



DEPARTMENT OF WATER SUPPLY
COUNTY OF MAUI
P.O. BOX 1109

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May 22, 2002

OFFICE OF ENVIRONMENTAL
QUALITY CONTROL

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

Dear Ms. Salmonson,

RE: Final Environmental Assessment (DEA), for the Keokea Lateral, Phase II
Project located in Keokea, Maui, Hawaii (TMK: (2) 2-2-04/2-2-03)

The Department of Water Supply has reviewed the final environmental assessment for the subject project, and has determined that a Findings of No Significant Impact (FONSI) is warranted. Please publish notice of availability for this project in the June 8, 2002, OEQC Environmental Notice.

We have enclosed four (4) copies of the Final EA, and will be transmitting a completed OEQC Publication form and project summary via e-mail (e-mail will be transmitted by Chris Hart & Partners). Should you have any questions, please call our Engineering Division at 808-270-7835, or Mr. Rory Frampton of Chris Hart & Partners at 808-242-1955.

Very truly yours,

David R. Craddick
Director

/ATM:sc
Enclosures: Final EA (4)

xc: Mr. Alan Murata, Department of Water Supply w/out encl.
Mr. Kirk Tanaka, Tanaka Engineers, Inc. w/out encl.
Mr. Rory Frampton, Chris Hart & Partners, Inc. w/out encl.

"By Water All Things Find Life"

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FINAL ENVIRONMENTAL ASSESSMENT

(KEOKEA LATERAL) PHASE II

(Project No. 92-21)

TMK: (2) 2-2-04/2-2-03

Kula • Maui • Hawaii



MAY 2002

FINAL ENVIRONMENTAL ASSESSMENT

KEOKEA LATERAL, PHASE II

TMK: (2) 2-2-04/2-2-03

Kula • Maui • Hawai'i

PREPARED FOR:
COUNTY OF MAUI
Department of Water Supply
200 South High Street
Wailuku, Maui, Hawaii 96793

Prepared by:
CHRIS HART & PARTNERS, INC.
1955 Main Street, Suite 200
Wailuku, HI 96793



MAY 2002



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Appendix A	Preliminary Design Engineering Criteria Report
Appendix B	Draft EA Comment and Response Letters



I. PROJECT INFORMATION

A. PURPOSE OF THE REQUEST

This environmental assessment has been prepared to assess the impacts associated with the County of Maui, Department of Water Supply's, Keokea Lateral, Phase II water system improvement project to include a new 8-inch water line and appurtenances for fire protection and water system improvements along Middle and Cross Roads, Keokea, Maui, Hawaii.

B. PROPERTY OWNER

Property Owner:	County of Maui
Address:	Department of Finance
(Road right-of-way)	250 South High Street
	Wailuku, Maui, Hawaii 96793
Tmk: 2-2-004: 094 (Lot 34-B)	Fong Aileen Lum Etal
Address:	495 Hukilike St. Bay 4
(Pressure Break Tank Site)	Kahului, HI 96732

C. ENGINEERING CONSULTANT

Engineering Consultant	RT Tanaka Engineers, Inc.
Address:	871 Kolu Street, Suite 201
	Wailuku, Maui, Hawaii 96793
Phone/Fax:	Phone: 808-242-6861, Fax: 808-244-7287
Contact:	Mr. Kirk Tanaka

D. PLANNING CONSULTANT

Land Use Planners:	Chris Hart & Partners
--------------------	-----------------------



Phone/Fax:
Contact:

1955 Main Street, Suite 200
Wailuku, Maui, Hawaii 96793-1706
Phone: 808-242-1955, Fax: 808-242-1956
Mr. Rory Frampton

E. PROPOSING AGENCY/ ACCEPTING AUTHORITY

Agency:

Department of Water Supply
County of Maui
200 South High Street
Wailuku, Maui, Hawaii 96793

Phone/Fax:

Phone: 808-270-7835, Fax: 808-270-7833

F. REQUIRED PERMITS AND APPROVALS

Grading Permit
Building Permit
Application for Permit to Perform Work upon County Highway

G. PRE-CONSULTED AGENCIES

A. COUNTY OF MAUI

Department of Planning
Department of Public Works and Waste Management

B. STATE OF HAWAII

State Historic Preservation Division



II. DESCRIPTION OF THE PROPERTY AND PROPOSED ACTION

A. PROPERTY LOCATION

The proposed waterline will be installed along the length of Cross Road from Middle Road to Kula Highway, and on a portion of Middle Road from Hookano Place to the front of parcel 18 TMK: (2) 2-2-004:018 (See: Figure Nos. 1, 2 and 3, "Regional Location", "Tax Map Key", and "Project Location").

B. EXISTING CONDITIONS

Keokea is situated on the western slopes of Haleakala, approximately 25 road miles southeast of Wailuku and is primarily a low-density rural and agricultural community. Cross and Middle Roads serve as minor rural collector roads and provide access to low-density rural and agricultural lots.

Both Cross Road and Middle Road have asphalt concrete pavement and grassed shoulders. The right of way contains utilities and improvements including overhead electric and telephone services, waterlines and water services, drainlines, mailboxes, driveways and walls.

C. LAND USE DESIGNATIONS

State Land Use Classification:	Rural / Agricultural (See: Figure No. 4, Land Use District Boundaries)
Makawao-Pukalani-Kula Community Plan:	Rural / Agriculture (See: Figure No. 5, Community Plan Map)



County Zoning:	Rural / Agricultural
Flood Zone Designation:	C
Special Designations	None

D. DESCRIPTION OF PROPOSED ACTION

The Department of Water Supply (DWS) is proposing to replace an existing substandard water system with a new water system comprising 3,200 lineal feet of new 8-inch waterline, installation of a 10,000 gallon pressure break water tank and appurtenances, water lateral replacements, connection to existing water meters, fire hydrants and appurtenances.

The existing water system within the project area includes 2 ½" (CI), 3" (CI), 2" (PE) and 1 ½" (Galv.) waterlines (See: Figure No. 6, "Existing Water System"). These waterlines serve the lots along Cross and Middle Roads. There is no fire protection along this stretch of the project area, except for fire hydrant (FH) 491 at Laumania and Cross Roads intersection, (FH) 396, and Standpipe 67 at Middle Road and Hookano Place.

The existing 2 ½" CI, 3" CI, 2" PE, 1 ½" galvanized and 2" galvanized waterlines will be replaced by new 8-inch ductile iron pipe (Class 52). The new waterline will be connected to the new 8-inch waterline at Kula Highway and will be tied-in to the existing 6-inch waterlines at the intersections of Cross and Middle Roads and Hookano Place. The waterline is about 3,200 lineal feet long and will require approximately seven (7) fire hydrants at 500 feet (max.) apart. Four of these fire hydrants will be installed on Cross Road and three (3) hydrants will be installed on Middle Road beginning at about 500 feet from the Hookano Place intersection. A 10,000-gallon tank will be installed as a pressure break located on Lot 34-B, Waiohuli-Keokea Subdivision at an elevation of 3,110 feet. The pressure break tank site will be acquired by the DWS and easements will be obtained for the access driveway and waterline. The new water mains will be installed with a cover between 3 and 8 feet according to DWS Standards. The proposed improvements also include water lateral replacements, installation of new fire hydrants and appurtenances and restoration of roadway facilities such as roadway pavement, markings, etc.



Abandonment of the existing waterlines and services will be done after the new system is ready for service. The existing buried pipes and service laterals will be plugged and abandoned in place.

The proposed improvements will require construction related work along Cross and Middle Roads within the County right-of-ways. Trenching will be required along the length of the project and will require the use of heavy construction equipment. Construction is anticipated to begin once all of the required State and County permits have been issued.

The estimated probable construction cost for the project is \$837,700.00. Construction of this project is anticipated to be completed in approximately seven (7) months.

E. PURPOSE AND NEED

The purpose of this project is to provide improved water distribution service for Keokea area residents and businesses. The affected community has expressed concern over inadequate fire protection, water pressure, and water quality due to the presence of inadequate lines. Implementation of the project will improve system services, reliability, and provide adequate fire flow protection for the existing uses in the area.

The DWS uses the Land Use and Zoning designations to determine the design criteria for improvements. The controlling land use on Cross Road and Middle Road is Rural. The zoning of the parcels in the Fong Store vicinity is County Town/Business and Residential. The County Town/Business zoning, by its nature of allowable uses, may resemble uses closer to residential standards. Thus, an 8-inch waterline is recommended in order to satisfy the fire flow requirement for the area.

F. ALTERNATIVES

1. No Action

Analysis. As discussed, the existing water system within the project area includes 2 1/2" (CI), 3" (CI), 2" (PE) and 1 1/2" (Galv.) waterlines. These waterlines serve rural and agricultural lots along Cross and Middle Roads. There is no fire protection along this



stretch of the project area, except for fire hydrant (FH) 491 at Laumania and Cross Roads intersection, Standpipe 67 at Middle Road and Hookano Place intersection and Standpipe 34 at Middle Road in From of parcel 76 (TMK: 3-2-003:076).

Keokea area residents have expressed concerns to the DWS regarding inadequate fire protection, water pressure, and water quality due to the existing substandard lines. According to DWS standards, an 8-inch waterline is recommended to satisfy the fire flow requirement for the area. The No Action alternative would not address the current substandard condition of the existing water system within the project area and would not address the community's concern regarding inadequate fire protection, water pressure, and water quality.

2. Alternative Design

Analysis. The proposed water system could be designed to exceed the minimum subdivision fire flow requirements established by the DWS for rural land uses. However, exceeding the minimum guidelines for fire flow requirements is unnecessary in consideration of the proposed land use pattern for the area as established by the Makawao-Pukalani-Kula Community Plan.



III. DESCRIPTION OF THE EXISTING ENVIRONMENT, POTENTIAL IMPACTS AND MITIGATIONS MEASURES

A. PHYSICAL ENVIRONMENT

1. Land Use

Existing Conditions. Keokea is situated on the western slopes of Haleakala, approximately 25 road miles southeast of Wailuku, and is primarily a low-density rural and agricultural community. The development pattern offers a mixture of low-density rural lots intermixed with agricultural land uses. Fong's store, the St. John's Episcopal Church, Keokea Park and School, and the Kula Sanatorium offer healthcare, goods and services to area residents. The predominant agricultural land use in Keokea is cattle ranching with truck farming also having a considerable impact on the region's settlement pattern. Extensive agricultural land uses generally contributes to the areas vast open space resources and unobstructed view corridors of the Pacific Ocean and Haleakala.

The proposed waterline will parallel Cross and Middle Roads, within the County right-of-ways. Adjacent properties to the east, west, south, and north support a land use pattern of low-density rural and agricultural homesteads that abut vast open space agricultural lands. The Community Plan Map presents an illustration of the range of potential future land uses planned within the immediate area (See: Figure No. 4, "Community Plan Map"). The following is a description of zoning, community plan designations, and existing land uses adjacent to the subject property.

North:

Zoning: Rural and Agricultural

Community Plan: Rural and Agricultural

Existing uses. Rural Homesteads, Limited Truck Farming, Cattle Ranching



Potential Impacts and Mitigation Measures. The proposed project will require excavation for installation of the underground waterline. Short-term environmental impacts to the topography and landform will be limited to those associated with roadwork and excavation. As the site has been previously graded and because the roads and streets will be restored to original grade, there are no significant long-term impacts to topography and landforms.

There are no significant topographic constraints at the proposed project site. Clearing and grading activities will be minimal and will therefore produce no significant impact to the soil or topography.

3. Terrestrial Biota (Flora and Fauna)

Existing Conditions. The subject road right-of-way strip has experienced grubbing, grading, and cutting while the surrounding area has an active history of cattle grazing and diversified agricultural activities. These agricultural related activities have had a significant impact on the types of flora and fauna that exist within the area. The subject right-of-way has been cleared of any significant vegetation. During the field reconnaissance survey of the site, vegetation observed included various bushes and grasses. No known rare, endangered or threatened species of flora and fauna was observed on the site.

Animal life in the project vicinity similarly reflects the rural and agricultural character of the region. Avifauna typically found in Kula includes the common myna, several species of dove, cardinal, house finch, game birds such as Pheasant and Franklin, and house sparrow. Mammals common to the area include cats, dogs, cows, horses, rodents, and mongoose.

Potential Impacts and Mitigation Measures. There are no known significant habitats of rare, endangered, or threatened species of flora and fauna located on the subject property. Thus, there will be no impact to rare, threatened, or endangered species as a result of the proposed action. Existing vegetation will be removed to accommodate the project.



4. Flood and Tsunami Hazard

Existing Conditions. The Flood Insurance Rate Map for the area (Panel Number 150003 0270) shows the subject property within Flood Zone C. Flood Zone C represents an area of minimal flooding.

Potential Impacts and Mitigation Measures. The proposed action will not involve any construction within a flood hazard area.

5. Air Quality

Existing Conditions. Air quality refers to the presence or absence of pollutants in the atmosphere. It is the combined result of the natural background and emissions from many pollution sources. The impact of land development activities on air quality in a proposed development's locale differs by project phase (site preparation, construction, occupancy) and project type. In general, air quality in the Kula region is considered good. There are no point sources of airborne emissions in the immediate vicinity of the project site. Non-point sources (e.g., automobiles) of emissions are not significant to generate a high concentration of pollutants. The relatively high quality of air can also be attributed to the region's constant exposure to wind, which quickly disperses concentrations of emissions. The Kula area is currently in attainment of all criteria pollutants established by the Clean Air Act, as well as the State of Hawaii Air Quality Standards.

Potential Impacts and Mitigation Measures. Air quality impacts attributed to the proposed action could include dust generated by the short-term construction related activities. Site work such as grading and trenching, for example, could generate airborne particulate. Standard dust control measures such as regular watering will be implemented to minimize the potential impact from wind-blown emissions. The project is not anticipated to generate additional traffic and will therefore not increase vehicular emissions such as carbon monoxide. Thus, the proposed action is not anticipated to be detrimental to local air quality.

6. Noise Characteristics

Existing Conditions. The noise level is an important indicator of environmental quality. In an urban environment, noise is due primarily to vehicular traffic, air traffic, heavy machinery, and heating, ventilation, and air-conditioning equipment. Ramifications of



various sound levels and types may impact health conditions and an area's aesthetic appeal. Noise levels in the vicinity of the project area are generally low. Vehicular traffic along Kula Highway is the predominant source of background noise in the vicinity of the subject property.

Potential Impacts and Mitigation Measures. In the short-term, the proposed project could generate some adverse impacts during construction. Noise from heavy construction equipment would be the dominant source of noise during the construction period. To minimize construction related impacts to the surrounding neighbors, the developer will limit construction activities to normal daylight hours, and adhere to the State Department of Health's noise regulations for construction equipment. In the longer-term, the proposed project should not significantly impact existing noise conditions in the area since the project will not generate significant traffic or produce an increase in ambient noise levels.

7. Archaeological/Historical Resources

Existing Conditions. The proposed project will be located primarily within the existing road right-of-way along Cross and Middle Roads and within an existing grassed pasture where the proposed 10,000 gallon pressure break water tank will be constructed. The right-of-way has previously experienced grubbing, grading, and cutting, is grassed, and contains utilities and improvements including overhead electric and telephone services, waterlines and water services, drainlines, mailboxes, driveways and walls.

Potential Impacts and Mitigation Measures. A site inspection was conducted with the State Historic Preservation Division, Department of Land and Natural Resources, (SHPD, DLNR), and it was determined that archeological sites are unlikely to exist on the affected area and therefore an Archaeological Inventory Survey isn't warranted for the project.

8. Visual Resources

Existing Conditions. The subject property offers sweeping makai views of the Western slope of Haleakala, West Maui, and the Pacific Ocean.

Potential Impacts and Mitigation Measures. Due to the subsurface nature of the project, the proposed waterline replacement project will not have any impact upon the visual character of the site and its immediate environs. The proposed 10,000-gallon



pressure break tank is situated in a cut area on the side of gulch where existing trees blend the site with the surrounding area. Views of the site from Cross and Middle roads are screened by a grove of waddle trees and the tank will not block mauka views given the steepness of terrain in the area. The tank will be painted with colors that blend in with the surrounding hillside.

9. Agricultural Resources

In May 1967 the Land Study Bureau (LSB) established a five-class rating system to determine the relative productivity of agricultural lands in the County, using the letters A, B, C, D, and E, with A representing the class of highest productivity and E the lowest. The LSB ratings have become the standard by which the productivity of agricultural land is measured in the State.

The subject property affected by the waterline maintains an overall productivity rating of "B" and "C" by the LSB, indicating a relatively high productive agricultural capacity.

The subject property is not classified by the State of Hawaii's Agricultural Lands of Importance to the State of Hawaii's classification system.

The proposed action will not displace or conflict with land currently being utilized for active agricultural purposes.

B. SOCIO-ECONOMIC ENVIRONMENT

1. Population

Existing Conditions. Maui County experienced relatively strong population growth during the past decade with the 2000 resident population expanding to 128,241, an 80.6% increase over the 1980 population of 70,991 (United States Department of the Census, 2000). Population growth is projected to continue with the year 2010's resident population projected to reach 140,060 (County of Maui, Office of Economic Development, June 2000). Similarly, visitor growth has increased significantly in the County over the last decade with the average daily visitor count increasing from 15,363 in 1980 to 43,270 in 1997, a 280% increase in visitors per day. Thus, the County's defacto population, defined as all persons physically present in an area, grew to 162,300 in 1997,



an 88% increase over 1980 levels (County of Maui, Office of Economic Development, June 2000).

Similarly, Kula experienced high growth rates as is witnessed by a 20.5% increase in population from 5,525 in 1990 to 6,659 in 2000 (United States Department of the Census, 2000).

Potential Impacts and Mitigation Measures. The proposed project will not induce any significant change in the region's population.

2. Economy

Existing Conditions. Tourism and agriculture are the predominant components of Maui County's economy. Large-scale mono-crop agriculture, including sugar, pineapple, and cattle ranching, is the County's dominant agricultural land use and generates the majority of the County's agricultural revenues (County of Maui, Department of Business Economic Development and Tourism, 2000).

The Makawao-Pukalani-Kula region is rooted in these agricultural land uses, which continue to have a major impact on the region's physical and socio-cultural environment. The region is also celebrated as a major supplier of diversified crops with numerous small farms engaged in the growing and harvesting of "Kula" onions, cabbage, herbs, tomatoes, corn, carnation, protea, and other diversified crops. However, agriculture's importance as an employer of Upcountry residents has diminished significantly over the last several decades, and today Kula is largely a bedroom community serving employment centers in Wailuku, Kahului, and Kihei.

Potential Impacts and Mitigation Measures. The project will generate construction-phase economic impacts that are generally short-term effects. They include employment, income, and expenditure impacts that are created by on-site and off-site construction employment, on-site and off-site trade/transportation/service employment, and manufacturing employment in support of construction.

Long-term operation phase employment. The proposed project will improve water service in the project area to the benefit of area businesses. It is not anticipated that the proposed project will induce any significant long-term employment impacts within the region.



C. PUBLIC SERVICES

1. Recreational Facilities

Existing Conditions. Kula is serviced by several recreational facilities that provide indoor and outdoor activities for the area's residents. These facilities include the County's Eddie Tam Park/Gym, Pukalani Recreation Center, Keokea Park, Rice Park, Kula Gym, Sun Yet Sen Park, Waiakoa Gym, and the Kula Ball Park.

Potential Impacts and Mitigation Measures. The proposed project will not significantly increase demand for the region's recreational facilities since it will have no effect on regional population.

