United States
Department of
Agriculture

Natural
Resources
Conservation
Service

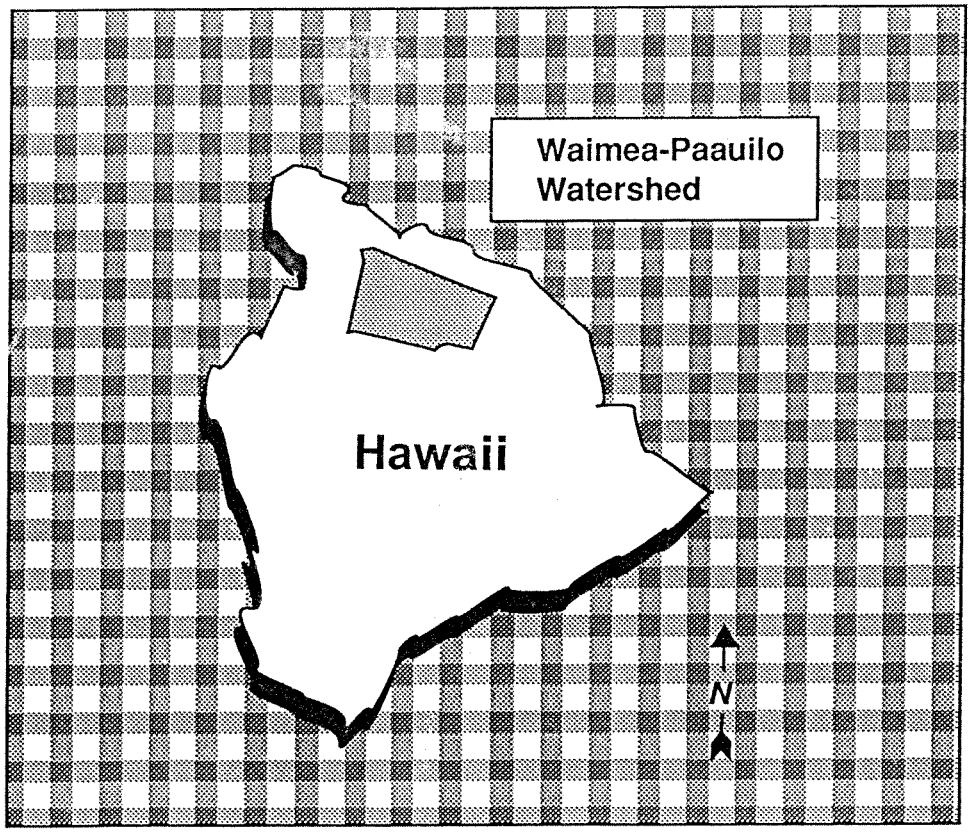
Honolulu,
Hawaii

September 1997

Final

Watershed Plan and Environmental Impact Statement

Waimea-Paauilo Watershed
County of Hawaii, Hawaii



NEED FOR THE SUPPLEMENT

This document, the Final Watershed Plan and Environmental Impact Statement for the Waimea-Paauilo Watershed, County of Hawaii, Hawaii, supplements the Waimea-Paauilo Watershed Plan prepared September 1989. This Plan Supplement is required by Section 506.03 of National Watershed Manual. This document has been prepared as a stand-alone Watershed Plan and Environmental Impact Statement and uses a NEPA-recommended format to facilitate environmental review.

A major feature of the Waimea-Paauilo Watershed project, the proposed storage reservoir, has been moved approximately three miles in location from the Waimea II site to the Kauahi site. The relocation of the reservoir site resulted from opposition by homeowners in a residential subdivision adjacent to the Waimea II site who cited concerns about dam safety and lowered property values. The sponsoring local organizations requested the evaluation of alternative reservoir locations.

The relocation of the reservoir site, concerns about dam safety, and increasing public scrutiny of water-related projects prompted the preparation of an Enviromental Impact Statement conforming to both NEPA and Hawaii environmental regulations.

Three new alternative plans were evaluated in addition to the three in the 1989 Watershed Plan. The additional alternatives include modification of the reservoir design at the Waimea II site to increase structural stability, installation of the reservoir at the newly-identified Kauahi site, and installation of the reservoir at the Kauahi site without development of the livestock drinking water distribution system. Alternative 5, the Kauahi Reservoir Plan (including the livestock drinking water distribution system) was selected by the sponsors as the Recommended Alternative.

