			600	597	21	24.5	
11:00	149	8940	14.5			600	596	21	24.7	
12:00	150	9000	14.6			600	591	21	25.1	
1:00	151	9060	14.6			600	592	21	25.3	

WELL TESTING DATA FORM PAGE 9

9

WAIMEA WATER SERVICES INC.

WELL NAME Hanapepe

DATE

TIME	ELAPSED TIME-MIN.	DRAWDOWN PSI	DRAWDOWN FT.	METER READING	FLOW GPM	EC.	CHL.	TEMP.	REMARKS
2:00	152	9120	14.6			600	589	21/105	25.7	
3:00	153	9180	14.6			600	592	21	25.7	
4:00	154	9240	14.6			600	591	21	26.0	
5:00	155	9300	14.6			600	589	21	25.3	
6:00	156	9360	14.6			600	593	21	25.1	
7:00	157	9420	14.6			600	594	21	24.9	
8:00	158	9480	14.6			600	593	21	24.3	
9:00	159	9540	14.5			600	595	21	24.4	
10:00	160	9600	14.5			600	594	21	24.2	
11:00	161	9660	14.5			600	593	21	24.3	
12:00 AM	162	9720	14.5			600	595	21	24.2	
1:00	163	9780	14.5			600	597	21	24.1	
2:00	164	9840	14.5			600	596	21	24.4	
3:00	165	9900				600	598	21	24.6	
4:00	166	9960				600	595	21	24.7	
5:00	167	10020				600	597	21	24.9	
6:00 MON 7	168	10080				600	596	21	24.5	
7:00	169		14.5			600	597	21	23.4	
8:00	170		14.5			600	600	21	24.1	
9:00	171		14.5			600	595	21	24.3	
10:00	172		14.5			600	602	21	24.9	
11:00	173		14.5			600	599	21	24.5	
12:00	174		14.5			600	591	21	25.4	
1:00	175		14.5			600	601	21	25.0	

WELL TESTING DATA FORM PAGE 10

WAIMEA WATER SERVICES INC. 10

WELL NAME HANAPEPE 4

DATE 5/4/93

TIME	ELAPSED TIME-MIN.	DRAWDOWN PSI	DRAWDOWN FT.	METER READING	FLOW GPM	EC.	CHL.	TEMP.	REMARKS
2:00	176	0 14.5			600	595	21 105	25.3	
3:00	177	0 14.5			600	549	21	25.9	
4:00	178	0 14.5			600	597	21	24.5	
5:00	179	0 14.5			600	600	21	24.3	
6:00	180	0 14.5			600	593	21	24.1	
7:00	181	0 14.5			600	591	21	24.0	
8:00	182	0 14.5			600	594	21	24.1	
9:00	183	11000 14.5			600	546	21	23.9	
10:00	184	0 14.5			600	597	21	23.8	
11:00	185	0 14.5			600	594	21	23.9	
12:00	186	0 14.5			600	596	21	23.7	
1:00	187	0 14.5			600	597	21	23.6	
2:00	188	0 14.5			600	598	21	23.9	
3:00	189	0 14.5			600	601	21	24.0	
4:00	190	0 14.5			600	599	21	23.8	
5:00	191	0 14.5			600	596	21	23.6	
TUES. 8 DAYS / 6:00 AM	192	0 14.5			600	597	21	24.1	
7:00	193.	0 14.5			600	596	21	23.4	
9:00	194	0 14.5			600	598	21	23.9	
HWY 9:00	195	0 14.5			600	590	21	24.3	
10:00	196	14.5			600	590	21	24.5	
11:00	197	14.5			600	589	21	25.0	
12:00	198	14.5			600	587	21	25.1	
1:00	199	14.6			600	582	20/150	26.1	~~WATER SAMPLES - ACCS~~
TUES. 2:00pm	200	12000 14.6		01432100	600	586	25/100	24.9	SHUT OFF

WELL TESTING DATA FORM PAGE 10 11

11

WAIMEA WATER SERVICES INC.

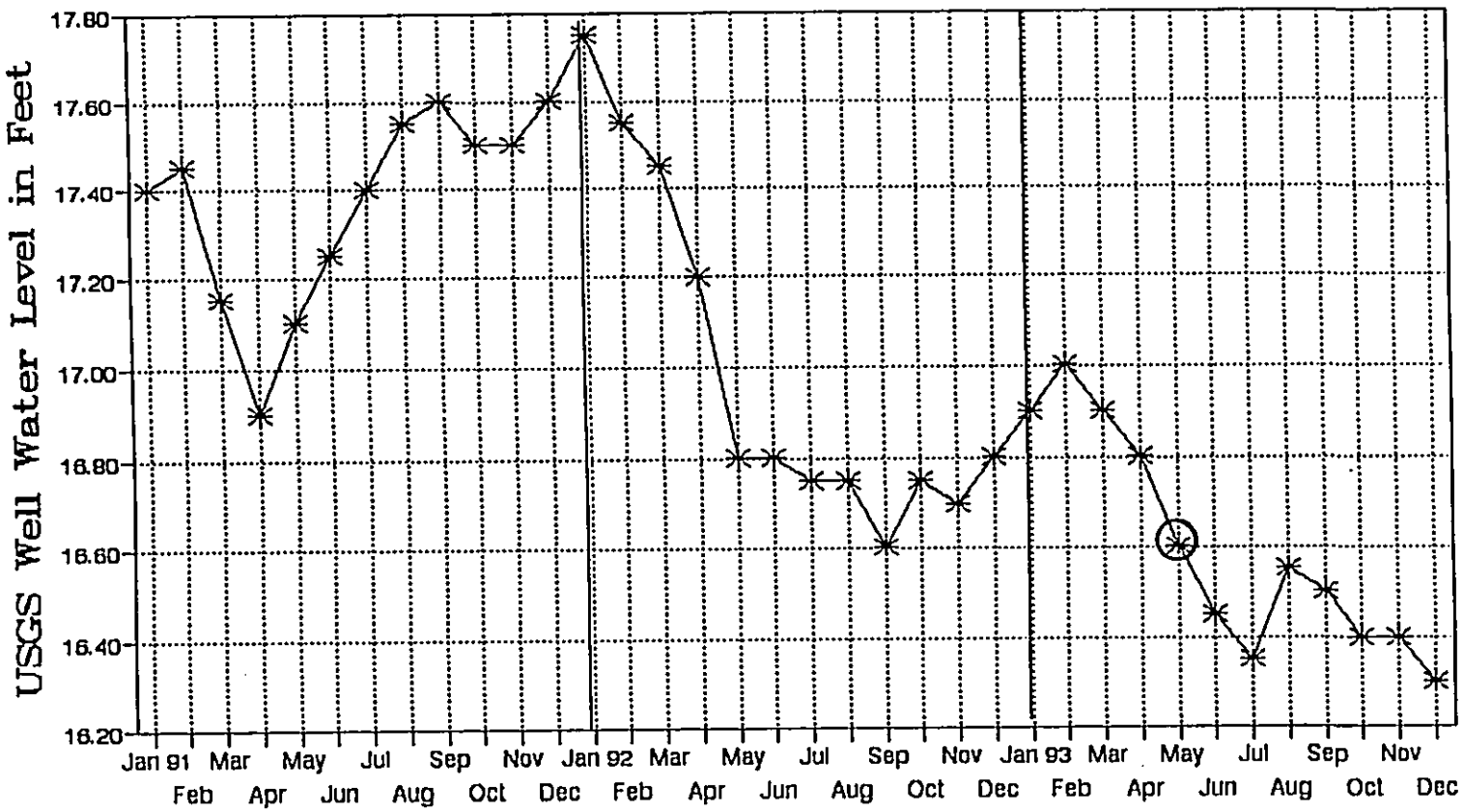
WELL NAME HANAPEPE

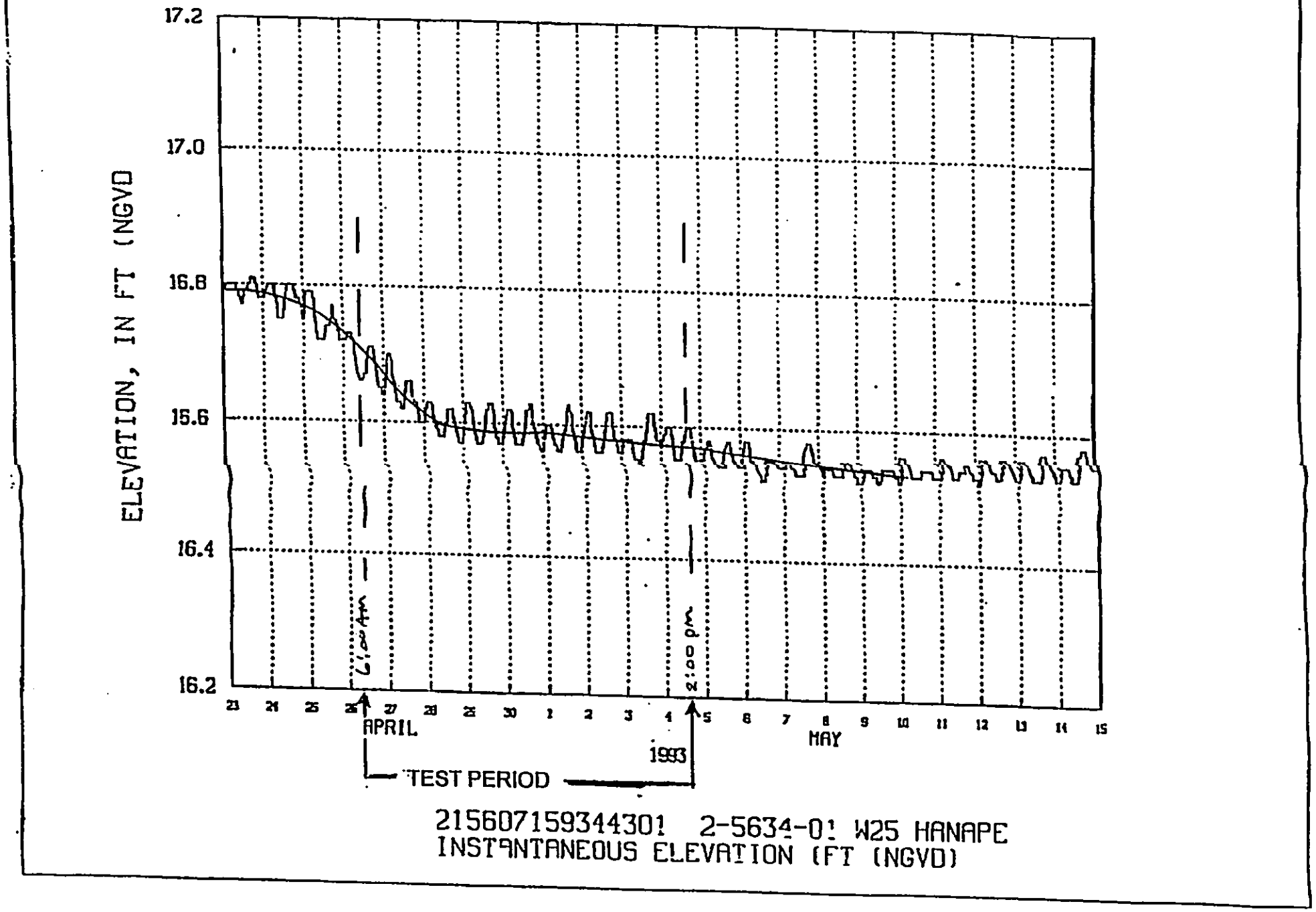
DATE 5/4/93 RECOVERY

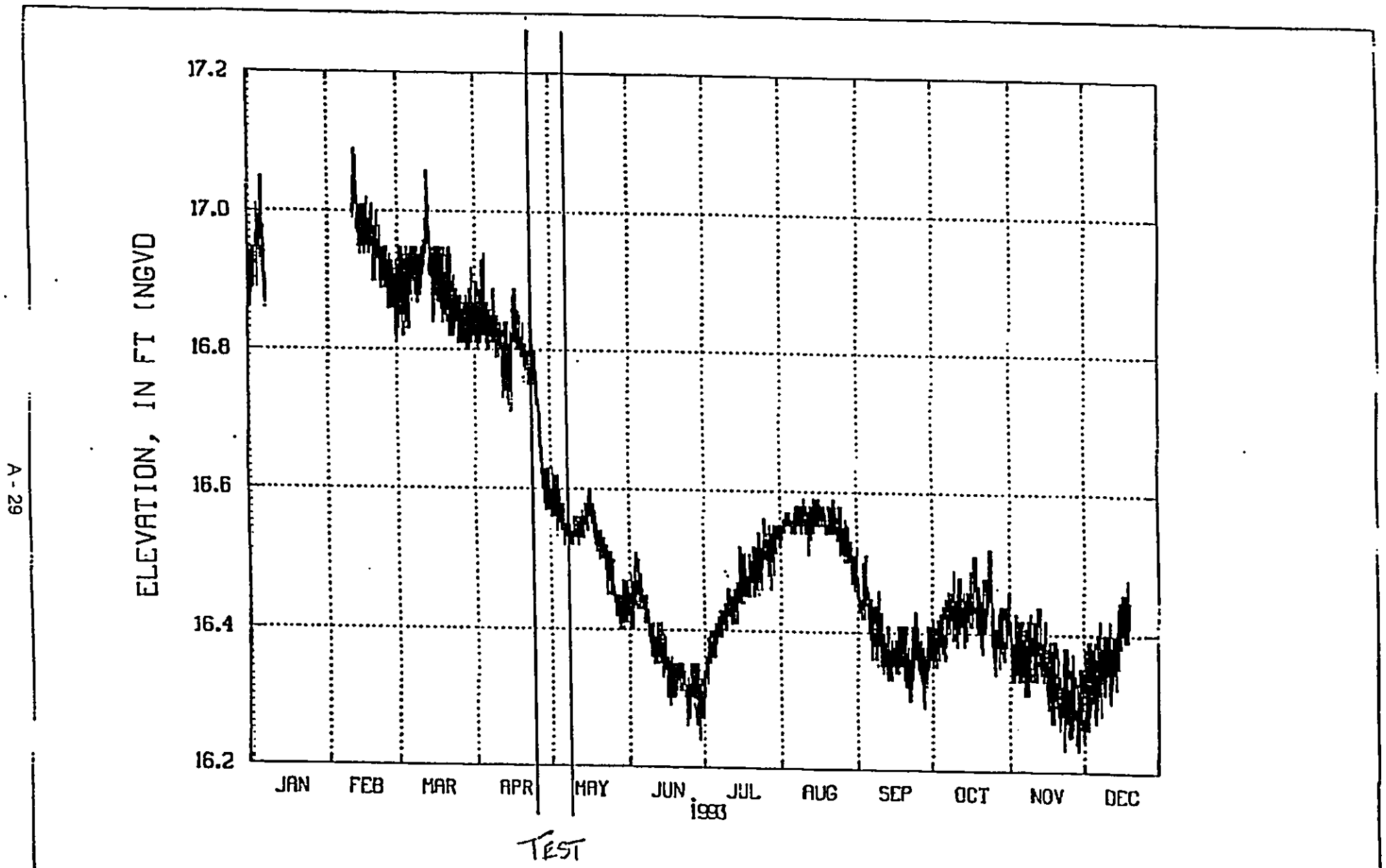
TIME	ELAPSED TIME-MIN.	DRAWDOWN PSI	DRAWDOWN FT.	METER READING	FLOW GPM	EC.	CHL.	TEMP.	REMARKS
RECOVERY									
2:00 PM	0	14.8			START				
	1	16.8							
	2	16.7							
	3	16.05							
	4	16.0							
	5	16.0							
	6	16.0							
	7	16.0							
	8	16.0							
	9	16.0							
	10	16.0							
	15								
	20								
	25								
	30								
	35								
	40								
	45								
	50								
HOURS	55								
1	60								
	65								
	70								
	75								
	80								
	85								
	90								
	95								
	100								
2	120								
3	180								
4	240								
5	300								
6	360								
7	420								

USGS Observation WELL CHARTS
#4

HANAPEPE WELL #4
USGS Well Water Levels




17.2
17.0
16.8
16.6
16.4
16.2
ELEVATION, IN FT (NGVD
23
24
25
26
27
28
29
30
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
APRIL
MAY
1993
TEST PERIOD
215607159344301 2-5634-01 W25 HANAPE
INSTANTANEOUS ELEVATION (FT (NGVD)


17.2
17.0
16.8
16.6
16.4
16.2
ELEVATION, IN FT (NGVD
JAN
FEB
MAR
APR
MAY
JUN
JUL
AUG
SEP
OCT
NOV
DEC
1993
TEST
215607159344301 2-5634-01 W25 HANAPE
INSTANTANEOUS ELEVATION (FT (NGVD)

GEOLOGIC LOG
#5

HANAPEPE WELL NO. 4
Geologic Log
By Glenn Bauer

Depth Interval (ft.)	Description
0-30	No sample collected
30-35	Mixture of red soil and weathered basalt
35-45	No sample collected
45-50	Weathered gray aa
50-55	Mixture of dense brown aa and soil
55-65	No sample collected
65-70	Dense gray aphyric aa
70-75	Same as above, except a few brown aa fragments included
75-80	Same as depth 65-70
80-85	Mixture of brown-red soil and gray aa
85-90	Very weathered basalt with coating of Mn and Ti
90-95	Mixture of red aphyric pahoehoe and dense dark gray aphyric aa
95-135	Gray-brown clay containing sand-size cuttings
135-145	Same as above, except rock cuttings are larger
145-170	No sample collected
170-180	Dark gray aa, some cuttings contain white clay minerals in the vesicles
180-190	Mixture of gray-brown clay and dense dark gray aa

FIGURE 8

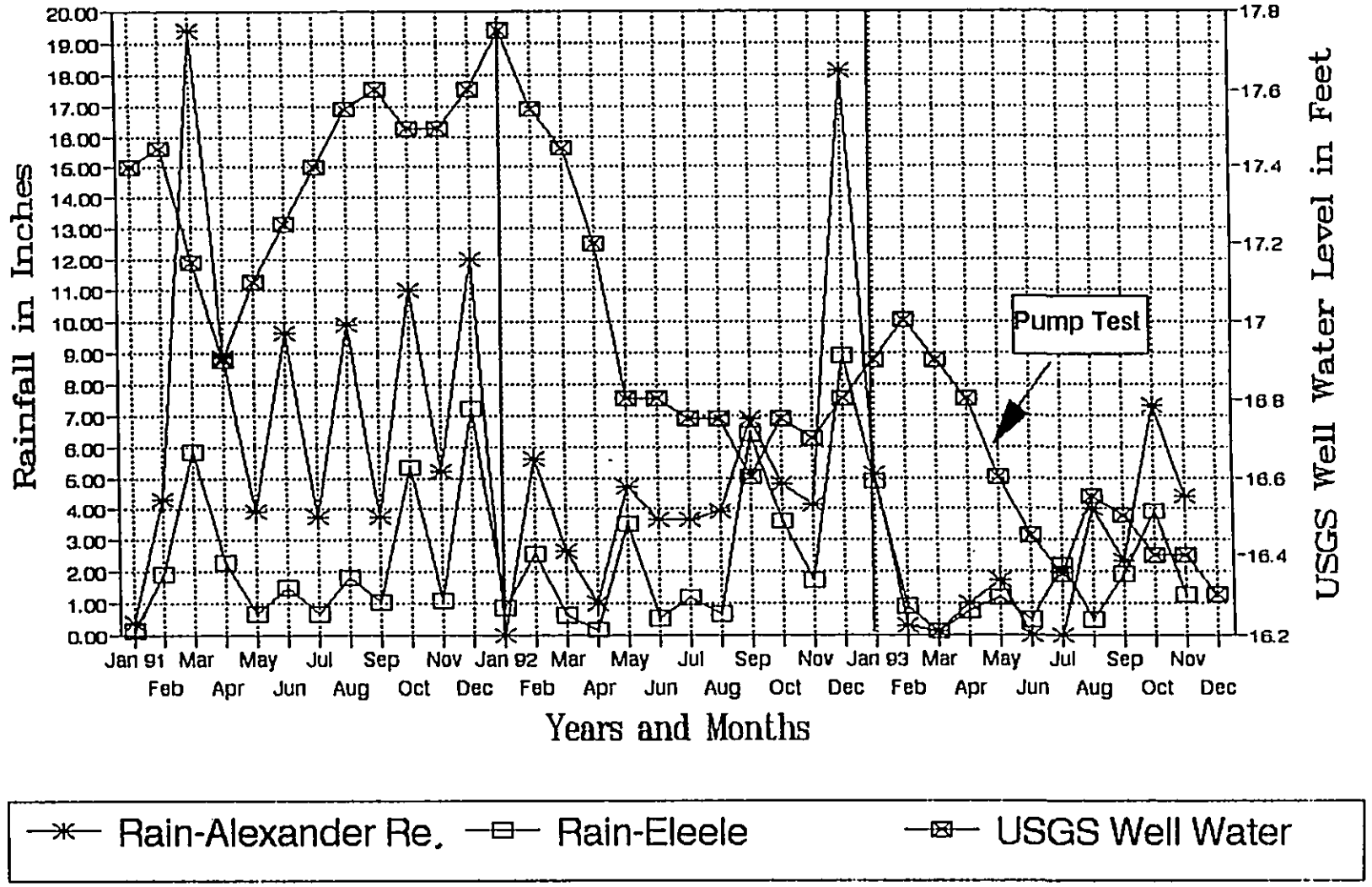
190-200	Mixture of gray-brown clay and weathered sand-size cuttings
200-205	Dense dark gray aa (large sample)--cuttings the same with gray-brown clay covering the cuttings
205-210	Slightly weathered pahoehoe → aa (?), some white clay mineral present in the vesicles
210-215	Red-brown pahoehoe (?), white clay mineral present
215-220	Mixture of gray clay and sand-size cuttings
220-225	Same as above, except clay > cuttings--cuttings appear weathered
225-230	Brown pahoehoe with small round vesicles filled with white clay minerals
230-240	Same as above, except gray clay also present
240-250	Soil (?) with very weathered aa
250-260	Mixture of dark gray pahoehoe and dense aa--white and tan clay minerals fill pahoehoe vesicles
260-280	Same as above, except aa >> pahoehoe
280-290	Dark gray aa containing fresh olivine phenocrysts 1-2 mm across
290-300	Gray pahoehoe with small vesicles, some filled with white clay minerals
300-305	Same as above, except one fragment is very scoriaceous
305-310	Gray pahoehoe (?)

