EXECUTIVE CHAMBERS

HONOLULU

JOHN WAIHEE
GOVERNOR

August 22, 1988

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OFC. OF ENVIRONMENTAL
QUALITY CONTROL

Marvin T. Miura, Ph.D.
Director
Office of Environmental Quality Control
465 South King Street, Room 104
Honolulu, Hawaii 96813

Dear Dr. Miura:

Based upon the recommendation of your office, I am pleased to accept the Final Environmental Impact Statement for the Kula Water System Improvements as satisfactory fulfillment of the requirements of Chapter 343, Hawaii Revised Statutes. This environmental impact statement will be a useful tool in the process of deciding whether the action described therein should be allowed to proceed. My acceptance of the statement is an affirmation of the adequacy of that statement under applicable laws, and does not constitute an endorsement of the proposed action.

When the decision is made regarding the proposed action itself, I expect the proposing agency to weigh carefully whether the societal benefits justify the environmental impacts which will likely occur. These impacts are adequately described in the statement, and, together with the comments made by reviewers, provide a useful analysis to the proposed action.

With kindest regards,

Sincerely,

JOHN WAIHEE

cc: The Honorable William Paty

FINAL ENVIRONMENTAL IMPACT STATEMENT FOR THE KULA WATER SYSTEM IMPROVEMENTS

MAKAWAO, MAUI, HAWAII

Prepared For:

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

Prepared By:

FUKUNAGA AND ASSOCIATES, INC.

AUGUST 1988

FINAL ENVIRONMENTAL IMPACT STATEMENT

FOR THE

KULA WATER SYSTEM IMPROVEMENTS

This environmental document is prepared pursuant
to Chapter 343, Hawaii Revised Statutes

LOCATION:	Upper Kula, Makawao Island of Maui State of Hawaii
PROPOSING AGENCY:	Division of Water and Land Development Department of Land and Natural Resources State of Hawaii
RESPONSIBLE OFFICIAL:	WILLIAM W. PATY — Date Chairperson of the Board Board of Land and Natural Resources Department of Land and Natural Resources State of Hawaii
ACCEPTING AUTHORITY:	Governor State of Hawaii
ENGINEERING CONSULTANT:	Norman Saito Engineering Consultants, Inc. Wailuku Townhouse, Suite 203 2158 Main Street Wailuku, Maui, Hawaii 96793
E.I.S. PREPARED BY:	Fukunaga & Associates, Inc. 1388 Kapiolani Boulevard, Second Floor Honolulu, Hawaii 96814

AUGUST 1988

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SUMMARY SHEET

1. Purpose of the Project

The main objective of this project is to provide a more dependable transmission line from the fresh water sources at Waikamoi to the treatment facilites at Olinda. The State of Hawaii, Department of Land and Natural Resources, Division of Water and Land Development proposes to install a new 36-inch water transmission line from the Kula Water System surface water sources at Waikamoi Stream and Reservoirs to the Olinda Water Treatment Plant. The new line will replace an existing cast-iron pipeline which is over 50 years old.

2. Proposed Improvements

The proposed improvements include the installation of a new 36-inch diameter transmission main connecting the Waikamoi Reservoirs to the Olinda Water Treatment Plant. The new line will replace the existing 12-inch/16-inch pipeline as the primary transmission conduit from the water source to the treatment facility. The proposed 36-inch pipeline will generally follow the alignment of the existing 12-inch/16-inch pipeline. The existing pipeline is programmed to remain as a back-up transmission line and as a supplementary source, collecting flows from five other existing intakes connected along the existing line.

Secondary improvements include reconstruction of damaged portions of an existing 24-inch corrugated metal pipe collector line and its existing four intakes. Replacement of the five feeder pipes from the existing 12-inch transmission line to its existing five intakes is also proposed. Minor reconstructive work at the intakes will be performed as needed.

3. Project Setting

The project is located along the slopes of Haleakala in the Makawao District on the island of Maui. The proposed improvements will extend from the Waikamoi Stream and reservoirs to the Olinda Water Treatment Plant and reservoir, generally within the 4000 ft. and 4400 ft. elevation contours along the northern slopes of Haleakala.

The project site passes through lands owned by Haleakala Ranch Co., State of Hawaii, Virginia C. Dubois Trust, Alexander and Baldwin, Inc. and East Maui Irrigation Co., Ltd. (TMK: 2-3-5:4, 2-3-6:6, 2-4-15:29, 2-4-16:1,2,3&4)

4. Probable Impacts

The major short term impacts which can be expected as a result of this project are all associated with construction activity necessitated by the proposed improvements. Increased traffic, construction noise, dust, mud, and vehicular and equipment emissions can be anticipated. Conscientious efforts to minimize disturbance of native flora and fauna are required during construction to protect valuable biological resources present in the area.

The major long term impact of the proposed project is the transformation of the existing transmission system into a more reliable and efficient water conveyance system and should result in increased productivity in the Upcountry Maui Water System service area.

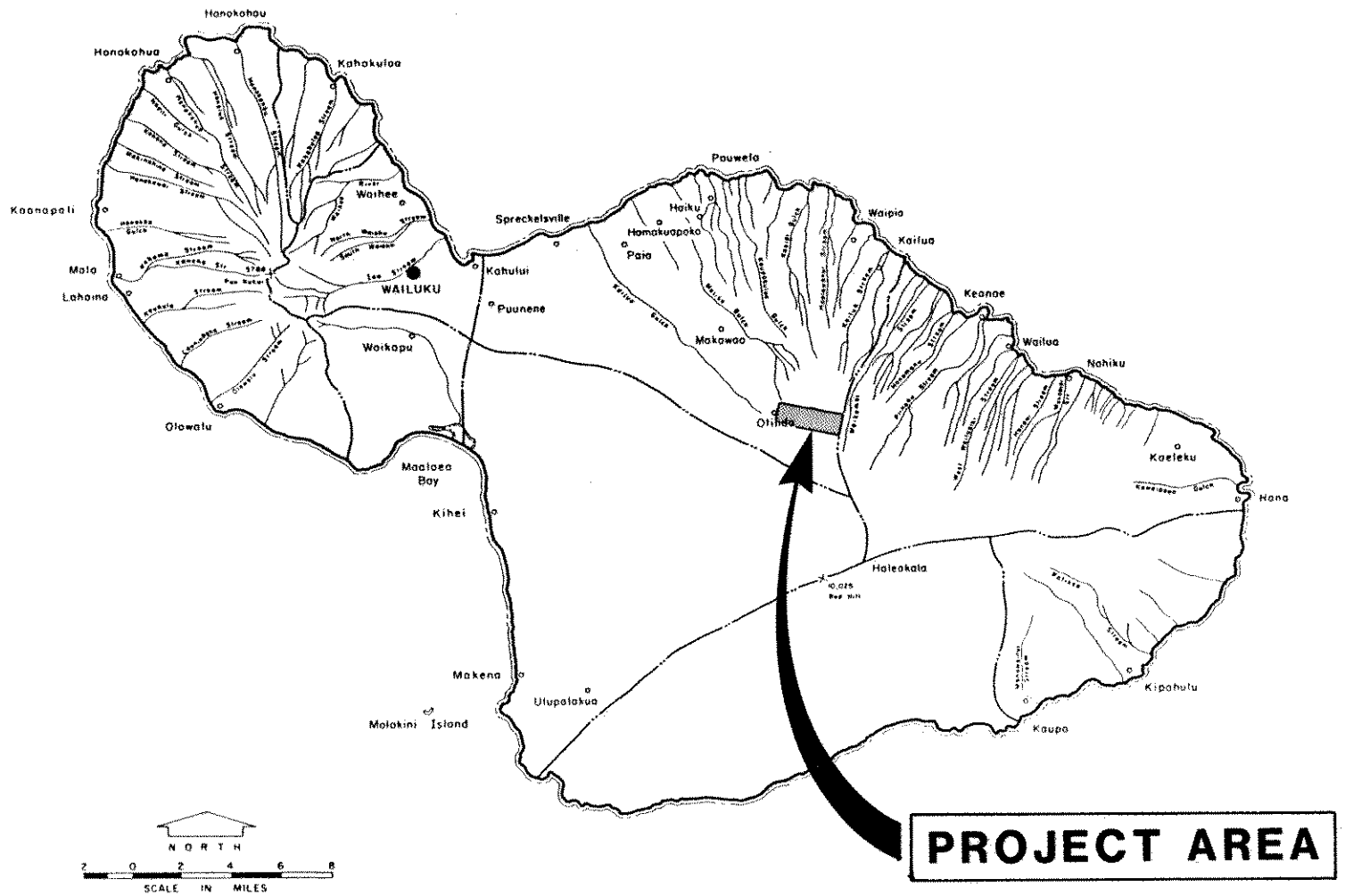
5. Alternatives to the Proposed Action

Several alternatives to the proposed project have been considered. However, the alternatives were rejected on the basis of either economic infeasibility or more significant adverse environmental impacts.

I. DESCRIPTION OF THE PROJECT

A. Introduction

The reliability of water supply to Upcountry Maui has been a major problem for many years. Water use restrictions are a common occurrence. Crop and livestock losses during periods of drought are often high. The existing Upcountry water system has been unable to collect and store sufficient amounts of water during high rainfall periods for use during low rainfall periods. By direction of the Mayor of the County of Maui, the Steering Commitee for the Water Resources Study for Upcountry Maui (WRSUM) was formed in 1985 to assess the water situation in Upcountry Maui. The Committee included representatives from various public and private organizations, including County, State and Federal government agencies, large plantations, and smaller-scale agricultural operations. The WRSUM Committee and Department of Water Supply County of Maui have proposed a general plan to improve the Upcountry Water System. Major improvements to the water system include replacement of the existing transmission main from the Waikamoi reservoirs to the Olinda Water Treatment Plant, additional storage reservoirs, and improvements to the distribution system. These major improvements are presently being formulated and evaluated by various agencies including the WRSUM Committee, the County of Maui Department of Water Supply, the State of Hawaii Department of Land and Natural Resources Division of Water and Land Development, and the U. S. Soil Conservation Service to implement recommendations developed by the WRSUM as a joint effort to increase the system reliability. State and County funding has been appropriated to replace portions of the existing Kula pipeline from the major sources at Waikamoi to the Olinda Water Treatment Plant as an initial effort to improve the system reliability.



LOCATION MAP

FIGURE I-1

elevation 4276 ft. The Waikamoi dam had an impoundment capacity of about 1.0 MG. The 6.0 MG Olinda reservoir was increased in capacity to 8.5 MG during 1933 by constructing vertical masonry walls around the perimeter of the structure. The Waikamoi dam was also raised in 1933 to a spillway elevation of 4282 ft. These storage facility improvements greatly improved the system reliability.

Subsequent improvements to the Upper Kula water system included the replacement of the original wood stave pipeline from Waikamoi dam to the Olinda storage constructed in 1912 with a cast iron pipe in 1934. The original wooden flume from Haipuena Stream to Waikamoi dam was also replaced in 1934.

Major improvements to the original Upper Kula water system since 1934 include the Waikamoi Arch Dam constructed in 1956 located approximately 400 feet upstream of the Waikamoi dam. The impoundment capacity of the Waikamoi Arch Dam is about 10 MG. Two 15 MG reinforced concrete open storage reservoirs were constructed at Waikamoi in 1959.

The existing Upper Kula water system is owned and operated by the County of Maui Department of Water Supply and presently serves approximately 1400 metered customers. Average daily consumption is estimated at 0.9 million gallons per day (MGD). Major components of the existing Upper Kula Water System include the Waikamoi Arch Dam, the Waikamoi Dam, two 15 MG concrete reservoirs at Waikamoi, 700 linear feet of 48-inch corrugated metal pipe from the Waikamoi Dam to the two 15 MG concrete reservoirs, 2000 linear feet of 24-inch corrugated metal pipe (CMP) from Kailua Stream tributary to the two 15 MG concrete reservoirs, and 17,000 linear feet of 12-inch and 16-inch cast iron pipe from the two 15 MG reservoirs to the Olinda Water Treatment Plant. Five small intakes intercept the flow from intermittent streams along the length of the 12-

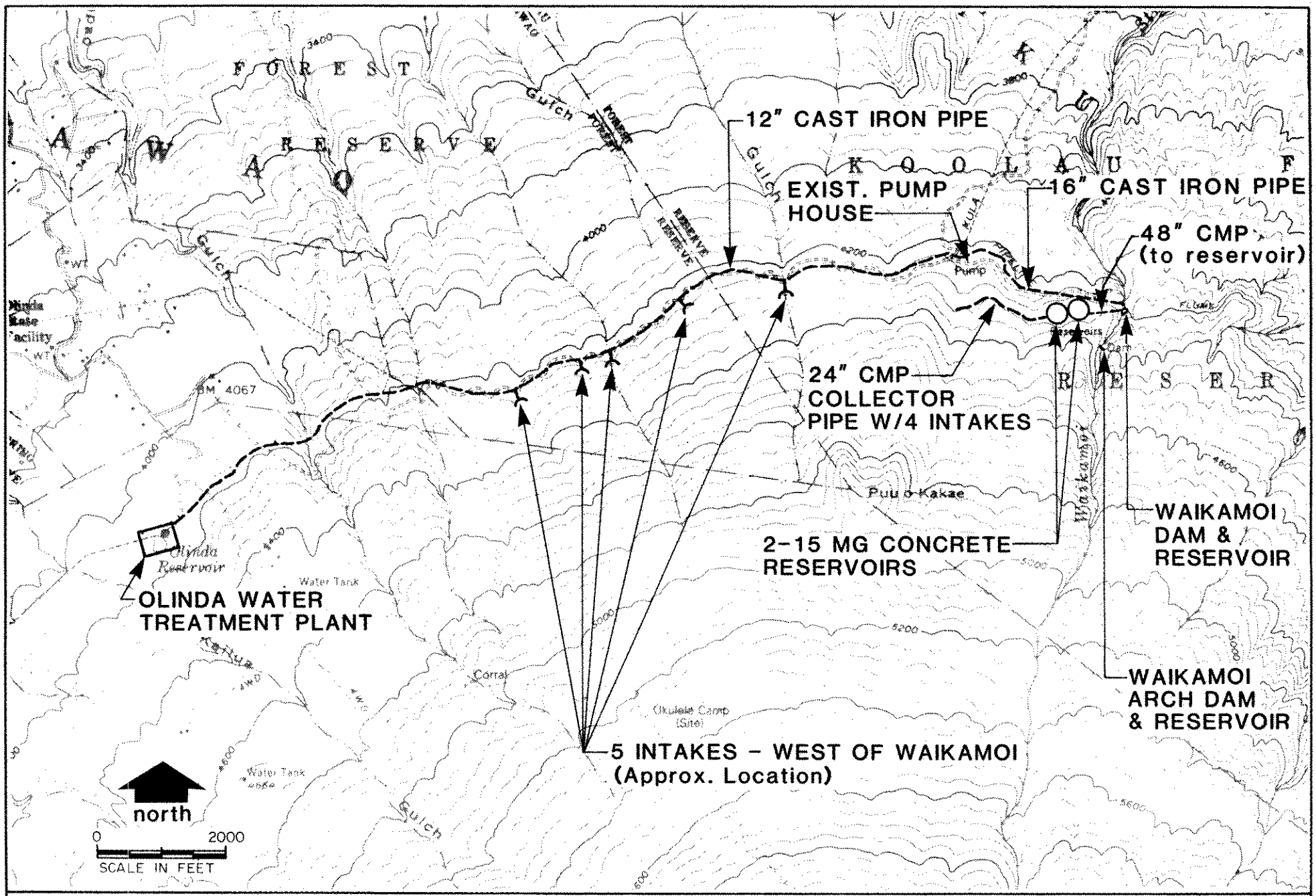


FIGURE I-2

EXISTING KULA WATER SYSTEM

inch transmission line. The existing system is shown on Figure I-2.

The major water sources for the Upper Kula water system are surface runoff collected from the Haipuena, Puohokamoa and Waikamoi Streams. Water from Haipuena and Puohokamoa Streams are transported to the Waikamoi Dam via a 24-inch by 12-inch redwood flume. Water from the Waikamoi Stream is collected by the Waikamoi Arch Dam and flows via a natural open channel into the Waikamoi Dam. Water from the Waikamoi Dam is piped into the two 15 MG concrete reservoirs via a 48-inch corrugated metal pipe. A 16-inch cast iron pipeline carries the water to the existing pumphouse and is reduced to a 12-inch cast iron pipeline from the pumphouse to the Olinda Water Treatment Plant. Treated water from the treatment plant is stored in a 3.0 MG steel tank located on the Olinda Plant site and then distributed to consumers via the County water distribution network.

D. Proposed Improvements

The improvements proposed in this project include the installation of approximately 16,700 linear feet of new 36-inch diameter transmission pipe connecting the Waikamoi Reservoirs to the Olinda Water Treatment Plant. The new line will replace the existing 12-inch and 16-inch pipeline as the main transmission line from the primary raw water sources east of Waikamoi to the Olinda water treatment facility. The proposed 36-inch pipeline will generally follow the alignment of the existing 12-inch and 16-inch pipeline. The proposed pipeline will have both exposed and buried reaches, depending upon the terrain encountered. The proposed alignment is shown in Figure I-3. The existing 12-inch and 16-inch cast iron pipeline is programmed to remain as a back-up transmission line and as a supplementary source, collecting flows from the five existing intakes west of Waikamoi.

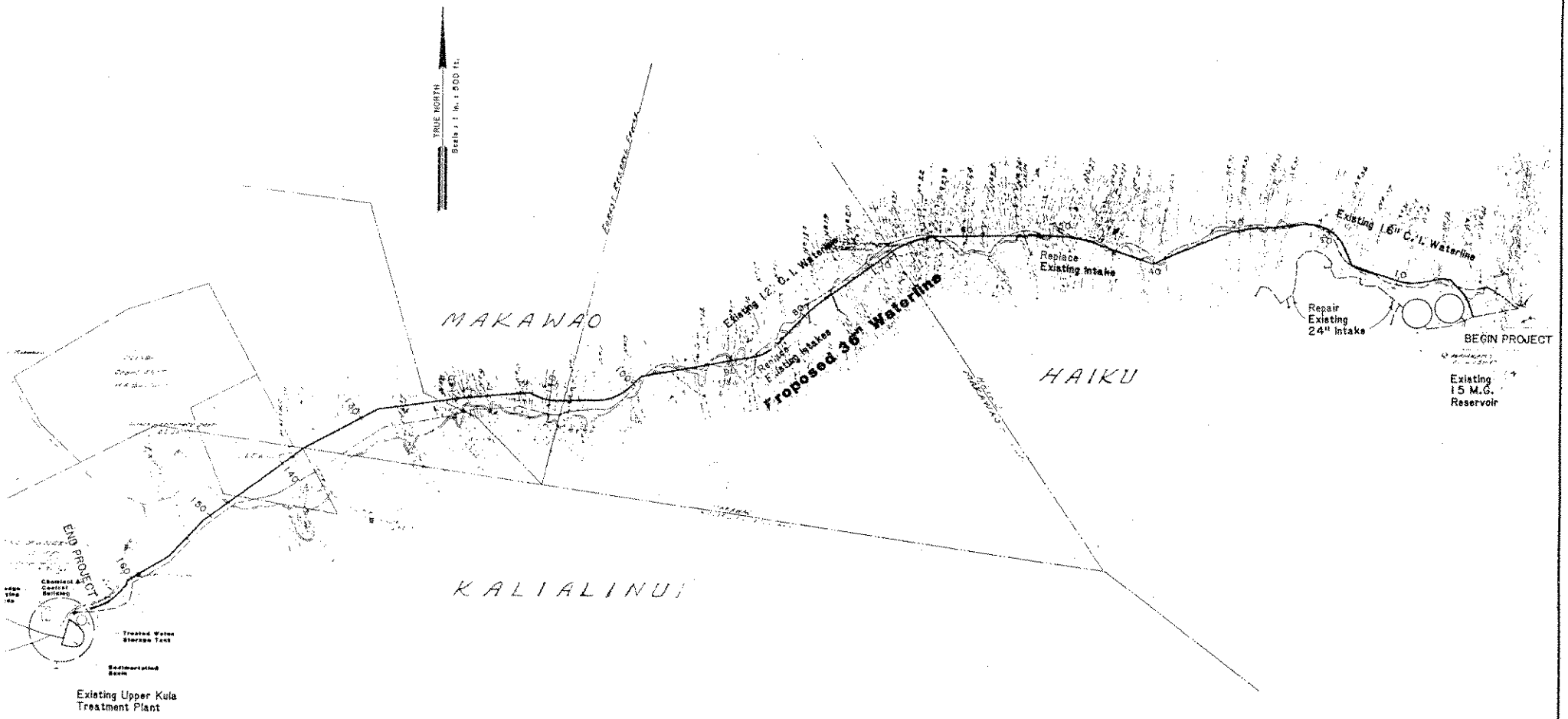


FIGURE I-3

SYM	DESCRIPTION	DATE	APP'D
	REVISIONS		

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

PROPOSED KULA WATER SYSTEM IMPROVEMENTS

DESIGNED: GT
DRAWN: N.B.
CHECKED:
SUBMITTED:
CHIEF DESIGN & CONSTR. ENGINEER
DATE:
APPROVED:
MANAGER-CHIEF ENGINEER
DATE:
FILE NO.