Modifications to the reservoir supply pipeline, the irrigation water distribution pipeline, and livestock drinking water pipeline alignments were required by the reservoir relocation. The number of booster pumps and the OM&R energy requirement were increased. No changes to water source, service area, project benefits, or water supply reliability were necessary.

The estimated project benefits and installation costs for all alternatives were updated to current (1996) dollars. The relocation of the reservoir will decrease the total installation cost of the new Recommended Plan over the old Recommended Plan by $284,800 but will increase the annual OM&R cost by $14,000. The total average annual net benefits increased from $67,400 to $75,700 and the benefit to cost ratio remained unchanged at 1.0 to 1.0. A Departmental Exception was received in 1986 to include NRCS funding for Engineering Services for the livestock drinking water system. Construction funding for installation of the livestock drinking water system will be provided totally by the local sponsors.

FINAL

WATERSHED PLAN-ENVIRONMENTAL IMPACT STATEMENT

WAIMEA-PAAUILO WATERSHED

LOCATION:	South Kohala and Hamakua Districts, Hawaii County, Hawaii
TAX MAP KEY:	3rd Division: 4-4-var., 4-6-var., 4-7-var., 4-9-var., 6-3-var., 6-4-var., 6-5-var., 6-6-var., 6-7-var.
PROPOSING AGENCY:	State of Hawaii Department of Agriculture
ACCEPTING AUTHORITY:	Governor, State of Hawaii
PREPARED BY:	USDA Natural Resources Conservation Service P.O. Box 50004 300 Ala Moana Blvd., Room 4316 Honolulu, Hawaii 96850

RESPONSIBLE OFFICIAL:

James J. Nakatani, Chairperson
Board of Agriculture

September 26, 1997
Date

Final

Watershed Plan and Environmental Impact Statement

Waimea-Paauilo Watershed
County of Hawaii, Hawaii

September 1997

The purpose of the Waimea-Paauilo Watershed project is to alleviate the agricultural water shortage problems caused by the inadequate quantity and distribution of water for crop irrigation and livestock drinking water in the Waimea area on the island of Hawaii. This document is an upgrade of a Plan and Environmental Assessment completed in September 1989. This document presents *six* alternative plans including a No Action Alternative and *five* alternatives which propose structural improvements to the existing agricultural water system. The Selected Plan, Alternative 5 - Kauahi Reservoir, proposes the installation of 1) a 131-million-gallon reservoir; 2) a reservoir supply pipeline; 3) extension of the irrigation water distribution system; and 4) a livestock drinking water distribution system. The Selected Plan will benefit 167 farmers with 1,985 acres of cropland and 265 ranchers with 22,962 acres of grazing land, most of whom are of native Hawaiian ancestry. Total average annual benefits have been estimated at $1,631,200. Total installation costs have been estimated at $17,376,600 with total average annual costs estimated at $1,555,500. The benefit:cost ratio for the Selected Plan is 1.0 : 1.0.

Responsible Agencies:

United States Department of Agriculture
Natural Resources Conservation Service

Mauna Kea Soil and Water Conservation District

State of Hawaii
Department of Agriculture

State of Hawaii
Department of Hawaiian Home Lands

Contacts:

Kenneth M. Kaneshiro, State Conservationist
USDA, Natural Resources Conservation Service
P.O. Box 50004
300 Ala Moana Blvd., Room 4316
Honolulu, Hawaii 96850-0050
Telephone: (808) 541-2601 FAX: (808) 541-1335

James J. Nakatani, Chairperson
Board of Agriculture
State of Hawaii, Department of Agriculture
P.O. Box 22159
Honolulu, Hawaii 96823-2159

The Waimea-Paauilo Watershed project was conducted under the authority of the Watershed Protection and Flood Prevention Act, Public Law 83-566 (PL 83-566), as amended (16 U.S.C. 1001-1008). Project planning was conducted and this Plan-EIS was prepared to fulfill the requirements of the following: 1) the National Environmental Policy Act of 1969 (NEPA), as amended, Public Law 91-190, 42 U.S.C. 4321- et seq. ; 2) the requirements of the Hawaii environmental review process as defined in Chapter 343, Hawaii Revised Statutes (HRS), including Act 241, SLH 1992 revisions, and Title 11, Chapter 200, Hawaii Administrative Rules, Department of Health; 3) the Water Resources Council's Economic and Environmental Principles and Guidelines for Water and Related Land Resources Implementation Studies; and 4) the NRCS's National Watershed Manual.