2. Police and Fire Protection

Existing Conditions. The County of Maui's Police Department is headquartered at its Wailuku Station, which provides service to Upcountry residents. The nearest police substation is located at the Eddie Tam Gymnasium in Makawao, approximately 2.5 miles away.

Potential Impacts and Mitigation Measures. Since the proposed development will not result in an overall significant increase in population levels, the proposed project is not anticipated to have an adverse impact upon existing emergency response, 911 calls, and other police and fire protection services. Implementation of the project will improve water system reliability and provide adequate fire flow protection for the existing uses in the area.

3. Schools

Existing Conditions. The Makawao-Pukalani-Kula region is serviced by both private and public schools, which provide education from preschool through high school. Public schools in the region include the Makawao Elementary School, Kalama Intermediate School, Pukalani Elementary School, Kula Elementary School, and King Kekauliki High School.

Potential Impacts and Mitigation Measures. The proposed project will not produce a significant increase in the number of school age children residing in Upcountry Maui and will therefore not have an impact upon school facilities.



4. Medical Facilities

Existing Conditions. The Wailuku based Maui Memorial Medical Center provides centralized medical services for the Island. Limited services are also available at Kula Sanatorium. Medical and dental offices are located in Pukalani and Makawao to serve the Upcountry region's residents.

Potential Impacts and Mitigation Measures. As noted, since the proposed project will not induce an increase in population levels, the project is not anticipated to produce an adverse impact upon existing medical facilities.

5. Solid Waste

Existing Conditions. Only two landfills are currently operating on Maui, the Central Maui Landfill in Puunene, and the Hana landfill. Solid waste generated in the Upcountry region is transported to the Central Maui Landfill in Puunene.

Potential Impacts and Mitigation Measures. Since the volume of waste generated will be minimal it will not produce a significant impact upon the Central Maui landfill. The contractor will deposit any solid waste generated during construction into the Maalaea landfill as required by the County.

D. INFRASTRUCTURE

1. Roadways and Traffic

The subject property is situated along Cross Road from Middle Road to Kula Highway, and on a portion of Middle Road from Hookano Place to the front of Parcel 18, TMK: 2-2-004:018. Cross and Middle Roads are two lane minor rural collector roads that provide access to rural and agricultural residences. Kula Highway is a two lane minor arterial. Kula Highway provides access to Keokea and Ulupalakula. Kula Highway is signalized at Makawao Highway and has a double yellow striped median.

Potential Impacts and Mitigation Measures. During construction, one lane of traffic will be affected along Cross and Middle Roads adjacent to the immediate area where construction related activities are occurring. Given the limited number of vehicular trips occurring along Cross and Middle Roads, the proposed project should not significantly



impact traffic conditions during construction. Once completed, the proposed project should not significantly impact roadway conditions in the area.

2. Water

Existing Conditions. The Upper Kula water system is supplied by surface water runoff collected on the windward slopes of Haleakala. The Upper Kula line is primarily supplied by a series of intakes in the Waikamoi Forest Reserve. Water treatment is provided by the Olinda water treatment plant.

The existing water system within the project area includes 2 ½" (CI), 3" (CI), 2" (PE) and 1 ½" (Galv.) waterlines (Exhibit 2). These water lines serve the lots along Cross and Middle Roads. The existing waterlines will be replaced by a new 8-inch ductile iron pipe (Class 52). The new waterline will be connected to the 8-inch waterline under construction at Kula Highway and will be tied-in to the existing 6-inch waterlines at the intersections of Cross and Middle Road and Hookano Place. The proposed project also includes the construction of a 10,000 gallon pressure break water tank and appurtenances, water lateral replacements, connection to existing water meters, fire hydrants and appurtenances.

Potential Impacts and Mitigation Measures. Over the long-term, surrounding uses will benefit by the improved water service. However, although distribution efficiency will be enhanced, the proposed project will not result in an increase in water source capacity to Upcountry Maui.

3. Drainage and Sewer

The proposed project will have no impact or need for drainage, or wastewater disposal.

4. Electrical and Telephone

Existing Conditions. There are existing overhead electrical and telephone distribution systems on Middle and Cross Roads fronting the project site.

Potential Impacts and Mitigation Measures. The proposed project will not require short- or long-term use of adjacent electrical and telephone infrastructure and will therefore have no impact upon Electrical and Telephone systems in the area.



IV. RELATIONSHIP TO GOVERNMENTAL PLANS, POLICIES, AND CONTROLS

A. STATE LAND USE

Chapter 205, Hawaii Revised Statutes, relating to the Land Use Commission, establishes four major land use districts into which all lands in the State are placed. These districts are designated Urban, Rural, Agricultural, and Conservation. The proposed project is within the State "Rural" and "Agricultural" District and is permitted as a "public utility".

B. GENERAL PLAN OF THE COUNTY

The General Plan of the County of Maui (1990 update) provides long-term goals, objectives, and policies directed toward improving living conditions in the County. The following General Plan Objectives and Policies are applicable to the proposed project:

Goal: WATER

Objective No. 1.: To provide an adequate supply of potable and irrigation water to meet the needs of Maui County's Residents.

Policy:

- a. Support the improvement of water distribution systems to those areas that historically experience critical water supply problems provided the improvements are consistent with the water priorities and the County's Water Use and Development Plan provisions for the applicable community plan area.
- c. Develop improved systems to provide better fire protection.



C. MAKAWAO-PUKALANI-KULA COMMUNITY PLAN

Nine community plan regions have been established in Maui County. Each region's growth and development is guided by a community plan, which contains objectives and policies in accordance with the Maui County General Plan. The purpose of the community plan is to outline a relatively detailed agenda for carrying out these objectives.

The subject property is located within the Makawao-Pukalani-Kula Community Plan region. The Community Plan was recently adopted by ordinance No. 2510 on July 23, 1996. The Makawao-Pukalani-Kula Community Plan Land Use Map identifies the project area as Rural and Agricultural. The proposed project is consistent with the "Rural" and "Agricultural" designation.

The Makawao-Pukalani-Kula Community Plan identifies major problems and opportunities of the region. One of the major problems identified in the Community Plan is the limited development of water resources and distribution systems to meet the needs of the region (Pg. 11). The proposed project will serve to address this issue.

The proposed water system improvement project is consistent with the following Makawao Pukalani-Kula Community Plan objectives and policies:

PHYSICAL INFRASTRUCTURE

Goal

The timely and environmentally sensitive development and maintenance of infrastructure systems which protect and enhance the safety and health of Upcountry's residents and visitors, including the provision of domestic water, utility and waste disposal services, and effective transportation systems which meet the needs of residents and visitors while maintaining the region's rural character.



Water

Objectives and Policies

3. The Department of Water supply shall expand water supply and distribution systems, including catchment systems, in accordance with the directions set forth in the Makawao-Pukalani-Kula Community Plan.

Implementing Actions

3. Systematically improve and upgrade the existing water delivery system.

D. MAUI COUNTY ZONING

The proposed project is situated within the County's Rural and Agricultural Districts and is permitted as a "minor utility facility".

E. ENVIRONMENTAL ASSESSMENT SIGNIFICANCE CRITERIA

In accordance with Title 11, Department of Health, Chapter 200 and Subchapter 6, Section 11-200-12, Environmental Impact Statement Rules, and based on the detailed analysis contained within this document, the following conclusions are supported:

1. The proposed action will *not* result in an irrevocable commitment to loss or destruction of natural or cultural resources.

Analysis. As documented in this report, the proposed project will not involve the loss or destruction of any natural or cultural resource (See Section III.A.B.C.D).

2. The proposed action will *not* curtail the range of beneficial uses of the environment.

Analysis. The proposed project will be located within the existing road right-of-way and will not negatively impact future land use opportunities for adjacent properties. The proposed water system improvements will improve water service to existing residential, commercial, and agricultural users.



3. The proposed action will *not* conflict with State or County long-term environmental policies and goals as expressed in Chapter 344, HRS, and those which are more specifically outlined in the Conservation District Rules.

Analysis. The project is being developed in compliance with the State's long-term environmental goals. As documented in this report, the proposed project will not cause negative impact to the environment, including flora and fauna, archeological and cultural resources, and scenic resources. All required permits will be obtained prior to construction and the project will be built in accordance with all required State and County water quality standards.

4. The proposed action will *not* substantially affect the economic or social welfare and activities of the community, county or state.

Analysis. The proposed project will provide improved water transmission and distribution service for Keokea area residents and businesses. The affected community has expressed concern over inadequate fire protection, water pressure, and water quality due to the existing inadequate lines. Implementation of the project will improve system reliability and provide adequate fire flow protection for the existing uses in the area thereby improving the economic and social welfare and activities of the Keokea community.

5. The proposed action will *not* substantially affect public health.

Analysis. As discussed, the proposed project will be built in accordance with all required State and County water quality standards. In addition, implementation of the project will improve system reliability and provide adequate fire flow protection for the existing uses in the area thereby improving public health for area residents.

6. The proposed action will *not* result in substantial secondary impacts.

Analysis. As discussed, over the long-term, surrounding uses will benefit by the improved water service. However, although regional distribution efficiency will be enhanced, the proposed project will not result in an increase in water source capacity to Upcountry Maui. As such, the proposed project is not anticipated to induce population growth or cause any other affects that would induce a change in the pattern of land use within the area.



7. The proposed action will *not* involve substantial degradation of environmental quality.

Analysis. Mitigation measures will be implemented during the construction phase in order to minimize negative impacts on the environment, especially with regards to construction runoff. Other environmental resources such as endangered species of flora and fauna, air and water quality, and archeological resources will not be significantly impacted by the subject project.

8. The proposed project will not produce cumulative impacts and does *not* have considerable effect upon the environment or involve a commitment for larger actions.

Analysis. The proposed project does not involve a commitment for larger action on behalf of the applicant or any public agency. In addition, the project is not anticipated to induce population growth and will therefore not produce considerable effect on the environment nor require a commitment for larger actions by governmental agencies.

9. The proposed project will *not* affect a rare, threatened, or endangered species, or its habitat.

Analysis. As described in Section III.A.3 of this report, there are no rare, threatened, or endangered species of flora and fauna at the project site.

10. The proposed action will *not* substantially or adversely affect air and water quality or ambient noise levels.

Analysis. As described in Section III.A.5 of this report, there is a potential for negative impacts to air or water quality and ambient noise levels related to short-term construction activities. Air, noise and dust impacts will be mitigated through implementation of standard mitigation measures as identified previously in this report. It is not anticipated that there will be significant long-term impacts to air or water quality and ambient noise levels due to the operation phase of the development.

11. The proposed action will *not* substantially affect or be subject to damage by being located in an environmentally sensitive area, such as flood plain, shoreline, tsunami zone, erosion-prone areas, estuary, fresh waters, geologically hazardous land or coastal waters.



Analysis. The proposed project lies within Flood Zone C, an area of minimal flood and tsunami hazard, as determined by the Flood Insurance Rate Map for the region. The proposed project will have no effect upon the existing flood or tsunami areas.

12. The proposed action will *not* substantially affect scenic vistas or view planes identified in county or state plans or studies.

Analysis. As discussed in Section III.A.8 of this report, due to the subsurface nature of the project, the proposed waterline replacement project will not have any impact upon the visual character of the site and its immediate environs.

13. The proposed action will not require substantial energy consumption

Analysis. The proposed project will not require hook-up to Maui Electric Company facilities and will therefore not require substantial energy consumption.



V. FINDINGS AND CONCLUSIONS

The purpose of the Department of Water Supply's Keokea Lateral, Phase II, water system improvement project is to provide improved water transmission and distribution service for Keokea area residents and businesses. The affected community has expressed concern over inadequate fire protection, water pressure, and water quality due to the existing inadequate lines. Implementation of the project will improve system reliability and provide adequate fire flow protection for the existing uses in the area.

The project involves replacing the existing water system along Cross and Middle Roads with a new water system comprising 3,200 lineal feet of 8-inch waterline, installation of a 10,000 gallon pressure break water tank and appurtenances, water lateral replacements, connection to existing water meters, fire hydrants and appurtenances, and restoration of roadway facilities such as roadway pavement, markings, etc. The new waterline will be connected to the 8-inch waterline at Kula Highway and will be tied-in to the 6-inch waterlines at the intersections of Cross and Middle Roads.

The proposed improvements will require construction related work along Cross and Middle Roads within the County right-of-ways. Trenching will be required along the length of the project and will require the use of heavy construction equipment.

As documented in this report, the proposed improvements will not significantly impact environmental resources in the area, including noise, air, and water quality; visual resources; archaeological or historic sites; and agricultural resources and users. The subject project will not induce population growth and will therefore not impact public services and infrastructure systems such as police and fire protection, medical facilities, schools, roadways, water, wastewater, electrical, and telephone facilities.

In light of the forgoing, it is hereby concluded that the proposed project will not result in significant impacts to the environment and a Finding of No Significant Impact (FONSI) is warranted..



VI. REFERENCES

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- County of Maui, Department of Planning. 1996. *Makawao-Pukalani-Kula Community Plan*. Wailuku, Hawaii.
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- University of Hawaii, Land Study Bureau. May 1967. *Detailed Land Classification – Island of Maui*. L.S.B. Bulletin No. 7. Honolulu, Hawaii.
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- U.S. Department of Agriculture, Soil Conservation Service in Cooperation with the University of Hawaii, Agricultural Experiment Station. 1972. *Soil Survey of the Islands of Kauai, Oahu, Maui, Molokai, and Lanai, State of Hawaii*. Washington, D.C.



