2003-06-08-MA-FEA-

Upper Kaupakulua 0.5 MG Water Storage Tank

Final Environmental Assessment

Department of Water Supply
County of Maui

May 2003

Upper Kaupakulua
0.5 MG Water Storage Tank

Final Environmental Assessment

Applicant:

Department of Water Supply
County of Maui

Prepared By:

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May 2003

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Preface

The Final Environmental Assessment incorporates comments received during the public review period. Substantive revisions to the Draft Environmental Assessment are shown with italicized text for additions and a line through the text for deletions.

1. INTRODUCTION

1.1 Proposing Agency and Action

The Department of Water Supply (DWS), County of Maui, proposes to construct a new 0.5-million gallon (MG) water storage tank, access road, appurtenant pipelines, and control mechanisms. The project is located in the foothills of Kaupakulua and would be integrated into the Makawao ~~and Lower Kula water systems~~ *water system by serving as a source of water in addition to the Pookela Tank.*

The subject project begins adjacent to the Lower Kaupakulua Tank, completed in 2000, where two 12-inch pipelines will be connected to existing stub-outs. The two pipelines—one for inflow and one for outflow—will connect the Upper and Lower Tanks and be installed within the road easement. A paved access road, measuring 12 feet wide and approximately 3,628 feet in length, will be constructed within the 24-foot wide easement and used to maintain and service the new Upper Kaupakulua Tank.

1.2 Purpose of the Environmental Assessment (EA)

Under Chapter 343, Hawaii Revised Statutes (HRS), Act 241 Session Laws of Hawaii (SLH) 1992, and Chapter 200 of Title 11, Department of Health (DOH) Administrative Rules, "Environmental Impact Statement Rules," the proposed project involves the use of public funds and is therefore subject to the environmental review process. The DWS is a department of the County of Maui and will fund the project through its capital improvement program. This EA has been prepared to address potential impacts that may occur during construction and/or operation of the proposed water tank and appurtenant facilities. Findings of the assessment are used to determine the project's significance.

1.3 Permits Required or Potentially Required

Governmental permits needed to implement the proposed action are listed below.

Type	Agency
Grading Permit; Building Permit	Dept. of Public Works, County of Maui
NPDES General Permit and NOI Form C	State Dept. of Health, Clean Water Branch

1.4 Location

As shown in Figure 1, access to the site is via a driveway off the south side of Kaupakulua Road. The asphalt-paved driveway is approximately 1,000 feet long and barricaded by a locked gate. It provides vehicular access to service the existing 200,000-gallon Lower Kaupakulua Tank and well, constructed in 2000.

The project area is located between the communities of Kokomo and Kaupakulua, and approximately 2 miles from the town of Makawao (see inset, Figure 1).

Driveway leading to the Lower Kaupakulua Tank, off Kaupakulua Road.

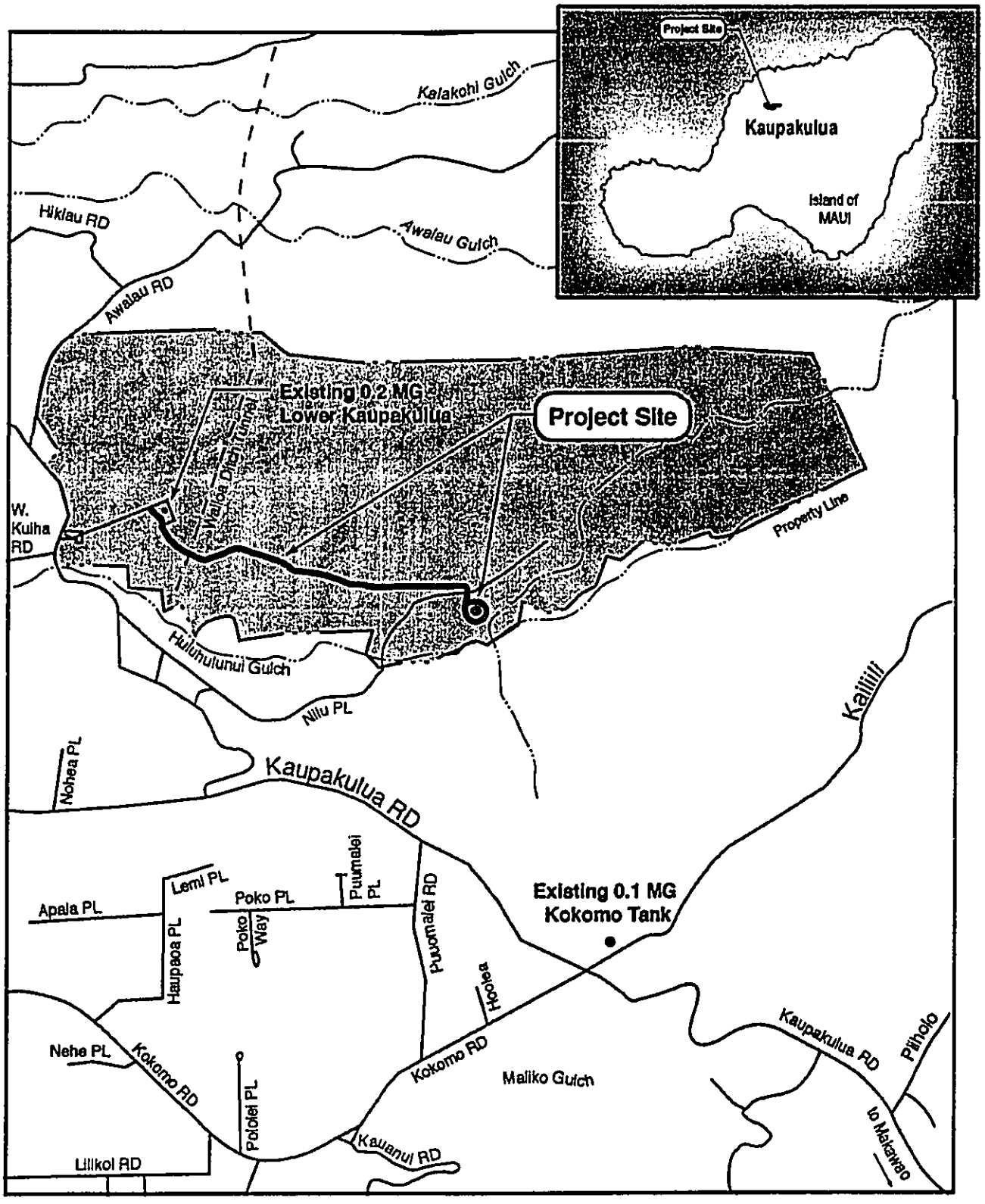

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Figure 1
Project Location Map

0.2 MG Lower Kaupakulua Tank and well at 1,250-foot elevation. The building contains chlorine treatment equipment for pumped groundwater.

The jeep trail leading to proposed Upper Kaupakulua tank site. The general alignment of this trail will serve as the new paved access road.

Proposed Upper Kaupakulua Tank site at an elevation of approximately 1,500 feet. Tree line marks the Huluhulunui Gulch.

1.5 Land Ownership

The proposed action is wholly located on property identified as TMK 2-7-15: 34 (see Figure 2). The 516.40-acre parcel is owned in fee by Alexander and Baldwin, Inc. and leased by Stephen Perreira for cattle grazing. ~~The County of Maui plans to subdivide and acquire approximately 1.17 acre of the parcel to construct the water tank.~~ *The County of Maui has subdivided and acquired a 1.17-acre parcel to construct the water tank. A separate TMK has not yet been assigned to the subdivided parcel.* The proposed access road will become a road easement.

1.6 Existing and Surrounding Uses

The project site is currently used as pasture land. The proposed tank site, at an elevation of 1,500 feet mean sea level (MSL), is near Huluhulunui Gulch. It is separated from the gulch by swamp mahogany trees, eucalyptus, and scattered strawberry guava shrubs, some of which are naturally occurring and others planted as a windbreak. At present, access to the proposed tank site is via an unpaved jeep trail.

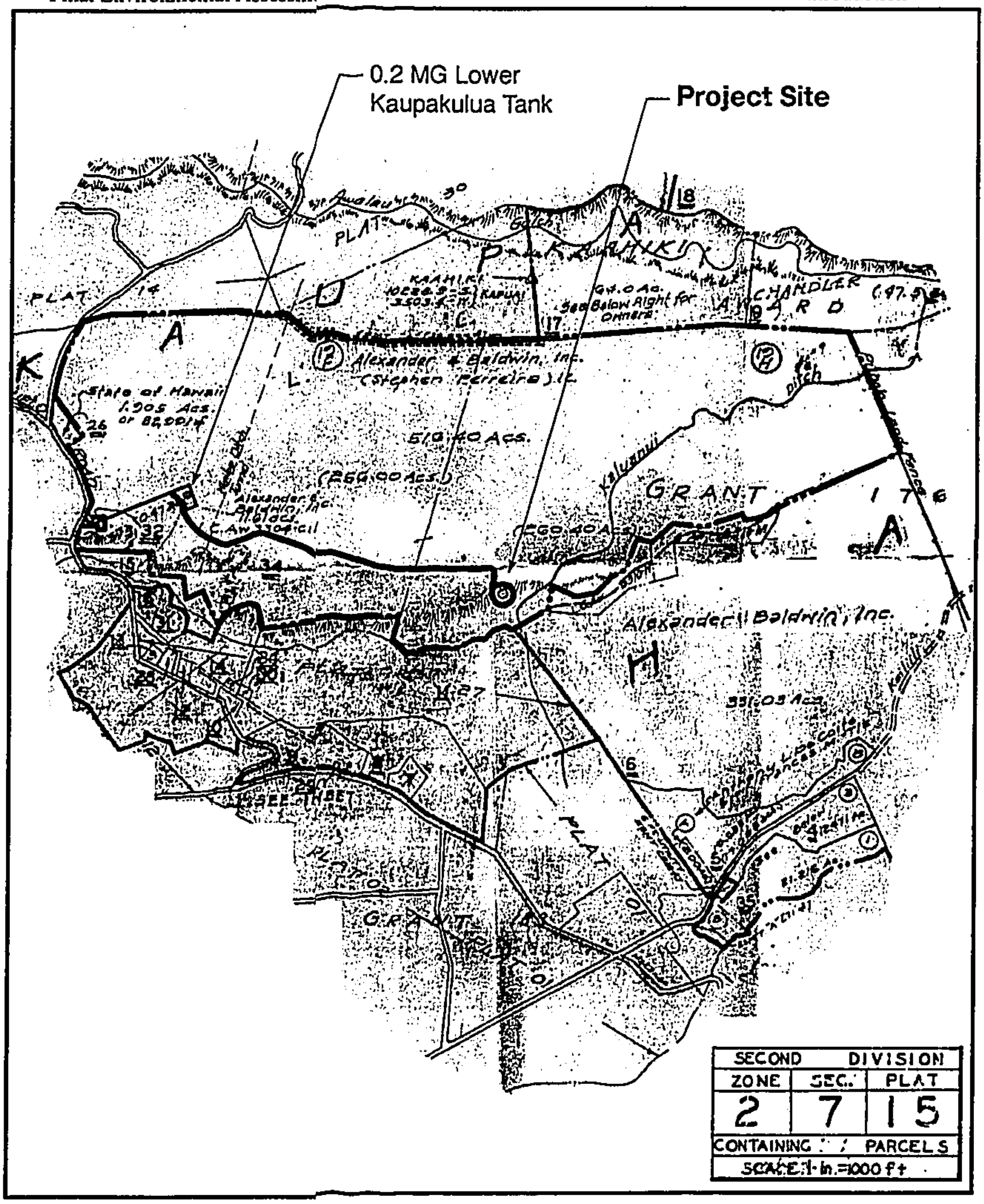

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Figure 2
Tax Map

General landscape of the project area. Jeep trail leading to the proposed upper tank site is visible on the right side of the photo.

1.7 Project Summary

Proposed Action	Construct 0.5 million gallon water storage tank, access road, and appurtenant pipelines, and control mechanisms
Location	Kaupakulua, Makawao District, Island of Maui
Tax Map Key	2-7-15: 34 *(The project site was formerly part of this TMK. It was recently subdivided, but a new TMK had not been assigned as of May 2003.)*
State Land Use District	Agricultural
Community Plan Land Use Designation	Agricultural
Zoning	Agricultural

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2. PROJECT DESCRIPTION

2.1 Project Purpose and Need

The proposed 0.5 million gallon (MG) water storage tank is intended to provide additional water storage capacity to meet the daily use and fire protection needs of customers in the ~~Makawao-and-Lower-Kula-water-systems.~~ *Kokomo-Kaupakulua, Kuiaha, and Haiku-Pauwela service areas.* This project is necessary to meet demands for domestic use and fire protection zones for the upper Haiku-Kokomo region. Because of water shortages, the DWS has limited development in the area by restricting the issuance and size of water meters. In addition, some customers currently lack adequate water pressure.

A storage reservoir with a capacity of 0.5 MG is needed for the Upper Kaupakulua Tank site. Determination of tank size was based on reservoir design criteria to provide an adequate water supply for both daily use and fire flow.

The existing Lower Kaupakulua Tank (200,000 gallons) and Kokomo Tank (100,000 gallons) currently provide water for the area encompassing Kokomo-Kaupakulua, Kuiaha, and Haiku-Pauwela. The Lower Kaupakulua Tank is fed by an adjacent well, and the Kokomo Tank is fed by the Pookela Tanks measuring 300,000 and 2,000,000 gallons, respectively. These tanks, in turn, are fed by the Kamole Forebay Water Treatment Facilities and an alternative source from Maluhia. The Lower Kaupakulua and Kokomo Tanks provide lower storage tanks in the Haiku area. A complete water system diagram is shown in Figure 3.

The design criteria calculations (presented below) show that the existing reservoir system is inadequate. The proposed tank will be fed by the Lower Kaupakulua Tank and Well. Situated at an elevation of 1,500 feet, the Upper Kaupakulua Tank will provide water for service areas above the ±1,211-foot elevation via gravity flow (where the upper system is based on a maximum pressure of 125 pounds per square inch or psi and a minimum residual pressure of 40 psi). The Lower Kaupakulua Tank—at an elevation of approximately 1,250 feet—will provide water for the service areas below the ±1,211-foot elevation (lower system) via gravity flow. As part of the new Ulumalu-Peahi Water system project, a new 12-inch water line will be connected to the Lower Kaupakulua Tank. This will create parallel water lines to separate the upper and lower water systems.

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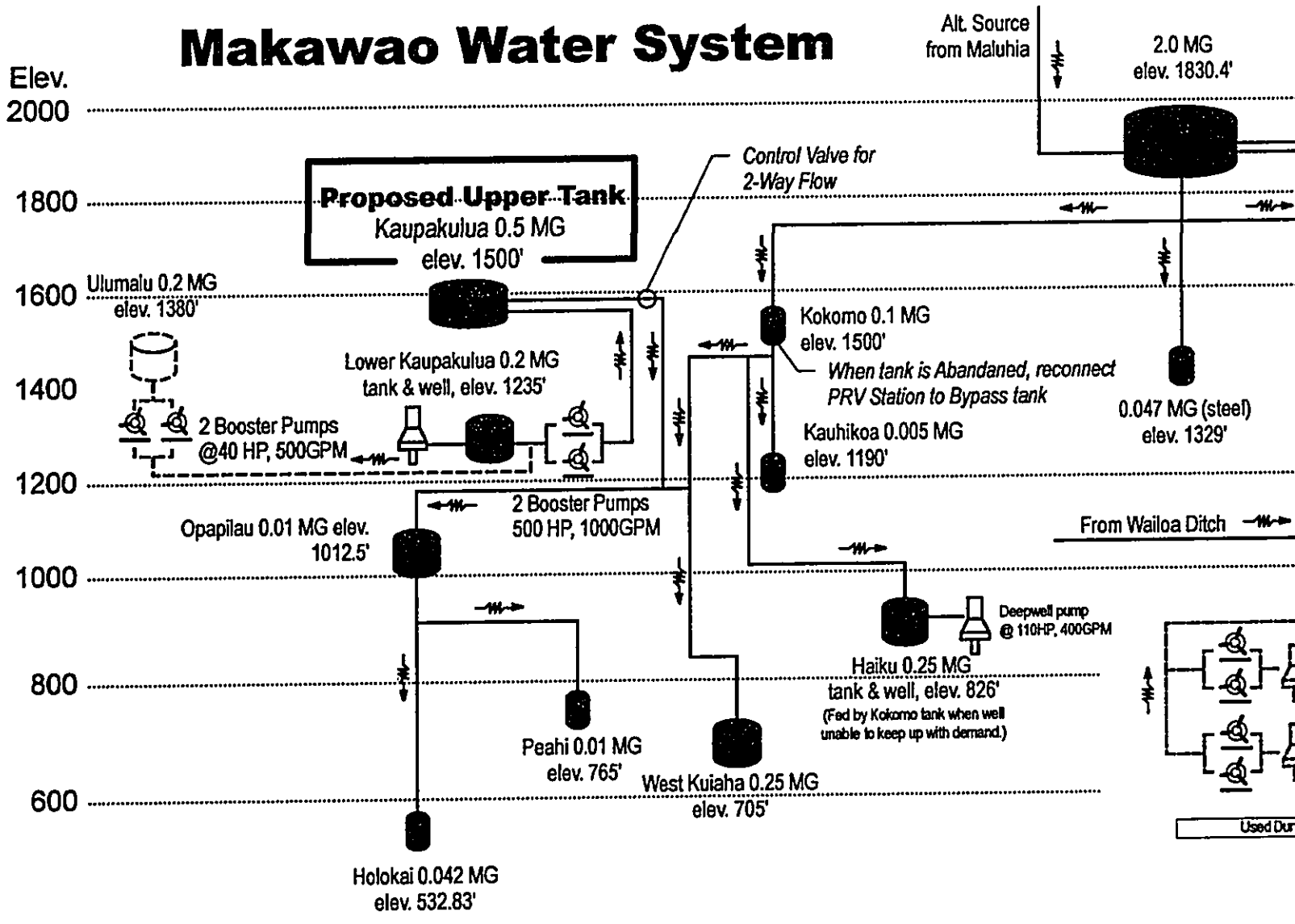
Makawao Water System



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Lower Kula Water System

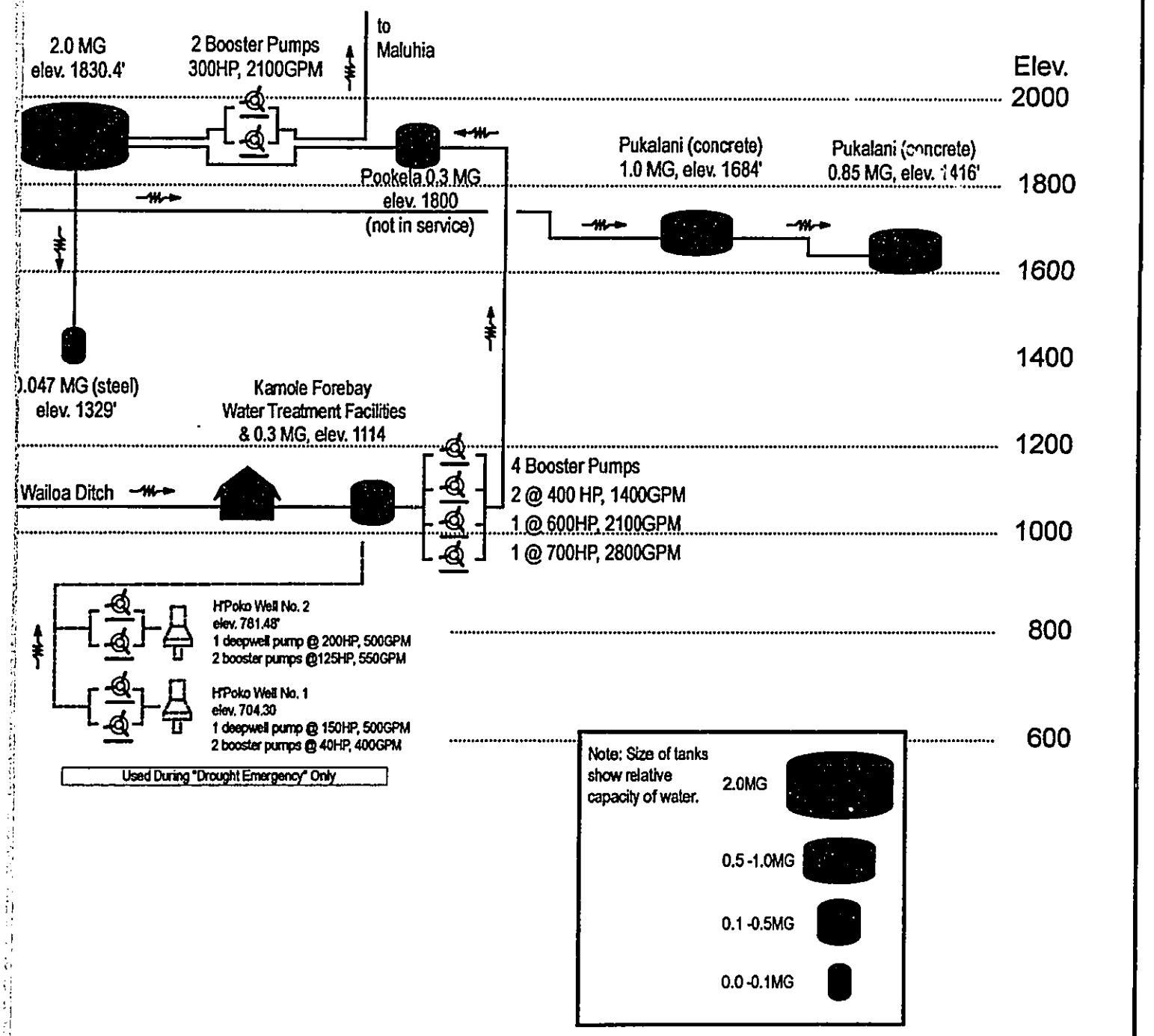

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Figure 3

Water System Diagram

The following parameters were used to calculate water consumption and the proposed tank size:

Demand Calculations

Average daily consumption per service connection was calculated from actual water consumption data taken from County of Maui, Department of Water Supply annual reports between 1990 and 2000. Based on the consumption data, average daily consumption per service connection was calculated to be approximately 450 gallons/day. The 2002 Water System Standards Domestic Consumption Guidelines for average daily demand for a single family residence is 600 gals/unit and will be used the calculate the tank storage requirements.

The proposed Upper Kaupakulua Tank will be serving approximately 157 existing water service connections in Kokomo-Kaupakulua. There are also 234 potential future services on the "Water Meter Priority List." The existing 157 water service connections will be used to calculate the existing storage requirements for the proposed tank.

Supply Calculations

Based on County of Maui standards for tank design, storage requirements are:

1. <u>Meet Maximum Daily Consumption:</u>
   Tank Capacity = Maximum Daily Consumption
   Maximum Daily Consumption = Average Day Consumption x 1.5 = (157 service connections x 600 gallons/day) x 1.5
   = 141,300 gallons

   Additional Storage Capacity = Maximum Daily Consumption – Total Existing Tank Volumes
   = 141,300 gallons – 0
   = 141,300 gallons

2. <u>Meet Maximum Daily Rate Plus Fire Flow for the Duration of Fire:</u>
   Tank Capacity = Maximum Daily Rate + Fire Flow - Credit for Incoming Pumps
   = 141,300 gallons + (2000 gpm x 2 hours x 60 min/hr) - (1140 gpm x 2 hours x 60 min/hr)
   = 244,500 gallons = ¾ Required Tank Volume

   Required Tank Volume = 326,000 gallons

   Additional Storage Capacity = Required Tank Volume - Total Existing Tank Volumes
   = 326,000 gallons - 0 gallons
   = 326,000 gallons

3. Required Additional Storage is the greater of a. and b. above
= 326,000 gallons

A tank capacity of 0.5 MG is needed to provide adequate water supply for both daily use and fire flow.

2.2 Technical Description of the Project

The proposed water system improvements include construction of a 0.5 MG water storage tank, a perimeter road around the new tank, gates, fencing, and waterline and drainline connections (see Figure 4). Maui DWS proposes to acquire approximately 1.17 acre for the proposed 0.5 MG water tank. Two 12-inch water lines will be constructed from the new water tank to the Lower Kaupakulua Tank. A 24-foot easement will be obtained to install the new pipelines and provide service access to the tank. A 12-foot asphalt road will be built within the easement.

Storage Reservoir Tank. The new water tank will be constructed of reinforced concrete with a concrete floor slab. The water tank will measure approximately 73 feet, 8 inches in diameter and 20 feet in height (see Figure 5). The finished floor elevation for the new water tank will be at an elevation of approximately +1,500 feet Mean Sea Level (MSL) with an overflow elevation of 1,520 feet. Based on a topographic survey, the existing ground surface elevations with the new water tank footprint generally range from about +1,500 to +1,510 feet MSL. Therefore, construction of the proposed water tank structure will involve cuts of up to about 10 feet deep into the existing ground. The total amount of soil to be removed for the cut is estimated at ±7,000 cubic yards. A six-foot high security chain link fence will be installed around the perimeter of the tank site with a 14-foot wide double swing gate.

Drainage System. The cut and fill slopes will be graded to 2:1. A cutoff ditch will be installed at the top of the cut slope in order to minimize the erosion that would otherwise occur due to rainfall runoff flowing down the proposed cut slope. A 4-foot wide concrete swale will be installed at the top and bottom of the cut slope. *Runoff accumulated in the swales will be converged to an 18-inch pipe drainage system via drain inlets.*

All unpaved surfaces will be covered by grass. Accumulated runoff will be conveyed from the drainage system or sheet flow into a proposed detention basin *(sized for a 50-year, 1-hour storm event)* adjacent to the tank. Overflow from the detention basin during large storm events will sheet flow to the pasture area downstream of the site.

Service Road. A new access road will be needed to service the facility. It will consist of a flexible pavement section, measuring approximately 3,637 feet long with a 12-foot wide pavement and 4-foot wide grassed shoulders. The paved road will continue around the water tank structure as a perimeter service road, also 12 feet wide. The alignment of the reservoir

access road between the proposed Upper Kaupakulua Tank and the existing Lower Kaupakulua Tank will follow an existing jeep trail. Two stretches of the new road will be relatively steep, with slopes measuring 11.4% and 9.6%, respectively.