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SUPPLEMENTAL WATERSHED AGREEMENT NO. 1

between the

Mauna Kea Soil and Water Conservation District

Department of Agriculture
State of Hawaii,

Department of Hawaiian Home Lands
State of Hawaii,

(collectively referred to herein as Sponsors)

and the

Natural Resources Conservation Service
United States Department of Agriculture

(referred to herein as NRCS)

Whereas, the watershed plan for the Waimea-Paauilo Watershed, County of Hawaii, Hawaii, executed by the Sponsors named herein and NRCS, became effective on the 2nd day of October, 1989; and

Whereas, the Watershed Agreement was modified by Addendum No. 1, affirming that the State of Hawaii, Department of Land and Natural Resources will continue to provide technical assistance to the State of Hawaii, Department of Agriculture and support this project as outlined in the watershed plan, which became effective on the 12th day of October , 1989; and

Whereas, the responsibility for administration of the Watershed Protection and Flood Prevention Act (16 U.S.C. 1001-1008), as amended, has been assigned by the Secretary of Agriculture to NRCS; and

Whereas, in order to carry out the watershed plan for said watershed, it has become necessary to revise and supercede said Watershed Agreement, as supplemented; and

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Whereas, a revised watershed plan-EIS which modifies the watershed plan dated September 1989 for said watershed has been developed through the cooperative efforts of the Sponsors and NRCS;

Now, therefore, the Secretary of Agriculture, through NRCS, and the Sponsors hereby agree on the revised watershed plan and that the works of improvement for this project will be installed, operated, and maintained in accordance with the terms, conditions, and stipulations provided for in the revised watershed plan and including the following:

1. Landrights: The Sponsors will acquire, with other than PL-566 funds, such real property interests or land rights as will be needed in connection with the works of improvement. (Estimated Cost $380,000)

2. Relocation Payments and Assurances: The Sponsors hereby agree that they will comply with all of the policies and procedures of the Uniform Relocation Assistance and Real Property Acquisition Policies Act (42 U.S.C. 4601 et. seq. as implemented by 7 C.F.R. Part 21) when acquiring real property interests for this federally assisted project. If the Sponsors are legally unable to comply with the real property acquisition requirements of the Act, they agree that, before any federal financial assistance is furnished, they will provide a statement to that effect, supported by a memorandum or letter by a legal officer of the State of Hawaii, containing a full discussion of the facts and law involved. This statement may be accepted as constituting compliance. In any event, the Sponsors agree that it will reimburse owners for necessary expenses as specified in the Uniform Relocation Assistance and Real Property Acquisition Policies Act.

   The cost of relocation payments in connection with the displacements under the Uniform Act will be shared by the State of Hawaii Department of Agriculture (DOA), The State of Hawaii Department of Hawaiian Home Lands (DHHL), and NRCS as follows:

Item	DOA (percent)	DHHL (percent)	NRCS (percent)	Estimated Relocation Payment Costs (dollars)
Relocation Payments	33.0	24.4	42.6	0 1/

1/ Investigation of the watershed project area indicates that no displacements will be involved under present conditions. However, in the event that displacement becomes necessary at a later date, the cost of relocation assistance and payments will be cost shared in accordance with the percentages shown.

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3. Water Rights: The Sponsors will acquire or provide assurance that they have acquired water rights pursuant to state law as may be needed in the installation and operation of the works of improvement. The Sponsors will retain the right to set water delivery charges to recover the annual operation and maintenance costs.

4. Permits: The Sponsors will obtain all necessary federal, state, and county permits required by law, ordinance, or regulation for installation of the works of improvement.