JOB NO. 89-MW-L SHEET NO. OF SHEETS

Secondary improvements include reconstruction of damaged portions of the existing 24-inch CMP collector pipe and its existing four intakes. Replacement of the five feeder pipes from the existing 12-inch transmission line to its existing five intakes is also proposed. Minor reconstructive work at the intakes will be performed as needed.

No additional diversions of surface water or water source development are proposed in this project.

Future improvements include additional storage reservoirs and improvements to the water distribution network. Alternatives and details for these future improvements are currently being developed and studied and will be assessed as the proposals become more definite.

E. Project Funding

Funding for the design and construction of the proposed project is provided from two sources:

1. State of Hawaii

2. County of Maui

F. Project Schedule

If necessary approvals for the project are obtained, construction of the proposed pipeline is tentatively scheduled to begin in October 1988. Construction period for the project is scheduled to take one and a half years (540 days); completed by March 1990.

II. PROJECT SETTING

A. Physical Characteristics

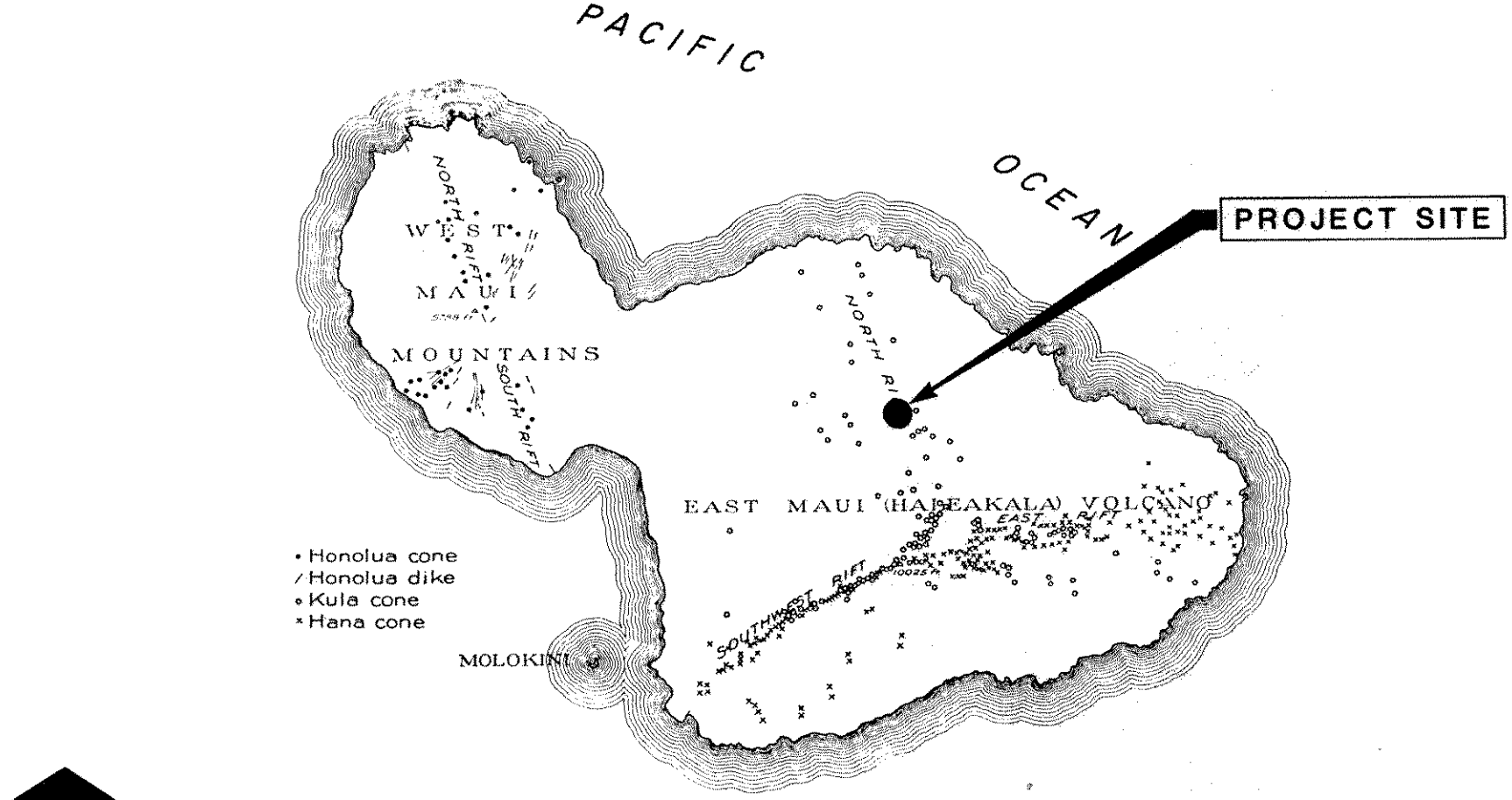
1. Project Location

The project site is located along the slopes of Haleakala in the Makawao District on the island of Maui as shown in Figure I-1. The proposed improvements will extend from the Waikamoi Stream and reservoirs to the Olinda Water Treatment Plant generally within the 4000 ft. and 4400 ft. elevation contours along the northern slopes of Haleakala. (See Figure I-3.)

2. Geology

The predominant geologic feature of East Maui is the Haleakala Volcano. The volcano was built over three rift zones, i.e., the north, east and southwest rifts. The project site lies across the north rift zone. (See Figure II-1.)

Three major volcanic series are evident in East Maui. (See Figure II-2.) The initial phase was the Honomanu Volcanic Series occurring during the Tertiary Era. The Honomanu lavas consists of thin-bedded basaltic pahoehoe and aa flows that are very permeable. Overlying the Honomanu series is the Kula Volcanic Series which occurred during the Pleistocene Era. The Kula lavas are composed primarily of thicker andesitic aa flows which contain many interstratified, thin ash-soil layers. Many large cinder cones were built during this phase resulting in numerous ash beds. Some olivine basalts and picrite basalts occur in the Kula series. The Kula series is less permeable than the Honomanu series, but does contain perched water on the



RIFT ZONES - ISLAND OF MAUI

FIGURE II-1

interstratified soils, conglomerates and ash. A long, inactive period followed the Kula series which allowed the erosion of deep canyons in the volcano. The third phase, the Hana Volcanic Series followed, occurring only in the east and southwest rift zones. The Hana lavas are andesitic, picritic and olivine basalts that generally carry little water except where they have covered earlier perennial streams.

3. Soils

The soil types found in the vicinity of the project site include soils of the Hydrandepts-Tropaquods and the Laumaia-Kaipoioi-Olinda associations. The Hydrandepts-Tropaquods associations are characterized by gently sloping to steep, well-drained to poorly drained soils that have a moderately fine textured or fine textured subsoil or underlying material. The Laumaia-Kaipoioi-Olinda associations are characterized by deep, gently sloping to very steep, well drained soils that have a moderately fine textured or medium-textured subsoil. A General Soil Map is shown in Figure II-3.

Specific soil types found along the project site are shown in Figure II-4. The specific soil types are described below.

<u>Amalu peaty silty clay, 3 to 20 percent slopes (rAMD)</u>

"This soil is on high ridges and mountaintops. Included in mapping were small areas of Honomanu and Olokui soils and of steep gulches.

In a representative profile an organic layer of black peat, about 8 inches thick, overlies a layer of gray massive clay about 8 inches thick. The substratum is soft, weathered basic igneous rock capped by a horizontal ironstone sheet 1/8 to 1 inch thick. The

soil is extremely acid above the ironstone layer.

Permeability is restricted by the ironstone sheet, which is impermeable except for cracks. Runoff is very slow, and the erosion hazard is no more than slight. Roots penetrate to a depth of 8 to 15 inches in places.

This soil is used for water supply and wildlife habitat."

Honomanu-Amalu association (rHR)

"The soils in this association have the profiles described as typical of their respective series. The areas are almost inaccessible by vehicle or on foot. They are on gently sloping to moderately steep, intermediate uplands on East Maui. The Honomanu soils occupy the more sloping, better drained side slopes. The Amalu soils occur on the less sloping tops of ridges and interfluves. The Honomanu soils are well drained; the Amalu soils are poorly drained. Runoff is slow to very slow, and the erosion hazard is slight.

Honomanu soils make up about 60 percent of the association, and Amalu soils about 40 percent. Included in mapping were small areas of Kailua soils and many small, very steep gulches.

This association is used for water supply and wildlife habitat. It is covered with dense rain forest vegetation."

Olinda loam, 12 to 20 percent slopes (OND)

"This soil is on smooth, intermediate to high mountain slopes. Included in mapping were small areas of Kaipoioi and Pane soils.

In a representative profile the surface layer is dark, reddish-brown loam about 6 inches thick. The subsoil, about 5 inches thick, is dark reddish-brown and yellowish-red silty clay loam that has subangular blocky structure. Below this is yellowish-red and reddish-brown silty clay loam and gravelly silty clay

loam. This is underlain by slightly weathered basic igneous rock. The soil is slightly acid in the surface layer and subsoil.

Permeability is moderately rapid. Runoff is slow to medium, and the erosion hazard is slight to moderate. The available water capacity is about 2.4 inches per foot in the surface layer and about 1.6 inches per foot in the subsoil. In places roots penetrate to a depth of 3 feet or more.

This soil is used for pasture, woodland, and water supply."

Olinda loam, 4 to 12 percent slopes (ONC)

"On this soil, runoff is slow and the erosion hazard is slight. Included in mapping were small, eroded spots.

This soil is used for truck crops and pasture. Small acreages are used for orchards."

Olinda loam, 20 to 40 percent slopes (ONE)

"This soil is subject to frequent fog and cloud cover. Small gullies are common. Runoff is medium to rapid, and the erosion hazard is moderate to severe. Included in mapping were small areas of rock outcrop and small, eroded spots.

This soil is used for pasture."

Rock Land (rRK)

"Rock land is made up of areas where exposed rock covers 25 to 90 percent of the surface. It occurs on all five islands. The rock outcrops and very shallow soils are the main characteristics. The rock outcrops are mainly basalt and andesite."

Rough Broken Land (rRR)

"Rough brokenland consists of very steep land broken by numerous intermittent drainage channels. In

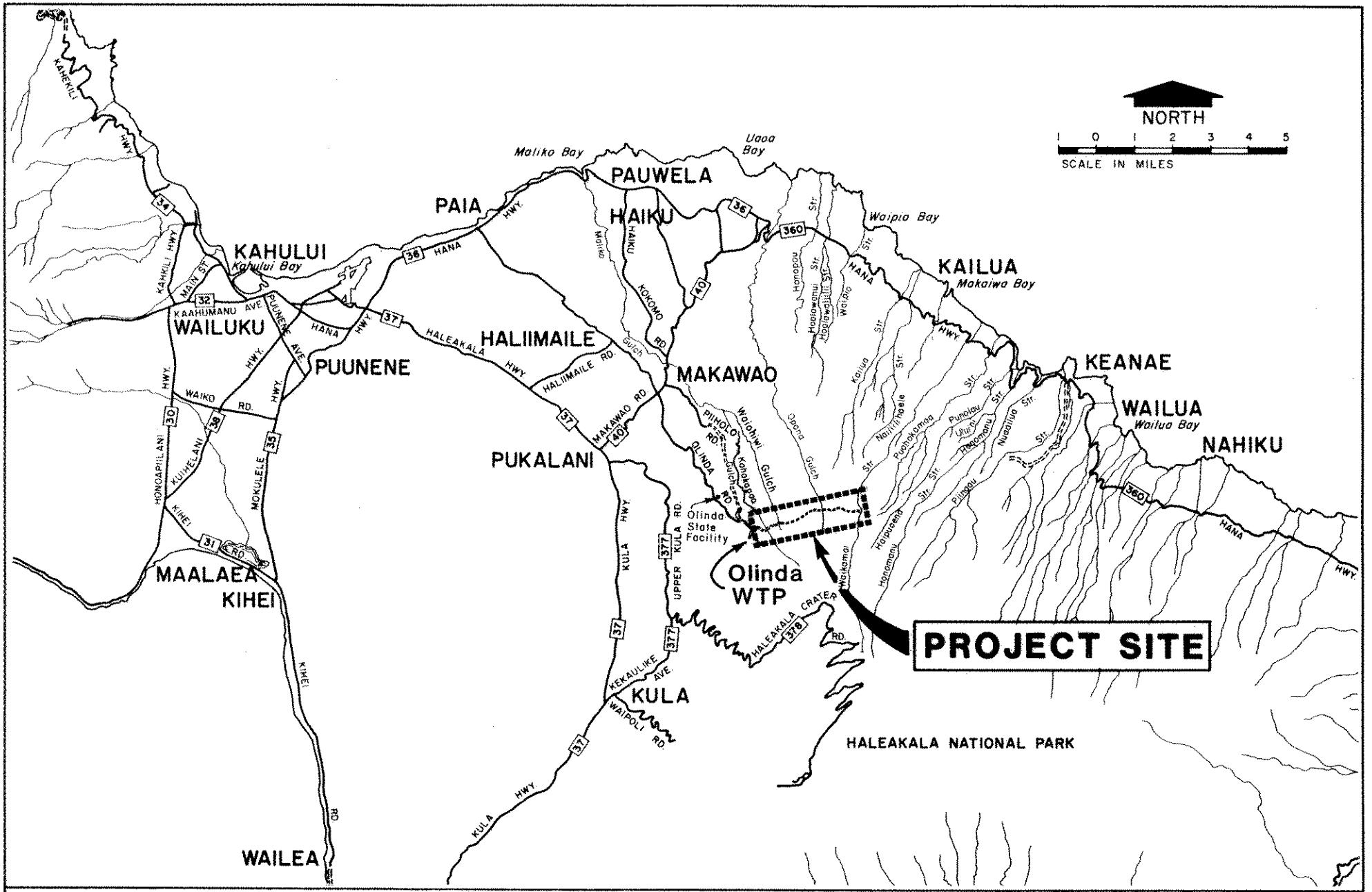
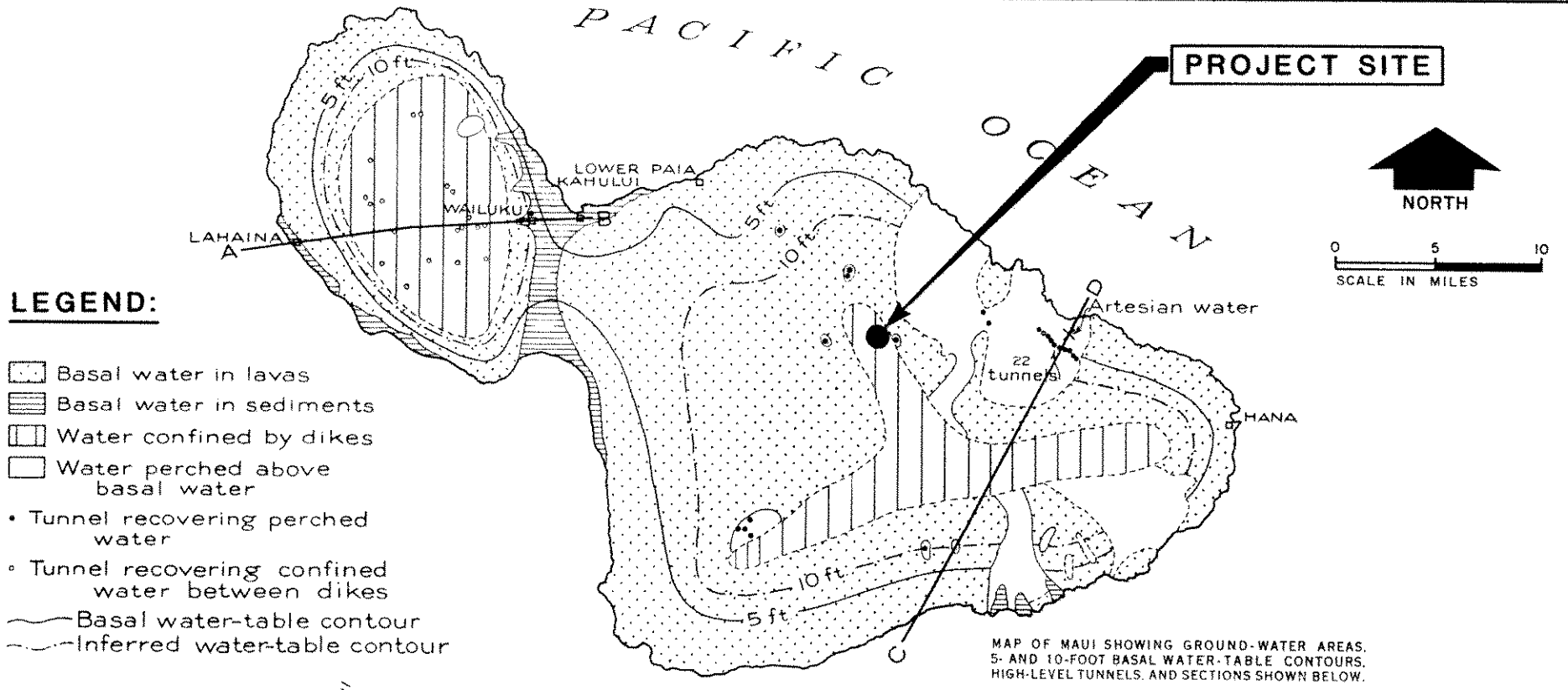


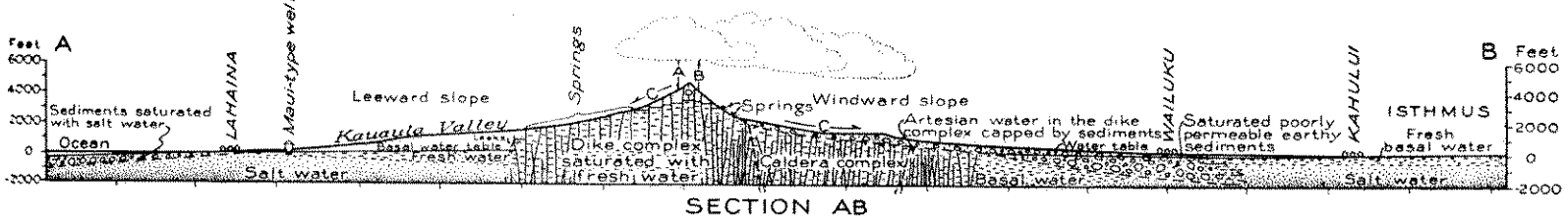
FIGURE II-5

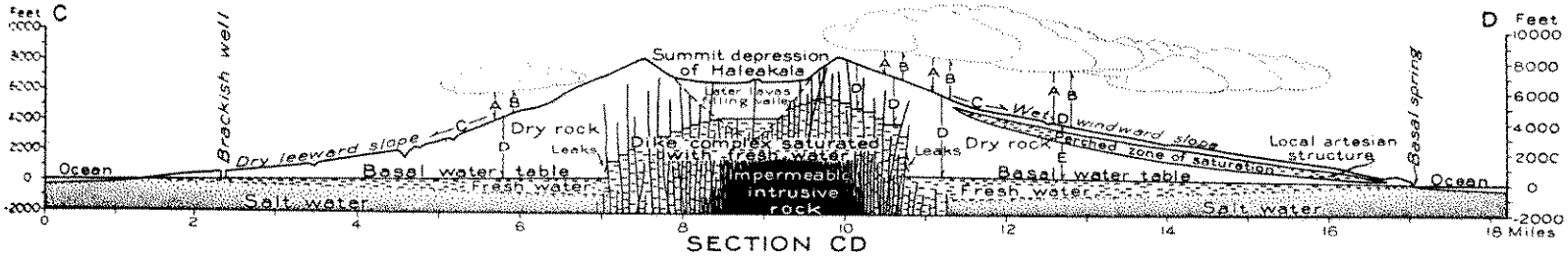
II-11

SURFACE WATER RESOURCES



MAP OF MAUI SHOWING GROUND-WATER AREAS, 5- AND 10-FOOT BASAL WATER-TABLE CONTOURS, HIGH-LEVEL TUNNELS, AND SECTIONS SHOWN BELOW.