Pipelines. Two 12-inch water lines will serve as the inflow and outflow to the proposed tank. Both pipelines will be connected to existing stub-outs near the Lower Kaupakulua Tank. A typical cross-section view of the trench for the waterlines is shown in Figure 6.

After each increment of pipeline is completed, it must undergo hydrostatic testing and chlorination to disinfect the line. These procedures will be conducted according to the DWS specifications and applicable Federal, State, and County requirements. Prior to construction, the contractor will prepare a Site Specific Best Management Plan (BMP), as needed, indicating the dechlorination methods and other BMP methods. The BMP will be submitted to the State Department of Health for review and approval as required by the NPDES permit.

Control System. The telemetry and control system will consist of equipment to interface with the existing Department of Water Supply, Kingfisher Supervisory Control and Data Acquisition (SCADA) system. This will allow remote operations and monitoring. A solar powered and remote terminal unit (RTU) will transmit data pertaining to the tank water levels to the existing Kaupakulua booster pumps for start and stop operations and to the Kahului baseyard to monitor the system's status.

The baseyard in Kahului will control the "on-off" set points for both the proposed Upper Kaupakulua Tank and the existing Kaupakulua booster pumps. They will also receive the alarm signal if transmission between the proposed tank and booster pumps is interrupted in either direction, in which case, they will control the booster pump operation accordingly.

2.3 Estimated Project Schedule and Cost

Construction will begin upon approval of all required governmental construction permits, estimated to be ~~May~~ *September* 2003. The estimated construction period is approximately 9 months. Total development costs are estimated at $1,750,000 and will be appropriated through County of Maui funds.

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TRUE NORTH
SCALE: 1 In. = 60 Ft.

GRAPHIC SCALE:
1" = 120'
60' 30' 0 60' 120'

MATCH LINE

UPPER KAUPAKULUA
TANK ACCESS ROAD

EASEMENT B-2
1,900 Acs.

TRUE NORTH
SCALE: 1 In. = 60 Ft.

EXISTING LOWER KAUPAKULUA
0.2 MG TANK & WELL

EXISTING
ACCESS
ROAD "A"

EXISTING
ACCESS
ROAD "B"

PROPOSED 12" INFLUENT
WATER LINE

PROPOSED 12" EFFLUENT
WATER LINE

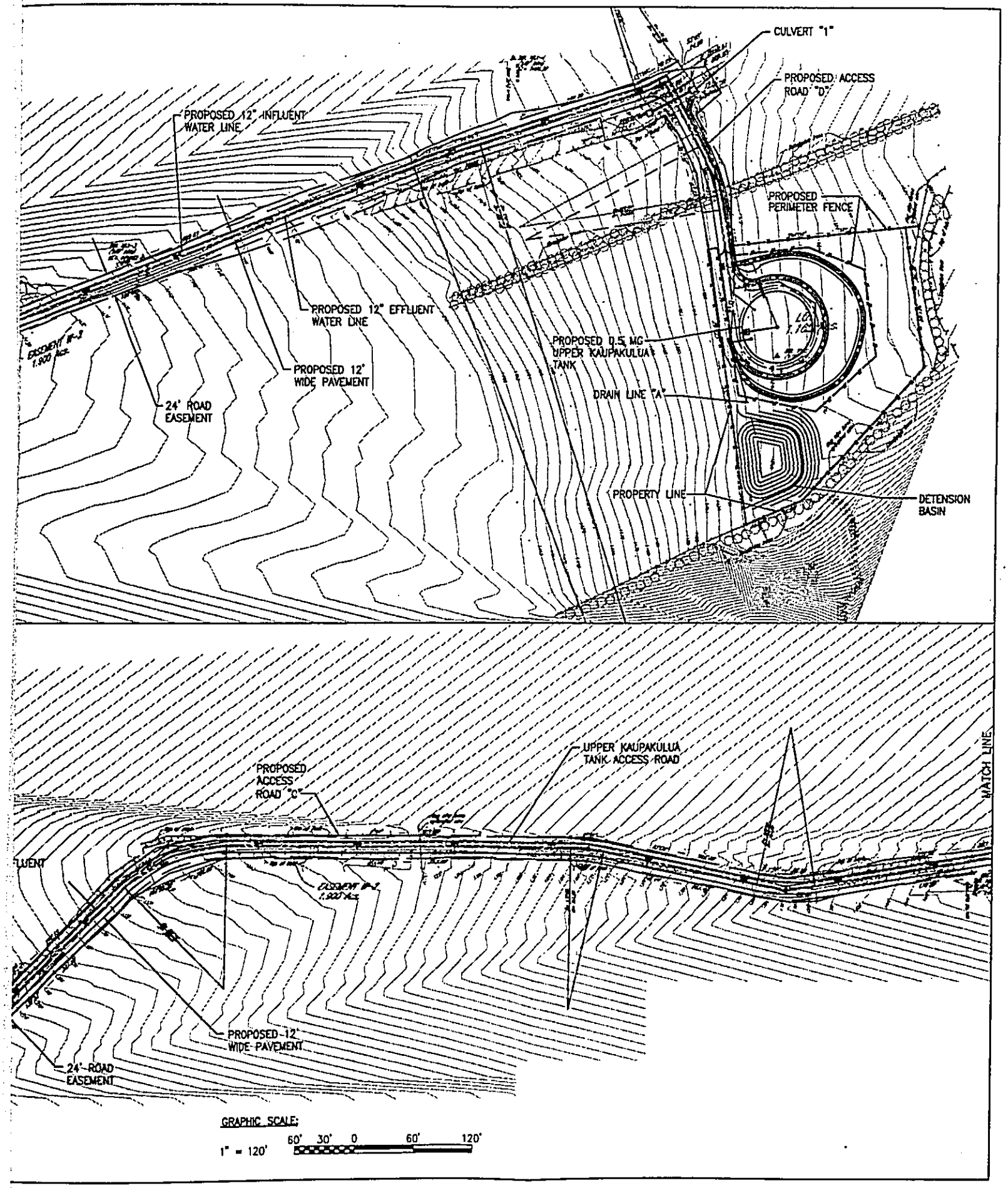

Figure 4
SITE PLAN

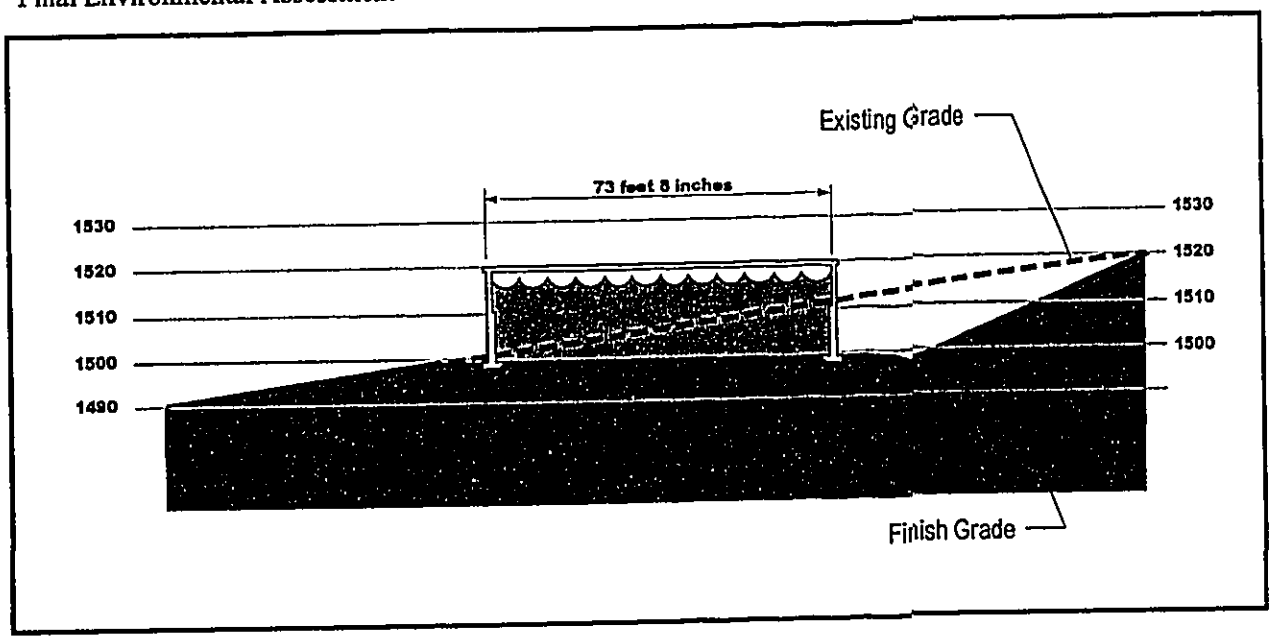

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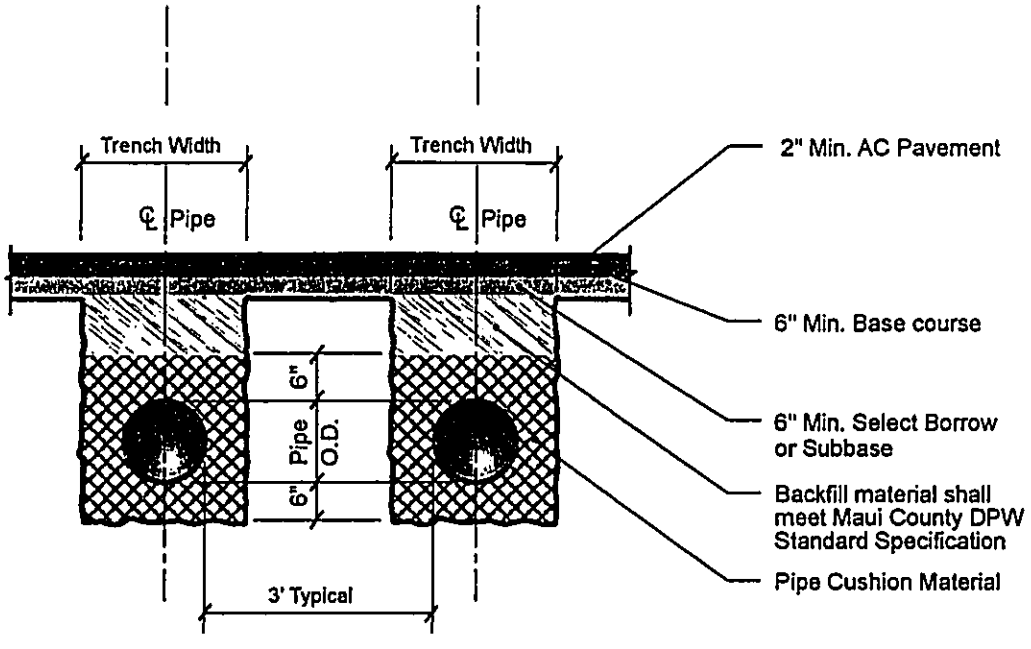
Figure 5
Tank Detail



Typical Cross-Section Detail

Not to Scale

3. EXISTING CONDITIONS, POTENTIAL IMPACTS, AND MITIGATION MEASURES

3.1 Geology, Hydrology, and Soils

The island of Maui is composed of two volcanic mountains: the older West Maui Volcano, and the younger Haleakala Volcano. These two dormant shield volcanoes are linked by a broad plain which formed when lava flows from the Haleakala Volcano joined the West Maui Mountains landmass. The project site is situated on the western slope of Haleakala.

Hydrology

There are no surface water sources on the project site. The nearest surface water source is Huluhulunui Gulch, an intermittent stream located approximately ~~75~~ *275* feet west of the proposed Upper Kaupakulua Tank site.

A prominent water source in the project area is the Wailoa Ditch, which runs east-west and is located south (upslope) of the Lower Kaupakulua Tank (see Figure 1, p. 3). The Wailoa Ditch runs through an underground channel ~~through the project area.~~ *that lies almost perpendicular to the proposed access road.* Although the proposed access road will pass over Wailoa Ditch, because the top of the tunnel lies approximately 35 feet below the surface, it will not be affected by surface disturbance to construct the access road and lay the 12-inch water lines.

Basal groundwater resources are assumed to underlie the project area at a depth of about 1,250 feet below the project site. Kaupakulua Well was put into service during the 2000 Fiscal Year.

Topography

The project site begins at an elevation of approximately 1,250 feet mean sea level (MSL), adjacent to the Lower Kaupakulua Tank is located (see Figure 7). The proposed access road and pipelines then follow an alignment that climbs to an elevation of approximately 1,500 feet MSL. The topography of the area is one of rolling hills interspersed with rocky outcrops. The proposed access road traverses land of varying grades from virtually flat (less than 1%) to moderately steep (11.4%). The proposed tank site has an average existing slope of 10.7%.

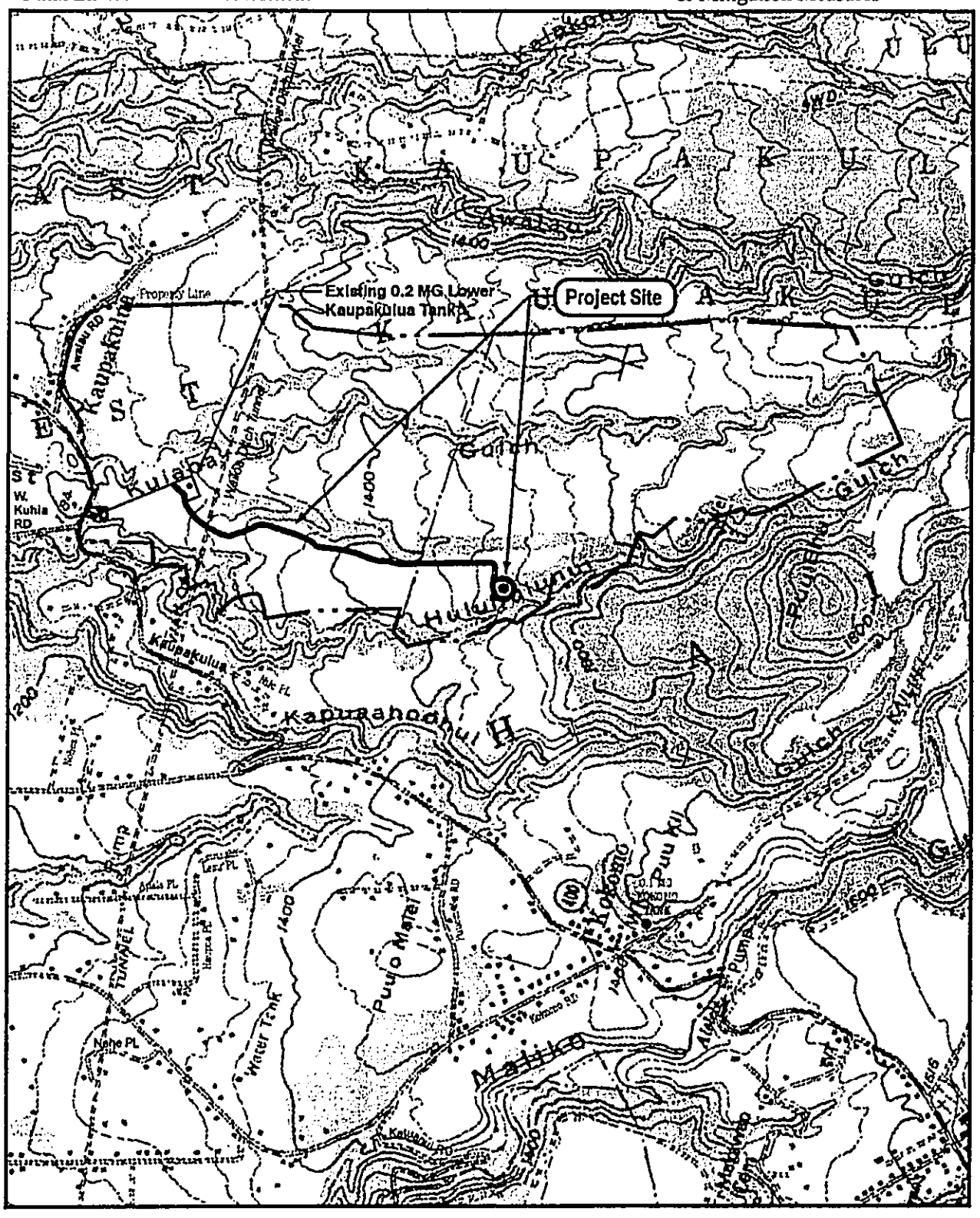


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Figure 7
Topography

Soils

In general, the soils underlying the project site and surrounding lands belong to the Pauwela-Haiku association. This association consists of well-drained, fine-textured soils on low uplands on the north-facing slopes of East Maui. These soils are gently sloping to moderately steep. They developed in material weathered from basic igneous rock and are found at elevations ranging from near sea level to 1,500 feet. Gulches and ravines are characterized by rock land and rough broken land.

There are nine soil types in the project area, as identified by the U.S. Department of Agriculture Soil Conservation Service. Figure 8 shows the general locations of various soils underlying the proposed tank site and along the route of the access road.

Pauwela clay, 3-7% (PfB), 7-15% (PfC), 15-25% (PfD)

This series consists of well-drained soils on uplands at elevations ranging from 150 to 1,500 feet. In a representative profile, the surface layer is dark grayish-brown clay about 12 inches thick. The subsoil, about 21 inches thick, is dark reddish-brown clay that has an angular blocky and subangular blocky structure. In the smooth uplands area with slopes of 3-7%, permeability is moderately rapid, runoff is slow, and the erosion hazard is slight. On slopes of 7-15%, runoff is slow to medium and the erosion hazard is slight to moderate. On steeper slopes of 15-25%, runoff is medium and the erosion hazard is moderate.

Subsurface Conditions

A geotechnical study was conducted in the project area and included six borings at the tank site to depths from 26.5 to 75.4 feet below the existing ground surface and two borings along the future access road alignment extending to depths of about 11.5 feet below the existing ground surface. In general, the field exploration encountered stiff saprolite soils derived from weathering of volcanic rocks extending to the maximum depth of about 75.4 feet. However, soft soil pockets, isolated boulder layers, and hard basalt rock ledges were also encountered at various depths in the majority of the borings drilled across the water tank site.

Groundwater was not encountered in the drilled borings; however, ground water levels may vary significantly depending on seasonal rainfall, time of year, and other factors. In addition, subterranean seepage may be anticipated during construction due to potentially high rainfall and sloping terrain at the project site.

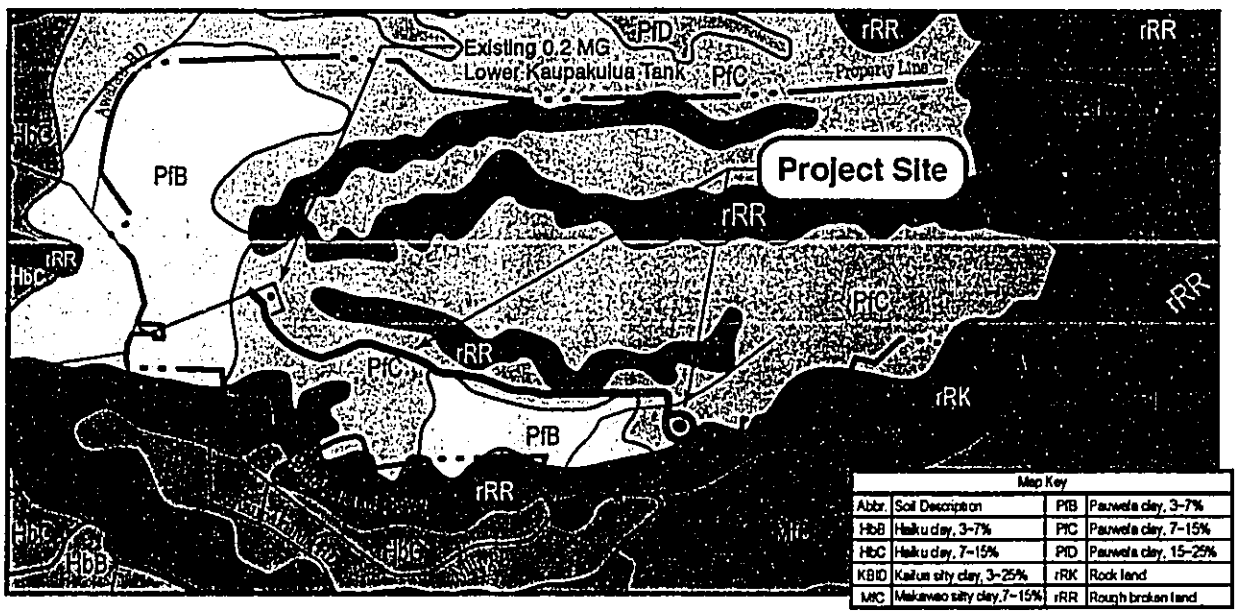

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Figure 8

Soils Map

Potential Impacts and Mitigation Measures

The total graded area for the reservoir and access road is estimated to be 2.5 acres. The project components will require earthwork in the following estimated volumes:

Access road: 2,200 cubic yards (CY) excavated
1,800 CY emb.

Reservoir: 2,700 CY excavated
50 CY emb.
970 CY structural fill

Most of the area that will be disturbed is underlain by clays in which runoff is slow to medium. Permeability of the soil is moderately rapid. Even with clayey soil, the erosion hazard increases as slopes become steeper; however, construction on steeper slopes is limited to a relatively narrow corridor to install the pipelines and roadway, therefore soil exposure will also be more limited.

To mitigate the potential for both water-borne erosion, the following best construction management practices will be followed:

- Clearing and grubbing will be held to the minimum necessary for grading and equipment operation.
- Construction will be sequenced to minimize the exposure time of cleared surface area.
- Pre-construction vegetative ground cover will not be destroyed, removed, or disturbed more than 20 calendar days prior to site work.
- Construction will be phased with one area stabilized before another phased is initiated. Stabilization will be accomplished by temporarily or permanently protecting the disturbed soil surface from rainfall and runoff.
- Erosion and sediment control measures will be in place and functional before earth-moving operations begin, and will be maintained throughout the construction period.
- Temporary soil stabilization with appropriate vegetation will be applied on areas that remain unfinished more than 30 calendar days. Permanent soil stabilization with perennial vegetation will be applied as soon as practicable after final grading.
- All surface water flowing toward the construction area will be diverted by using berms, channels, sediment traps, and other appropriate control measures, as practical.
- Silt fences and/or sandbags will be used down slope of all disturbed areas or stockpile areas.
- Gravel access including approaches, washdown area, and detention basin will be installed prior to the start of construction.

3.2 Agricultural Productivity

The State Department of Agriculture has established a classification system that identifies Agricultural Lands of Importance to the State of Hawaii (ALISH). The ALISH system is based primarily on soil characteristics and categorizes lands as "Prime," "Unique," and "Other Important Agricultural Land." The remaining lands are not classified. Prime agricultural lands are those best suited for the protection of food, feed, forage, and fiber crops. They have the soil quality, growing season, and moisture supply needed to produce sustained crop yields economically, given modern farming methods. Unique agricultural lands possess a combination of soil quality, growing season, and moisture supply to produce high yields of a specific crop. Other important agricultural land include those that have not been rated as "Prime" or "Unique."

As shown in Figure 9, the project site is located in lands designated as "Prime" agricultural land.

Another classification system is the Land Study Bureau's Detailed Land Classification which rates the agricultural suitability of soils. A five-class productivity rating is applied using the letters A through E. An "A" rating indicates lands of the highest productivity or very good, while "E" indicates lowest productivity or very poorly suited for agricultural production. The Land Study Bureau gives an overall rating of "D" to the Pauwela soil series underlying the project site.

3.3 Climate

Maui's climate varies according to altitude and is influenced by leeward/windward orientations. Lowland areas tend to have a semi-tropical climate, while higher elevations are characterized by temperate climates.

The weather station closest to the project site is located in Haliimaile, approximately 4 miles from Kaupakulua and at an elevation that is 400 feet lower than the project site. The Haliimaile weather station reports a median annual rainfall of 44 inches.[1] There is a distinct seasonality in rainfall levels with the rainy season occurring from November through April and the dry season from May through October. December is the wettest month with median rainfall of 5.7 inches, while June is historically the driest with median rainfall of 0.9 inch. Prevailing winds are the tradewinds that generally flow in a northeasterly direction, sweeping around Haleakala. These winds generally blow between 13 to 24 miles per hour.

[1] Owenby, James R. and D. S. Ezell. January 1992. ***Monthly Station Normals of Temperature, Precipitation, and Heating and Cooling Degree Days, 1961-90, Hawaii.*** U.S. Department of Commerce, National Oceanic and Atmospheric Admnistration, National Climatic Data Center, Asheville, North Carolina.