5. Construction Costs: The percentages of construction costs to be paid by the Sponsors and NRCS are as follows:

Works of Improvement	DOA (percent)	DHHL (percent)	NRCS (percent)	Estimated Construction Costs (dollars)
Reservoir Supply Pipeline	47.8	4.5	47.8	4,075,500
Kauahi Reservoir	47.8	4.5	47.8	4,261,800
Irrigation Pipeline	39.5	10.5	50.0	1,343,100
Stockwater Pipeline	8.3	91.7	0.0	3,556,400
Total Construction Cost				13,596,800

6. Engineering Services Costs: The percentages of the engineering services costs to be borne by the Sponsors and NRCS are as follows:

Works of Improvement	DOA (percent)	DHHL (percent)	NRCS (percent)	Estimated Engineering Services Costs (dollars)
Reservoir Supply Pipeline	0.0	0.0	100.0	611,300
Kauahi Reservoir	0.0	0.0	100.0	693,300
Irrigation Pipeline	0.0	0.0	100.0	201,500
Stockwater Pipeline	0.0	0.0	100.0	533,500
Total Engineering Services Cost				2,039,600

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7. Project Administration: The Sponsors and NRCS will each bear the costs of project administration that each incurs, estimated to be $478,700 for the Department of Agriculture, $343,500 for the Department of Hawaiian Home Lands, and $537,700 for NRCS.

8. Operation, Maintenance, and Replacement: The Sponsors will be responsible for the operation, maintenance, and replacement of the works of improvement by actually performing the work or arranging for such work, in accordance with agreements to be entered into before issuing invitations to bid for construction work. Annual operation, maintenance, and replacement costs are estimated to be $196,100.

9. Costs: The costs shown in this plan are preliminary estimates. Final costs to be borne by the parties hereto will be the actual costs incurred in the installation of works of improvement.

10. Funding: This agreement is not a fund-obligating document. Financial and other assistance to be furnished by NRCS and funds, land and water rights, and other commitments to be provided by the Sponsors, in carrying out the plan is contingent upon the fulfillment of applicable laws and regulations and the availability of appropriations for this purpose. Without limiting the foregoing, funding by the Sponsors of their share of installation costs is subject to legislative appropriation.

11. Financial Agreement: A separate agreement will be entered into between NRCS and Sponsors before either party initiates work involving funds of the other party. Such agreements will set forth in detail the financial and working arrangements and other conditions that are applicable to the specific works of improvement.

12. Plan Revision: The watershed plan may be amended or revised only by mutual agreement of the parties hereto, except that NRCS may deauthorize or terminate funding at any time it determines that the Sponsors have failed to comply with the conditions of this agreement. In this case, NRCS shall promptly notify the Sponsors in writing of the determination and the reasons for the deauthorization of project funding, together with the effective date. Payments made to the Sponsors or recoveries by NRCS shall be in accord with the legal rights and liabilities of the parties when project funding has been deauthorized. An amendment to incorporate changes affecting a specific measure may be made by mutual agreement between NRCS and the Sponsor(s) having specific responsibilities for the measure involved.

13. Conflict of Interest: No member of or delegate to congress, or resident commissioner, shall be admitted to any share or part of this watershed plan, or to any benefit that may arise therefrom; but this provision shall not be construed to extend to this agreement if made with a corporation for its general benefit.

14. Nondiscrimination: The program conducted will be in compliance with all requirements respecting nondiscrimination, as contained in the Civil Rights Act of 1964, as amended, and the regulations of the Secretary of Agriculture (7 CFR 15), which provide that no person in the United States shall, on the grounds of race, color, national origin, sex, age, handicap, or religion, be excluded from participation in, be denied the benefits of, or otherwise be

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subjected to discrimination under any program or activity receiving federal financial assistance from the Department of Agriculture or any agency thereof.

15. Certification Regarding Drug-Free Workplace Requirements (7 CFR 3017, Subpart F):

By signing this watershed agreement, the Sponsors are providing the certification set out below. If it is later determined that the Sponsors knowingly rendered a false certification, or otherwise violated the requirements of the Drug-Free Workplace Act, the NRCS, in addition to any other remedies available to the Federal Government, may take action authorized under the Drug-Free Workplace Act.

Controlled substance means controlled substance in Schedules I through V of the Controlled Substances Act (21 U.S.C. 812) and as further defined by regulation (21 CFR 1308.11 through 1308.15);

Conviction means a finding of (including a plea of nolo contendre) or imposition of sentence, or both, by any judicial body charged with the responsibility to determine violations of the federal or state criminal drug statutes;

Criminal drug statute means a federal or non-federal criminal statute involving the manufacturing, distribution, dispensing, use, or possession of any controlled substance;

Employee means the employee of a grantee directly engaged in the performance of work under a grant, including: (i) all direct charge employees; (ii) all indirect charge employees unless their impact or involvement is insignificant to the performance of the grant; and, (iii) temporary personnel or consultants who are directly engaged in the performance of work under the grant and who are on the grantee's payroll. This definition does not include workers not on the payroll of the grantee (e.g., volunteers, even if used to meet a matching requirement; consultants or independent contractors not on the grantee's payroll; or employees of subreceipients or subcontractors in the covered workplaces).