SIMPLIFIED SECTIONS OF WEST MAUI (AB) AND EAST MAUI (CD) SHOWING THE SOURCE AND DISPOSAL OF RAINFALL. A, Rainfall; B, fly-off or evaporation and transpiration; C, run-off; D, run-in or recharge to zone of saturation; E, percolation from perched zone of saturation to basal water table. Shows the various high- and low-level springs and the bodies of rock saturated with ground water.

GROUND WATER CONDITIONS

FIGURE II-6

II-12

5. Climate

a. Rainfall

Rainfall varies significantly along the project site. Average annual rainfall near the Olinda Water Treatment Plant is about 70 inches per year. Rainfall increases to approximately 250 inches per year as one moves east along the project site to the Waikamoi Reservoirs. (See Figures II-7 and II-8.) Even higher rates, over 300 inches per year, are estimated in the watershed area feeding the Haipuena Stream and flume.

b. Temperature

Average temperatures in the area range between 50 and 70 degrees F. The relatively low temperature range can be attributed to the project area being situated at relatively high elevation (4200-4400 ft. MSL) on the windward side of the island.

c. Wind

The prevailing wind throughout the year in Hawaii is the northeasterly trade wind. Trade winds are more prevalent during the summer occurring nearly 90 percent of the time, while during the winter trade winds can be expected about 50 percent of the time. Wind gages and recorders at Kahului Airport indicate winds from the north to east northeast to be the prevailing wind accounting for nearly 70 percent frequency.

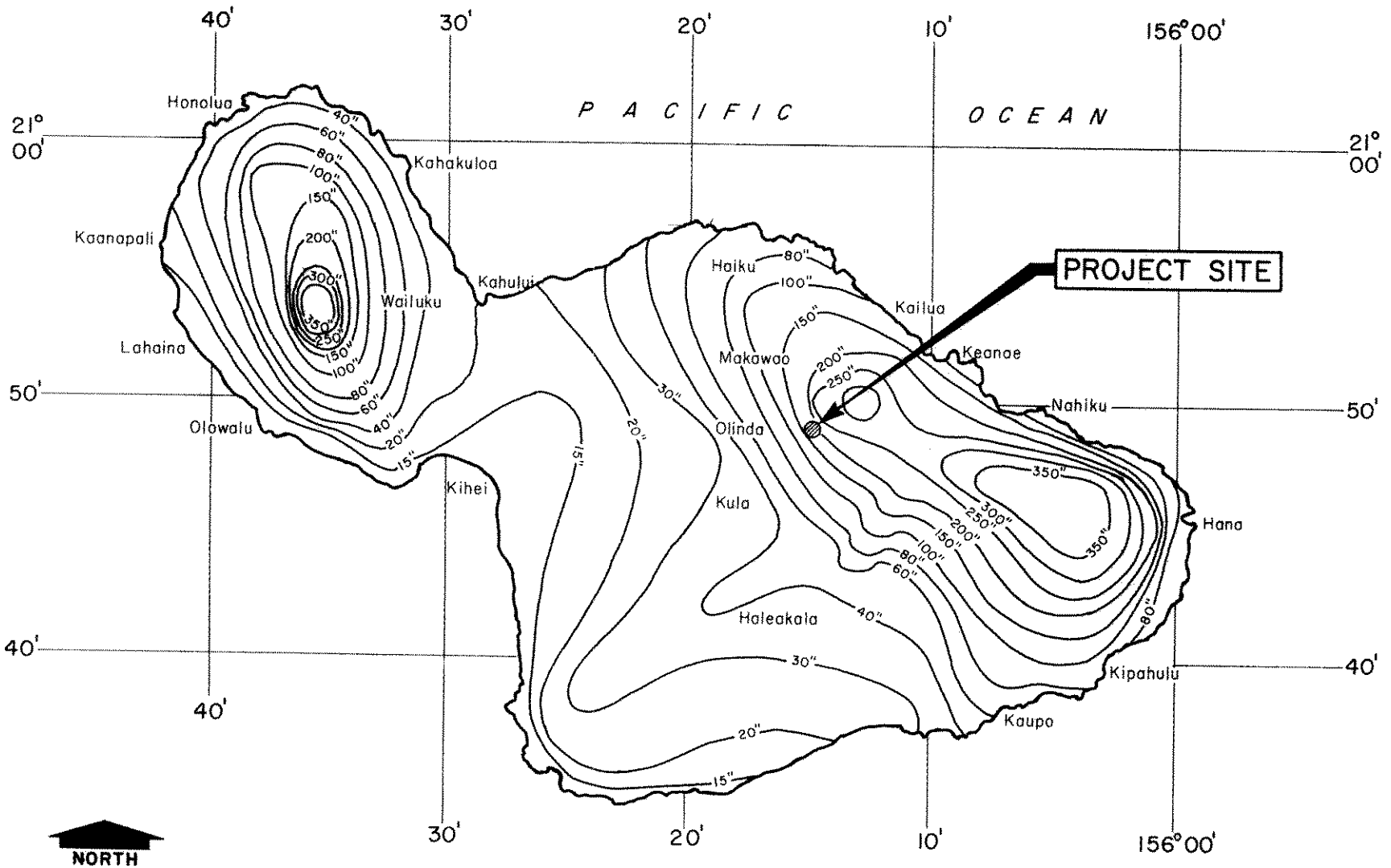
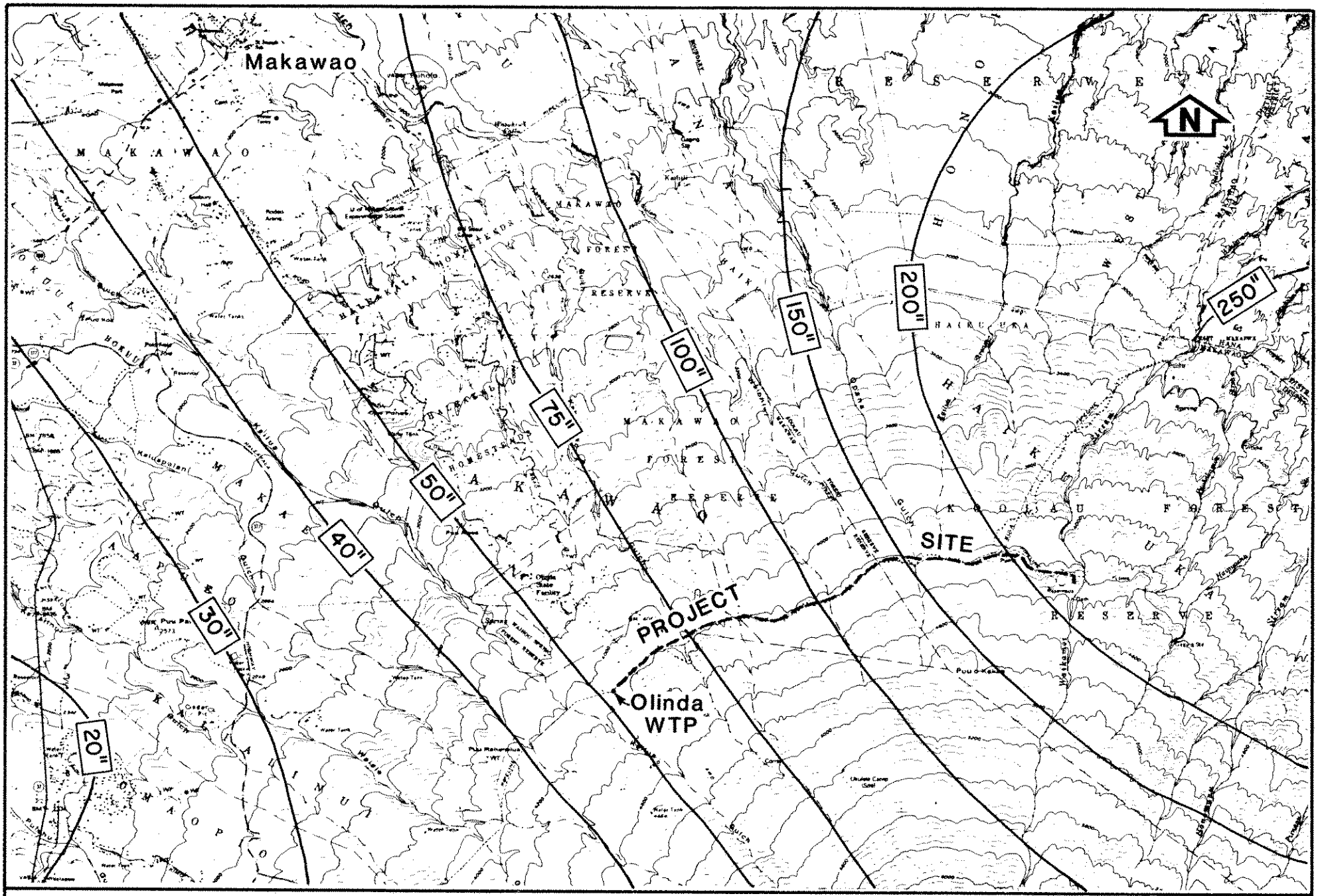


FIGURE II-7

AVERAGE ANNUAL RAINFALL - ISLAND OF MAUI



AVERAGE ANNUAL RAINFALL ALONG PROJECT SITE

FIGURE II-8

6. Flood/Tsunami Hazard

The project site is situated in areas of minimal flood and tsunami hazard based on information presented in the Flood Insurance Rate Maps of the island of Maui, prepared by the Federal Insurance Administration.

7. Seismic Risk

The island of Maui is in Seismic Zone 2, as established by the Uniform Building Code, indicating moderate damage risk from earthquake, corresponding to intensity VII of the Modified Mercalli Intensity Scale of 1931. Range of seismic risk varies from Zone 0, indicating no damage, to Zone 4, indicating major damage.

B. Biological Characteristics

1. Flora

Approximately 70 percent of the project site is situated in State Forest Reserve areas. These areas have been identified as native Koa (Acacia koa) and ohia (Metrosideros collina) forests. A detailed survey of plants along the proposed alignment was conducted by the Division of Forestry and Wildlife (DLNR-DOFAW). Results of the survey are included in Appendix A. About 145 species of plants were identified, including both native and introduced varieties. No threatened or endangered species were found along the project site. The existing pipeline corridor presently supports many exotic plant species which have probably been introduced into the area as a result of previous construction and maintenance work done on the existing line.

2. Fauna

a. Terrestrial

A detailed survey of terrestrial fauna was conducted by DLNR-DOFAW to identify bird and mammal species found along the project site. Results of the survey are included in Appendix A. The survey list is supplemented with species which have been seen in the past by DLNR-DOFAW personnel.

No threatened or endangered mammal species are known to inhabit the project areas. All mammal species identified are introduced species.

The forest reserve areas surrounding the project site has been identified as the habitat for three endangered species of native Hawaiian forest birds. The three species which have been sited in the forest reserve areas surrounding the project site include the Maui Parrotbill (Pseudonestor xanthophyrs), the Maui Akepa (Loxops coccineus ochraceus), and the Crested Honeycreeper (Palmeria dolei). Based on the terrestrial fauna survey, the Crested Honeycreeper, the Maui Parrotbill and the Hawaiian Goose, or Nene (Nesochen sandvicensis) which is on State and Federal Threatened and Endangered Species List, have been seen in the past along the pipeline corridor. However, sightings of these birds along the project site and existing jeep trail are rare.

The Hawaii Endangered Species Propagation (ESP) Facility has been established by the State DLNR-DOFAW at the Olinda State Facility site. The

ESP Facility is currently involved in breeding the endangered Hawaiian Crow, or Alala (Corvus tropicus) in captivity. Future expansion of the facility is in progress, ultimately to include other endangered species in their propagation programs. The ESP Facility is situated along the upper reaches of Olinda Road which is the primary access to the project site. (See Figure II-11.)

b. Aquatic

Previous aquatic biological surveys performed in the project area have not identified any endangered species of stream fauna. Fishlife in surrounding streams at that high elevation (+4000 ft MSL) has been limited or non-existent. The endemic shrimp, opae kalaole (Atya bisulcata) have been identified in perennial streams adjacent to and downslope of the project site.

A detailed survey of the aquatic macrofauna inhabiting streams along the project site was conducted by the Division of Aquatic Resources (DAR-DLNR). All of the streams along the project site are intermittent and are diverted further in downstream areas. No threatened or endangered species of aquatic life were found. No native gobies (o'opu), shrimp (opae kalaole), neritid snail (hihiwai) or any other "major" aquatic fauna were found in any of the streams. The only aquatic fauna observed were a few damselfy nymphs and other aquatic insects, indicating that the aquatic ecosystems are very pauperate. Results of the stream survey are included in Appendix B.

C. Archaeological Features

No known or recorded archaeological sites are believed to be endangered by the proposed project. Any site or artifacts which may have been present were probably destroyed or disturbed during the intial construction of the existing Upper Kula Water System and access roads. The proposed pipeline will generally follow the alignment of the existing 12-inch and 16-inch pipeline and/or the existing jeep trail.

A detailed archaeological surface survey along the proposed project alignment was conducted by the Historic Sites Section of the Division of State Parks, Historic Sites and Outdoor Recreation (DLNR). No evidence of historic sites was found. In general, historic sites in this type of environment are scarce and localized. The forest reserve would have provided a good resource base for bird feather, koa and other useful plants. If any evidence of the exploitation of these resources exists, it is more likely to be buried. The results of the archaeological survey are included in Appendix C. The proposed project will have "no effect" on significant historic sites.

D. Socio-economic Characteristics

1. Population

The Makawao District of the County of Maui has experienced substantial growth since 1970. Resident population in 1970 was 9,979. The population increased by 90.4 percent to 19,005 in 1980, and another 16.4 percent to 22,129 in 1985, making it one of the fastest growing districts in the State of Hawaii. See Figure II-9 for the Makawao District boundaries and Table II-1 for the district's growth relative to other areas in the State.

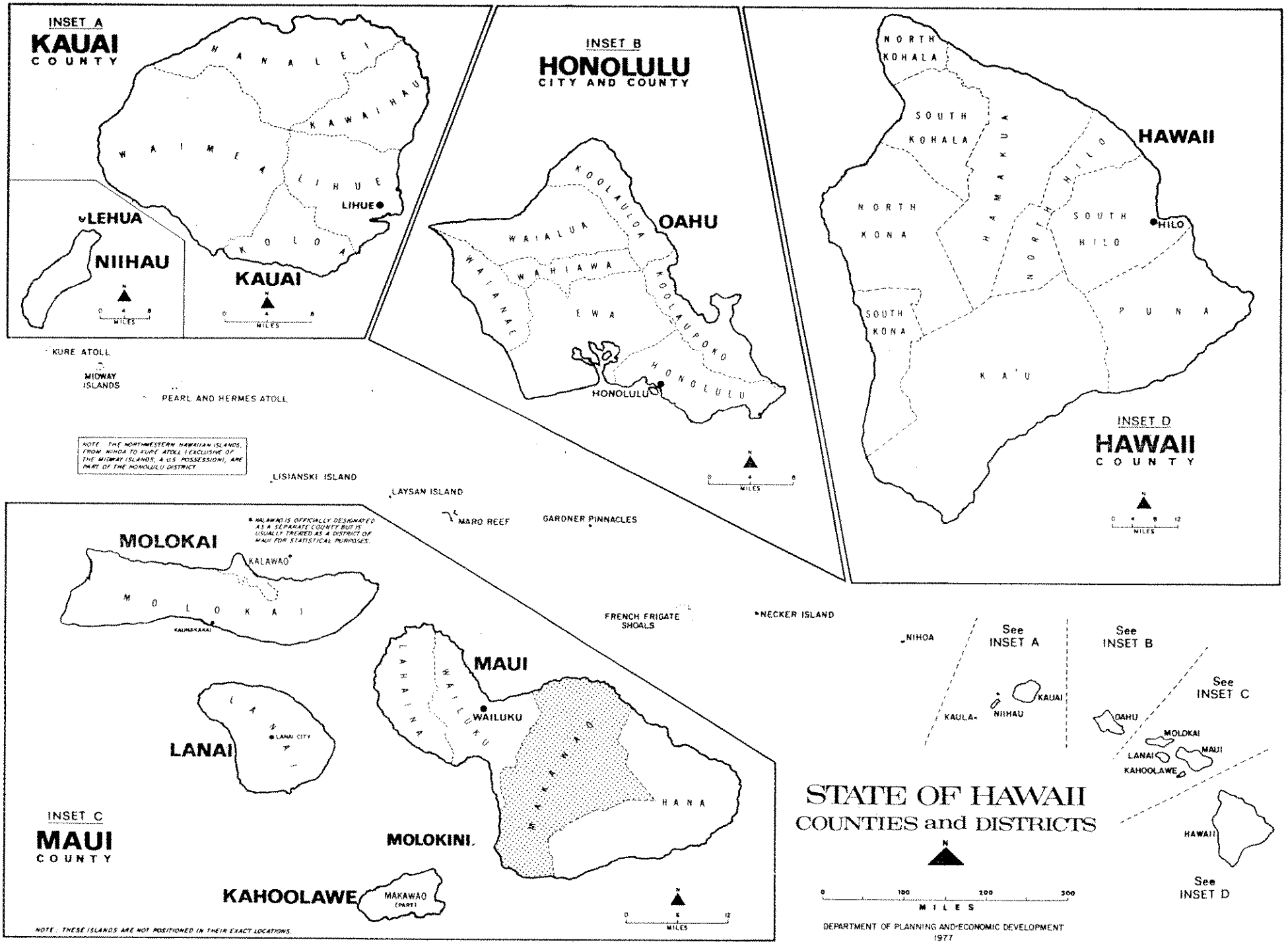

INSET A
KAUAI
COUNTY
HANALEI
WAIMEA
KAWAIHAU
LIHUE
KOLOA
LIHUE
LEHUA
NIIHAU
KAUAI
INSET B
HONOLULU
CITY AND COUNTY
KOOLAULOA
WAIALUA
WAHIAWA
WAIANAE
EWA
KOOLAUPOKO
HONOLULU
OAHU
INSET D
HAWAII
COUNTY
NORTH KOHALA
SOUTH KOHALA
HAMAKUA
NORTH HILO
SOUTH HILO
HILO
NORTH KONA
SOUTH KONA
KA'U
PUNA
HAWAII
KURE ATOLL
MIDWAY ISLANDS
PEARL AND HERMES ATOLL
NOTE: THE NORTHWESTERN HAWAIIAN ISLANDS, FROM NIHOA TO KURE ATOLL (EXCLUSIVE OF THE MIDWAY ISLANDS, A U.S. POSSESSION), ARE PART OF THE HONOLULU DISTRICT.
LISIANSKI ISLAND
LAYSAN ISLAND
MARO REEF
GARDNER PINNACLES
FRENCH FRIGATE SHOALS
NECKER ISLAND
NIHOA
INSET C
MAUI
COUNTY
MOLOKAI
KALAWAO
KAUNAKAKAI
* KALAWAO IS OFFICIALLY DESIGNATED AS A SEPARATE COUNTY BUT IS USUALLY TREATED AS A DISTRICT OF MAUI FOR STATISTICAL PURPOSES.
LANAI
LANAI CITY
MAUI
WAILUKU
HANA
MOLOKINI
KAHOOLAWE
MAKAWAO (PART)
NOTE: THESE ISLANDS ARE NOT POSITIONED IN THEIR EXACT LOCATIONS.
See INSET A
See INSET B
See INSET C
See INSET D
KAULA
NIIHAU
KAUAI
OAHU
MOLOKAI
LANAI
MAUI
KAHOOLAWE
HAWAII
STATE OF HAWAII
COUNTIES and DISTRICTS
MILES
DEPARTMENT OF PLANNING AND ECONOMIC DEVELOPMENT
1977