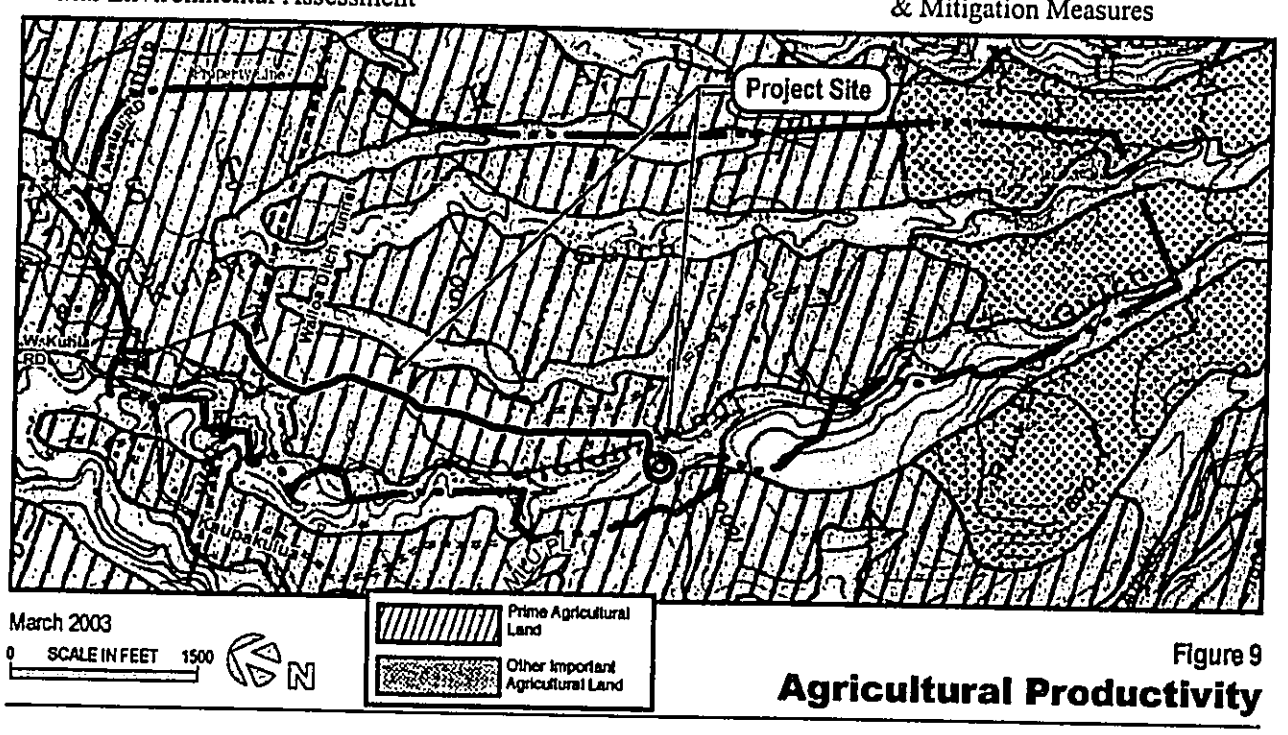

Figure 9
Agricultural Productivity

3.4 Flora and Fauna

A botanical resources assessment was conducted in August 2000. (See full report, reproduced in Appendix B.) The project site is currently used as a cattle pasture and this use is expected to continue in the adjacent areas. The pasture grasses are a mixture of various species which include Hilo grass (*Paspalum conjugatum*), African dropseed grass (*Sporobolus africanus*), pangola grass (*Digitaria pentzii*), and yellow foxtail (*Setaria gracilis*). Scattered through the thick mat of grasses are plants of Spanish clover or ka'imi (*Desmodium incanum*), sensitive plant or puahilahila (*Mimosa pudica* var. *unijuga*), honohono (*Commelina diffusa*), and two native sedges, *Cyperus polystachyos* and *Fimbristylis dichotoma*. Near the reservoir site, Formosan koa trees (*Acacia confusa*), 5 to 15 feet tall, line the proposed access road. The proposed reservoir site is open pasture with swamp mahogany trees (*Eucalyptus robusta*) bordering three sides of the pasture. The Eucalyptus are 70 to 80 feet tall. Under the trees there are clumps of downy wood-fern (*Christella parasitica*), and mossy mats of *Leucobryum* sp. and *Rhizogonium spiniforme*. The grassy pasture area on the reservoir site supports scattered guava shrubs (*Psidium guajava*), 3 to 6 feet tall, and saplings of Formosan koa and Eucalyptus. Two macadamia nut trees (*Macadamia integrifolia*) are also found nearby. Woody cover is about 5%. Besides the grasses mentioned previously, other grasses found on this pasture area are golden beardgrass (*Chrysopogon aciculatus*) and *Schizachyrium condensatum*.

The adjacent gulch is dominated by a dense growth of strawberry guava (Psydium cattleianum). Java plum (Eugenia couminii), soily oak (Grevillea robusta), kuiui (Aleurites moluccana) trees are also common with white ginger (Hedychium coronarium) along the streambed.

A field survey was conducted on September 8, 2000 to assess the wildlife resources found at the proposed water storage tank site and along the proposed access road. The objectives of the survey were to provide a record of wildlife on the site and to determine whether the project would adversely impact any important wildlife resources in the area. (Full report is reproduced in Appendix C.)

The survey was conducted between 11:00 a.m. and 1:40 p.m. Three count stations were established approximately 0.4 miles apart. The first station was approximately 100 feet above the center of the water tank site at an elevation of 1600 feet. The second station was downslope from the water tank site, on a jeep trail through the pasture at about the 1,406-foot elevation. The third count station was on a paved road leading to the existing booster pump at the 1,278-foot elevation. Observations were made for eight minutes at each station. All birds seen and heard were recorded. In addition to the counts at the three stations, searches for wildlife signs and incidental observations were made above the tank site, in the gulch, and along the jeep road.

Birds

Moderate northeasterly tradewinds blew throughout the survey period making audio detection less than optimal. This did not hamper the survey, however, since the project site and road corridor were in pasture land that made visual observations easy. Only nine species of birds were encountered during the station counts.

Pacific golden plover (*Pluvialis fulva*)
Cattle egret (*Bulbulcus ibis*)
Chestnut manikins (*Lonchura malacca*)
Spotted dove (*Streptopelia chinensis*)
Zebra dove (*Geopelia striata*)
Melodius laughing thrus (*Garrulax canorus*)
Northern cardinal (*Cardinalis cardinalis*)
Common myna (*Acridotheres tristis*)
Japanese white-eye (*Zosterops japonicus*)

Of these nine species found during the survey, only the Pacific golden plover is considered native. The Pacific golden plover was present at Station 3 along the paved road leading to the booster pump, where the vegetation was cropped low from heavier concentration of grazing livestock and mechanical disturbance from either bulldozing or mowing. Pacific golden plovers are migratory. They are present in the Hawaiian Islands from August through March where they typically establish feeding territories on lawns or open flats where they feed on insects. The pastures on site were not suitable for plovers because the grass was too dense and long.

No native honeycreepers (family *Drepanididae*) or other native forest species were found on the site. This was expected since only introduced trees and pasture grasses were present. There were no native trees, such as ohia (*Metrosideros* spp.) or koa (*Acacia koa*) that would support populations of native birds and none in the vicinity. More suitable habitat for native forest birds occurs much further upslope or to the east in extant native rainforests of the forest reserves.[2]

No native short-eared owl or pueo (*Asio flammeus sandwichensis*) was seen during the survey, but are expected to occur in the area. Pueo inhabit grasslands, shrublands, and montane parklands throughout Maui. Unlike the common barn owl, the pueo is active during the day and can be readily observed at midday. This species is widespread on all the main islands except Oahu where the population on that island is listed by the State of Hawaii as

[2] Scott, J. M. S. Mountainspring, F. L. Ramsey, and C. B. Kepler. 1986. *Forest Bird Communities of the Hawaiian Islands: Their Dynamics, Ecology, and Conservation*. Studies in Avian Biology No. 9. Cooper Ornithological Society.

endangered. The Maui population is not endangered or threatened. Short-eared owls feed extensively on house mice (*Mus musculus*) and Polynesian rats (*Rattus exulans*).
The following is a list of introduced birds that were expected, but not encountered during the survey.

Ring-necked pheasant (*Phasianus colchicus*)
Common barn owl (*Tyto alba*)
House finch (*Carpodacus mexicanus*)
Nutmeg mannikins (*Lonchura punctulata*)
Eurasian skylark (*Alauda arvensis*)
Red-billed leiothrix (*Leiothrix lutea*)

Mammals

Axis deer tracks and fecal pellets were found on game trails under Formosa koa stands. The sign indicated that deer had recently crossed the property. Axis deer are more common in the southern portion of Haleakala volcano where they were introduced in 1959. They have since expanded their range northward where they are now common in Kula and have been encountered as far north as Waikamoi Preserve.[3] The mosaic of forested gulches, windrows, and open pastures with stands of shrubs and small trees make the area ideally suited for axis deer colonization.

The following mammals were expected, but not encountered during the survey:

Feral pig (Sus srofa)
Small Indian mongoose (*Herpestes auropunctatus*)
Feral cat (*Felis cattus*)
Rats (*Rattus* sp.)
House mouse (*Mus musculus*)

The Hawaiian hoary bat (*lasiurus cinereus semotus*) is a federally listed endangered species. Bats are commonly observed at dusk, therefore it was unlikely to be detected during the survey which occurred at midday. the habitat on the project site and in the vicinity is suitable for bats. On Maui, the hoary bat has been mostly reported from Upcountry areas, between elevations of 1,970 to 6,560 feet elevation in a variety of habitats. It has been observed in nearby Makawao town and in Maliko Gulch (Duvall 1991). Kepler and Scott (1990) stated that records of bat sightings on Maui suggest that the hoary bat occurs on the island only as a migrant from the island of Hawaii. Duvall's (1991) records lean toward a resident, reproductively active population.

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[3] Waring, G. H. 1996. *Preliminary Study of the Behavior and Ecology of Axis Deer on Maui, Hawaii.* Research report to Haleakala National Park and the National Park Service. Department of Zoology, Southern Illinois Uniersity, Carbondale, IL.

3.5 Archaeological, Historic, and Cultural Resources

Archival research and archaeological field investigation of the project site was conducted by the firm Cultural Surveys Hawaii Inc. (The complete report reproduced in Appendix A).

Kaupakulua is poorly documented in pre-contact traditions and no traditions specific to the Kaupakulua ahupua'a were identified. It is likely to have followed same pattern as other ahupua'a in the Hamakualoa district, where the gently sloping kula lands, intersected by small gulches, would have provided an area amenable to plantings of several crops by the Hawaiian population, especially sweet potato, along with gathering of non-cultivated plants (i.e., olona and medicinal plants). This area would also likely have contained habitation sites—both permanent and temporary—associated with agriculture. The Kaupakulua Complex (State site 50-50-06-1221) consisting of irrigated terraces and associated features located approximately 1 mile makai (north) of the project site supports this scenario.

The entire ahupua'a of Kaupakulua was awarded to Nueku Namau'u by Land Commission Award #10474 and Royal Patent No. 4490 (Boundary Commission, Maui, Vol. 3: pages 496-528). Namau'u's land was later incorporated into the Haiku Sugar Company which was established after the mid-ninetenth century by Samuel T. Alexander and Henry Perrine Baldwin (Speakerman 1978:120). Haiku Sugar Company was subsumed in the larger Maui Agricultural Company in 1904.

The Wailoa Ditch, a historic property, is schematically represented on maps as bisecting the project area. However, the ditch is a tunnel in this area, so would not be visible from the surface. Ken Nomura of Alexander and Baldwin Properties, Inc., was present during the field investigation and pointed out a collapsed section of the tunnel. ~~Though it was on the property, adjacent to Awalau Road, it was approximately 600 yards north of the northern end of the project area.~~ *This particular section of the tunnel is located on the east side of the existing paved driveway near Kaupakulua Road, and is not located in the project area.*

Potential Impacts

Figure 10 shows the location of documented historic sites that are closest to the project area. They include the former Kaupakulua Winery and an unmarked grave site, and are located some distance away and will not be affected by the project.

The State Historic Preservation Division (SHPD) of the Department of Land and Natural Resources, has determined that no historic properties are expected to be affected by the project (see correspondence dated May 7, 2003 in Chapter 9). However, in the event that historic sites or artifacts are identified during construction, all work will cease in the immediate vicinity of the find, the find will be protected from additional disturbance, and the SHPD and the Maui Island Burial Council will be contacted immediately.

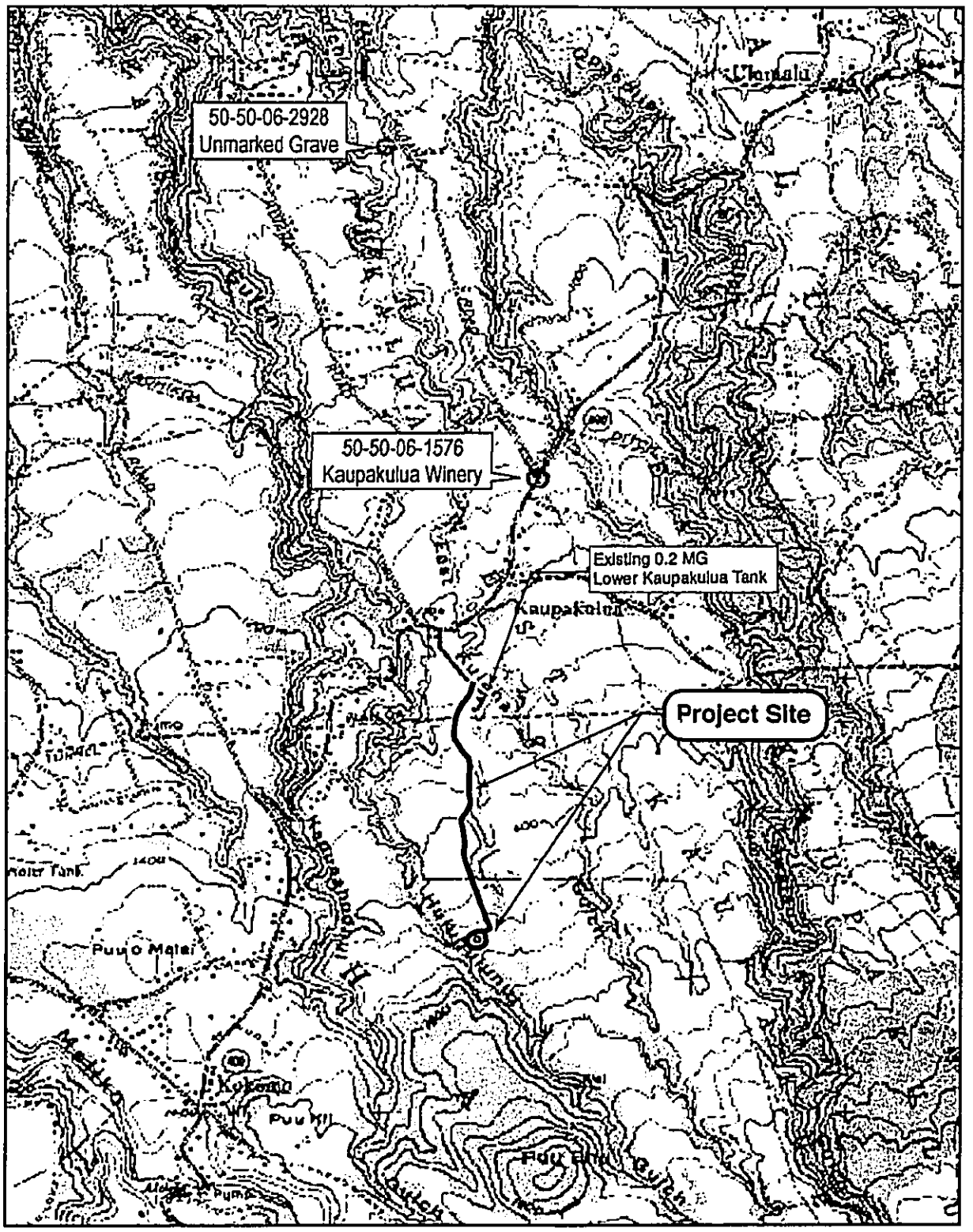

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Figure 10
Archaeological Sites

Cultural Impacts

The project area is essentially tableland, in pasture dominated by historically introduced species. No native rights concerns (burials, sacred sites, trails, unique resources, gathering practices, etc.) were observed in the course of the historical background research or field inspection. On this basis, there appears to be no native rights issues pertinent to the project area. There were native Hawaiian land claims in the general vicinity (but not within the study area) with use of swales for taro cultivation and claims of pasture lands as well. Much of this slope of Hamakualoa District is in similar pasture lands and there is believed to be nothing unique associated with this particular piece of table land.

It seems far more likely that traditional Hawaiian practices in the vicinity would have focused on *Huluhulunui* and *Kuiaha* Gulches, which lie outside the project area—to the west and east, respectively. These gulches probably offered a much greater diversity of resources for native Hawaiian use even in historic times. ~~Therefore, the proposed action, which will largely be limited to construction of an access road through the existing pasture and development of a reservoir site on a tableland area of overwhelmingly introduced grass species, is not expected to impact traditional native Hawaiian land use or rights.~~

Contemporary access through the property (which is privately owned), and from the property to adjacent areas is controlled by fencing and a locked gate across the paved driveway (off Kaupakulua Road). Such controls are necessary to manage livestock movement and because of liability concerns. The proposed action includes fencing around the new water tank for public safety and security purposes. However, there will be no encumbrances on access beyond what exists currently. With no expected change in the status quo, the proposed action is not expected to have any adversely affects on contemporary cultural resources or practices.

3.6 Air and Noise Quality

Ambient noise and air quality in the region comply with existing State and federal regulations. Both air and noise quality are excellent due to the distance from highway traffic and industrial uses, and the prevailing tradewinds.

Potential Impacts and Mitigation Measures

A temporary increase in noise levels can be anticipated during construction of the facilities. Sources of noise include construction vehicles operating to and from the site and equipment operating on the site. Noise impacts will be mitigated to the extent possible through the use of mufflers on construction equipment and construction during daytime hours. The area is thinly populated and adequate distance separates the proposed construction site from the

nearest noise sensitive neighbors. The nearest resident is located more than 1,000 feet from the project site.

Ambient air quality is also expected to decline temporarily in the immediate project area due to dust and emissions from construction vehicles and equipment and exposed soil. Due to the distance of the project site from the nearest residences, there should be no adverse air quality impacts from the project. Dust control measures, such as water sprinkling and spraying, will be implemented as necessary.

There will be no adverse long-term impact on either noise or air quality.

3.7 Population and Economy

The project site is located in Census Tract 302 (Haiku-Pauwela), but it is also located close to Census Tract 304.01 (Makawao), therefore, data for both are shown below.

Table 1
Population in the Project Area and Vicinity, 1990-2000

	1990	2000	Net Change 1990-2000	Percent Change 1990-2000
CT 302 – Haiku-Pauwela	5,695	8,377	2,682	47.1
CT 304.01 – Makawao	7,271	8,147	876	12.0
Haiku-Makawao	12,966	16,524	3,558	27.5
Maui County	100,504	128,241	27,737	27.6
State of Hawaii	1,108,229	1,211,537	103,308	9.3

Source: U.S. Bureau of the Census, 1990, 2000

Table 2
Housing Units in the Project Area and Vicinity, 1990-2000

	1990	2000	Net Change 1990-2000	Percent Change 1990-2000
CT 302 – Haiku-Pauwela	2,074	3,195	1,121	54.0
CT 304.01 – Makawao	2,382	2,869	487	20.4
Haiku-Makawao	4,456	6,064	1,608	36.1
Maui County	42,160	56,377	14,217	33.7
State of Hawaii	389,810	460,240	70,430	18.1

Source: U.S. Bureau of the Census, 1990, 2000

The two census tracts encompassing Haiku-Pauwela-Makawao had a combined population of 16,524 in 2000, compared to 12,966 in 1990. This amounted to a net increase of 3,558 persons or 27.5 percent through the 1990s. Overall, growth in this area was comparable to growth in Maui County as a whole. However, when the data is disaggregated, the population increase in Haiku-Pauwela (CT 302) was significantly higher than in Makawao (CT 304.01). Changes in the number of housing units paralleled trends in population growth. In 1990, there were 4,456 housing units in the Haiku-Pauwela-Makawao area. More than 1,600 additional housing units were added during the 1990s, resulting in a count of 6,064 housing units in 2000. In Haiku-Pauwela (CT 302), specifically, the number of housing units increased by more than 50% between 1990 and 2000, from 2,074 to 3,195, respectively. This growth rate was significantly higher than both Maui County as a whole and the State of Hawaii.

Potential Impacts

Although infrastructure projects are frequently viewed as spurs to growth, the proposed action is not expected to have a stimulative effect. Rather, it is intended to address the water needs of population growth that has occurred already. The proposed water storage tank is part of an incremental series of improvements to strengthen the Upcountry water service. It will help to distribute supply to cover uneven water use during the day (i.e., peak-use periods) and maintain adequate water pressure levels.

The proposed action will have no long-term impact on existing economic activity. Earlier action by the County of Maui to acquire and subdivide 1.17 acres for the new water storage tank removed this area from pasturage; however, this land area represents a small proportion of the total pasture land and the surrounding area remains viable for grazing.

Economic benefits associated with project construction will be temporary and the impacts are expected to be dispersed throughout the island economy. As standard procedure, the construction contract will be bid by DWS to a contractor who will be responsible for all aspects of the project, including supplying a construction crew. The contractor and construction crew will most likely come from all areas of Maui.

3.8 Scenic Resources

The pastoral landscape of the project area combines undeveloped grassy, pasture land with rocky outcrops. Nearby is a gulch with heavy vegetation including large canopy trees and brush. The 0.5 MG water tank will be approximately 73.7 feet in diameter and 20 feet high. The finish floor grade of the tank is set at elevation 1,500 feet Mean Sea Level. These dimensions indicate a structure of significant size; however, its location behind the curvature of the hills renders the tank unobtrusive.

Potential Impacts

The completed facilities will be virtually hidden from public view. All of the construction will occur away from public roadways. The structure will be built into a ten-foot cut in the hillside which shields it from view. As seen in Figure 11, the closest public road is Nilu Place, across Huluhulunui Gulch. Based on the angle of view from Kaupakulua Road, and the topography of the area, the tank would be screened by Eucalyptus trees in the gulch, if not by the hillocks.

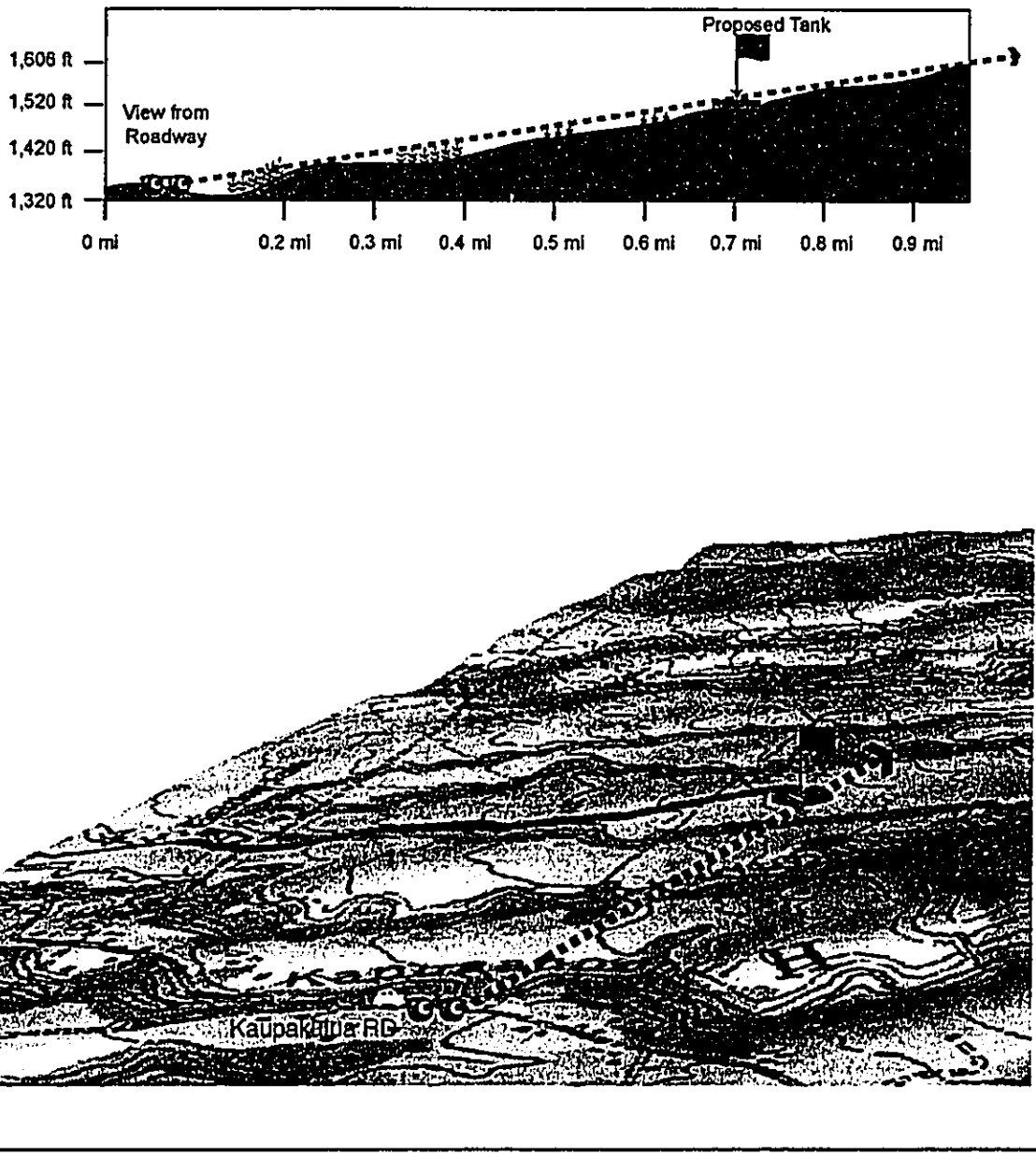

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Figure 11
Section and 3D Topo

3.9 Traffic

The project site is located off Kaupakulua Road (Highway 365). Highway 365 stretches between Pukalani and Ulumalu. At the Pukalani end, Highway 365 forms a "T" intersection with Kula Highway (Highway 37) while at the Ulumalu end, it forms a "T" intersection with Hana Highway (Highway 36). From Pukalani through the town of Makawao, Highway 365 is known as Makawao Avenue. The street name changes to Kaupakulua east of the intersection with Kokomo Road. Although Highway 365 is a relatively narrow two-lane rural road, it serves as the primary connector through a string of Upcountry towns from Pukalani and Makawao to Kokomo, Kaupakulua, Ulumalu and Haiku.

Potential Impacts and Proposed Mitigation Measures

The proposed action does not involve construction within any public roadway. However, a temporary increase of traffic on Kaupakulua Road will be experienced during the construction period. Because traffic conditions are light and no lane closures are required, the impact of increase construction-related traffic on Kaupakulua Road is not expected to be significant.