A. The Sponsors certify that they will or will continue to provide a drug-free workplace by:

(1) Publishing a statement notifying employees that the unlawful manufacture, distribution, dispensing, possession, or use of a controlled substance is prohibited in the grantee's workplace and specifying the actions that will be taken against employees for violation of such prohibition;

(2) Establishing an ongoing drug-free awareness program to inform employees about --

(a) The danger of drug abuse in the workplace;

(b) The grantee's policy of maintaining a drug-free workplace;

(c) Any available drug counseling, rehabilitation, and employee assistance programs; and

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(d) The penalties that may be imposed upon employees for drug abuse violations occurring in the workplace;

(3) Making it a requirement that each employee to be engaged in the performance of the grant be given a copy of the statement required by paragraph (1);

(4) Notifying the employee in the statement required by paragraph (1) that, as a condition of employment under the grant, the employee will --

(a) Abide by the terms of the statement; and

(b) Notify the employer in writing of his or her conviction for a violation of a criminal drug statute occurring in the workplace no later than five calendar days after such conviction;

(5) Notifying the NRCS in writing, within ten calendar days after receiving notice under paragraph (4) (b) from an employee or otherwise receiving actual notice of such conviction. Employers of convicted employees must provide notice, including position title, to every grant officer or other designee on whose grant activity the convicted employee was working, unless the Federal agency has designated a central point for the receipt of such notices. Notice shall include the identification number(s) of each affected grant;

(6) Taking one of the following actions, within 30 calendar days of receiving notice under paragraph (4) (b), with respect to any employee who is so convicted --

(a) Taking appropriate personnel action against such an employee, up to and including termination, consistent with the requirements of the Rehabilitation Act of 1973, as amended; or

(b) Requiring such employee to participate satisfactorily in a drug abuse assistance or rehabilitation program approved for such purposes by a Federal, State, or local health, law enforcement, or other appropriate agency.

(7) Making a good faith effort to continue to maintain a drug-free workplace through implementation of paragraphs (1), (2), (3), (4), (5), and (6)

B. The Sponsors may provide a list of the site(s) for the performance of work done in connection with a specific project or other agreement.

C. Agencies shall keep the original of all disclosure reports in the official files of the agency.

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16. Certification Regarding Lobbying (7 CFR 3018):

A. The Sponsors certify to the best of their knowledge and belief, that:

(1) No Federal appropriated funds have been paid or will be paid, by or on behalf of the Sponsors, to any person for influencing or attempting to influence an officer or employee of a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with the awarding of any Federal contract, the making of any Federal grant, the making of any Federal loan, the entering into any cooperative agreement, and the extension, continuation, renewal, amendment, or modification of any Federal contract, grant, loan, or cooperative agreement.

(2) If any funds other than Federal appropriated funds have been paid or will be paid to any person for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with this Federal contract, grant, loan, or cooperative agreement, the undersigned shall complete and submit Standard Form - LLL, "Disclosure Form to Report Lobbying," in accordance with its instructions.

(3) The Sponsors shall require that the language of this certification be included in the award documents for all subawards at all tiers (including subcontracts, subgrants, and contracts under grants, loans, and cooperative agreements) and that all subrecipients shall certify and disclose accordingly.

B. This certification is a material representation of fact upon which reliance was placed when this transaction was made or entered into. Submission of this certification is a prerequisite for making or entering into this transaction imposed by Section 1352, Title 31, U.S. Code. Any person who fails to file the required certification shall be subject to a civil penalty of not less than $10,000 and not more than $100,000 for each such failure.

17. Certification Regarding Debarment, Suspension, and Other Responsibility Matters - Primary Covered Transactions (7 CFR 3017) :

A. The Sponsors certify to the best of their knowledge and belief, that they and their principals:

(1) Are not presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded from covered transactions by any Federal department or agency.