FIGURE II-9

TABLE II-1 - RESIDENT POPULATION OF COUNTIES AND DISTRICTS 1970, 1980, AND 1985

COUNTY AND DISTRICT	APRIL 1 1970	APRIL1 1980	JULY 1 1985	PERCENT CHANGE 1970 TO 1980	PERCENT CHANGE 1980 TO 1985
STATE TOTAL	769,913	964,691	1,053,884	25.3	9.2
HAWAII COUNTY	63,468	92,053	109,159	45.0	18.6
PUNA	5,154	11,751	17,522	128.0	49.1
SOUTH HILO	33,915	42,278	44,621	24.7	5.5
NORTH HILO	1,881	1,679	1,525	-10.7	-9.2
HAMAKUA	4,648	5,128	5,288	10.3	3.1
NORTH KOHALA	3,326	3,249	3,451	-2.3	6.2
SOUTH KOHALA	2,310	4,607	6,310	99.4	37.0
NORTH KONA	4,832	13,748	18,962	184.5	37.9
SOUTH KONA	4,004	5,914	6,937	47.7	17.3
KA'U	3,398	3,699	4,543	8.9	22.8
MAUI COUNTY	46,156	70,991	85,303	53.8	20.2
HANA	969	1,423	1,654	46.9	16.2
MAKAWAO	9,979	19,005	22,129	90.4	16.4
WAILUKU	22,219	32,111	39,270	44.5	22.3
LAHAINA	5,524	10,284	13,577	86.2	32.0
LANAI	2,204	2,119	2,178	-3.9	2.8
MOLOKAI	5,089	5,905	6,354	16.0	7.6
KALAWAO	172	144	141	-16.3	-2.1
C & C OF HONOLULU	630,528	762,565	814,642	20.9	6.8
HONOLULU	324,871	365,048	381,676	12.4	4.6
KOOLAUPOKO	92,219	109,373	114,600	18.6	4.8
KOOLAULOA	10,562	14,195	16,367	34.9	15.3
WAIALUA	9,171	9,849	10,922	7.4	10.9
WAHIAWA	37,329	41,562	43,099	11.3	3.7
WAIANAE	24,077	31,487	34,029	30.8	8.1
EWA	132,299	191,051	213,949	44.4	12.0
KAUAI COUNTY	29,761	39,082	44,781	31.3	14.6
HANALEI	1,182	2,668	4,327	125.7	62.2
KAWAIHAU	7,393	10,497	12,104	42.0	15.3
LIHUE	6,766	8,590	9,219	27.0	7.3
KOLOA	6,851	8,734	10,520	27.5	20.4
WAIMEA	7,569	8,593	8,611	13.5	0.2

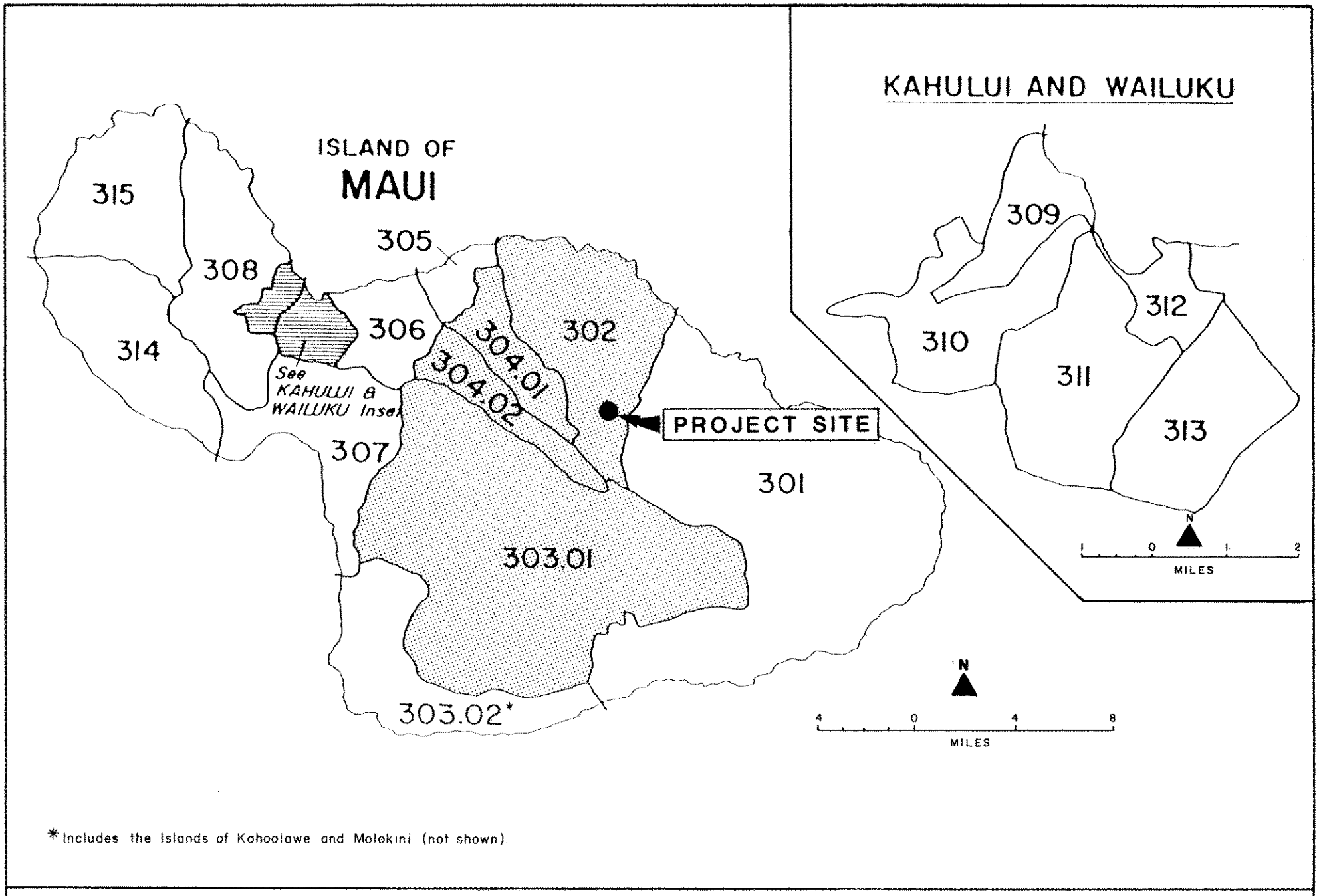
SOURCE: U.S. BUREAU OF THE CENSUS, 1980 CENSUS POPULATION, NUMBER OF INHABITANTS, HAWAII, PC80-1-A13 (OCTOBER 1981), TABLE 4; HAWAII STATE DEPARTMENT OF PLANNING AND ECONOMIC DEVELOPMENT, UNPUBLISHED 1985 ESTIMATES.

The Census Tracts in the vicinity of the project site, including existing and future service areas are shown in Figure II-10, designated as Tracts 302, 303.01, 304.01 and 304.02. These areas had a cumulative resident population of 8,214 in 1970, increasing to 16,068 in 1980 (an increase of 95.6 percent).

Population projections by the State Department of Planning and Economic Development anticipates a population increase of 42 percent for Maui County from 1980 to 1990. However, population growth in the project area may be more significantly governed by the County's Makawao-Pukalani-Kula Community Plan which directs land use and growth in the Upcountry Maui region. The Community Plan uses a projected resident population of 17,000 to 20,000 over the next 20 years.

2. Regional Economy

Agriculture is the dominant economic activity in the Upcountry area. Primary crops include head cabbage, head lettuce, and round onions. Production of ornamental flowers, including carnations and protea, is also a major activity. The majority of crop and flowers farms are small operations, typically 5 to 10 acres in size. The Kula area is a major truck crop and flower producing area in the State of Hawaii. Cattle ranching is also prevalent in the Upcountry region, primarily in the Ulupalakua area.



* Includes the Islands of Kahoolawe and Molokini (not shown).

1980 CENSUS TRACTS - ISLAND OF MAUI

FIGURE II-10

TT-22

E. Project Area Infrastructure

1. Electrical Power and Telephone

Electrical power and telephone service is available at the west end of the project site at the Olinda Water Treatment Plant. An overhead electrical power line also feeds the existing booster pumphouse located midway along the project site.

2. Potable Water

The proposed pipeline will serve as the raw water supply to the Olinda Treatment Plant. The project site is situated upstream of the Upper Kula Water Distribution System and is therefore not serviced with treated potable water.

3. Wastewater Collection and Disposal

There are no sewage collection or disposal facilities serving the project site. The agricultural and residential areas in the vicinity of the project site, including Makawao town use cesspools for domestic wastewater disposal. Portions of Pukalani are served by County-owned sewers. Sewage is treated at a privately-owned sewage treatment plant.

4. Solid Waste Disposal

Solid wastes generated from the project will be disposed at the County-operated Central Maui Landfill located at Puunene. A solid watse disposal facility is located at Makawao, however its use is restricted to non-commercial users only.

F. Public Service Facilities

1. Police Protection

The project area is situated in secured private lands or State controlled Forest Reserve areas. Surrounding areas are patrolled by forces of the County Police Department. The nearest police station is the Wailuku Station, the headquarters office of the Police Department.

2. Fire Protection

The nearest County fire station is the Makawao Fire Station located in Makawao town, approximately 5 miles from the project site.

3. Emergency Medical Services

Emergency medical services are coordinated through Maui Memorial Hospital located in Wailuku. A paramedic unit is stationed at the Makawao Fire Station and is in constant communication with the Hospital.

4. Schools

Educational institutions in the vicinity of the project site include Makawao School, Haiku School, Pukalani Elementary School, Kula Elementary School, Kalama Intermediate School, St. Joseph School and Seabury Hall.

5. Public Access

Primary access routes to the project site from the Kahului-Wailuku area include the Hana Highway, Haleakala Highway, Makawao Avenue, Olinda Road, and Piiholo Road. (See Figure II-11.) Access roads leading to and within the project site are secured private roadways with several locked gates to control public vehicular access.

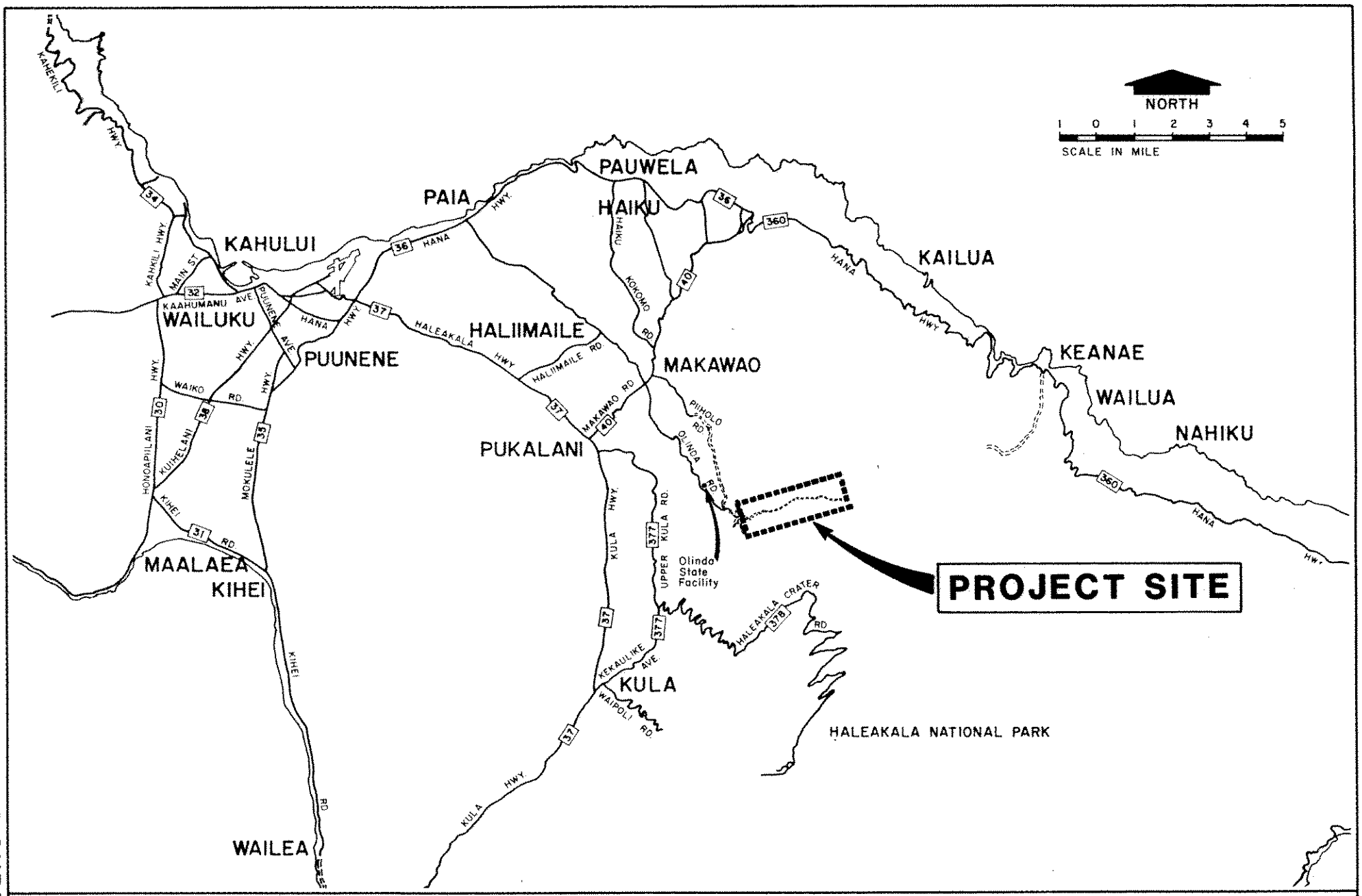
G. Land Use Plans, Policies, and Controls

1. Land Ownership

The project site passes through lands owned by various private owners and the State of Hawaii. The various land owners and land parcels are listed in Table II-2. The locations of the various parcels in relation to the project site are shown in Figure II-12.

2. State Land Use Designation

Most of the proposed improvements are situated in land designated for Conservation use by the State Land Use Commission. (See Figure II-13.) The project site passes through the Makawao and Koolau Forest Reserves. The Makawao Forest Reserve and the western portion of the Koolau Forest Reserve is designated as a Resource Subzone by DLNR. The eastern portion of the Koolau Forest Reserve is designated as a Protective Subzone. The Conservation District Subzones are shown in Figure II-14. The western reaches of the project site, from the Makawao Forest Reserve to the Olinda Water Treatment Plant are in lands designated for Agricultural use.

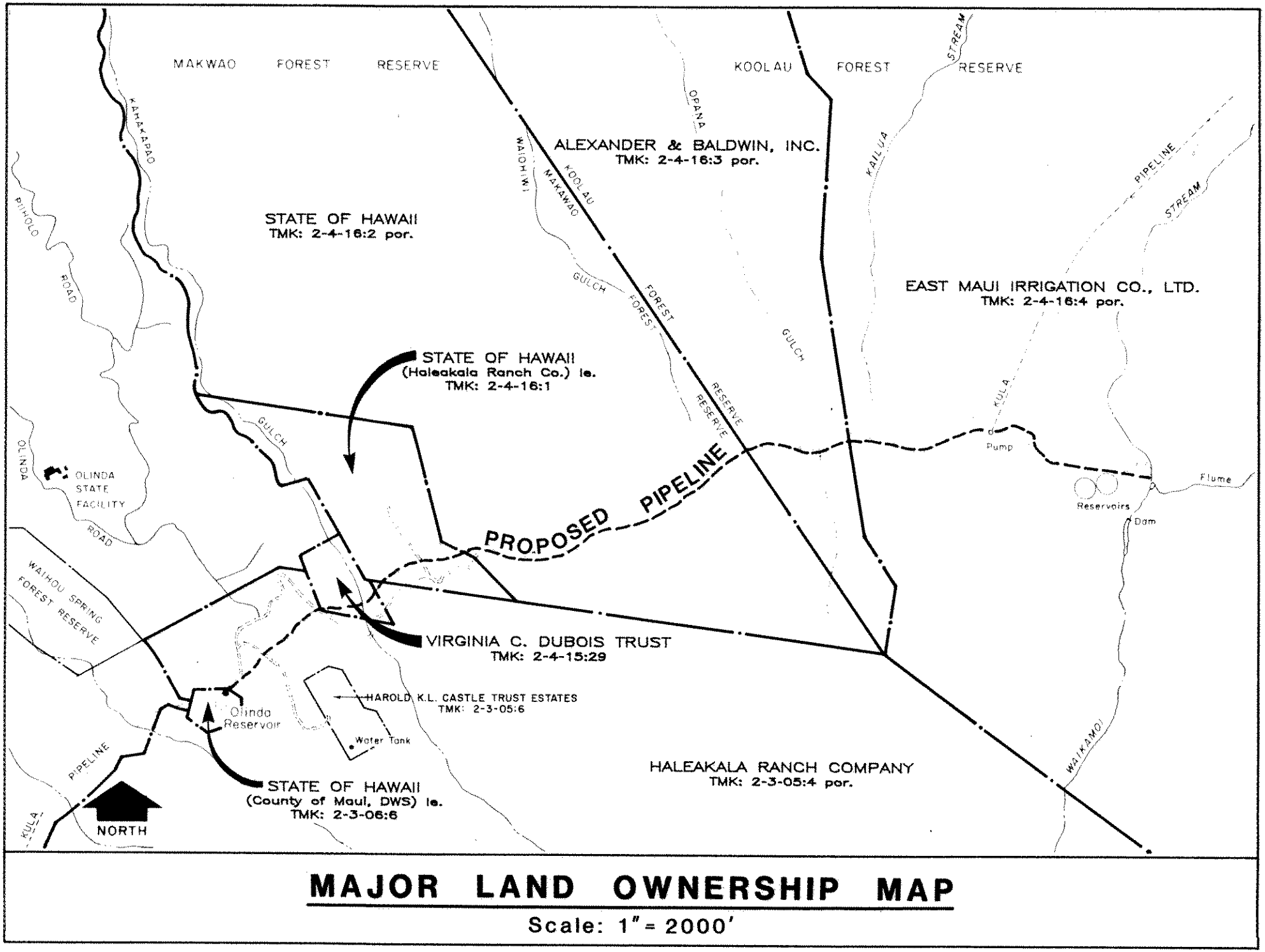


ACCESS TO PROJECT SITE

FIGURE II-11

TABLE II-2 - PROJECT AREA LAND OWNERSHIP

TAX MAP KEY PARCEL NO.	OWNER
2-3-5:4	Haleakala Ranch Co.
2-3-6:6	State of Hawaii, leased to DWS, County of Maui
2-4-15:29	Virginia C. DuBois Trust
2-4-16:1	State of Hawaii, R.P. Haleakala Ranch Co.
2-4-16:2	State of Hawaii, easement to DWS, County of Maui
2-4-16:3	Alexander & Baldwin, Inc.
2-4-16:4	East Maui Irrigation Co., Ltd.