FIGURES

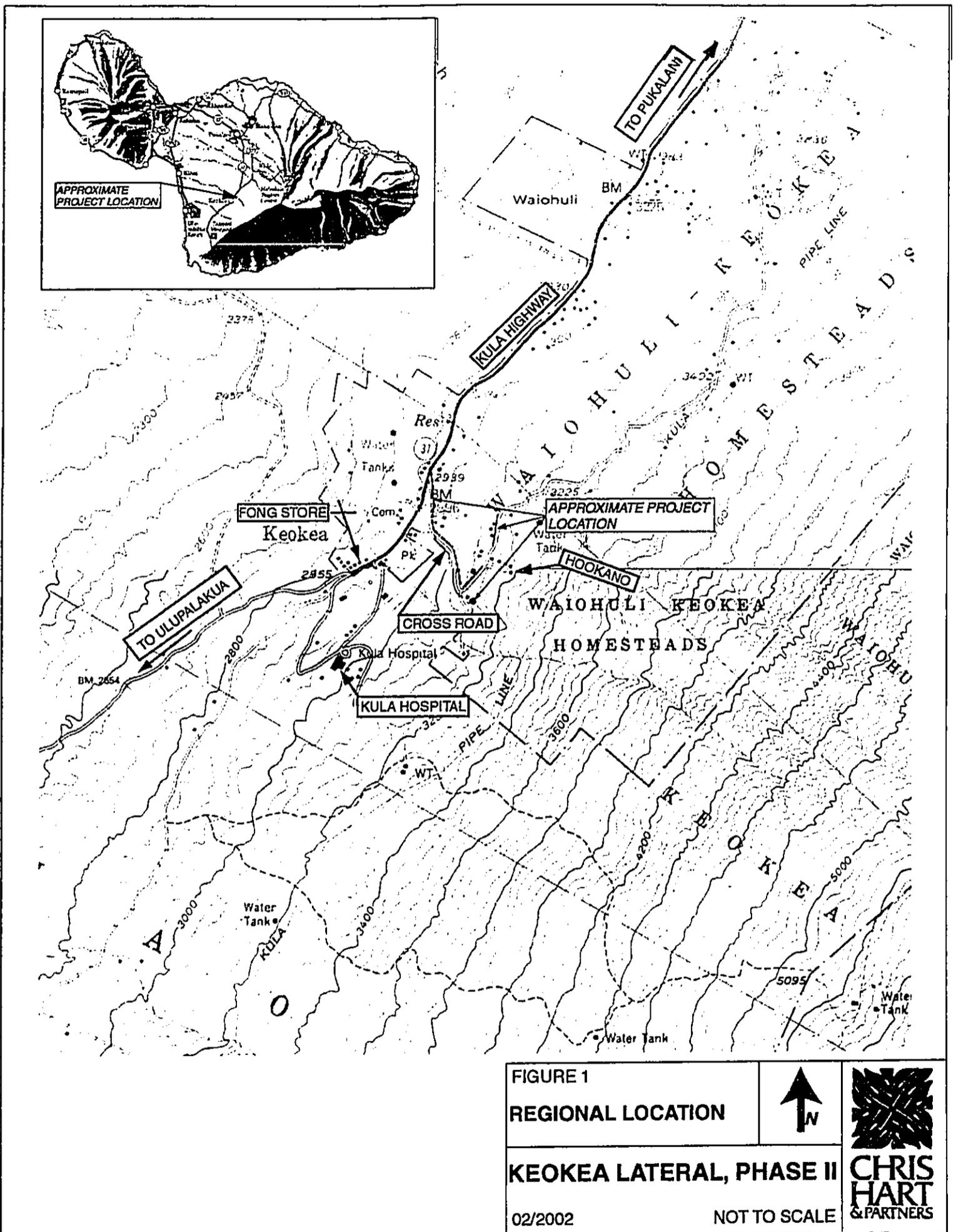


FIGURE 1
REGIONAL LOCATION



KEOKEA LATERAL, PHASE II
02/2002

NOT TO SCALE

CHRIS
HART
& PARTNERS

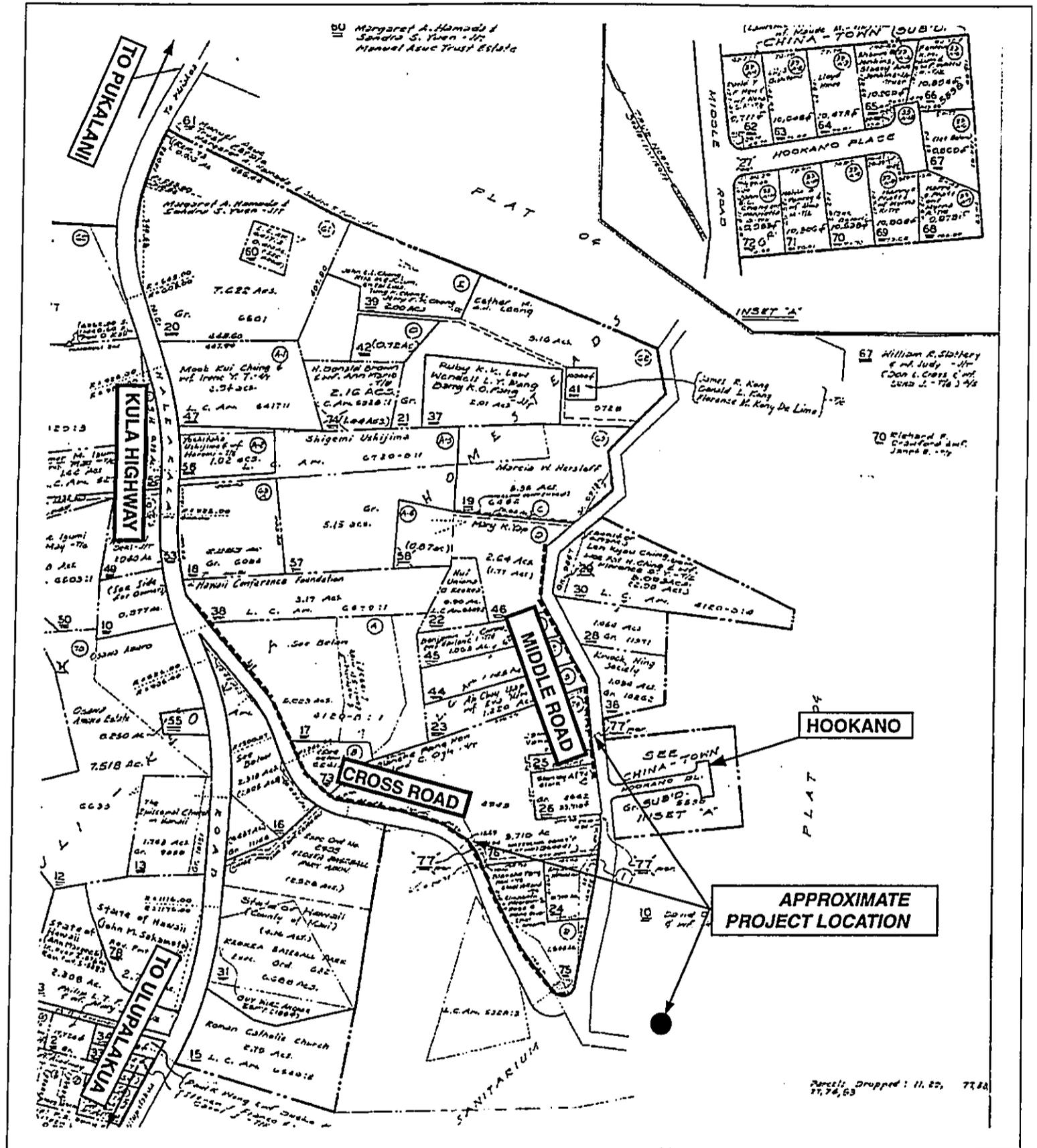


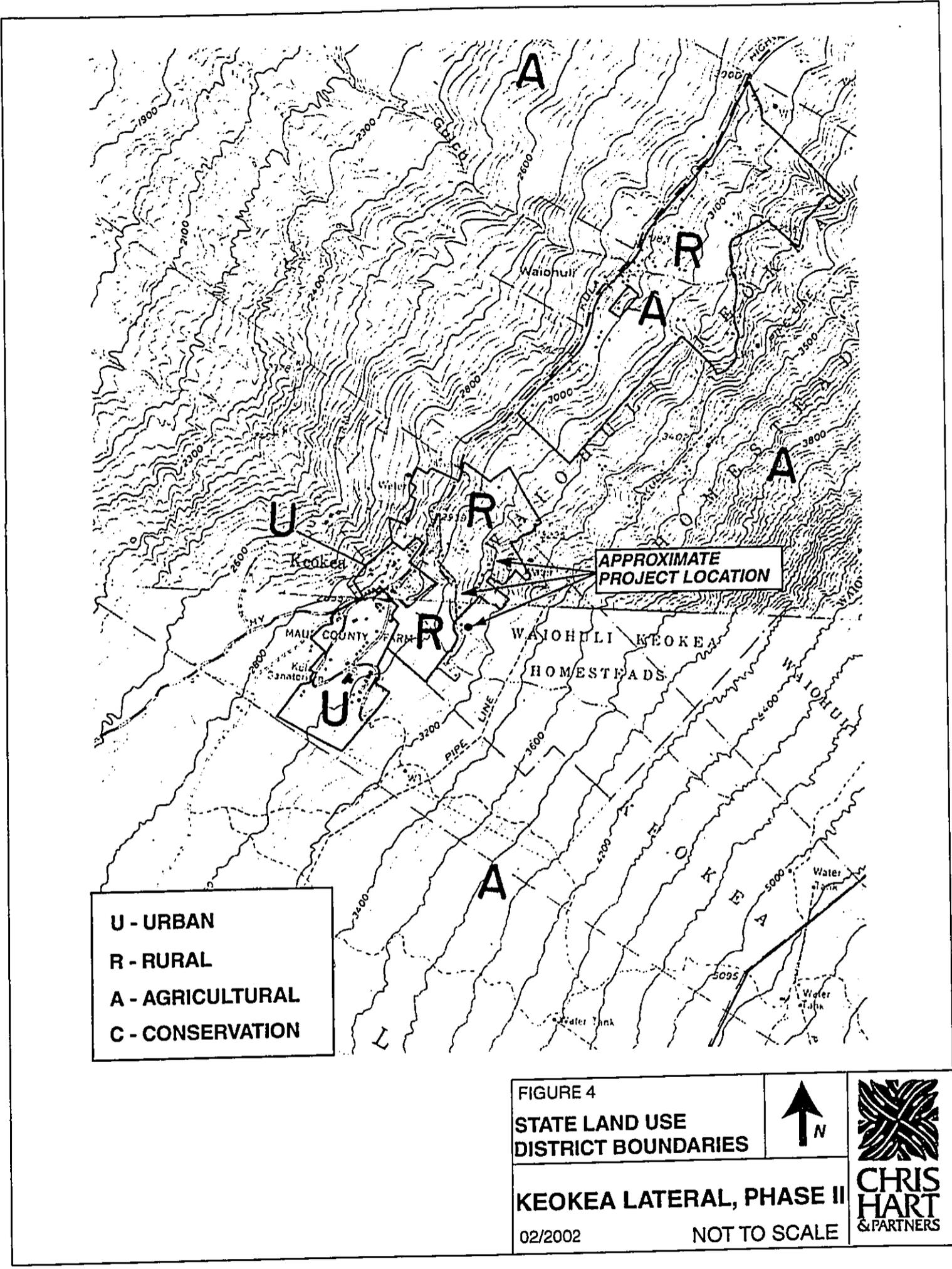
FIGURE 2
TAX MAP KEY
PLAT NO. 2-2-003

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KEOKEA LATERAL, PHASE II

02/2002 NOT TO SCALE

CHRIS HART & PARTNERS



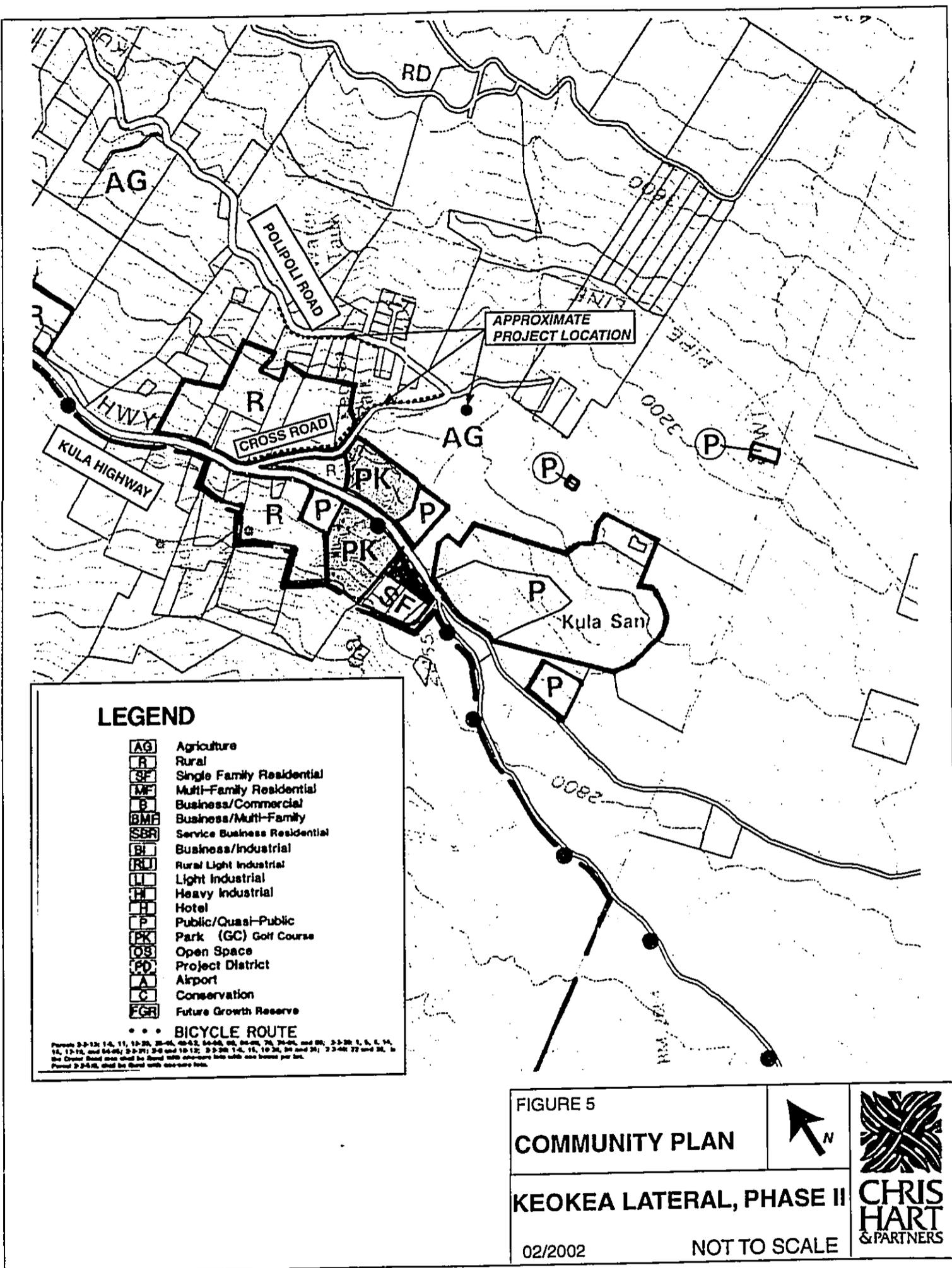
U - URBAN
R - RURAL
A - AGRICULTURAL
C - CONSERVATION

FIGURE 4
STATE LAND USE
DISTRICT BOUNDARIES



KEOKEA LATERAL, PHASE II
02/2002 NOT TO SCALE

CHRIS
HART
& PARTNERS



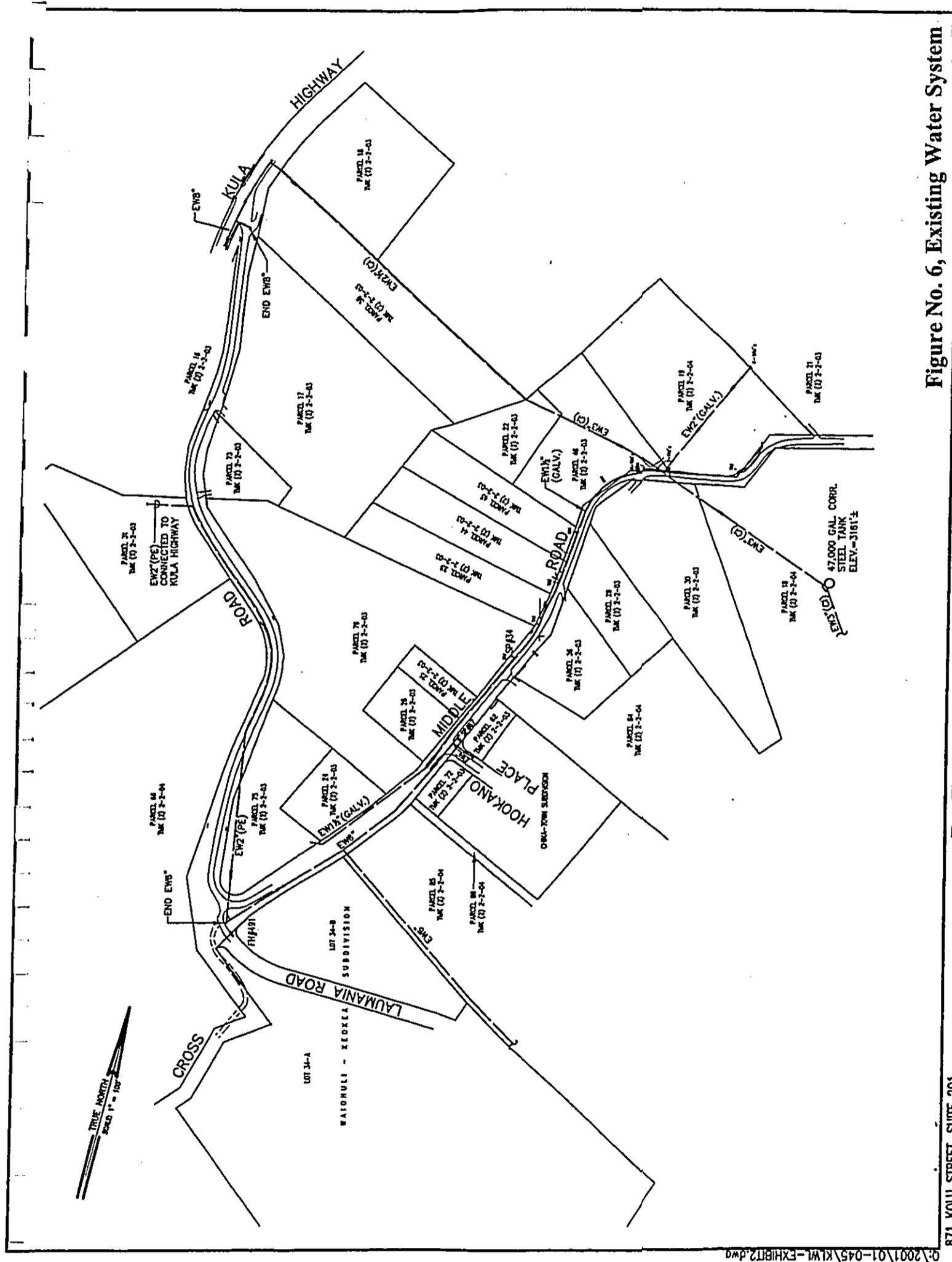
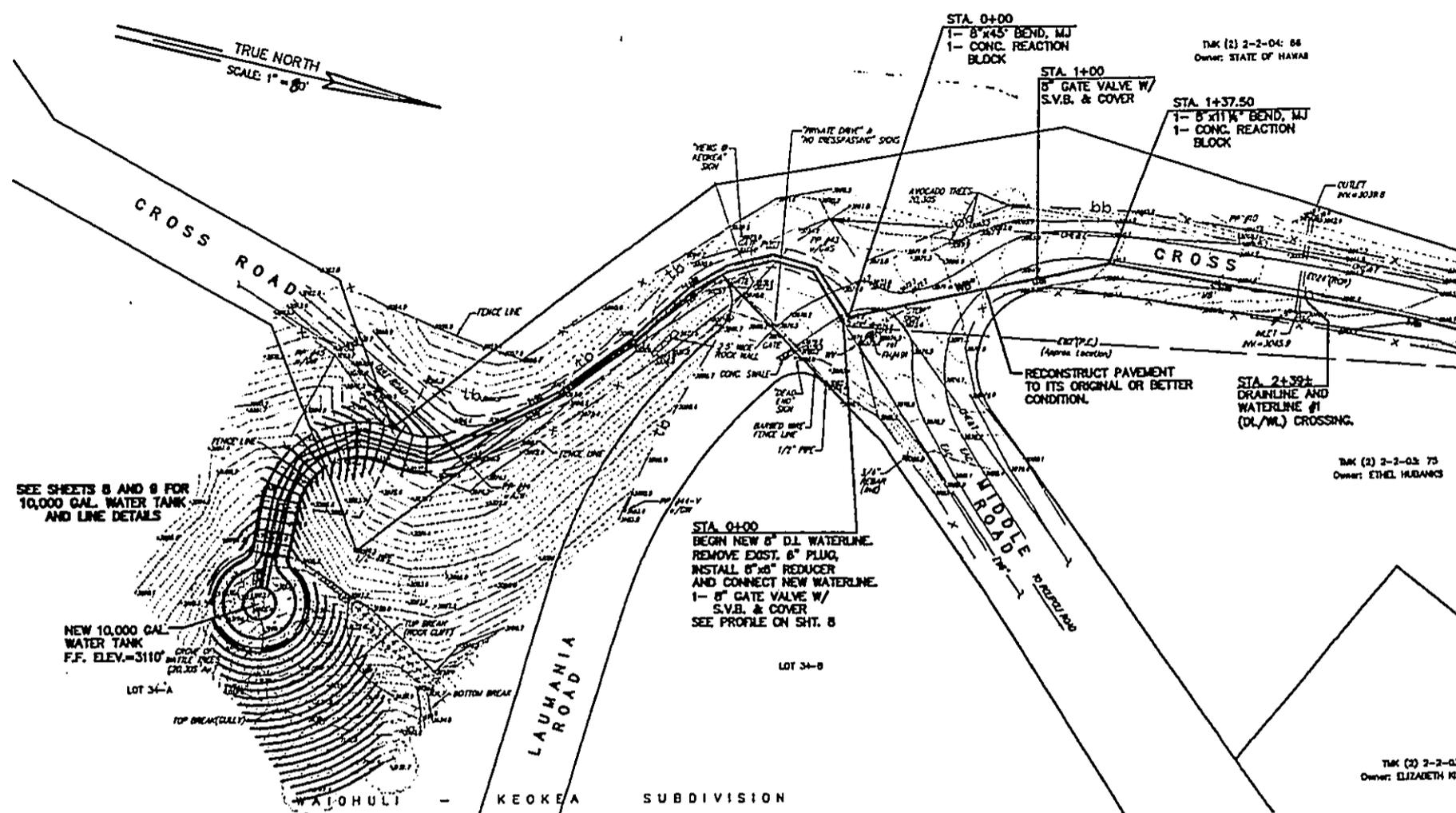
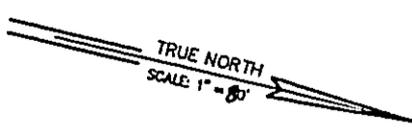


Figure No. 6, Existing Water System

871 KOLU STREET, SUITE 201
WAILUKO, MAUI, HAWAII 96793

R. T. TANAKA ENGINEERS, INC.
LAND SURVEYORS - CIVIL & STRUCTURAL ENGINEERS

JOB NO. 01-045



SEE SHEETS 8 AND 9 FOR
10,000 GAL. WATER TANK
AND LINE DETAILS

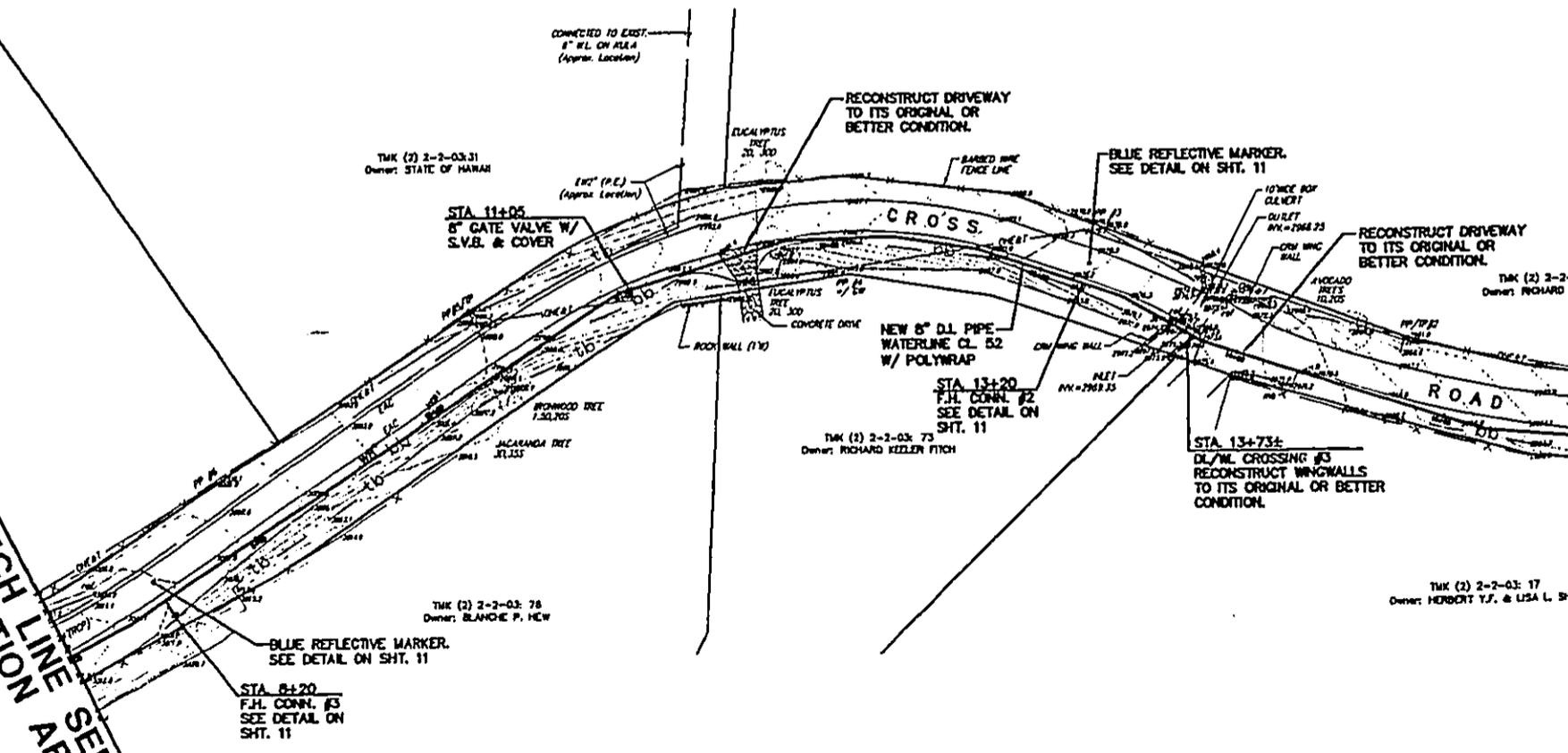
NEW 10,000 GAL.
WATER TANK
F.F. ELEV.=3110'

STA. 0+00
BEGIN NEW 8" D.I. WATERLINE.
REMOVE EXIST. 6" PLUG,
INSTALL 6"x6" REDUCER
AND CONNECT NEW WATERLINE.
1- 8" GATE VALVE W/
S.V.B. & COVER
SEE PROFILE ON SHT. 8

RECONSTRUCT PAVEMENT
TO ITS ORIGINAL OR BETTER
CONDITION.