(2) Have not within a three year period preceding this proposal been convicted of or had a civil judgement rendered against them for commission of fraud or a criminal offense in connection with obtaining, attempting to obtain, or performing a public (Federal, State, or local) transaction or contract under a public transaction; violation of Federal or State antitrust statutes or commission of embezzlement,

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theft, forgery, bribery, falsification or destruction of records, making false statements, or receiving stolen property;

(3) Are not presently indicted for or otherwise criminally or civilly charged by a government entity (Federal, State, or local) with commission of the offenses enumerated in paragraph (1)(b) of this certification; and

(4) Have not within a three-year period preceding this application/proposal had one or more public transactions (Federal, State, or local) terminated for cause or default.

B. Where the primary Sponsors are unable to certify to any of the statements in this certification, such prospective participant shall attach an explanation to this agreement.

DEPARTMENT OF AGRICULTURE
STATE OF HAWAII

By:_____
Chairperson, Board of Agriculture

Date:_____

Approval as to Form:

Signed:_____
Deputy Attorney General

Date:_____

DEPARTMENT OF HAWAIIAN
HOME LANDS
STATE OF HAWAII

By:_____

Date:_____

The signing of this plan was authorized by a resolution of the Hawaiian Homes Commission adopted on _____.

Signed:_____

Date:_____

MAUNA KEA SOIL AND WATER
CONSERVATION DISTRICT

By:_____
Chairman

Date:_____

The signing of this plan was authorized by a resolution of the governing body of the Mauna Kea Soil and Water Conservation District adopted on _____.

Signed:_____

Date:_____

UNITED STATES DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE

By:_____
Kenneth M. Kaneshiro, State
Conservationist

Date:_____

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GLOSSARY OF ABBREVIATIONS

Ag. Park	Agricultural Park
DHHL	Department of Hawaiian Home Lands
DIP	ductile iron pipeline
DLNR	Department of Land and Natural Resources
DOA	Department of Agriculture
DOWALD	Division of Water and Land Development, DLNR
DWS	Department of Water Supply, County of Hawaii
FW/O	Future Without (Project Conditions)
HAAWS	Hamakua Area Agricultural Water Study
HDPE	high density polyethylene
MG	million gallons
mgd	million gallons per day
NED	National Economic Development
NEPA	National Environmental Policy Act
NRCS	Natural Resources Conservation Service (formerly SCS)
OM&R	operation, maintenance and replacement
PL 83-566	Public Law 83-566
PLAN-EA	Plan and Environmental Assessment
PLAN-EIS	Plan and Environmental Impact Statement
PVC	polyvinyl chloride
SCS	Soil Conservation Service (now NRCS)
SWCD	Soil and Water Conservation District
UHD	Upper Hamakua Ditch
USDA	United States Department of Agriculture
WIS	Waimea Irrigation System

METRIC CONVERSION TABLE

The following conversion factors may be used to convert the U.S. customary measuring units, used in this report, to System International d'Unites (SI) measuring units.

Multiply U.S. customary units	By	To obtain SI units
Length:		
inch (in.)	25.4	millimeter (mm)
foot (ft.)	0.3048	meter (m)
mile (mi.)	1.609	kilometer (km)
Area:		
square foot (ft^2)	0.09294	square meter (m^2)
acre (ac.)	0.4047	hectare (ha)
Liquid Volume:		
gallon (gal.)	3.785	liter (L)
million gallons (MG)	3785.0	cubic meter (m^3)
Discharge:		
gallon per minute (gpm)	0.06309	liter/second
million gallons per day (mgd)	0.4381	cubic meter/second

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SUMMARY OF WATERSHED PLAN AND ENVIRONMENTAL IMPACT STATEMENT

1. INTRODUCTION

Project Name: Waimea-Paauilo Watershed

County, State: County of Hawaii, Hawaii

Project Description: The Waimea-Paauilo Watershed project proposes a plan to alleviate the agricultural water shortage problems experienced by farmers and ranchers in the Waimea area by increasing the storage and distribution capacity of the Waimea Irrigation System. The Selected Plan proposes the installation of a 131-million gallon reservoir, a reservoir supply pipeline, and crop irrigation water and livestock drinking water distribution systems.

Planning Authorization: Watershed Protection and Flood Prevention Act, Public Law 83-566 (PL 83-566), as amended (16 U.S.C. 1001-1008)

Responsible Agencies: USDA, Natural Resources Conservation Service (NRCS)
Mauna Kea Soil and Water Conservation District (SWCD)
State of Hawaii, Department of Agriculture (DOA)
State of Hawaii, Department of Hawaiian Home Lands (DHHL)

2. PROJECT SETTING

Location: Northeast part of the island of Hawaii. Includes part of the South Kohala and Hamakua Districts.