It should be noted that sight distance from the driveway onto Kaupakulua Road is somewhat limited. Therefore, during certain phases when frequent delivery of construction material (such as concrete or asphalt) is required, a signalman may be used to control the flow of traffic and facilitate the movement of vehicles on and off the site. *DWS will work with the Police Department and hire Special Assignment Off Duty Officers as required.*

Signs will be posted, as necessary, to alert motorists of trucks using the driveway. All signage will conform with the "Administrative Rules of Hawaii Governing the Use of Traffic Control Devices at Work Sites On or Adjacent to Public Streets and Highways" and the "Manual of Uniform Traffic Control Devices."

3.10 Public Infrastructure and Services

Water System

The proposed action would be integrated into the Upcountry water system, and specifically into the Makawao system which operates below the 2,000-foot elevation. The system relies extensively on surface water sources.

Three treatment facilities in the East District—Kamole, Piiholo, and Olinda—provide water for the Makawao, Lower Kula, and Upper Kula water systems, respectively. The water source for these facilities is the Waiakamoi watershed. Additional sources for Upcountry Maui include the Haiku Well, which services a portion of Haiku; the Hamakuapoko Wells,

which provide groundwater to supplement surface water supplies during times of drought emergency; and the Kaupakulua Well. Groundwater pumped from the Kaupakulua Well is chlorinated on site and stored in the Lower Kaupakulua Tank. This well will also feed the proposed Upper Kaupakulua Tank, as needed, via a 12-inch water line and booster pumps. The Kokomo Tank is fed by a higher water system and will be another water source for the proposed tank.

Raw water storage for the district consists of the Waiakamoi and Kahakapao Reservoirs on the Upper Kula system which totals 130 million gallons, and the Piiholo reservoir on the Lower Kula system which has a capacity of 50 million gallons. Currently, the Department has no raw water storage for the Makawao system, which draws its water from the Wailoa Ditch. The three east district facilities have a maximum combined capacity of approximately 18 million gallons per day.

Police and Fire Services

The police station nearest to the project site is the main headquarters in Wailuku. Police are dispatched to the field as needed, and also perform regular patrols. The nearest fire station is the Makawao Fire Station located approximately two miles from the project site.

The proposed action is not expected to have a significant impact on police or fire services.

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4. RELATIONSHIP TO LAND USE PLANS, POLICIES, AND CONTROLS

4.1 Hawaii State Plan

The Hawaii State Plan, Chapter 226, HRS, serves as a written guide for the future long-range development of the State by identifying goals, objectives, policies, and priorities and by providing a basis for determining priorities and allocating limited resources, such as public funds, services, manpower, land, energy, water, and other resources. Relevant State Plan goals, objectives, policies and priority guidelines are noted below.

The proposed project would be in conformance with State Plan objectives and policies for facility systems – in general,

> "(a) Planning for the State's facility systems in general shall be directed towards achievement of the objective of water, transportation, waste disposal, and energy and telecommunication systems that support statewide social, economic, and physical objectives."
>
> "(b) To achieve the general facility systems objective, it shall be the policy of this State to: (1) Accommodate the needs of Hawaii's people through coordination of facility systems and capital improvement priorities in consonance with state and county plans...: and "(3) Ensure that required facility systems can be supported within resource capacities and at reasonable cost to the user." (Section 22-14, HRS).

The project also conforms to Section 22-6-16, Water, HRS,

> "(a) Planning for the State's facility systems with regard to water shall be directed towards achievement of the objective of the provision of water to adequately accommodate domestic, agricultural, commercial, industrial, recreational, and other needs within resource capacities" (Section 226-16, HRS).

4.2 State Land Use Classification

The State Land Use Commission, pursuant to Chapter 205 and 205A, HRS and Chapter 15-15, Hawaii Administrative Rules, is empowered to classify all lands in the State into one of four land use districts: urban, rural, agricultural and conservation. The water tank and appurtenant improvements are located within the Agricultural District (see Figure 12).

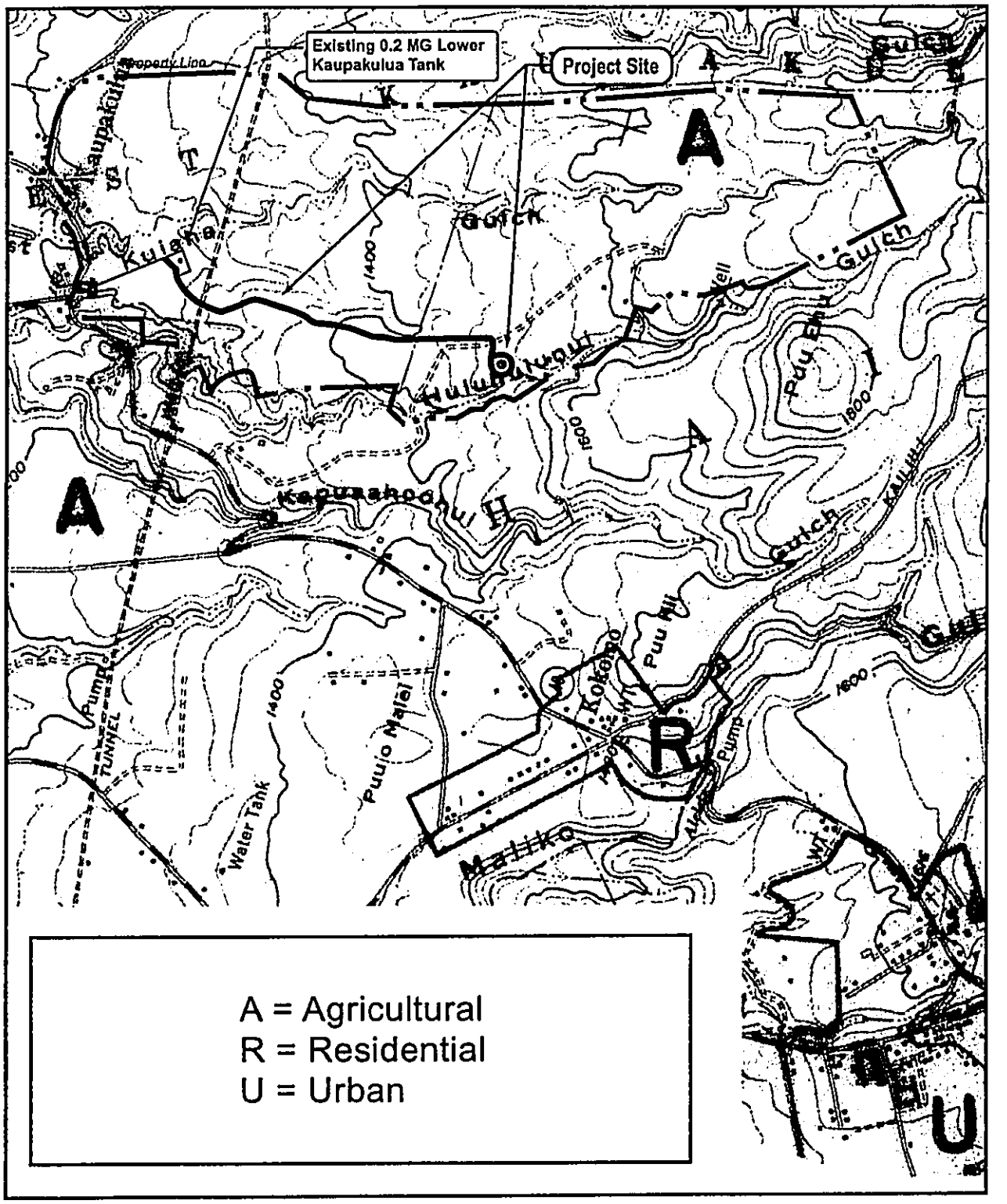

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Figure 12
State Land Use Map

According to Chapter 205, Section 4.5, HRS, the proposed action is a permitted use. Specifically, the statute allows:

> 205-4.5 (7) Public, private, and quasi-public utility lines and roadways, transformer stations, communications equipment buildings, solid waste transfer stations, **major water storage tanks, and appurtenant small buildings, such as booster pumping stations,** but not including offices or yards for equipment, material, vehicle storage, repair or maintenance, or treatment plants, or corporation yards, or other like structures (emphasis added).

4.3 County of Maui General Plan

The General Plan (1990) is a document that sets forth strategies to shape the county's physical, social, and economic environments. These strategies are expressed as statements of objectives and policies that are used by County officials guide decision-making, including decisions about capital improvements.

The following objectives and policies concern water supply within the county:

Objective 1: To provide an adequate supply of domestic and irrigation water to meet the needs of our people.

Policies: (1) Support water supply services to whose which historically experience critical water problems.

(10) Develop sufficient water supply during drought seasons so as to keep agricultural activities viable.

The proposed Upper Kaupakulua Tank and appurtenant improvements will enhance the overall efficiency of the Makawao water system. Current shortages experienced during times of drought will be alleviated through the water system improvements.

Objective 2: To make more efficient use of existing supplies of water.

Policies: (5) Maximize use of existing water sources by expanding storage capabilities.

The proposed action addresses this objective directly by expanding water storage capabilities through the new 0.5 MG tank.

4.4 Paia-Haiku Community Plan

The proposed action is located within the Paia-Haiku Community Plan area, one of nine planning regions in the County of Maui. The purpose of the community plan is to provide specific recommendations that address the goals, objectives, and policies in the General Plan, while recognizing the values and attributes unique to each region. The current Paia-Haiku Community Plan was updated in 1992-93 and became effective in May 1995.

Rural and small town or village character of the region. Future residential expansion is directed to Paia Town.

As stated in the Plan, the Goal for Water Infrastructure is to provide for "An adequate supply of potable and irrigation water to meet the needs of the region." The Plan further identifies six objectives and policies to meet that goal. Foremost among them, the Plan calls for the following:

- Increase water storage capacity with a reserve for drought periods.
- Ensure that adequate water capacity is available for domestic and agricultural needs of the region.

The Paia-Haiku Community Plan land use map designates the project site as Agricultural. The Agricultural designation indicates areas for agricultural activity which are in keeping with the economic base of the County and the requirements and procedures of Chapter 205 H.R.S., as amended. As noted in Section 4.2, above, the proposed water tank and appurtenant improvements are permitted under State land use regulations.

4.5 County of Maui Zoning

The project site lies within the Agricultural District (see Figure 13). The County's Comprehensive Zoning Code, Section 19.30A.050, permits "minor utility facilities" as a principal use within the agricultural district. Minor utility facilities are defined in Section 19.04.040 as transmission lines used directly in the distribution of utility services that have minor impact on adjacent land uses which include, but which are not limited to, ...water wells, tanks and distribution equipment..."

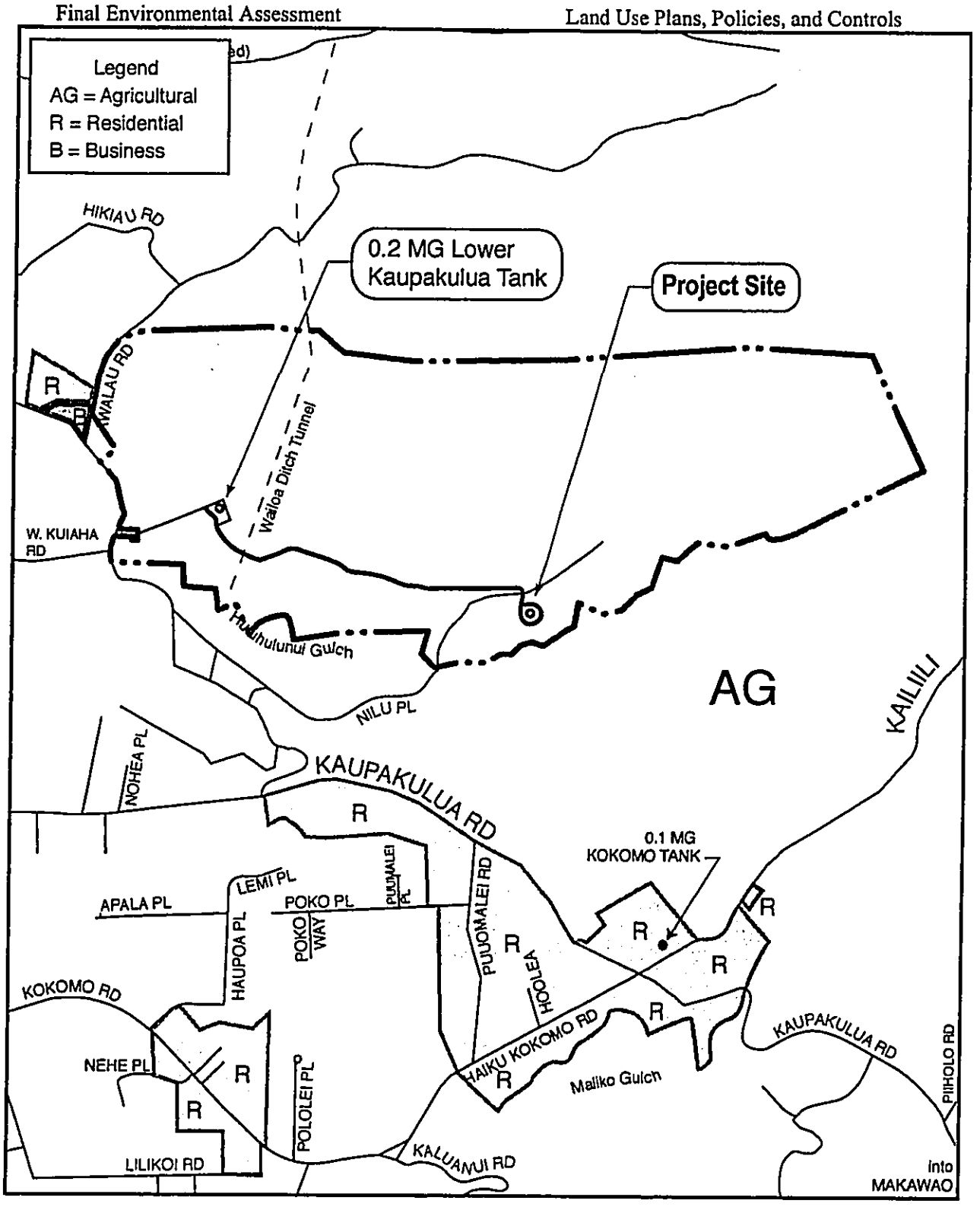

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Figure 13
Zoning Map

4.6 Required Permits and Approvals

The following permits and approvals are required or potentially required.

State of Hawaii

National Pollutant Discharge Elimination System (NPDES) Notice of Intent for Discharges of Storm Water Associated with Construction Activities (Form C)	State Department of Health Clean Water Branch

County of Maui

Grading permit	Department of Public Works and Waste Management
Building permit	

5. ALTERNATIVES CONSIDERED

5.1 NO ACTION

The "no action" alternative assumes the status quo, i.e., continued reliance on the existing water storage system in the project area. Existing storage capacity is unable to provide adequate service during periods of peak flow (maximum daily consumption) and, therefore, does not meet the County's design standards. Under the "no action" alternative, the DWS's objective of providing an adequate supply of water for domestic and agricultural uses would not be achieved.

5.2 DELAYED ACTION

To delay the project will mean continued reliance on the existing storage system until the action is initiated. Delaying the project would not significantly alter the environmental consequences of the project. In the interim, project costs are likely to increase because of inflation and changes in economic and labor supply conditions.

5.3 ALTERNATIVE LOCATIONS

Alternative locations are constrained because of the hookup to the Lower Kaupakulua Tank and the efficiency of working with a single landowner. The proposed location for the new tank meets the technical specifications of appropriate elevation to provide sufficient water pressure, a tank site of sufficient size that is relatively flat, and accessible by a route that is relatively direct and traversable by vehicles.

5.4 REPLACEMENT OF KOKOMO TANK

The proposed Upper Kaupakulua Tank has been planned to eliminate the need for the deteriorating 100,000 gallon Kokomo water storage tank which incurs high maintenance costs. An existing pressure reducing valve (PRV) station will need to be reconnected in the future to bypass the Kokomo Tank when it is taken out of service.

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6. DETERMINATION

Based on the information described in this document, the proposed project is not expected to result in significant social, economic, cultural, or environmental impacts. Consequently, a finding of no significant impact is warranted pursuant to the provisions of Subchapter 6 of Chapter 200, Title 11, Hawaii Administrative Rules of the Department of Health.

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7. FINDINGS AND REASONS SUPPORTING THE DETERMINATION

This Environmental Assessment, prepared in accordance with Chapter 343, HRS, as amended, has found that the potential for impacts associated with the proposed action will not be significant, with the exception of unavoidable traffic disruptions. Potential environmental impacts will be temporary and are not expected to adversely impact the long-term environmental quality of the area.

The potential effects of the proposed project were evaluated based on the significance criteria in Section 11-200-12 (Hawaii Administrative Rules, revised in 1996). The following is a summary of potential effects of the action.

Significance Criteria

1. Irrevocable commitment to loss or destruction of natural or cultural resources.

The proposed project is not anticipated to adversely impact natural or cultural resources. The project is located on land that had been disturbed previously for agricultural purposes, and it continues to be used for grazing. There are no known cultural artifacts on the site.

2. Curtailment of the range of beneficial uses of the environment.

Except for the immediate areas that will be occupied by new facilities, the environment will be able to support its present use as pasture land.

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 project is consistent with the environmental policies, goals, and guidelines defined in Chapter 344, HRS. The project is associated with resource conservation and quality of life for the people of Hawaii since an efficient, well-designed water system is an integral part of managing, distributing, and consuming a valuable natural resource.

4. Substantially affects the economic or social welfare of the community or state.

The project is intended to ensure the long-term availability of potable water through an upgraded and reliable storage and distribution system. Short-term negative impacts are

associated with construction noise and dust; however the project site is in an isolated area removed from residences and these impacts are expected to be minimal.

5. Substantially affects public health.

The proposed project will be completed in accordance with Federal, State and County of Maui rules and regulations governing public safety and health. Primary public health concerns involve air quality, noise, traffic, and water quality impacts. However, it is expected that these impacts can be minimized or brought to negligible levels by appropriate use of the mitigation measures described in this document. Additionally, the contractor will be obligated to meet the environmental standards and procedures of various governmental agencies in the course of obtaining necessary permits.

The proposed action itself is expected to strengthen the community's position with regard to public health by enhancing the physical infrastructure and providing County officials with more additional facilities to manage the water supply.

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

The proposed project is part of a DWS program to improve the existing water storage and distribution system. The improvements are designed to serve existing water customers and existing residents who currently lack proper water service and fire protection.

7. Involves substantial degradation of environmental quality.

The project will alter a very small proportion of the agricultural environment. The presence of the water storage tank and access road is not expected to significantly disturb or disrupt existing activities.

8. Is individually limited but cumulatively has considerable effect on the environment, or involves a commitment for large actions.

The proposed project is one component of the DWS's overall plant and water supply operations. The project is not expected to have significant effects on local, regional, and island-wide land use and/or population. The DWS's long-term plans call for a second Lower Kaupakulua Tank that will allow removal of deteriorating Kokomo Tank; however, the current project is independent of that future proposal in terms of function and timing.

9. Substantially affects a rare, threatened, or endangered species, or its habitat.

Plant and wildlife surveys were conducted in the project area. No rare, threatened, or endangered species were discovered.

10. Detrimentally affects air or water quality or ambient noise levels.

There will be short-term impacts on the air quality and noise levels inside of and adjacent to the construction area. Mitigation measures will be implemented to minimize construction-related impacts.

11. Affect 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.

The project area is not at high risk for tsunami inundation or flooding, and is away from the Special Management Area and coastal resources.

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

The improvements are tucked amid the rolling hillside and will be further screened by existing natural vegetation. There will be very little visual evidence of the project from any public roadway when completed.

13. Requires substantial energy consumption.

Installation of the water tank, access road, and pipelines will require energy levels that are typical for a construction project of this type; no extraordinary energy consumption is anticipated.

Conclusion

The analysis contained in this Environmental Assessment has determined that the proposed action will not have significant adverse impacts on the environment. Project impacts are expected to be temporary and will not irrevocably or irretrievably degrade environmental quality in the area. Therefore, the County of Maui, Department of Water Supply has issued a Finding of No Significant Impact (FONSI) and concluded that an Environmental Impact Statement (EIS) is not required.

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8. BIBLIOGRAPHY

Baker, Harold L. May 1972. *Land Classification and Determination of Highest and Best Use of Hawaii's Agricultural Lands*. LSB report No. 10, Land Study Bureau, University of Hawaii.

Board of Water Supply, County of Maui. *1998 Annual Report*.

Department of Water Supply, County of Maui. *Annual Report for Fiscal Year ending June 30, 2000*.

Department of Water Supply, "Your Water in Maui County" from website: www.mauiwater.org/backgrnd.html

Char & Associates. August 2000. "Botanical Resources Assessment, Kokomo Tank Replacement, Kokomo, Makawao, Maui."

County of Maui. 1990. General Plan.

County of Maui. May 1995. Paia-Haiku Community Plan.

Juvik, Sonia P. and James O. Juvik, eds. 1998. *Atlas of Hawaii, 3rd Edition*. Honolulu: University of Hawaii Press.

Murabayashi, Edwin T. June 1970. *Maui Lands Classified by Physical Qualities for Urban Usage*. Land Study Bureau, University of Hawaii.

Ohashi, Tim J. October 2000. "Wildlife Survey, Kokomo Tank Replacement Site, Kokomo Road, Makawao, Maui, Hawaii."

State of Hawaii, Department of Agriculture. November 1977. *Agricultural Lands of Importance to the State of Hawii (Revised)*.

Winieski, John and Hallett H. Hammatt. August 2000. "Archaeological Inventory Survey for the Proposed Kokomo 1MG Reservoir and Access Road, Kaupakulua Ahupua'a, Hamakualoa District, Maui (TMK: 2-7-15: 34)."

United States Department of Agriculture, Soil Conservation Service, In Cooperation with the University of Hawaii Agriculture Experiment Station. August 1972. *Soil Survey of Kauai, Oahu, Maui, Molokai and Lanai, State of Hawaii*.

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9. ORGANIZATIONS AND AGENCIES CONSULTED

9.1 Organizations Contacted during Preparation of the Draft EA

State Department of Land and Natural Resources, Historic Preservation Division
Maui County Department of Planning

9.2 Organizations to be Contacted during the DEA Comment Period

The Draft Environmental Assessment (DEA) was published in the April 8, 2003 issue of the Office of Environmental Quality Control (OEQC) *Environmental Notice.* The organizations and agencies listed below were contacted during the 30-day comment period for the DEA. In addition, a copy of the DEA was placed at the Makawao Public Library for public review. Written responses were received from 11 agencies (indicated by asterisk). All comment letters and DWS responses are included in this document.

Federal Agencies
*Army Corps of Engineers, Pacific Ocean Division
U.S. Fish and Wildlife Service
*U.S. Geological Survey

State Agencies
Department of Business, Economic Development & Tourism, Office of Planning
*Department of Hawaiian Home Lands
*Department of Land and Natural Resources, Land Division
Department of Land and Natural Resources, Commission on Water Resources Management
*Department of Land and Natural Resources, State Historic Preservation Division
*Department of Health, Clean Water Branch
Department of Health, Environmental Management Division
*Office of Environmental Quality Control
*Office of Hawaiian Affairs
University of Hawaii, Environmental Center

County of Maui
Department of Fire Control
*Department of Planning
*Department of Public Works
*Police Department

Private and Community Organizations and Elected Officials
Council Members, Maui County Council
Paia Community Association
Kula Community Association
Mauka Group
Representative Kika Bukoski
Representative Chris Halford
Senator Avery Chumbley

ALAN M. ARAKAWA
MAYOR

OUR REFERENCE
tj
YOUR REFERENCE

POLICE DEPARTMENT
COUNTY OF MAUI

55 MAHALANI STREET
WAILUKU, HAWAII 96793
(808) 244-6400
FAX (808) 244-6411

THOMAS M. PHILLIPS
CHIEF OF POLICE

KEKUHAUPIO R. AKANA
DEPUTY CHIEF OF POLICE

April 25, 2003

Mr. George Tengan
Department of Water Supply
County of Maui
200 South High Street
Wailuku, HI 96793

Dear Mr. Tengan:

SUBJECT: DRAFT ENVIRONMENTAL ASSESSMENT (EA) UPPER KAUPAKULUA 0.5 MG WATER STORAGE TANK

This is in response to your letter dated April 8, 2003, requesting comments on the above subject.

Please refer to the enclosed copy of the memo submitted by Officer Randall Burgess for our comments and recommendations.

Sincerely,

Assistant Chief Sydney Kikuchi
for: Thomas M. Phillips
Chief of Police

Enclosure

c: Kimura International, Inc.

TO : THOMAS PHILLIPS, CHIEF, MAUI POLICE DEPARTMENT

VIA : CHANNELS 04/24/03

FROM : RANDALL BURGESS, P.O.III, COMMUNITY POLICING

SUBJECT : UPPER KAUPAKULUA 0.5 MG WATER STORAGE TANK

Sir, this To/From is being submitted in regards to police comments to the proposed Department of Water Supply water storage tank located in Upper Kaupakulua (TMK 2-7-15:34) Makawao, Hi.

Project review and site inspection reveals the following comments:

* In regards to roadways/traffic; sight distance from the ingress/egress to the project onto Kaupakulua Rd. is limited. Therefore, this safety situation may necessitate the hiring of Special Assignment Off Duty Officers for traffic control during certain phases of construction.

In closing, there are no further comments at this time.

Respectfully submitted,

Randall Burgess

Randall BURGESS #1023
042303 @ 1330 hours

COMMENTS NOTED
FORWARD FOR CONSIDERATION
SGT. [illegible]

CONCUR,

4/24/03

ALAN M. ARAKAWA
Mayor

GEORGE Y. TENGAN
Director

JEFFREY T. PEARSON
Deputy Director

DEPARTMENT OF WATER SUPPLY
COUNTY OF MAUI
P.O. BOX 1109
WAILUKU, MAUI, HAWAII 96793-6109
TELEPHONE (808) 270-7816 • FAX (808) 270-7833 • www.mauiwater.org

May 23, 2003

Thomas M. Phillips, Chief of Police
Maui County Police Department
55 Mahalani Street
Wailuku, HI 96793

Attn: Assistant Chief Sydney Kikuchi

Dear Chief Phillips,

Subject: Draft Environmental Assessment (EA) for the
Proposed Upper Kaupakulua 0.5 MG Water Storage Tank
Makawao District, Maui, Hawaii

Thank you for reviewing the Draft EA for the proposed Upper Kaupakulua water storage tank.