STA. 2+39.4
DRAINLINE AND
WATERLINE #1
(D.I./W.L.) CROSSING.

MATCH LINE SEE
CONTINUATION ABOVE



STA. 11+05
8" GATE VALVE W/
S.V.B. & COVER

NEW 8" D.I. PIPE
WATERLINE CL. 52
W/ POLYWRAP

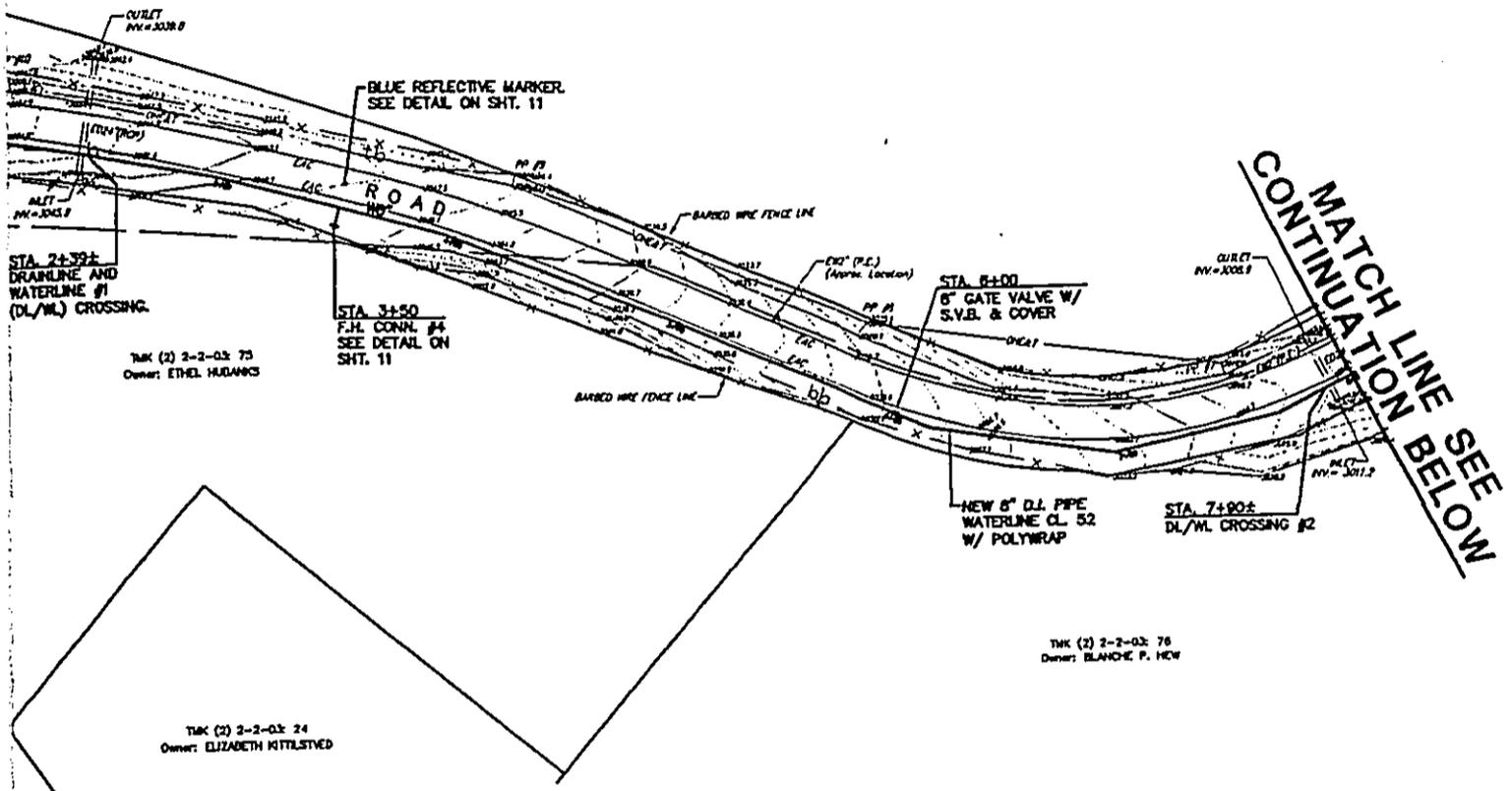
STA. 13+20
F.J.L. CONN. #2
SEE DETAIL ON
SHT. 11

STA. 13+73.4
DL/WL CROSSING #3
RECONSTRUCT WINGWALLS
TO ITS ORIGINAL OR BETTER
CONDITION.

STA. 8+20
F.J.L. CONN. #3
SEE DETAIL ON
SHT. 11

12-2-04: 88
STATE OF HAWAII

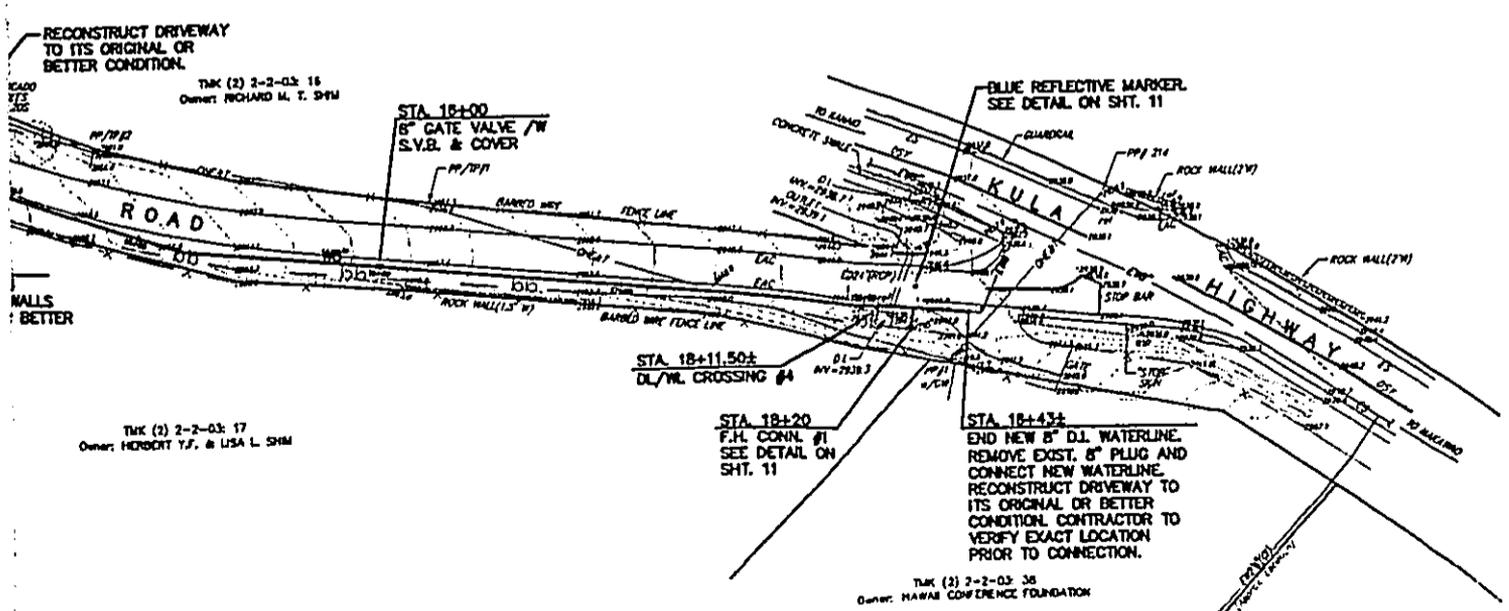
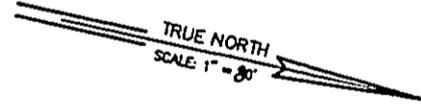
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Y BEND, WJ
REACTION



MATCH LINE SEE
CONTINUATION BELOW

TKK (2) 2-2-03: 76
Owner: BLANCHE P. HEW

TKK (2) 2-2-03: 24
Owner: ELIZABETH KITTLSTVED

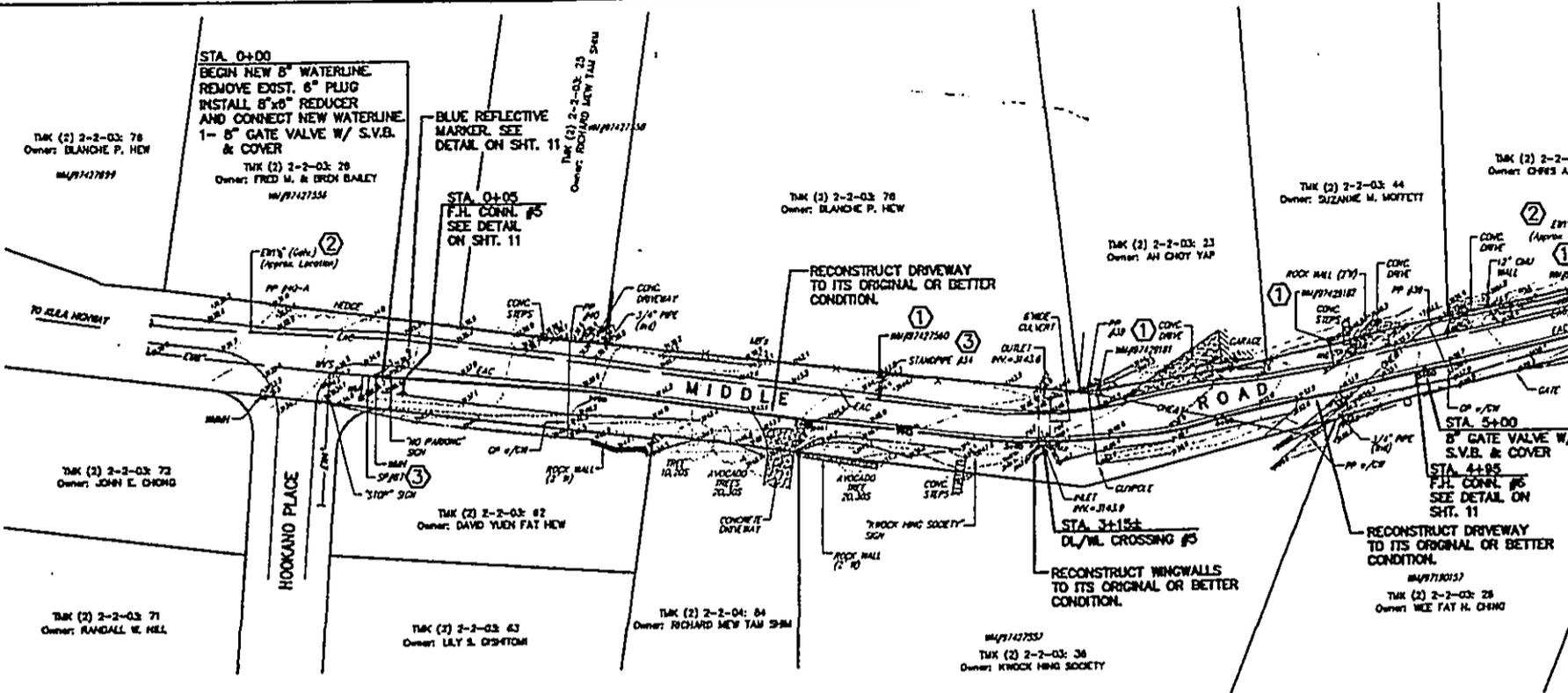


TKK (2) 2-2-03: 16
Owner: RICHARD M. T. SHIM

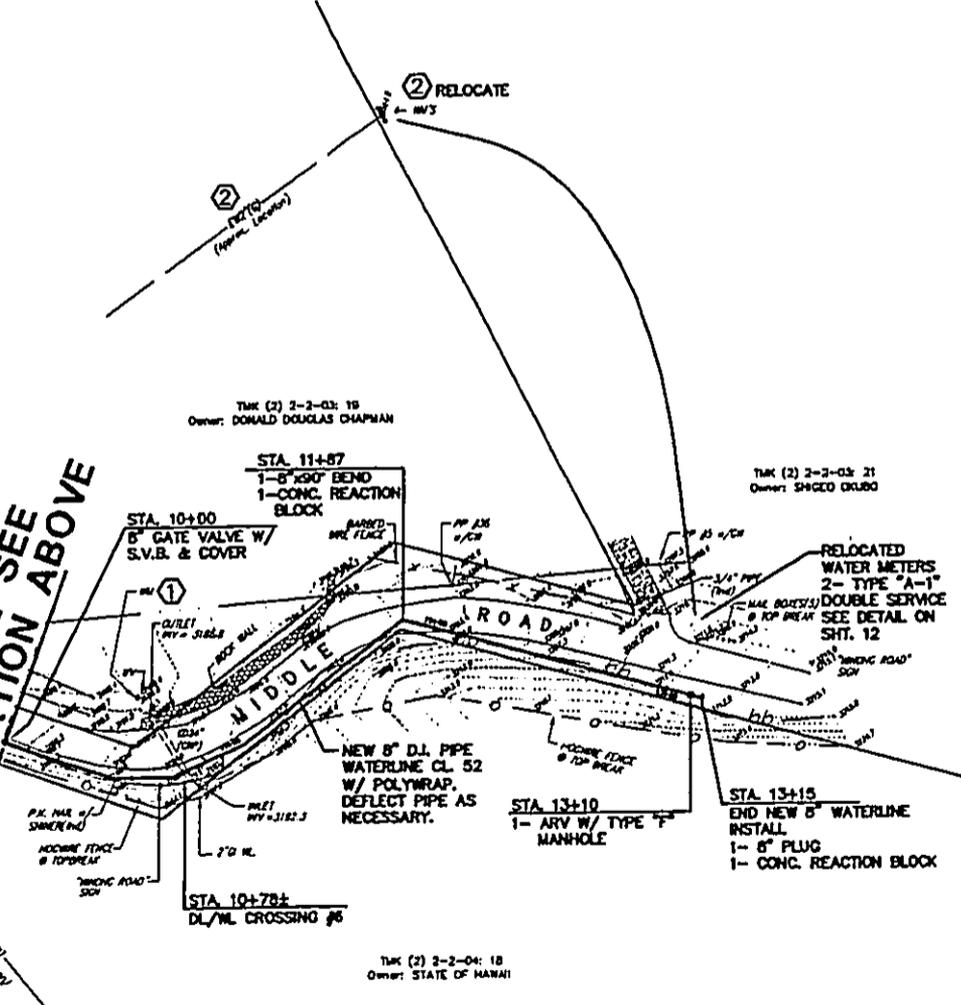
TKK (2) 2-2-03: 17
Owner: HERBERT Y.F. & LISA L. SHIM