310-315	Slightly weathered light gray pahoehoe transitional to aa
315-320	Gray pahoehoe with small vesicles, some filled with clay minerals
320-335	Dense medium gray aa
335-345	Dense gray aa with small olivine phenocrysts comprising between 15-20% of sample
345-350	Dense dark gray pahoehoe with small olivine phenocrysts comprising about 5% of sample
350-355	Same as above, except pahoehoe is brown and scoriaceous
355-360	Dense dark gray pahoehoe transitional to aa with small (.5 mm) olivine phenocyrsts comprising 5% percent of sample
360-365	Dense dark gray pahoehoe with olivine phenocyrsts comprising about 15% of sample
365-370	Same as above, except pahoehoe is transitional to aa
370-375	Gray-brown pahoehoe (?)
375-380	Mixture of large cuttings: 1) Dense aphyric pahoehoe 2) Brown aa 3) Gray scoriaceous pahoehoe contain weathered olivine phenocrysts, some 3 mm across 4) Weathered aa with white clay minerals filling vesicles
380-385	Mixture of brown and dark gray sand-size cuttings
385-390	Mixture of brown sand-size cuttings and dense gray aa
390-395	Dense dark gray pahoehoe

395-400	Same as above, except some cuttings are fine sand-size
400-405	Mixture of brown pahoehoe and dense gray aa, some aa fragments contain olivine phenocrysts up to 1 mm across
405-410	Same as above, except pahoehoe is red-brown and scoriaceous
410-415	Dark gray aa (?), dense but coarse sand-size cuttings
415-425	Dense dark gray pahoehoe with minor olivine phenocrysts
425-445	Same as above, except weathered and lighter gray in color
445-450	Mixture of red-brown and gray sand-size cuttings--one large scoriaceous sample is intruded by chalcedony
450-455	Dark gray sand-size cuttings
455-460	Same as above, except minor olivine phenocyrsts are present

RAIN FALL DATA
#6

HANAPEPE WELL #4
Aquifer and Rainfall Data



Rainfall Data
HANAPEPE WELL #4
AQUIFER REPORT

MONTH	GAGE Alexander Res.	Accum In	GAGE Eleele	Accum.In.	USGS WELL WATER LEVEL	Accum.Ft.
Jan 91	0.4		0.12		17.4	
Feb	4.3	4.7	1.88	2	17.45	34.85
Mar	19.4	24.1	5.83	7.83	17.15	52
Apr	8.85	32.95	2.26	10.09	16.9	68.9
May	3.9	36.85	0.67	10.76	17.1	86
Jun	9.6	46.45	1.48	12.24	17.25	103.25
Jul	3.7	50.15	0.65	12.89	17.4	120.65
Aug	9.9	60.05	1.78	14.67	17.55	138.2
Sep	3.7	63.75	1.03	15.7	17.6	155.8
Oct	11	74.75	5.32	21.02	17.5	173.3
Nov	5.2	79.95	1.08	22.1	17.5	190.8
Dec	12	91.95	7.22	29.32	17.6	208.4
Jan 92	0	91.95	0.82	30.14	17.75	226.15
Feb	5.6	97.55	2.54	32.68	17.55	243.7
Mar	2.6	100.15	0.62	33.3	17.45	261.15
Apr	1	101.15	0.14	33.44	17.2	278.35
May	4.7	105.85	3.46	36.9	16.8	295.15
Jun	3.6	109.45	0.54	37.44	16.8	311.95
Jul	3.6	113.05	1.17	38.61	16.75	328.7
Aug	3.9	116.95	0.68	39.29	16.75	345.45
Sep	6.9	123.85	6.37	45.66	16.6	362.05
Oct	4.8	128.65	3.59	49.25	16.75	378.8
Nov	4.1	132.75	1.7	50.95	16.7	395.5
Dec	18.1	150.85	8.9	59.85	16.8	412.3
Jan 93	5.1	155.95	4.89	64.74	16.9	429.2
Feb	0.3	156.25	0.9	65.64	17	446.2
Mar	0.1	156.35	0.1	65.74	16.9	463.1
Apr	1	157.35	0.74	66.48	16.8	479.9
May	1.7	159.05	1.15	67.63	16.6	496.5
Jun	0	159.05	0.46	68.09	16.45	512.95
Jul	0	159.05	2.15	70.24	16.35	529.3
Aug	4	163.05	0.48	70.72	16.55	545.85
Sep	2.3	165.35	1.9	72.62	16.5	562.35
Oct	7.3	172.65	3.89	76.51	16.4	578.75
Nov	4.4	177.05	1.27	77.78	16.4	595.15
Dec					16.3	611.45

APPENDIX B

Water Quality Analyses of
Hanapepe Well No. 4 (5634-02)
by AECOS Laboratory of Hawaii

HANAPEPE WELL #4
NO. 5634-2

CLIENT: Waimea Water Service
P.O. Box 326
Kamuela, Hawaii 96743
ATTENTION: John Stubbart

FILE No.:	740
REPORT DATE:	6/15/93
PAGE:	1 of 1

REPORT OF ANALYTICAL RESULTS

SAMPLE TYPE: Potable Water
DATE SAMPLED: 5/4/93
***AECOS* LOG No.:** 6665
DATE RECEIVED: 5/5/93

SAMPLE ID ⇨ / ANALYTE ⇩	WELL No. 2				Analysis Date / Analyst ID
Chloroform (µg/l)	<0.5				5/19/93 AL
Dichloro-bromomethane (µg/l)	<0.5				5/19/93 AL
Dibromo-chloromethane (µg/l)	<0.5				5/19/93 AL
Bromoform (µg/l)	<0.5				5/19/93 AL
TOTAL TRIHALO-METHANES (µg/l)	<0.5				5/19/93 AL

K. Klein, Laboratory Director

HANAPEPE WELL #4
NO. 5634-2

CLIENT: Waimea Water Service
P.O. Box 326
Kamuela, Hawaii 96743
ATTENTION: John Stubbart

FILE No.: 740
REPORT DATE: 6/15/93
PAGE: 1 of 4

REPORT OF ANALYTICAL RESULTS

SAMPLE TYPE: Potable water
DATE SAMPLED: 5/4/93

AECOS LOG No.: 6665
DATE RECEIVED: 5/5/93

SAMPLE ID ⇨ / ANALYTE ⇩	Hanapepe No. 4				Analysis Date/ Analyst ID
pH	7.70				5/5/93 eh
Turbidity (ntu)	0.25				5/5/93 eh
Conductivity (µmhos/cm)	522				5/5/93 eh
Color (APCU)	< 5				5/5/93 eh
Fluoride (mg/L)	0.42				5/12/93 AL
Chloride (mg/L)	91.2				5/13/93 eh
Alkalinity (mg $CaCO_3$/L)	98				5/7/93 eh

K. Klein, Laboratory Director

HANAPEPE WELL #4
NO. 5634-2

CLIENT: Waimea Water Service

ATTENTION: John Stubbart

FILE No.:	740
REPORT DATE:	6/15/93
PAGE:	2 of 4

LOG No.: 6665

SAMPLE ID ⇨ / ANALYTE ⇩	Hanapepe No. 4				Analysis Date/ Analyst ID
Total dissolved solids (mg/L)	361				4/26-5/7/93 lr
Sulfate (mg/L)	37.4				5/11/93 klm
MBAS (mg/L)	<0.025				5/5/93 lr
Nitrate (mgN/L)	0.77				5/5/93 jr
Nitrite (mgN/L)	0.003				5/6/93 jr
Cadmium (mg/L)	<0.002				6/7/93 ds
Chromium (mg/L)	0.032				6/13/93 ds
Iron (mg/L)	<0.05				5/4/93 ds
Total hardness (mg/L)	66.1				6/2/93 ds
Manganese (mg/L)	<0.05				6/2/93 ds

HANAPEPE WELL #4
NO. 5634-2

CLIENT: Waimea Water Service

ATTENTION: John Stubbart

FILE No.: 740
REPORT DATE: 6/15/93
PAGE: 3 of 4

LOG No.: 6665

SAMPLE ID ⇨ / ANALYTE ⇩	Hanapepe No. 4				Analysis Date/ Analyst ID
Calcium (mg/L)	9.46				6/2/93 ds
Magnesium (mg/L)	12.2				6/2/93 ds
Mercury (mg/L)	0.00037				5/25/93 ds
Copper (mg/L)	<0.02				5/6/93 ds
Zinc (mg/L)	<0.01				5/6/93 ds
Selenium (mg/L)	<0.02				5/9/93 ds
Arsenic (mg/L)	<0.005				5/7/93 ds
Lead (mg/L)	<0.005				5/11/93 ds
Barium (mg/L)	<0.05				5/3/93 ds
EPA 505	ND*				5/19/93 AL

* See attached list
ND = none detected

HANAPEPE WELL #4
NO. 5634-2

CLIENT: Waimea Water Service

ATTENTION: John Stubbart

FILE No.:	740
REPORT DATE:	6/15/93
PAGE:	4 of 4
LOG No.:	6665

SAMPLE ID ⇨ / ANALYTE ⇩	Hanapepe No. 4				Analysis Date/ Analyst ID
EPA 515.1	ND*				5/19/93 AL
EPA 524.2	ND*				5/19/93 AL
EPA 504					5/19/93 AL
EDB (µg/L)	ND<0.01				
DBCP (µg/L)	ND<0.02				
EPA 531.1					5/19/93 AL
Carbofuran (µg/L)	ND<5				
Oxamyl (µg/L)	ND<5				

* See attached list
ND = none detected.

HANAPEPE WELL #4
NO. 5634-2

EPA Method 515.1	Detection Limit (ug/L)
Bentazon	0.2
2,4-D	0.2
Dalapon	1.3
2,4-DB	0.8
DCPA	0.02
Dicamba	0.081
Dinoseb	0.19
2,4,5-T	0.08
2,4,5-TP	0.075

EPA Method 505	Detection Limit (ug/L)
Alachlor	0.225
Aldrin	0.007
Atrazine	2.4
alpha-Chlordane	0.006
gamma-Chlordane	0.012
Chlordane	0.14
Dieldrin	0.012
Endrin	0.063
Heptachlor	0.003
Heptachlor Epoxide	0.004
Hexachlorobenzene	0.002
Hexachlorocyclopentadiene	0.13
Lindane	0.003
Methoxychlor	0.96
cis-Nonachlor	0.027
trans-Nonachlor	0.011
Simazine	6.8
Toxaphene	1.0
Arochlor 1016	0.08
Arochlor 1221	15.0
Arochlor 1232	0.48
Arochlor 1242	0.31
Arochlor 1248	0.102
Arochlor 1254	0.102
Arochlor 1260	0.189

EPA METHOD 524.2	Detection Limits (ug/l)
Benzene	0.5
Bromobenzene	0.5
Bromochloromethane	0.5
Bromodichloromethane	0.5
Bromoform	0.5
Bromomethane	0.5
n-Butylbenzene	0.5
sec-Butylbenzene	0.5
tert-Butylbenzene	0.5
Carbon tetrachloride	0.5
Chlorobenzene	0.5
Chloroethane	0.5
Chloroform	0.5
Chloromethane	0.5
2-Chlorotoluene	0.5
4-Chlorotoluene	0.5
Dibromochloromethane	0.5
1,2-Dibromo-3-chloropropane	0.5
1,2-Dibromoethane	0.5
Dibromomethane	0.5
1,2-Dichlorobenzene	0.5
1,3-Dichlorobenzene	0.5
1,4-Dichlorobenzene	0.5
Dichlorodifluoromethane	0.5
1,1-Dichloroethane	0.5
1,2-Dichloroethane	0.5
1,1-Dichloroethene	0.5
cis-1,2-Dichloroethene	0.5
trans-1,2-Dichloroethene	0.5
1,2-Dichloropropane	0.5
1,3-Dichloropropane	0.5
2,2-Dichloropropane	0.5
1,1-Dichloropropene	0.5
1,3-Dichloropropene, Total	0.5
Ethylbenzene	0.5
Hexachlorobutadiene	0.5
Isopropylbenzene	0.5
4-Isopropyltoluene	0.5
Methylene chloride	0.5
Naphthalene	0.5
n-Propylbenzene	0.5
Styrene	0.5

EPA Method 524.2 (Cont.)	Detection Limits (ug/l)
1,1,1,2-Tetrachloroethane	0.5
1,1,2,2-Tetracholroethane	0.5
Tetrachloroethene	0.5
Toluene	0.5
1,2,3-Trichlorobenzene	0.5
1,2,4-Trichlorobenzene	0.5
1,1,1-Trichloroethane	0.5
1,1,2-Trichloroethane	0.5
Trichloroethene	0.5
Trichlorofluoromethane	0.5
1,2,3-Trichloropropane	0.5
1,2,4-Trimethylbenzene	0.5
1,3,5-Trimethylbenzene	0.5
Vinyl chloride	0.5
Xylenes, Total	0.5

STATE OR FEDERAL
REGULATED SAFE DRINKING WATER CONTAMINANTS

	Contaminant	MCL (mg/l)
Inorganic Chemicals	antimony	0.006
	asbestos	7 million fibers/liter (longer than 10 µm)
	arsenic	0.05
	barium	2
	beryllium	0.004
	cadmium	0.005
	chromium	0.1
	cyanide	0.2
	fluoride	4
	mercury	0.002
	nickel	0.1
	nitrate	10
	nitrite	1
	nitrate/nitrite	10
	selenium	0.05
	thallium	0.002

	Contaminant	MCL (mg/l)
Radionuclides	gross alpha	15.0 pCi/l
	combined radium-226 and radium-228	5.0 pCi/l
Microbes	Total Coliforms	Absence
Turbidity	Conv. Treatment	0.5 NTU
	Direct Filtration	0.5 NTU
	Diatomaceous	1.0 NTU
	Slow Sand	1.0 NTU
Lead/Copper	Lead (Action Lvl)	0.015 mg/l
	Copper (")	1.3 mg/l

	Contaminant	MCL (mg/l)
Volatile Organic Chemicals	Vinyl chloride	0.002
	benzene	0.005
	carbon tetrachloride	0.005
	1,2-dichloroethane	0.005
	trichloroethylene	0.005
	para-dichlorobenzene	0.075
	1,1-dichloroethylene	0.007
	1,1,1-trichloroethane	0.2
	cis-1,2-dichloroethylene	0.07
	dichloromethane	0.005
	1,2-dichloropropane	0.005
	ethylbenzene	0.7
	monochlorobenzene	0.1
	o-dichlorobenzene	0.6
	styrene	0.1
	1,2,4-Trichlorobenzene	0.07
	1,1,2-Trichloroethane	0.005
	tetrachloroethylene	0.005
	toluene	1
	trans- 1,2-dichloroethylene	0.1
	1,2,3Trichloropropane	0.0008
	xylenes	10
Chlorinated Organic Chemicals	Endrin	0.0002
	TTHMs	0.10
Acrylamide and Epichlorohydrin Treatment Technique	These are flocculents used in some treatment plants. The treatment technique is a dosage requirement of 0.05% dosed at 1 mg/l for acrylamide and 0.01% dosed at 20 mg/l for epichlorohydrin.	

	Contaminant	MCL (mg/l)
Synthetic Organic Chemicals	alachlor	0.002
	aldicarb	0.003
	aldicarb sulfoxide	0.004
	aldicarb sulfone	0.002
	atrazine	0.003
	benzo(a)pyrene	0.0002
	carbofuran	0.04
	chlordane	0.002
	Dalapon	0.2
	Di(2-ethylhexyl)adipate	0.4
	Di(2-ethylhexyl)phthalate	0.006
	Dibromochloropropane	0.00004
	Dinoseb	0.007
	Dioxin	$3x10^{-8}$
	Diquat	0.02
	2,4-D	0.07
	endothall	0.1
	endrin	0.002
	ethylene dibromide	0.00004
	glyphosate	0.7
	heptachlor	0.0004
	heptachlor epoxide	0.0002
	Hexachlorobenzene	0.001
	Hexachlorocyclopentadiene	0.05
	lindane	0.0002
	methoxychlor	0.04
	oxamyl	0.2
	picloram	0.5
	polychlorinatodbiphenyls	0.0005
	pentachlorophenol	0.001
	simazine	0.004
	toxaphene	0.003
	2,4,5-TP	0.05

AECOS LABORATORY OF HAWAII
Frame 10 Center • 75-5586 Ololi Rd. Suite 207 • Kailua-Kona, HI 96740
Telephone (808) 329-8411 • Fax (808) 329-6343

Aloha John-

See page 4 of 4 of results-

EPA 515.1
542.2
504
531.1
> analyst ID AL is Associated Labs

Hope this is all of this —

ICK

[6665]

AECOS LABORATORY OF HAWAII

P.O. BOX 789 HOLUALOA, HAWAII 96725
TELEPHONE/FAX: (808) 324-0447

CHAIN OF CUSTODY

Client: WAIMEA WATER SERVICE
Address: HANAPEPE #4
Contact person: KAREN KLEIN
Phone# 329-8411
PO #
Project: WELL #4

Special Handling Request
☐ Rush
☐ Verbal
☐ Other

Sample ID	Date	Time	Grab	Comp	No. of Containers	Waste Type	Preservation	Analysis request
WELL #4	05/04		✓					TOTAL TRIHALO METHANES
								EPA 502

Disposal of oil samples, solvent samples, and samples deemed hazardous by AECOS are the responsibility of the client.

Collected By: K Klein	05/04/93	1500	Delivery By:	Date / Time
Received By:	Date	Time	Relinquished By:	Date / Time
Received By:	Date	Time	Relinquished By:	Date / Time
Received for laboratory by: Anuoka Mello	Date 5/5/93	Time 1330	Comments (Precautions/hazards)	
Final disposition:				

B-11

[6665]

AECOS

970 N. Kalaheo Avenue, Suite C311 • Kailua, Hawaii 96734
Telephone: (808) 254-5884

FOLLOW PROPER COLLECTION AND PRESERVATION INSTRUCTIONS. STORE DRINKING WATER AT 4°C and TRANSPORT ON ICE WITHIN 24hrs.

CHAIN OF CUSTODY

lent: WAIMEA WATER SERVICE Contact person: KAREN KLEIN

dress: _____ Phone# 885-5941

_____ PO # _____

_____ Project: HANAPEPE KAUAI

Special Handling Request
☐ Rush
☐ Verbal
☐ Other

Sample ID	Date	Time	Grab	Comp	No. of Containers	Waste Type	Preservation	Analysis request
					3 40ml VOA		HCL pH <2	9 EPA 524.2
					3 40 ml VOA		↓	10. trip blank EPA 524.2 Ewell #4
					1 Liter Poly			11 MBAS
					3 40 ml VOA			12. EPA 504
					1 Liter Poly			13 X Asbestos No
					1 Liter GLASS			14 EPA 531 351 (carbofuran oxamyl)
					3 40 ml VOA			Total trihalomethanes EPA 502
								* NO DIOXINS - NO ASBESTOS NO RADIO - NOTRI HALOMETHANE

isposal of oil samples, solvent samples, and samples deemed hazardous by AECOS are the responsibility of the client.

ected by: R Klein	05/04/93	1335	Delivery by	Date	Time
ived by:	Date	Time	Relinquished by:	Date	Time
ived by:	Date	Time	Relinquished by:	Date	Time
ived for laboratory by: Anokia Mello	5/5/93	1200	Comments (Precautions/hazards)		
al disposition:					

B-12

AECOS

970 N. Kalaheo Avenue, Suite C311 • Kailua, Hawaii 96734
Telephone (808) 254-5884

FOLLOW PROPER COLLECTION AND PRESERVATION INSTRUCTIONS. STORE DRINKING WATER AT 4°C and TRANSPORT ON ICE WITHIN 24

CHAIN OF CUSTODY

Client: WAIMEA WATER SERVICE
Address:

Contact person: KAREN KLEIN
Phone# 885-5941
PO #
Project: HANAPEPE EPA KAUAI

Special Handling Request
☐ Rush
☐ Verbal
☐ Other

Sample ID	Date	Time	Grab	Comp	No. of Containers	Waste Type	Preservation	Analysis request
1a, 1b					2 liter glass		1	1a, 1b EPA 505 ↑ switch
2					1 liter glass			2 EPA 515. ↑ CRACKERS
3a, 3b					2 125 ml poly			3a, 3b NO_2, NO_3
4					1 liter poly			4 As, Ba, Cd, Cr, Cu, Pb, Hg, Se, Ca, Mn, Fl
5					1 Liter poly			5. Alkalinity, TDS, SO_4, Hardness
6					1 250 ml poly			6 color, pH, cond, turb
7					1 250ml poly			7 fluoride, chloride
8					1 liter poly			8. Radioactivity No

Disposal of oil samples, solvent samples, and samples deemed hazardous by AECOS are the responsibility of the client.

Collected by: K Klein 05/04/93 13:35	Delivery by: Date	Time
Received by: Date	Relinquished by: Date	Time
Received by: Date	Relinquished by: Date	Time
Received for laboratory by: Anokia Mills Date 5/5/93 Time 1336	Comments (Precautions/hazards)	
Final disposition:		

1 of 1

AECOS LABORATORY OF HAWAII

P.O. BOX 789 HOLUALOA, HAWAII 96725
TELEPHONE/FAX: (808) 324-0447

CHAIN OF CUSTODY

Client: WAIMEA WATER SERVICE
Address:
Contact person: K. KLEIN
Phone# 329-8411
PO #
Project:

Special Handling Request
☐ Rush
☐ Verbal
☐ Other

Sample ID	Date	Time	Grab	Comp	No. of Containers	Waste Type	Preservation	Analysis request
P1 WHIRL PAC HANAPEPE #4	5/4/93		✓		3	—	CHILL	TOTAL COLIFORM

Disposal of oil samples, solvent samples, and samples deemed hazardous by AECOS are the responsibility of the client.

	Date	Time		Date	Time
Collected by: K Klein	5/4/93	1335	Delivery by:		
Received by: J Kalvitis	050593	0750	Relinquished by: K Klein	5/4/93	
Received by:			Relinquished by:		
Received for laboratory by: [illegible]	5/5/93	0820	Comments (Precautions/hazards): 050593 1 SAMPLE PER KAREN KLEIN - JK		
Final disposition:					

BREWER ENVIRONMENTAL INDUSTRIES, INC.
a C Brewer company

LABORATORY ANALYSIS REPORT
Environmental Laboratories Division

CLIENT: AECOS, INC.
P.O. BOX 789
HOLUALOA, HAWAII 96725

ATTN: K. KLEIN

JOB NUMBER: 0127

DATE: MAY 07, 1993

SAMPLE LOCATION: WAIMEA WATER SERVICE

Date/Time Sampled: 05/04/93 @ ---
Date/Time Received: 05/05/93 @ 0750
TEMPERATURE CONTROL: NONE REC'D

TYPE: SPECIAL
Matrix: WATER
SAMPLE #: WHIRL PAC
SAMPLER: K. KLEIN

Analysis Date/Time: 04/05-06/93 @ 1000

Analyst: M. KISE/V. HEYER

ANALYSIS	RESULT col/100	METHOD NUMBER
TOTAL COLIFORM	TNTC	MF

TNTC = TOO NUMEROUS TO COUNT (Non Coliform)

05/06/93 @ 0850 hrs - called Karen with final results.

Approved by: M. Sakaki

BREWER ENVIRONMENTAL LABORATORIES
PO BOX 552
PAPAIKOU HI 96781

APPENDIX C

Water Quality Analyses of
Hanapepe Well A (Well No. 5533-01), Pages C-1 to C-21 and
Hanapepe Well 25-1 (Well No. 5534-03), Pages C-22 to C-42

by Montgomery Laboratories

MONTGOMERY LABORATORIES
555 East Walnut Street
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1 800 566 LABS (1 800 566 5227)

HANAPEPE WELL A

Laboratory Report

for

Kauai Water Department
P.O. Box 1706

Lihue, HI 96766

Attention: Wayne Hinazumi

Report#: 23367

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Laboratory
Report
#23367

Kauai Water Department
Wayne Hinazumi
P.O. Box 1706
Lihue , HI 96766

Sample Received
06-oct-1995 15:24:26

Date Sampled
10/05/95

Sample# 951006045 Location: HANAPEPE TOWN 404-036

Parameter	Units	Result	MDL	MCL	Prepared	Analyzed
Pesticides (ML/EPA 508)						
Toxaphene	ug/l	ND	0.50	3	10/10/95	10/24/95
PCB's	ug/l	ND	0.10	0.5	10/10/95	10/24/95
Herbicides/Chlorinated Acids in Water (ML/EPA 515.1)						
2,4,5-TP (Silvex)	ug/l	ND	0.20	50	10/12/95	11/03/95
2,4-D	ug/l	ND	0.10	70	10/12/95	11/03/95
Dalapon (qualitative)	ug/l	ND	1	200	10/12/95	11/03/95
Dinoseb	ug/l	ND	0.20	7	10/12/95	11/03/95
Pentachlorophenol	ug/l	ND	0.040	1	10/12/95	11/03/95
Picloram	ug/l	ND	0.10	500	10/12/95	11/03/95
Semivolatiles/Synthetic Organics in Water (ML/EPA 525.2)						
Benzo(a)pyrene	ug/l	ND	0.020	0.2	10/12/95	10/18/95
Di-(2-Ethylhexyl)adipate	ug/l	ND	0.60	400	10/12/95	10/18/95
Di(2-Ethylhexyl)phthalate	ug/l	ND	0.60	6	10/12/95	10/18/95
Endothall in Water (ML/EPA 548.1)						
Endothall	ug/l	ND	5	100	10/11/95	10/13/95
Diquat in Water (ML/EPA 549.1)						
Diquat	ug/l	ND	0.40	20	10/11/95	10/16/95
Dioxin (2,3,7,8-TCDD) in Water (ML/EPA 1613)						
2,3,7,8 - Dioxin	Picograms/L	ND	1.6	30	10/13/95	10/17/95
Cyanide in Water (ML/SM 4500 CN-F)						
Cyanide	mg/l	ND	0.025	0.2		10/17/95

Report 23367 Comment Page

Group Validation Comments

Result for TCDD analysis submitted by Quanterra Environmental Services.
(508) Low recovery for chlorothalonil, high recoveries for DDT and methoxychlor on continuing calibration standards; chlrothalonil reported as NA. Reference QIR-GC-95-189.