MAJOR LAND OWNERSHIP MAP

Scale: 1" = 2000'

FIGURE II-12

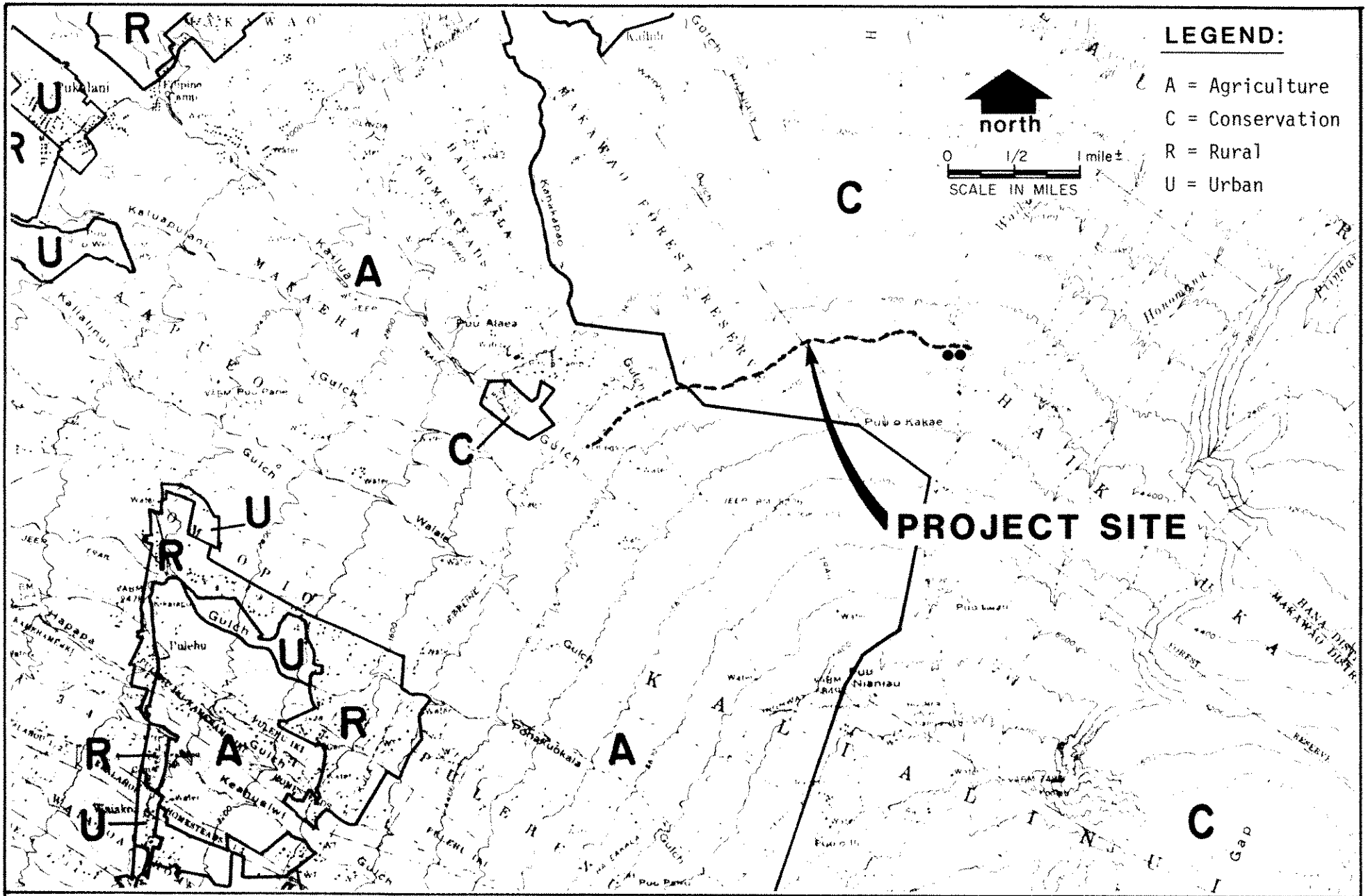
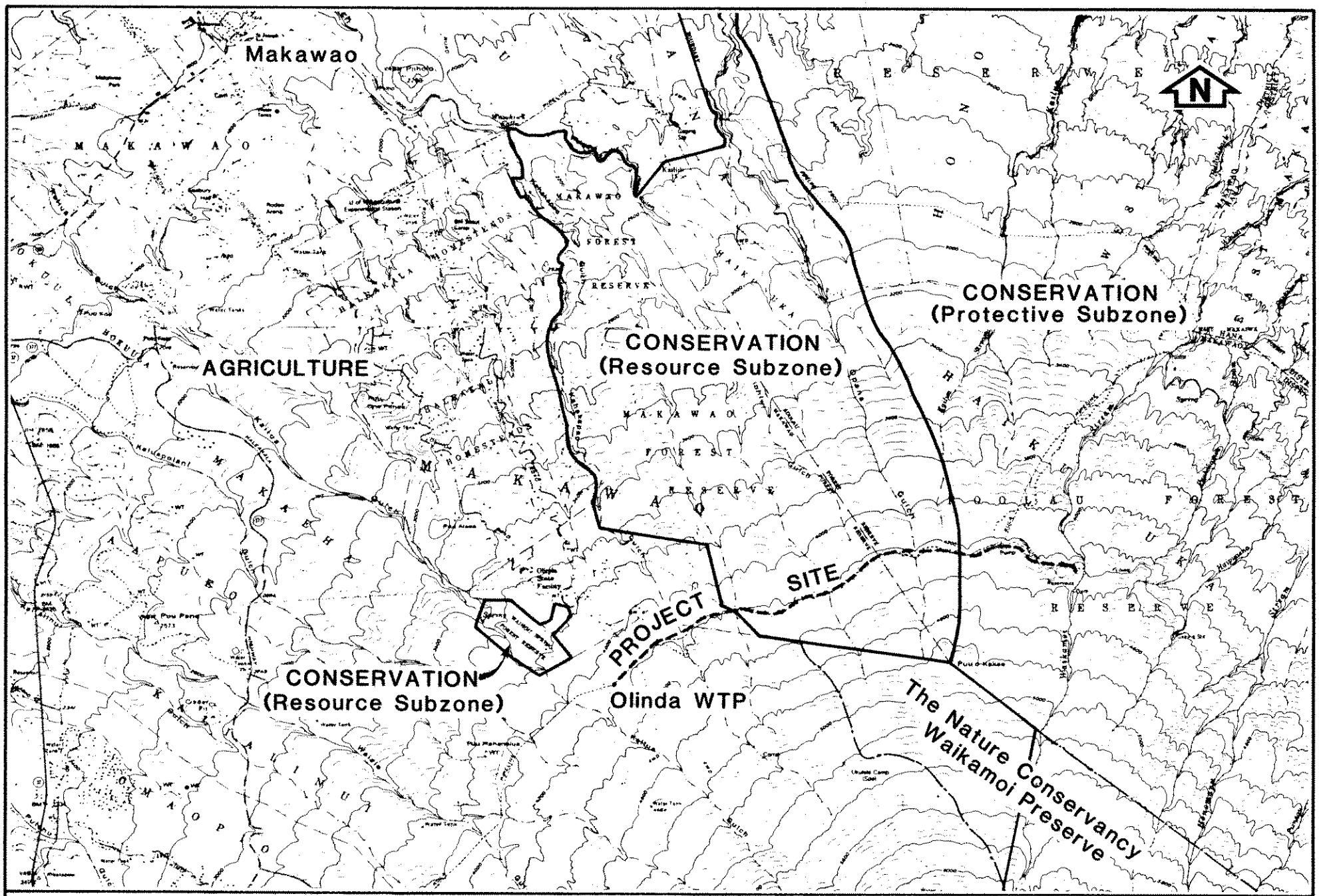


FIGURE II-13

STATE LAND USE CLASSIFICATION



CONSERVATION DISTRICT SUBZONES

3. Makawao-Pukalani-Kula General Plan

The Makawao-Pukalani-Kula Community Plan, adopted in October 1981, is the primary decision making tool used by the County for implementing the County General Plan within the Upcountry region of Maui. The Community Plan establishes land use and population growth policies within the area. The Makawao-Pukalani-Kula Planning Region is shown in Figure II-15.

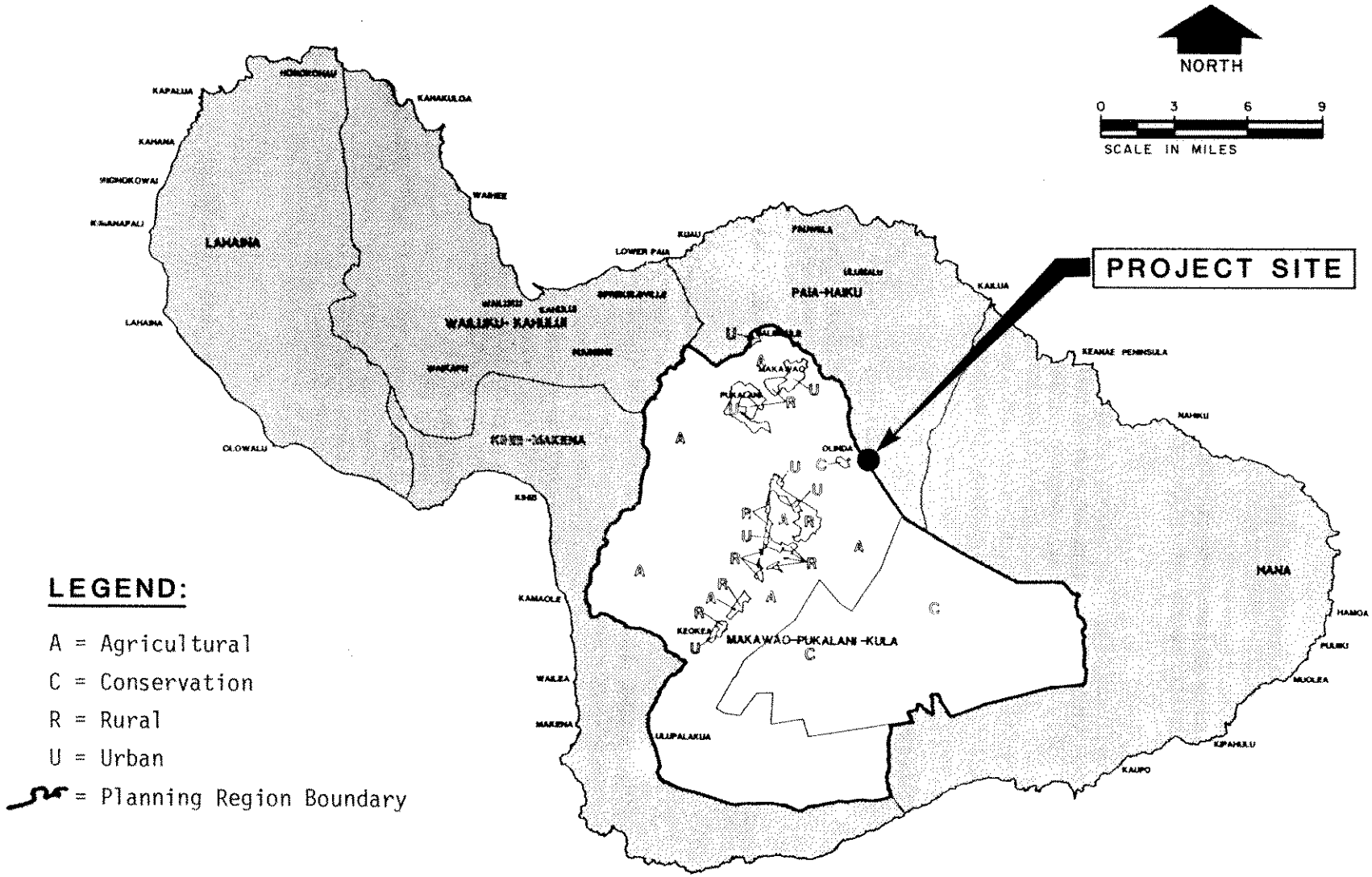
Several basic principles were used in the development of the Community Plan. The principles were based on Maui County's General Plan Objectives and Policies, and the desires of the community as expressed through a Citizens Advisory Committee. The basic principles were:

"1. Preservation of the "Up-Country" way of life.

Underlying this principle is the desire to maintain the open space and rural character of the "up-country" communities. This implies maintaining the country atmosphere, preservation of ranching and agriculture and accomodation of residential growth consistent with the form and character of the various "up-country" communities.

2. Protection of the agricultural land base.

Ranching and crop production are important economic activities for the "up-country" communities and the County as a whole. Protection of this land base from conversion to other uses is critical to preserving the "up-country" atmosphere and way of life.



MAKAWAO-PUKALANI-KULA PLANNING REGION

FIGURE II-15

3. Guide the majority of future growth in an efficient and economical manner.

The majority of future residential growth should occur as contiguous expansion and infill in Pukalani and Makawao. The necessary supporting infrastructure can more readily and economically accomodate future expansion, as opposed to a more dispersed pattern.

4. Protection of Environmental Quality.

The protection of open space, improvements to water supply and quality, and respect for land resources are critical concerns to be addressed by the Community Plan."

One of the major concerns identified in the Community Plan is the Upcountry water supply and quality. A major goal of the plan is to insure the adequate supply and quality of water to meet the demands of both agricultural and domestic uses. Specific recommendations stated in the Community Plan regarding Water Distribution are as follows:

"Insure the adequate supply and quality of water. The combined demands of agriculture and domestic users served by one system is inefficient. Separating these systems will be more cost-effective by reducing treatment and pumping costs. The following improvements should therefore be implemented:

a. Establish separate domestic and irrigation water systems.

b. Treatment of domestic supply.

c. Develop catchment reservoirs at higher elevations to serve agricultural lands.

d. Increase the pumping capacity from Wailoa Ditch to upper areas to supplement the surface water supply.

e. Establish a program to systematically improve older, deteriorating distribution lines.

f. Regulate the sequence of future growth in upcountry communities to the expansion of water supply and distribution systems."

The proposed project addresses initial needs of the Upper Kula Water System by replacing the existing old, deteriorating transmission line from system's primary source of water. Establishing a reliable supply line is vital to the successful operation of the water system.

4. Water Resources Study for Upcountry Maui

The Steering Committee for the Water Resources Study for Upcountry Maui (WRSUM) was formed in 1985 as a result of a request by the Mayor of the County of Maui to assess the water situation in Upcountry Maui. The Committee is composed of representatives from various public and private organizations, including County, State and Federal government agencies, large plantations, and smaller agricultural operations. The objective of the WRSUM was to provide adequate and sufficient water to meet the needs in the Upcountry Maui area. A major concern of the WRSUM committee was to confine urbanization except family subdivisions, that would not be compatible with the agricultural

pursuits within this area. Agricultural pursuits include ranching, truck, and other diversified crop activities, as well as sugar, pineapple, and dairy pursuits. Top priority in this study is supplying water to the Department of Hawaiian Home Lands project in Keokea.

The proposed project addresses the immediate needs of the Upcountry Water System by establishing a more reliable source collection and transmission system. Future improvements including additional storage and distribution facilities are currently being studied by various agencies including the Maui Department of Water Supply, the State Department of Land and Natural Resources Division of Water and Land Development, and the U.S. Soil Conservation Service.

5. Upcountry Water System Improvements Master Plan

The "Upcountry Water System Improvements Master Plan" has been developed by the County of Maui, Department of Water Supply. The master plan, completed in September 1987, includes recommendations for improvements to the Upcountry Maui water systems to meet both domestic and agricultural water needs consistent with the Upcountry (Makawao-Pukalani-Kula) Community Plan. The recommended improvements also include considerations for a pipeline serving the Hawaiian Home Lands located at Keokea.

Specific recommendations for improvements to the Upper Kula Water System include:

a. The installation of a 36-inch pipeline from Waikamoi to Olinda to replace the existing 12-inch and 16-inch line which is old and deteriorating.

b. Repair intakes and collection line at Waikamoi as well as intakes west of Waikamoi.
c. Construct additional storage facilities.
d. Expansion of the Olinda Water Treatment Plant capacity from 1.7 MGD to 2.5 MGD.
e. Expansion of the distribution and pumping systems within the Upper Kula System.

The proposed project addresses the immediate needs of the Upper Kula Water system by establishing a more reliable source collection and transmission system. Future improvements are currently being studied by various agencies including the Maui Department of Water Supply, the State Department of Land and Natural Resources Division of Water and Land Development, and the U.S. Soil Conservation Service.

5. Interim Instream Flow Standards

Administrative Rules for the State Water Code are currently being processed by the State. When the State Water Code rules and regulations are in effect, interim instream flow standards will be established for streams of East Maui, as well as all other islands. The proposed project does not involve a change in the amount of water diverted from the streams.

III. ANTICIPATED ENVIRONMENTAL IMPACTS AND MITIGATIVE MEASURES

A. Short Term Impacts and Mitigative Measures

Short term impacts are those which are related and limited to the activities and duration of the construction period. Construction of the project is expected to take one and a half years (540 days).

1. Noise

Increased noise levels will be experienced during construction of the proposed improvements. Noise will be generated by heavy equipment required to haul materials to and within the project site, as well as equipment used for excavation and installation of the pipeline and appurtenances.

The contractor will be required to comply with the State Department of Health's regulations for vehicular noise control. The contractor will be responsible for properly maintaining construction equipment to minimize noise levels. Equipment mufflers or other noise attenuating equipment may be necessary if noise levels are determined to be excessive. Construction activities will be limited to daylight hours only.

2. Air Quality

Ambient air quality will temporarily decrease as a result of construction activities. The contractor will be responsible for minimizing dust generated during construction, particularly during earth-moving operations including trenching, excavating and road clearing, as prescribed in the State Department of Health Public Health Regulations, Chapter 60 on Air Pollution Control. The contractor will be required to

implement precautions to prevent particulate matter from becoming airborne, such as water sprinkling.

Emissions from construction equipment and other motor vehicles involved in construction activities may adversely affect ambient air quality. The contractor shall minimize these impacts by properly maintaining construction equipment and vehicles.

3. Water Quality

Some soil runoff into existing water courses can be expected from areas requiring excavation and vegetation removal. Soil runoff can be minimized through strict adherence to erosion control procedures and minimal disturbance of ground surfaces and vegetative cover.

4. Traffic

During the construction period, increased traffic along existing roadways leading to the project site can be anticipated. Vehicles carrying materials, equipment and construction workers will increase traffic volumes. These impacts are unavoidable since alternate routes to the site are limited. The contractor will be responsible for providing traffic control measures and safety precautions to minimize adverse effects.

5. Waste Disposal

Solid waste generated by the construction activities shall be disposed of at the County-operated sanitary landfill at Puunene. Completely contained chemical toilets will be provided for construction workers, and the contractor shall dispose the waste in accordance with State and County regulations.

6. Biological Resources

Construction activities will undoubtably have some impact on the plant and animal life along the project site. Clearing of vegetation will be required to install the proposed pipeline and appurtenances. Vegetation removal should be kept to the extreme minimum to limit adverse effects, especially in the forest reserve areas. Removal of native plant life shall be minimized since infiltration of exotic species will most likely occur, displacing the native varieties. It should be noted that many exotic species of plant life have already been introduced into and now occupy the pipeline corridor as a result of previous construction and maintenance activities. The Maui Forest Manager shall be consulted for the selection of plant species required for any revegetating efforts.

Threatened and endangered native birds have occasionally been seen in the vicinity of the project site. These birds will probably avoid the area during the construction period, but should return upon completion of the project. Impacts on these birds shall be minimized by minimizing vegetation removal, construction noise, and vehicular emissions.

The Hawaii Endangered Species Propagation (ESP) Facility is located along the upper reaches of Olinda Road. Noise and emissions from construction vehicles passing the ESP Facility are of primary concern. The sensitive breeding period of the Hawaiian Crow (Alala) is between mid-February to July. As a mitigative measure to minimize disturbance of the Alala population at the Facility, the contractor shall be required to use an alternate access route (Piiholo Road) during the sensitive breeding period.

No significant adverse impacts are anticipated affecting aquatic life in and around the project site. The proposed pipeline alignment crosses several intermittent stream channels. Some work will be required in these channels. Erosion control measures shall be employed to minimize sediment discharge into the streams.

7. Archaeological Resources

No known archaeological sites are located along the project site. However, if evidence of any archaeological resource is discovered during construction, the State Historic Preservation Officer shall be notified and work in the area shall cease until the site has been studied and appropriate measures are implemented. Based on the archaeolocical survey performed for this project the existence of historic sites in this area is unlikely.

8. Economic

Proceeding with the proposed project will have short term impacts on the local economy. The project will provide job opportunities for local workers employed in the construction industry. The increased construction activities will also benefit local material suppliers and retail businesses.

9. Public Health and Safety

Appropriate measures to assure public health and safety will be one of the contractor's prime concerns and responsibility during all phases of construction. The construction site shall be secured during non-work hours as required by State and County regulations.

B. Long Term Impacts and Mitigative Measures

Long term impacts are those which will result from the implementation and operation of the proposed improvements.

1. Biological Resources

Upon completion of the proposed improvements, natural revegetation of disturbed areas will occur. It is likely that exotic varieties of plants will outgrow native species, thus resulting in a dominance of exotic plant life along the pipeline corridor. As stated earlier, many exotic species of plant life have already been introduced into and now occupy the existing pipeline corridor as a result of previous construction and maintenance activities. As a mitigative measure, vegetation removal should be kept to the extreme minimum to limit adverse effects, especially in the forest reserve areas. Removal of native plant life should be minimized since infiltration of exotic species will most likely occur, displacing the native varieties.

Restoration of the forested areas to its near-original condition should encourage the return of birds and other animals into the project area. Threatened and endangered native birds that have occasionally been seen in the vicinity of the project site, should return upon completion of the project. Impacts on these birds shall be minimized by minimizing vegetation removal.

No adverse long term impacts affecting aquatic life in and around the project site are anticipated since no additional diversion of streamflow will result from this project.

2. Economic Impacts

Long term economic impacts of the proposed project include increased productivity within the service area of the Upper Kula Water System. No new water sources will be developed as a result of this project, however, the reliability of the water system will be enhanced. Crop and livestock losses resulting from drought conditions should decrease. Future improvements to the system will hopefully provide even better water service to the project area.