In responding to your concern for safe access to and from the project site via Kaupakulua Road, we note that the Draft EA similarly identified limited sight distance from the driveway as a potential hazard. The Draft EA recommended the use of signalmen to control the flow of traffic and facilitate the movement of vehicles on and off the site. The Final EA will be revised to state that DWS will work with the Police Department and hire Special Assignment Off Duty Officers as needed.

If you have any questions, please contact Larry Winter at (808) 270-7672.

Sincerely,

George Y. Tengan
Director

GYT/GK/lw
cc: Glenn Kimura, Kimura International, Inc.

LINDA LINGLE
GOVERNOR
STATE OF HAWAII

MICAH A. KANE
CHAIRMAN
HAWAIIAN HOMES COMMISSION

BEN HENDERSON
DEPUTY TO THE CHAIRMAN

KAULANA H. PARK
HHL EXECUTIVE ASSISTANT

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

April 10, 2003

Mr. George Tengan
Department of Water Supply
200 South High Street
Wailuku, Hawaii 96793

Dear Mr. Tengan:

Subject: Draft Environmental Assessment
Upper Kaupakulua 0.5 MG Water Storage Tank, Maui

Thank you for the opportunity to review the subject draft assessment report. The Department of Hawaiian Home Lands has no comments to offer.

If you have any questions, please call me at 586-3801 or call our Planning Office at 586-3836.

Aloha and mahalo,

for Micah A. Kane, Chairman
Hawaiian Homes Commission

c: Kimura International, Inc.
OEQC

ALAN M. ARAKAWA
Mayor

GEORGE Y. TENGAN
Director

JEFFREY T. PEARSON
Deputy Director

DEPARTMENT OF WATER SUPPLY
COUNTY OF MAUI
P.O. BOX 1109
WAILUKU, MAUI, HAWAII 96793-6109
TELEPHONE (808) 270-7816 • FAX (808) 270-7833 • www.mauiwater.org

May 23, 2003

Mr. Micah A. Kane, Chairman
Hawaiian Homes Commission
P.O. Box 1879
Honolulu, HI 96805

Dear Mr. Kane,

Subject: Draft Environmental Assessment (EA) for the
Proposed Upper Kaupakulua 0.5 MG Water Storage Tank
Makawao District, Maui, Hawaii

Thank you for reviewing the Draft EA for the proposed Upper Kaupakulua water storage tank. We acknowledge that you have no comments on this project.

If you have any questions, please contact Larry Winter at (808) 270-7672.

Sincerely,

George Y. Tengan
Director
GYT/GK/lw
cc: Glenn Kimura, Kimura International, Inc.

PHONE (808) 594-1888 FAX (808) 594-1865

04/03

RECEIVED
2003 APR 17 AM 11:31
DEPT. OF WATER SUPPLY
COUNTY OF MAUI

STATE OF HAWAI'I
OFFICE OF HAWAIIAN AFFAIRS
711 KAPI'OLANI BOULEVARD, SUITE 500
HONOLULU, HAWAI'I 96813

April 14, 2003

Mr. George Tengan
Department of Water Supply
200 South High Street
Wailuku, Maui 96793

SUBJECT: CONSTRUCTION OF A .05 MILLION GALLON WATER STORAGE TANK – DEA

Dear Mr. Tengan:

Thank you for the opportunity to review the above referenced Draft Environmental Assessment for the construction of a water storage tank in the foothills of Kaupakulua.

The Office of Hawaiian Affairs (OHA) requests that you amend the language in Section V. Findings and Recommendation (page 15) to reflect that if there are any archaeological remains found, that work will be halted and both the State Historic Preservation Division and the Maui Island Burial Council will be contacted.

If you have any questions, please contact Jerry B. Norris at 594-1847 or email him at jerryn@oha.org.

Sincerely,

Peter L. Yee
Director
Nationhood and Native Rights Division

cc: Mr. Glenn Kimura, Kimura International, Inc.

ALAN M. ARAKAWA
Mayor

GEORGE Y. TENGAN
Director

JEFFREY T. PEARSON
Deputy Director

DEPARTMENT OF WATER SUPPLY
COUNTY OF MAUI
P.O. BOX 1109
WAILUKU, MAUI, HAWAII 96793-6109
TELEPHONE (808) 270-7816 • FAX (808) 270-7833 • www.mauiwater.org

May 23, 2003

Mr. Peter Yee, Director
Nationhood and Native Rights Division
Office of Hawaiian Affairs
711 Kapiolani Boulevard, Suite 500
Honolulu, HI 96813

Dear Mr. Yee,

Subject: Draft Environmental Assessment (EA) for the
Proposed Upper Kaupakulua 0.5 MG Water Storage Tank
Makawao District, Maui, Hawaii

Thank you for reviewing the Draft EA for the proposed Upper Kaupakulua water storage tank.

In response to your concern regarding inadvertent discovery of archaeological remains, the Final EA will be revised to state that in the event that *iwi* or other cultural artifacts are found, work will cease in the immediate vicinity, the find will be protected from additional disturbance, and both the State Historic Preservation Division and the Maui Island Burial Council will be contacted immediately.

If you have any questions, please contact Larry Winter at (808) 270-7672.

Sincerely,

George Y. Tengan
Director

GYT/GK/lw
cc: Glenn Kimura, Kimura International, Inc.

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

REPLY TO
ATTENTION OF: CEPOH-EC-T

April 14, 2003

Civil Works Technical Branch

Mr. George Tangan
Department of Water Supply
County of Maui
200 South High Street
Wailuku, Maui, Hawaii 96793

Dear Mr. Tangan:

Thank you for the opportunity to review and comment on the Draft Environmental Assessment (DEA) for the Upper Kaupakulua Water Storage Tank Project, Makawao, Maui (TMK 2-7-15: 34). The following comments are provided in accordance with 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 not be required for the project.

b. The flood hazard information provided on page 74 of the DEA is correct.

A copy of this letter has been furnished to Mr. Glenn Kimura, Kimura International, 1600 Kapiolani Boulevard, Suite 1610, Honolulu, Hawaii 96814.

Should you require additional information, please contact Ms. Jessie Dobinchick of my staff at (808) 438-8876.

Sincerely,

James Pennaz, P.E.
Chief, Civil Works
Technical Branch

ALAN M. ARAKAWA
Mayor

GEORGE Y. TENGAN
Director

JEFFREY T. PEARSON
Deputy Director

DEPARTMENT OF WATER SUPPLY
COUNTY OF MAUI
P.O. BOX 1109
WAILUKU, MAUI, HAWAII 96793-6109
TELEPHONE (808) 270-7816 • FAX (808) 270-7833 • www.mauiwater.org

May 23, 2003

Mr. James Penmaz, P.E.
Chief, Civil Works Technical Branch
Department of the Army
U.S. Army Engineer District, Honolulu
Fort Shafter, HI 96858-5440

Dear Mr. Penmaz,

Subject: Draft Environmental Assessment (EA) for the
Proposed Upper Kaupakulua 0.5 MG Water Storage Tank
Makawao District, Maui, Hawaii

Thank you for reviewing the Draft EA for the proposed Upper Kaupakulua water storage tank. We have received your comments by letter dated April 14, 2003 and acknowledge the following:

- A Department of Army permit is not required for the project
- The flood hazard information presented in the report is correct

If you have any questions, please contact Larry Winter at (808) 270-7672.

Sincerely,

George Y. Tengan
Director

GYT/GK/lw
cc: Glenn Kimura, Kimura International, Inc.

United States Department of the Interior

U.S. GEOLOGICAL SURVEY
WATER RESOURCES
677 Ala Moana Blvd., Suite 415
Honolulu, HI 96813
Phone: (808) 587-2400/Fax: (808) 587-2401

April 14, 2003

Mr. George Tengan, Director
Department of Water Supply
200 South High Street
Wailuku, Maui, HI 96793

Dear Mr. Tengan:

Subject: Draft Environmental Assessment for Upper Kaupakulua 0.5 mg Water Storage Tank, Maui, Makawao District, Tax Map Key Numbers: 2-7-15:34

Thank you for forwarding the subject Draft Environment Assessment for review and comment by the staff of the U.S. Geological Survey, Water Resources, Hawaii District office. We regret however, that due to prior commitments and lack of available staff, we are unable to review this document and are returning it for your future use.

We appreciate the opportunity to participate in the review process.

Sincerely,

Gordon Tribble
District Chief

Enclosure

Cc w/o enclosure: Mr. Glenn Kimura
Kimura International, Inc.
1600 Kapiolani Boulevard, Suite 1610
Honolulu, Hawaii 96814

Office of Environmental Quality Control
235 South Beretania Street, Suite 702
Honolulu, Hawaii 96813

ALAN M. ARAKAWA
Mayor

GEORGE Y. TENGAN
Director

JEFFREY T. PEARSON
Deputy Director

DEPARTMENT OF WATER SUPPLY
COUNTY OF MAUI
P.O. BOX 1109
WAILUKU, MAUI, HAWAII 96793-6109
TELEPHONE (808) 270-7816 • FAX (808) 270-7833 • www.mauiwater.org

May 23, 2003

Mr. Gordon Tribble
District Chief, Water Resources
U.S. Geological Survey
677 Ala Moana Boulevard, Suite 415
Honolulu, HI 96813

Dear Mr. Tribble,

Subject: Draft Environmental Assessment (EA) for the
Proposed Upper Kaupakulua 0.5 MG Water Storage Tank
Makawao District, Maui, Hawaii

Thank you for responding to our request for comments on the Draft EA for the proposed Upper Kaupakulua water storage tank. We appreciate being notified by letter dated April 14, 2003 that you are unable to review the document at this time.

If you have any questions, please contact Larry Winter at (808) 270-7672.

Sincerely,

George Y. Tengan
Director

GYT/GK/lw
cc: Glenn Kimura, Kimura International, Inc.

LINDA LINGLE
GOVERNOR OF HAWAII

PETER T. YOUNG
CHAIRPERSON
BOARD OF LAND AND NATURAL RESOURCES
COMMISSION ON WATER RESOURCE MANAGEMENT

DAN DAVIDSON
DEPUTY DIRECTOR - LAND

ERNEST Y.W. LAU
DEPUTY DIRECTOR - WATER
COMMISSION ON WATER RESOURCE MANAGEMENT

AQUATIC RESOURCES
BOATING AND OCEAN RECREATION
BUREAU OF CONVEYANCES
CONSERVATION AND RESOURCES ENFORCEMENT
FORESTRY AND WILDLIFE
HISTORIC PRESERVATION
KAHOOLAWE ISLAND RESERVE COMMISSION
LAND
STATE PARKS
WATER RESOURCE MANAGEMENT

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
LAND DIVISION

POST OFFICE BOX 621
HONOLULU, HAWAII 96809

April 25, 2003

Ref.: KAUPAKULUA05MGWSTDEA.RCM
Author: LD-PEM

Mr. Glenn Kimura
Kimura International
1600 Kapiolani Bovd., Suite 1610
Honolulu, Hawaii 96814

Dear Mr. Kimura:

Subject: Draft Environmental Assessment – Upper Kaupakulua 0.5 MG Water Storage Tank, Makawao, Maui, Tax Map Key: (2) 2-7-15:34

Thank you for the opportunity to review and comment on the subject Draft Environmental Assessment. Request for comments were forwarded to our divisions and a copy was made available for their review.

The Department of Land and Natural Resources has no comment to offer at this time.

Should you have any questions, please contact Nick Vaccaro at 587-0384 or Patti Miyashiro at 587-0385.

Very truly yours,

Charlene E. Unoki

for Dierdre S. Mamiya
Administrator

Enclosure

ALAN M. ARAKAWA
Mayor

GEORGE Y. TENGAN
Director

JEFFREY T. PEARSON
Deputy Director

DEPARTMENT OF WATER SUPPLY
COUNTY OF MAUI
P.O. BOX 1109
WAILUKU, MAUI, HAWAII 96793-6109
TELEPHONE (808) 270-7816 • FAX (808) 270-7833 • www.mauiwater.org

May 23, 2003

Ms. Dierdre S. Mamiya, Administrator
Land Division
Department of Land and Natural Resources
P.O. Box 621
Honolulu, HI 96809

Dear Mr. Mamiya,

Subject: Draft Environmental Assessment (EA) for the Proposed Upper Kaupakulua 0.5 MG Water Storage Tank Makawao District, Maui, Hawaii

Thank you for reviewing the Draft EA for the proposed Upper Kaupakulua water storage tank. We acknowledge that you have no comments on this project.

If you have any questions, please contact Larry Winter at (808) 270-7672.

Sincerely,

George Y. Tengan
Director
GYT/GK/lw
cc: Glenn Kimura, Kimura International, Inc.

ALAN M. ARAKAWA
Mayor

MICHAEL W. FOLEY
Director

WAYNE A. BOTEILHO
Deputy Director

COUNTY OF MAUI
DEPARTMENT OF PLANNING

May 6, 2003

Mr. George Tengan, Director
Department of Water Supply
200 South High Street
Wailuku, Maui, Hawaii 96793

Dear Mr. Tengan:

RE: Draft Environmental Assessment for the Upper Kaupakulua 0.5 MG Water Storage Tank Located at Tax Map (2) 2-7-015: 034, Maui, Makawao District (LTR 2003/1475)

The Draft Environmental Assessment (DEA) for the proposed Upper Kaupakulua 0.5 MG Water Storage Tank was received by the Department of Planning (Department) on April 8, 2003. The Department has the following comments:

- Section 2.2, Technical Description of the Project, provides a discussion of the Best Management Practices (BMPs) for the proposed water storage tank. Further discussion of the BMP methods is provided in Section 3.1, Geology, Hydrology, and Soils under the Potential Impacts and Mitigation Measures subheading. The discussion directly addresses erosion control measures for the proposed water storage tank, however, the proposed paved roadway is not directly addressed. What mitigative measures will be implemented to control the potential for water-borne erosion from the construction of the roadway?

- The Department confirms the agricultural designation for the Paia Haiku Community Plan and County Zoning. The proposed project conforms to the objectives and policies set forth in the Maui County General Plan and the Paia Haiku Community Plan. In addition, the proposed project is consistent with the County Zoning requirements.

ALAN M. ARAKAWA
Mayor

GEORGE Y. TENGAN
Director

JEFFREY T. PEARSON
Deputy Director

DEPARTMENT OF WATER SUPPLY
COUNTY OF MAUI
P.O. BOX 1109
WAILUKU, MAUI, HAWAII 96793-6109
TELEPHONE (808) 270-7816 • FAX (808) 270-7833 • www.mauiwater.org

May 23, 2003

Mr. Michael W. Foley, Director
Department of Planning
County of Maui
250 South High Street
Wailuku, HI 96793

Dear Mr. Foley,

Subject: Draft Environmental Assessment (EA) for the
Proposed Upper Kaupakulua 0.5 MG Water Storage Tank
Makawao District, Maui, Hawaii

Thank you for reviewing the Draft EA for the proposed Upper Kaupakulua water storage tank. We have received your letter dated May 6, 2003 and offer the following in response to your comments and concerns (in italics). The Final EA will be revised accordingly.

1. *The discussion directly addresses erosion control measures for the proposed water storage tank, however, the proposed paved roadway is not directly addressed. What mitigative measures will be implemented to control the potential for water-borne erosion from the construction of the roadway?*

   Several types of erosion control measures will be implemented during construction of the proposed access road. Grassed swales will collect and convey runoff within the shoulder areas of the cut road sections. Several asphaltic concrete-lined outlet discharge points will be placed at the end of the cut sections. A filter fence will be installed along the downhill side of the fill slopes and at the discharge points. All runoff will sheet flow into the adjacent pastureland. All graded areas will be grassed in a timely manner as described in the erosion control notes providing instructions to the contractor.

2. We also acknowledge your finding that the project conforms to Maui County planning and zoning requirements.

If you have any questions, please contact Larry Winter at (808) 270-7672.

Sincerely,

George Y. Tengan
Director
GYT/GK/lw
cc: Glenn Kimura, Kimura International, Inc.

LINDA LINGLE
GOVERNOR OF HAWAII

GENEVIEVE SALMONSON
DIRECTOR

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
E-mail: oeqc@health.state.hi.us

May 7, 2003

Mr. George Y. Tengan
Department of Water Supply
County of Maui
200 South High Street
Wailuku, Hawai'i 96793

Mr. Glenn Kimura
Kimura International, Inc.
1600 Kapi'olani Boulevard, Suite 1610
Honolulu, Hawai'i 96814

Dear Messrs. Tengan and Kimura:

The Office of Environmental Quality Control has reviewed the draft environmental assessment (DEA) for the Upper Kaupakulua 0.5 MG Storage Tank, Tax Map Key No. 2-7-15:34 and submit the following comment for your consideration and response.

1. CULTURAL IMPACT ASSESSMENT: Page 27 of the DEA assumes that there are no native rights concerns because of the historic use of the parcel as pasture and the absence of "native rights concerns (burials, sacred sites, trails, unique resources, gathering practices, etc.) ... during the course of the historical background research or field inspection." Later in the text, on page 28, the DEA reads "[i]t seems far more likely that traditional Hawaiian practices in the vicinity would have focused on Huluhulunui and Kuiaha Gulches, which *lie outside the project area* [italics supplied] – to the west and east, respectively." The purpose of Act 50, Session Laws of Hawai'i, Regular Session of 2000, was to require that environmental documents include the disclosure of effects of a proposed action (in this case, the water tank and associated improvements) on the contemporary cultural practices of the community and the State.

   The question to ask then, is not whether contemporary cultural resources or practices *lay outside the project area*, but whether the proposed action impacts such cultural resources or practices. Given the proximity of the table land to the aforementioned gulches, we would like to ask: What is the likelihood that the proposed project would impact contemporary access to and from the Huluhulunui and Kuiaha gulches? Traversing the length of a gulch for cultural resources would be much harder than hiking to the table land immediately above a cultural resource in the gulch.

2. GUIDANCE DOCUMENTS ON SUSTAINABLE BUILDING DESIGN, GLASSPHALT, AND NATIVE PLANTINGS FOR LANDSCAPING: We ask that you visit our website at http://www.state.hi.us/health/oeqc/index.html for guidance on sutainable buildings, use of glassphalt and native plantings.

Thank you for the opportunity to review this document. If there are any questions, please call Mr. Leslie Segundo of my staff at (808) 586-4185.

Sincerely,

Genevieve Salmonson

GENEVIEVE SALMONSON
Director

ALAN M. ARAKAWA
Mayor

GEORGE Y. TENGAN
Director

JEFFREY T. PEARSON
Deputy Director

DEPARTMENT OF WATER SUPPLY
COUNTY OF MAUI
P.O. BOX 1109
WAILUKU, MAUI, HAWAII 96793-6109
TELEPHONE (808) 270-7816 • FAX (808) 270-7833 • www.mauiwater.org

May 23, 2003

Ms. Genevieve Salmonson
Director
Office of Environmental Quality Control
235 South Beretania Street, Suite 702
Honolulu, HI 96813

Dear Ms. Salmonson,

Subject: Draft Environmental Assessment (EA) for the
Proposed Upper Kaupakulua 0.5 MG Water Storage Tank
Makawao District, Maui, Hawaii

Thank you for reviewing the Draft EA for the proposed Upper Kaupakulua water storage tank. We have received your letter dated May 7, 2003 and offer the following in response to your comments and concerns (in italics). The Final EA will be revised accordingly.

1. *The question to ask, then, is not whether contemporary cultural resources or practices lay outside the project area* (emphasis in original) *but whether the proposed action impacts such cultural resources or practices. Given the proximity of the table land to the aforementioned gulches, we would like to ask: What is the likelihood that the proposed project would impact contemporary access to and from the Huluhulunui and Kuiaha gulches? Traversing the length of a gulch for cultural resources would be much harder than hiking to the table land immediately above a cultural resource in the gulch.*

   Contemporary access through the property (which is privately owned), and from the property to adjacent areas is controlled by fencing and a locked gate across the paved driveway (off Kaupakulua Road). Such controls are necessary to manage livestock movement and because of liability concerns. The proposed action includes fencing around the new water tank for public safety and security purposes. However, there will be no encumbrances on access beyond what exists currently. With no expected change in the status quo, we have concluded that the proposed action will have no impact on contemporary cultural resources or practices.

2. We also note that guidance documents on the topics of sustainable building design, glassphalt, and native plantings for landscaping are available through the OEQC website.

If you have any questions, please contact Larry Winter at (808) 270-7672.

Sincerely,

George Y. Tengan
Director
GYT/GK/lw
cc: Glenn Kimura, Kimura International, Inc.

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
HISTORIC PRESERVATION DIVISION
KAKUHIHEWA BUILDING, ROOM 555
601 KAMOKILA BOULEVARD
KAPOLEI, HAWAII 96707

HAWAI'I HISTORIC PRESERVATION DIVISION REVIEW

Log #: 2003.0515
Doc #: 0305CD18

Applicant/Agency: Glenn Kimura
Address: Kimura International
1600 Kapi`olani Blvd., Suite 1610
Honolulu, Hawaii 96814

SUBJECT: Chapter 6E-42 Historic Preservation Review – Draft Environmental Assessment for the Proposed Upper Kaupakalua o.5 MG Water Storage Tank
Ahupua`a: Kaupakalua
District, Island: Makawao, Maui
TMK: (2) 2-7-015:034

1. We believe there are no historic properties present, because:

____ a) intensive cultivation has altered the land
____ b) residential development/urbanization has altered the land
____ c) previous grubbing/grading has altered the land
✓ d) an acceptable archaeological assessment or inventory survey found no historic properties (SHPD DOC NO.: 0010MK06/LOG NO.: 26490)
✓ e) other: In the event that historic sites (human skeletal remains, etc.) are identified during the construction activities, all work needs to cease in the immediate vicinity of the find, the find needs to be protected from additional disturbance, and the State Historic Preservation Office needs to be contacted immediately at 243-5169, on Maui, or at (808) 692-8023, on O`ahu.

2. This project has already gone through the historic preservation review process, and mitigation has been completed ___.

✓ Thus, we believe that "no historic properties will be affected" by this undertaking

Staff: Cathleen A. Dagher Date: 7 May 2003
Cathleen A. Dagher
Assistant Maui/Lana`i Island Archaeologist
(808) 692-8023

ALAN M. ARAKAWA
Mayor

GEORGE Y. TENGAN
Director

JEFFREY T. PEARSON
Deputy Director

DEPARTMENT OF WATER SUPPLY
COUNTY OF MAUI
P.O. BOX 1109
WAILUKU, MAUI, HAWAII 96793-6109
TELEPHONE (808) 270-7816 • FAX (808) 270-7833 • www.mauiwater.org

May 23, 2003

Ms. P. Holly McEldowney, Acting Administrator
State Historic Preservation Division
Dept. of Land and Natural Resources
601 Kamokila Boulevard, Room 555
Kapolei, HI 96707

Dear Ms. McEldowney,

Subject: Draft Environmental Assessment (EA) for the
Proposed Upper Kaupakulua 0.5 MG Water Storage Tank
Makawao District, Maui, Hawaii

Thank you for reviewing the Draft EA for the proposed Upper Kaupakulua water storage tank. We have received your letter dated May 7, 2003, which confirms that an acceptable archaeological assessment has found no historic properties and, therefore, "no historic properties will be affected" by the project.

We further note that in the event that historic sites or artifacts are identified during construction, all work will cease in the immediate vicinity of the find, the find will be protected from additional disturbance, and the State Historic Preservation Office and the Maui Island Burial Council will be contacted immediately.

If you have any questions, please contact Larry Winter at (808) 270-7672.

Sincerely,

George Y. Tengan
Director

GYT/GK/lw
cc: Glenn Kimura, Kimura International, Inc.

LINDA LINGLE
GOVERNOR OF HAWAII

CHIYOME L. FUKINO, M.D.
DIRECTOR OF HEALTH

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

In reply, please refer to:
EMD / CWB

05027PKP.03

May 9, 2003

Ms. Nancy Ishikawa
Kimura International, Inc.
1600 Kapiolani Boulevard, Suite 1610
Honolulu, Hawaii 96814

Dear Ms. Ishikawa:

Subject: Draft Environmental Assessment
Upper Kaupakulua 0.5 MG Water Storage Tank

The Department of Health, Clean Water Branch (CWB) has reviewed the subject document and offers the following comments:

1. The Army Corps of Engineers should be contacted at (808) 438-9258 to identify whether a Federal license or permit (including a Department of Army permit) is required for this project. Pursuant to Section 401(a)(1) of the Federal Water Pollution Act (commonly known as the "Clean Water Act"), a Section 401 Water Quality Certification is required for "[a]ny applicant for Federal license or permit to conduct any activity including, but not limited to, the construction or operation of facilities, which may result in any discharge into the navigable waters...."

2. A National Pollutant Discharge Elimination System (NPDES) general permit coverage is required for the following activities:

   a. Storm water associated with industrial activities, as defined in Title 40, Code of Federal Regulations, Sections 122.26(b)(14)(i) through 122.26(b)(14)(ix) and 122.26(b)(14)(xi).

   b. Construction activities, including clearing, grading, and excavation, that result in the disturbance of equal to or greater than one (1) acre of total land area. The total land area includes a contiguous area where multiple separate and distinct construction activities may be taking place at different times on different schedules under a larger common plan of development or sale. **An NPDES permit is required before the commencement of the construction activities.**

   c. Discharge of treated effluent from leaking underground storage tank remedial activities.

   d. Discharge of once through cooling water less than one (1) million gallons per day;

   e. Discharge of hydrotesting water.

f. Discharge of construction dewatering effluent.

g. Discharge of treated effluent from petroleum bulk stations and terminals.

h. Discharge of treated effluent from well drilling activities.

i. Discharges of treated effluent from recycled water distribution systems.

j. Discharges of storm water from a small municipal separate storm sewer system.

k. Discharge of circulation water from decorative ponds or tanks.