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Laboratory Report

Kauai Water Department
P.O. Box 1706

Lihue , HI 96766
ATTN: Wayne Hinazumi

Sample # 951006045 Sample ID HANAPEPE TOWN 404-036 Project PHASEV
Sample Type Water Sampled 05-oct-1995 Received 06-oct-1995 Reported 08-nov-1995

Parameter		Units	Result	Conc.	%Rec	Dilution	Det.Limit	Prepared	By	Analyzed	By
Cyanide	(ML/SM 4500)	mg/l	ND			5	0.025	11-oct-1995	rvd	17-oct-1995	huy
Endothall	(ML/EPA 548.1)	ug/l	ND			1.6		13-oct-1995	col	13-oct-1995	crw
2,3,7,8 - Dioxin	(1613)	Picograms/L	ND							17-oct-1995	col

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Kauai Water Department
P.O. Box 1706

Lihue , HI 96766
ATTN: Wayne Hinazumi

Sample # 951006045 Sample ID HANAPEPE TOWN 404-036 Project PHASEV
Sample Type Water Sampled 05-oct-1995 Received 06-oct-1995 Reported 08-nov-1995

Single Determination Analytes
Quality Control

Control	Parameter	Units	Actual	Found	%Recv
LCS1	Cyanide	mg/l	0.10	0.099	99
MBLK	Cyanide	mg/l	ND	ND	
MS	Cyanide	mg/l	0.10	0.0982	98
MSD	Cyanide	mg/l	0.10	0.0868	87
LCS1	Endothall	ug/l	25	21.8	87
MBLK	Endothall	ug/l	ND	ND	
MS	Endothall	ug/l	25	20.9	84

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Laboratory Report

Kauai Water Department
P.O. Box 1706

Lihue , HI 96766
ATTN: Wayne Hinazumi

Sample # 9510006045 Sample ID HANAPEPE TOWN 404-036 Project PHASEV
Sample Type Water Sampled 05-oct-1995 Received 06-oct-1995 Reported 08-nov-1995

Diquat and Paraquat (ML/EPA 549.1)

Parameter	Units	Result	Conc.	%Rec	Dilution	Det.Limit	Prepared	By	Analyzed	By
Diquat	ug/l	ND				0.4	11-oct-1995	cfl	16-oct-1995	yka
Paraquat	ug/l	ND				2	11-oct-1995	cfl	16-oct-1995	yka

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Laboratory Report

Kauai Water Department
P.O. Box 1706

Lihue , HI 96766
ATTN: Wayne Hinazumi

Sample # 951006045 Sample ID HANAPEPE TOWN 404-036 Project PHASEV
Sample Type Water Sampled 05-oct-1995 Received 06-oct-1995 Reported 08-nov-1995

Diquat and Paraquat (ML/EPA 549.1)
Quality Control

Control	Parameter	Units	Actual	Found	%Recv
LCS1	Diquat	ug/l	10.0	11.0	110
LCS1	Paraquat	ug/l	10.0	8.9	89
MBLK	Diquat	ug/l	ND	ND	
MBLK	Paraquat	ug/l	ND	ND	
MS	Diquat	ug/l	10.0	11.0	110
MS	Paraquat	ug/l	10.0	8.7	87

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Laboratory Report

Kauai Water Department
P.O. Box 1706

Lihue , HI 96766
ATTN: Wayne Hinazumi

Sample # 9510060-45 Sample ID HANAPEPE TOWN 404-036 Project PHASE V
Sample Type Water Sampled 05-oct-1995 Received 06-oct-1995 Reported 08-nov-1995

525 Semivolatiles by GC/MS (ML/EPA 525.2)

Parameter	Units	Result	Conc.	%Rec	Dilution	Det.Limit	Prepared	By	Analyzed	By
2,4-Dinitrotoluene	ug/l	ND				0.1	12-oct-1995	rod	18-oct-1995	crw
alpha-Chlordane	ug/l	ND				0.05	12-oct-1995	rod	18-oct-1995	crw
Acenaphthylene	ug/l	ND				0.1	12-oct-1995	rod	18-oct-1995	crw
Alachlor	ug/l	ND				0.05	12-oct-1995	rod	18-oct-1995	crw
Aldrin	ug/l	ND				0.05	12-oct-1995	rod	18-oct-1995	crw
Anthracene	ug/l	ND				0.02	12-oct-1995	rod	18-oct-1995	crw
Atrazine	ug/l	ND				0.05	12-oct-1995	rod	18-oct-1995	crw
Benz(a)Anthracene	ug/l	ND				0.05	12-oct-1995	rod	18-oct-1995	crw
Benzo(a)pyrene	ug/l	ND				0.02	12-oct-1995	rod	18-oct-1995	crw
Benzo(b)Fluoranthene	ug/l	ND				0.02	12-oct-1995	rod	18-oct-1995	crw
Benzo(g,h,i)Perylene	ug/l	ND				0.05	12-oct-1995	rod	18-oct-1995	crw
Benzo(k)Fluoranthene	ug/l	ND				0.02	12-oct-1995	rod	18-oct-1995	crw
Bi(2-Ethylhexyl)phthalate	ug/l	ND				0.6	12-oct-1995	rod	18-oct-1995	crw
Butylbenzylphthalate	ug/l	ND				0.5	12-oct-1995	rod	18-oct-1995	crw
Bromacil	ug/l	ND				2	12-oct-1995	rod	18-oct-1995	crw
Butachlor	ug/l	ND				0.05	12-oct-1995	rod	18-oct-1995	crw
Caffeine	ug/l	ND				0.02	12-oct-1995	rod	18-oct-1995	crw
Chrysene	ug/l	ND				0.02	12-oct-1995	rod	18-oct-1995	crw
Dibenz(a,h)Anthracene	ug/l	ND				0.05	12-oct-1995	rod	18-oct-1995	crw
Di-(2-Ethylhexyl)adipate	ug/l	ND				0.6	12-oct-1995	rod	18-oct-1995	crw
Diethylphthalate	ug/l	ND				0.5	12-oct-1995	rod	18-oct-1995	crw
Dieldrin	ug/l	ND				0.2	12-oct-1995	rod	18-oct-1995	crw
Dimethylphthalate	ug/l	ND				0.5	12-oct-1995	rod	18-oct-1995	crw
Dimethoate	ug/l	ND				10	12-oct-1995	rod	18-oct-1995	crw
Di-n-Butylphthalate	ug/l	ND				0.5	12-oct-1995	rod	18-oct-1995	crw
Endrin	ug/l	ND				0.1	12-oct-1995	rod	18-oct-1995	crw
Fluorene	ug/l	ND				0.05	12-oct-1995	rod	18-oct-1995	crw
gamma-Chlordane	ug/l	ND				0.05	12-oct-1995	rod	18-oct-1995	crw
Hexachlorobenzene	ug/l	ND				0.05	12-oct-1995	rod	18-oct-1995	crw

Report #: 23367

C-8

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Laboratory Report

Kauai Water Department
P.O. Box 1706

Lihue , HI 96766
ATTN: Wayne Hinazumi

Sample # 951006045 Sample ID HANAPEPE TOWN 404-036 Project PHASEV
Sample Type Water Sampled 05-oct-1995 Received 06-oct-1995 Reported 08-nov-1995

525 Semivolatiles by GC/MS (ML/EPA 525.2)

Parameter	Units	Result	Conc.	%Rec	Dilution	Det.Limit	Prepared	By	Analyzed	By
Hexachlorocyclopentadiene	ug/l	ND				0.05	12-oct-1995	rod	18-oct-1995	crw
Heptachlor	ug/l	ND				0.04	12-oct-1995	rod	18-oct-1995	crw
Heptachlor Epoxide	ug/l	ND				0.02	12-oct-1995	rod	18-oct-1995	crw
Indeno(1,2,3,c,d)Pyrene	ug/l	ND				0.05	12-oct-1995	rod	18-oct-1995	crw
Isophorone	ug/l	ND				0.5	12-oct-1995	rod	18-oct-1995	crw
Lindane	ug/l	ND				0.02	12-oct-1995	rod	18-oct-1995	crw
Methoxychlor	ug/l	ND				0.05	12-oct-1995	rod	18-oct-1995	crw
Metribuzin	ug/l	ND				0.05	12-oct-1995	rod	18-oct-1995	crw
Molinate	ug/l	ND				0.2	12-oct-1995	rod	18-oct-1995	crw
Metolachlor	ug/l	ND				0.05	12-oct-1995	rod	18-oct-1995	crw
trans-Nonachlor	ug/l	ND				0.05	12-oct-1995	rod	18-oct-1995	crw
Pentachlorophenol	ug/l	ND				1	12-oct-1995	rod	18-oct-1995	crw
Phenanthrene	ug/l	ND				0.02	12-oct-1995	rod	18-oct-1995	crw
Prometryn	ug/l	ND				0.5	12-oct-1995	rod	18-oct-1995	crw
Propachlor	ug/l	ND				0.05	12-oct-1995	rod	18-oct-1995	crw
Pyrene	ug/l	ND				0.05	12-oct-1995	rod	18-oct-1995	crw
Simazine	ug/l	ND				0.05	12-oct-1995	rod	18-oct-1995	crw
Thiobencarb	ug/l	ND				0.2	12-oct-1995	rod	18-oct-1995	crw
Trifluralin	ug/l	ND				0.1	12-oct-1995	rod	18-oct-1995	crw

Report #: 23367

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Laboratory Report

Kauai Water Department
P.O. Box 1706

Lihue , HI 96766
ATTN: Wayne Hinazumi

Sample # 951006045 Sample ID HANAPEPE TOWN 404-036 Project PHASEV
Sample Type Water Sampled 05-oct-1995 Received 06-oct-1995 Reported 08-nov-1995

525 Semivolatiles by GC/MS (ML/EPA 525.2)
Surrogate Summary

Parameter	Percent Recovery	Acceptable Range
Perylene-d12	85	70 - 130

Report #: 23367

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Laboratory Report

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P.O. Box 1706

Lihue , HI 96766
ATTN: Wayne Hinazumi

Sample # 951006045 Sample ID HANAPEPE TOWN 404-036 Project PHASEV
Sample Type Water Sampled 05-oct-1995 Received 06-oct-1995 Reported 08-nov-1995

525 Semivolatiles by GC/MS (ML/EPA 525.2)
Quality Control

Control	Parameter	Units	Actual	Found	%Recv
LCS1	alpha-Chlordane	ug/l	2	1.94	97
LCS1	Acenaphthylene	ug/l	2	1.73	86
LCS1	Alachlor	ug/l	2	1.89	94
LCS1	Aldrin	ug/l	2	1.56	78
LCS1	Anthracene	ug/l	2	1.74	87
LCS1	Atrazine	ug/l	2	1.98	99
LCS1	Benz(a)Anthracene	ug/l	2	1.87	94
LCS1	Benzo(a)pyrene	ug/l	2	1.79	90
LCS1	Benzo(b)Fluoranthene	ug/l	2	1.85	92
LCS1	Benzo(g,h,i)Perylene	ug/l	2	1.94	97
LCS1	Benzo(k)Fluoranthene	ug/l	2	1.92	96
LCS1	Di(2-Ethylhexyl)phthalate	ug/l	2	1.95	98
LCS1	Butylbenzylphthalate	ug/l	2	2.13	106
LCS1	Caffeine	ug/l	2	1.63	82
LCS1	Chrysene	ug/l	2	1.95	98
LCS1	Dibenz(a,h)Anthracene	ug/l	2	1.86	93
LCS1	Di-(2-Ethylhexyl)adipate	ug/l	2	1.77	88
LCS1	Diethylphthalate	ug/l	2	2.11	106
LCS1	Dimethylphthalate	ug/l	2	1.78	89
LCS1	Di-n-Butylphthalate	ug/l	2	2.28	114
LCS1	Endrin	ug/l	2	1.81	90
LCS1	Fluorene	ug/l	2	1.92	96
LCS1	gamma-Chlordane	ug/l	2	1.88	94
LCS1	Hexachlorobenzene	ug/l	2	1.85	92
LCS1	Hexachlorocyclopentadiene	ug/l	2	1.61	80
LCS1	Heptachlor	ug/l	2	1.86	93
LCS1	Heptachlor Epoxide	ug/l	2	1.99	100
LCS1	Indeno(1,2,3,c,d)Pyrene	ug/l	2	1.84	92
LCS1	Lindane	ug/l	2	2.01	100
LCS1	Methoxychlor	ug/l	2	2.14	107
LCS1	Molinate	ug/l	2	2.06	103

Report #: 23367

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Laboratory Report

Kauai Water Department
P.O. Box 1706

Lihue , HI 96766
ATTN: Wayne Hinazumi

Sample # 951006045 Sample ID HANAPEPE TOWN 404-036 Project PHASEV
Sample Type Water Sampled 05-oct-1995 Received 06-oct-1995 Reported 08-nov-1995

525 Semivolatiles by GC/MS (ML/EPA 525.2)
Quality Control

Control	Parameter	Units	Actual	Found	%Recv
LCS1	trans-Nonachlor	ug/l	2	1.98	99
LCS1	Pentachlorophenol	ug/l	8	7.02	88
LCS1	Phenanthrene	ug/l	2	1.98	99
LCS1	Pyrene	ug/l	2	2.08	104
LCS1	Simazine	ug/l	2	1.82	91
LCS1	Thiobencarb	ug/l	2	2.11	106
MBLK	alpha-Chlordane	ug/l	ND	ND	
MBLK	Acenaphthylene	ug/l	ND	ND	
MBLK	Alachlor	ug/l	ND	ND	
MBLK	Aldrin	ug/l	ND	ND	
MBLK	Anthracene	ug/l	ND	ND	
MBLK	Atrazine	ug/l	ND	ND	
MBLK	Benz(a)Anthracene	ug/l	ND	ND	
MBLK	Benzo(a)pyrene	ug/l	ND	ND	
MBLK	Benzo(b)Fluoranthene	ug/l	ND	ND	
MBLK	Benzo(g,h,i)Perylene	ug/l	ND	ND	
MBLK	Benzo(k)Fluoranthene	ug/l	ND	ND	
MBLK	Di(2-Ethylhexyl)phthalate	ug/l	ND	ND	
MBLK	Butylbenzylphthalate	ug/l	ND	ND	
MBLK	Bromacil	ug/l	ND	ND	
MBLK	Butachlor	ug/l	ND	ND	
MBLK	Caffeine	ug/l	ND	ND	
MBLK	Chrysene	ug/l	ND	ND	
MBLK	Dibenz(a,h)Anthracene	ug/l	ND	ND	
MBLK	Di-(2-Ethylhexyl)adipate	ug/l	ND	ND	
MBLK	Diethylphthalate	ug/l	ND	ND	
MBLK	Diazinon	ug/l	ND	ND	
MBLK	Dieldrin	ug/l	ND	ND	
MBLK	Dimethylphthalate	ug/l	ND	ND	
MBLK	Dimethoate	ug/l	ND	ND	
MBLK	Di-n-Butylphthalate	ug/l	ND	0.31J	

Report #: 23367

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Laboratory Report

Kauai Water Department
P.O. Box 1706

Lihue , HI 96766
ATTN: Wayne Hinazumi

Sample # 951006045 Sample ID HANAPEPE TOWN 404-036 Project PHASEV
Sample Type Water Sampled 05-oct-1995 Received 06-oct-1995 Reported 08-nov-1995

525 Semivolatiles by GC/MS (ML/EPA 525.2)
Quality Control

Control	Parameter	Units	Actual	Found	%Recv
MBLK	Endrin	ug/l	ND	ND	
MBLK	Fluorene	ug/l	ND	ND	
MBLK	gamma-Chlordane	ug/l	ND	ND	
MBLK	Hexachlorobenzene	ug/l	ND	ND	
MBLK	Hexachlorocyclopentadiene	ug/l	ND	ND	
MBLK	Heptachlor	ug/l	ND	ND	
MBLK	Heptachlor Epoxide	ug/l	ND	ND	
MBLK	Indeno(1,2,3,c,d)Pyrene	ug/l	ND	ND	
MBLK	Isophorone	ug/l	ND	ND	
MBLK	Lindane	ug/l	ND	ND	
MBLK	Methoxychlor	ug/l	ND	ND	
MBLK	Metribuzin	ug/l	ND	ND	
MBLK	Molinate	ug/l	ND	ND	
MBLK	Metolachlor	ug/l	ND	ND	
MBLK	trans-Nonachlor	ug/l	ND	ND	
MBLK	Pentachlorophenol	ug/l	ND	ND	
MBLK	Phenanthrene	ug/l	ND	ND	
MBLK	Prometryn	ug/l	ND	ND	
MBLK	Propachlor	ug/l	ND	ND	
MBLK	Pyrene	ug/l	ND	ND	
MBLK	Simazine	ug/l	ND	ND	
MBLK	Thiobencarb	ug/l	ND	ND	
MBLK	Trifluralin	ug/l	ND	ND	
MS	alpha-Chlordane	ug/l	2	1.84	92
MS	Acenaphthylene	ug/l	2	1.73	86
MS	Alachlor	ug/l	2	2.05	102
MS	Aldrin	ug/l	2	1.79	90
MS	Anthracene	ug/l	2	1.60	80
MS	Atrazine	ug/l	2	1.92	96
MS	Benz(a)Anthracene	ug/l	2	1.78	89
MS	Benzo(a)pyrene	ug/l	2	1.62	81

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Laboratory Report

Kauai Water Department
P.O. Box 1706

Lihue , HI 96766
ATTN: Wayne Hinazumi

Sample # 9510006045 Sample ID HANAPEPE TOWN 404-036 Project PHASEV
Sample Type Water Sampled 05-oct-1995 Received 06-oct-1995 Reported 08-nov-1995

525 Semivolatiles by GC/MS (ML/EPA 525.2)
Quality Control

Control	Parameter	Units	Actual	Found	%Recv
MS	Benzo(b)Fluoranthene	ug/l	2	1.83	92
MS	Benzo(g,h,i)Perylene	ug/l	2	1.76	88
MS	Benzo(k)Fluoranthene	ug/l	2	1.79	90
MS	Di(2-Ethylhexyl)phthalate	ug/l	2	1.90	95
MS	Butylbenzylphthalate	ug/l	2	2.00	100
MS	Caffeine	ug/l	2	1.46	73
MS	Chrysene	ug/l	2	2.01	100
MS	Dibenz(a,h)Anthracene	ug/l	2	1.59	80
MS	Di-(2-Ethylhexyl)adipate	ug/l	2	1.78	89
MS	Diethylphthalate	ug/l	2	1.99	100
MS	Dimethylphthalate	ug/l	2	1.69	84
MS	Di-n-Butylphthalate	ug/l	2	1.91	96
MS	Endrin	ug/l	2	1.72	86
MS	Fluorene	ug/l	2	1.72	86
MS	gamma-Chlordane	ug/l	2	1.80	90
MS	Hexachlorobenzene	ug/l	2	1.71	86
MS	Hexachlorocyclopentadiene	ug/l	2	1.58	79
MS	Heptachlor	ug/l	2	1.84	92
MS	Heptachlor Epoxide	ug/l	2	1.84	92
MS	Indeno(1,2,3,c,d)Pyrene	ug/l	2	1.71	86
MS	Lindane	ug/l	2	1.93	96
MS	Methoxychlor	ug/l	2	2.13	106
MS	Molinate	ug/l	2	1.86	93
MS	trans-Nonachlor	ug/l	2	1.91	96
MS	Pentachlorophenol	ug/l	8	7.38	92
MS	Phenanthrene	ug/l	2	1.83	92
MS	Pyrene	ug/l	2	2.12	106
MS	Simazine	ug/l	2	1.76	88
MS	Thiobencarb	ug/l	2	2.03	102

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Laboratory Report

Kauai Water Department
P.O. Box 1706

Lihue , HI 96766
ATTN: Wayne Hinazumi

Sample # 951006045 Sample ID HANAPEPE TOWN 404-036 Project PHASEV
Sample Type Water Sampled 05-oct-1995 Received 06-oct-1995 Reported 08-nov-1995

Herbicides by 515.1 (ML/EPA 515.1)

Parameter	Units	Result	Conc.	%Rec	Dilution	Det.Limit	Prepared	By	Analyzed	By
2,4,5-T	ug/l	ND				0.2	12-oct-1995	mbr	03-nov-1995	dat
2,4,5-TP (Silvex)	ug/l	ND				0.2	12-oct-1995	mbr	03-nov-1995	dat
2,4-D	ug/l	ND				0.1	12-oct-1995	mbr	03-nov-1995	dat
2,4-DB	ug/l	ND				2	12-oct-1995	mbr	03-nov-1995	dat
Dichlorprop	ug/l	ND				0.5	12-oct-1995	mbr	03-nov-1995	dat
5-Hydroxydicamba	ug/l	ND				0.2	12-oct-1995	mbr	03-nov-1995	dat
Acifluorfen (qualitative)	ug/l	ND				0.2	12-oct-1995	mbr	03-nov-1995	dat
Bentazon	ug/l	ND				0.5	12-oct-1995	mbr	03-nov-1995	dat
Chloramben (qualitative)	ug/l	ND				0.5	12-oct-1995	mbr	03-nov-1995	dat
Dalapon (qualitative)	ug/l	ND				1	12-oct-1995	mbr	03-nov-1995	dat
3,5-Dichlorobenzoic acid	ug/l	ND				0.6	12-oct-1995	mbr	03-nov-1995	dat
DCPA	ug/l	ND				0.2	12-oct-1995	mbr	03-nov-1995	dat
Dicamba	ug/l	ND				0.2	12-oct-1995	mbr	03-nov-1995	dat
Dinoseb	ug/l	ND				0.2	12-oct-1995	mbr	03-nov-1995	dat
Pentachlorophenol	ug/l	ND				0.04	12-oct-1995	mbr	03-nov-1995	dat
Picloram	ug/l	ND				0.1	12-oct-1995	mbr	03-nov-1995	dat
4-Nitrophenol (qualitative)	ug/l	ND				5	12-oct-1995	mbr	03-nov-1995	dat
Data Entry	--	11/07/95				0	12-oct-1995	mbr	03-nov-1995	dat

Report #: 23367

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Laboratory Report

Kauai Water Department
P.O. Box 1706

Lihue , HI 96766
ATTN: Wayne Hinazumi

Sample # 951006045 Sample ID HANAPEPE TOWN 404-036 Project PHASEV
Sample Type Water Sampled 05-oct-1995 Received 06-oct-1995 Reported 08-nov-1995

Herbicides by 515.1 (ML/EPA 515.1)
Surrogate Summary

Parameter	Percent Recovery	Acceptable Range
2,4-Dichlorophenylacetic acid	106	70 - 130

Report #: 23367

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Kauai Water Department
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ATTN: Wayne Hinazumi

Sample # 951006045 Sample ID HANAPEPE TOWN 404-036 Project PHASEV
Sample Type Water Sampled 05-oct-1995 Received 06-oct-1995 Reported 08-nov-1995

Herbicides by 515.1 (ML/EPA 515.1)
Quality Control

Control	Parameter	Units	Actual	Found	%Recv
LCS1	2,4,5-TP (Silvex)	ug/l	0.500	0.48	96
LCS1	2,4-D	ug/l	1.00	0.86	86
LCS1	Bentazon	ug/l	1.00	0.88	88
LCS2	2,4,5-TP (Silvex)	ug/l	0.500	NA	
LCS2	2,4-D	ug/l	1.00	NA	
LCS2	Bentazon	ug/l	1.00	NA	
MBLK	2,4,5-T	ug/l	ND	ND	
MBLK	2,4,5-TP (Silvex)	ug/l	ND	ND	
MBLK	2,4-D	ug/l	ND	ND	
MBLK	2,4-DB	ug/l	ND	ND	
MBLK	Dichlorprop	ug/l	ND	ND	
MBLK	5-Hydroxydicamba	ug/l	ND	ND	
MBLK	Acifluorfen (qualitative)	ug/l	ND	ND	
MBLK	Bentazon	ug/l	ND	ND	
MBLK	Chloramben (qualitative)	ug/l	ND	ND	
MBLK	Dalapon (qualitative)	ug/l	ND	ND	
MBLK	3,5-Dichlorobenzoic acid	ug/l	ND	ND	
MBLK	DCPA	ug/l	ND	ND	
MBLK	Dicamba	ug/l	ND	ND	
MBLK	Dinoseb	ug/l	ND	ND	
MBLK	Pentachlorophenol	ug/l	ND	ND	
MBLK	Picloram	ug/l	ND	ND	
MBLK	4-Nitrophenol (qualitative)	ug/l	ND	ND	
MS	2,4,5-TP (Silvex)	ug/l	0.500	0.46	92
MS	2,4-D	ug/l	1.00	0.90	90
MS	Bentazon	ug/l	1.00	0.95	95
MSD	2,4,5-TP (Silvex)	ug/l	0.500	NA	
MSD	2,4-D	ug/l	1.00	NA	
MSD	Bentazon	ug/l	1.00	NA	

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Kauai Water Department
P.O. Box 1706

Lihue , HI 96766
ATTN: Wayne Hinazumi

Sample # 9510060-45 Sample ID HANAPEPE TOWN 404-036 Project PHASE V
Sample Type Water Sampled 05-oct-1995 Received 06-oct-1995 Reported 08-nov-1995

SDWA Pesticides (ML/EPA 508)

Parameter	Units	Result	Conc.	%Rec	Dilution	Det.Limit	Prepared	By	Analyzed	By
PCB 1016 Aroclor	ug/l	ND				0.1	10-oct-1995	mbr	24-oct-1995	rok
PCB 1221 Aroclor	ug/l	ND				0.1	10-oct-1995	mbr	24-oct-1995	rok
PCB 1232 Aroclor	ug/l	ND				0.1	10-oct-1995	mbr	24-oct-1995	rok
PCB 1242 Aroclor	ug/l	ND				0.1	10-oct-1995	mbr	24-oct-1995	rok
PCB 1248 Aroclor	ug/l	ND				0.1	10-oct-1995	mbr	24-oct-1995	rok
PCB 1254 Aroclor	ug/l	ND				0.1	10-oct-1995	mbr	24-oct-1995	rok
PCB 1260 Aroclor	ug/l	ND				0.1	10-oct-1995	mbr	24-oct-1995	rok
Alpha-BHC	ug/l	ND				0.01	10-oct-1995	mbr	24-oct-1995	rok
Alachlor (Alanex)	ug/l	ND				0.05	10-oct-1995	mbr	24-oct-1995	rok
Aldrin	ug/l	ND				0.01	10-oct-1995	mbr	24-oct-1995	rok
Beta-BHC	ug/l	ND				0.01	10-oct-1995	mbr	24-oct-1995	rok
Chlordane	ug/l	ND				0.1	10-oct-1995	mbr	24-oct-1995	rok
Chlorthalonil (Drconil, Bravo)	ug/l	NA				0.01	10-oct-1995	mbr	24-oct-1995	rok
Delta-BHC	ug/l	ND				0.01	10-oct-1995	mbr	24-oct-1995	rok
p,p' DDD	ug/l	ND				0.01	10-oct-1995	mbr	24-oct-1995	rok
p,p' DDE	ug/l	ND				0.01	10-oct-1995	mbr	24-oct-1995	rok
p,p' DDT	ug/l	ND				0.01	10-oct-1995	mbr	24-oct-1995	rok
Dieldrin	ug/l	ND				0.01	10-oct-1995	mbr	24-oct-1995	rok
Endrin Aldehyde	ug/l	ND				0.01	10-oct-1995	mbr	24-oct-1995	rok
Endrin	ug/l	ND				0.01	10-oct-1995	mbr	24-oct-1995	rok
Endosulfan I (alpha)	ug/l	ND				0.01	10-oct-1995	mbr	24-oct-1995	rok
Endosulfan II (beta)	ug/l	ND				0.01	10-oct-1995	mbr	24-oct-1995	rok
Endosulfan sulfate	ug/l	ND				0.01	10-oct-1995	mbr	24-oct-1995	rok
Heptachlor	ug/l	ND				0.01	10-oct-1995	mbr	24-oct-1995	rok
Heptachlor Epoxide	ug/l	ND				0.01	10-oct-1995	mbr	24-oct-1995	rok
Lindane (gamma-BHC)	ug/l	ND				0.01	10-oct-1995	mbr	24-oct-1995	rok
Methoxychlor	ug/l	ND				0.05	10-oct-1995	mbr	24-oct-1995	rok
Toxaphene	ug/l	ND				0.5	10-oct-1995	mbr	24-oct-1995	rok
Data Entry	--	10/27/95				0	10-oct-1995	mbr	24-oct-1995	rok

Report #: 23367

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Laboratory Report

Kauai Water Department
P.O. Box 1706

Lihue , HI 96766
ATTN: Wayne Hinazumi

Sample # 951006045 Sample ID HANAPEPE TOWN 404-036 Project PHASEV
Sample Type Water Sampled 05-oct-1995 Received 06-oct-1995 Reported 08-nov-1995

SDWA Pesticides (ML/EPA 508)
Surrogate Summary

Parameter	Percent Recovery	Acceptable Range
Dibutyl Chlorendate	96	70 - 130
Tetrachlorometaxylene	100	70 - 130

Report #: 23367

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Laboratory Report

Kauai Water Department
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Lihue , HI 96766
ATTN: Wayne Hinazumi

Sample # 951006045 Sample ID HANAPEPE TOWN 404-036 Project PHASEV
Sample Type Water Sampled 05-oct-1995 Received 06-oct-1995 Reported 08-nov-1995