Population growth and land use patterns in the area are controlled primarily by the County General Plan and the Makawao-Pukalani-Kula Community Plan. The proposed improvements are in concert with these planning documents.

IV. ALTERNATIVES TO THE PROPOSED ACTION

A. No Action Alternative

Acceptance of a "No Action" alternative would result in a continued exposure of Upcountry residents to water restrictions and subsequent loss of productivity. The existing cast iron pipeline from Waikamoi to the Olinda WTP is over 50 years old and is overdue for replacement. Replacement of the existing pipeline is of immediate concern as stated in the Maui Department of Water Supply (DWS) Master Plan.

B. Alternate Pipeline Alignment

The proposed pipeline alignment follows the existing pipeline as closely as practical (without disrupting the water service through the existing line) to minimize the need to encroach and disturb additional forest reserve lands. Implementation of alternate alignments from the raw water sources at Waikamoi would involve disturbance, i.e., vegetation removal, of native forest areas and result in more significant environmental impacts.

C. Alternate Source Development

The existing surface water sources available at Waikamoi are good sources of both agricultural and domestic water. To abandon these sources would be a waste of an excellent water resource. The development of an alternate source in lieu of continued use of the existing sources would be economically unsound. However, the investigation and development of alternate water sources to supplement the existing sources does warrant further consideration. Preliminary studies by the County DWS indicate a need for increased water supplies to meet future water demands, for both domestic and agricultural uses.

D. Pumping from Existing Sources at Lower Elevations

The pumping of water from lower reaches of the Upcountry Water System as well as from the East Maui Irrigation System is currently being done during emergency conditions. The employment of a permanent pumping system as the primary water supply to the Upper Kula System would result in significant operational and maintenance costs. The existing system which collects water at higher elevations and transmits it downstream by gravity is a more reliable and efficient means of providing source water to the Upper Kula System.

V. IRREVERSIBLE AND IRRETRIEVABLE COMMITMENT OF RESOURCES

The installation of the proposed pipeline will involve the irretrievable commitment of State and County funds, labor, materials, and fuel. Labor, materials and fuel will also be required for the operation and maintenance of the new pipeline.

VI. THE RELATIONSHIP BETWEEN LOCAL SHORT-TERM USES OF MAN'S ENVIRONMENT AND THE MAINTENANCE AND ENHANCEMENT OF LONG-TERM PRODUCTIVITY

The short-term effects of the proposed improvements on man's environment are expected to be minimal in comparison to the long-term benefits to be gained. The construction activities involved with this project will cause disruptions and nuisances in the vicinity of the project site. Implementation of prudent construction methods and careful monitoring of construction related activities should minimize adverse short-term impacts.

Long-term benefits resulting from the proposed project include a more reliable transmission line from the Upcountry water sources to the County's treatment/distribution facilities. Water service to both domestic and agricultural consumers would therefore be enhanced and should result in increased agricultural productivity. Future improvements to the Upcountry water system are currently being jointly planned by several agencies including the Maui Department of Water Supply, the State Department of Land and Natural Resources, and the U.S. Soil Conservation Service and when implemented will ultimately transform the entire system into one capable of providing reliable, efficient water service to the Upcountry Maui service area.

VII. LIST OF NECESSARY APPROVALS

FEDERAL GOVERNMENT

Department of the Army

- Department of the Army Nationwide Permit

STATE OF HAWAII

Department of Land and Natural Resources

- Conservation District Use Permit

COUNTY OF MAUI

Department of Water Supply

- Construction Plan Approval

VIII. REFERENCES

Aotani & Associates, Inc., Makawao-Pukalani-Kula Community Plan, prepared for the County of Maui, October 1981.

County of Maui, Department of Water Supply, Upcountry Water System Improvements Master Plan, 1987.

Environment Impact Study Corporation, Environmental Impact Statement for the Makawao and Kula Water Treatment Plants, for County of Maui, Department of Water Supply, March 1982.

State of Hawaii, Department of Land and Natural Resources, Division of Water and Land Development, An Assessment of the Kula Water Situation, December 1973.

State of Hawaii, Department of Planning and Economic Development, The State of Hawaii Data Book 1986, December 1986.

Stearns, H.T., Geology of the Hawaiian Islands, Bulletin 8, Department of Land and Natural Resources, State of Hawaii, 1974.

Stearns, H.T. and G.A. MacDonald, Geology and Ground-Water Resources of the Island of Maui, Hawaii, Bulletin 7, Division of Hydrography, Territory of Hawaii, in cooperation with the Geological Survey, U.S. Department of the Interior, 1942.

U.S. Department of Agriculture, Forest Service, Soil Conservation Service, Preauthorization Planning Report Upcountry Maui Watershed - Phase I (Draft), in cooperation with County of Maui, Central Maui Soil and Water Conservation District, Hana Soil and Water Conservation District, and Olinda-Kula Soil and Water Conservation District, November 1987.

U.S. Department of Agriculture, Soil Conservation Service, Soil Survey of Islands of Kauai, Oahu, Maui, Molokai, and Lanai, State of Hawaii, U.S. Government Printing Office, Washington, D.C., 1972.

U.S. Fish and Wildlife Service, Maui-Molokai Forest Birds.

University of Hawaii, Department of Geography, Atlas of Hawaii, University Press of Hawaii, Honolulu, Hawaii, 1973.

IX. ORGANIZATIONS AND PERSONS CONSULTED IN THE PREPARATION OF THIS DOCUMENT

FEDERAL AGENCIES

U.S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

U.S. DEPARTMENT OF THE INTERIOR
FISH AND WILDLIFE SERVICE

STATE AGENCIES

DEPARTMENT OF AGRICULTURE

DEPARTMENT OF HAWAIIAN HOME LANDS

DEPARTMENT OF HEALTH

DEPARTMENT OF LAND AND NATURAL RESOURCES
- DIVISION OF AQUATIC RESOURCES
- DIVISION OF FORESTRY AND WILDLIFE
- DIVISION OF STATE PARKS, OUTDOOR RECREATION AND HISTORIC SITES
- DIVISION OF WATER AND LAND DEVELOPMENT

OFFICE OF ENVIRONMENTAL QUALITY CONTROL

COUNTY AGENCIES

DEPARTMENT OF PUBLIC WORKS

DEPARTMENT OF WATER SUPPLY

X. DRAFT ENVIRONMENTAL IMPACT STATEMENT COMMENTS AND RESPONSES

The following agencies and organizations provided comments on the Draft Environmental Impact Statement. The comment and response letters are reproduced in this section.

	Date
FEDERAL AGENCIES	
DEPARTMENT OF THE ARMY	7/08/88
DEPARTMENT OF THE NAVY	6/07/88*
U.S. DEPARTMENT OF THE INTERIOR	
FISH AND WILDLIFE SERVICE	7/12/88
STATE OF HAWAII	
DEPARTMENT OF AGRICULTURE	7/25/88*
DEPARTMENT OF ACCOUNTING AND GENERAL SERVICES	6/15/88*
DEPARTMENT OF BUSINESS AND ECONOMIC DEVELOPMENT	7/06/88*
DEPARTMENT OF DEFENSE	
HAWAII AIR NATIONAL GUARD	6/08/88*
DEPARTMENT OF HEALTH	7/06/88*
DEPARTMENT OF LAND AND NATURAL RESOURCES	
DIVISION OF STATE PARKS	6/22/88
DEPARTMENT OF TRANSPORTATION	7/28/88*
COUNTY OF MAUI	
DEPARTMENT OF PARKS AND RECREATION	6/14/88*
DEPARTMENT OF PUBLIC WORKS	6/24/88*
DEPARTMENT OF WATER SUPPLY	6/16/88
OFFICE OF ECONOMIC DEVELOPMENT	6/06/88*
PRIVATE ORGANIZATIONS AND INDIVIDUALS	
MAUI ELECTRIC COMPANY, LTD.	7/11/88
MAUI PINEAPPLE COMPANY, LTD.	7/18/88

* Responded to solicitations for comments on the Draft EIS, but did not require substantive responses.

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

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DIV. OF WATER & LAND DEVELOPMENT

REPLY TO ATTENTION OF

July 8, 1988

Planning Branch

Dr. Marvin Miura
Office of Environmental Quality Control
465 South King Street, Room 104
Honolulu, Hawaii 96813

Dear Dr. Miura:

Thank you for the opportunity to review the Draft Environmental Impact Statement (DEIS) for the Kula Water System Improvements, Makawao, Maui, Hawaii. The following comments are offered:

a. The proposed project would involve fill in Opana Gulch and would therefore require a Department of the Army permit. The project may be covered by a Department of the Army nationwide permit. For further information, the applicant should contact Operations Branch (telephone 438-9258).

b. The project site is in an area for which no Flood Insurance Rate Map (FIRM) panels have been printed. The pipeline alignment is located generally in areas of minimal flooding; however, where stream crossings are encountered, evaluation of flood hazard impacts must be developed by the applicant.

Sincerely,

Kisuk Cheung
Chief, Engineering Division

Copy furnished:

Mr. Gordon Akita
Division of Water and Land Development
State of Hawaii Department of
Land and Natural Resources
P.O. Box 373
Honolulu, Hawaii 96809

X-2

JOHN WAIHEE
GOVERNOR OF HAWAII

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

WILLIAM W. PATY, CHAIRPERSON
BOARD OF LAND AND NATURAL RESOURCES

LIBERT K. LANDGRAF
DEPUTY

AQUACULTURE DEVELOPMENT PROGRAM
AQUATIC RESOURCES
CONSERVATION AND ENVIRONMENTAL AFFAIRS
CONSERVATION AND RESOURCES ENFORCEMENT
CONVEYANCES
FORESTRY AND WILDLIFE
LAND MANAGEMENT
STATE PARKS
WATER AND LAND DEVELOPMENT

August 8, 1988

Mr. Kisuk Cheung
Chief
Engineering Division
U.S. Army Engineer District, Honolulu
Department of the Army
Fort Shafter, Hawaii 96858-5440

Dear Mr. Cheung:

Draft Environmental Impact Statement
Kula Water System Improvements

Thank you for your comments on the Draft EIS.

The following information is provided in response to your comments:

1. The State will obtain the necessary permits in accordance with the Department of the Army requirements. We will contact the Operations Branch for further details.

2. We understand that the potential flood hazards have not been assessed in the project area by the Department of the Army. Therefore, the County of Maui, Department of Public Works will be consulted to verify that the project is in conformance with all County Flood Insurance Ordinances.

Sincerely,

MANABU TAGOMORI
Deputy for Water Resource Management

HY:fc

cc: Fukunaga & Associates

United States Department of the Interior

FISH AND WILDLIFE SERVICE
300 ALA MOANA BOULEVARD
P O BOX 50167
HONOLULU HAWAII 96850

JUL 13 3:14 ES
Room 6307

JUL 12 1988

Dr. Marvin T. Miura, Director
Office of Environmental Quality Control
465 South King Street, Room 104
Honolulu, Hawaii 96813

Re: Draft Environmental Impact Statement, Kula Water System Improvements, Maui

Dear Dr. Miura:

We have reviewed the May 1988 Draft Environmental Impact Statement for the proposed Kula Water System Improvements and offer the following comments for your consideration.

We support the mitigation measure that would direct construction traffic away from the Hawaii Endangered Species Propagation Facility at Olinda during the alala breeding season. Where possible, we encourage the use of endemic plants for revegetating cleared areas in consultation with the Maui Forest Manager.

We appreciate the opportunity to comment.

Sincerely yours,

Ernest Kosaka

Ernest Kosaka, Field Supervisor
Office of Environmental Services
Pacific Islands Office

cc: DLNR, Gordon Akita

X-3

CONSERVE AMERICA'S ENERGY

Save Energy and You Serve America!

JOHN WAIHEE
GOVERNOR OF HAWAII

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

WILLIAM W. PATY, CHAIRPERSON
BOARD OF LAND AND NATURAL RESOURCES

LIBERT K. LANOGRAS
DEPUTY

AQUACULTURE DEVELOPMENT PROGRAM
AQUATIC RESOURCES
CONSERVATION AND ENVIRONMENTAL AFFAIRS
CONSERVATION AND RESOURCES ENFORCEMENT
CONVEYANCES
FORESTRY AND WILDLIFE
LAND MANAGEMENT
STATE PARKS
WATER AND LAND DEVELOPMENT

August 8, 1988

Mr. Ernest Kosaka
Field Supervisor
Office of Environmental Services
Pacific Islands Office
U.S. Dept. of the Interior
Fish and Wildlife Service
300 Ala Moana Blvd.
P. O. Box 50167
Honolulu, Hawaii 96850

Dear Mr. Kosaka:

Draft Environmental Impact Statement
Kula Water System Improvements

Thank you for your comments on the Draft EIS.

Your concurrence regarding mitigative measures to protect the HESP Facility at Olinda and your recommendation to use endemic plants for revegetation will be noted and reemphasized in the EIS.

Sincerely,

Kenneth G. Akita for

MANABU TAGOMORI
Deputy for Water Resource Management

HY:fc

cc: Fukunaga & Associates

JOHN WAIHEE
GOVERNOR OF HAWAII

RECEIVED
'88 JUN 24 A8:30
OFFICE OF ENVIRONMENTAL QUALITY CONTROL

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
P. O. BOX 621
HONOLULU, HAWAII 96809

WILLIAM W. PATY, CHAIRPERSON
BOARD OF LAND AND NATURAL RESOURCES

LIBERT K. LANDGRAF
DEPUTY

AQUACULTURE DEVELOPMENT PROGRAM
AQUATIC RESOURCES
CONSERVATION AND ENVIRONMENTAL AFFAIRS
CONSERVATION AND RESOURCES ENFORCEMENT
CONVEYANCES
FORESTRY AND WILDLIFE
LAND MANAGEMENT
STATE PARKS
WATER AND LAND DEVELOPMENT

June 22, 1988

MEMORANDUM

TO: Marvin T. Miura, Executive Director
Office of Environmental Quality Control

FROM: Ralston H. Nagata, State Parks Administrator

SUBJECT: Review of the Draft EIS for the Kula Water System Improvements
Kula, Makawao, Maui
TMK 2-3-5:4; 2-3-6:6; 2-4-15:29; 2-4-16:1,2,3,4

HISTORIC SITES SECTION CONCERNS:

On page 11-19 of this document, it mentions that an archaeological survey was conducted by our office and that the report is attached as Appendix C. Due to the absence of historic sites, we recommend that a concluding statement that the project will have "no effect" on significant historic sites be added under the section on Archaeological Features.

RECREATION CONCERNS:

There are no state park concerns.

RALSTON H. NAGATA

cc. Gordon Akita ✓

X-4

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
Division of Water and Land Development
Honolulu, Hawaii

August 8, 1988

MEMORANDUM

TO: Mr. Ralston Nagata

FROM: Manabu Tagomori

SUBJECT: Draft Environmental Impact Statement for Kula Water System Improvements

Thank you for your comments on the Draft EIS. The final EIS will be revised to incorporate your comments.

for MANABU TAGOMORI

HY:fc

cc: Fukunaga & Associates

DEPARTMENT OF WATER SUPPLY
COUNTY OF MAUI
P. O. BOX 1109
WAILUKU, MAUI, HAWAII 96793

June 16, 1988

Dr. Marvin Miura
Office of Environmental Quality Control
465 South King Street, Room 104
Honolulu, Hawaii 96813

Dear Dr. Miura:

Subject: ENVIRONMENTAL IMPACT STATEMENT FOR KULA WATER SYSTEM IMPROVEMENTS

We wish to thank you for giving us the opportunity to review and comment on the Environmental Impact Statement for the Kula Water System Improvements.

The following comments are for your consideration:

1. Page i, Paragraph 2, Line 4, should be reworded to, "The new line will replace the existing 12-inch/16-inch pipeline..."

   Present wording could mean two pipelines (12-inch and 16-inch).

2. Page I-6, Last Paragraph, should be reworded to "No additional diversions are proposed in this project".

3. Page II-19, Paragraph 3, Line 6, the word "counties" should be replaced with "district".

4. Page II-24, Item 4 - Solid Waste Disposal

   Please note that the nearest solid waste disposal for the proposed project site is Makawao and not Puunene.

5. Page II-36, Item d, should be changed to 1.7 mgd.

"By Water All Things Find Life"

X-5

If you require additional information, please feel free to contact us at 244-7816.

Sincerely,

Vince G. Bagovo, Jr., Director

VGB/ao

cc: Carl Kaiama, DWS Engr.
Gordon Akita, DLNR Engr.

August 8, 1988

Mr. Vince Bagoyo, Jr.
Director
Department of Water Supply
County of Maui
P. O. Box 1109
Wailuku, Maui 96793

Dear Mr. Bagoyo:

Draft Environmental Impact Statement
Kula Water System Improvements

Thank you for your comments on the Draft EIS. The final EIS will be revised to incorporate your comments.

Sincerely,

for MANABU TAGOMORI
Deputy for Water Resource Management

HY:fc

cc: Fukunaga & Associates

9-X

Maui Electric Company, Ltd. • 210 West Kamehameha Avenue • PO Box 398 • Kahului, Maui, HI 96732-0398 • (80

GOV 4
M-W/G

July 11, 1988

Mr. Marvin T. Miura
State of Hawaii
Office of Environmental Quality Control
465 South King Street
Honolulu, Hawaii 96813

Dear Mr. Miura:

Subject: Draft Environmental Impact Statement (EIS) for the Kula Water System Improvement

We have reviewed the subject draft EIS and and offer the following comments:

1. Although we do have distribution facilities along portions of the pipeline between the Olinda Treatment Plant and the Waikamoi Dam, we do not anticipate any major problems with the subject pipeline project. However, because of the heavy construction that is anticipated on this project, Maui Electric would like to be notified whenever construction is performed in close proximity to our overhead lines. Also, we would appreciate a copy of the final construction drawings before construction starts.

2. Based on the scope of the pipeline project, we are not required to make any modifications or improvements to our facilities within the project area.

Thank you for the opportunity to comment on the subject draft EIS. Should you have any questions on this matter, please call me at 871-2341.

Sincerely,

Neal Shinyama

Neal Shinyama, Staff Engineer
Engineering Department

cc: C. Kuwanoe (MECO)
G. Akita (DLNR)

X-7

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

August 8, 1988

Mr. Neal Shinyama
Staff Engineer
Engineering Department
Maui Electric Company, Ltd.
210 West Kamehameha Avenue
P. O. Box 398
Kahului, Maui 96732-0398

Dear Mr. Shinyama:

Draft Environmental Impact Statement
Kula Water System Improvements

Thank you for your comments on the Draft EIS.

Maui Electric will be notified whenever construction is to be performed in close proximity of your overhead lines. A set of final construction drawings will be sent to you before construction of this project commences.

Sincerely,

MANABU TAGOMORI
Deputy for Water Resource Management

HY:fc

cc: Fukunaga & Associates
Design & Construction

Maui Pineapple Company, Ltd.
Haliimaile Division

July 18, 1988

Department of Land & Natural Resources
Division of Water and Land Development
P. O. Box 621
Honolulu, Hi

Gentlemen:

I would like to comment on the Environmental Impact Statement for the Kula Water System Improvements.

The improvements in the catchment intakes on the Upper Opana Stream may have a negative impact on the agricultural community makai of the intake.

At present Opana Stream is diverted through a tunnel system to Awalau, where the water is harvested and used by a number of agricultural operations. The largest user of this water is Maui Pineapple Company, which stores water from this diversion in two reservoirs. One is a ten-million gallon storage at Kailiili and the other, Puukoa, is somewhat smaller, located on Haleakala Highway. This source supplies the primary irrigation needs for over 4,000 acres.

The second major user of water from this diversion is Haleakala Dairy. This water is used for the water troughs across the up-country area, as well as being the primary source of water for the dairy's operating facility.

The third user of water is Kaonoulu Ranch. The Ranch uses this water for its water troughs, as well as a number of domestic services.

X-8

870 Haliimaile Highway • Haliimaile, Maui, Hawaii 96768 • Telephone (808) 572-7211

It might also be noted that the County of Maui uses approximately one million gallons a day from the Opana diversion for its Makawao System. This diversion supplies most of the domestic needs of the town of Makawao. Consequently, should any changes be made on any of the present intakes, this change should be addressed, as it may qualify as Additional Diversion under the present State Water Code.

Other areas which should be addressed are:

1. There is inadequate storage included in the Environmental Impact Statement. Further note should be made of this, as this is only Phase I of a number of phases needed to supply adequate water for the up-country area.

2. There should be some consideration given to the future cost of water for agricultural purposes, as this will have a major impact on agriculture in the up-country area.