The CWB requires that a Notice of Intent (NOI) to be covered by a NPDES general permit for any of the above activities be submitted at least 30 days before the commencement of the respective activities. The NOI forms may be picked up at our office or downloaded from our website at http://www.state.hi.us/doh/eh/cwb/forms/genl-index.html.

3. The applicant may be required to apply for an individual NPDES permit if there is any type of activity in which wastewater is discharged from the project into State waters and/or coverage of the discharge(s) under the NPDES general permit(s) is not permissible (i.e. discharges into Class 1 or Class AA waters). An application for the NPDES permit is to be submitted at least 180 days before the commencement of the respective activities. The NPDES application forms may also be picked up at our office or downloaded from our website at http://www.state.hi.us/doh/eh/cwb/forms/indiv-index.html.

4. Hawaii Administrative Rules, Section 11-55-38, also requires the owner to either submit a copy of the new NOI or NPDES permit application to the State Department of Land and Natural Resources, State Historic Preservation Division (SHPD) or demonstrate to the satisfaction of the DOH that the project, activity, or site covered by the NOI or application has been or is being reviewed by SHPD. Please submit a copy of the request for review by SHPD or SHPD's determination letter for the project.

If you have any questions, please contact the CWB at 586-4309.

Sincerely,

DENIS R. LAU, P.E., CHIEF
Clean Water Branch

KP:rk

ALAN M. ARAKAWA
Mayor

GEORGE Y. TENGAN
Director

JEFFREY T. PEARSON
Deputy Director

DEPARTMENT OF WATER SUPPLY
COUNTY OF MAUI
P.O. BOX 1109
WAILUKU, MAUI, HAWAII 96793-6109
TELEPHONE (808) 270-7816 • FAX (808) 270-7833 • www.mauiwater.org

May 23, 2003

Mr. Denis R. Lau, PE, Chief
Clean Water Branch
Department of Health
P.O. Box 3378
Honolulu, HI 96801-3378

Dear Mr. Lau,

Subject: Draft Environmental Assessment (EA) for the
Proposed Upper Kaupakuhua 0.5 MG Water Storage Tank
Makawao District, Maui, Hawaii

Thank you for reviewing the Draft EA for the proposed Upper Kaupakuhua water storage tank. We have received your letter dated May 9, 2003 and offer the following in response to your comments and concerns (in italics). The Final EA will be revised accordingly.

1. *The Army Corps of Engineers should be contacted... to identify whether a Federal license or permit is required for this project.*

   The Army Corps of Engineers has determined that this project does not require a Department of Army permit. Notification was provided by letter dated April 14, 2003.

2. *A National Pollutant Discharge Elimination System (NPDES) general permit is required for [several] activities.*

   Thank you for providing the checklist of activities requiring NPDES general permit coverage.

3. *The applicant may be required to apply for an individual NPDES permit...*

   Based on the project parameters and existing site conditions, we do not anticipate a need for an individual NPDES permit. No wastewater will be generated by the project, and the receiving waters is an intermittent stream, class 2 inland classification.

4. *Hawaii Administrative Rules, Section 11-55-38, also requires the owner to either submit a copy of the new NOI or NPDES permit application to the State Department of Land and Natural Resources, State Historic Preservation Division (SHPD) or demonstrate to the satisfaction of the DOH that the project, activity or site covered by the NOI or application has been or is being reviewed by SHPD.*

   As part of the HRS 343, environmental assessment process, SHPD reviewed an

archaeological inventory survey conducted for the project site (SHPD DOC NO.: 0010MK06/LOG NO.: 26490). By letter dated May 7, 2003 and signed by Cathleen A. Dagher, Assistant Maui/Lanai Island Archaeologist, SHPD indicated that the inventory survey was acceptable and confirmed the survey's finding of no historic properties. SHPD thus concluded that no historic properties are expected to be affected by the proposed action. A copy of this letter will be forwarded to your office by the consulting project engineer.

If you have any questions, please contact Larry Winter at (808) 270-7672.

Sincerely,

George Y. Tengan
Director
GYT/GK/lw
cc: Glenn Kimura, Kimura International, Inc.

ALAN M. ARAKAWA
Mayor

GILBERT S. COLOMA-AGARAN
Director

MILTON M. ARAKAWA, A.I.C.P.
Deputy Director

Telephone: (808) 270-7845
Fax: (808) 270-7955

COUNTY OF MAUI
DEPARTMENT OF PUBLIC WORKS AND ENVIRONMENTAL MANAGEMENT
200 SOUTH HIGH STREET
WAILUKU, MAUI, HAWAII 96793

RALPH NAGAMINE, L.S., P.E.
Development Services Administration

TRACY TAKAMINE, P.E.
Wastewater Reclamation Division

LLOYD P.C.W. LEE, P.E.
Engineering Division

BRIAN HASHIRO, P.E.
Highways Division

JOHN D. HARDER
Solid Waste Division

May 13, 2003

MEMO TO: GEORGE TENGAN, DIRECTOR
DEPARTMENT OF WATER SUPPLY

FROM: for GILBERT S. COLOMA-AGARAN, DIRECTOR
DEPARTMENT OF PUBLIC WORKS AND ENVIRONMENTAL MANAGEMENT Milton Arakawa

SUBJECT: DRAFT ENVIRONMENTAL ASSESSMENT
UPPER KAUPAKALUA WATER STORAGE TANK
TMK: (2) 2-7-015:034

We reviewed the subject draft environmental assessment and have the following comments:

1. Submit a solid waste management plan for construction waste disposal and recycling.

2. One of the drainage culverts crossing Kaupakalua Road at Kapuaahoohui Gulch has recently failed and the road is sinking. Heavy truck traffic may be banned from crossing prior to and during repair of the culvert. Proposed repair of the culvert is currently under review by our Department.

3. Construction of the project shall comply with the provisions of the grading ordinance and County drainage rules. Best management practices shall be implemented to the maximum extent practicable to prevent pollutants, including dust and sediment from discharging off the project site. Runoff from the project site shall create no adverse impacts to adjoining and downstream properties.

If you have any questions regarding this memorandum, please call Milton Arakawa at 270-7845.

GSCA:RMN:msc
xc: [redacted]
Office of Environmental Quality Control
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ALAN M. ARAKAWA
Mayor

GEORGE Y. TENGAN
Director

JEFFREY T. PEARSON
Deputy Director

DEPARTMENT OF WATER SUPPLY
COUNTY OF MAUI
P.O. BOX 1109
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TELEPHONE (808) 270-7816 • FAX (808) 270-7833 • www.mauiwater.org

May 23, 2003

Mr. Gilbert S. Coloma-Agaran, Director
Department of Public Works and Environmental Management
County of Maui
200 South High Street
Wailuku, HI 96793

Dear Mr. Coloma-Agaran,

Subject: Draft Environmental Assessment (EA) for the
Proposed Upper Kaupakulua 0.5 MG Water Storage Tank
Makawao District, Maui, Hawaii

Thank you for reviewing the Draft EA for the proposed Upper Kaupakulua water storage tank. We have received your letter dated May 13, 2003 and offer the following in response to your comments and concerns (in italics). The Final EA will be revised accordingly.

1. *Submit a solid waste management plan for construction waste disposal and recycling.*

   A solid waste management plan will be submitted prior to construction.

2. *One of the drainage culverts crossing Kaupakulua Road at Kapuaahoohui Gulch has recently failed and the road is sinking. Heavy truck traffic may be banned from crossing prior to and during repair of the culvert. Proposed repair of the culvert is currently under review by our Department.*

   Kapuaahoohui Gulch is about 4,500 feet east of the access road along Kaupakulua Road. Access from the other end of the road should not be a problem. DWS will instruct the contractor(s) to coordinate their construction schedule with your department as needed, especially if the culvert is not repaired by the start of construction.

3. *Construction of the project shall comply with the provisions of the grading ordinance and County drainage rules. Best management practices shall be implemented to the maximum extent practicable to prevent pollutants, including dust and sediment from discharging off the project site. Runoff from the project site shall create no adverse impacts to adjoining and downstream properties.*

   The project will comply with all applicable County and State laws and regulations on grading, drainage, and sediment control. Several types of erosion control measures, incorporating best management practices, will be implemented during construction of

the project, including, but not limited to, grassed swales, filter fencing, and timely grassing of graded areas.

If you have any questions, please contact Larry Winter at (808) 270-7672.

Sincerely,

George Y. Tengan
Director

GYT/GK/lw
cc: Glenn Kimura, Kimura International, Inc.

APPENDICES

A. Archaeological Inventory Survey
(TMK: 2-7-15: 34)

B. Botanical Resources Assessment

C. Wildlife Survey

APPENDIX A

Archaeological Inventory Survey
(TMK: 2-7-15: 34)

ARCHAEOLOGICAL INVENTORY SURVEY FOR THE PROPOSED KOKOMO 1MG RESERVOIR AND ACCESS ROAD, KAUPAKALUA *AHUPUA`A*, HĀMĀKUALOA DISTRICT, MAUI (TMK 2-7-15:34)

by
John Winieski, M.A.
and
Hallett H. Hammatt, Ph.D.

Prepared for

Kimura International

Cultural Surveys Hawai`i
August 2000

ABSTRACT

At the request of Kimura International, Cultural Surveys Hawai`i Inc. conducted an archaeological inventory survey for a portion of the proposed Kokomo 1MG Reservoir and Access Road, Kaupakalua *Ahupua`a*, Hāmākualoa District, Maui (TMK 2-7-15:34). The specific project area includes a proposed reservoir site, and an approximate 1100 meter access road corridor and water-line alignment, located on gently sloping short-grass pasture between 1200' and 1500' elevation. No evidence of significant cultural resources were observed during surface inspection. A collapsed portion of the Wailoa Ditch tunnel was observed outside the northern end of the project area and will not be affected by the project. Based on the absence of Historic Properties in the project area no further archaeological research is warranted.

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LIST OF FIGURES

I. INTRODUCTION

A. Project Background

At the request of Kimura International, Cultural Surveys Hawai`i Inc. (CSH) conducted an archaeological inventory survey at the site of the proposed Kokomo 1MG Reservoir and Access Road, Kaupakalua *Ahupua`a*, Hāmākualoa District, Maui (TMK 2-7-15:34) (Figs. 1-5). The site is located on Alexander and Baldwin Properties, Inc. pasture land which is presently leased for cattle ranching to Thomas Decoite. The project area includes a proposed reservoir site, and a 24 foot wide corridor which will accommodate a 12 foot wide access road and adjacent water-line alignment. The project area which extends approximately 1100 meters in a north/south direction is located just south of the intersection of Awalau Road and West Kuiaha Road. The water-line will be connected to an existing control reservoir and pumping station at the northern end of the project area.

B. Scope of Work

The scope of work called for:

1. A complete ground survey of the proposed waterline alignment, access road, and proposed reservoir site. All sites would be located, described, and mapped with evaluation of function, interrelationships, and significance. Documentation will include photographs and scale drawings of selected sites and complexes. All sites will be assigned State site numbers.

2. If warranted, limited subsurface testing to determine depth and quantity of cultural materials within archaeological sites and to obtain datable samples for chronological information if none is available for sites in the immediate area from previous studies.

3. Research on historic and archaeological background, including search of historic maps, written records, Land Commission Award documents. This research will focus on the specific area with general background on the *ahupua`a* and district and will emphasize settlement patterns.

4. Preparation of a survey report which will include the following:

    a. A topographic map, if available, of the survey area showing all archaeological sites and site areas;

    b. Description of all archaeological sites with selected photographs, scale drawings, and discussions of function;

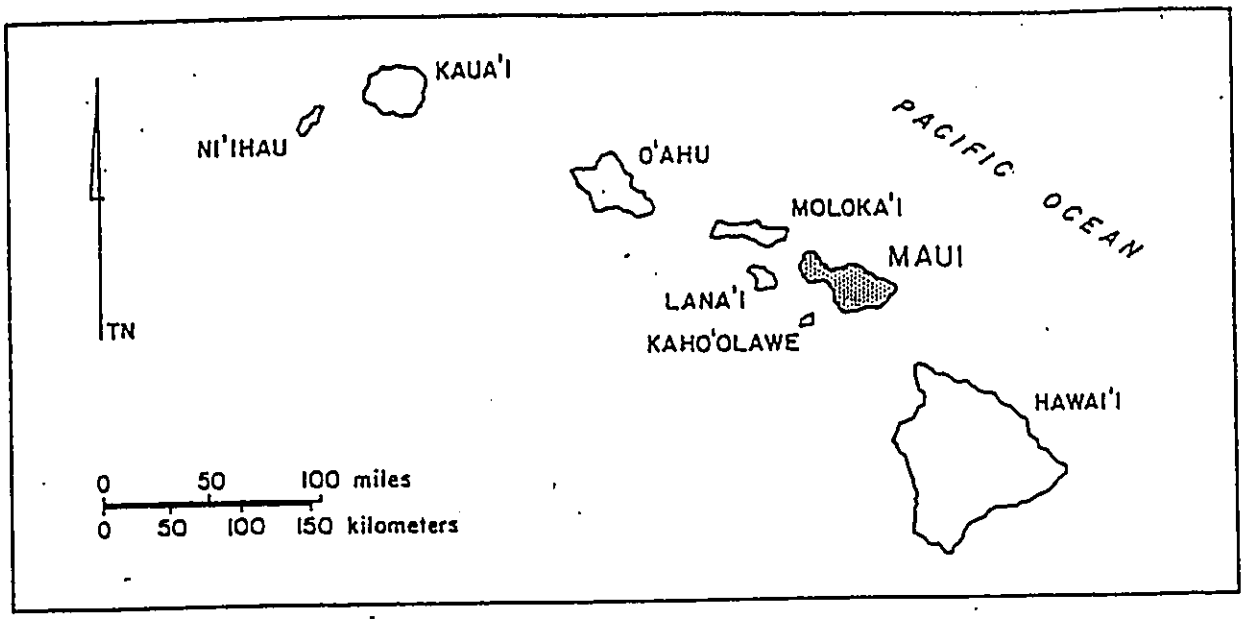


Figure 1 State of Hawai`i

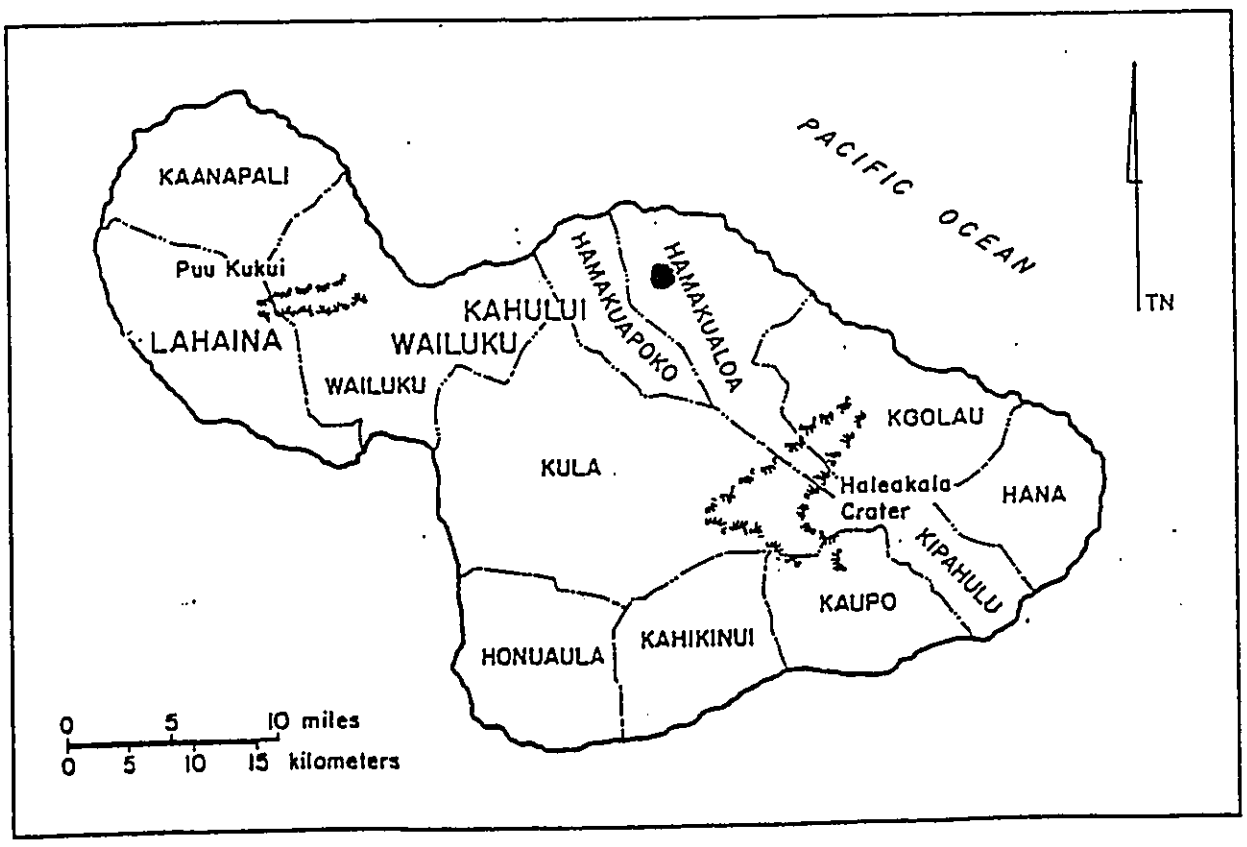


Figure 2 General Location Map, Maui Island

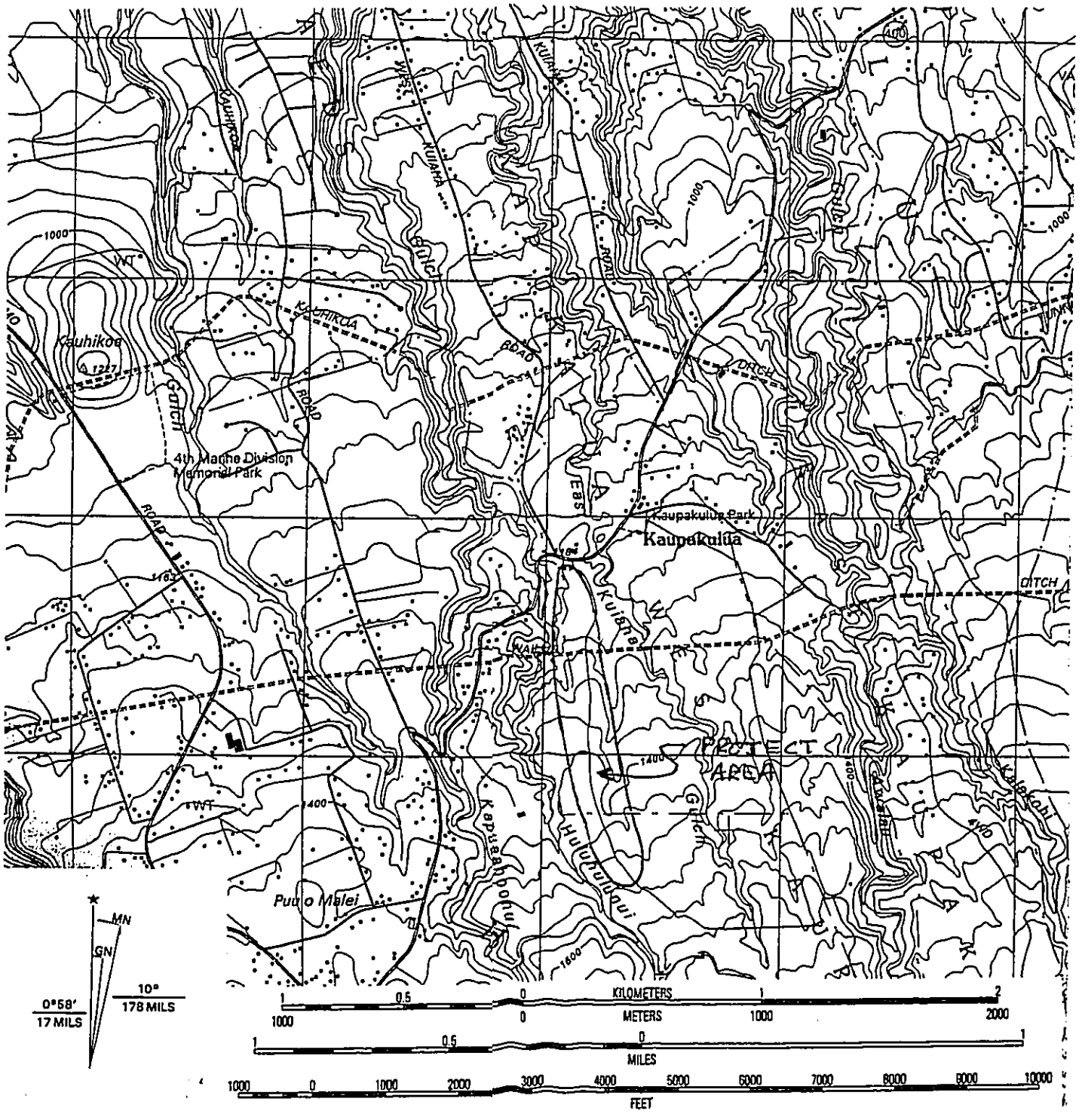


Figure 3 Portion of USGS 7.5 minute series, Haiku Quad, displaying project area

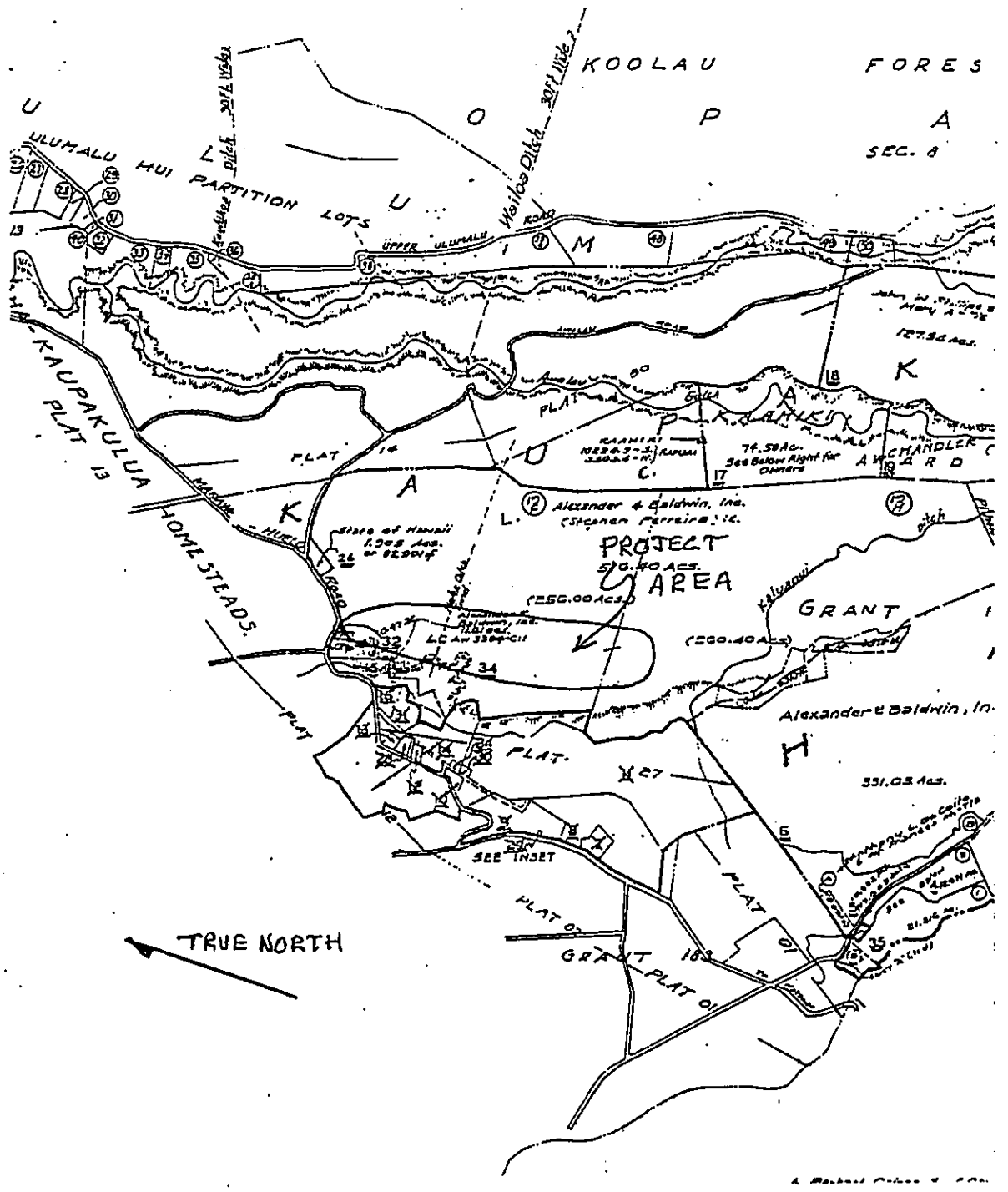


Figure 4 Portion of Tax Map Key 2:7:15 Showing Location of Project Area

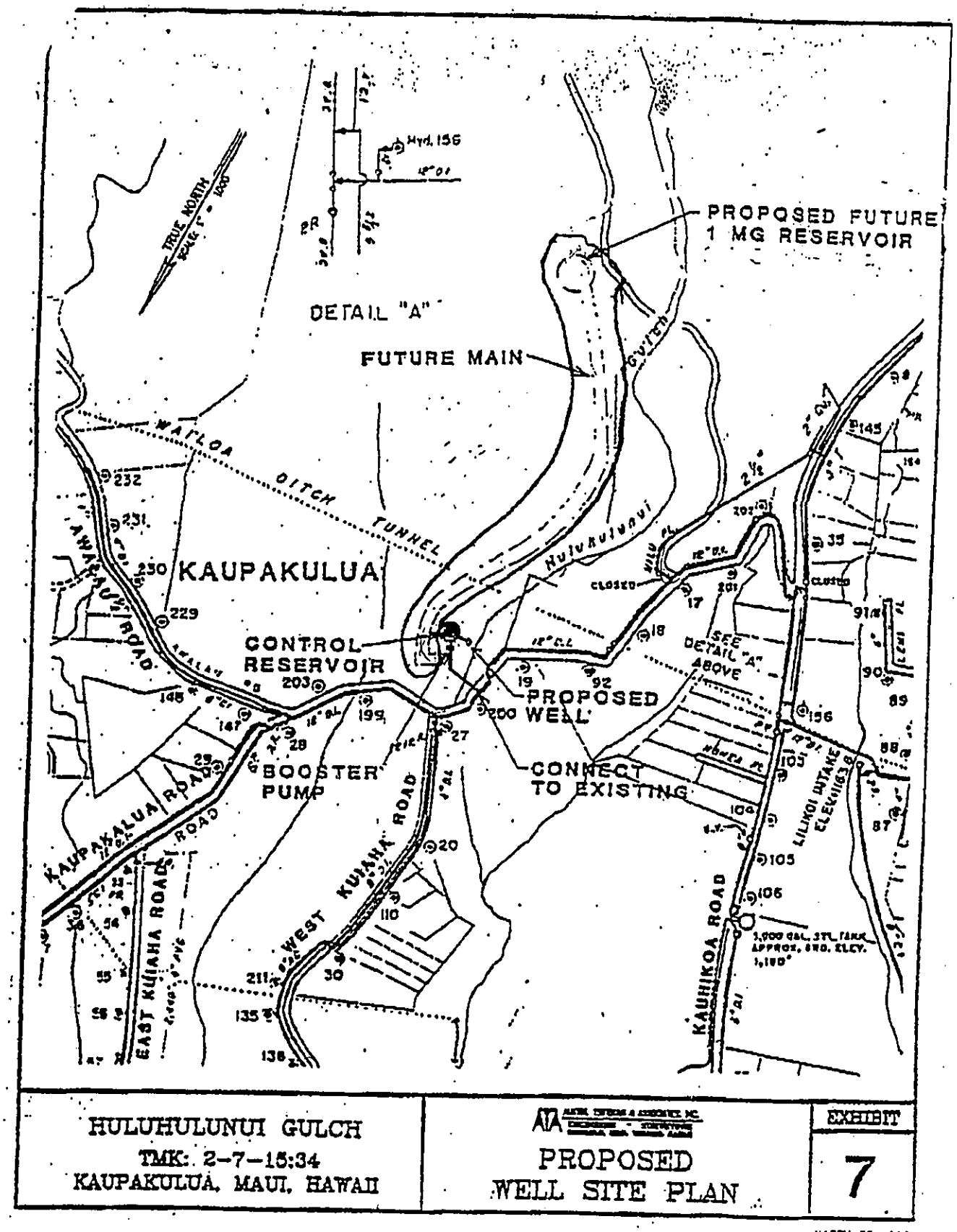


Figure 5 TMK 2-7-15:34 Showing Proposed Location of Kokomo 1MG Reservoir, Access Road, and Waterline Alignment

c. Historical and archaeological background sections summarizing prehistoric and historic land use as they relate to the archaeological features;

d. A summary of site categories, their significance in an archaeological and historic context;

e. Recommendations based on all information generated which will specify what steps should be taken to mitigate impact of development on archaeological resources - such as data recovery (excavation) and preservation of specific areas. These recommendations will be developed in consultation with the client and the State agencies.