SDWA Pesticides (ML/EPA 508)
Quality Control

Control	Parameter	Units	Actual	Found	%Recv
LCS1	Aldrin	ug/l	0.050	0.036	72
LCS1	p,p' DDT	ug/l	0.100	0.130	130
LCS1	Dieldrin	ug/l	0.100	0.102	102
LCS1	Endrin	ug/l	0.100	0.103	103
LCS1	Gamma-BHC (Lindane)	ug/l	0.050	0.048	96
LCS1	Heptachlor	ug/l	0.050	0.037	74
LCS2	Aldrin	ug/l	0.050	NA	
LCS2	p,p' DDT	ug/l	0.100	NA	
LCS2	Dieldrin	ug/l	0.100	NA	
LCS2	Endrin	ug/l	0.100	NA	
LCS2	Gamma-BHC (Lindane)	ug/l	0.050	NA	
LCS2	Heptachlor	ug/l	0.050	NA	
MBLK	PCB 1016 Aroclor	ug/l	ND	ND	
MBLK	PCB 1221 Aroclor	ug/l	ND	ND	
MBLK	PCB 1232 Aroclor	ug/l	ND	ND	
MBLK	PCB 1242 Aroclor	ug/l	ND	ND	
MBLK	PCB 1248 Aroclor	ug/l	ND	ND	
MBLK	PCB 1254 Aroclor	ug/l	ND	ND	
MBLK	PCB 1260 Aroclor	ug/l	ND	ND	
MBLK	Alpha-BHC	ug/l	ND	ND	
MBLK	Alachlor (Alanex)	ug/l	ND	ND	
MBLK	Aldrin	ug/l	ND	ND	
MBLK	Chlordane	ug/l	ND	ND	
MBLK	Chlorthalonil (Drconil, Bravo)	ug/l	ND	ND	
MBLK	Delta-BHC	ug/l	ND	ND	
MBLK	p,p' DDD	ug/l	ND	ND	
MBLK	p,p' DDE	ug/l	ND	ND	
MBLK	p,p' DDT	ug/l	ND	ND	
MBLK	Dieldrin	ug/l	ND	ND	
MBLK	Endrin Aldehyde	ug/l	ND	ND	
MBLK	Endrin	ug/l	ND	ND	

Report #: 23367

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Kauai Water Department
P.O. Box 1706

Lihue , HI 96766
ATTN: Wayne Hinazumi

Sample # 951006045 Sample ID HANAPEPE TOWN 404-036 Project PHASEV
Sample Type Water Sampled 05-oct-1995 Received 06-oct-1995 Reported 08-nov-1995

SDWA Pesticides (ML/EPA 508)
Quality Control

Control	Parameter	Units	Actual	Found	%Recv
MBLK	Endosulfan I (alpha)	ug/l	ND	ND	
MBLK	Endosulfan II (beta)	ug/l	ND	ND	
MBLK	Endosulfan sulfate	ug/l	ND	ND	
MBLK	Gamma-BHC (Lindane)	ug/l	ND	ND	
MBLK	Heptachlor	ug/l	ND	ND	
MBLK	Heptachlor Epoxide	ug/l	ND	ND	
MBLK	Methoxychlor	ug/l	ND	ND	
MBLK	Toxaphene	ug/l	ND	ND	
MS	Aldrin	ug/l	0.050	0.043	86
MS	P,P' DDT	ug/l	0.100	0.130	130
MS	Dieldrin	ug/l	0.100	0.113	113
MS	Endrin	ug/l	0.100	0.107	107
MS	Gamma-BHC (Lindane)	ug/l	0.050	0.048	96
MS	Heptachlor	ug/l	0.050	0.047	94

Report #: 23367

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HANAPEPE WELL 25-1

Laboratory Report

for

Kauai Water Department
P.O. Box 1706

Lihue, HI 96766

Attention: Wayne Hinazumi

Report#: 23367

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10/23/1995

Laboratory
Report
#23367

Kauai Water Department
Wayne Hinazumi
P.O. Box 1706
Lihue , HI 96766

Sample Received
06-oct-1995 15:24:26

Date Sampled
10/05/95

Sample# 951006046 Location: HANAPEPE VALLEY 404-037

Parameter	Units	Result	MDL	MCL	Prepared	Analyzed
Pesticides (ML/EPA 508)						
Toxaphene	ug/l	ND	0.50	3	10/10/95	10/24/95
PCB's	ug/l	ND	0.10	0.5	10/10/95	10/24/95
Herbicides/Chlorinated Acids in Water (ML/EPA 515.1)						
2,4,5-TP (Silvex)	ug/l	ND	0.20	50	10/12/95	11/03/95
2,4-D	ug/l	ND	0.10	70	10/12/95	11/03/95
Dalapon (qualitative)	ug/l	ND	1	200	10/12/95	11/03/95
Dinoseb	ug/l	ND	0.20	7	10/12/95	11/03/95
Pentachlorophenol	ug/l	ND	0.040	1	10/12/95	11/03/95
Picloram	ug/l	ND	0.10	500	10/12/95	11/03/95
Semivolatiles/Synthetic Organics in Water (ML/EPA 525.2)						
Benzo(a)pyrene	ug/l	ND	0.020	0.2	10/12/95	10/18/95
Di-(2-Ethylhexyl)adipate	ug/l	ND	0.60	400	10/12/95	10/18/95
Di(2-Ethylhexyl)phthalate	ug/l	ND	0.60	6	10/12/95	10/18/95
Endothall in Water (ML/EPA 548.1)						
Endothall	ug/l	ND	5	100	10/11/95	10/13/95
Diquat in Water (ML/EPA 549.1)						
Diquat	ug/l	ND	0.40	20	10/11/95	10/16/95
Dioxin (2,3,7,8-TCDD) in Water (ML/EPA 1613)						
2,3,7,8 - Dioxin	Picograms/L	ND	1	30	10/13/95	10/17/95
Cyanide in Water (ML/SM 4500 CN-F)						
Cyanide	mg/l	ND	0.025	0.2		10/17/95

Report 23367 Comment Page

Group Validation Comments

Result for TCDD analysis submitted by Quanterra Environmenta
l Services.
(508) Low recovery for chlorothalonil, high recoveries for DDT and methoxychlor on continuing calibration standards; chlrothalonil reported as NA. Reference QIR-GC-95-189.

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Laboratory Report

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Lihue , HI 96766
ATTN: Wayne Hinazumi

Sample # 951006046 Sample ID HANAPEPE VALLEY 404-037 Project PHASEV
Sample Type Water Sampled 05-oct-1995 Received 06-oct-1995 Reported 08-nov-1995

Parameter		Units	Result	Conc.	%Rec	Dilution	Det.Limit	Prepared	By	Analyzed	By
Cyanide	(ML/SM 4500)	mg/l	ND				0.025			17-oct-1995	huy
Endothall	(ML/EPA 548.1)	ug/l	ND				5	11-oct-1995	rvd	13-oct-1995	crw
2,3,7,8 - Dioxin	(1613)	Picograms/L	ND				1	13-oct-1995	col	17-oct-1995	col

Report #: 23367

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Sample # 951006046 Sample ID HANAPEPE VALLEY 404-037 Project PHASEV
Sample Type Water Sampled 05-oct-1995 Received 06-oct-1995 Reported 08-nov-1995

Single Determination Analytes
Quality Control

Control	Parameter	Units	Actual	Found	%Recv
LCS1	Cyanide	mg/l	0.10	0.099	99
MBLK	Cyanide	mg/l	ND	ND	
MS	Cyanide	mg/l	0.10	0.0982	98
MSD	Cyanide	mg/l	0.10	0.0868	87
LCS1	Endothall	ug/l	25	21.8	87
MBLK	Endothall	ug/l	ND	ND	
MS	Endothall	ug/l	25	20.9	84

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Kauai Water Department
P.O. Box 1706

Lihue , HI 96766
ATTN: Wayne Hinazumi

Sample # 951006046 Sample ID HANAPEPE VALLEY 404-037 Project PHASE V
Sample Type Water Sampled 05-oct-1995 Received 06-oct-1995 Reported 08-nov-1995

Diquat and Paraquat (ML/EPA 549.1)

Parameter	Units	Result	Conc.	%Rec	Dilution	Det.Limit	Prepared	By	Analyzed	By
Diquat	ug/l	ND				0.4	11-oct-1995	cfl	16-oct-1995	yka
Paraquat	ug/l	ND				2	11-oct-1995	cfl	16-oct-1995	yka

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ATTN: Wayne Hinazumi

Sample # 951006046 Sample ID HANAPEPE VALLEY 404-037 Project PHASEV
Sample Type Water Sampled 05-oct-1995 Received 06-oct-1995 Reported 08-nov-1995

Diquat and Paraquat (ML/EPA 549.1)
Quality Control

Control	Parameter	Units	Actual	Found	%Recv
LCS1	Diquat	ug/l	10.0	11.0	110
LCS1	Paraquat	ug/l	10.0	8.9	89
MBLK	Diquat	ug/l	ND	ND	
MBLK	Paraquat	ug/l	ND	ND	
MS	Diquat	ug/l	10.0	11.0	110
MS	Paraquat	ug/l	10.0	8.9	89

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ATTN: Wayne Hinazumi

Sample # 951006046 Sample ID HANAPEPE VALLEY 404-037 Project PHASEV
Sample Type Water Sampled 05-oct-1995 Received 06-oct-1995 Reported 08-nov-1995

525 Semivolatiles by GC/MS (ML/EPA 525.2)

Parameter	Units	Result	Conc.	%Rec	Dilution	Det.Limit	Prepared	By	Analyzed	By
2,4-Dinitrotoluene	ug/l	ND				0.1	12-oct-1995	rod	18-oct-1995	crw
alpha-Chlordane	ug/l	ND				0.05	12-oct-1995	rod	18-oct-1995	crw
Acenaphthylene	ug/l	ND				0.1	12-oct-1995	rod	18-oct-1995	crw
Alachlor	ug/l	ND				0.05	12-oct-1995	rod	18-oct-1995	crw
Aldrin	ug/l	ND				0.05	12-oct-1995	rod	18-oct-1995	crw
Anthracene	ug/l	ND				0.02	12-oct-1995	rod	18-oct-1995	crw
Atrazine	ug/l	ND				0.05	12-oct-1995	rod	18-oct-1995	crw
Benz(a)Anthracene	ug/l	ND				0.05	12-oct-1995	rod	18-oct-1995	crw
Benzo(a)pyrene	ug/l	ND				0.02	12-oct-1995	rod	18-oct-1995	crw
Benzo(b)Fluoranthene	ug/l	ND				0.02	12-oct-1995	rod	18-oct-1995	crw
Benzo(g,h,i)Perylene	ug/l	ND				0.05	12-oct-1995	rod	18-oct-1995	crw
Benzo(k)Fluoranthene	ug/l	ND				0.02	12-oct-1995	rod	18-oct-1995	crw
Bi(2-Ethylhexyl)phthalate	ug/l	ND				0.6	12-oct-1995	rod	18-oct-1995	crw
Butylbenzylphthalate	ug/l	ND				0.5	12-oct-1995	rod	18-oct-1995	crw
Bromacil	ug/l	ND				2	12-oct-1995	rod	18-oct-1995	crw
Butachlor	ug/l	ND				0.05	12-oct-1995	rod	18-oct-1995	crw
Caffeine	ug/l	ND				0.02	12-oct-1995	rod	18-oct-1995	crw
Chrysene	ug/l	ND				0.02	12-oct-1995	rod	18-oct-1995	crw
Dibenz(a,h)Anthracene	ug/l	ND				0.05	12-oct-1995	rod	18-oct-1995	crw
Di-(2-Ethylhexyl)adipate	ug/l	ND				0.6	12-oct-1995	rod	18-oct-1995	crw
Diethylphthalate	ug/l	ND				0.5	12-oct-1995	rod	18-oct-1995	crw
Dieldrin	ug/l	ND				0.2	12-oct-1995	rod	18-oct-1995	crw
Dimethylphthalate	ug/l	ND				0.5	12-oct-1995	rod	18-oct-1995	crw
Dimethoate	ug/l	ND				10	12-oct-1995	rod	18-oct-1995	crw
Di-n-Butylphthalate	ug/l	ND				0.5	12-oct-1995	rod	18-oct-1995	crw
Endrin	ug/l	ND				0.1	12-oct-1995	rod	18-oct-1995	crw
Fluorene	ug/l	ND				0.05	12-oct-1995	rod	18-oct-1995	crw
gamma-Chlordane	ug/l	ND				0.05	12-oct-1995	rod	18-oct-1995	crw
Hexachlorobenzene	ug/l	ND				0.05	12-oct-1995	rod	18-oct-1995	crw

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Sample # 951006046 Sample ID HANAPEPE VALLEY 404-037 Project PHASEV
Sample Type Water Sampled 05-oct-1995 Received 06-oct-1995 Reported 08-nov-1995

525 Semivolatiles by GC/MS (ML/EPA 525.2)

Parameter	Units	Result	Conc.	%Rec	Dilution	Det.Limit	Prepared	By	Analyzed	By
Hexachlorocyclopentadiene	ug/l	ND				0.05	12-oct-1995	rod	18-oct-1995	crw
Heptachlor	ug/l	ND				0.04	12-oct-1995	rod	18-oct-1995	crw
Heptachlor Epoxide	ug/l	ND				0.02	12-oct-1995	rod	18-oct-1995	crw
Indeno(1,2,3,c,d)Pyrene	ug/l	ND				0.05	12-oct-1995	rod	18-oct-1995	crw
Isophorone	ug/l	ND				0.5	12-oct-1995	rod	18-oct-1995	crw
Lindane	ug/l	ND				0.02	12-oct-1995	rod	18-oct-1995	crw
Methoxychlor	ug/l	ND				0.05	12-oct-1995	rod	18-oct-1995	crw
Metribuzin	ug/l	ND				0.05	12-oct-1995	rod	18-oct-1995	crw
Molinate	ug/l	ND				0.2	12-oct-1995	rod	18-oct-1995	crw
Metolachlor	ug/l	ND				0.05	12-oct-1995	rod	18-oct-1995	crw
trans-Nonachlor	ug/l	ND				0.05	12-oct-1995	rod	18-oct-1995	crw
Pentachlorophenol	ug/l	ND				1	12-oct-1995	rod	18-oct-1995	crw
Phenanthrene	ug/l	ND				0.02	12-oct-1995	rod	18-oct-1995	crw
Prometryn	ug/l	ND				0.5	12-oct-1995	rod	18-oct-1995	crw
Propachlor	ug/l	ND				0.05	12-oct-1995	rod	18-oct-1995	crw
Pyrene	ug/l	ND				0.05	12-oct-1995	rod	18-oct-1995	crw
Simazine	ug/l	ND				0.05	12-oct-1995	rod	18-oct-1995	crw
Thiobencarb	ug/l	ND				0.2	12-oct-1995	rod	18-oct-1995	crw
Trifluralin	ug/l	ND				0.1	12-oct-1995	rod	18-oct-1995	crw

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Sample Type Water Sampled 05-oct-1995 Received 06-oct-1995 Reported 08-nov-1995

525 Semivolatiles by GC/MS (ML/EPA 525.2)
Surrogate Summary

Parameter	Percent Recovery	Acceptable Range
Perylene-d12	90	70 - 130

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525 Semivolatiles by GC/MS (ML/EPA 525.2)
Quality Control

Control	Parameter	Units	Actual	Found	%Recv
LCS1	alpha-Chlordane	ug/l	2	1.94	97
LCS1	Acenaphthylene	ug/l	2	1.73	86
LCS1	Alachlor	ug/l	2	1.89	94
LCS1	Aldrin	ug/l	2	1.56	78
LCS1	Anthracene	ug/l	2	1.74	87
LCS1	Atrazine	ug/l	2	1.98	99
LCS1	Benz(a)Anthracene	ug/l	2	1.87	94
LCS1	Benzo(a)pyrene	ug/l	2	1.79	90
LCS1	Benzo(b)Fluoranthene	ug/l	2	1.85	92
LCS1	Benzo(g,h,i)Perylene	ug/l	2	1.94	97
LCS1	Benzo(k)Fluoranthene	ug/l	2	1.92	96
LCS1	Di(2-Ethylhexyl)phthalate	ug/l	2	1.95	98
LCS1	Butylbenzylphthalate	ug/l	2	2.13	106
LCS1	Caffeine	ug/l	2	1.63	82
LCS1	Chrysene	ug/l	2	1.95	98
LCS1	Dibenz(a,h)Anthracene	ug/l	2	1.86	93
LCS1	Di-(2-Ethylhexyl)adipate	ug/l	2	1.77	88
LCS1	Diethylphthalate	ug/l	2	2.11	106
LCS1	Dimethylphthalate	ug/l	2	1.78	89
LCS1	Di-n-Butylphthalate	ug/l	2	2.28	114
LCS1	Endrin	ug/l	2	1.81	90
LCS1	Fluorene	ug/l	2	1.92	96
LCS1	gamma-Chlordane	ug/l	2	1.88	94
LCS1	Hexachlorobenzene	ug/l	2	1.85	92
LCS1	Hexachlorocyclopentadiene	ug/l	2	1.61	80
LCS1	Heptachlor	ug/l	2	1.86	93
LCS1	Heptachlor Epoxide	ug/l	2	1.99	100
LCS1	Indeno(1,2,3,c,d)Pyrene	ug/l	2	1.84	92
LCS1	Lindane	ug/l	2	2.01	100
LCS1	Methoxychlor	ug/l	2	2.14	107
LCS1	Molinate	ug/l	2	2.06	103

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Sample Type Water Sampled 05-oct-1995 Received 06-oct-1995 Reported 08-nov-1995

525 Semivolatiles by GC/MS (ML/EPA 525.2)
Quality Control

Control	Parameter	Units	Actual	Found	%Recv
LCS1	trans-Nonachlor	ug/l	2	1.98	99
LCS1	Pentachlorophenol	ug/l	8	7.02	88
LCS1	Phenanthrene	ug/l	2	1.98	99
LCS1	Pyrene	ug/l	2	2.08	104
LCS1	Simazine	ug/l	2	1.82	91
LCS1	Thiobencarb	ug/l	2	2.11	106
MBLK	alpha-Chlordane	ug/l	ND	ND	
MBLK	Acenaphthylene	ug/l	ND	ND	
MBLK	Alachlor	ug/l	ND	ND	
MBLK	Aldrin	ug/l	ND	ND	
MBLK	Anthracene	ug/l	ND	ND	
MBLK	Atrazine	ug/l	ND	ND	
MBLK	Benz(a)Anthracene	ug/l	ND	ND	
MBLK	Benzo(a)pyrene	ug/l	ND	ND	
MBLK	Benzo(b)Fluoranthene	ug/l	ND	ND	
MBLK	Benzo(g,h,i)Perylene	ug/l	ND	ND	
MBLK	Benzo(k)Fluoranthene	ug/l	ND	ND	
MBLK	Di(2-Ethylhexyl)phthalate	ug/l	ND	ND	
MBLK	Butylbenzylphthalate	ug/l	ND	ND	
MBLK	Bromacil	ug/l	ND	ND	
MBLK	Butachlor	ug/l	ND	ND	
MBLK	Caffeine	ug/l	ND	ND	
MBLK	Chrysene	ug/l	ND	ND	
MBLK	Dibenz(a,h)Anthracene	ug/l	ND	ND	
MBLK	Di-(2-Ethylhexyl)adipate	ug/l	ND	ND	
MBLK	Diethylphthalate	ug/l	ND	ND	
MBLK	Diazinon	ug/l	ND	ND	
MBLK	Dieldrin	ug/l	ND	ND	
MBLK	Dimethylphthalate	ug/l	ND	ND	
MBLK	Dimethoate	ug/l	ND	ND	
MBLK	Di-n-Butylphthalate	ug/l	ND	0.38J	

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Sample Type Water Sampled 05-oct-1995 Received 06-oct-1995 Reported 08-nov-1995

525 Semivolatiles by GC/MS (ML/EPA 525.2)
Quality Control

Control	Parameter	Units	Actual	Found	%Recv
MBLK	Endrin	ug/l	ND	ND	
MBLK	Fluorene	ug/l	ND	ND	
MBLK	gamma-Chlordane	ug/l	ND	ND	
MBLK	Hexachlorobenzene	ug/l	ND	ND	
MBLK	Hexachlorocyclopentadiene	ug/l	ND	ND	
MBLK	Heptachlor	ug/l	ND	ND	
MBLK	Heptachlor Epoxide	ug/l	ND	ND	
MBLK	Indeno(1,2,3,c,d)Pyrene	ug/l	ND	ND	
MBLK	Isophorone	ug/l	ND	ND	
MBLK	Lindane	ug/l	ND	ND	
MBLK	Methoxychlor	ug/l	ND	ND	
MBLK	Metribuzin	ug/l	ND	ND	
MBLK	Molinate	ug/l	ND	ND	
MBLK	Metolachlor	ug/l	ND	ND	
MBLK	trans-Nonachlor	ug/l	ND	ND	
MBLK	Pentachlorophenol	ug/l	ND	ND	
MBLK	Phenanthrene	ug/l	ND	ND	
MBLK	Prometryn	ug/l	ND	ND	
MBLK	Propachlor	ug/l	ND	ND	
MBLK	Pyrene	ug/l	ND	ND	
MBLK	Simazine	ug/l	ND	ND	
MBLK	Thiobencarb	ug/l	ND	ND	
MBLK	Trifluralin	ug/l	ND	ND	
MS	alpha-Chlordane	ug/l	2	1.84	92
MS	Acenaphthylene	ug/l	2	1.73	86
MS	Alachlor	ug/l	2	2.05	102
MS	Aldrin	ug/l	2	1.79	90
MS	Anthracene	ug/l	2	1.60	80
MS	Atrazine	ug/l	2	1.92	96
MS	Benz(a)Anthracene	ug/l	2	1.78	89
MS	Benzo(a)pyrene	ug/l	2	1.62	81

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Sample Type Water Sampled 05-oct-1995 Received 06-oct-1995 Reported 08-nov-1995

525 Semivolatiles by GC/MS (ML/EPA 525.2)
Quality Control

Control	Parameter	Units	Actual	Found	%Recv
MS	Benzo(b)Fluoranthene	ug/l	2	1.83	92
MS	Benzo(g,h,i)Perylene	ug/l	2	1.76	88
MS	Benzo(k)Fluoranthene	ug/l	2	1.79	90
MS	Di(2-Ethylhexyl)phthalate	ug/l	2	1.90	95
MS	Butylbenzylphthalate	ug/l	2	2.00	100
MS	Caffeine	ug/l	2	1.46	73
MS	Chrysene	ug/l	2	2.01	100
MS	Dibenz(a,h)Anthracene	ug/l	2	1.59	80
MS	Di-(2-Ethylhexyl)adipate	ug/l	2	1.78	89
MS	Diethylphthalate	ug/l	2	1.99	100
MS	Dimethylphthalate	ug/l	2	1.69	84
MS	Di-n-Butylphthalate	ug/l	2	1.91	96
MS	Endrin	ug/l	2	1.72	86
MS	Fluorene	ug/l	2	1.72	86
MS	Gamma-Chlordane	ug/l	2	1.85	93
MS	Hexachlorobenzene	ug/l	2	1.71	86
MS	Hexachlorocyclopentadiene	ug/l	2	1.58	79
MS	Heptachlor	ug/l	2	1.84	92
MS	Heptachlor Epoxide	ug/l	2	1.84	92
MS	Indeno(1,2,3,c,d)Pyrene	ug/l	2	1.71	86
MS	Lindane	ug/l	2	1.93	96
MS	Methoxychlor	ug/l	2	2.13	106
MS	Molinate	ug/l	2	1.86	93
MS	trans-Nonachlor	ug/l	2	1.91	96
MS	Pentachlorophenol	ug/l	2	1.83	92
MS	Phenanthrene	ug/l	2	2.12	106
MS	Pyrene	ug/l	2	1.76	88
MS	Simazine	ug/l	2	2.03	102
MS	Thiobencarb	ug/l	2		

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Sample # 951006046 Sample ID HANAPEPE VALLEY 404-037 Project PHASEV
Sample Type Water Sampled 05-oct-1995 Received 06-oct-1995 Reported 08-nov-1995

Herbicides by 515.1 (ML/EPA 515.1)

Parameter	Units	Result	Conc.	%Rec	Dilution	Det.Limit	Prepared	By	Analyzed	By
2,4,5-T	ug/l	ND				0.2	12-oct-1995	mbr	03-nov-1995	dat
2,4,5-TP (Silvex)	ug/l	ND				0.2	12-oct-1995	mbr	03-nov-1995	dat
2,4-D	ug/l	ND				0.1	12-oct-1995	mbr	03-nov-1995	dat
2,4-DB	ug/l	ND				2	12-oct-1995	mbr	03-nov-1995	dat
Dichlorprop	ug/l	ND				0.5	12-oct-1995	mbr	03-nov-1995	dat
5-Hydroxydicamba	ug/l	ND				0.2	12-oct-1995	mbr	03-nov-1995	dat
Acifluorfen (qualitative)	ug/l	ND				0.2	12-oct-1995	mbr	03-nov-1995	dat
Bentazon	ug/l	ND				0.5	12-oct-1995	mbr	03-nov-1995	dat
Chloramben (qualitative)	ug/l	ND				0.5	12-oct-1995	mbr	03-nov-1995	dat
Dalapon (qualitative)	ug/l	ND				1	12-oct-1995	mbr	03-nov-1995	dat
3,5-Dichlorobenzoic acid	ug/l	ND				0.6	12-oct-1995	mbr	03-nov-1995	dat
DCPA	ug/l	ND				0.2	12-oct-1995	mbr	03-nov-1995	dat
Dicamba	ug/l	ND				0.2	12-oct-1995	mbr	03-nov-1995	dat
Dinoseb	ug/l	ND				0.2	12-oct-1995	mbr	03-nov-1995	dat
Pentachlorophenol	ug/l	ND				0.04	12-oct-1995	mbr	03-nov-1995	dat
Picloram	ug/l	ND				0.1	12-oct-1995	mbr	03-nov-1995	dat
4-Nitrophenol (qualitative)	ug/l	ND				5	12-oct-1995	mbr	03-nov-1995	dat
Data Entry	--	11/07/95				0	12-oct-1995	mbr	03-nov-1995	dat