Your consideration will be greatly appreciated.

Sincerely,

L. D. MacCluer
Plantation Manager

LDM/sj

xc: Central File
H'maile Kailiili Water System
H'maile Up-Country Water

AUG - 5 1988

Mr. L. D. MacCluer
Maui Pineapple Company, Ltd.
Hallimaile Division
870 Hallimaile Highway
Hallimaile, Maui 96788

Dear Mr. MacCluer:

Draft Environmental Impact Statement
Kula Water System Improvements

Thank you for your comments on the Draft EIS. We understand your concern regarding potential impacts to water users downstream of the proposed project. The improvements proposed in this project are not intended to divert additional water from the upland stream reaches. The scope of work is limited to minor repair and reconstruction work to intakes and replacement pipe.

Future improvements to the Upcountry Water System, including additional storage facilities and expansion of the distribution network, are currently being studied and alternatives will be evaluated and assessed as they become more definite. Your comments and questions will be noted and considered for future developments.

Very truly yours,

WILLIAM W. PATY Chairperson
Board of Land and Natural Resources

X-9

DEPARTMENT OF THE NAVY
COMMANDER
NAVAL BASE PEARL HARBOR
BOX 110
PEARL HARBOR, HAWAII 96860-5020

IN REPLY REFER TO
5090 (24B)
Ser N5B/1333

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DIV. OF WATER & LAND DEVELOPMENT
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Mr. Marvin T. Miura
Office of Environmental Quality Control
465 South King Street, Room 104
Honolulu, HI 96813

Dear Mr. Miura:

DRAFT ENVIRONMENTAL IMPACT STATEMENT
KULA WATER SYSTEM IMPROVEMENTS

The Draft Environmental Impact Statement for the Kula Water System Improvements has been reviewed and we have no comments to offer. Since we have no further use for the EIS, it is being returned to your office

Thank you for the opportunity to review the Draft.

Sincerely,

W. K. LIU
Assistant Base Civil Engineer
By direction of
the Commander

Enclosure

Copy to:
Mr. Gordon Akita
DLNR, Division of Water and Land Development
P. O. Box 373
Honolulu, Hawaii 96809

X-10

JOHN WAIHEE
GOVERNOR

SUZANNE D. PETERSON
CHAIRPERSON, BOARD OF AGRICULTURE

ROBERT Y. TSUYEMURA
ACTING DEPUTY
TO THE CHAIRPERSON

State of Hawaii
DEPARTMENT OF AGRICULTURE
1428 So. King Street
Honolulu, Hawaii 96814-2512

Mailing Address:
P. O. Box 22159
Honolulu, Hawaii 96822-0159

RECEIVED
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July 25, 1988

COPY

Dr. Marvin T. Miura, Interim Director
Office of Environmental Quality Control
465 South King Street, Room 104
Honolulu, Hawaii 96813

Dear Dr. Miura:

Subject: Draft Environmental Impact Statement (DEIS)
Kula Water System Improvements
TMK: 2-3-5:4 Kula, Maui
2-3-6:6
2-4-15:29
2-4-16:1, 2, 3 & 4

The Department of Agriculture has reviewed the subject document and supports the construction of a new 36-inch water transmission line from the Kula Water System surface water sources at Waikamoi Stream and Reservoirs to the Olinda Water Treatment Plant would benefit Hawaiian agriculture by increasing the agricultural productivity of that area.

Thank you for the opportunity to comment.

Sincerely,

SUZANNE D. PETERSON
Chairperson, Board of Agriculture

cc: Mr. Gordon Akita, DLNR

88 JUN 16 A8:02

DIV. OF WATER & LAND DEVELOPMENT

(P)1520.8

JUN 15 1988

Dr. Marvin Miura
Interim Director
Office of Environmental
Quality Control
465 South King Street, Rm. 104
Honolulu, Hawaii 96813

X-11

Dear Dr. Miura:

Subject: Draft Environmental Impact Satement
for the Kula Water System Improvements

We have reviewed the subject document and have no comments to offer.

Very truly yours,

TEUANE TOMINAGA
State Public Works Engineer

MY:jk
cc: Mr. Gordon Akita

STATE OF HAWAII

DEPARTMENT OF BUSINESS AND ECONOMIC DEVELOPMENT

KAMAMALU BUILDING, 250 SOUTH KING ST., HONOLULU, HAWAII
MAILING ADDRESS: P.O. BOX 2359, HONOLULU, HAWAII 96804 TELEX: 7430250 HIDPED

ROGER A. ULVELING
DIRECTOR
BARBARA KIM STANTON
DEPUTY DIRECTOR
LESLIE S. MATSUBARA
DEPUTY DIRECTOR

88 JUL 11 P1:16

Ref. No. P-8524

July 6, 1988

DIV. OF WATER & LAND DEVELOPMENT

MEMORANDUM

TO: Dr. Marvin T. Miura, Director
Office of Environmental Quality Control

FROM: Roger A. Ulveling

SUBJECT: Environmental Impact Statement, Kula Water System Improvements, Makawao, Maui

We have reviewed the subject document and do not have any comments to offer.

Thank you for the opportunity to review this document.

ORIGINAL SIGNED BY
ROGER A. ULVELING

cc: Mr. Gordon Akita
DOWALD, DLNR

RECEIVED

'88 JUN 13 A8:23

DIV. OF WATER &
LAND DEVELOPMENT

Engineering Office

June 8, 1988

Dr. Marvin T. Miura
Office of Environmental
Quality Control
465 South King Street, Room 104
Honolulu, Hawaii 96813

Dear Dr. Miura:

Kula Water System Improvements
Makawao, Maui

Thank you for providing us the opportunity to review the subject project.

We have no comments to offer at this time regarding this project.

Yours truly,

Jerry P. Matsuda
Major, Hawaii Air
National Guard
Contr & Engr Officer

cc: Gordon Akita, DLNR

X-12

JOHN WAIHEE
GOVERNOR OF HAWAII

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

JOHN C. LEWIN, M.D.
DIRECTOR OF HEALTH

In reply, please refer to
EPHSD

July 6, 1988

MEMORANDUM

To: Dr. Marvin T. Miura, Director
Office of Environmental Quality Control

From: Deputy Director for Environmental Health

Subject: Draft Environmental Impact Statement (DEIS) for Kula Water System Improvements, Makawao, Maui, Hawaii

Thank you for allowing us to review and comment on the subject DEIS. We have no comments at this time.

BRUCE S. ANDERSON, Ph.D.

cc: Mr. Gordon Akita, DLNR ✓

X-13

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STP 8.3029

July 28, 1988

Dr. Marvin Miura, Director
Office of Environmental Quality Control
465 South King Street, Room 104
Honolulu, Hawaii 96813

Dear Dr. Miura:

Draft Environmental Impact Statement
Proposed Kula Water System Improvements

We have no objection to the proposed Kula Water System Improvements project.

Thank you for this opportunity to provide comments.

Very truly yours,

Edward Y. Hirata
Director of Transportation

DT:ko

cc: STP(dt)
Mr. Gordon Akita, DLNR

HANNIBAL TAVARES
Mayor

MARILYN MONIZ-KAHOOHANOHANO
Director

KENJI KAWAGUCHI
Deputy Director

COUNTY OF MAUI
DEPARTMENT OF PARKS AND RECREATION
1580 Kaahumanu Avenue
Wailuku, Maui, Hawaii 96793

June 14, 1988

Mr. Marvin T. Miura
Office of Environmental Quality Control
465 South King Street, Room 104
Honolulu, Hawaii 96813

Dear Dr. Miura:

SUBJECT: EIS FOR KULA WATER SYSTEM IMPROVEMENTS

We have reviewed the above referenced report and have no comments on the matter.

Please feel free to contact me should you have any questions.

Very truly yours,

Marilyn Moniz-Kahoohanohano

MARILYN MONIZ-KAHOOHANOHANO
Director of Parks & Recreation

cc: Gordon Akita, DLNR

HANNIBAL TAVARES
Mayor

ALVIN K. FUKUNAGA
Director

BRIAN HASHIRO, P.E.
Deputy Director

GEORGE KAYA
Highways Division

FRED ARAKI, P.E.
Engineering Division

EASSIE MILLER, P.E.
Waste Management Division

AARON SHINMOTO, P.E.
Land Use and Codes Administration

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

June 24, 1988

Department of Land and Natural
Resources
Division of Water and Land
Development
P.O. Box 373
Honolulu, Hawaii 96809

Attn: Mr. Gordon Akita

Gentlemen:

Re: Environmental Impact Statement Review for the Kula Water System Improvements, Makawao, Maui.

We have reviewed the above request and have no comments to offer at this time.

If you have any questions, please call the Land Use and Codes Administration at 244-7760.

Very truly yours,

Brian Hashiro

for ALVIN K. FUKUNAGA
Director of Public Works

AS/ms

HANNIBAL TAVARES
Mayor

dc

FRED MATSUMOTO
Coordinator

COUNTY OF MAUI
OFFICE OF ECONOMIC DEVELOPMENT
WAILUKU, MAUI, HAWAII 96793
TELEPHONE 244-7710

June 6, 1988

Mr. Marvin T. Miura
Office of Environmental Quality Control
465 South King Street, Room 104
Honolulu, HI 96813

Dear Mr. Miura:

Subject: Draft Environmental Impact Statement
for the Kula Water System Improvements.

The Office of Economic Development have reviewed the subject environmental impact statement and find that, in general it has adequately identified and assessed the major environmental impacts which can be anticipated to result from the proposed project.

We have no other comments to offer at this time; however, we thank you for the opportunity to review the environmental impact statement.

Sincerely,

Fred Matsumoto

FRED MATSUMOTO
Economic Development Coordinator

cc: Mr. Gordon Akita
Dept. of Land & Natural Resources
Division of Water & Land Development
P. O. Box 373
Honolulu, HI 96809

XI. LIST OF PREPARERS OF THIS DOCUMENT

FUKUNAGA & ASSOCIATES, INC.

Jon K. Nishimura, Civil Engineer
University of Hawaii, BSCE, 1975
University of Hawaii, MSCE, 1978
Registered Professional Engineer, State of Hawaii, 1980

Alyson K.L. Yim, Civil Engineer
University of Hawaii, BSCE, 1984
Engineer-In-Training, Part I, 1980

Edlyn K. Hayashida, Graphic Artist

APPENDIX A

SURVEY OF PLANT, BIRD AND MAMMAL SPECIES FOUND ALONG PROPOSED PIPELINE CORRIDOR KULA WATER SYSTEM IMPROVEMENTS KULA, MAUI, HAWAII

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

SURVEY OF PLANT, BIRD AND MAMMAL SPECIES FOUND ALONG PROPOSED PIPELINE CORRIDOR KULA WATER SYSTEM IMPROVEMENTS KULA, MAUI, HAWAII

I. INTRODUCTION

A survey of plant, bird and mammal species found along the proposed pipeline alignment for the Kula Water System Improvements project was conducted during March 1988. Survey team members included Forester Robert Hobdy and Biologist Meyer Ueoka of the Division of Forestry and Wildlife (DOFAW). The survey data is supplemented by information compiled from past observations by DOFAW personnel.

II. OBJECTIVE

The objective of the survey is to assist the Division of Water and Land Development (DOWALD) in obtaining qualitative data on the terrestrial flora and fauna existing in the project area.

III. DESCRIPTION OF THE PROJECT AREA

The proposed project area shown in Figure 1 extends from the Waikamoi Stream to the Olinda Water Treatment Plant. It is understood that the proposed pipeline will generally follow the alignment of the existing pipeline. The proposed pipeline corridor will pass through the Makawao and Koolau Forest Reserves.

IV. METHODOLOGY

The survey of the terrestrial flora and fauna was accomplished by DOFAW personnel who walked along the proposed pipeline corridor and existing jeep trail. Plant, bird and mammal species observed were identified and recorded. The list of species found during the survey was supplemented with species which have been seen in the past by DOFAW personnel.

V. FINDINGS AND DISCUSSION

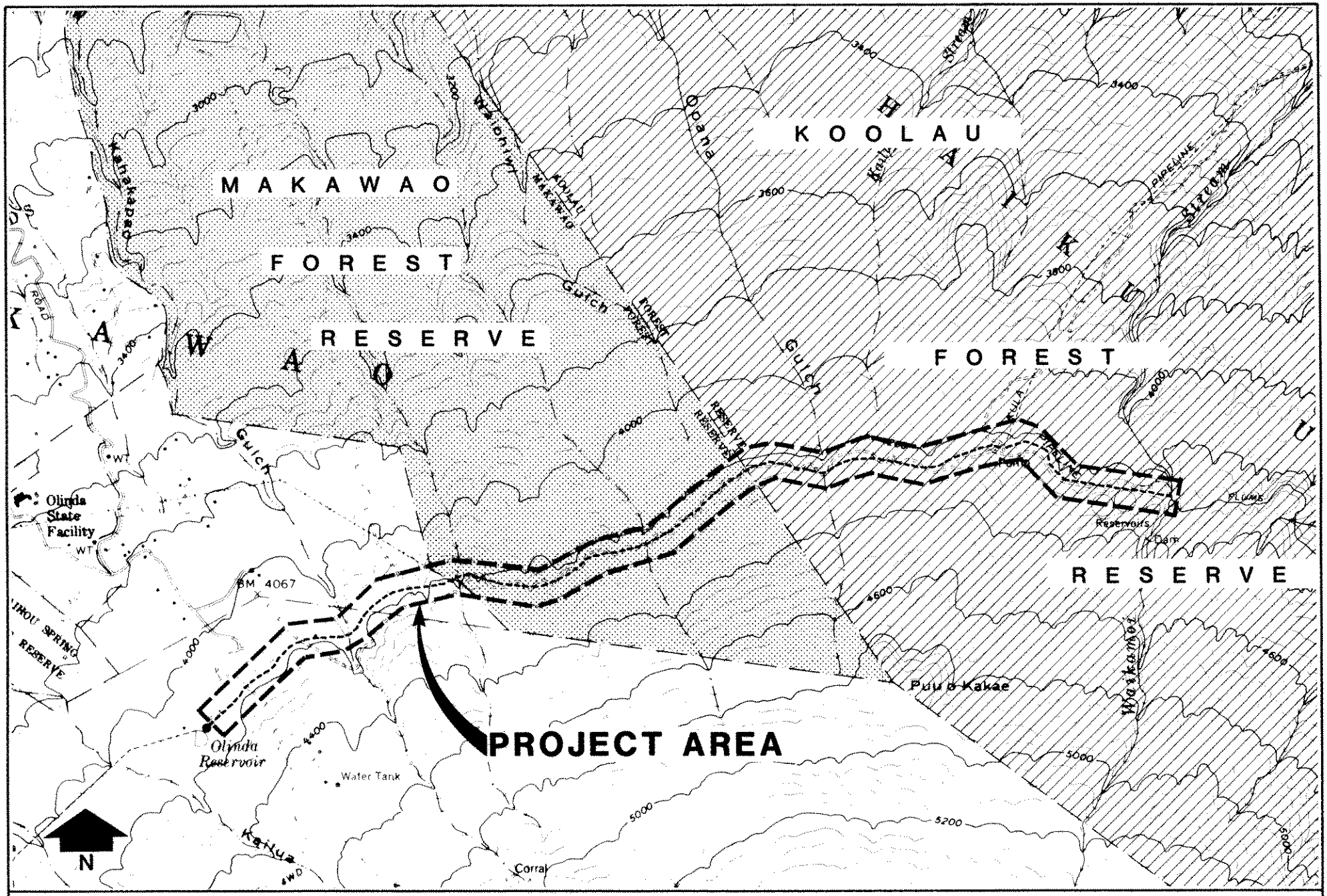
The lists of plant, bird and mammal species found within the proposed Pipeline Project Right-of-Way in the Makawao and Koolau Forest Reserves, East Maui, are presented in Tables I, II and III respectively. The lists include just about all the species of plants and wildlife in the pipeline corridor. In the project area there are no known listed threatened and endangered (T & E) plants and three species of birds (Crested Honeycreeper, Hawaiian Goose, and Maui Parrotbill) listed as a T & E species. However, these birds are only rarely seen in this area and may not be impacted by this project.

The major impact of this project will be on the native plant life in the area particularly those that will be removed or damaged in the construction phase. In a native forest of this type, when native plants are removed and the forest floor is exposed to light, an invasion by exotic species normally occurs. Blackberry, kikuyu, paspalum and other grasses generally outgrow the native species and eventually occupies the site permanently. Presently because of the previous construction and maintenance work done on the existing line, the area supports many exotic species. It is anticipated that this project will accelerate the spread of exotic species within the project corridor. As a result, some areas will be converted totally to exotic species as exemplified in some areas along the existing pipeline where earlier disturbance occurred.

VI. RECOMMENDATIONS

It is recommended that should this project be permitted to proceed all cutting, removal, and unnecessary destruction of vegetation in the pipeline corridor and adjacent areas shall be kept to an extreme minimum.

Further, should any landscaping or revegetating in the project area be required, the Maui Forestry Manager shall be consulted for species selection.



PROJECT LOCATION

Scale: 1" = 2000'

FIGURE 1

TABLE I - PLANT SPECIES OCCURRING ALONG THE WAIKAMOI PIPELINE CORRIDOR

	Common Name	Scientific Name
1.	Bracken Fern	Pteridium decompositum
2.	Uluhe	Dicranopteris lineraris
3.	Hoio	Diplazium sandwichianum
4.		Dryopteris hawaiiensis
5.	Kilau	Dryopteris glabra
6.	Laukahi	Dryopteris wallichiana
7.		Dryopteris fusco-atra
8.		Dryopteris tetrapinnata
9.		Dryopteris subbipinnata
10.		Dryopteris uniformis
11.		Dryopteris sandwicensis
12.		Cystopteris douglasii
13.	Iwaiwa	Asplenium adiantum-nigrum
14.		Asplenium macraei
15.		Asplenium normale
16.		Asplenium contiguum
17.		Asplenium polyodon
18.	Piipiilaumanamana	Asplenium lobulatum
19.		Asplenium sphenotomum
20.		Asplenium acuminatum
21.	Pamoho	Asplenium unilaterale
22.		Ctenitis rubiginosa
23.		Ctenitis honoluluensis
24.	Loulu	Coniogramme pilosa
25.		Hypolepis punctata
26.	Hapuu	Cibotium glaucum
27.	Hapuu ii	Cibotium chamissoi
28.	Palaa	Sphenomeris chinensis
29.	Amaumau	Sadleria cyatheoides
30.	Amau	Sadleria pallida
31.	Amau	Sadleria souleyetiana
32.		Sadleria squarossa
33.	Palapalai	Microlepia strigosa
34.		Adenophorus pinnatifidus
35.	Wahine nohomauna	Adenophorus tamariscinus
36.		Adenophorus tripinnatifidus
37.	Pai	Adenophorus hymenophylloides
38.	Kihi	Xiphopteris saffordii
39.		Grammitis hookeri
40.	Kolokolo	Grammitis tenella
41.	Ekaha Akolea	Pleopeltis thunbergii
42.	Kilau	Vandenboschia davallioides
43.	Pali hinahina	Sphaerocionium lanceolatum
44.	Ohiaku	Mecodium recurvum
45.		Gonocormus prolifer
46.	Ekaha	Elaphoglossum hirtum
47.	Ekaha	Elaphoglossum wawrae
48.		Sticherus owyhiensis
49.		Diplopterigium pinnatum
50.	Pala	Marattia douglasii

TABLE I - PLANT SPECIES OCCURRING
ALONG THE WAIKAMOI PIPELINE CORRIDOR (CONTINUED)