TKK (2) 2-2-03: 38
Owner: HAWAII CONFERENCE FOUNDATION

Figure No. 7, A, Proposed Waterline Replacement



MATCH LINE SEE CONTINUATION ABOVE



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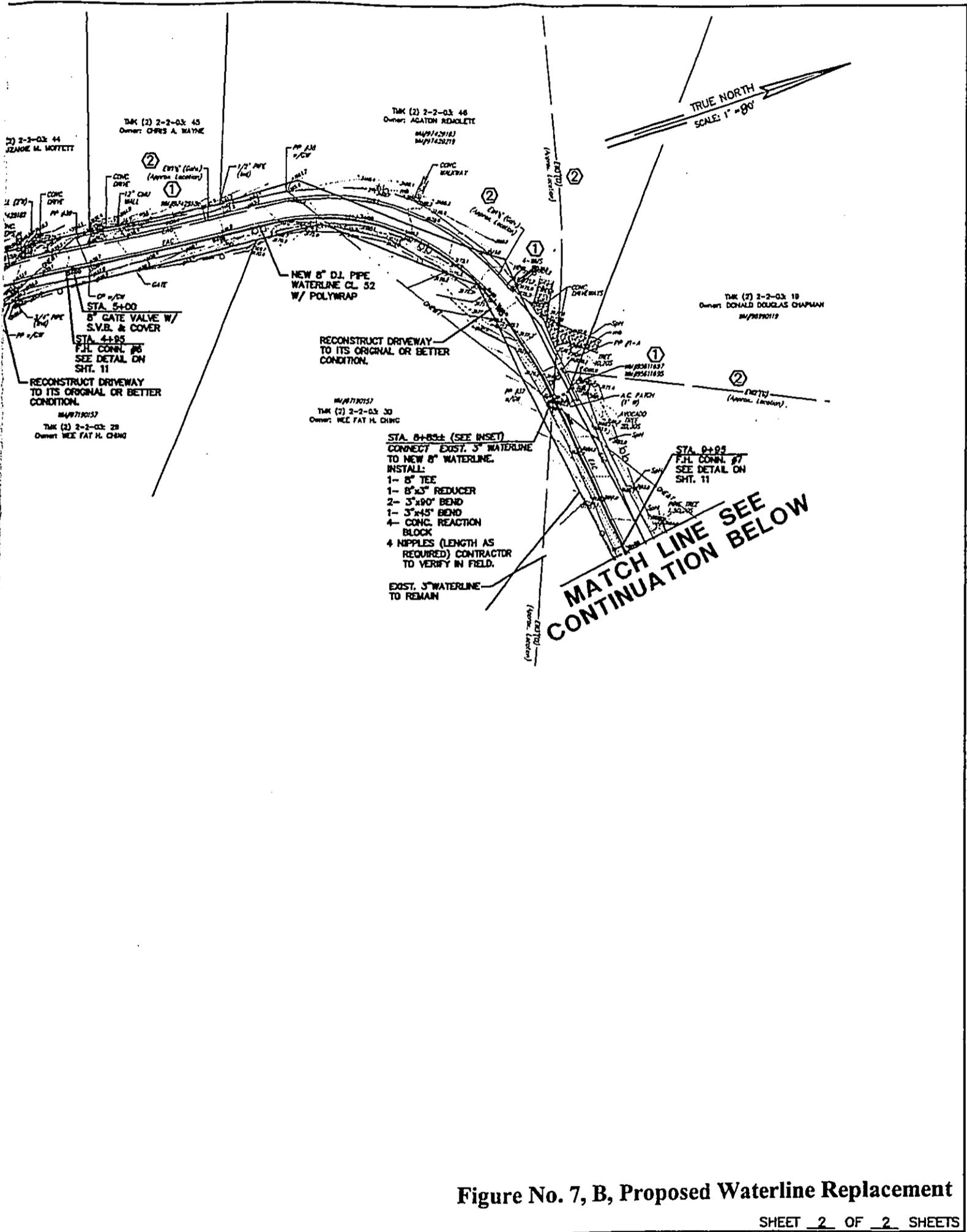
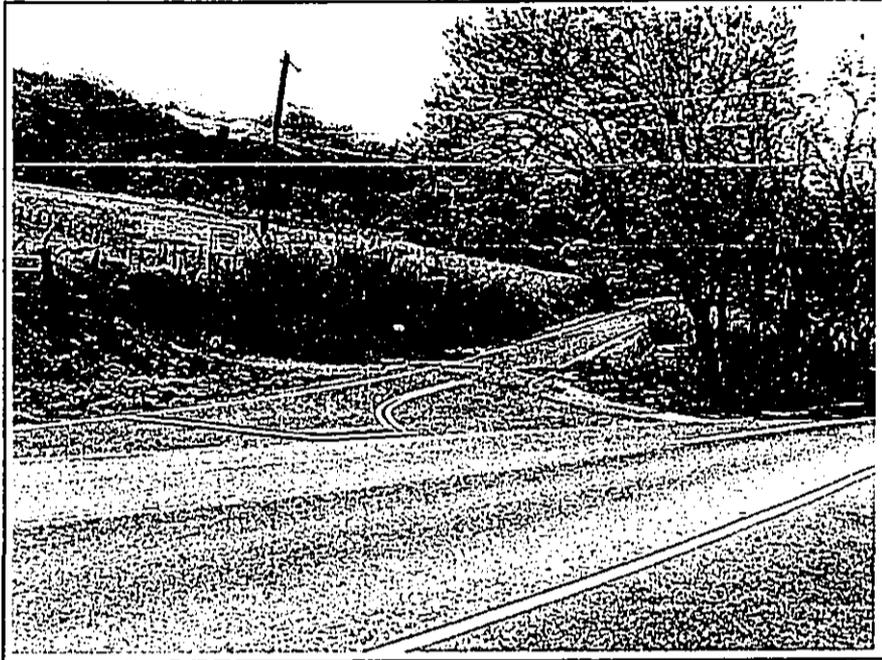
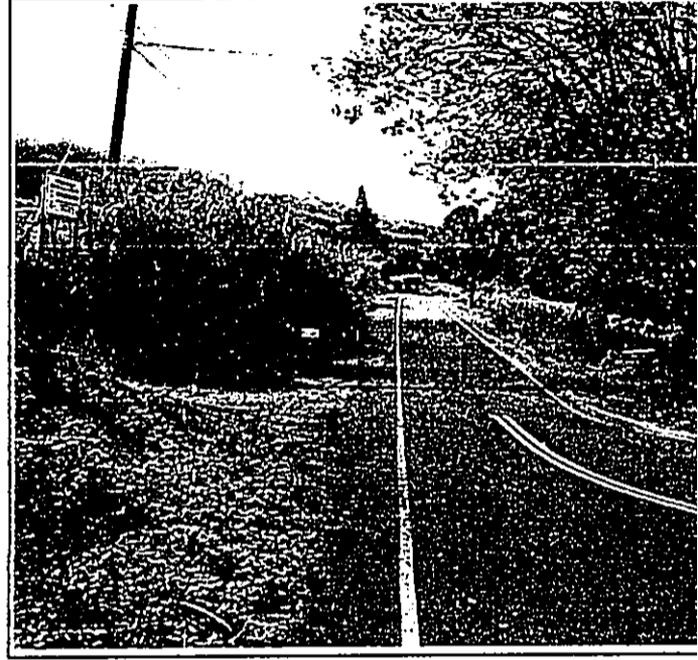


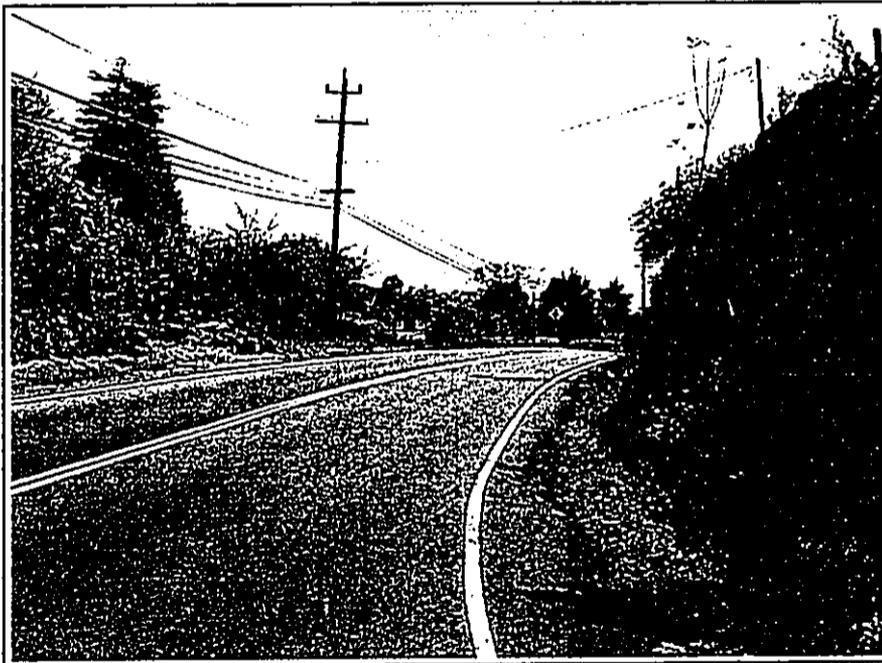
Figure No. 7, B, Proposed Waterline Replacement



Looking at the intersection of Kula Highway and Cross Road.



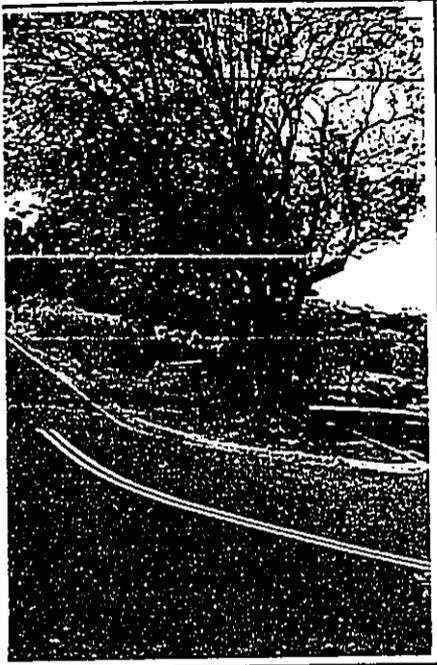
Looking mauka along Cross Road from Kula Highway.



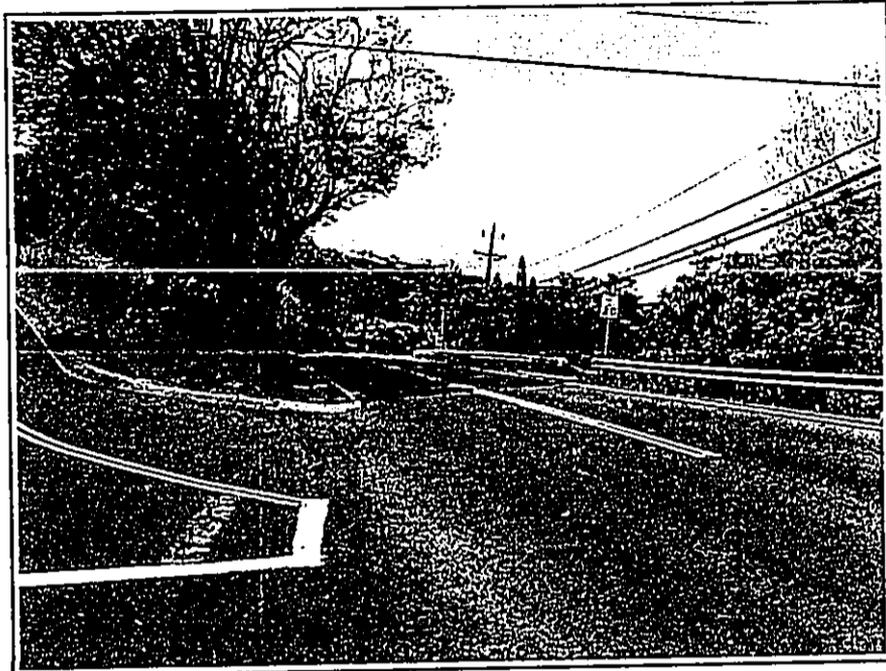
Looking north along Kula Highway from the intersection of Kula Highway and Cross Road.



Looking mauka along Cross Road.



ad from Kula Highway.



Looking south along Kula Highway from the intersection of Kula Highway and Cross Road.



ad.



Looking mauka along Cross Road towards the intersection of Cross Road and Middle Road.

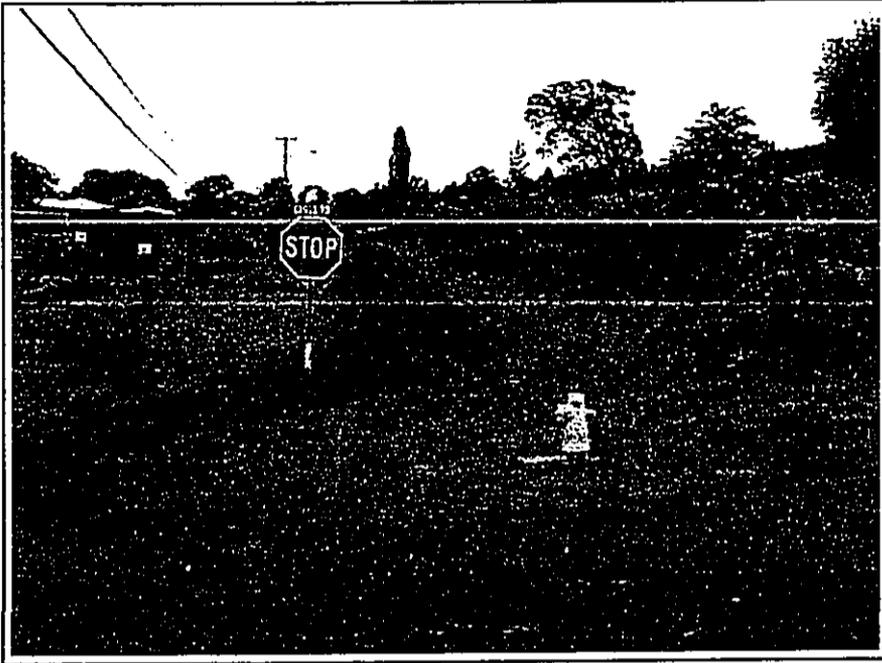
FIGURE 8, A

SITE PHOTOGRAPHS

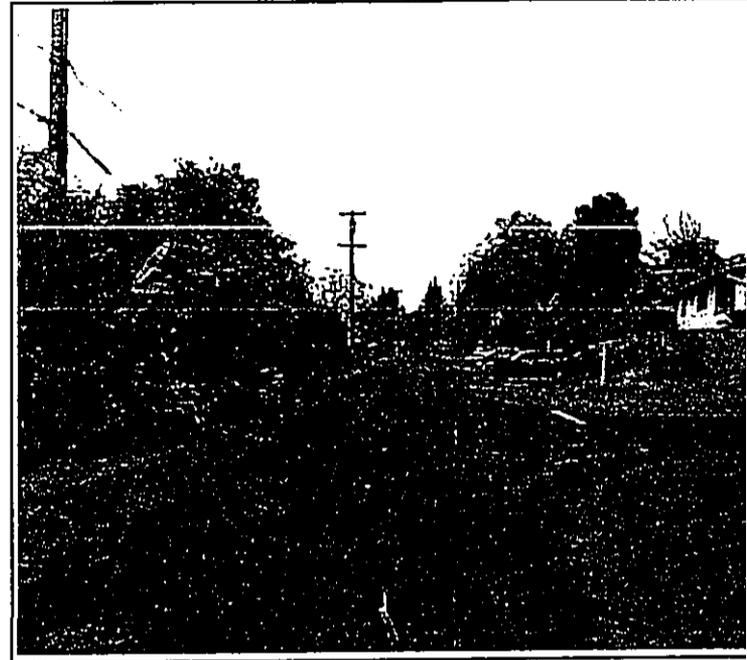
KEOKEA LATERAL, PHASE II

02/2002

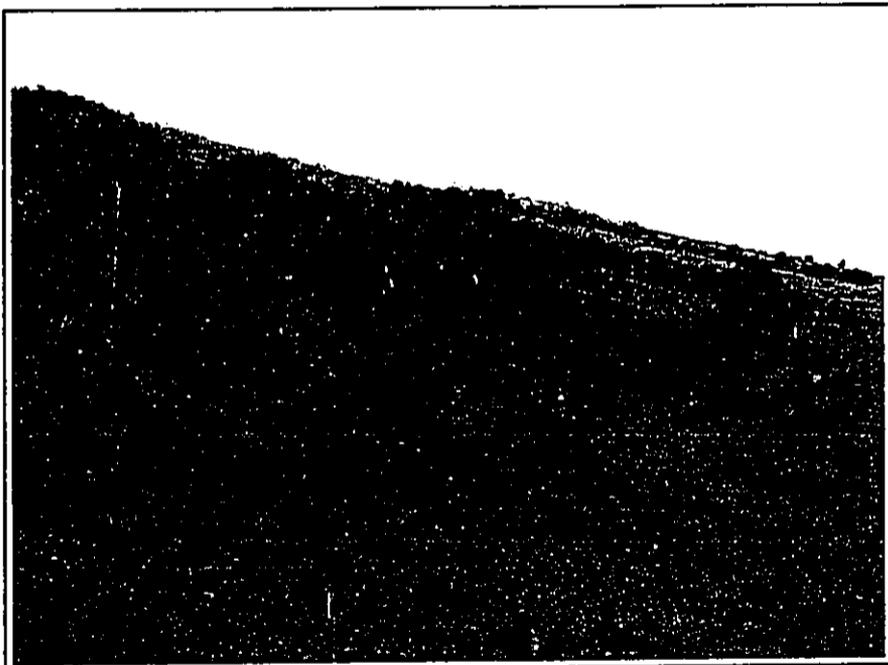




Looking south towards Middle Road from the intersection of Middle Road and Laumania Road.



Looking north along Middle Road towards the intersection of Middle Road and Hookano Place.



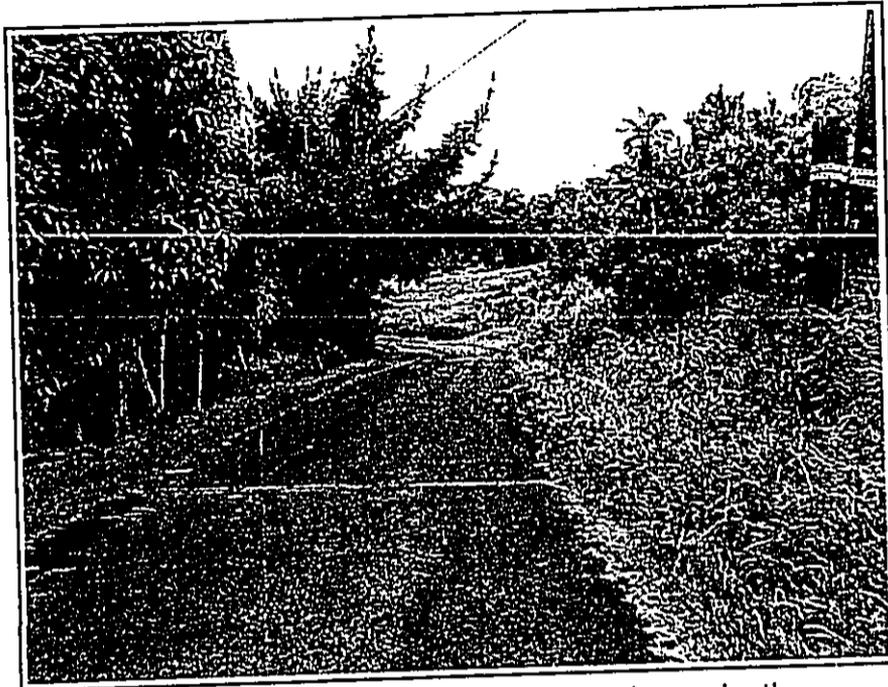
Looking towards the proposed Pressure Break Tank site.



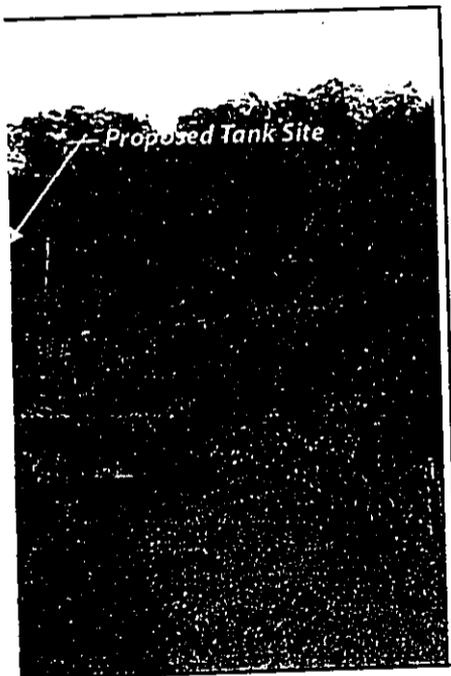
Proposed Pressure Break Tank site.



ad towards the intersection of
ce.



Looking north along Middle Road towards the project's
boundary.



site.



Looking makai from Cross Road at the open space character of
the surrounding area.

FIGURE 8, B
SITE PHOTOGRAPHS

KEOKEA LATERAL, PHASE II

05/2002





APPENDICES

CORRECTION

THE PRECEDING DOCUMENT(S) HAS
BEEN REPHOTOGRAPHED TO ASSURE
LEGIBILITY
SEE FRAME(S)
IMMEDIATELY FOLLOWING

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APPENDICES

Appendix - A
Preliminary Design Engineering Criteria Report

PRELIMINARY DESIGN ENGINEERING CRITERIA REPORT

FOR

KEOKEA LATERAL, PHASE II

**DWS JOB NO. 92-21
TMK: (2) 2-2-04/2-2-03
AT KULA, MAUI, HAWAII**

PREPARED FOR:

**DEPARTMENT OF WATER SUPPLY
COUNTY OF MAUI
200 S. HIGH STREET
WAILUKU, MAUI, HAWAII - 96793
PHONE: (808) 270-7835
FAX: (808) 270-7833**

PREPARED BY:



CIVIL & STRUCTURAL ENGINEERING - LAND SURVEYING - CONSTRUCTION MANAGEMENT & INSPECTIONAL SERVICES

**871 KOLU STREET, SUITE 201
WAILUKU, HAWAII - 96793**

**OCTOBER 2001
Revised: FEBRUARY 25, 2002**

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I. PURPOSE:

The purpose of this Preliminary Engineering Report is to review the existing water system and provide design and construction recommendations for the Keokea Lateral, Phase II on Cross Road (between Kula Highway and Middle Road) and on Middle Road (between Hookano Place and TMK: (2) 2-2-04:18), D.W.S. Job No. 92-21.