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Sample Type Water Sampled 05-oct-1995 Received 06-oct-1995 Reported 08-nov-1995

Herbicides by 515.1 (ML/EPA 515.1)
Surrogate Summary

Parameter	Percent Recovery	Acceptable Range
2,4-Dichlorophenylacetic acid	100	70 - 130

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Sample Type Water Sampled 05-oct-1995 Received 06-oct-1995 Reported 08-nov-1995

Herbicides by 515.1 (ML/EPA 515.1)
Quality Control

Control	Parameter	Units	Actual	Found	%Recv
LCS1	2,4,5-TP (Silvex)	ug/l	0.500	0.48	96
LCS1	2,4-D	ug/l	1.00	0.86	86
LCS1	Bentazon	ug/l	1.00	0.88	88
LCS2	2,4,5-TP (Silvex)	ug/l	0.500	NA	
LCS2	2,4-D	ug/l	1.00	NA	
LCS2	Bentazon	ug/l	1.00	NA	
MBLK	2,4,5-T	ug/l	ND	ND	
MBLK	2,4,5-TP (Silvex)	ug/l	ND	ND	
MBLK	2,4-D	ug/l	ND	ND	
MBLK	2,4-DB	ug/l	ND	ND	
MBLK	Dichlorprop	ug/l	ND	ND	
MBLK	5-Hydroxydicamba	ug/l	ND	ND	
MBLK	Acifluorfen (qualitative)	ug/l	ND	ND	
MBLK	Bentazon	ug/l	ND	ND	
MBLK	Chloramben (qualitative)	ug/l	ND	ND	
MBLK	Dalapon (qualitative)	ug/l	ND	ND	
MBLK	3,5-Dichlorobenzoic acid	ug/l	ND	ND	
MBLK	DCPA	ug/l	ND	ND	
MBLK	Dicamba	ug/l	ND	ND	
MBLK	Dinoseb	ug/l	ND	ND	
MBLK	Pentachlorophenol	ug/l	ND	ND	
MBLK	Picloram	ug/l	ND	ND	
MBLK	4-Nitrophenol (qualitative)	ug/l	ND	ND	
MS	2,4,5-TP (Silvex)	ug/l	0.500	0.46	92
MS	2,4-D	ug/l	1.00	0.90	90
MS	Bentazon	ug/l	1.00	0.95	95
MSD	2,4,5-TP (Silvex)	ug/l	0.500	NA	
MSD	2,4-D	ug/l	1.00	NA	
MSD	Bentazon	ug/l	1.00	NA	

Report #: 23367

[illegible] LAB [illegible]
555 East Walnut Street
Pasadena, California 91101
818 568 6400; FAX 818 568 6324;
1 800 566 LABS (1 800 566 5227)

Lab to: Rep

Kauai Water Department
P.O. Box 1706

Lihue , HI 96766
ATTN: Wayne Hinazumi

Sample # 951006046 Sample ID HANAPEPE VALLEY 404-037 Project PHASEV
Sample Type Water Sampled 05-oct-1995 Received 06-oct-1995 Reported 08-nov-1995

SDWA Pesticides (ML/EPA 508)

Parameter	Units	Result	Conc.	%Rec	Dilution	Det.Limit	Prepared	By	Analyzed	By
PCB-1016 Aroclor	ug/l	ND				0.1	10-oct-1995	mbr	24-oct-1995	rok
PCB 1221 Aroclor	ug/l	ND				0.1	10-oct-1995	mbr	24-oct-1995	rok
PCB 1232 Aroclor	ug/l	ND				0.1	10-oct-1995	mbr	24-oct-1995	rok
PCB 1242 Aroclor	ug/l	ND				0.1	10-oct-1995	mbr	24-oct-1995	rok
PCB 1248 Aroclor	ug/l	ND				0.1	10-oct-1995	mbr	24-oct-1995	rok
PCB 1254 Aroclor	ug/l	ND				0.1	10-oct-1995	mbr	24-oct-1995	rok
PCB 1260 Aroclor	ug/l	ND				0.1	10-oct-1995	mbr	24-oct-1995	rok
Alpha-BHC	ug/l	ND				0.01	10-oct-1995	mbr	24-oct-1995	rok
Alachlor (Alanex)	ug/l	ND				0.05	10-oct-1995	mbr	24-oct-1995	rok
Aldrin	ug/l	ND				0.01	10-oct-1995	mbr	24-oct-1995	rok
Beta-BHC	ug/l	ND				0.01	10-oct-1995	mbr	24-oct-1995	rok
Chlordane	ug/l	ND				0.1	10-oct-1995	mbr	24-oct-1995	rok
Chlorthalonil (Drconil, Bravo)	ug/l	NA				0.01	10-oct-1995	mbr	24-oct-1995	rok
Delta-BHC	ug/l	ND				0.01	10-oct-1995	mbr	24-oct-1995	rok
p,p' DDD	ug/l	ND				0.01	10-oct-1995	mbr	24-oct-1995	rok
p,p' DDE	ug/l	ND				0.01	10-oct-1995	mbr	24-oct-1995	rok
p,p' DDT	ug/l	ND				0.01	10-oct-1995	mbr	24-oct-1995	rok
Dieldrin	ug/l	ND				0.01	10-oct-1995	mbr	24-oct-1995	rok
Endrin Aldehyde	ug/l	ND				0.01	10-oct-1995	mbr	24-oct-1995	rok
Endrin	ug/l	ND				0.01	10-oct-1995	mbr	24-oct-1995	rok
Endosulfan I (alpha)	ug/l	ND				0.01	10-oct-1995	mbr	24-oct-1995	rok
Endosulfan II (beta)	ug/l	ND				0.01	10-oct-1995	mbr	24-oct-1995	rok
Endosulfan sulfate	ug/l	ND				0.01	10-oct-1995	mbr	24-oct-1995	rok
Heptachlor	ug/l	ND				0.01	10-oct-1995	mbr	24-oct-1995	rok
Heptachlor Epoxide	ug/l	ND				0.01	10-oct-1995	mbr	24-oct-1995	rok
Lindane (gamma-BHC)	ug/l	ND				0.01	10-oct-1995	mbr	24-oct-1995	rok
Methoxychlor	ug/l	ND				0.05	10-oct-1995	mbr	24-oct-1995	rok
Toxaphene	ug/l	ND				0.5	10-oct-1995	mbr	24-oct-1995	rok
Data Entry	..	10/27/95				0	10-oct-1995	mbr	24-oct-1995	rok

Report #: 23367

MONTGOMERY LABORATORIES
555 East Walnut Street
Pasadena, California 91101
818 568 6400; FAX 818 568 6324;
1 800 566 LABS (1 800 566 5227)

Laboratory Report

Kauai Water Department
P.O. Box 1706

Lihue , HI 96766
ATTN: Wayne Hinazumi

Sample # 951006046 Sample ID HANAPEPE VALLEY 404-037 Project PHASEV
Sample Type Water Sampled 05-oct-1995 Received 06-oct-1995 Reported 08-nov-1995

SDWA Pesticides (ML/EPA 508)
Surrogate Summary

Parameter	Percent Recovery	Acceptable Range
Dibutyl Chlorendate	96	70 - 130
Tetrachlorometaxylene	104	70 - 130

Report #: 23367

MONTGOMERY LABORATORIES
555 East Walnut Street
Pasadena, California 91101
818 568 6400; FAX 818 568 6324;
1 800 566 LABS (1 800 566 5227)

Laboratory Report

Kauai Water Department
P.O. Box 1706

Lihue , HI 96766
ATTN: Wayne Hinazumi

Sample # 951006046 Sample ID MANAPEPE VALLEY 404-037 Project PHASEV
Sample Type Water Sampled 05-oct-1995 Received 06-oct-1995 Reported 08-nov-1995

SDWA Pesticides (ML/EPA 508)
Quality Control

Control	Parameter	Units	Actual	Found	%Recv
LCS1	Aldrin	ug/l	0.050	0.036	72
LCS1	p,p' DDT	ug/l	0.100	0.130	130
LCS1	Dieldrin	ug/l	0.100	0.102	102
LCS1	Endrin	ug/l	0.100	0.103	103
LCS1	Gamma-BHC (Lindane)	ug/l	0.050	0.048	96
LCS1	Heptachlor	ug/l	0.050	0.037	74
LCS2	Aldrin	ug/l	0.050	NA	
LCS2	p,p' DDT	ug/l	0.100	NA	
LCS2	Dieldrin	ug/l	0.100	NA	
LCS2	Endrin	ug/l	0.100	NA	
LCS2	Gamma-BHC (Lindane)	ug/l	0.050	NA	
LCS2	Heptachlor	ug/l	0.050	NA	
MBLK	PCB 1016 Aroclor	ug/l	ND	ND	
MBLK	PCB 1221 Aroclor	ug/l	ND	ND	
MBLK	PCB 1232 Aroclor	ug/l	ND	ND	
MBLK	PCB 1242 Aroclor	ug/l	ND	ND	
MBLK	PCB 1248 Aroclor	ug/l	ND	ND	
MBLK	PCB 1254 Aroclor	ug/l	ND	ND	
MBLK	PCB 1260 Aroclor	ug/l	ND	ND	
MBLK	Alpha-BHC	ug/l	ND	ND	
MBLK	Alachlor (Alanex)	ug/l	ND	ND	
MBLK	Aldrin	ug/l	ND	ND	
MBLK	Chlordane	ug/l	ND	ND	
MBLK	Chlorthalonil (Drconil, Bravo)	ug/l	ND	ND	
MBLK	Delta-BHC	ug/l	ND	ND	
MBLK	p,p' DDD	ug/l	ND	ND	
MBLK	p,p' DDE	ug/l	ND	ND	
MBLK	p,p' DDT	ug/l	ND	ND	
MBLK	Dieldrin	ug/l	ND	ND	
MBLK	Endrin Aldehyde	ug/l	ND	ND	
MBLK	Endrin	ug/l	ND	ND	

Report #: 23367

MONTGOMERY LABORATORIES
555 East Walnut Street
Pasadena, California 91101
818 568 6400; FAX 818 568 6324;
1 800 566 LABS (1 800 566 5227)

Laboratory Report

Kauai Water Department
P.O. Box 1706

Lihue , HI 96766
ATTN: Wayne Hinazumi

Sample # 951006046 Sample ID HANAPEPE VALLEY 404-037 Project PHASEV
Sample Type Water Sampled 05-oct-1995 Received 06-oct-1995 Reported 08-nov-1995

SDWA Pesticides (ML/EPA 508)
Quality Control

Control	Parameter	Units	Actual	Found	%Recv
MBLK	Endosulfan I (alpha)	ug/l	ND	ND	
MBLK	Endosulfan II (beta)	ug/l	ND	ND	
MBLK	Endosulfan sulfate	ug/l	ND	ND	
MBLK	Gamma-BHC (Lindane)	ug/l	ND	ND	
MBLK	Heptachlor	ug/l	ND	ND	
MBLK	Heptachlor Epoxide	ug/l	ND	ND	
MBLK	Methoxychlor	ug/l	ND	ND	
MBLK	Toxaphene	ug/l	ND	ND	
MS	Aldrin	ug/l	0.050	0.043	86
MS	p,p' DDT	ug/l	0.100	0.130	130
MS	Dieldrin	ug/l	0.100	0.113	113
MS	Endrin	ug/l	0.100	0.107	107
MS	Gamma-BHC (Lindane)	ug/l	0.050	0.048	96
MS	Heptachlor	ug/l	0.050	0.047	94

Report #: 23367

APPENDIX D

Letter from Waimea Water Services, Inc.

December 24, 1997

Subject:
Hanapepe Well No. 4 (5634-02) impacts on groundwater and surface waters

waimea water services inc.

December 24, 1997

Att'n Valerie Suzuki
Fukunaga and Associates, Inc.
1388 Kapiolani Blvd.
Honolulu, HI, 96814

Subject: Hanapepe Well No. 4 (5634-02) impacts on goundwater and surface waters

Based on the data collected during the aquifer test of April/May 1993 (attached), it is reasonable to conclude that there will be very little impact from the sustained pumping of Well 4. A slight downward water level trend during the pumping period can be seen.

The observation well (5634-01) water levels not only showed no measureable influence from the pumping well but reflected regional downward trends before and after the testing period. Any direct influence from the pumping well is too small to be significant.

It might be concluded that the groundwater flow is in the direction of the Hanapepe River, however, there is no factual information to support such a conclusion. In fact, recorded notes by W.O. Clark in the Mcbryde Sugar Company files indicate that during the construction of Shaft #4, Pump 3, salty water was struck when attempting to tunnel beneath the river from the south.

Wells 5534-03 and 05 are constructed in lava of the Koloa volcanic series while the subject well produces its yield from the Waimea napali basalt. The only published geologic map (Macdonald 1960) shows that 5534- 03 and 05 might tapwater in the Waimea series. This was found to be incorrect as a result of field work by G.A Macdonald and S.P. Bowles (personal communication).

Wells 5533-01 and 02 appear to tap water either from a permeable section of the Koloa lavas or possibly gravels and cobbles of the valley alluvium. It is unlikely that they are built in the Waimea series lavas.

There is inadequate data to state conclusively that Hanapepe Well # 4 will have any measureable impact on the flow of the Hanapepe River. In drilling performed in the flood plain west of the Village of Hanapepe, it was determined that the groundwater head was increasing with depth and, further that the water

P.O. Box 326 • Kamuela, Hawaii 96743 • (808) 885-5941 • FAX (808) 885-7851

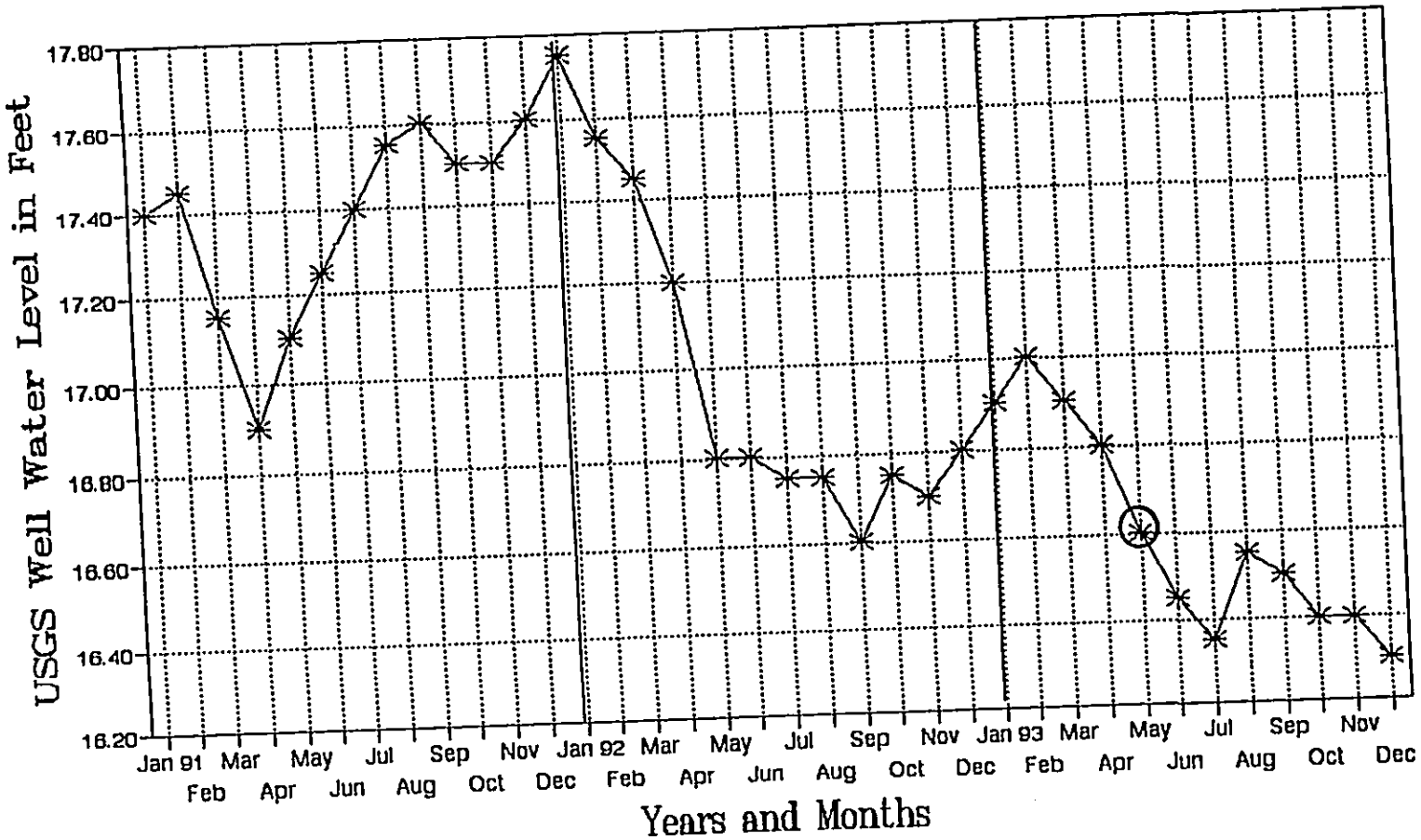
was confined under artesian conditions within the Koloa lavas (S.P. Bowles files).

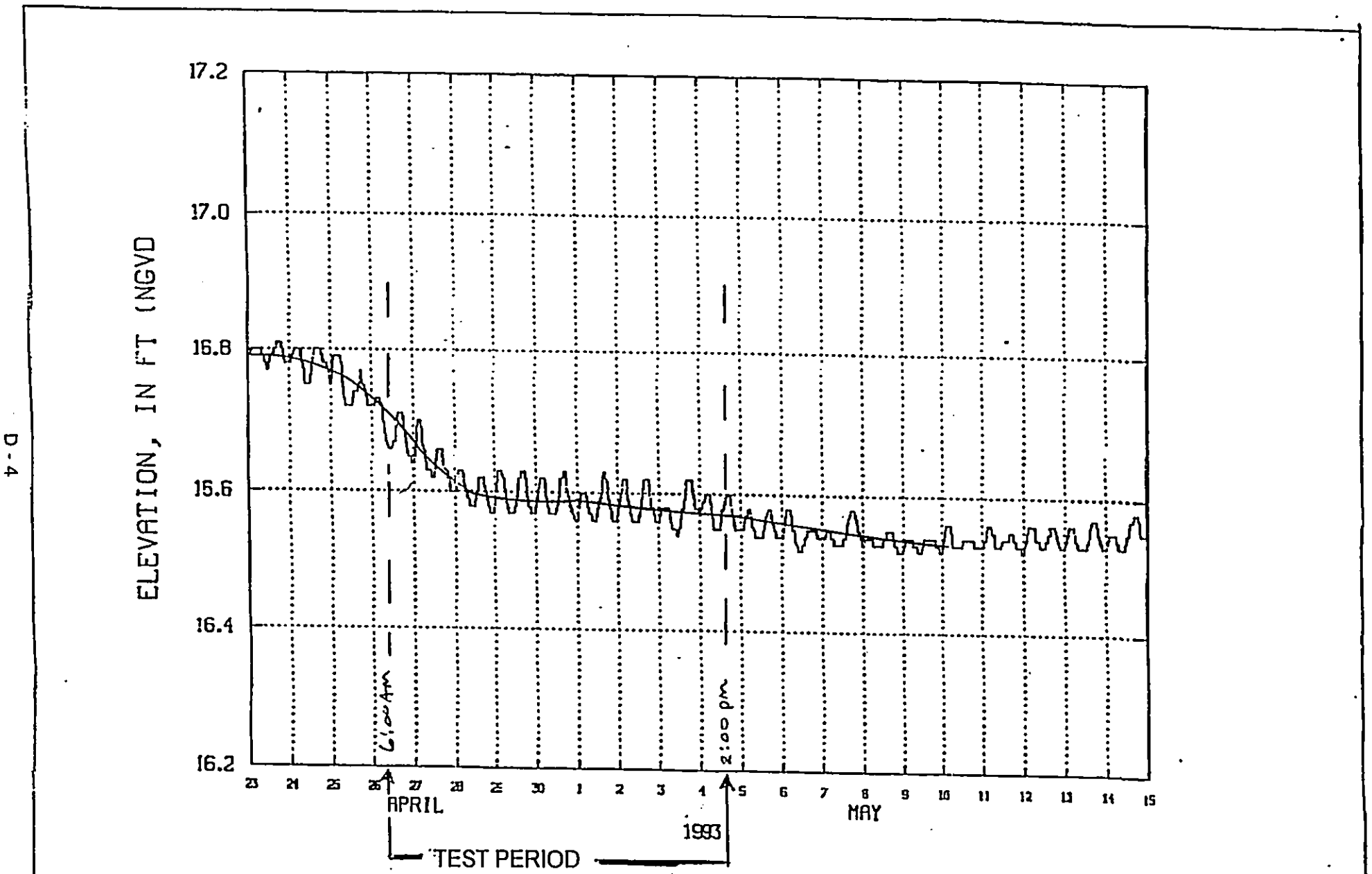
There are no wells below an elevation of 400' between the Hanapepe river and Waimea River known to penetrate the Waimea volcanic series, thus any conclusion on impacts on surface water or groundwater is speculative at best.

Sincerely,

Stephen P. Bowles
Geologist

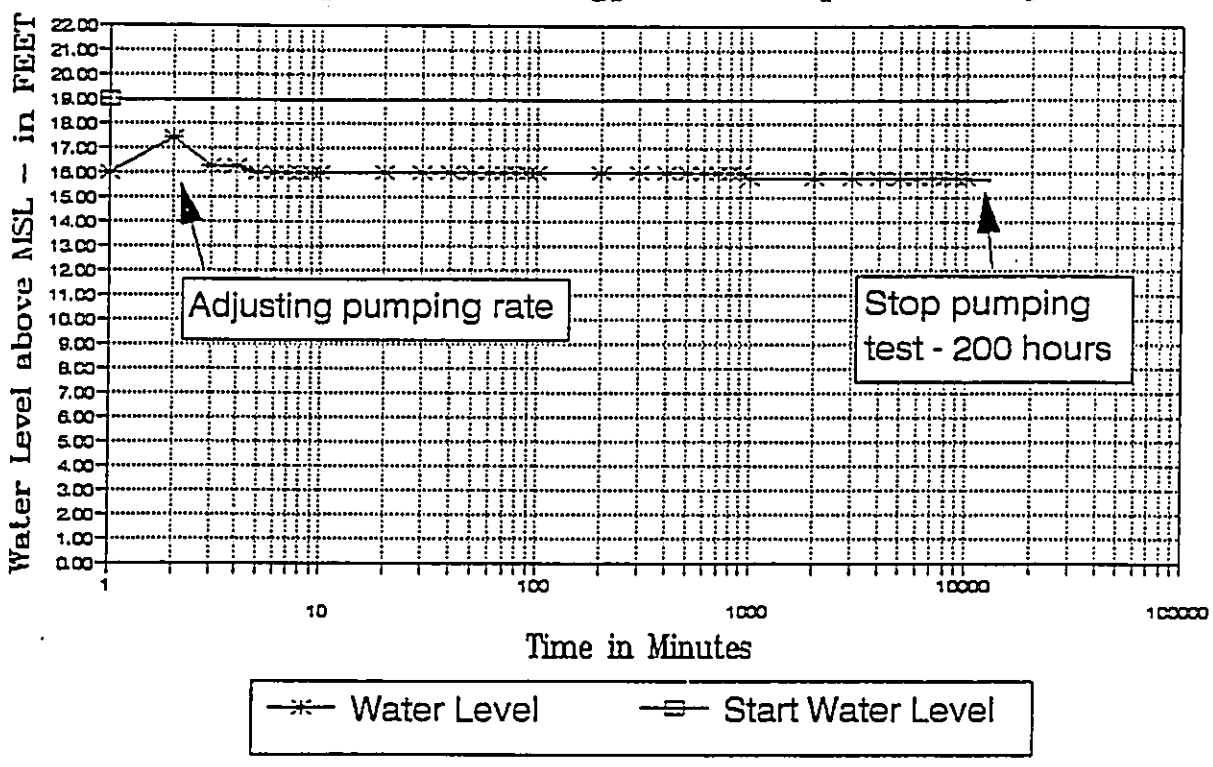
HANAPEPE WELL #4
USGS Well Water Levels





215607159344301 2-5634-01 W25 HANAPE
INSTANTANEOUS ELEVATION (FT (NGVD)

Hanapepe Well #4
Pump Test – 600 gpm – 26 Apr to 4 May



APPENDIX E

Draft Environmental Assessment
Comment and Response

BENJAMIN J. CAYETANO
GOVERNOR OF HAWAII

MICHAEL D. WILSON, CHAIRPERSON
BOARD OF LAND AND NATURAL RESOURCES

DEPUTY
GILBERT COLOMA-AGARAN

AQUACULTURE DEVELOPMENT PROGRAM
AQUATIC RESOURCES
BOATING AND OCEAN RECREATION
CONSERVATION AND RESOURCES
ENFORCEMENT
CONVEYANCES
FORESTRY AND WILDLIFE
HISTORIC PRESERVATION
LAND DIVISION
ENGINEERING BRANCH
PLANNING BRANCH
TECHNICAL & SUPPORT BRANCH
STATE PARKS
WATER RESOURCE MANAGEMENT

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
LAND DIVISION
ENGINEERING BRANCH
P.O. BOX 373
HONOLULU, HAWAII 96809

FEB 24 1998

Mr. Royce S. Fukunaga, President
Fukunaga and Associates, Incorporated
1388 Kapiolani Boulevard, 2nd Floor
Honolulu, Hawaii 96814

Attn: Ms. Valerie Suzuki

Dear Mr. Fukunaga:

Draft Environmental Assessment (DEA)
for Hanapepe Well Development, Transmission and Appurtenances

Reference is made to your letter of January 22, 1998, requesting comments on the subject DEA.

We confirm that the proposed project is located in Zone X, an area located outside the 500-year flood plain.

Thank you for the opportunity to review the DEA. Should you have any questions, please contact Mr. Eric Yuasa of the Project Planning Section at 587-0227.