C. Methods

Field work was conducted on August 15, 2000 by CSH archaeologists David Shideler and John Winieski. Field work consisted of a 100% pedestrian ground survey of the reservoir site and corridor for the access road and water-line alignment. Ground visibility was excellent due to only ankle-high pasture grass vegetation. Photographic documentation of the project area and surroundings was also conducted during the survey.

D. Project Area Description

The project area was dominated by an equal co-mix of Hilo grass, fox-tail grass, and African dropseed. The reservoir site, at the southern end of the project area contained stands of swamp mahogany (*Eucalyptica robusta*) planted as a wind break, and scattered common guava (*Psidium guajava*), macadamia (*Macadamia integrifolia*), and Formosan koa (*Acacia confusa*).

The project area is situated between the 1200 and 1500 ft. a.m.s.l. elevation within Kaupakulua *Ahupua`a* within Hāmākualoa District, on the northern slopes of Haleakalā. The soil type is Pauwela clay (PFC) which is characterized as "developed in material weathered from basic igneous rock," and that "the soils are used for pasturage and water supply. Small acreages are used for pineapple and woodland." (Foote *et al.* 1973:111,112). Rainfall averages between 75 and 100 inches per year (Armstrong, ed. 1973).

II. HISTORIC BACKGROUND

The present study parcel is situated in Kaupakulua, an *ahupua`a* in the Hāmākualoa District of Maui. Historical documentation by E. F. Craighill Handy and Elizabeth Handy outline likely general patterns in the several *ahupua`a* of Hāmākualoa:

> Hāmākua Poko (Short Hāmākua) and Hāmākua Loa (Long Hāmākua) are two coastal regions where gently sloping *kula* lands intersected by small gulches come down to the sea along the northern coast line of East Maui....Stream taro was probably planted along the watercourses well up into the higher *kula* land and forest taro throughout the lower forest zone. The number of narrow *ahupua`a* thus utilized along the whole of the Hāmākua coast indicates that there must have been a very considerable population. This would be despite the fact that it is an area of only moderate precipitation because of being too low to draw rain out of trade winds flowing down the coast from the rugged and wet northeast Ko`olau area that lies beyond. It was probably a favorable region for breadfruit, banana, sugar cane, arrowroot; and for yams and `awa in the interior. The slopes between the gulches were covered with good soil, excellent for sweet-potato planting (Handy and Handy 1972:498).

The Handys' observations suggest that the lands of and surrounding the present study parcel would have offered an area amenable to plantings of several crops by the Hawaiian population; sweet potato being specific to the subject area along with gathering of non-cultivated plants (i.e. *olona* and medicinal plants). This area would also likely have contained habitation sites -both permanent and temporary- associated with agriculture near the coast. The Kaupakalua Complex (State site 50-50-06-1221), consisting of irrigated terraces and associated features, *makai* (north), approximately one mile, of the present study area, supports their discussion.

Hāmākualoa in general and Kaupakalua specifically are very poorly documented in pre-contact traditions. No traditions specific to Kaupakalua *Ahupua`a* were identified. Hāmākualoa seems to have been most associated as a residence of the *kauwā* or pariah caste as documented in the proverbial saying: "*Pe`epe`e pūhala*" which Pukui (1983: saying 2623) glosses as "Hiders among the hala trees - An epithet for the *kauwā* of Hāmākualoa, Maui". Perhaps the association of the district with kauwā was a factor in the traditions of this area not being better known.

The low hill known as "Kapuai o Kamehameha", located roughly 1 mile northeast of the project area in the *ahupua`a* of Opana and Peahi, is said to have been a camp of the forces of Kamehameha the Great in 1778 during his wars against Kahekili.

Along with nine or ten other *ahupua`a* on Hawai`i, O`ahu, and Maui Islands, the entire *ahupua`a* of Kaupakulua was awarded to Nueku Namau`u, Land Commission Award #10474 and Royal Patent No. 4490 (Boundary Commission, Maui, Vol. 3: page 496-528). In Marion Kelly's "Gardens of Kona" (1983:26) she relates the following on Namau`u:

Through his father, Manena, Nueku Namau`u was a distant cousin of Mataio Kekuanao`a, father of Kamehameha IV and V and Governor of Oahu in the 1840s (Pukui, Elbert, and Mookini 1974:106). Manena worked for Kamehameha I, serving perhaps as an assistant to John Young on Oahu in 1812 (Reynolds 1938:110-111). Namau`u was a brother-in-law of Manuia, who was nephew of Ke`eaumoku and was one of several *kahu* (guardians) of Liholiho (Kamakau 1961:220); he accompanied Liholiho to England in 1823 (Ibid.:256). On his return, Manuia was placed in charge of "Fort Ke-kua-nohu, of the fortified hill of Punchbowl, and the harbor of Kou [Honolulu] and made...Chief Marshall" (Kamakau 1961:273). Having such politically powerful relatives encouraged Namau`u to be active in government affairs. He served the Kamehameha family and was a *konohiki* of lands on Oahu (Native Testimony 3:25 ff). Before Manuia left Hawaii to accompany Boki to the New Hebrides in 1829, he gave his property to Liliha, Boki's wife, and she in turn gave it to Kapoli, the wife of Namau`u, according to testimony by M. Kekuanao`a (Probate 885, First Circuit Court).

Namau`u was given control of the *ahupua`a* of Ho`ae`ae in `Ewa by Manuia, who had received it from Liholiho (Native Testimony 3:65). Manuia had given permission to Lewis Rees to raise goats on Ualena, an *`ili* within Ho`ae`ae. The arrangement was that Rees would care for the goats and would receive as his compensation half interest in any new kids born there. Rees was awarded 3,453 acres (LCA 193), the whole seaward portion of Ho`ae`ae, after many pages of testimony had been taken by the Commissioners (Award Bk. 1:523-531); the award to Namau`u was reduced by the acreage awarded Rees (Award Bk. 10:624-625).

In the *Māhele* of 1848, Namau`u received eleven lands. Some of his land came in recognition of his and his father`s services, and some because he and his sister, Kaupena, had inherited them from her husband Manuia (Native Testimony 3:25-30, 54-56, 64-66).

On August 18, 1847, N. Namau`u was appointed to the Board of Commissioners to Quiet Land Titles in place of John Young Kanehoa, eldest son of John Young, Sr., who resigned (Kuydendall 1938:280, note 37). Upon his death in 1848, Namau`u was replaced on the Board by S.M. Kamakau (Ibid.).

Namau`u's lands were incorporated into the Haiku Sugar Company which was established after the mid-nineteenth century by Samuel T. Alexander and Henry Perrine Baldwin (Speakman 1978:120) (see Fig. 6). Haiku Sugar Company was subsumed in the larger Maui Agricultural Company in 1904.

There were three other land claims near the project area in the *Māhele*. LCA 3304-C:1, just west of the northern end of the project area, was claimed as taro and pasture land by Kanoa. LCA's 6510-M and 6510-N, located just west of the northern end of the project area, were claimed by Kaiwi as taro and pasture land as well.

The Wailoa Ditch, a historic property, is schematically represented on several maps as bisecting the project area (Figs. 3-5). However, the ditch is a tunnel in this area, so would not be visible from the surface. Additionally, Ken Nomura of Alexander and Baldwin Properties, Inc., was present during the inventory survey and pointed out a collapsed section of the tunnel. Though it was on the property, adjacent to Awalau Road, it was approximately 200 meters north of the northern end of the project area

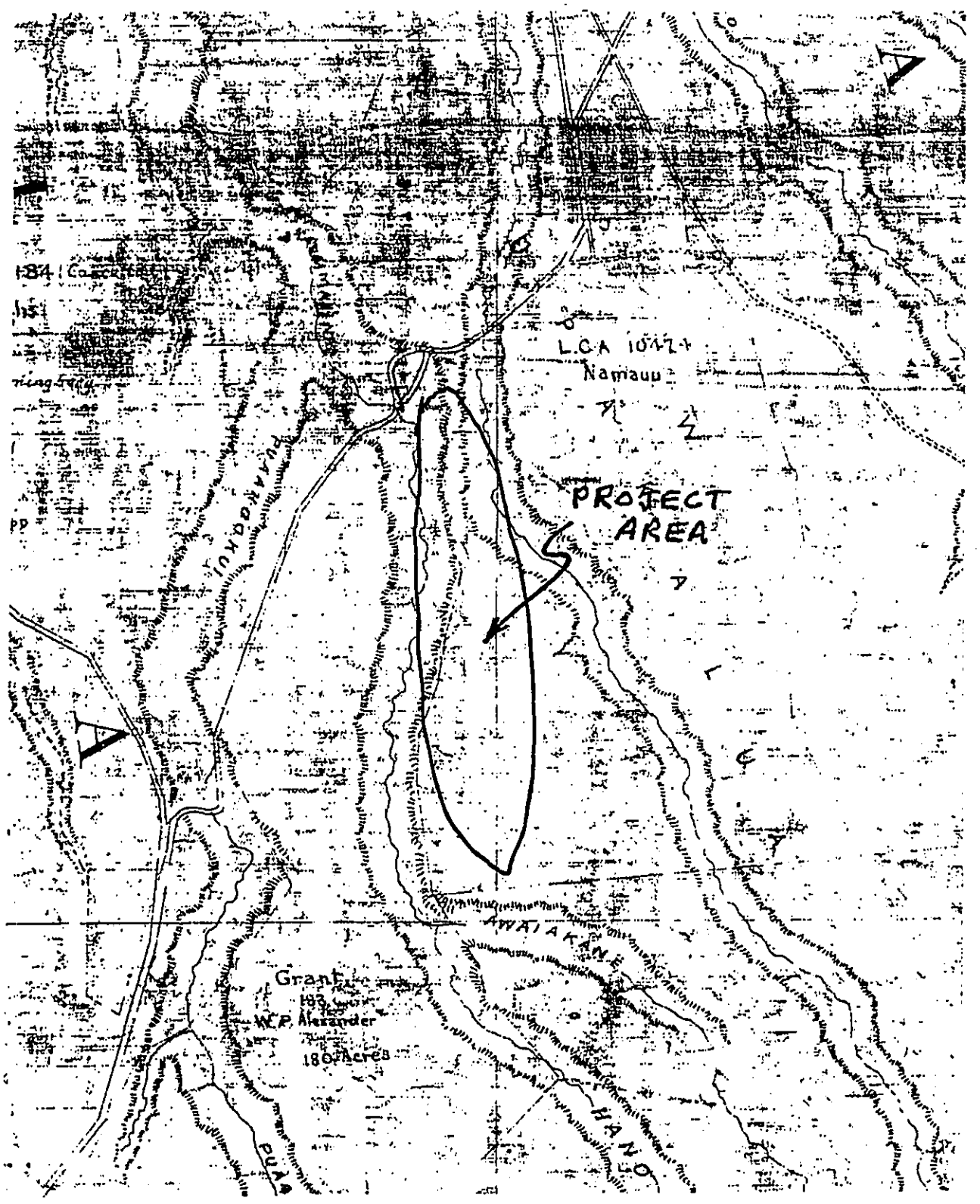


Figure 6 Portion of Map of Haiku Plantation and Adjoining Lands (circa 1900) Showing Location of the Project Area

III. PREVIOUS ARCHAEOLOGICAL RESEARCH

No archaeological studies have been conducted within the project area or the immediate vicinity. Archaeological studies in Hāmākualoa District reviewed include: Walker (1931), Donham (1992), Sinoto and Pantaleo (1992), Xamanek Researchers (1993), Colin and Hammatt (1996), Hammatt and Chiogioji (1998), and Shideler et al. (2000).

Winslow M. Walker (1931:151,) recorded a number of sites (Figure 7) in the region including:

> Site 61: Kapuai o Menehune *Heiau* at Kuloli, Ulumalu, a destroyed *heiau* site. Site 50-50-06-61, was reported destroyed by the Statewide Inventory Survey. It was situated inland at Kuloli in the *ahupua`a* of Opana.
>
> Site 62: Pahoa *Heiau* at Opana; only a remnant of a small platform remains, a destroyed *heiau* site. Site 50-50-06-62, was also reported destroyed by the Statewide Inventory Survey. It was situated along the coastal point in the *ahupua`a* of Opana.
>
> Site 63: Pu`uokaniau *Heiau* at Peahi, a destroyed *heiau* site. Site 50-50-06-63, Pu`uokaniau *Heiau* site was also reported destroyed by the Statewide Inventory Survey. It was situated inland near the Peahi Reservoir.
>
> Site 64: Mokahio *Heiau*, Peahi region, an irregular structure terraced on several sides.
>
> Site 65: Kaapahu *Heiau* at Kakipi, a destroyed *heiau* site.

The Kaupakalua agriculture complex (State site 50-50-06-1221) is situated within the Kaupakalua gulch along the *makai* (north) side of the Hana Highway. The Kaupakalua Winery (State site 50-50-06-1576) is located at the junction of East Kuiaha Road and Kaupakalua Road approximately 2 kilometers to the west of the project area. The third site, the Kaupakalua Village (State site 50-50-06-1569) is located mid-way between Makawao and Pauwela. In the neighboring bays and gulches within surrounding *ahupua`a* a number of sites have been recorded. The closest of these sites is approximately 1.2 kilometers away. The following is a short synopsis of these sites :

> Site 50-50-06-2928, an unmarked grave site, was reported by Donham (1992). This site is briefly reported on by Xamanek Researchers (1993). It is situated to the northwest of the present study area on the eastern edge of East Kuiaha.
>
> Site 50-50-06-1221, Kaupakalua Complex, this site consists of an agricultural complex comprised of irrigated terraces and associated features. It is located approximately one mile from the coast and is situated approximately four

kilometers northwest of the present study area. It was recorded during the 1973 Statewide Inventory.

Site 50-50-06-2798, Possible shrine, this site "consists of a badly deteriorated segment of a retaining wall, a scatter of rocks and boulders, and one prominent boulder in a central area on a 30% slope (Sinoto and Pantaleo 1992:7). It is situated in Keali`i iki Gulch within the *ahupua`a* of Peahi. This site was recorded in 1992 by Aki Sinoto and Jeffrey Pantaleo in "Archaeological Inventory Survey of the Proposed Pili Hale Agricultural Subdivision, Peahi, Makawao, Maui, TMK 2-8-04:15 and :30."

-50-50-06-2799, a historic roadway, situated in the *ahupua`a* of Peahi, also recorded in the aforementioned study (Pantaleo and Sinoto 1992:9-10).

-50-50-06-1576, the Kaupakalua Winery, is a historic winery, situated in the *ahupua`a* of Kaupakalua. It was recorded by J.C. Wright in March of 1974 and the only evidence left of the site consists of two cisterns and a small waterhole. The site is listed as being of reserved value.

-50-50-06-1569, the Kaupakalua Village, situated mid-way between Makawao and Pauwela, was noted by J.C. Wright in March 1974 and is listed as being of marginal value.

There have been two recent inventory surveys *makai* (north) of the Hana Highway in the adjacent *ahupua`a* (to the east) of Opana and Kea`aula with a portion of one extending into the subject *ahupua`a* of Ulumalu. The survey related to the then proposed Sea Ranch Estates, consisted of some 73 acres in Ulumalu, Opana, and Kea`aula (Dunn and Spear 1996). The survey of Manawai Homesteads Subdivision included some 121 acres of plateau and undeveloped gulch terrain (Dunn, Burgett and Spear 1995).

The two projects had some overlapping site boundaries. Thus combined, there were a total of 12 sites documented. Of the twelve sites four were historic, two roads and two ditch segments with eight considered pre-Contact. The pre-Contact site interpretations include, agricultural (3), quarry(s) and lithic scatter (4), and habitation (1) (Dunn, Burgett and Spear 1995; Dunn and Spear 1996). The site locations are depicted on Figure 7.

The historic period sites include: 50-50-067-4086, Spreckles Ditch; -4092, Ha`iku Ditch, and two roads, -4093 and -4095. The pre-Contact sites include: agriculture 50-50-06-4085, 40989 and 4091, Quarry/Lithics -4087, 4088, 4094, and 4182; and habitation 50-50-06-4090.

The conclusion drawn from these two surveys included: (1) that the more favorable plateau lands have been extensively altered by commercial pineapple and therefore only sites in the gulches still exist; (2) though sites were found only in the gulches, the majority of gulches were not suitable for sites, "Due to the steep sites and relatively narrow bottoms of the gulches there is a lack of habitation and agricultural sites" (Dunn and Spear 1996:16), and (3) C14 analysis of samples from the only pre-Contact site 50-50-06-4090 yielded date ranges into the historic period - suggesting late pre-Contact habitation use (Dunn, Burgett and Spear 1995:32, 33).

An inventory survey for the Ulumalu-Peahi Water System Improvements reservoir and access road approximately one mile to the east of the present project area found no evidence of significant cultural resources (Shideler et al. 2000).

IV. SETTLEMENT PATTERN SUMMARY AND EXPECTED FINDINGS

The settlement pattern for the area surrounding the project would have probably been typical for the Hamakualoa District of Maui. It would be expected that habitation would have been concentrated near the coast and within the larger valley systems with permanent stream flow. Within these valleys intensive agricultural pursuits (i.e. taro *lo`i*) would have been taking place in association with habitation activities. For areas without constant stream flow (i.e. the project area) agricultural activities would not have been as intensive but rather more opportunistic with sweet potato being the main crop although the gathering of non-cultivated agricultural crops (i.e. *olonā* and possibly medicinal plants) would also be expected. Habitation within areas without constant stream flow would still be expected to be concentrated near the coast. Therefore, within the project area, site density would be relatively low, habitation activities would be expected further *makai* along the coast and agricultural activities would be expected to be non-intensive. Although agricultural activities most likely took place within the project area the probability for evidence of this activity remaining is extremely low due to the non-intensive nature of the agriculture.

Additionally, based on background research, it is probable that commercial agriculture, pineapple and/or sugar cane, occurred within the presently open pasture lands within which the project area lies. The Wailoa Ditch system, related to these agricultural ventures, traverses near the project area, although the ditch is a tunnel in this area.

V. FINDINGS AND RECOMMENDATION

The surface survey was initiated from the south end of the project area, at the proposed reservoir site. The site was accessed by an existing dirt road originating at Awalau Road. The dirt road lies on the same path as the proposed 6 meter (20 foot) wide corridor intended for the permanent access road and water-line alignment. The distance from the proposed reservoir to the existing pumping station facility, to which the waterline will be connected is approximately 1100 meters.

The reservoir site covers approximately one acre within a grassy paddock, surrounded by tall swamp mahogany (*eucalyptus robusta*) windbreak. A barbed wire fence borders the area to the south and west where the terrain descends steeply into the Huluhulunui Gorge. Visibility was excellent since the grass was only ankle high, making a pedestrian survey quite simple. A pedestrian survey of the entire length of the access road and water-line alignment was then made. The vegetation was exclusively heavily grazed ankle high grass, with excellent visibility. No historic properties of any kind were observed in the project area.

Due to the absence of historic sites no further archaeological research is warranted.

If, in the unlikely event, any archaeological remains are encountered during construction, work should be halted in that area and State Historic Preservation Division (SHPD) should be contacted at 587-0047 to determine appropriate treatment of any findings.

VI. REFERENCES CITED

Armstrong, Warwick, Ed.
1973 *Atlas of Hawai`i*, University of Hawaii Press, Honolulu, HI.

Boundary Commission
n.d. *Boundary Commission, Maui*, Vol. 3: page 496-528

Colin, Brian L. and Hallett H. Hammatt
1996 *Archaeological Assessment of the Proposed Bridge Replacement Site at Kaupakalua, Hamakualoa District, Island of Maui*, Cultural Surveys Hawai`i

Donham, Theresa K.
1992 "Field Inspection of an Unmarked Grave Site (50-50-06-2928), East Kuiaha, Hamakualoa, Maui, (TMK 2-7-12:63)."

Dunn, A. E., B. Burgett, and R. L. Spear
1995 *An Archaeological Inventory Survey of Manawai Homesteads Subdivision, Kea`aula Ahupua`a, Makawao District, Island of Maui, Hawai`i (TMK 2-8-03:18, 20, 21, 26)*, Scientific Consultant Services, Inc., Honolulu.

Dunn, A. E., and R. L. Spear
1996 *An Archaeological Inventory Survey of Sea Ranch Estates Subdivision, Ulumalu and Opana Ahupua`a, Makawao District, Island of Maui, Hawai`i (TMK 2-8-03:17)*, Aki Sinoto Consulting and Scientific Consultant Services Inc, Honolulu.

Foote, Donald E., E.L. Hill, S. Nakamura and F. Stephens
1972 *Soil Survey of the Islands of Kauai, Oahu, Maui, Molokai and Lanai, State of Hawaii*, U.S. Dept. of Agriculture, U.S. Government Printing Office, Washington, D.C.

Handy, E.S. Craighill and Elizabeth G. Handy
1972 *Native Planters in Old Hawaii: Their Life, Lore, and Environment*, Bishop Museum Bulletin 233, Honolulu.

Hammatt Hallett H. and Rodney Chiogioji
1998 *Archaeological Assessment of a Proposed New Kaupakalua Bridge Alignment on the Hana Highway, Kaupakalua Ahupua`a, Island of Maui*, Cultural Surveys Hawai`i, Kailua.

Hawaii Heritage Center
1990 *Historic Bridge Inventory and Evaluation, Island of Maui and Molokai*, Department of Transportation Highways Division, Honolulu.

Kamakau, Samuel Manaiakalani
1961 *Ruling Chiefs of Hawaii*, The Kamehameha Schools Press, Honolulu, HI.

Kelly, Marion
1983 *Nā māla o kona: Gardens of Kona, A History of Land Use in Kona, Hawai`i*, Bernice P. Bishop Museum, Honolulu.

Kuykendall, Ralph S.
1938 *The Hawaiian Kingdom, Volume 1*, U.H. Press, Honolulu, HI.

Mckinzie, Edith K.
1983 *Hawaiian Genealogies, 2 v.*, University of Hawaii Press, Honolulu.

Pukui, Mary Kawena
1983 *`Ōlelo No`eau Hawaiian Proverbs and Poetical Sayings* B. P. Bishop Museum

Pukui, Mary K., Samuel H. Elbert and Esther Mookini
1974 *Place Names of Hawaii*, University of Hawaii Press, Honolulu, HI.

Reynolds, Stephen
1989 *Journal of Stephen Reynolds, Volume 1: 1823-1829*, Pauline N. King, editor Ku Pa`a Incorporated, Honolulu, HI.

Shideler, David, Douglas Borthwick and Hallett Hammatt
2000 *Archaeological Inventory Survey for the Ulumalu-Peahi Water System Improvements Ulumalu Ahupua`a, Hamakualoa District Maui (TMK 2-8-01:Por. 4, 54, 61, 63, 65, 68)*, Cultural Surveys Hawaii, Inc., Kailua.