II. PROJECT DESCRIPTION AND LOCATION:

The Department of Water Supply (DWS), County of Maui proposes to install a new 8" water system along Cross Road from Middle Road to Kula Highway, and on a portion of Middle Road from Hookano Place to the front of Parcel 18 TMK: (2) 2-2-04 in Kula. The improvements consist of about 3,200 lineal feet of new waterline, installation of a 10,000 gallon pressure break water tank and appurtenances, water lateral replacements, connection to existing water meters, fire hydrants and appurtenances. The project location is shown on Exhibit 1.

III. EXISTING CONDITIONS:

Both Cross Road and Middle Road have asphalt concrete pavement and grassed shoulders. The right of way contains utilities and improvements including overhead electric and telephone services, waterlines and water services, drainlines, mailboxes, driveways and walls.

The existing water system within the project area includes 2½" (CI), 3" (CI), 2" (PE) and 1½" (Galv.) waterlines (Exhibit 2). These waterlines serve the lots along Cross and Middle Roads.

There is no fire protection along this stretch of the project area, except for fire hydrant (FH) 491 at Laumania and Cross Roads intersection, Standpipe 67 at Middle Road and Hookano Place intersection and Standpipe 34 at Middle Road in front of Parcel 76 [TMK: (2) 2-2-03].

IV. DESIGN CRITERIA:

The design and construction of the project will be in accordance with the Department of Water Supply, County of Maui's Water System Standards (1985), Approved Material List and Standard Details for Water System Construction (1985), and the Maui Revisions to Standard Details for Water System Construction (1989, 1997 and the latest revisions). A list of Sections and Standards Details that are expected to be used in this project are given in Appendix A.

Restoration of existing roadway improvements on Cross Road and Middle Road such as pavement restoration will be in accordance with the requirements of the County's Department of Public Works and Waste Management Division and to the latest revisions of the Hawaii Standard Specifications for Road, Bridge, and Public Works Construction (1994). Sections of the Hawaii Standard Specifications that are anticipated to be applicable to this project are listed in Appendix A.

V. DESIGN CONSIDERATIONS:

The Department of Water Supply uses the Land Use and Zoning designations to determine the design criteria for improvements. The State Land Use designations in the area are Rural and Agriculture and the County Zoning is primarily Interim. The County's Makawao-Pukalani-Kula Community Plan

designates adjacent lands along the project site as Rural (R) and Agriculture (AG).
(See Exhibit 4)

Ultimately, the proposed Keokea Lateral, Phase II will provide a connection between the Upper Kula waterline and the proposed 8" waterline along Kula Highway ending in the vicinity of Fong Store.

The zoning of the parcels in the Fong Store vicinity are Country Town/Business and Residential.

Although the business nature of the Fong Store area may require the installation of a 12" waterline for adequate fire protection, the Country Town Business Zoning, by its nature of allowable uses, may resemble uses closer to residential standards. Thus, an 8" waterline down Cross Road may be appropriate.

Recognizing this, the proposed waterline along Kula Highway to the vicinity of Fong Store is 8 inches in diameter.

The design criteria for fire protection of the various land uses are as follows:

<u>Land Use</u>	<u>Fire Flow (gpm)</u>	<u>Fire Duration (hrs.)</u>	<u>Fire Hydrant Spacing (ft.)</u>
Rural (R)	400	2	500
Agricultural (AG)	250	2	500
Residential	1000	2	350
Businesses	2000	2	250

Referring to Exhibit 4, the controlling land use on Cross Road and Middle Road is Rural with a fire flow design criteria of 400 gpm. An 8-inch waterline is recommended for this project for future connection upstream to the Waiohuli Tank

and to provide adequate domestic supply and fire flow downstream, namely in the vicinity of Fong Store, since Phase I of this Keokea Lateral project will extend an 8" waterline to the vicinity of Fong Store. This segment is about 3,200 feet long and will require about seven (7) fire hydrants at 500 feet (max.) apart. Four (4) of these fire hydrants will be installed on Cross Road. The first hydrant installed at the intersection of Kula Highway and Cross Road. The remaining three (3) hydrants will be installed on Middle Road beginning at about 500 feet from Hookano Place intersection.

Existing standpipes will be removed, cleaned and will be returned to DWS Baseyard.

The new FH's will be located at suitable locations within the right-of-way. Wherever possible the regulatory maximum spacings will be provided, but the maximum spacing may be slightly lessened to accommodate existing topographical constraints.

VI. PROPOSED WATERLINE REPLACEMENT:

The existing 2½" CI, 3" CI, 2" PE, 1½" galvanized and 2" galvanized waterlines will be replaced by new 8-inch ductile iron pipe (Class 52). The new waterline will be connected to the existing 8-inch waterline at Kula Highway and will be tied-in to the existing 6-inch waterlines at the intersections of Cross and Middle Roads and Middle Road and Hookano Place.

According to DWS Standards, the maximum allowable static system pressure is 125 psi. A 10,000 gallon tank will be installed as a pressure break located on Lot 34-A, Waiohuli-Keokea Subdivision at an elevation of 3,110' (see Exhibit 3) so as

not to allow the static pressure to exceed 125 psi in the vicinity of Fong Store (approximate elevation = 2,850 ft.). The end of the waterline improvements (Phase I) will be completed by others. The other consideration for the placement of the break tank is to insure adequate (minimum 40 psi) pressures at the proposed locations of the new water meters. Parcels 17 (Shim) and 13 (Fitch) of Tax Map Key: (2) 2-2-03 would be serviced from the proposed 8" waterline on Cross Road with anticipated static water pressures between 50 and 60 psi at the meters. Since the homes are located above the meters, lower static water pressures in the vicinity of 28 to 32 psi may be experienced at the houses on the Shim property. The residences on the Fitch property would appear to have static pressures above 40 psi.

Interconnection of the Middle Road Tank system with the Hookano Road/Cross Road system can be accomplished by the resetting of the 4" pressure reducing station adjacent to Laumania Road or the bypassing of the 47,000 gallon Middle Road Tank via the existing 3" pressure reducing station adjacent to it and adjusting the outlet pressure setting to balance the system. The pressures would need to be equalized by adjustment in one or both systems.

The reduction of the outlet pressure setting in Laumania Road PRV may cause low pressures in the top lots along Hookano Road though.

A third proposal to balance the pressures within this system would be to isolate the Middle Road and Cross Road systems by closing the valve on the Makawao (north) side of the Hookano Road section, thereby continuing the use of the Middle Road Tank and allowing the separate pressure systems to coexist.

The new water mains will be installed with a cover between 3 and 8 feet according to DWS Standards. The proposed improvements also include water lateral replacements, installation of new fire hydrants and appurtenances and restoration of roadway facilities such as roadway pavement, markings, etc.

Abandonment and removal of the existing waterlines and services will be done after the new system is ready for service. The existing buried pipes and service laterals will be abandoned in place. Standpipes 67 and 34 will be salvaged, cleaned and delivered to the DWS Baseyard at Kahului.

VII. CONSTRUCTION PLANS AND APPROVALS:

The construction plans for this project will be prepared on standard 24" x 36" sheets. Plan views will be drawn to a scale of 1 inch = 40 feet, while profiles will be presented at a vertical scale of 1 inch = 8 feet. Enlargement of plan and profile views will be provided, if necessary.

Approval of the construction plans will be obtained from DWS for water system improvements and from Department of Public Works and Waste Management (DPWWM) for work on County Roads. The construction plans will also be reviewed by the Hawaii State Historic and Preservation Division (SHPD) to determine if there is any archaeological impact of the project. Comments, if any, from SHPD should be addressed before DPWWM approval of the construction plans. Preliminary discussion and a site inspection with Ms. Melissa Kirkendall of the SHPD have been conducted and the tank siting was set based, in part, on her comments to avoid potential concerns by SHPD.

VIII. PERMITS:

A "Permit to Perform on County Highways" is required for work on Middle and Cross Roads. A permit for grading and grubbing and building will be required for the construction of the 10,000 gallon break tank. These permits will be obtained from the Land Use and Codes Administration of the DPWWM.

No other permits are anticipated for this project.

IX. EASEMENTS:

Installation of the proposed 8-inch waterline may require easements in the vicinity of the pressure break tank. Every effort will be made to keep the waterlines and proposed fire hydrants within the existing right-of-way, but if necessary, easements will be created within private property if the hydrants cannot fit within the right-of-way of Cross and Middle Roads.

Preliminary discussions have taken place with the County, State and adjacent land owners of Homestead Road to determine the appropriate parties to approach for authorization to install the proposed waterline with the Homestead Road right-of-way. Ultimately, if the government bodies do not claim ownership of this road, we may have to approach the users of this road for authorization.

X. PROBABLE CONSTRUCTION COST AND PERIOD:

The estimated probable construction cost for the project is \$837,700.00 (see Exhibit 5). Construction of this project is anticipated to be completed in four (4) months.

XI. REFERENCES:

1. Water System Standards, Department of Water Supply, County of Maui, State of Hawaii, 1985.
2. Standard Details for Water System Construction, Department of Water Supply, County of Maui, State of Hawaii, 1985.
3. Maui Revisions to Standard Details for Water System Construction, Department of Water Supply, County of Maui, State of Hawaii, 1989 (1997 revisions).
4. Fire Protection System for Maui and Molokai (Sheets 28 and 30), Department of Water Supply, County of Maui, Wailuku, Maui, Hawaii 1996.
5. Makawao-Pukalani-Kula Community Plan, County of Maui, July 23, 1996.

APPENDIX A

A. SECTIONS OF "WATER SYSTEM STANDARDS" APPLICABLE TO THIS PROJECT:

PART 1 - PLANNING

1. WATER MAINS AND APPURTENANCES
 - 1.1 GENERAL
 - 1.2 MAINS
 - 1.2.1 Location
 - 1.2.3 Cover
 - 1.2.4 Diameter
 - 1.2.5 Type, Class
 - 1.2.6 Jackets
 - 1.2.7 Deflection
 - 1.3 MAIN VALVES
 - 1.3.1 Location, Type, Working Pressure
 - 1.3.2 Manholes and Valve Boxes
 - 1.4 APPURTENANCES
 - 1.4.1 Hydrants
 - 1.4.1a Spacing
 - 1.4.1b Location
 - 1.4.1c Depth
 - 1.4.2 Service Laterals and Connections
 - 1.4.2a Location
 - 1.4.2b Cover
 - 1.4.2c Diameter
 - 1.4.2d Type of Lateral and Connection
 - 1.4.2e Connection to Main
 - 1.4.3 Meter Boxes
 - 1.4.4 Fittings
 - 1.4.5 Thrust Blocks and Beams
 - 1.4.7 Air Relief Valves
8. WATER REQUIREMENTS
 - 8.3 Fire Flows, Durations, and Hydrant Spacing

9. CONSTRUCTION PLANS

- 9.1 General
- 9.2 Plans

PART II - MATERIALS

1. GENERAL

2. CAST IRON PIPE (GRAY AND DUCTILE), FITTING AND SPECIAL CASTINGS

- 2.1 General
- 2.3 Mechanical Joint
- 2.4 Push-on Joint
- 2.5 Flanged Joint

6. VALVES AND APPURTENANCES

- 6.1 Gate Valves
- 6.3 Tapping Valves and Sleeves
- 6.5 Air Relief Valves and Appurtenances

7. HYDRANTS AND APPURTENANCES

- 7.1 General
- 7.2 Wet-Barrel Hydrants

8. CAST IRON MANHOLE COVERS, FRAMES, RUNGS, EYEBOLTS, METER BOX AND VALVE BOX COVERS AND FRAMES AND STANDPIPES

- 8.1 General
- 8.2 Manhole Covers and Frames
- 8.3 Manhole Rungs
- 8.5 Meter Box Covers and Frames
- 8.6 Valve Box Covers and Frames and Standpipes

9. SERVICE LATERALS AND APPURTENANCES

- 9.1 Copper Tubing
- 9.4.1 Fittings
- 9.5 Corporation Stops
- 9.6 Stopcocks
- 9.7 Ballcocks and Ballcorps
- 9.8 Service Saddle

10. PREMOLDED FILLER, CRUSHED ROCK, PIPE CUSHION, BACKFILL MATERIAL AND BRICKS

- 10.1 Premolded Filler
- 10.2 Pipe Cushion
- 10.3 Crushed Rock
- 10.4 Backfill Material

PART III - CONSTRUCTION

INTRODUCTION

1. WATER MAINS AND APPURTENANCES

- 1.1 General
- 1.2 Excavation and Backfill
 - 1.2.1 Trench Excavation
 - 1.2.2 Trench Backfill
- 1.3 Sheathing
- 1.8 Connections, Lowering, etc.
- 1.9 Manholes
- 1.10 Thrust Blocks, Beams and Test Blocks
- 1.11 Surplus Excavation
- 1.12 Installation
 - 1.12.1 General
 - 1.12.2 Preparation of Trench Bottom
 - 1.12.3 Cast Iron Pipe (Ductile)
 - 1.12.6 Fittings and Specials (Cast Iron, Concrete Cylinder or Asbestos Cement Pipe)
 - 1.12.7 Gate Valves and Butterfly Valves
 - 1.12.8 Air Relief Valves and Appurtenances
 - 1.12.9 Service Laterals, Connection and Pipes
 - 1.12.10 Meter Boxes
 - 1.12.11 Fire Hydrants
 - 1.12.12 Concrete Blocks, Jackets, Beams and Curb Guards
 - 1.12.13 Pipe Pressure Tests
 - 1.12.14 Manholes
 - 1.12.15 Valve Boxes
 - 1.12.16 Connections, Relocations and Lowering of Mains and Laterals
 - 1.12.17 Chlorination of Water Pipelines
 - 1.12.18 Removing, Re-Installing or Returning Existing Pipes, Fittings, Fire Hydrants and Appurtenances
 - 1.12.19 Existing Water System
 - 1.12.20 Water Supply
 - 1.12.21 Concrete
 - 1.12.22 Reinforcing Steel

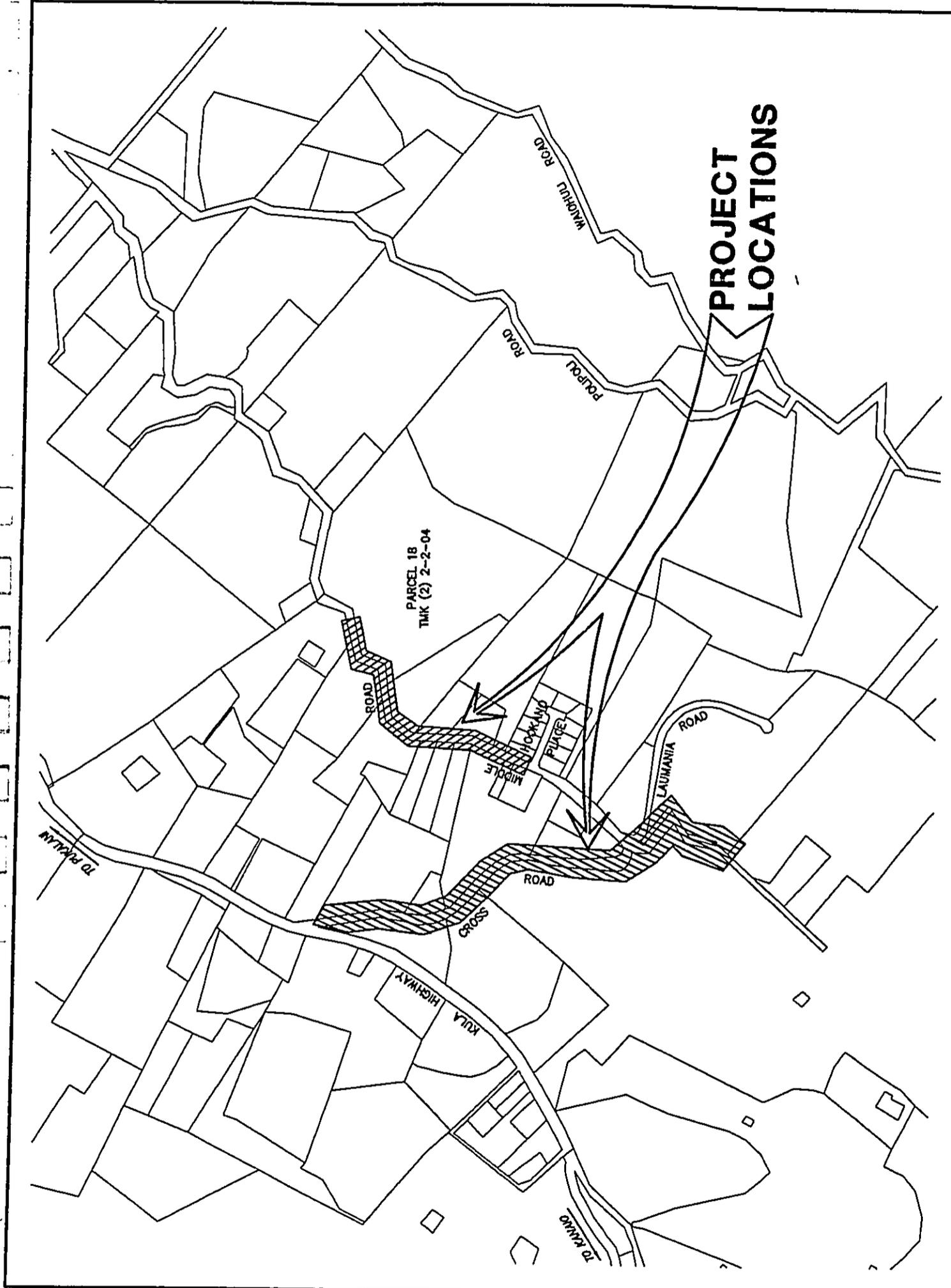
- 1.12.23 Pipe Hangers, Lateral Bracing and Inserts
- 1.12.25 Cleanouts and Risers
- 1.12.28 Restoring Pavements, driveways, Sidewalks, Curbs, Gutters,
Fences and Walls
- 1.12.29 Corrosion Protection
- 1.12.30 Cleaning Up
- 1.12.31 Demolishing Manholes and Reaction Blocks

B. WATER SYSTEM STANDARD DETAILS APPLICABLE TO THIS PROJECT:

<u>PLATE</u>	<u>DESCRIPTION</u>
16	8-inch Valve Box - Frame & Cover
18R	Sliding Valve Box Assembly
23R	Air Valve Connection in Manhole
25R	Air Valve Manhole - Type "F"
27R	Hydrant Connection - Straight Run
31R	Hydrant Curb Guard and Valve Marker
40R	5/8" and 3/4" Cast Iron Meter Box
41R	1" Cast Iron Meter Box
80R	Service Laterals and Connections - Standard Sizing Arrangements
81R	Single Service Lateral (Type A, 5/8" and 3/4" Meters)
82R	Double Service Lateral (Type A-1, 5/8" and 3/4" Meters)
83R	Single Service Lateral (Type B, 1" Meter)
84R	Double Service Lateral (Type B-1, 1" Meter)
89R	Typical Service Lateral
100M	Horizontal Thrust Block for Water Mains
104R	Reinforced Concrete Jacket - Typical Detail
105	Horizontal Thrust Block - Minimum Bearing Areas
123	Trench Backfill