Sincerely,

Andrew M. Monden

ANDREW M. MONDEN
Chief Engineer

DI:ek

BENJAMIN J. CAYETANO
GOVERNOR OF HAWAII

STATE OF HAWAII

DEPARTMENT OF LAND AND NATURAL RESOURCES

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

MICHAEL D. WILSON, CHAIRPERSON
BOARD OF LAND AND NATURAL RESOURCES

DEPUTIES

GILBERT COLOMA-AGARAN

AQUACULTURE DEVELOPMENT PROGRAM
AQUATIC RESOURCES
CONSERVATION AND RESOURCES ENFORCEMENT
CONVEYANCES
FORESTRY AND WILDLIFE
HISTORIC PRESERVATION DIVISION
LAND DIVISION
STATE PARKS
WATER AND LAND DEVELOPMENT

February 17, 1998

Ms. Valerie Suzuki
Fukunaga and Assoc.
1368 Kapiolani Boulevard, 2nd Floor
Honolulu, Hawaii 96814

LOG NO: 21028
DOC NO: 9802NM01

Dear Ms. Suzuki:

SUBJECT: Historic Preservation Review -- DEA Hanapepe Well Development
Hanapepe, Kauai

One site - a rock wall was found outside the project boundary. We concur with your DEA. In general, we believe that the Hanapepe Well No. 4, and pipeline will have "no effect" on significant historic sites.

If you have any questions, please call Nancy McMahon at 742-7033.

Aloha,

DON HIBBARD, Administrator
State Historic Preservation Division

NM:amk

BENJAMIN J. CAYETANO
GOVERNOR
STATE OF HAWAII

STATE OF HAWAII
DEPARTMENT OF HAWAIIAN HOME LANDS
P O BOX 1879
HONOLULU, HAWAII 96805

KALI WATSON
CHAIRMAN
HAWAIIAN HOMES COMMISSION

JOBIE M. K. M. YAMAGUCHI
DEPUTY TO THE CHAIRMAN

February 12, 1998

received
2/17/98

Ms. Valerie Suzuki
Fukunaga & Associates, Inc.
1388 Kapiolani Boulevard, 2nd Floor
Honolulu, HI. 96814

Dear Ms. Suzuki:

Subject: Hanapepe Well Development, Transmission and Appurtenances, Draft Environmental Assessment, TMK No. 1-8-13:36, 1-7-6:05 & 06, 1-8-06:02, 1-8-7:10, Hanapepe, Kauai, Dated January, 1998

Thank you for the opportunity to review the subject application. The Department of Hawaiian Home Lands has no comment to offer.

If you have any questions, please call Daniel Ornellas at 586-3836

Aloha,

for KALI WATSON, Chairman
Hawaiian Homes Commission

STATE OF HAWAI'I
OFFICE OF HAWAIIAN AFFAIRS
711 KAPIOLANI BOULEVARD, SUITE 500
HONOLULU, HAWAII 96813-5249
PHONE (808) 594-1888
FAX (808) 594-1865

February 02, 1998

Ms. Valerie Suzuki
Fukunaga & Associates, Inc.
1388 Kapiolani Blvd., Second Floor
Honolulu, HI 96814

Subject: Draft Environmental Assessment (DEA) for Hanapepe Well Development, Transmission and Appurtenances, Island of Kauai

Dear Ms. Suzuki:

Thank you for the opportunity to review the Draft Environmental Assessment (DEA) for Hanapepe Well Development, Transmission and Appurtenances, Island of Kauai. The County of Kauai is proposing to develop existing Hanapepe Well No. 4 and construct a 12-inch transmission line approximately 3,600 feet long from the well to an existing reservoir within Eleele Water System. The proposed development will upgrade the County's capacity to meet local water demands.

The Office of Hawaiian Affairs (OHA) has no objections at this time to the proposed development. The well and the accessory water line apparently bear no adverse impacts on adjacent lands nor upon existing flora or fauna and no known archaeological remains exist in the area. Furthermore, the proposed volume rate of pumping of about 1 MGD will not significantly impact the sustainable yield of the Makaweli aquifer.

Please contact Colin Kippen (594-1938), LNR Officer, or Luis Manrique (594-1758), should you have any questions on this matter.

Sincerely yours,

Randall Ogata
Administrator

Colin Kippen
Officer,
Land and Natural
Resources Division

cc: Board of Trustees

MARYANNE W. KUSAKA
MAYOR

CESAR C. PORTUGAL
COUNTY ENGINEER
TELEPHONE 241-6600

RUSSELL SUGANO
ACTING DEPUTY COUNTY ENGINEER
TELEPHONE 241-6631

AN EQUAL OPPORTUNITY EMPLOYER
COUNTY OF KAUAI
DEPARTMENT OF PUBLIC WORKS
4444 RICE STREET
MO'IKEHA BUILDING, SUITE 275
LIHU'E, KAUA'I, HAWAI'I 96766

PW1.178

January 28, 1998

rec'd
2/3/98

Fukunaga & Associates, Inc.
1388 Kapiolani Blvd., 2nd Floor
Honolulu, Hawaii 96814

Attention: Ms. Valerie Suzuki

Gentlemen:

SUBJECT: HANAPEPE WELL DEVELOPMENT, TRANSMISSION AND APPURTENANCES, DRAFT ENVIRONMENT ASSESSMENT (DEA)

We have reviewed the subject draft Environmental Assessment and have no comments.

Thank you for the opportunity to review and offer our comments. Should you have any questions, please feel free to contact Mr. Wallace Kudo of my staff at (808) 241-6620.

Very truly yours,

CESAR C. PORTUGAL
County Engineer

WK/cu

BENJAMIN J. CAYETANO
GOVERNOR

ESTHER UEDA
EXECUTIVE OFFICER

STATE OF HAWAII
DEPARTMENT OF BUSINESS, ECONOMIC DEVELOPMENT & TOURISM
LAND USE COMMISSION
P.O. Box 2359
Honolulu, HI 96804-2359
Telephone: 808-587-3822
Fax: 808-587-3827

January 28, 1998

received
1/30/98

Ms. Valerie Suzuki
Fukunaga & Associates, Inc.
1388 Kapiolani Boulevard, 2nd Floor
Honolulu, Hawaii 96814

Dear Ms. Suzuki:

Subject: Hanapepe Well Development, Transmission and Appurtenances - Draft Environmental Assessment

We have reviewed the subject draft environmental assessment ("DEA") as transmitted by your letter dated January 22, 1998, and have the following comments to offer:

1) We confirm that the existing Reservoir 212, as shown on Figures 5 and 8 of the DEA, is within the State Land Use Urban District.

2) We confirm that the proposed developments of Hanapepe Well No. 4, the 12 inch transmission line from Hanapepe Well No. 4 to the existing Reservoir 402, and connection at Reservoir 402, as depicted on Figures 5 and 8 of the DEA, are within the State Land Use Agricultural District.

We have no further comments to offer at this time.

Thank you for the opportunity to provide comments on the subject draft environmental assessment.

If you have any questions in regards to this matter, please feel free to contact me or Leo Asuncion of my staff at 587-3822.

Sincerely,

ESTHER UEDA
Executive Officer

EU:th

cc: Mr. Gregg Fujikawa
OEQC

MARYANNE W. KUSAKA
MAYOR

GERALD W. DELA CRUZ
DIRECTOR

COUNTY OF KAUAI
OFFICE OF ECONOMIC DEVELOPMENT

4280-B RICE STREET
LIHUE, KAUAI, HAWAII 96766
TELEPHONE (808) 241-6390
FAX (808) 241-6399

received
1/30/98

January 28, 1998

Fukunaga & Associates, Inc.
1388 Kapiolani Boulevard, 2nd Floor
Honolulu, HI 96814

Attn: Valerie Suzuki

Subject: Draft Environmental Assessment for the Hanapepe Well Development, Transmission and Appurtenances

We have reviewed the draft environmental assessment and do not have any specific concerns or comments to offer at this time. We support this project aimed at providing more reliable ground water source and source capacity to meet the maximum day demand requirements for the Hanapepe-Eleele water system.

Thank you for the opportunity to provide comment.

Sincerely,

Gerald Dela Cruz
Director

DEPARTMENT OF THE ARMY
U.S. ARMY ENGINEER DISTRICT, HONOLULU
FORT SHAFTER, HAWAII 96858-5440

REPLY TO ATTENTION OF

February 4, 1998

Planning and Operations Division

received
2/5/98

Ms. Valerie Suzuki
Fukunaga and Associates, Inc.
1388 Kapiolani Boulevard, 2nd Floor
Honolulu, Hawaii 96814

Dear Ms. Suzuki:

Thank you for the opportunity to review and comment on the Draft Environmental Assessment (DEA) for the Hanapepe Well Development Project, Waimea, Kauai. The following comments are provided in accordance with the U.S. Army Corps of Engineers authorities to provide flood hazard information and to issue Department of the Army (DA) permits.

a. Based on the information provided, a DA permit will be required for the project. Please contact our Regulatory Section at 438-9258 for further information and refer to file number 980000085.

b. The flood hazard information provided on page 17 of the DEA is correct.

Sincerely,

for Paul Mizue, P.E.
Acting Chief, Planning
and Operations Division

1388 KAPIOLANI BOULEVARD / 2ND FLOOR HONOLULU, HAWAII 96814 / PH: (808) 944-7821 / FAX (808) 946-9339

March 27, 1998

Mr. Paul Mizue, P.E., Acting Chief
Department of the Army
Planning and Operations Division
U.S. Army Engineer District, Honolulu
Fort Shafter, Hawaii 96858-5440

Dear Mr. Mizue

Subject: Comments on Draft Environmental Assessment (DEA)
Hanapepe Well Development, Transmission, and Appurtenances

Thank you for your review and comment on the Draft EA. This letter is in response to the comments in your letter dated February 4, 1998.

a. Comment: Based on the information provided, a DA permit will be required for the project. Please contact our Regulatory Section at 438-9258 for further information and refer to file number 980000085.

Response: We have already checked on the permit requirements and are in the process of filing a U.S. Army Corps of Engineers General GP95-002.

b. Comment: The flood hazard information provided on page 17 of the DEA is correct.

Response: Thank you for the verification.

We hope these responses address your comments to your satisfaction. The Final EA will be mailed to you next week.

Sincerely,
FUKUNAGA & ASSOCIATES, INC.

Jon K. Nishimura

BENJAMIN J. CAYETANO
GOVERNOR OF HAWAII

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
COMMISSION ON WATER RESOURCE MANAGEMENT
P. O. BOX 621
HONOLULU, HAWAII 96809

MICHAEL D. WILSON
CHAIRPERSON

ROBERT G. GIRALD
DAVID A. NOBRIGA
LAWRENCE H. MIKE
RICHARD H. COX
HERBERT M. RICHARDS, JR.

EDWIN T. SAKODA
ACTING DEPUTY DIRECTOR

February 17, 1998

received
2/18/98

Ms. Valerie Suzuki
Fukunaga & Associates, Inc.
1388 Kapiolani Blvd., 2nd Floor
Honolulu, HI 96814

Dear Ms. Suzuki:

SUBJECT: Hanapepe Well Development, Transmission and Appurtenances
Draft Environmental Assessment (DEA)

Thank you for the opportunity to review the subject document. Our comments related to water resources are marked below.

In general, the CWRM strongly promotes the efficient use of our water resources through conservation measures and use of alternative non-potable water resources whenever available, feasible, and there are no harmful effects to the ecosystem. Also, the CWRM encourages the protection of water recharge areas which are important for the maintenance of streams and the replenishment of aquifers.

[x] We recommend coordination with the county government to incorporate this project into the county's Water Use and Development Plan.

[ ] We recommend coordination with the Land Division of the State Department of Land and Natural Resources to incorporate this project into the State Water Projects Plan.

[ ] We are concerned about the potential for ground or surface water degradation/contamination and recommend that approvals for this project be conditioned upon a review by the State Department of Health and the developer's acceptance of any resulting requirements related to water quality.

[x] A Well Construction Permit and/or a Pump Installation Permit from the Commission would be required before ground water is developed as a source of supply for the project.

[ ] The proposed water supply source for the project is located in a designated water management area, and a Water Use Permit from the Commission would be required prior to use of this source.

[ ] Groundwater withdrawals from this project may affect streamflows which may require an instream flow standard amendment.

[ ] We recommend that no development take place affecting highly erodible slopes which drain into streams within or adjacent to the project.

[x] If the proposed project includes construction of a stream diversion, the project may require a stream diversion works permit and amend the instream flow standard for the affected stream(s).

[x] If the proposed project alters the bed and banks of a stream channel, the project may require a stream channel alteration permit.

[x] OTHER:

The well completion report for Well No. 5634-02 was received and accepted on May 17, 1993. The results of the pump test indicate that the well can sustain withdrawals at the proposed rate of 600 gpm. As indicated above, a pump installation permit is required prior to actual use of the well.

If there are any questions, please contact Lenore Nakama at 587-0218.

Sincerely,

EDWIN T. SAKODA
Acting Deputy Director

LN:ss

1355 KAPIOLANI BOULEVARD / 2ND FLOOR/HONOLULU, HAWAII 96814 / PH. (808) 944-1821 / FAX (808) 946-9339

March 27, 1998

Mr. Edwin T. Sakoda, Acting Deputy Director
State of Hawaii
Commission on Water Resource Management
P.O. Box 621
Honolulu, Hawaii 96809

Dear Mr. Sakoda

Subject: Comments on Draft Environmental Assessment (DEA)
Hanapepe Well Development, Transmission, and Appurtenances

Thank you for your review and comment on the Draft EA. This letter is in response to the comments in your letter dated February 17, 1998.

1. Comment: We recommend coordination with the county government to incorporate this project into the county's Water Use and Development Plan.

   Response: This project is for the Kauai County Department of Water (DOW) and will be incorporated with the county's Water Use and Development Plan. The project is intended to provide a reliable source of ground water to augment the existing Hanapepe-Eleele Water System which does not currently meet DOW Water System Standards maximum day requirement.

2. Comment: A Well Construction Permit and/or a Pump Installation Permit from the Commission would be required before ground water is developed as a source of supply for the project.

   Response: This project involves the installation of a pump on an existing well. We are in the process of filing a Pump Installation permit with the State of Hawaii, Commission on Water Resource Management, Department of Land and Natural Resources.

3. Comment: If the proposed project includes construction of a stream diversion, the project may require a stream diversion works permit and amend the instream flow standard for the affected stream(s).

   Response: The proposed project does not involve the construction of a stream diversion.

FUKUNAGA&ASSOCIATES, INC.

4. Comment: If the proposed project alters the bed and banks of a stream channel, the project may require a stream channel alteration permit.

   Response: The proposed project involves trenching through an existing stream bed that is normally dry, only receiving water when excess irrigation water from Gay and Robinson is released, or when runoff from heavy rainfall reaches the stream bed. Construction will be done while the stream is dry, and this will be coordinated with Gay and Robinson irrigation operations and weather forecasts. In the event of unexpected streamflow during construction, the Contractor will be prepared to stop construction and protect exposed areas with plastic sheeting and steel plates. After construction is completed, the trenched area will be covered with geotextile and stream bed stones to prevent erosion of the trench during streamflow. We are in the process of filing a Stream Channel Alteration Permit with the State of Hawaii, Commission on Water Resource Management, Department of Land and Natural Resources.

5. Comment: The well completion report for Well No. 5634-02 was received and accepted on May 17, 1993. The results of the pump test indicate that the well can sustain withdrawals at the proposed rate of 600 gpm. As indicated above, a pump installation permit is required prior to actual use of the well.

   Response: As discussed in item 2 above, we are in the process of filing the necessary permit.

We hope these responses address your comments to your satisfaction. The Final EA will be mailed to you next week.

Sincerely,
FUKUNAGA & ASSOCIATES, INC.

Jon K. Nishimura

United States Department of the Interior

U.S. GEOLOGICAL SURVEY
United States Geological Survey
Water Resources Division
677 Ala Moana Blvd. Suite 415
Honolulu, HI, 96813

February 6, 1998

received
2/10/98

Valerie Suzuki
Fukunaga and Associates
1388 Kapiolani Blvd.
2nd Floor
Honolulu, HI 96814

Dear Ms. Suzuki:

Thank you for the opportunity to review and comment on the *Draft Environmental Assessment for the Hanapepe Well Development, Transmission and Appurtenances* (DEA). Our comments focus on estimation of well yield and affects of pumpage.

1. The DEA states that Hanapepe well 4 can be pumped at a continuous rate of 1 mgd based on a 600 gpm pump test where the drawdown "stabilized" at 3 ft during the 200 hours of the test. The airline data presented, however, are not accurate enough to assess whether the drawdown curve truly stabilized (i.e. achieved a horizontal slope) or whether drawdown was continuing to increase at the end of the 200-hour test. The airline data was recorded only to the nearest 0.1 psi, which translates to 0.23 ft (nearly a quarter foot). This accuracy is rather rough considering that the total drawdown measured over the 8-day pump test was only about 3 ft.

2. The DEA states that Hanapepe well 4 may yield as much as 1 mgd without significantly raising chloride levels because the well "did not show any sensitivity to pumping rate." This conclusion is not consistent with the principles of well hydraulics. A change in pumping rate will always result in a change in the drawdown the well will ultimately achieve, although it may be difficult to measure this change if the change in the pumping rate is small. Whether or not saltwater intrusion will occur depends on the well's ultimate drawdown, which was not conclusively determined. Even if the well showed no increase in chlorides during the pump test, the possibility of saltwater intrusion still exists. Upconing is a relatively slow process; saltwater may intrude the well later during sustained pumping. Sufficient data are not presented to determine whether the well will ultimately be affected by saltwater intrusion.

3. The DEA reports that there is not enough data at the present time to conclude whether the pumpage will affect the flow of stream in the Hanapepe River. We agree that the effect of the pumpage on Hanapepe River or other streams may be difficult to quantify with the data presently available, but the existing data do indicate that some effect on the river is likely. Seepage-run and base-flow studies conducted by the U.S. Geological Survey in cooperation with the Kauai Department of Water indicate that about 54 percent of the average annual flow of Hanapepe River comes from ground-water discharge. Considering the relatively close proximity of the well to the Hanapepe River compared to the greater distance to other areas of ground-water discharge such as the coast, it appears likely that the cone of depression from pumping the well will reach the Hanapepe River where it will cause a reduction of base flow.

Considering the small drawdown rate compared to the pre-pumping water level and the apparent high permeability in the vicinity of Hanapepe well 4, it is conceivable that the well could produce the estimated 1 mgd (and possibly more) for a prolonged period of time, but the data and analysis presented do not show this conclusively and do not address the likely possibility that the pumpage will affect the Hanapepe River. There is always uncertainty in determining long-term well yield and associated effects from short-term test data (e.g. pump-test data), but a better estimate can be made if the spread of the cone of depression to discharge or low-permeability boundaries is considered.

I hope these comments are helpful. If you have any questions, please call me at 522-8290.

Sincerely,

William Meyer
District Chief

cc Kauai Department of Water

733 KAPIOLANI BOULEVARD / 2ND FLOOR/HONOLULU, HAWAII 96814 / PH. (808) 944-1821 / FAX (808) 946-9329

March 27, 1998

Mr. William Meyer, District Chief
United States Department of the Interior
U.S. Geological Survey
Water Resources Division
677 Ala Moana Boulevard, Suite 415
Honolulu, Hawaii 96813

Dear Mr. Meyer:

Subject: Comments on Draft Environmental Assessment (DEA)
Hanapepe Well Development, Transmission, and Appurtenances

Thank you for your review and comment on the DEA. We offer the following in response to your comments:

Comments 1 and 2

The well was tested in April through May, 1993 in accordance with the State Commission on Water Resource Managements's (CWRM) requirements and protocol. We understand that any short-term well testing results must be evaluated with some degree of uncertainty, especially when trying to project long-term impacts. However, the conclusions drawn were based on the best available data at that time.

The Kauai Department of Water (DOW) is very much concerned with the long-term condition of the well source and is committed to carefully monitor the physical and chemical parameters of the well. Through this long-term monitoring, it is believed that the DOW would be able to properly manage this valuable water source.

Comment 3

We are in agreement that there are not enough data (and as discussed with your staff, there may never be sufficient information) to definitely quantify the impact of the well pumpage on the stream flow in the Hanapepe River.

Analysis of the significance of pumping this well is further complicated by impacts from other users (irrigated agriculture), which produce far more groundwater than is proposed for this well. Any evaluation would also need to consider the uncertainty of future irrigation needs. As discussed in the response to comments 1 and 2, many of the impacts can only be evaluated through a long-term monitoring program. The DOW will participate in a cooperative monitoring program by sharing information from its facilities with the CWRM and USGS.

FUKUNAGA&ASSOCIATES,INC.

General Response

The DOW has a great interest in maintaining the integrity of all groundwater sources on the island, consistent with their primary function to provide a safe and adequate water supply for the people of Kauai. To do so, the DOW must be able to effectively manage its water sources and not jeopardize the quality and quantity of its available resources. Long-term monitoring, and continued assessments, using tools such as the groundwater models being developed by the USGS, will provide additional information to properly manage the groundwater resource. The DOW is committed to work with the USGS and other water agencies to share information so that the best possible management decisions can be implemented.

I hope that these responses address your concerns. Please call us at (808) 944-1821 if you have any questions. The Final EA will be mailed to you next week.

Sincerely,
FUKUNAGA & ASSOCIATES, INC.

Jon K. Nishimura

BENJAMIN J. CAYETANO
GOVERNOR

STATE OF HAWAII
OFFICE OF ENVIRONMENTAL QUALITY CONTROL

235 SOUTH BERETANIA STREET
SUITE 702
HONOLULU, HAWAII 96813
TELEPHONE (808) 586-4185
FACSIMILE (808) 586-4186

GARY GILL
DIRECTOR

February 23, 1998

Mr. Ernest Lau
Department of Water
County of Kauai
4398 Pua Loke Street
Lihue, Hawaii 96766

Dear Mr. Lau:

Subject: Draft Environmental Assessment for the Hanapepe Well Development, Transmission, and Appurtenances, Kauai

Thank you for the opportunity to review the subject document. We have the following comments.

1. The environmental assessment describes that "there are inadequate data to state conclusively that the development of the Hanapepe Well No. 4 will have any measurable impact on the flow of Hanapepe River." Since there is a probability that the project may impact Hanapepe River, an adequate monitoring program for the river should be implemented.

2. Please describe whether there are any wetlands in the area. If so, please evaluate the impacts of the project to the wetlands.

3. In some instances, a well is developed by private financing, the transfer of public lands to government or private developers, or in return for a water allocation credit to supply an urban development. The EA should include a full discussion of any institutional, financial or land use arrangements or commitments related to developing the well and delivering water to end users.

   These arrangements may include the formation of public utility companies and subsequent rate-setting, the establishment of county water commitments, the co-funding of state or county water system development, an executive order or other set-aside of state lands, and purchase of land or easements by public entities.

   Any or all of these arrangements and all permits or

   governmental approvals required to fulfill these commitments should be listed.

4. Please discuss how waters from the well will be used and an analysis of how the proposed well development may affect land and water uses in the region. The analysis should include a discussion of the following:

   * County General, Development, and/or Community Plans
   * Any secondary or cumulative impacts caused by promoting land uses that alter the hydrology of the source and/or end-use area
   * An assessment of the well's impact on the land owners, water users including farmers and kuleana residents in the region and a declaration if ceded lands are involved.

5. Please include list of alternatives to new groundwater development and discussion of their related costs and benefits. The list should include but not be limited to wastewater reuse, rainfall catchment, conservation, and nonpotable water supplies.

6. Please discuss the findings and reasons for supporting the FONSI determination based on the significant criteria listed in §11-200-12 of the EIS rules. Please see the enclosed example.

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

Sincerely,

Gary Gill
Director

c: Fukunaga and Associates

8.0 DETERMINATION, FINDINGS AND REASONS FOR SUPPORTING DETERMINATION

8.1 SIGNIFICANCE CRITERIA

According to the Department of Health Rules (11-200-12), an applicant or agency must determine whether an action may have a significant impact on the environment, including all phases of the project, its expected consequences both primary and secondary, its cumulative impact with other projects, and its short and long-term effects. In making the determination, the Rules establish "Significance Criteria" to be used as a basis for identifying whether significant environmental impact will occur. According to the Rules, an action shall be determined to have a significant impact on the environment if it meets any one of the following criteria:

(1) Involves an irrevocable commitment to loss or destruction of any natural or cultural resources;

The proposed project will not impact scenic views of the ocean or any ridge lines in the area. The visual character of the area will change from the current agricultural land to an improved 4-lane highway which is compatible with the surrounding land use plans and programs being implemented for the region. The highway corridor is comprised of "Prime" agricultural land which is an important resource. Development of drainage systems will follow established design standards to ensure the safe conveyance and discharge of storm runoff. In addition, the subject property is located outside of the Count's Special Management Area (SMA).

As previously noted, no significant archaeological or historical sites are known to exist within the corridor. Should any archaeologically significant artifacts, bones, or other indicators of previous on-site activity be uncovered during the construction phases of development, their treatment will be conducted in strict compliance with the requirements of the Department of Land and Natural Resources.

(2) Curtails the range of beneficial uses of the environment;

Although the subject property is suitable for agricultural uses, the land area adjoining the Mokulele Highway is naturally suited for transportation purposes due to its location proximate to an existing highway system. To return the site to a natural environmental condition is not practical from both an environmental and economic perspective.

(3) Conflicts with the State's long-term environmental policies or goals and guidelines as expressed in Chapter 344, HRS; and any revisions thereof and amendments thereto, court decisions, or executive orders;

The proposed development is consistent with the Environmental Policies established in Chapter 344, HRS, and the National Environmental Policy Act.

(4) Substantially affects the economic or social welfare of the community or state;

The proposed project will provide a significant contribution to Maui's future population by providing residents with the opportunity to "live and work in harmony" in a high quality living environment. The proposed project is designed to support surrounding land use patterns, will not negatively or significantly alter existing residential areas, nor will unplanned population growth or its distribution be stimulated. The project's development is responding to projected population growth rather than contributing to new population growth by stimulating in-migration.