	Common Name	Scientific Name
51.	Ae	Polypodium pellucidum
52.	Wawaeiole	Lycopodium cernuum
53.	Wawaeiole	Lycopodium polytrichoides
54.	Wawaeiole	Lycopodium venustulum
55.	Akolea	Athyrium microphyllum
56.		Doodya kunthiana
57.		Stegnogramma sandwicensis
58.	Palapalai o kaumaapua	Amauropelta globulifera
59.		Pseudophegopteris keraudreniana
60.		Selaginella arbuscula
61.	Waimakanui	Pteris excelsa
62.	Owalii	Pteris cretica
63.	Nianiau	Nephrolepsis cordifolia
64.	Pipi	Psilotum complanatum
65.	Kikuyugrass	Pennisetum clandestinum*
66.	Vaseygrass	Paspalum urvillei*
67.	Carpetgrass	Axonopus compressus*
68.	Velvetgrass	Holcus lanatus*
69.	African dropseed	Sporobolus africanus*
70.	Annual bluegrass	Poa annua*
71.	Mauu	Deschampsia australis
72.	Sweet vernalgrass	Anthoxanthom ordoratum*
73.	Loblolly pine	Pinus taeda*
74.	Monterey cypress	Cupressus macrocarpa*
75.	Gum myrtle	Angophora lanceolata*
76.	Port Orford cedar	Chamaecyparis lawsoniana*
77.	American ash	Fraxinum americana*
78.	Methley plum	Prunus cerasifera*
79.	Sydney bluegum	Eucalyptus saligna*
80.	Hawaiian sedge	Carex alligata
81.		Cyperus polystachyus
82.	Uki	Machaerina angustifolia
83.	Rush	Juncus planifolius*
84.	Rush	Juncus polyanthemus*
85.	Painiu	Astelia degeneri
86.	Hoi kuahiwi	Smilax sandwicensis
87.	White ginger	Hedychium coronarium*
88.	Kahili ginger	Hedychium garderianum*
89.	Alaalawainui	Peperomia cookei
90.	Alaalawainui	Peperomia hirtipetiola
91.	Alaalawainui	Peperomia subpetiolata
92.	Alaalawainui	Peperomia waikamoiama
93.		Pilea peploides
94.	Mamaki	Pipturus rockii
95.	Opuhe	Urera sandwicensis
96.	Hulumoa	Korthalsella complanata
97.	Hulumoa	Korthaslsells degeneri
98.	Popolo-ku-mai	Phytolacea sandwicensis
99.	Kanawao	Broussaisia arguta
100.	Hoawa	Pittosporum insignis

TABLE I - PLANT SPECIES OCCURRING
ALONG THE WAIKAMOI PIPELINE CORRIDOR (CONTINUED)

	Common Name	Scientific Name
101.	Akala	Rubus hawaiiensis
102.	Blackberry	Rubus argutus*
103.	Koa	Acacia koa
104.	Trefoil	Lotus angustissimus*
105.	Mamane	Sophora chrysophylla
106.	White clover	Trifolium repens*
107.	Gorse	Ulex europaeus*
108.	Alani	Pelea clusiaefolia
109.	Alani	Pelea hawaiiensis
110.	Alani	Pelea molokaiensis
111.	Kawau	Ilex anomala
112.	Olomea	Perottetia sandwicensis
113.	Ohia	Metrosideros collina
114.	Olapa	Cheirodendron trigynum
115.	Ohe	Tetraplasandra meiandra
116.	Ohelo	Vaccinium calycinum
117.	Pukiawe	Styphelia tameiameiae
118.		Embelia pacifica
119.	Kolea	Myrsine lessertiana
120.	Kolea	Myrsine emarginata
121.	Kolea	Myrsine sandwicensis
122.	Kamakahala	Labordia venosa
123.	Maile	Alyxia olivaeformis
124.		Phyllostegia ambigua
125.	Self-heal	Prunella vulgaris*
126.		Stenogyne kamehamehoe
127.	Corn speedwell	Veronica arvensis*
128.	Kanawao keokeo	Cyrtandra platyphylla
129.	Pilo	Coprosma foliosa
130.	Pilo	Coprosma ochracea
131.	Manono	Hedyotis affinis
132.	Manono	Hedyotis axillaris
133.		Hedyotis centranthoides
134.	Kopiko	Psychotria mauiensis
135.	Ohawai	Clermontia kakeana
136.	Ahawai	Clermontia arborescens
137.	Hahanui	Cyanea aculeatiflora
138.	Haha	Cyanea maceldowneyi
139.	Haha	Cyanea bishopii
140.	Haha	Cyanea macrostegia
141.	Naupaka kuahiwi	Scaevola chamissoniana
142.	Naenae	Dubautia plantaginea
143.	Kupaua	Dubautia scabra
144.	Maui Pamakani	Ageratina adenophora*
145.	Nipplewort	Lapsana communis*

* Introduced species
** Listed on State and Federal T & E Species List

TABLE II - BIRD SPECIES OCCURRING ALONG THE WAIKAMOI PIPELINE CORRIDOR

	Common Name	Scientific Name
1.	Crested Honeycreeper	*Palmeria dolei***
2.	Iiwi	*Vestiaria coccinea*
3.	Apapane	*Himatione sanguinea*
4.	Amakihi	*Hemignathus virens wilsoni*
5.	Maui Creeper	*Paroreomyza montana newtoni*
6.	Hawaiian Owl (Pueo)	*Asio flammeus sandwichensis*
7.	Lesser Golden-plover	*Pluvialis dominica*
8.	Red-billed Leiothrix	*Leiothrix lutea**
9.	Melodious Laughing-thrush	*Garrulax canorus**
10.	Japanese White-eye	*Zosterops japonicus**
11.	House Finch	*Carpodacus mexicanus**
12.	Common Myna	*Acridotheres tristis**
13.	Spotted Dove	*Streptopelia chinensis**
14.	Nutmeg Mannikin (Rice bird)	*Lonchura punctulata**
15.	Northern Cardinal	*Cardinalis cardinalis**
16.	Red Avadavat (Strawberry Finch)	*Amandava amandava**
17.	Eurasian Skylark	*Alauda arvensis**
18.	Ring-necked Pheasant	*Phasianus colchicus**
19.	Hawaiian Goose (Nene)	*Nesochen sandvicensis***
20.	Maui Parrotbill	*Pseudonestor xanthophrys***

* Introduced species
** Listed on State and Federal T & E Species List

TABLE III - MAMMAL SPECIES OCCURRING ALONG THE WAIKAMOI PIPELINE CORRIDOR

	Common Name	Scientific Name
1.	Feral pig	*Sus scrofa**
2.	Feral cat	*Felix catus**
3.	Feral dog	*Canis familiaris**
4.	Mongoose	*Herpestes auropunctatus**
5.	Roof rat	*Rattus rattus**
6.	Polynesian Rat	*Rattus exulans*
7.	House Mouse	*Mus musculus**

* Introduced species
** Listed on State and Federal T & E Species List

BOTANICAL & BIOLOGICAL REFERENCE BOOKS

1. Berger, A. J., 1972, Hawaiian Birdlife, University Press of Hawaii, Honolulu, Hawaii.

2. Berger, A. J., 1983, Hawaiian Birdlife, University of Hawaii Press, Honolulu, Hawaii.

3. Degener, Otto, 1932-1988, Flora Hawaiiensis, 1-7 and continuation, Privately Published, Honolulu, Hawaii.

4. Hawaii Audubon Society, 1981, Hawaii's Birds, Third Edition, Hawaii Audubon Society, Honolulu, Hawaii.

5. Hillebrand, Wilhelm, 1888, Flora of the Hawaiian Islands, Carl Winter, University Bookseller, Heidelberg, Germany.

6. Neal, Marie C., 1965, In Gardens of Hawaii, Bishop Museum Press, Honolulu, Hawaii.

7. Peterson, R. T., 1961, A Field Guide to Western Birds, 2nd Edition, Houghton Mifflin Co., Boston.

8. Pratt, H. D., Bruner, P. L., and Berrett, P. G., 1987, The Birds of Hawaii and the Tropical Pacific, Princeton University Press, Princeton, New Jersey.

9. Pyle, R. L., 1983, Checklist of Hawaii's Birds, Hawaii Audubon Society , Honolulu, Hawaii.

10. Pyle, R. L., A. Engilis, Jr., 1987, Field Card to Hawaii's Birds, Hawaii Audubon Society, Honolulu, Hawaii.

11. Rock, Joseph F., 1913, The Indigenous Trees of the Hawaiian Islands, Charles E. Tuttle Company, Rutland, Vermont.

12. St. John, Harold, 1973, List and Summary of the Flowering Plants in the Hawaiian Islands, Pacific Tropical Botanical Garden, Memoir number 1, Lawai, Hawaii.

13. Scott, J. M., S. Mountainspring, F. Ramsey, C. B. Kepler, 1986, Forestbird Communities of the Hawaiian Islands: Their Dynamics, Ecology, and Conservation, Cooper Ornithological Society, Studies in Avian Biology No. 9, Lawrence, Kansas.

14. Shallenberger, R. J., ed., 1986, Hawaii's Birds, Hawaii Audubon Society, Honolulu, Hawaii.

APPENDIX B

SURVEY OF THE FRESHWATER AQUATIC FAUNA IN THE STREAMS OF THE UPPER KULA WATER SYSTEM ISLAND OF MAUI

State of Hawaii
Department of Land and Natural Resources
DIVISION OF AQUATIC RESOURCES

Survey of the Freshwater Aquatic Fauna in the Streams of the Upper Kula Water System Island of Maui

INTRODUCTION

A survey of the aquatic macrofauna in the perennial and intermittent streams of the Upper Kula Water System, Maui, was conducted on May 19, 1988, by Division Aquatic Biologists Dennis Shinno and Skippy Hau.

OBJECTIVE

To assist the Division of Water and Land Development in obtaining quantitative and qualitative data on aquatic macrofauna and ecosystem to assess potential effects of a proposed project to install a new 36-inch diameter water transmission line connecting the Waikamoi Reservoirs to the Olinda Water Treatment Plant.

PROCEDURES AND DESCRIPTION OF AREA

The project area follows the 4,400 to 4,200 feet elevation contours along the northern slopes of Haleakala. The other streams or stream reaches which supplement the System, and located in the project area are all intermittent and include tributaries of the Kailua Stream, Opana Gulch, Waiohiwi Gulch and Kahakapao Gulch (Figure 1). The primary water source, the perennial Haipuaena and Waikamoi Streams are located to the east of the subject project. Also, all of the subject Streams are diverted further in downstream areas.

Surveys of the macrofauna were conducted by visual and snorkeling observations. Samples for identification purposes were collected with a net.

FINDINGS

No native gobies (o'opu), shrimp (opae kalaole) or neritid snail (hihiwai) or any other "major" aquatic fauna were found in any of the streams. The only aquatic fauna observed were a few damselfly nymphs and other aquatic insects, indicating that the aquatic ecosystems are very depauperate.

CONCLUSION

The proposed project will not significantly affect aquatic resources values in the streams of the Upper Kula Water System.

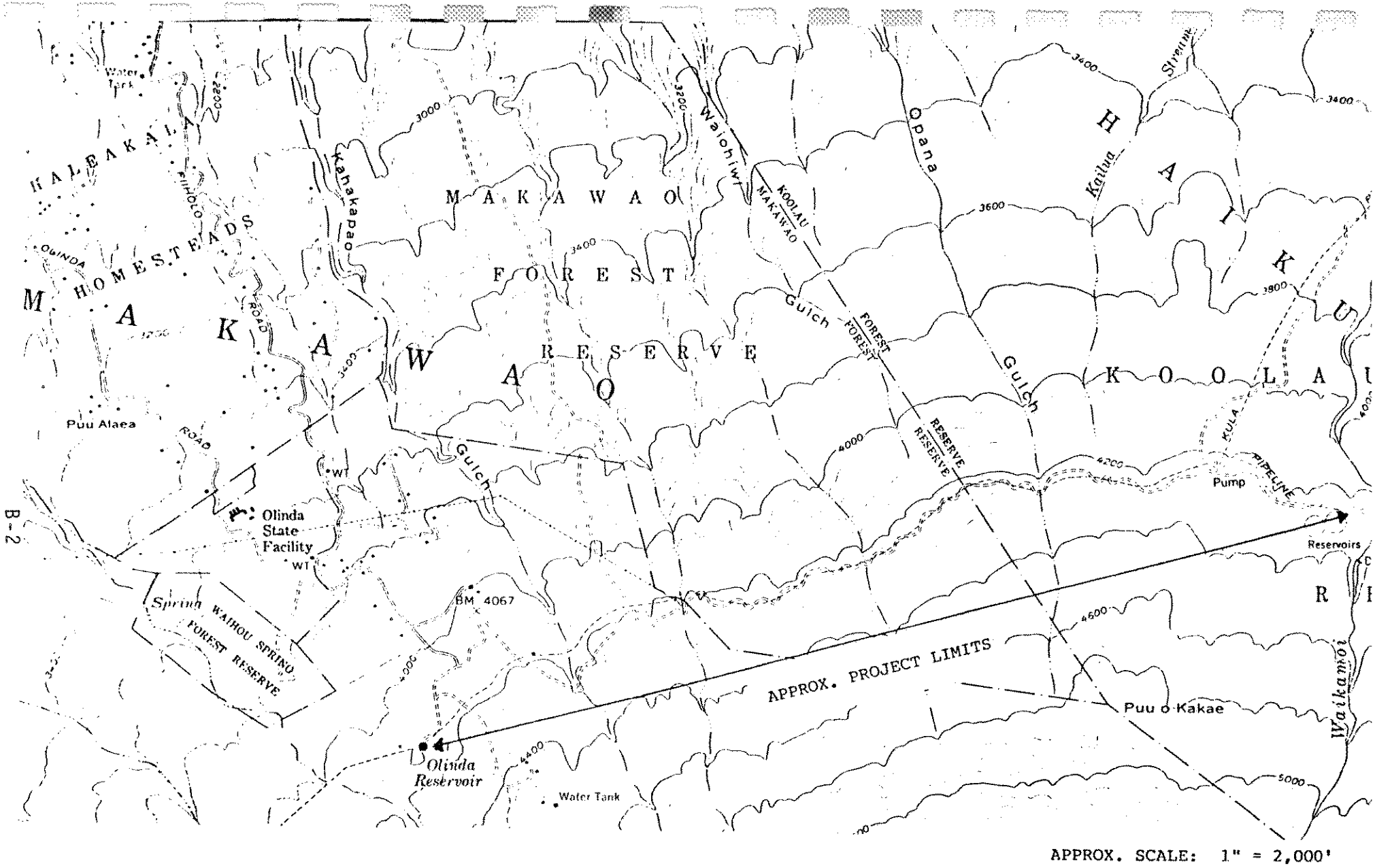


FIGURE 1. UPPER KULA WATER SYSTEM, MAUI.

APPENDIX C

AN ARCHAEOLOGICAL SURFACE SURVEY OF THE PROPOSED KULA WATER SYSTEM IMPROVEMENTS KULA, MAKAWAO, MAUI

AN ARCHAEOLOGICAL SURFACE SURVEY OF THE PROPOSED KULA WATER SYSTEM IMPROVEMENTS
Kula, Makawao, Maui
TMK 2-3-5:4, 2-3-6:6, 2-4-15:29, 2-4-16:1-4

Agnes Estioko-Griffin
Division of State Parks, Historic Sites
and Outdoor Recreation
Department of Land and Natural Resources

April 27, 1988

Introduction

As requested by Division of Water and Land Development, an archaeological survey was conducted of the proposed 36" waterline on April 25, 1988. I was accompanied to the project site by Mr. Herbert Kogasaka of Norman Saito Engineering Consultants, Inc.

The purpose of the survey was to determine the presence/absence of significant historic sites in the project area. If significant historic sites are present, mitigation measures will be recommended.

The proposed project includes the replacement of the existing 17,000 linear feet of 12-inch and 16-inch pipelines connecting the Waikamoi Reservoirs to the Olinda Water Treatment Plant with a 36-inch pipeline (map 1). As shown in map 2, the section of the new pipeline in the forest reserve will generally follow the existing waterline. Only about 2,000 feet along the west end outside of the forest reserve will the new pipeline be far from the existing one.

The pipeline generally follows the 4200 ft. contour line. The section outside the forest reserve (west end) is being used for pasture. It is characterized by gently sloping ridges, and covered with low grass. This area must have been previously forested, but has been cleared for pasture. The ground is clear of any rocks indicating extensive ground disturbance. The forest reserve, on the other hand, is steep and dissected by numerous intermittent streams. Ohia (Metrosideros collina), the native koa (Acacia koa), and numerous species of shrubs and grasses comprise the plant cover.

Previous archaeological work

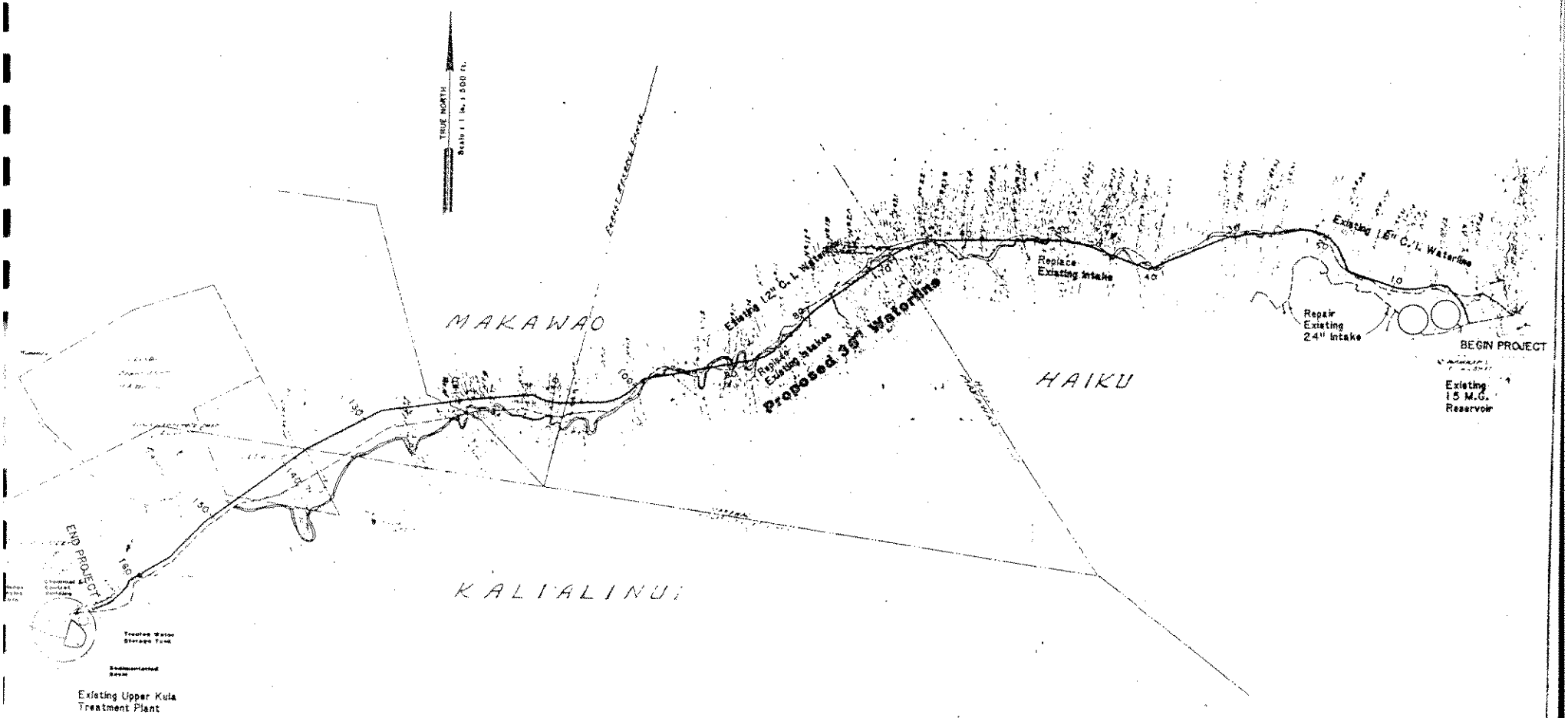
A review of records at the Historic Sites Section indicates the absence of known historic sites in the area. Also, no previous archaeological work has been conducted in this part of the Kula region.

The Survey

It was my initial plan to focus the survey on the portion of the new pipeline that will be away from the existing one (west end), since this area is suspected to be still undisturbed. However, this portion was found to be also previously disturbed. Thus, the survey was done from the vehicle. Because the existing pipeline generally follows the access road, it was felt that this was the most efficient way. Any historic sites that may have been present would have been destroyed or disturbed by the existing pipeline and access roads.

The Findings

No evidence of historic sites was found. In general, historic sites in this type of environment are scarce and localized. The forest reserve would have provided a good resource base for bird feather, koa and other useful plants. If any evidence of the exploitation of these resources exists, it is more likely to be buried.



MAP 2: THE KULA WATER SYSTEM IMPROVEMENTS

—— Proposed 36" waterline

- - - - Existing waterline

~~~ Access road

SYM	DESCRIPTION	DATE	APP'D
	REVISIONS		

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

GENERAL PLAN

DESIGNED:	SUBMITTED:
DRAWN:	CHIEF DESIGN & CONSTR. ENGINEER
CHECKED:	DATE:
APPROVED:	FILE NO.
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