Sinoto, Aki and Jeffrey Pantaleo,
1992 *Archaeological Inventory Survey of the Proposed Pili Hale Agricultural Subdivision, Peahi, Makawao, Maui, TMK 2-8-04:15 and 30.* Aki Sinoto Consulting, Honolulu.

Speakman, Cummins E.
1978 *Mowee: An Informal History*, Pueo Press, San Rafael, CA.

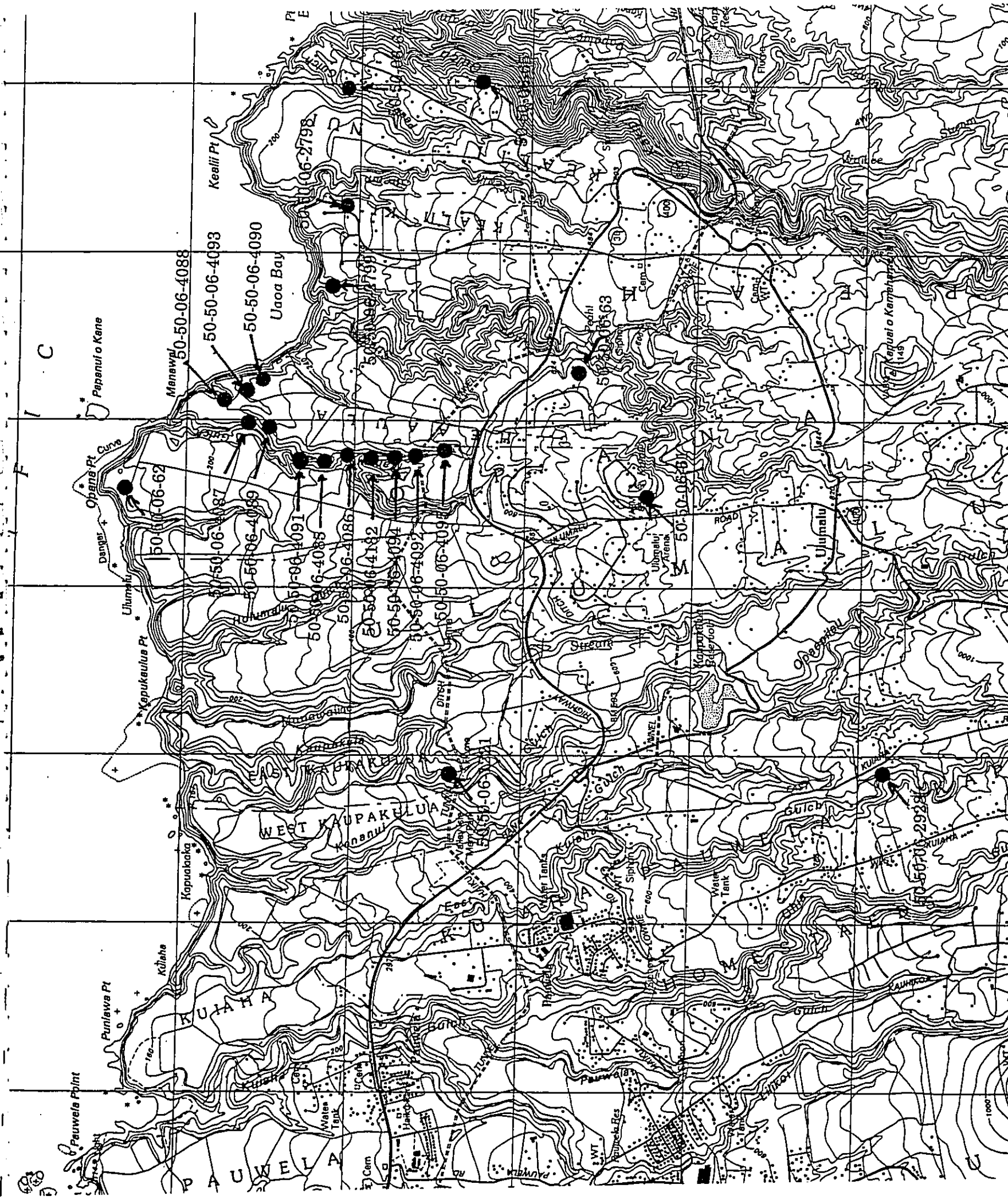
Sterling, Elspeth P.
1998 *Sites of Maui*, B. P. Bishop Museum

Walker, Winslow, Metcalf
1931 *Archaeology of Maui*, B. P. Bishop Museum

Xamanek Researches
1993 *Subsurface Testing of an Unmarked Grave Site (#50-06-2928), East Kuiaha, Hamakualoa, Maui, (TMK 2-7-12:63)*

PHOTOGRAPHIC APPENDIX

DOCUMENT CAPTURED AS RECEIVED



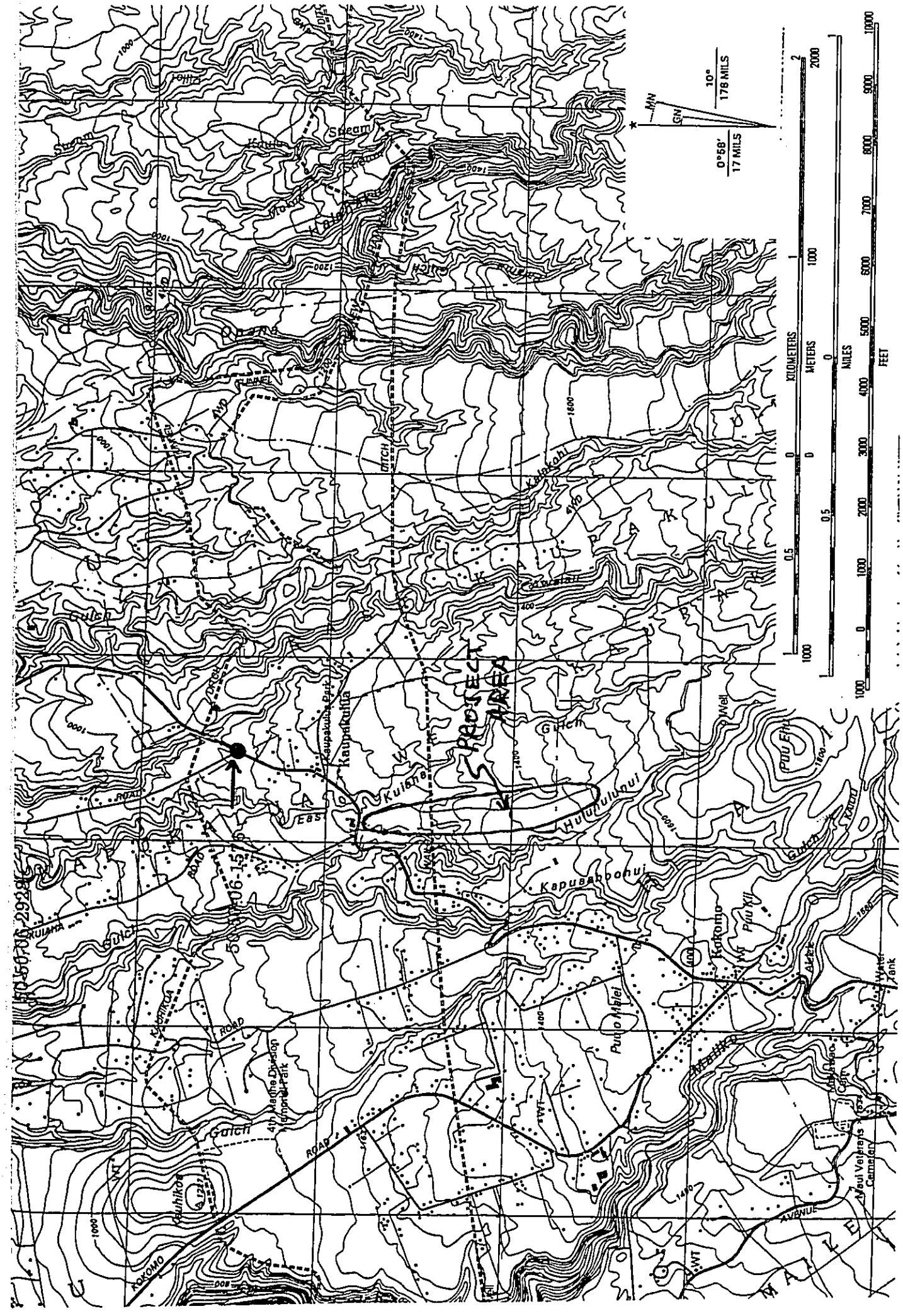


Figure 7 Portion of USGS 7.5 minute series, Haiku Quad, showing archaeological sites in the vicinity

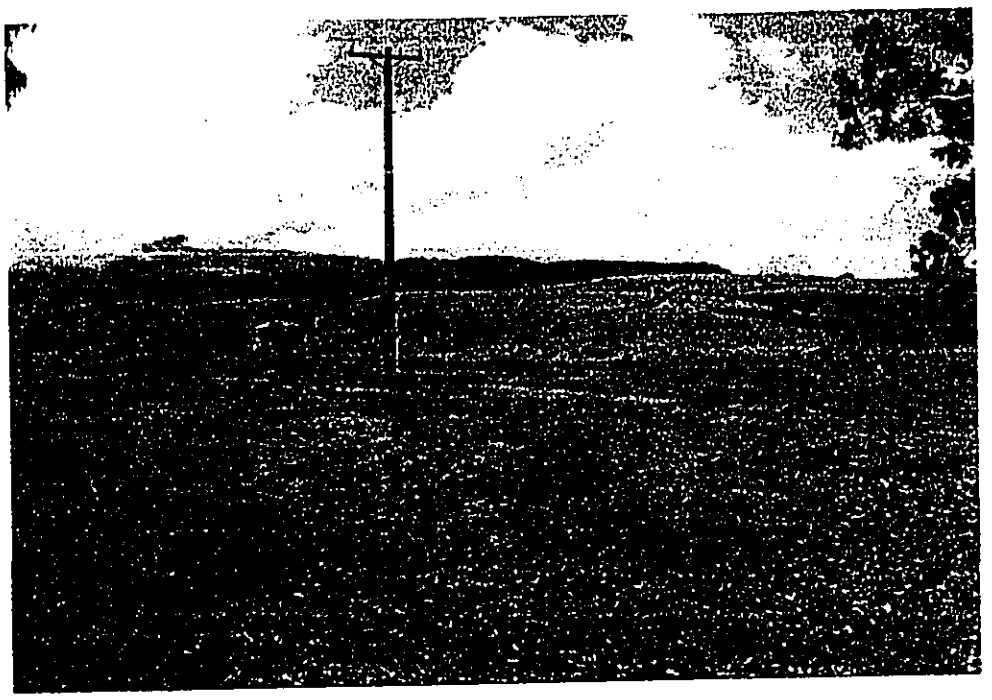


Figure 8 Photograph Showing Existing Facility and Project Area Above and to the Right, View South from Awalau Road

Figure 9 Photograph of Proposed Reservoir Tank Site (Huluhulunui Gulch Descends on Left), View to North-West

Figure 10 Photograph From Top of Proposed Access Road and Waterline Alignment near Proposed Reservoir Site, View to North-West

Figure 11 Photograph Midway Down Proposed Access Road and Waterline Alignment, View to North

Figure 12 Photograph of Collapsed Section of Wailoa Ditch Tunnel North of Project Area

Figure 13 Photograph of Probable Location of LCA 3304-C North of Northern End of Project Area, View to East

STATE OF HAWAII

DEPARTMENT OF LAND AND NATURAL RESOURCES

HISTORIC PRESERVATION DIVISION
Kakuhihewa Building, Room 555
601 Kamokila Boulevard
Kapolei, Hawaii 96707

November 20, 2000

Hallett H. Hammatt, Ph.D.
Cultural Surveys Hawai'i
733 North Kalaheo Avenue
Kailua, Hawaii 96734

LOG NO:26490 ✓
DOC NO: 0010MK06

Dear Dr. Hammatt,

SUBJECT: **Review of Archaeological Inventory Survey for the Proposed Kokomo 1MG Reservoir and Access,**
Kaupakulua Ahupua'a, Hamakualoa District, Maui TMK 2-7-15:34

Thank you for the opportunity to review this report which our staff received on September 20, 2000 (Winieski and Hammatt 2000, *Archaeological Inventory Survey for the Proposed Kokomo 1MG Reservoir and Access Road, Kaupakulua Ahupua'a, Hamakualoa District, Maui TMK 2-7-15:34*...CSH ms.).

The background section is acceptable. It provides a summary of the precontact *ahupua'a* settlement pattern. The historical information provided summarizes the history of the post-contact period land uses, and includes information on the awarding of the entire *ahupua'a* of Kaupakulua to Nueku Namau'u. The summary of previous archaeological work in the area is detailed, giving information on previously located sites in the vicinity, and providing a baseline for the current work.

We believe that the survey has adequately covered the project area, finding no historic sites.

The authors should note that Kaupakulua *ahupua'a* is misspelled "Kaupakalua" in the title, on the title page, and elsewhere in the text. It is spelled correctly in the citations and on the maps.

We find this report to be acceptable. With no sites present, any development of this parcel would have "no effect" on significant historic sites. Thus, the historic preservation process is concluded. However, as always, if, during construction, archaeological sites are encountered, work in the immediate vicinity of the finds should stop and our office be contacted.

Should you have questions, please contact Dr. Melissa Kirkendall (Maui/Lana'i SHPD 243-5169).

Aloha,

Don Hibbard, Administrator
State Historic Preservation Division

MK:jen

c: John Min, Director, Department of Planning, County of Maui, FAX 270-7634
Bert Ratte, County of Maui, Land Use and Codes, FAX 270-7972

APPENDIX B

Botanical Resources Assessment

CHAR & ASSOCIATES
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August 2000

BOTANICAL RESOURCES ASSESSMENT
KOKOMO TANK REPLACEMENT
KOKOMO, MAKAWAO, MAUI

INTRODUCTION

The proposed project consists of a 1 million gallon (MG) reservoir and access road to be developed by the County of Maui. The site is located east of Huluhulunui Gulch and mauka of Kaupakalua Road. The site is currently used as a cattle pasture. A stand of tall Eucalyptus trees is found near the reservoir location.

Field studies to assess the botanical resources found on the proposed reservoir site and along the access road were conducted on 15 August 2000. The primary objectives of the survey were to:

1) provide a description of the vegetation on the project site;
2) search for threatened and endangered species as well as species of concern; and
3) identify areas of potential environmental problems or concerns and propose appropriate mitigation measures.

DESCRIPTION OF THE VEGETATION

The plant names used in this report follow Wagner et al. (1990). The few recent name changes since 1990 follow those recorded in the Hawaii Biological Survey series (Evenhuis and Miller 1995-1998; Evenhuis and Eldredge 1999).

The access road passes through open pasture land used to graze cattle. The pasture grasses are a mixture of various species which include Hilo grass (Paspalum conjugatum), African dropseed grass (Sporobolus africanus), pangola grass (Digitaria pentzii), and yellow foxtail (Setaria gracilis). Scattered through the thick mat of grasses are plants of Spanish clover or ka'imi (Desmodium incanum), sensitive plant or puahilahila (Mimosa pudica var. unijuga), honohono (Commelina diffusa), and two native sedges, Cyperus polystachyos and Fimbristylis dichotoma. Near the reservoir site, trees of Formosan koa (Acacia confusa), 5 to 15 feet tall, line the proposed access road.

The proposed reservoir site is open pasture with swamp mahogany trees (Eucalyptus robusta) bordering three sides of the pasture. The Eucalyptus are 70 to 80 feet tall. Under the trees there are a few scattered strawberry guava shrubs (Psidium cattleianum), clumps of downy wood-fern (Christella parasitica), and mossy mats of Leucobryum sp. and Rhizogonium spiniforme. The grassy pasture area on the reservoir site supports scattered guava shrubs (Psidium guajava), 3 to 6 feet tall, and saplings of Formosan koa and Eucalyptus. Two macadamia nut trees (Macadamia integrifolia) are also found nearby. Woody cover is about 5%. Besides the grasses mentioned previously, other grasses found on this pasture area are golden beardgrass (Chrysopogon aciculatus) and Schizachyrium condensatum.

DISCUSSION AND RECOMMENDATIONS

The project site as well as the surrounding lands have been used for sugar cane cultivation or pasture land in the past. As a result of these past disturbances, the vegetation is dominated by introduced species such as the various pasture grasses, guava, Eucalyptus, Spanish clover, Formosan koa, etc. Introduced or alien species are all those plants which were brought to the

Hawaiian Islands by humans, intentionally or accidentally, after Western contact, that is, Cook's discovery of the islands in 1778.

Only three native species were observed on the project site, these were the two sedges, Fimbristylis dichotoma and Cyperus polystachyos, and the golden beardgrass or manienie 'ula (Chrysopogon aciculatus). These plants are all indigenous, that is, they are native to Hawai'i and elsewhere. None of the plants found during the field studies is a threatened and endangered species or a species of concern (U.S. Fish and Wildlife Service 1999). All of the plants can be found in similar habitats throughout the main Hawaiian Islands.

Given the findings above, the proposed use of the site for a reservoir and access road is not expected to have a significant negative impact on the botanical resources. It is recommended, however, that areas cleared of vegetation be revegetated as soon as possible to prevent soil erosion. Hilo grass which is already found on the site is suitable for this purpose; it is quick growing and forms low, dense mats.

LITERATURE CITED

Evenhuis, N.L. and S.E. Miller, editors. 1995-1998. Records of the Hawaii Biological Survey. Bishop Museum Occasional Papers Nos. 41-56.

Evenhuis, N.L. and L.G. Eldredge, editors. 1999. Records of the Hawaii Biological Survey. Bishop Museum Occasional Papers Nos. 58-59.

U.S. Fish and Wildlife Service. 1999. U.S. Fish and Wildlife Service species list, plants. March 23, 1999. Pacific Islands Ecoregion Office, Honolulu, HI.

Wagner, W.L., D.R. Herbst, and S.H. Sohmer. 1990. Manual of the flowering plants of Hawai'i. 2 vols. University of Hawai'i Press and Bishop Museum Press, Honolulu, HI. Bishop Museum Special Publication 83.

APPENDIX C

Wildlife Survey

Wildlife Survey
Kokomo Tank Replacement Site
Kokomo Road, Makawao
Maui, Hawaii

Prepared for:
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1600 Kapiolani Blvd., Ste. 1610
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Prepared by:
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October 6, 2000

1.0 Introduction

A field survey was conducted on September 8, 2000 to assess the wildlife resources found on a small parcel of pasture land south of Kaupakulua, Maui, Hawaii. The construction of a 1 million gallon water storage tank is proposed with an access road from Kaupakulua Road. The objectives of the survey were to provide a record of wildlife on the site and determine whether the project would adversely impact any important wildlife resources in the area.

2.0 Site and Habitat Description

The proposed project site is adjacent to Huluhulunui Gulch approximately one mile due south of Kaupakulua at approximately 1600 ft elev. (488 m). The site falls within vegetation zone D_1 (Ripperton and Hosaka in Schwartz and Schwartz 1949), which is characterized by moderate temperatures with a minimum of 60 inches of rain originated by northeast trade winds. Formerly in sugarcane, the zone is made up of perennial shrubs and grasses on open ridges and slopes, with introduced trees planted as windrows. The project site is pasture with mature eucalyptus (*E. robusta*) windrows and scattered Formosa koa (*Acacia confusa*) and clumps of guava (*Psidium guajava*). The adjacent gulch was dominated by a dense growth of strawberry guava (*Psidium cattleianum*). Java plum (*Eugenia couminii*), silky oak (*Grevillea robusta*), kukui (*Aleurites moluccana*) trees were also common with white ginger (*Hedychium coronarium*) along a streambed. No native trees or forest species were present on or near the site. Residential homes were scattered throughout the area (Fig. 1)

3.0 Method

The survey was conducted between 11:00 a.m and 1:40 p.m. Three count stations were established approximately 0.4 miles apart (Fig 2). The first station was near the center of the water tank site at 1600 ft. elev. (488 m). The second station was downslope from the water tank site, on the jeep trail through the pasture at about 1,406 ft elev. (428 m). The third count station was on the paved road leading to the existing booster pump at 1,278 ft. elev. (389 m). Observations were made for eight minutes at each station. All birds seen and heard were recorded.

In addition to the counts at the three stations, searches for wildlife signs and incidental observations were made above the tank site, in the gulch, and along the jeep road.

4.0 Results

Birds

Moderate northeasterly trade winds blew throughout the survey period making audio detection less than optimal. This did not hamper the survey, however, since the project site and road corridor were in pasture land that made visual observations easy. Only nine species of birds were encountered during the station counts:

Pacific golden plover (*Pluvialis fulva*)
Cattle egret (*Bulbulcus ibis*)
Chestnut mannikins (*Lonchura malacca)*
Spotted dove (*Streptopelia chinensis*)
Zebra dove (*Geopelia striata*)
Melodius laughing thrush (*Garrulax canorus*)
Northern cardinal (*Cardinalis cardinalis*)
Common myna (*Acridotheres tristis*)
Japanese White-eye (*Zosterops japonicus*)

Of these nine species found during the survey, only the Pacific golden plover is considered native. The Pacific golden plover was present at Station 3 along the paved road leading to the booster pump, where the vegetation was cropped low from heavier concentration of grazing livestock and mechanical disturbance from either bulldozing or mowing (Fig 3). Pacific golden plovers are migratory. They are present in the Hawaiian islands from August through March where they typically establish feeding territories on lawns or open flats where they feed on insects. The pastures on site were not suitable for plovers because the grass was too dense and long. Maintaining a lawn around the proposed tank site and cutting grass along the access roadway may actually increase plover habitat.

No native honeycreepers (family Drepanididae) or other native forest species were found on the site. This was expected since only introduced trees and pasture grasses were present. There were no native trees such as ohia (*Metrosideros* spp.) or koa (*Acacia koa*) that could support populations of native birds and none in the vicinity. More suitable habitat for native forest birds occurs much further upslope or to the east in extant native rainforests of the forest reserves (Scott et. al. 1986).

No native short-eared owl or pueo (*Asio flammeus sandwichensis*) was seen during the survey but are expected to occur in the area. Pueo inhabit grasslands, shrublands and montane parklands throughout Maui. Unlike the common barn owl, the pueo is active during the day and can be readily observed at mid-day. This species is widespread on all the main islands except Oahu where the population on that island is listed by the State of Hawaii as endangered. The Maui population is not endangered or threatened. Short-eared owls feed extensively on house mice (*Mus musculus*) and Polynesian rats (*Rattus exulans*).

The following is a list of introduced birds that were expected but not encountered during the survey.

Ring-necked pheasant (*Phasianus colchicus*)
Common barn owl (*Tyto alba*)
House finch (*Carpodacus mexicanus*)
Nutmeg mannikins (*Lonchura punctulata*)
Eurasian skylark (*Alauda arvensis*)
Red-billed leiothrix (*Leiothrix lutea*)

Mammals

Axis deer tracks and fecal pellets were found on game trails under Formosa koa stands. The sign indicated recent traversing of the property by deer. Axis deer are more common in the southern portion of Haleakala volcano where they were introduced in 1959. They have since expanded their range northward where they are now common in Kula and have been encountered as far north as Waikamoi Preserve (Waring 1996). The mosaic of forested gulches, windrows and open pastures with stands of shrubs and small trees make the area ideally suited for axis deer colonization.

The following mammals were expected but not encountered during the survey:

Feral pig (*Sus srofa*)
Small Indian mongoose (*Herpestes auropunctatus*)
Feral cat (*Felis cattus*)
Rats (*Rattus* sp.)
House mouse (*Mus musculus*)

The Hawaiian hoary bat (*Lasiurus cinereus semotus*) is a federally listed endangered species. Bats are commonly observed at dusk, therefore it was unlikely to be detected during the survey. The habitat on the project site and in the vicinity is suitable for bats. On Maui, the hoary bat has been mostly reported from Upcountry between elevations of 1,968 to 6,560 ft. elev. (600 - 2000 m) in a variety of habitats. It has been observed in nearby Makawao town and in Maliko Gulch (Duvall 1991). Kepler and Scott (1990) stated that records of bat sighting on Maui suggest that the hoary bat occurs on the island only as a migrant from the island of Hawaii. Duvall's (1991) records lean toward a resident population, perhaps a reproductively active one.

5.0 Conclusion and Summary

The project site and access roadway are within pasture land that was in sugarcane during the previous century. The area does not support native forest species. No threatened or endangered wildlife were observed. The Hawaiian hoary bat, a federally listed endangered species has been observed in nearby Makawao and Maliko Gulch. It is not clearly established whether Maui has a resident population, but one can expect at least that the hoary bat may occur as a transient over the project site. No pueo were observed but they are expected in such habitat. Pueo nest on the ground, usually in the grass but I saw no signs of pueo presence. Pacific golden plovers are migratory birds that are expected to increase in the area if a lawn is maintained around the storage tank and the grass along the roadway is mowed.

6.0 Bibliography

Duvall, F. and R. Gassman-Duvall. 1991. No bats on Maui?. Elepaio 51(3): 1-2.

Kepler, C.B. and J. M. Scott. Notes on Distribution and Behavior of the Endangered Hawaiian Hoary Bat (*Lasiurus cinereus semotus*), 1964-1983. Elepaio 50(7):50-64.

Schwartz, C.W. and E.R. Schwartz. 1949. The game birds in Hawaii. Board of Commissioners of Agriculture and Forestry, Territory of Hawaii. 168 pp.

Scott, J.M., S. Mountainspring, F.L. Ramsey and C.B. Kepler. 1986. Forest bird communities of the Hawaiian Islands: their dynamics, ecology and conservation. Studies in Avian Biology No. 9. Cooper Ornithological Society. 431 pp.

Waring. G.H. 1996. Preliminary study of the behavior and ecology of axis deer on Maui, Hawaii. Research report to Haleakala National Park and the National Park Service. Dept. of Zoology, Southern Illinois University, Carbondale, IL.