(5) Substantially affects public health

Impacts to public health may be affected by air, noise, and water quality impacts, however, these will be insignificant or not detectable, especially when weighed against the positive economic, social, and quality of life implications associated with the project. Overall, air, noise, and traffic impacts will be significantly positive in terms of public health as compared to the "no action" alternative.

(6) Involves substantial secondary impacts, such as population changes or effects on public facilities

Existing and planned large-scale housing development projects within Wailuku-Kahului and Kihei will contribute to a future population growth rate that will require expansion of public and private facilities and services. These improvements will become necessary as the overall population of Maui grows and settlement patterns shift. However, the proposed project will not in itself generate new population growth, but provide needed infrastructure the area's present and future population.

In addition, new employment opportunities will generate new sources of direct and indirect revenue for individuals and the County of Maui by providing both temporary and long-term employment opportunities during the construction period. Indirect employment in a wide range of service related industries will also be created from construction during project development.

(7) Involves a substantial degradation of environmental quality;

The proposed development will utilize existing vacant agricultural land. With development of the proposed project, the addition of urban landscaping will significantly mitigate the visual impact of the development as viewed from outside the site while the overall design will complement background vistas.

Makai views from the subject property are available, however, they are not significant nor generally available to the public in the property's present restricted condition.

(8) Is individually limited but cumulatively has considerable effect on the environment, or involves a commitment for larger actions;

By planning now to address the future needs of the community and the State, improvement of the transportation system is consistent with the long term plans for Maui. No views will be obstructed or be visually incompatible with the surrounding area.

(9) Substantially affects a rare, threatened or endangered species or its habitat;

No endangered plant or animal species are located within the highway corridor.

(10) Detrimentally affects air or water quality or ambient noise levels;

Any possible impact to near-shore ecosystems resulting from surface runoff, will be mitigated by the establishment of on-site retention basins during the construction phases of development. After development, retention areas within the highway right-of-way will serve the same function to encourage recharge of the groundwater.

(11) Affects or is likely to suffer damage by being located in an environmentally sensitive area, such as a flood plain, tsunami zone, beach, erosion-prone area, geologically hazardous land, estuary, freshwater, or coastal waters.

Development of the property is compatible with the above criteria since there are not environmentally sensitive areas associated with the project and the physical character of the corridor has been previously disturbed by agricultural uses. As such, the property no longer reflects a "natural environment". Shoreline, valleys, or ridges will not be impacted by the development.

(12) Substantially affects scenic vistas and view planes identified in county or state plans or studies;

Due to topographical characteristics of the property, views of the area to be developed are generally not significant although they are visible. The majority of the proposed project will not be visible, except from higher elevations by the general public or from persons traveling along the highway.

(13) Requires substantial energy consumption.

The location of the proposed project is between Maui's major growth areas. This relationship will reduce travel times and energy consumption after project build out through efficiencies gained by the increased capacity of the highway. Construction of the proposed project will not require substantial energy consumption relative to other similar projects.

1164 KAPIOLANI BOULEVARD / 2ND FLOOR HONOLULU, HAWAII 96814 / PH. (808) 944-1821 / FAX (808) 946-9339

March 27, 1998

Mr. Gary Gill, Director
State of Hawaii
Office of Environmental Quality Control
236 South Beretania Street, Suite 702
Honolulu, Hawaii 96813

Dear Mr. Gill

Subject: Comments on Draft Environmental Assessment (DEA)
Hanapepe Well Development, Transmission, and Appurtenances

Thank you for your review and comment on the Draft EA. This letter is on behalf of the County of Kauai, Department of Water, in response to the comments in your letter dated February 23, 1998.

1. Comment: The environmental assessment describes that "there are inadequate data to state conclusively that the development of the Hanapepe Well No. 4 will have any measurable impact on the flow of Hanapepe River." Since there is a probability that the project may impact Hanapepe River, an adequate monitoring program for the river should be implemented.

   Response: The Kauai Department of Water (DOW) has a great interest in both the long term condition of the well, and any impacts it may have on the Hanapepe River. The DOW will participate in a cooperative long term monitoring program by sharing information from its facilities with the State Commission on Water Resource Management (CWRM) and the U.S. Geological Survey (USGS). The monitoring program will utilize state-of-the-art tools such as groundwater models being developed by the USGS to provide the information needed to properly manage the groundwater resource. The DOW is committed to work with the USGS and other water agencies to share information so that the best possible management decisions can be implemented.

2. Comment: Please describe whether there are any wetlands in the area. If so, please evaluate the impacts of the project to the wetlands.

   Response: The proposed pipeline crosses a gulch classified as a Paulistine, Forested, Broad-leaved Evergreen, Temporary Non-tidal water regime. Impacts are anticipated to be minimal since changes to the topography will be kept to a minimum, and a portion the pipeline crossing the gulch will be kept above

ground on piers. A figure will be added to the Final EA (FEA) illustrating the wetlands in the area, along with an evaluation of the impacts of the project to the wetlands. See **Attachments 1 and 2** for new figure and excerpt from FEA.

3. Comment: In some instances, a well is developed by private financing, the transfer of public lands to government or private developers, or in return for a water allocation credit to supply an urban development. The EA should include a full discussion of any institutional, financial or land use arrangements or commitments related to developing the well and delivering water to end users.

   These arrangements may include the formation of public utility companies and subsequent rate-setting, the establishment of county water commitments, the co-funding of state or county water system development, an executive order or other set-aside of state lands, and purchase of land or easements by public entities.

   Any or all of these arrangements and all permits or governmental approvals required to fulfill these commitments should be listed.

   Response: The construction of the new well will be funded by the State of Hawaii and County of Kauai, as stated under Construction Funding, Page 25 of DEA. The purpose of the project is to supplement the existing County of Kauai Department of Water (DOW) Hanapepe-Eleele water system, as illustrated in Figure 4 and as discussed in the Purpose of the Project on Page 1 of the DEA.

4. Comment: Please discuss how water from the well will be used and an analysis of how the proposed well development may affect land and water uses in the region. The analysis should include a discussion of the following:

   - County General, Development, and/or Community Plans
   - Any secondary or cumulative impacts caused by promoting land uses that alter the hydrology of the source and/or end-use area
   - An assessment of the well's impact on the land owners, water users including farmers and kuleana residents in the region and a declaration if ceded lands are involved.

   Response: As discussed on Page 1 of the DEA, the purpose of this project is to supplement the existing Kauai Department of Water (DOW) Hanapepe-

Eleele water system with a new reliable ground water source, and is in accordance with the Kauai County general, development and community plans. The Hanapepe-Eleele water system service area includes rural, urban, and agricultural lands as shown in Figures 4 and 8 of the DEA. The existing water system is vulnerable to flooding, and is unable to meet the maximum day requirements based on the DOW Water System Standards. The development of a new well will provide a reliable source of ground water to meet the increasing demands of all the water users in the Hanapepe-Eleele community.

The proposed project will not promote land uses that will significantly alter the hydrology of the source or end-use area. The estimated amount of water to be drawn from the aquifer is 1.0 mgd, which is less than 4 percent of the sustainable yield (30 mgd). The end-use area, or Hanapepe-Eleele Water System, has a maximum daily demand that exceeds the current supply. The additional water will serve to support the existing end-use condition, and is in accordance with the development plans of the area.

Impacts of the new well on land owners, are discussed under Long Term Impacts, Page 26 of the DEA.

5. Comment: Please include list of alternatives to new groundwater development and discussion of their related costs and benefits. The list should include but not be limited to wastewater reuse, rainfall catchment, conservation, and nonpotable water supplies.

Response: A discussion of alternative water sources shall be added to the FEA under Section VI, Alternatives to the Proposed Project, to encompass wastewater reuse, rainfall catchment, conservation, and nonpotable water supplies. See **Attachment 3** for excerpt from FEA.

6.. Comment: Please discuss the findings and reasons for supporting the FONSI determination based on the significant criteria listed in §11-200-12 of the EIS rules. Please see the enclosed example.

Response: Findings and reasons will be discussed in Section VIII, Findings and Reasons Supporting the Anticipated Determination, of the FEA. See **Attachment 4** for excerpt from FEA.

We hope these responses address your comments to your satisfaction.

Sincerely,
FUKUNAGA & ASSOCIATES, INC.

Jon K. Nishimura

6. Flood/Tsunami Hazards

The Federal Emergency Management Agency's March 4, 1987 Flood Insurance Rate Map (FIRM) Panel 150002 0180 C for Kauai County designates the project area to be within Zone X, areas determined to be outside the 500-year flood plain.

Tsunami inundation areas are located in low-lying areas along the shoreline. This does not affect the project area which is on high ground and about 2.5 miles inland from the coast.

7. Flora and Fauna

According to the "Atlas of Hawaii, Second Edition", dated 1983, flora common to the area are Lantana (*Lantana camara*), Koa Hale (*Leucaena leucocephala*), Klu (*Acacia farnesiana*), Panini (*Opuntia ficus-indica*), Ilima (*Sida fallax*), Natal Redtop Grass (*Rhynchelytrum repens*).

Animals near the project area include cattle (*Bos taurus*), dog (*Canis familiaris*), and pig (*Sus scrota*). Birds in the vicinity of the project area include the cardinal (*Cardinalis cardinalis*), barred dove (*Geopelia striata*), spotted dove (*Streptopelia chinensis*), mockingbird (*Mimus polyglottos*), golden plover (*Pluvialis dominica fulva*), Pueo (*Aseo flammeus sandwichensis*), Ricebird (*Lonchura punctulata*) and White Eye (*Zosterop japonicus*). None of the above are considered threatened or endangered.

While the animals near the project area are not considered threatened or endangered, the U.S. Department of the Interior, Fish and Wildlife Service, has revealed a threatened species that is known to fly through this project site. The Newell's shearwater (Puffinus auricularis newelli), listed by the state and federal government as a threatened species, is known to breed inland of this site and is known to fly through the Hanapepe area when moving between the inland nesting and ocean foraging sites.

→ Generally, the proposed project is within lands already cleared of its original native landscape for agricultural use. Most of the project area is surrounded by sugarcane fields and pasture lands. Kapahili Gulch remains largely uncultivated but is used by Gay and Robinson for grazing cattle. There are existing jeep trails inside the gulch which are used by Gay and Robinson for their ranching operations. The intermittent stream in the Kapahili Gulch is classified as a Paulistine, Forested, Broad-leaved Evergreen, Temporary Non-tidal water regime by the National Wetlands Inventory, U.S. Department of the Interior (see Figure 11).

Attachment 1 (p. 1 of 2)

been documented occurrences of this bird colliding with human structures, especially power lines. Consequently, mitigative measures will be taken to prevent these collisions. Mitigative measures used by the Kauai Electric Company will be followed which involve the use of High Visibility Marker Balls on the power lines to alert the shearwater of the above ground power lines.

→ Impacts on the stream in the Kapahili Gulch will be minimal. Work will be limited to the width of the trench, and erosion control measures will be implemented as described in Section III, A., 2. Erosion. In addition to the erosion control measures, the stream in Kapahili Gulch is classified as intermittent so it is not constantly exposed to the eroding effect of water. Flow in the gulch occurs when there is runoff from heavy rainfall and when excess irrigation water is periodically released by Gay and Robinson from a reservoir located in the mountains.

3. Archeological Features

Because the area surrounding the well site and the pipeline corridor has been previously cleared and the historic rock wall is away from the pipeline corridor, the project will have no effect on any significant archeological sites. To protect the rock wall site during construction, the Contractor will be required to limit construction work in the immediate vicinity and to take careful precautions to protect the rock wall.

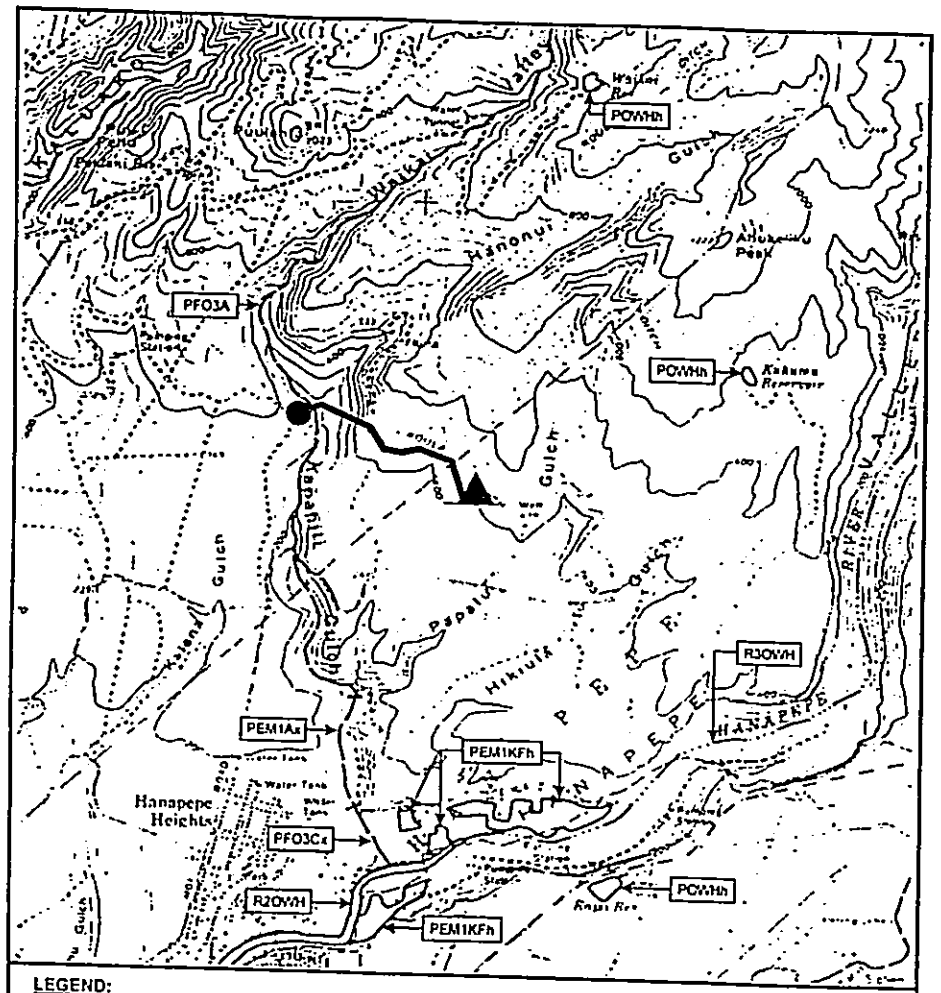
4. Surface Water

There are inadequate data to state conclusively that the development of Hanapepe Well No. 4 will have any measurable impact on the flow of Hanapepe River (letter from Waimea Water Service, Inc.; Appendix D).

5. Existing Wells.

Based on the data collected during the aquifer test of April and May of 1993, it can be concluded that there will be very little impact from the sustained pumping of Hanapepe Well No. 4 (letter from Waimea Water Services, Inc.; Appendix D). During the pump test, the observation well (Well No. 5634-01), which is approximately 1000 feet east of the Hanapepe Well No. 4, not only showed no measurable influence from the pumping of the well but reflected regional downward trends before and after the testing period. Thus, any direct influence from the Hanapepe Well No. 4 with other nearby wells is too small too be significant.

Attachment 1 (p. 2 of 2)



LEGEND:

PEM1Ax = Palustrine, Emergent, Persistent, Temporary Non-Tidal Water Regime, Excavated
PEM1KFh = Palustrine, Emergent, Persistent, Artificial, Semi-Permanent Non-Tidal Water Regime, Diked Impounded
PFO3A = Palustrine, Forested, Broad-leaved Evergreen, Temporary Non-Tidal Water Regime
PFO3Cx = Palustrine, Forested, Broad-leaved Evergreen, Seasonal Non-Tidal Water Regime, Excavated
POWHh = Palustrine, Open Water (unknown bottom), Permanent Non-Tidal Water Regime, Diked Impounded
R2OWH = Riverine, Lower Perennial, Open Water (unknown bottom), Permanent Non-Tidal Water Regime
R3OWH = Riverine, Upper Perennial, Open Water (unknown bottom), Permanent Non-Tidal Water Regime

SOURCE: "National Wetlands Inventory" map, U.S. Department of the Interior, Fish and Wildlife Service, December 1978

NORTH

SCALE: 1"=2000'

WETLANDS INVENTORY MAP

FIGURE 11

Attachment 2 (p. 1 of 1)

6. Water Quality

The results of the 1993 water quality tests for Hanapepe Well No. 4 show that the water is of good quality. There were no indications of contamination from the nearby agricultural operations. No mitigation measures are required.

7. Public Funds, Energy and Construction Materials

The project will involve the irretrievable commitment of public funds, electrical energy, and construction materials.

IV. ALTERNATIVES TO THE PROPOSED PROJECT

A. No Project Alternative

One alternative to the proposed project is the "no project" alternative. This would result in no change of existing conditions. The Hanapepe-Eleele Water System would remain dependent on the existing sources and thus be vulnerable to water outages and potential source contamination. In addition, the water system source requirements will continue to be deficient to meet maximum day demand.

B. Alternative Well Sites

Other well sites were considered for exploratory drilling in the Hanapepe area. The Hanapepe Well No. 4 site was selected since the well would tap into the Napali Volcanics which was considered an excellent basal water source. The 1993 pump test and subsequent water quality test showed that Hanapepe Well No. 4 is a high yielding well with good quality water and very suitable for development.

C. Alternate Transmission Main Alignment

An alternative transmission main alignment was considered for this project. The alternate alignment followed existing cane hauls which provided vehicle access to the well site from Moi Road, the nearest improved County street. At Moi Road the transmission line would connect into an existing 12-inch water main within Moi Road that serves as the influent-effluent line for Reservoir 402. This alignment was not selected because it would interfere with Gay and Robinson's current and long-term agricultural operations.

D. Water Conservation

Water conservation programs can be used to better meet future water demands, and are typically implemented when a water shortage is likely. Conservation programs generally fall into two major categories: Water System Conservation and

Attachment 3 (p. 1 of 3)

Consumer Conservation.

Water system conservation is the responsibility of the water purveyor, and entails careful monitoring of all water in the transmission and distribution systems. County water uses such as for firefighting and street and sewer flushing could be targeted for more efficient use. Additionally, detection and repair of leaks in the transmission and distribution system would be effective in reducing water losses.

Consumer conservation is the responsibility of the consumer, and could reduce the per capita consumption. Consumers are encouraged to use water saving practices, detect and repair leaks within their property, and in general, to minimize wasteful water use.

Water conservation is a beneficial practice regardless of the water supply situation. However, Kauai experiences a very wet climate and has an abundant groundwater and surface water supply. The water sources for the Hanapepe-Eleele Water System are located in the Makaweli, Hanapepe, and Koloa Aquifers, which have a combined sustainable yield of 86 mgd. The average water use in this water system in 1996 was approximately 0.80 mgd, less than one (1) percent of the estimated sustainable yield. Even with further development of well water sources, the water use will be a mere fraction of the aquifer yield. Although it is a practice that should be observed by all consumers, water conservation alone will not provide the quantity of water required to meet demands. The DOW is initiating a water conservation program to reduce demands; however, the anticipated savings will not affect the need for this project.

E. Rainfall Catchment

Rainfall catchment involves the construction of a series of ditches and reservoirs to intercept rainfall runoff from large areas of land, and is an ideal source for agricultural use. According to the Kauai Water Use and Development Plan, February 1992, over 80 percent of the water used on Kauai is by sugarcane plantations which rely on rainfall catchment (surface waters) as the primary water source. However, if surface water is used to supply municipal drinking water systems, it is subject to the DOH Surface Water Treatment Rule which requires costly and cumbersome treatment, monitoring and reporting. Consequently, the immense cost of constructing, operating, and maintaining a water treatment facility renders this alternative infeasible, especially when there is an ample supply of potable groundwater.

F. Wastewater Reuse and Nonpotable Water Supplies

Wastewater reuse and nonpotable water supplies are potentially viable alternative water sources for applications such as irrigation. However, the relative cost to construct, maintain and operate facilities to properly treat wastewater and nonpotable water is relatively higher than the cost to provide water from a potable

groundwater source. Irrigation water is not in critically short supply in this area; therefore, the relative value of and demand for treated sewage effluent and nonpotable water supplies is considered to be low.

The treatment plant in the area is the Eleele Wastewater Treatment Plant, and it produces about 0.35 mgd of treated effluent which could potentially be used by the large agricultural acreage nearby, operated by Mcbryde Sugar Company. However, concern was expressed that irrigating with treated sewage effluent might detract from the company's marketing of "high quality" coffee beans to Hills Brothers. Accordingly, reclamation and re-use of the effluent was deemed, by Mcbryde Sugar Co., to be not viable. The costs to construct, operate, and monitor the facilities necessary to treat wastewater and nonpotable water in an area where potable groundwater is readily available, render this alternative infeasible and undesirable.

V. LIST OF NECESSARY PERMITS AND APPROVALS

The required approvals and permits for the project are:

1. Use Permit, County of Kauai, Planning Department
2. Well Construction Permit, State of Hawaii, Commission on Water Resource Management
3. National Pollutant Discharge Elimination System Permit, State of Hawaii, Department of Health
4. General GP95-002 Permit for Utility Lines In, Under, or Above Waters of the United States, Including Navigable Waters, in the State of Hawaii, U.S. Army Corps of Engineers, Honolulu District
5. Approval of a satisfactory Engineering Report complying with requirements set forth in Hawaii Administrative Rules, Title 11, Chapter 20, Section 11-20-29 by the Director of the Department of Health.

VI. AGENCIES AND ORGANIZATIONS CONSULTED

A. FEDERAL GOVERNMENT

U.S. Army Corps of Engineers, Pacific Division,
Honolulu District Engineer
U.S. Department of the Interior
Fish and Wildlife Services

B. STATE GOVERNMENT

Department of Land and Natural Resources
State Historic Preservation
Commission on Water Resource Management
Department of Health
Safe Drinking Water Branch, Environmental Management Division

C. PRIVATE

Gay and Robinson

VII. ANTICIPATED DETERMINATION

After completing a draft environmental assessment of the potential environmental affects of the proposed project, it is believed that an Environmental Impact Statement is not required and a Negative Declaration is anticipated.

VIII. FINDINGS AND REASONS SUPPORTING THE ANTICIPATED DETERMINATION

Findings and reasons supporting the Negative Declaration determination are as follows, using the criteria, policies, guidelines and provision of Title 11, Chapter 200, Environmental Impact Statement Rules and Chapter 343, HRS. The Rules list several "significance criteria" that are to be used to check if an action will have a significant effect on the environment. The criteria are as follows:

1. Involves an irrevocable commitment to loss or destruction of any natural or cultural resource:

   The proposed project will not cause any loss or destruction of a natural or cultural resource. As described in this report, the proposed project area has been researched extensively with no findings of significant impacts. Any discovery of archaeologically significant resources uncovered during the construction will be handled in compliance with the requirements of the State of Hawaii, Department of Land and Natural Resources.

B. Curtail the range of beneficial uses of the environment:

   This project is enhancing the beneficial use of the environment, as it is drawing upon the naturally occurring groundwater supply in the area to serve a growing demand for drinking water by the community. The project area is limited to the well site and waterline. As described in this report, the majority of the waterline is to be buried along an existing dirt road. The well site will be on land that could

be used for agriculture. However, this area is a small fraction of the total area that is available for agriculture in the area, and the well site is providing valuable groundwater for the Hanapepe-Eleele water system.

C. Conflict with the State's long-term environmental policies or goals and guidelines as expressed in Chapter 344, Hawaii Revised Statutes, and revisions thereof and amendments thereto, court decisions or executive orders:

   The proposed project is in accordance with the guidelines set forth in the State Environmental Policy Chapter 344, Hawaii Revised Statutes.

D. Substantially affects the economic or social welfare of the community or State:

   The proposed project will serve to increase the amount of potable water available for the Hanapepe-Eleele water system that cannot meet the current maximum daily demand. It will enhance the welfare of the community by providing ample supplies of potable water to all users.

E. Substantially affect public health:

   The proposed project will not substantially affect public health in a negative way.

F. Involves a substantial secondary impact, such as population changes or effects on public facilities:

   The proposed project will be tied in to the existing Hanapepe-Eleele water system to serve the current maximum daily demand for the existing population. It will not involve any substantial secondary impacts.

G. Involves a substantial degradation of environmental quality:

   The proposed project will not involve any substantial degradation of environmental quality. As described in this report, the impacts on the quality of the environment are minimal.

H. Is individually limited but cumulatively has considerable effect upon the environment or involve a commitment for larger actions:

   As described in this report, the proposed project does not have any significant impacts or effects upon the environment or involve any commitment for larger actions.

I. Substantially affect a rare threatened or endangered species, or its habitat:

   As discussed in this report, the only threatened species that may be affected by this project is the Newell's shearwater bird which is known to fly through the area.

This bird has been known to collide with power lines, so mitigative measures will be taken to prevent these collisions. The mitigative measure is one used by the Kauai Electric Company, and involves placing High Visibility Marker Balls on the power lines to alert the birds of the above ground power lines. With this mitigative measure, impacts are anticipated to be minimal.

J. Detrimentally affect air or water quality or ambient noise levels;

The proposed project provides potable groundwater for human use and consumption. It will not detrimentally affect air or water quality, or ambient noise levels.

K. Detrimentally affect an environmentally sensitive area, such as a flood plain tsunami zone, erosion-prone area, geologically hazardous land, estuary, fresh water, or coastal water. [Eff. Dec. 06, 1985](Auth: HRS Sec. 343-6)(Imp. HRS Sec. 343, 343-6).

As discussed in detail in this report, the proposed project does not detrimentally affect any environmentally sensitive areas.

REFERENCES

1. Department of Geography, University of Hawaii, Atlas of Hawaii, Second Edition, University of Hawaii Press, 1983.

2. Fukunaga & Associates, Inc., Environmental Impact Assessment and Negative Declaration for Drilling Hanapepe Well No. 4, February 1992.

3. Fukunaga & Associates, Inc., Eleele Wastewater Treatment Plant Expansion Phase I, prepared for the County of Kauai, Department of Public Works, May 1993.

4. County of Kauai, Department of Water, Computer Printout - Analysis of Metered Sales by Meter Size for Regular Bills for Fiscal Year 1995-1996, September 1997.