**C. SECTIONS OF "HAWAII STANDARD SPECIFICATIONS FOR ROAD, BRIDGE,
AND PUBLIC WORKS CONSTRUCTION" APPLICABLE TO THIS PROJECT:**

<u>SECTION</u>	<u>DESCRIPTION</u>
206	Excavation and Backfill or Conduits and Structures
301	Plant Mix Asphalt Concrete Base Course
305	Aggregate Subbase
401	Asphalt Concrete Pavement
407	Bituminous Tack Coat
408	Prime Coat
629	Pavement Markings
645	Traffic Control Devices



PROJECT LOCATIONS

EXHIBIT 1

JOB NO. 01-045

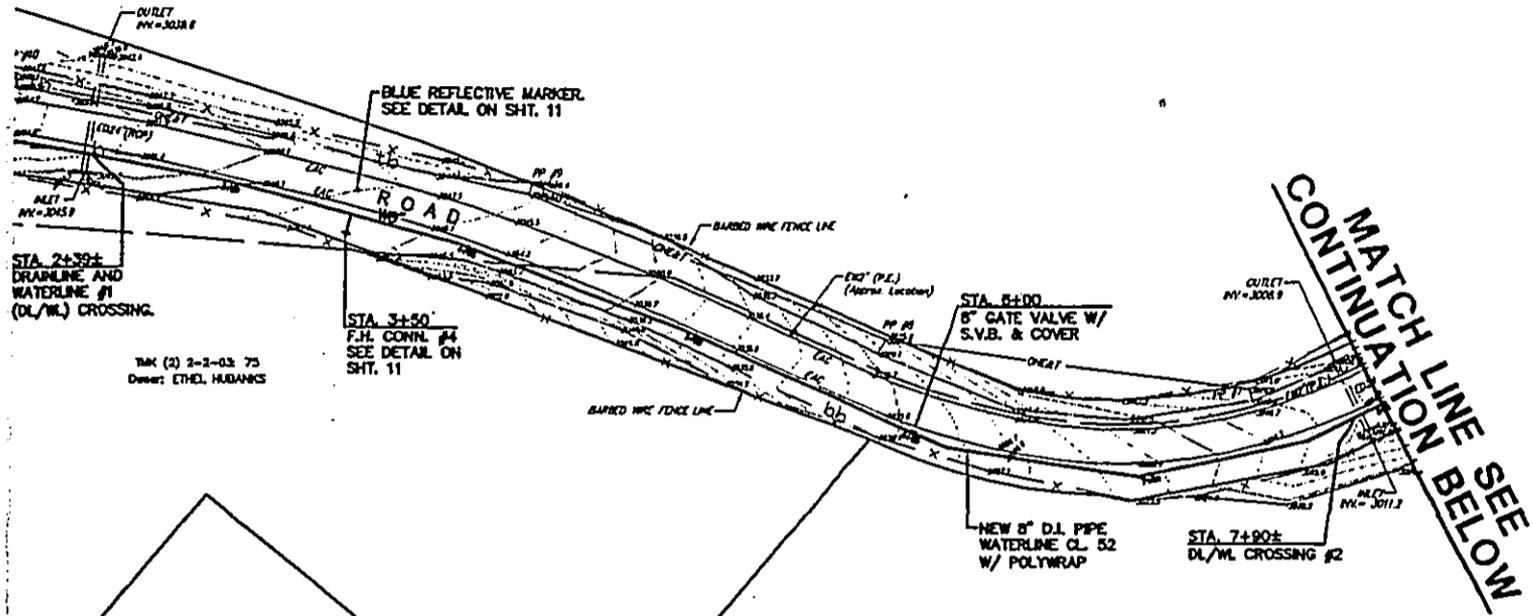
R. T. TANAKA ENGINEERS, INC.
 LAND SURVEYORS - CIVIL & SURVEILLANCE ENGINEERS

871 KOLU STREET, SUITE 201
 WAILUKU, MAUI, HAWAII 96793

0:\2001\01-045\KLM-EXHIBIT2.dwg

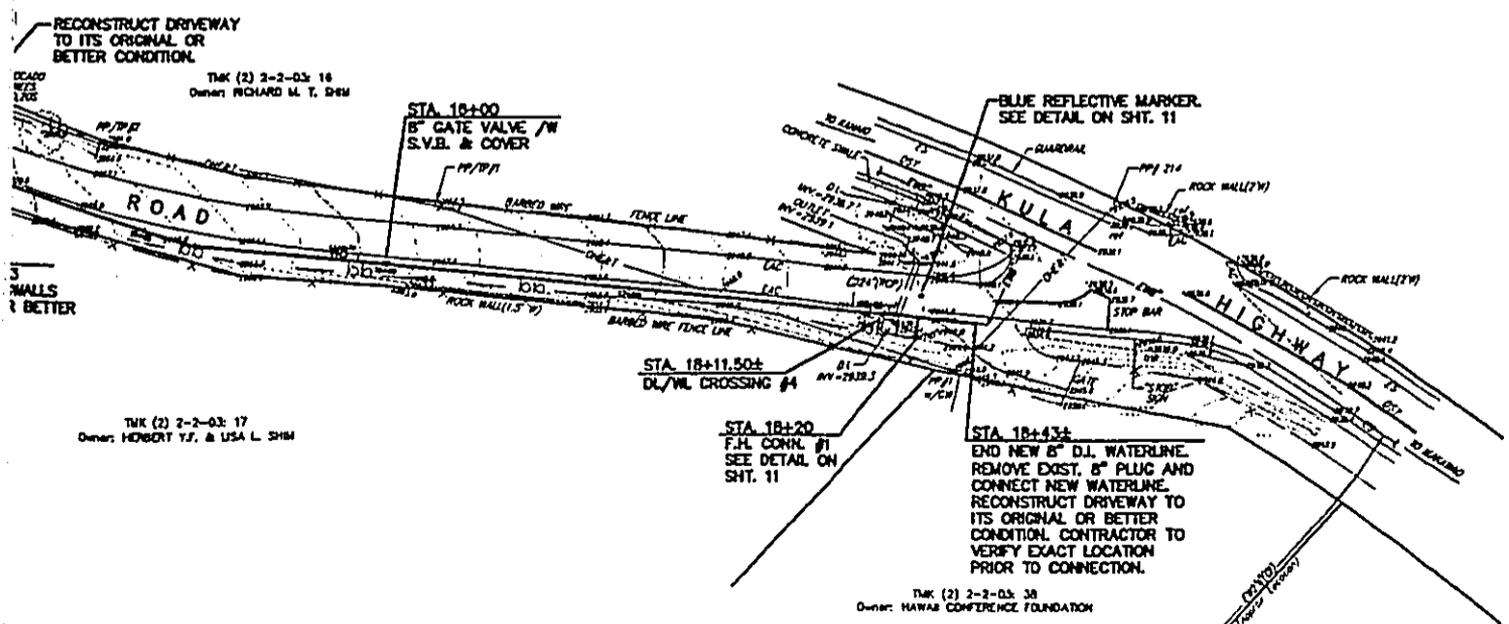
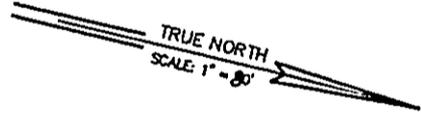
2-2-04: 66
STATE OF HAWAII

50
BEND, WJ
REACTION

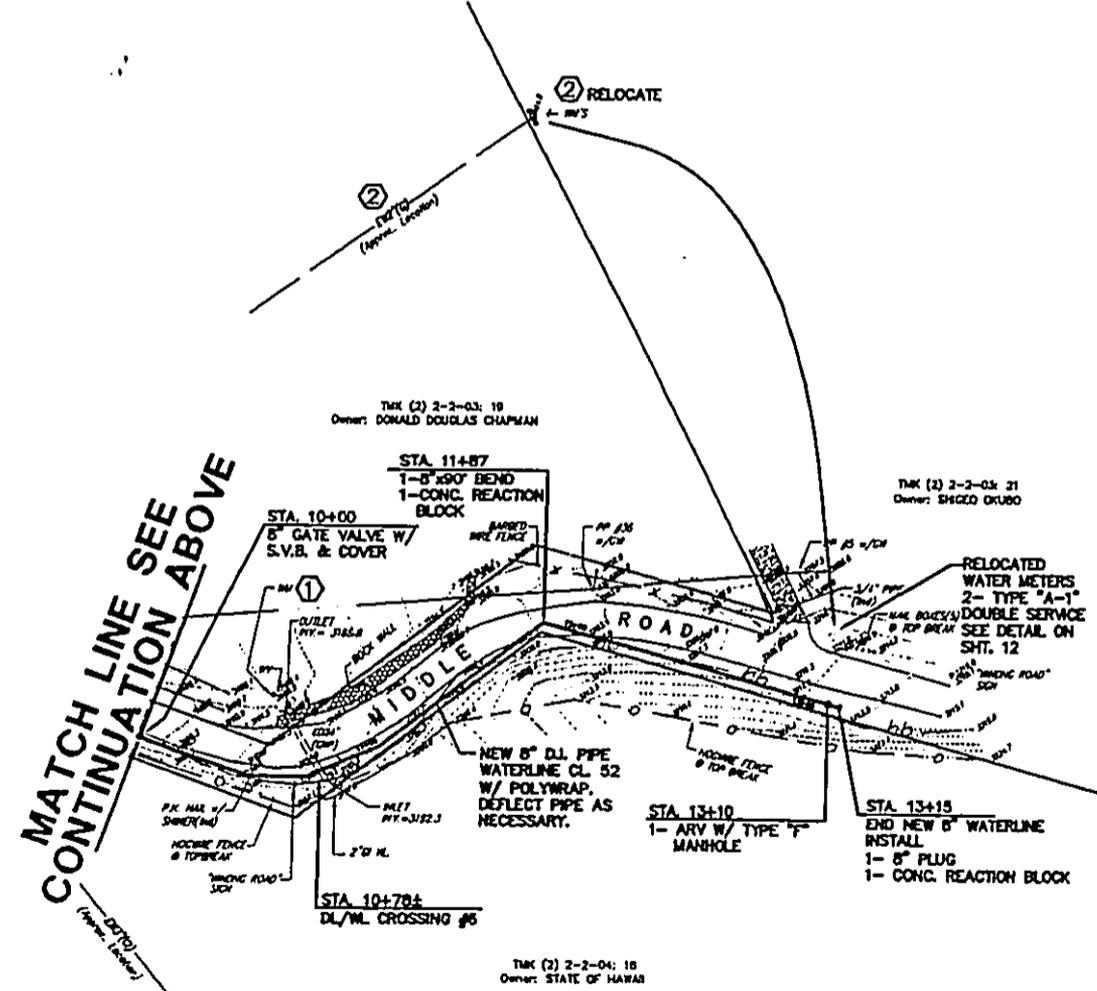
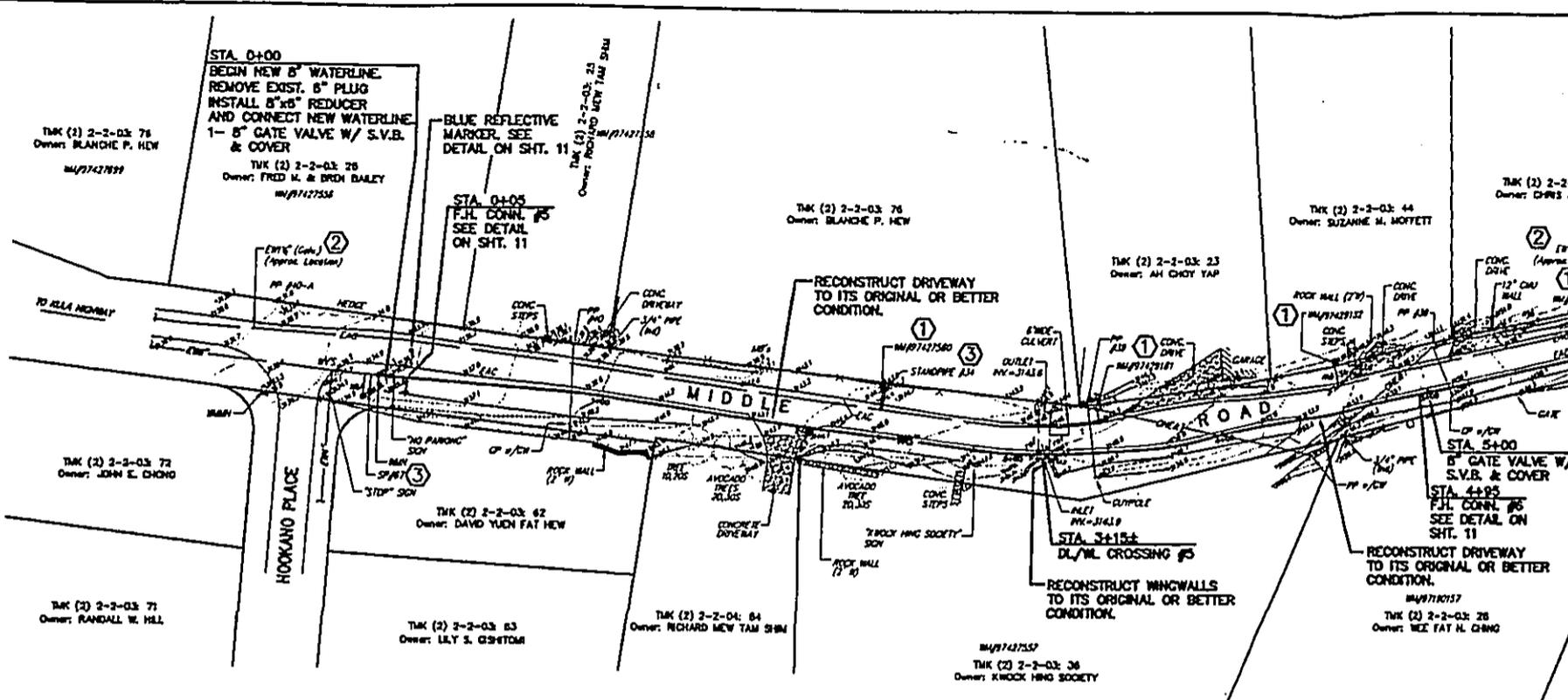


TKM (2) 2-2-03: 24
Owner: ELIZABETH KOTILSTVED

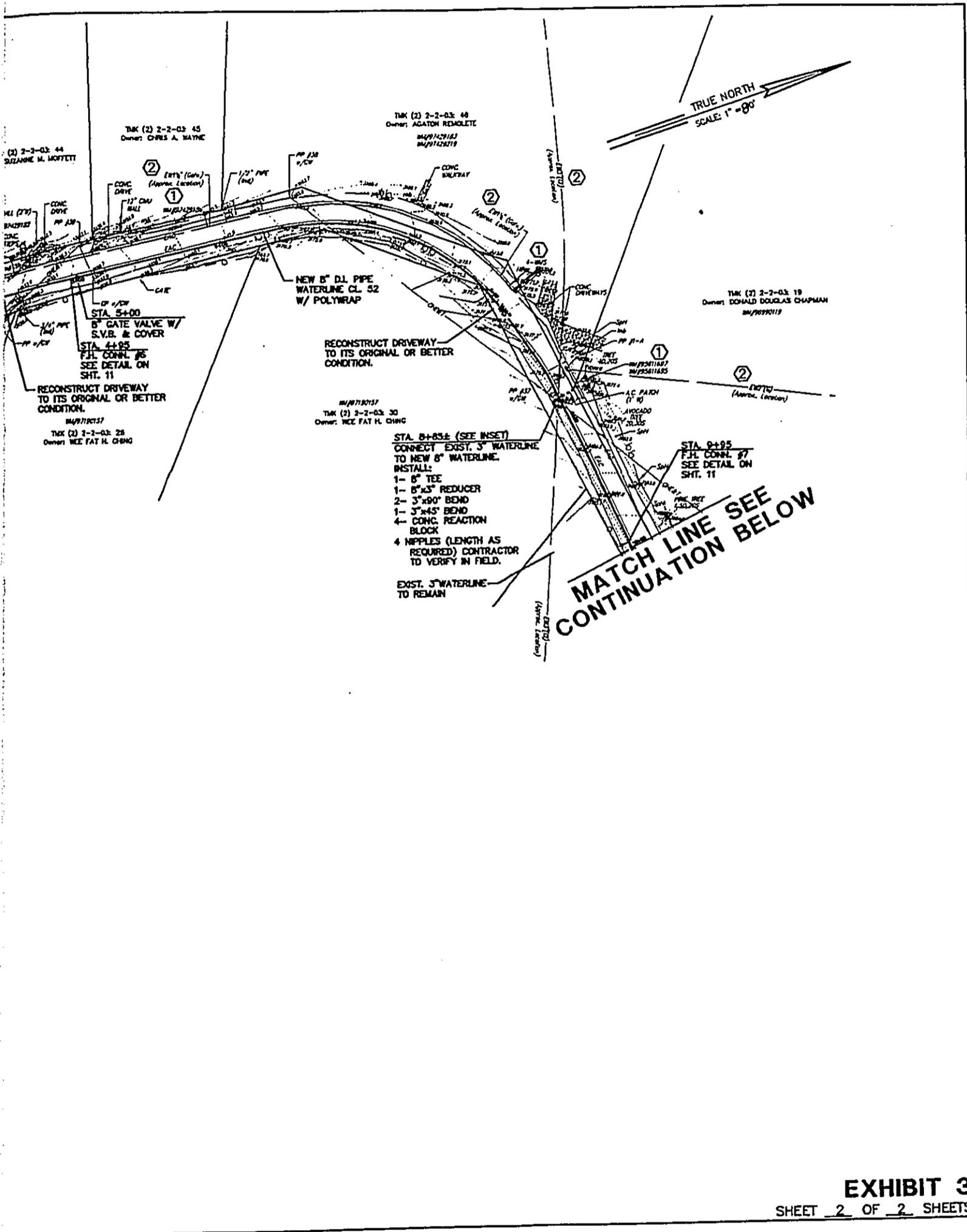
TKM (2) 2-2-03: 78
Owner: BLANCHE P. HEW