5. State of Hawaii, Department of Business, Economic Development and Tourism, The Sate of Hawaii Data Book 1996, A Statistical Abstract

6. State of Hawaii, Commission on Water Resource Management, Department of Land and Natural Resources, Hawaii Water Plan, State Water resources Protection Plan, v. I, II, prepared by George Yuen and Associates, Inc., March 1992.

7. State of Hawaii, Commission on Water Resource Management, Department of Land and Natural Resources, Hawaii Water Plan, Kauai Water Use and Development Plan, prepared by R.M. Towill Corporation, February 1990.

United States Department of the Interior
FISH AND WILDLIFE SERVICE
Pacific Islands Ecoregion
300 Ala Moana Blvd., Room 3-122
P.O. Box 50088
Honolulu, Hawaii 96850
Telephone: (808)541-3441; Fax: (808)541-3470

In reply refer to: DH

received
2/27/98

FEB 27 1998

Valerie Suzuki
Fukunaga & Associates Inc.
1388 Kapiolani Blvd., 2nd Floor
Honolulu, HI 96814

Re: Draft Environmental Assessment for Hanapepe Well Development, Transmission, and Appurtenances

Dear Ms. Suzuki:

The U.S. Fish and Wildlife Service (Service) has reviewed the January 1998 Draft Environmental Assessment (DEA) for Hanapepe Well Development, Transmission, and Appurtenances. The proposed project is sponsored by the Department of Water (DOW), Kauai County, and the DEA has been prepared by Fukunaga & Associates Inc. The proposed project would increase the amount and reliability of potable water that is used by the communities of Hanapepe and Eleele of Waimea District. The Service offers the following comments for your consideration.

The proposal is to develop Hanapepe Well No. 4 and transfer water from this source to the existing Reservoir 402. A 12-inch pipeline will be installed both under and above ground along different portions of its length (total length = 3,600 feet). In order to power the pump at the proposed well site, an extension of the existing aerial power lines from Reservoir 402 will be made to the proposed well. Four aerial power lines will span the upper reaches of Kapahili Gulch.

The areas proposed for project-related construction are of low elevation and have a long history of agricultural use. Areas not directly used for agriculture are dominated by alien vegetation, and we have no records of rare or endangered plants in the area. However, the Newell's shearwater (*Puffinus auricularis newelli*), which is listed by the state and federal government as a threatened species, is known to breed inland of this site and is known to fly through the Hanapepe area when moving between the inland nesting and ocean foraging sites. Of concern is the long and well-documented history of this bird colliding with human structures, especially power lines. The phenomenon of seabird "fallout" (disorientation, fatigue, and grounding) due to artificial lighting has also contributed to seabird mortality and is likely enhanced around human structures such as power lines. Because the proposed project involves constructing new power lines across Kapahili Gulch, we recommend that informal consultation under section 7 of the Endangered Species Act, as amended, be initiated with the Service.

Since the effects to the Newell's shearwater were not considered in the DEA, the Service believes that the DEA does not adequately address the potential effects of the project on fish and wildlife in the area. The Service recommends that the contractor evaluate potential impacts to the shearwater in the Final Environmental Assessment (FEA). The FEA should include realistic measures that will eliminate or minimize negative impacts to this species due to proposed development of new power lines.

The DEA states that a graded road, 10 to 15 feet wide, will be maintained through the Kapahili Gulch for maintenance of the buried pipeline. Since an intermittent stream runs through this gulch, the Service recommends that impacts to the stream be addressed in the FEA, including the design of appropriate drainage structures (e.g., culverts). While we have no records of native aquatic organisms using the intermittent Kapahili Stream, siltation into the stream resulting from the maintained road, the underground pipeline, and other soil disturbances from related structures or activities, could negatively impact the fauna and flora of the Hanapepe River and adjacent coastal habitats. The Service recommends that the FEA adequately outline how such negative effects of this project will be controlled, not just during construction of the pipeline, but during routine operation. Such controls should accommodate maximum flow of the stream in order to prevent or minimize siltation during flood conditions.

The Service appreciates the opportunity to provide comments on the DEA. If you have any questions regarding these comments, please contact Fish and Wildlife Biologist Dave Hopper at the above address.

Sincerely,

Donald Palawski

for Brooks Harper
Field Supervisor

cc: DOW, Kauai
DOFAW, Kauai, State of Hawaii
DAR, Kauai, State of Hawaii
NRCS, Honolulu
USEPA, Honolulu
CZMP, Honolulu
CWB, Honolulu

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March 27, 1998

Mr. Brooks Harper, Field Supervisor
United States Department of the Interior
Fish and Wildlife Service, Pacific Islands Ecoregion
300 Ala Moana Blvd., Room 3-122
P.O. Box 50088
Honolulu, Hawaii 96850

Dear Mr. Harper:

Subject: Comments on Draft Environmental Assessment (DEA)
Hanapepe Well Development, Transmission, and Appurtenances

Thank you for your review and comment on the DEA. We have identified two areas of concern that you raised for consideration.

The first concern is regarding the protection and safety of the Newell's shearwater (*Puffinus auricularis newelli*), listed by the state and federal government as a threatened species. As requested, we have evaluated the potential impacts to the shearwater and have proposed mitigative measures in the Final Environmental Assessment (FEA) to minimize negative impacts to this species due to the proposed new power lines. Kauai Electric Company currently utilizes High Visibility Marker Balls on their power lines as a mitigative measure to alert the shearwater to above ground power lines. The FEA proposes to use the same marker balls on the new power lines to minimize any negative impacts to this species. See **Attachment 1** for excerpt from FEA. We have also acted upon your recommendation for informal consultation under Section 7 of the Endangered Species Act with the Fish and Wildlife Service, and are currently working with the Service to come to an agreeable solution.

The second concern is how the "graded road" and other construction activities will cause soil disturbances leading to siltation in the intermittent stream. The DEA mistakenly stated that the road would be "graded and cleared". This road is an existing dirt road that will not be graded, just cleared of surface obstructions to allow for vehicle travel. The owner requested that changes to the existing road be kept to a minimum. The owner and DLNR will supervise the clearing of the existing road so that no more of an area is cleared than necessary. Changes to existing drainage and runoff patterns should be minimal since there will not be any changes to the grade of the existing road. The FEA has been revised to correct the description of the access road (see **Attachment 2**), and to include a description of erosion control measures for the other areas affected by construction activities (see **Attachment 3**).

We hope these responses address your comments to your satisfaction. The Final EA will be mailed to you next week.

Sincerely,
FUKUNAGA & ASSOCIATES, INC.

Jon K. Nishimura

6. Flood/Tsunami Hazards

The Federal Emergency Management Agency's March 4, 1987 Flood Insurance Rate Map (FIRM) Panel 150002 0180 C for Kauai County designates the project area to be within Zone X, areas determined to be outside the 500-year flood plain.

Tsunami inundation areas are located in low-lying areas along the shoreline. This does not affect the project area which is on high ground and about 2.5 miles inland from the coast.

7. Flora and Fauna

According to the "Atlas of Hawaii, Second Edition", dated 1983, flora common to the area are Lantana (*Lantana camara*), Koa Hale (*Leucaena leucocephala*), Klu (*Acacia farnesiana*), Panini (*Opuntia ficus-indica*), Ilima (*Sida fallax*), Natal Redtop Grass (*Rhynchelytrum repens*).

Animals near the project area include cattle (*Bos taurus*), dog (*Canis familiaris*), and pig (*Sus scrota*). Birds in the vicinity of the project area include the cardinal (*Cardinalis cardinalis*), barred dove (*Geopelia striata*), spotted dove (*Streptopelia chinensis*), mockingbird (*Mimus polyglottos*), golden plover (*Pluvialis dominica fulva*), Pueo (*Aseo flammeus sandwichensis*), Ricebird (*Lonchura punctulata*) and White Eye (*Zosterop japonicus*). None of the above are considered threatened or endangered.

→ While the animals near the project area are not considered threatened or endangered, the U.S. Department of the Interior, Fish and Wildlife Service, has revealed a threatened species that is known to fly through this project site. The Newell's shearwater (Puffinus auricularis newelli), listed by the state and federal government as a threatened species, is known to breed inland of this site and is known to fly through the Hanapepe area when moving between the inland nesting and ocean foraging sites.

Generally, the proposed project is within lands already cleared of its original native landscape for agricultural use. Most of the project area is surrounded by sugarcane fields and pasture lands. Kapahili Gulch remains largely uncultivated but is used by Gay and Robinson for grazing cattle. There are existing jeep trails inside the gulch which are used by Gay and Robinson for their ranching operations. The intermittent stream in the Kapahili Gulch is classified as a Paulistine, Forested, Broad-leaved Evergreen, Temporary Non-tidal water regime by the National Wetlands Inventory, U.S. Department of the Interior (see Figure 11).

4. Excess Water Discharge

Disposal of excess water generated from the testing of the pump, hydrotesting and chlorination of the waterline, and storm water runoff will comply with all applicable National Pollutant Discharge Elimination System (NPDES) requirements.

5. Traffic

Traffic will increase due to the construction activities along the local streets near the project site and along the cane haul roads used primarily by Gay and Robinson. The increased traffic will be temporary only lasting the length of the construction period. Disruptions to Gay and Robinson operations by the traffic will be minimized through conscientious efforts by the contractor to confine the construction activities to a limited area.

6. Noise

There will be an increase in noise from the construction activity. However, the increased noise should not adversely affect the residences in the nearby subdivision since the construction area is approximately 4,000 feet away from the closest house in the subdivision. All noise generated by the construction activity shall conform to the noise regulations established by the State Department of Health.

B. LONG TERM IMPACTS

1. Lands

There will be the loss of useable agricultural lands from the construction of the project. The loss of lands will be limited to the development of the well site which includes the construction of a control building, pump discharge piping and pumping pad, electrical facilities, and improved access to the site. The transmission main will be primarily underground as it traverses through existing cane haul roads and crosses Kapahili gulch. All other work required for the project will be done within the existing reservoir sites.

2. Flora and Fauna

The project area has been previously cleared for sugarcane cultivation and ranching. There are no indications of rare or endangered flora or fauna in the project area. The stream in the Kapahili Gulch is normally dry, so it is unlikely that any endangered or native stream fauna exist within the gulch. However, the new power lines may have a possible impact on the Newell's shearwater which is known to fly through the area. There have

been documented occurrences of this bird colliding with human structures, especially power lines. Consequently, mitigative measures will be taken to prevent these collisions. Mitigative measures used by the Kauai Electric Company will be followed which involve the use of High Visibility Marker Balls on the power lines to alert the shearwater of the above ground power lines.

Impacts on the stream in the Kapahili Gulch will be minimal. Work will be limited to the width of the trench, and erosion control measures will be implemented as described in Section III, A., 2. Erosion. In addition to the erosion control measures, the stream in Kapahili Gulch is classified as intermittent so it is not constantly exposed to the eroding effect of water. Flow in the gulch occurs when there is runoff from heavy rainfall and when excess irrigation water is periodically released by Gay and Robinson from a reservoir located in the mountains.

3. Archeological Features

Because the area surrounding the well site and the pipeline corridor has been previously cleared and the historic rock wall is away from the pipeline corridor, the project will have no effect on any significant archeological sites. To protect the rock wall site during construction, the Contractor will be required to limit construction work in the immediate vicinity and to take careful precautions to protect the rock wall.

4. Surface Water

There are inadequate data to state conclusively that the development of Hanapepe Well No. 4 will have any measurable impact on the flow of Hanapepe River (letter from Waimea Water Service, Inc.; Appendix D).

5. Existing Wells.

Based on the data collected during the aquifer test of April and May of 1993, it can be concluded that there will be very little impact from the sustained pumping of Hanapepe Well No. 4 (letter from Waimea Water Services, Inc.; Appendix D). During the pump test, the observation well (Well No. 5634-01), which is approximately 1000 feet east of the Hanapepe Well No. 4, not only showed no measurable influence from the pumping of the well but reflected regional downward trends before and after the testing period. Thus, any direct influence from the Hanapepe Well No. 4 with other nearby wells is too small too be significant.

Attachment 1 (p. 3 of 3)

2. The 12-inch transmission pipeline connecting Hanapepe Well No. 4 to the existing Hanapepe-Eleele Water System is approximately 3,600 lineal feet long. The pipeline will proceed underground from the well site along the existing cane haul road leading to Kapahili Gulch. Along the dirt road, the pipeline will cross under an existing ditch. Upon reaching Kapahili Gulch, the buried main will proceed down the eastern side of the gulch, to the bottom, and cross under a stream bed to the opposite side of the gulch. The pipeline will then proceed up the opposite side of the gulch (west side), where the pipeline will be constructed above ground on piers due to the steep terrain and rock formations encountered along the slope. At the top of the gulch, the pipeline will be placed underground until it connects to the Reservoir 402 12-inch influent/effluent line (see Figure 6).

   A 10 to 15 foot wide cleared area will be provided along the segment of pipeline within Kapahili Gulch to facilitate maintenance of the pipeline. An existing overgrown jeep road leading into Kapahili Gulch will be cleared of surface obstructions to allow for vehicle travel. All clearing work will be kept to a minimum at the request of the land owner.

3. Modifying the existing water facilities to allow water to flow from Reservoir 402 to Reservoir 212. This will involve the construction of a by-pass line at the Reservoir 212 site. All work on the by-pass line will be confined to the existing reservoir site.

4. Providing power to the well site will involve upgrading the existing aerial single phase power lines from the Cliffside Subdivision to the Reservoir 402 site into a three phase line and extending the existing aerial line from the Reservoir 402 site to the well site. The aerial extension, consisting of four wires, will span the width of the gulch from the Reservoir 402 site to the other side of the gulch. At each end of the span, there will be wooden H-frame supports approximately 50 feet high. At the other side of the gulch, the aerial lines supported on single wooden poles will follow the same alignment of the 12-inch transmission main.

5. Radio telemetry links between the well site, Reservoir 402 site, and Reservoir 212 site will be provided to control and monitor the operations between the pump and reservoirs.

6. On the long-term, another well (location unknown at this time) may be planned in the vicinity of the existing Hanapepe Well No. 4, which will also use the 12-inch transmission main.

Attachment 2 (p. 1 of 1)

ditches, and discharged into the ocean.

3. Electricity

Electricity is supplied by Kauai Electric, a Division of Citizen Utilities Company.

4. Solid Waste Disposal

Solid wastes generated from residential areas are collected by the County's refuse crews. Solid wastes from multi-family, industrial and commercial areas are collected by private haulers. Solid wastes collected from the Hanapepe-Eleele area are disposed of at the County's Kekaha Landfill.

5. Road System

The main roadway serving the Hanapepe-Eleele area is the State owned Kaumualii Highway. Various County roads branching off the main highway serve the residential town areas.

E. CONSTRUCTION FUNDING

Funding for this project will be provided by the State of Hawaii and the County of Kauai.

III. PROBABLE IMPACTS AND MITIGATIVE MEASURES

A. SHORT TERM CONSTRUCTION RELATED IMPACTS

1. Air Quality

There will be an increase in dust and vehicular exhaust emissions in the vicinity of the project area during construction. Dust control measures will be used to reduce dust if it becomes a problem. Exhaust emission should not have any significant affect on the area because prevailing winds should disperse any exhaust gas concentration.

2. Erosion

The Contractor will be required to implement erosion and sediment control measures during construction. Grading and soil disturbance will be minimized, and areas that are disturbed will be properly graded and revegetated to prevent erosion. The Contractor will be instructed to minimize the time of construction, retain ground cover until the latest practicable date to complete construction, and construct drainage control features early in the

Attachment 3 (p. 1 of 2)

construction time schedule. Continued maintenance will be required for nine months from the accepted completion date of the planting period to ensure proper revegetation. There are three segments of the project which demand particular attention to erosion control measures which include the following: 1) Hanapepe Well No. 4 site development; 2) trenching for pipeline on the steep slopes of Kapahili Gulch; and 3) trenching for pipeline across the intermittent stream at the bottom of Kapahili Gulch.

The well site will be graded; disturbed areas will either be paved, grassed, or provided with erosion control matting. Runoff will be controlled and directed with paved swales. On-site runoff will be piped to an existing irrigation ditch.

Construction within the gulch on steep slopes will involve slope stabilization methods utilizing a cellular confinement system and erosion control/turf reinforcement mat. These materials will provide cover and stabilize the slopes while allowing growth of permanent vegetation.

Construction across the intermittent stream will be scheduled during periods when the stream is dry. Streamflow results from rainfall runoff or from irrigation water released by Gay and Robinson. The Contractor will schedule work in the intermittent stream according to weather forecasts and will coordinate with Gay and Robinson to schedule work around the release of irrigation water. After pipeline installation, the trenched area will be covered with geotextile and streambed stones (riprap) to prevent erosion of the trench during streamflow. In the event of unexpected streamflow during construction, the Contractor will be prepared to stop construction and protect exposed areas with plastic sheeting and steel plates.

3. Surface Water Quality

The installation of underground pipes through the streambed in Kapahili Gulch and the existing ditch along the dirt road may potentially affect water quality downstream of Kapahili Gulch. Both drainage ways are intermittent and construction will mostly be done when the streambed and ditch are dry. However, there is the potential of flow developing in the streambed during construction from rain water runoff, which would require the re-routing of flows around work areas. Flow from released irrigation water through the gulch can be controlled by Gay and Robinson during the construction of the pipeline across the streambed. To minimize adversely impacting downstream water quality, best-management practices and a water quality monitoring program conforming to Corps of Engineers and Department of Health requirements will be developed as part during the design of this project.

Attachment 3 (p. 2 of 2)

United States
Department of
Agriculture

Natural
Resources
Conservation
Service

P O Box 50004
Honolulu, HI
96850

USDA

Our People...Our Islands...In Harmony

March 5, 1998

Ms. Valerie Suzuki
Fukunaga & Associates, Inc.
1388 Kapiolani Boulevard, 2nd Floor
Honolulu, Hawaii 96814

Subject: Draft Environmental Assessment (DEA) - Hanapepe Well Development, Transmission, and Appurtenances, Hanapepe, Kauai

We have reviewed the above mentioned document and offer the following comments:

Soil and erosion factors and concerns are appropriately identified and addressed. On page 25, they mention that "...erosion and sediment control measures will be maintained and closely monitored..." and that "Slope stabilization procedures will be imposed..."; also in several places, the report states that "Best Management Practices (BMPs) will be followed." This report does not go into detail about what the specific BMPs, control measures, or stabilization procedures would be.

Site specific prescriptions for practices such as revegetation after soil disturbing activities and proper access road design and maintenance should be be spelled out in future plans to prevent any off-site sediment delivery problems.

Improperly designed and maintained cane haul roads on Kauai are a major source of sedimentation and runoff problems. Roads need to be properly graded, crowned, and ditched with strategically placed waterbars, rolling dips, or culverts to properly transfer water to a safe and stable outlet.

Thank you for the opportunity to review this document.

Sincerely,

KENNETH M. KANESHIRO
State Conservationist

733 KAPIOLANI BOULEVARD / 2ND FLOOR/HONOLULU, HAWAII 96814 / PH (808) 944-1821 / FAX (808) 946-9339

March 27, 1998

Mr. Kenneth M. Kaneshiro, State Conservationist
United States Department of Agriculture
Natural Resources Conservation Service
P.O. Box 50004
Honolulu, Hawaii 96850

Dear Mr. Kaneshiro

Subject: Comments on Draft Environmental Assessment (DEA)
Hanapepe Well Development, Transmission, and Appurtenances

Thank you for your review and comment on the Draft EA. This letter is in response to the comments in your letter dated March 5, 1998.

We recognize and understand your concern for proper implemenation of mitigative measures to prevent off-site sediment delivery problems. Some specific measures to be taken are discussed below and will be added to the Final EA.

1. The Contractor will be required to implement erosion and sediment control measures during construction. Grading and soil disturbance will be minimized, and areas that are disturbed will be properly graded and revegetated to prevent erosion. The Contractor will be instructed to minimize the time of construction, retain ground cover until the latest practicable date to complete construction, and construct drainage control features early in the construction time schedule. Continued maintenance will be required for nine months from the accepted completion date of the planting period to ensure proper revegetation. There are three segments of the project which demand particular attention to erosion control measures which include the following: 1) Hanapepe Well No. 4 site development; 2) trenching for pipeline on the steep slopes of Kapahili Gulch; and 3) trenching for pipeline across the intermittent stream at the bottom of Kapahili Gulch.

2. The well site will be graded; disturbed areas will either be paved, grassed, or provided with erosion control matting. Runoff will be controlled and directed with paved swales. On-site runoff will be piped to an existing irrigation ditch.

3. Construction within the gulch on steep slopes will involve slope stabilization methods utilizing a cellular confinement system and erosion control/turf reinforcement mat. These materials will provide cover and stabilize the slopes while allowing growth of permanent vegetation.

FUKUNAGA&ASSOCIATES INC.

4. Construction across the intermittent stream will be scheduled during periods when the stream is dry. Streamflow results from rainfall runoff or from irrigation water released by Gay and Robinson. The Contractor will schedule work in the intermittent stream according to weather forecasts and will coordinate with Gay and Robinson to schedule work around the release of irrigation water. After pipeline installation, the trenched area will be covered with geotextile and streambed stones (riprap) to prevent erosion of the trench during streamflow. In the event of unexpected streamflow during construction, the Contractor will be prepared to stop construction and protect exposed areas with plastic sheeting and steel plates.

5. No new roads will be constructed aside from the 85 lineal feet of paved access road to the well site with an adjacent and parallel swale. The cane haul road mentioned in the Draft Environmental Assessment is an existing road, and modifications will be minimized to limited clearing at the request of the landowner.

We hope these responses address your comments to your satisfaction. The Final EA will be mailed to you next week.

Sincerely,
FUKUNAGA & ASSOCIATES, INC.

Jon K. Nishimura

BENJAMIN J. CAYETANO
GOVERNOR OF HAWAII

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

LAWRENCE MIKE
DIRECTOR OF HEALTH

In reply, please refer to

March 6, 1998

98-013/epo

Ms. Valerie Suzuki
Fukunaga & Associates, Inc.
1388 Kapiolani Boulevard, 2nd Floor
Honolulu, Hawaii 96814

Dear Ms. Suzuki:

Subject: Draft Environmental Assessment (DEA)
Hanapepe Well Development (State Well No. 5634-02)
Waimea District
Kauai, Hawaii
TMK: 1-8-13: 36

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

Drinking Water

1. Federal and state regulations define a public water system as a system that serves 25 or more individuals at least 60 days per year or has at least 15 service connections. All public water system owners and operators are required to comply with Hawaii Administrative Rules, Title 11, Chapter 20, "Rules Relating to Potable Water Systems."

2. The environmental assessment indicates that the project will include the development of new sources of potable water. Section 11-20-29 requires that all new sources of potable water serving a public water system be approved by the Director of Health prior to its use. Such an approval is based primarily upon the submission of a satisfactory engineering report which addresses the requirements set in Section 11-20-29.

3. The engineering report must identify all potential sources of contamination and evaluate alternative control measures which could be implemented to reduce or eliminate the potential for contamination, including treatment of the water source. In addition, water quality analyses,

performed by a laboratory certified in the State of Hawaii, must be submitted as part of the report to demonstrate compliance with all drinking water standards. Additional tests may be required by the Director upon his review of the information submitted.

4. Section 11-20-30 requires that new or substantially modified distribution systems for public water systems be approved by the Director. However, if the water system is under the jurisdiction of the County of Kauai, the Department of Water will be responsible for the review of the plans.

If you have any questions on this matter, please contact Mr. Mark Yonamine of the Safe Drinking Water Branch at 586-4258.

Water Pollution

1. The applicant should contact the Army Corps of Engineers to identify whether a federal permit (including a Department of Army permit) is required for this project. If a federal permit is required, then a Section 401 Water Quality Certification is required from the State Department of Health, Clean Water Branch.

2. A National Pollutant Discharge Elimination System (NPDES) general permit is required for the following discharges to waters of the State:

   a. Storm water discharges relating to construction activities, such as clearing, grading, and excavation, for projects equal to or greater than five acres;

   b. Storm water discharges from industrial activities;

   c. Construction dewatering activities;

   d. Noncontact cooling water discharges less than one million gallons per day;

   e. Treated groundwater from underground storage tank remedial activities;

   f. Hydrotesting water;

   g. Treated effluent from petroleum bulk stations and terminals; and

   h. Treated effluent from well drilling activities.

Any person requesting to be covered by a NPDES general permit for any of the above activities should file a Notice of Intent with the Department's Clean Water Branch at least 30 days prior to commencement of any discharge to waters of the State.

3. After construction of the proposed facility is completed, an NPDES individual permit will be required if the operation of the facility involves any wastewater discharge into State waters.

Any questions regarding these comments should be directed to Mr. Denis Lau, Branch Chief, Clean Water Branch at 586-4309.

Sincerely,

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

c: SDWB
CWB

1585 KAPIOLANI BOULEVARD / 2ND FLOOR/HONOLULU, HAWAII 96814 / PH (808) 944-1821 / FAX (808) 946-9339

March 27, 1998

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

Dear Dr. Anderson

Subject: Comments on Draft Environmental Assessment (DEA)
Hanapepe Well Development, Transmission, and Appurtenances

Thank you for your review and comment on the Draft EA. This letter is in response to the comments in your letter dated March 6, 1998.

Drinking Water

As discussed with your staff, we are aware of and will comply with all regulations and requirements related to this project and its engineering report.

Water Pollution

1. We are in the process of filing a U.S. Army Corps of Engineers General GP95-002 which is a general permit that does not require the Section 401 Water Quality Certification.

2. The Contractor will be required to obtain any necessary NPDES permits necessary for construction.

3. This facility will have two blow off lines at low points along the proposed 12" potable waterline to allow flushing for maintenance purposes. As discussed with your staff, no permit is required for this application. The only concern is that the discharge should comply with Water Quality Standards, Chapter 11-54. The Kauai County, Department of Water, will comply with all Department of Health and Water Quality standards.

We hope these responses address your comments to your satisfaction. The Final EA will be mailed to you next week.

Sincerely,
FUKUNAGA & ASSOCIATES, INC.

Jon K. Nishimura