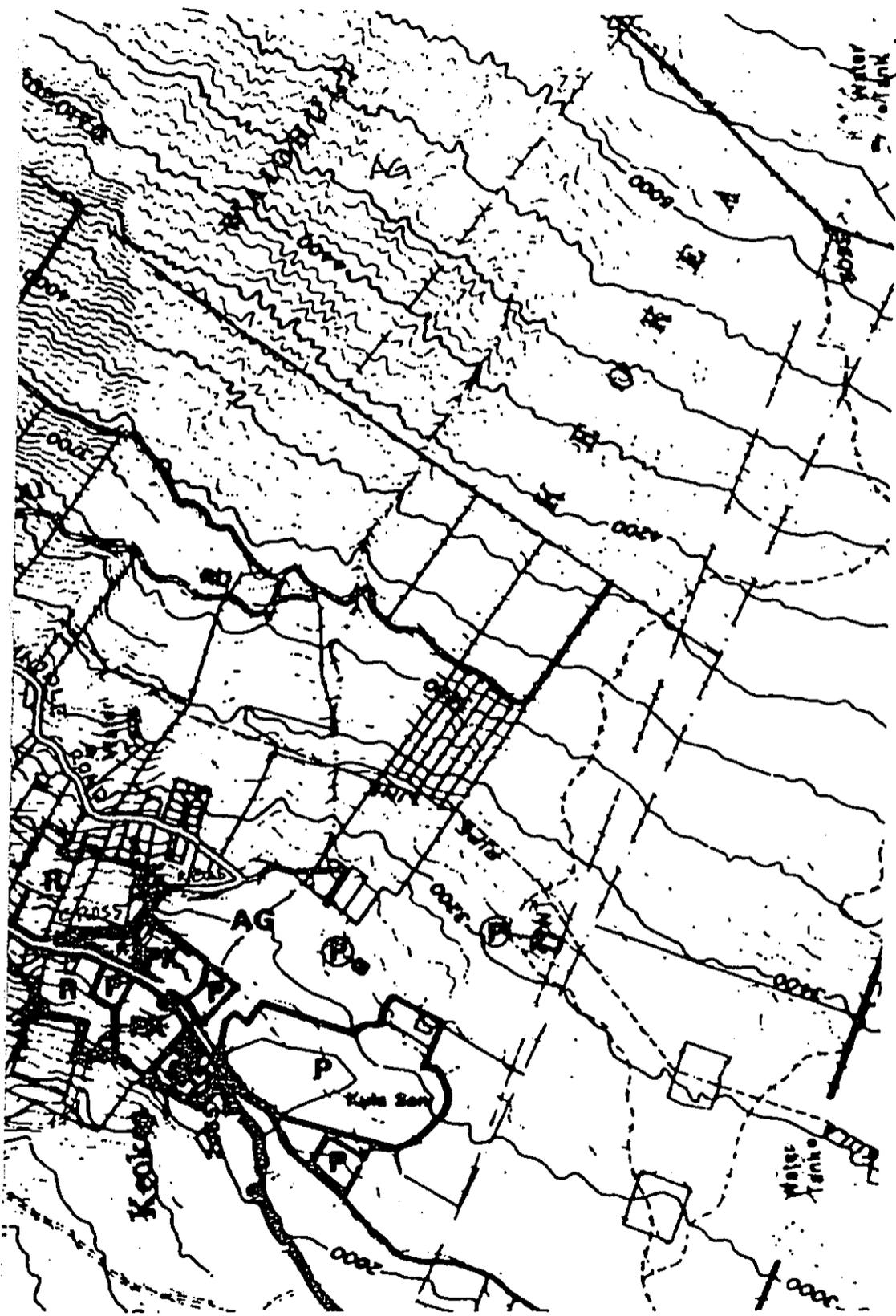
TKM (2) 2-2-03: 17
Owner: HOBERT Y.F. & USA L. SHIM



001 045 13.05 11-11



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PROBABLE CONSTRUCTION COST

KEOKEA LATERAL, PHASE II

TMK: (2) 2-2-04/2-2-03

KULA, MAUI, HAWAII

DWS JOB NO. 92-21

OCTOBER 2001

Revised: FEBRUARY 2002

Owner: Department of Water Supply
 County of Maui
 200 S. High Street, 5th Floor
 P. O. Box 1109
 Wailuku, Maui, Hawaii - 96793

Engineer: R. T. Tanaka Engineers, Inc.
 871 Kolu Street, Suite 201
 Wailuku, Maui, Hawaii - 96793

Item	Description	Quantity	Unit	Unit Price	Total
CROSS ROAD:					
1.	8" D.I. Waterline, Class 52 with polyethelene encasement, including appurtenances and pavement restoration	1,845	L.F.	\$120	\$221,400
2.	Fire Hydrant, including concrete slab, reflectors and markers	4	Ea.	\$3,000	\$12,000
3.	Water Service Laterals, including reconnection of existing services	6	Ea.	\$2,000	\$12,000
4.	Signs and Pavement Marking		L.S.	\$2,500	\$2,500
5.	Traffic Control		L.S.	\$12,500	\$12,500
6.	Connection to Existing Waterline	2	Ea.	\$2,500	\$5,000
7.	ARV with Type "F" Manhole	3	Ea.	\$3,000	\$9,000
8.	Testing and Chlorination		L.S.	\$4,000	\$4,000
9.	PRV w/Manhole	1	Ea.	\$15,000	\$15,000
				Subtotal =	\$293,400

Item	Description	Quantity	Unit	Unit Price	Total
MIDDLE ROAD:					
1.	8" D.I. Waterline, Class 52 with polyethelene encasement, including appurtenances and pavement restoration	1,315	L.F.	\$120	\$157,800
2.	Fire Hydrant, including concrete slab, reflectors and markers	3	Ea.	\$3,000	\$9,000
3.	Water Service Laterals, including reconnection of existing services	14	Ea.	\$2,000	\$28,000
4.	Signs and Pavement Marking		L.S.	\$2,500	\$2,500
5.	Traffic Control		L.S.	\$12,500	\$12,500
6.	Connection to Existing Waterline	1	Ea.	\$2,500	\$2,500
7.	ARV with Type "F" Manhole	3	Ea.	\$3,000	\$9,000
8.	Testing and Chlorination		L.S.	\$3,000	\$3,000
				Subtotal =	\$224,300
1.	10,000 Gallon Pressure Break Tank (Glass Lined Bolted Tank) with Appurtenant Sitework, including Waterline		L.S.	\$210,000	\$210,000
	Contingencies @ 15%±				\$110,000
	Total				\$837,700

Appendix - B
Draft EA Comment and Response Letters



**DEPARTMENT OF WATER SUPPLY
COUNTY OF MAUI**

P.O. BOX 1109
WAILUKU, MAUI, HAWAII 96793-6109
TELEPHONE (808) 270-7816 • FAX (808) 270-7833 • www.mauewater.org

May 22, 2002

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

Dear Ms. Salmonson:

RE: Draft Environmental Assessment for the Keokea Lateral, Phase II, Project,
Kula, Maui, Hawaii

Thank you for your letter dated April 22, 2002, regarding the above-referenced Draft Environmental Assessment.

In response to your letter, we offer the following comments:

1. Pre-consultation. The Department of Water Supply has been in contact with neighboring landowners regarding the proposed project. In addition, the following agencies were consulted as part of the Draft EA preparation:
 - Department of Public Works and Waste Management;
 - Department of Planning; and
 - State Historic Preservation Division.
2. Required permits and approvals. Grading and building permits are required prior to construction. In addition, a Work to Perform on County Road Permit is required for work occurring on County roadway.
3. Visual Impacts. The tank site has been more accurately located on the site photographs in Figures 8a and 8b. Views of the site from Cross and Middle roads are screened by a grove of waddle trees. In addition, even if the tank site were visible from these roads it would not block mauka views given the steepness of terrain in the area. In other words, it would only block views of a small portion of the background hillside, which quickly rises behind the tank structure. The tank will be painted with colors that blend in with the surrounding hillside.

"By Water All Things Find Life"

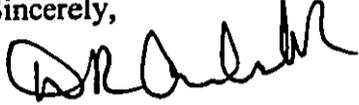
Printed on recycled paper



Ms. Genevieve Salmonson, Director
Office of Environmental Quality Control
May 22, 2002
Page 2

Thank you for your consideration of our application. Should you have any questions, please contact myself, or Mr. Rory Frampton, Chris Hart & Partners, at 808-242-1955.

Sincerely,

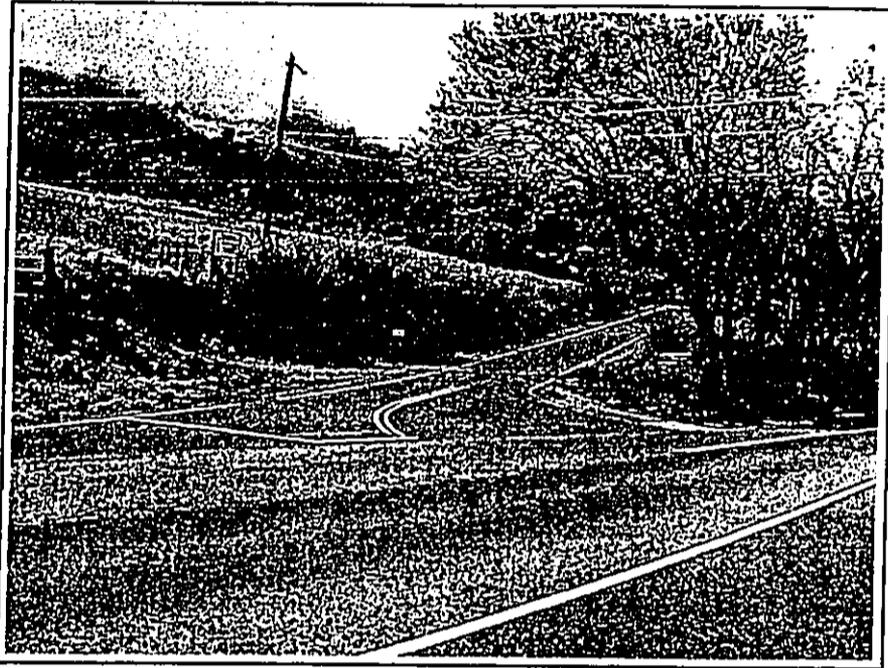


David R. Craddick
Director

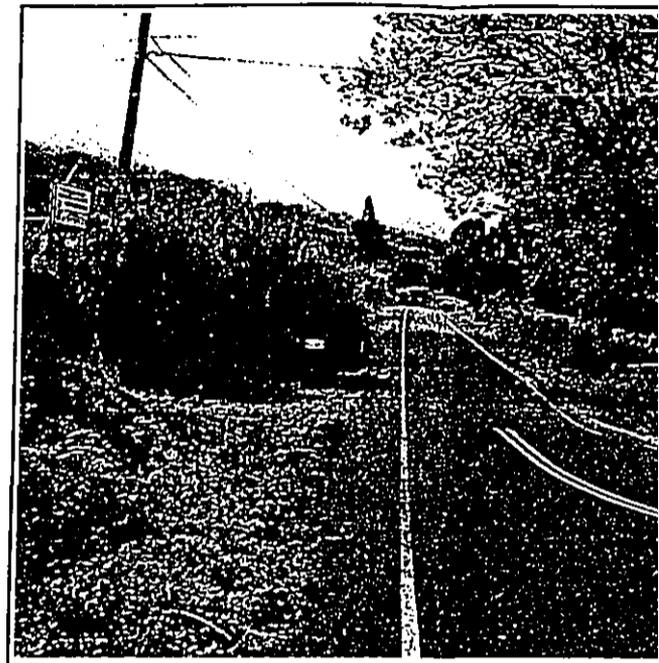
/ATM:sc
Enclosure: Photographs (2 pgs)

xc: Mr. Herb Kogasaka, Department of Water Supply w/out encl.
Mr. Kirk Tanaka, Tanaka Engineers, Inc. w/out encl.
Mr. Rory Frampton, Chris Hart & Partners w/out encl.

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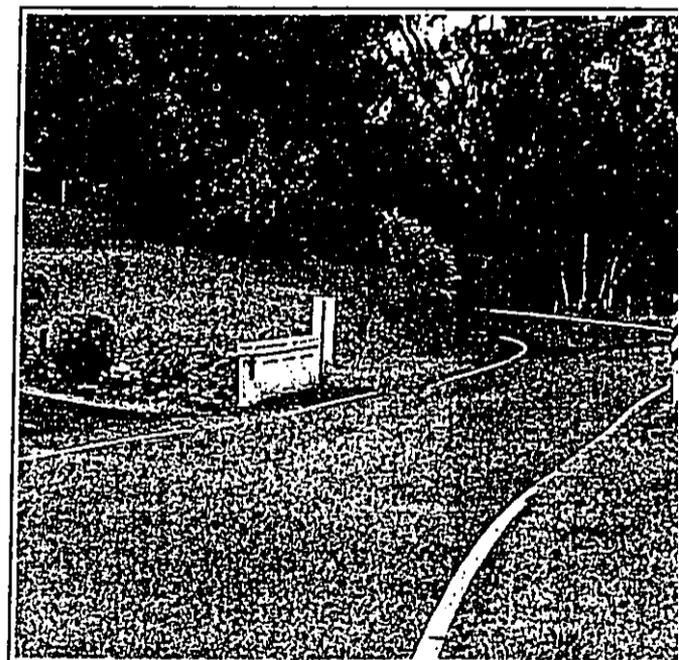
Looking at the intersection of Kula Highway and Cross Road.



Looking mauka along Cross Road from Kula Highway.



Looking north along Kula Highway from the intersection of Kula Highway and Cross Road.



Looking mauka along Cross Road.

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oad from Kula Highway.



Looking south along Kula Highway from the intersection of Kula Highway and Cross Road.



oad.



Looking mauka along Cross Road towards the intersection of Cross Road and Middle Road.

FIGURE 8, A

SITE PHOTOGRAPHS

KEOKEA LATERAL, PHASE II

02/2002



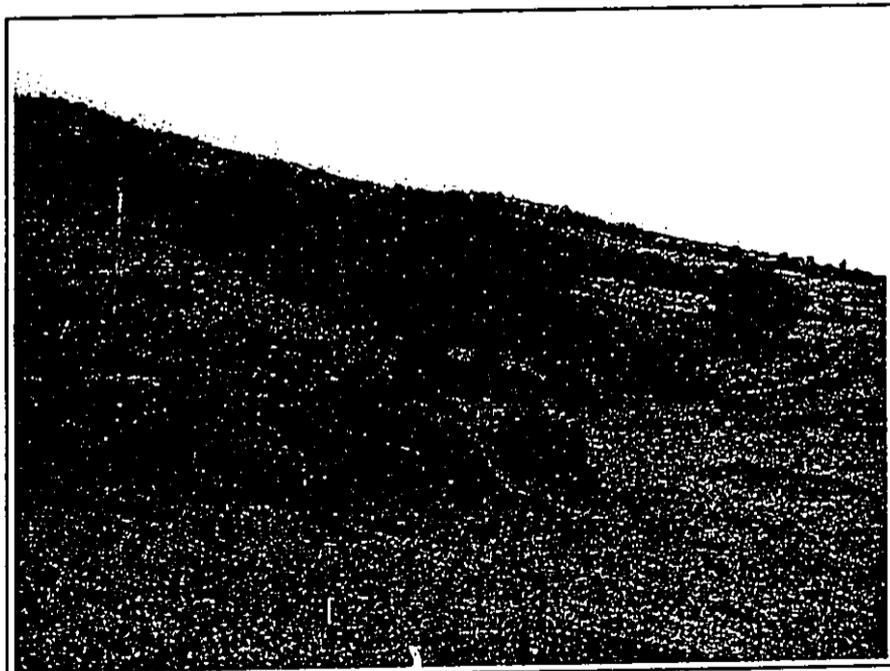
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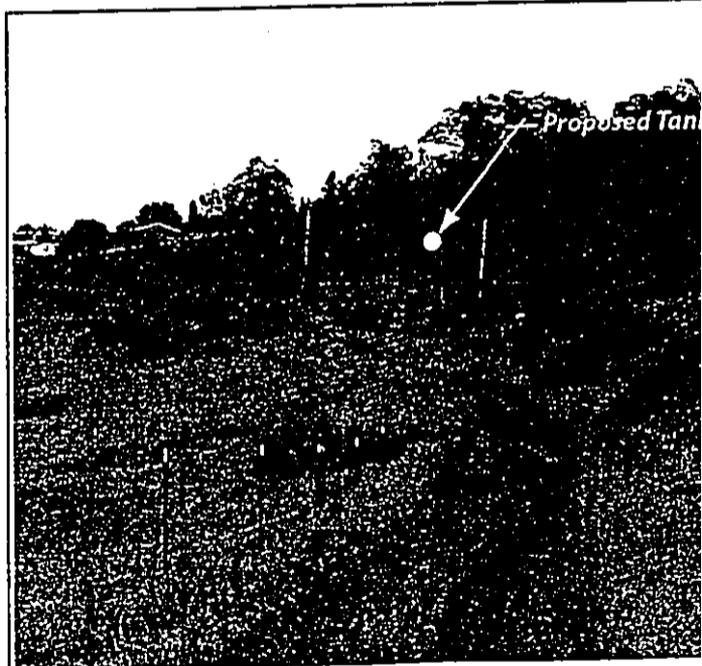
Looking south towards Middle Road from the intersection of Middle Road and Laumania Road.



Looking north along Middle Road towards the intersection of Middle Road and Hookano Place.



Looking towards the proposed Pressure Break Tank site.

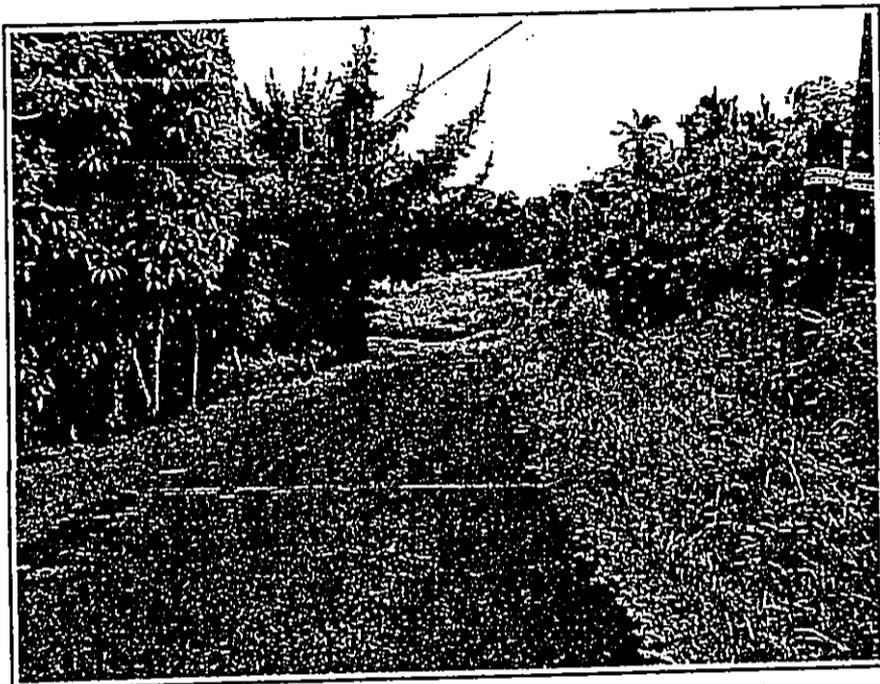


Proposed Pressure Break Tank site.

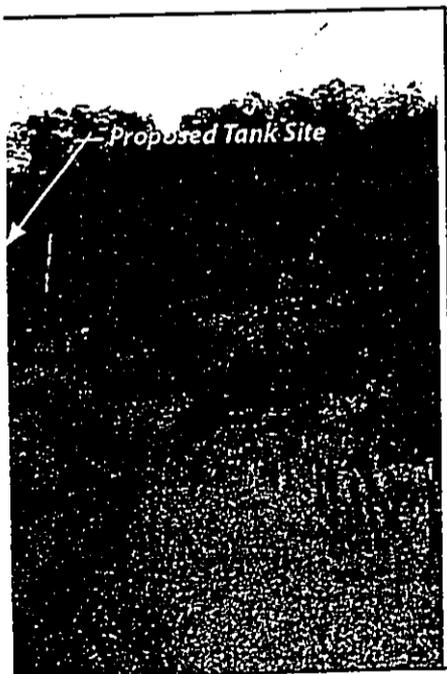
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oad towards the intersection of
ice.



Looking north along Middle Road towards the project's
boundary.



site.



Looking makai from Cross Road at the open space character of
the surrounding area.

FIGURE 8, B

SITE PHOTOGRAPHS

KEOKEA LATERAL, PHASE II

05/2002



CHRIS
HART
& PARTNERS