TMK: 3rd Tax Division, 4-4-various, 4-6-various, 4-7-various, 4-9-various, 6-3-various, 6-4 various, 6-5 various, 6-6 various, and 6-7 various.

Size: 143,900 acres

Land Use:

Table i
PRESENT LAND USE

Land Use	Acres	Percent
Grazing	115,492	80
Former sugarcane	12,200	8
Forest reserve	8,140	6
Urban and built-up	3,142	2
Cropland (truck crops)	1,324	1
Other	3,602	3
Total	143,900	100

Land Ownership:

Table ii
LAND OWNERSHIP

Landowner	Acres	Percent
Private	88,629	61
State of Hawaii (*not* including DHHL)	*29,840*	21
Department of Hawaiian Home Lands	*25,406*	18
County of Hawaii	25	< 1
Total	143,900	100

Population: 8,800 persons (1990)

Agriculture: The watershed area is one of the most important agricultural areas in the State of Hawaii. The two main agricultural industries are the production of irrigated truck crops and cattle ranching. Nearly two-thirds of the total state production of Chinese cabbage, celery, head lettuce, burdock, and daikon is grown in the watershed area. There are over 300 ranches with over 40,000 head of cattle on 115,492 acres of grazing land in the watershed area.

Existing Water Supply Systems:

- **Waimea Irrigation System (WIS):** State of Hawaii-owned agricultural water system operated by the DOA. Provides irrigation water to the Lalamilo, Puukapu, and DHHL farmlots.
- **Parker Ranch System:** Privately-owned water system which provides stockwater to Parker Ranch.
- **Department of Water Supply:** County of Hawaii-owned and operated water system which provides domestic water.

3. PROJECT PURPOSE AND NEED

Project Purpose: To alleviate the agricultural water shortage problems caused by the inadequate quantity and distribution of water for crop irrigation and livestock drinking water (stockwater) in the watershed area. The project purpose under PL 83-566 is agricultural water management.

Problems and Opportunities: WIS farmers are often subject to water use restrictions because of insufficient storage capacity of the system, a condition exacerbated by droughts. The restrictions result in reductions in crop quality and yield, total crop losses, reductions in new plantings, and disruptions in marketing patterns. Many ranchers must use the more expensive treated domestic water for stockwater because a source of agricultural water is not available to them. Opportunities to expand both crop and livestock production are limited by the inadequate water supply. Agricultural losses have been estimated at $1,670,400 on an average annual basis, under present conditions. Losses will increase to an estimated $3,749,900 in the future if no action is taken to solve the problems.

4. FORMULATION AND COMPARISON OF ALTERNATIVES

Candidate Plans:

- **Alternative 1**, the **No Action Alternative,** describes and quantifies the conditions expected if no action is taken to the solve the problems. It served as the baseline against which the effects of the other alternatives are measured.
- **Alternative 2,** the **National Economic Development (NED) Plan,** provides the highest economic benefits after the cost expenditures is considered (net benefits). It proposes the following improvements to the WIS: 1) installation of a reservoir supply pipeline from the Upper Hamakua Ditch (UHD) to the proposed reservoir; 2) construction of a 131-MG reservoir (Waimea II) with a 2:1 embankment downslope; and 3) expansion of the irrigation distribution system to supply the planned 270-acre Lalamilo Ag. Park expansion area. It does not include improvements to provide stockwater.
- **Alternative 3,** the **Waimea II Reservoir Plan,** is similar to Alternative 2, except that it also includes the installation of a stockwater distribution system to service 265 ranchlots totaling 22,962 acres. The reservoir supply pipeline, reservoir, and irrigation water distribution system are unchanged from Alternative 2.
- **Alternative 4,** the **Modified Waimea II Reservoir Plan,** is similar to Alternative 3, except that it proposes constructing a modified Waimea II Reservoir which incorporates design features to increase the structural stability of the reservoir's embankment, including a lower embankment height and 3:1 downslope. These modifications will lower the storage capacity of the reservoir to 120-million gallons.
- **Alternative 5,** the **Kauahi Reservoir Plan,** differs from the other alternatives, in that it proposes the installation of a 131-million gallon reservoir at the Kauahi site, approximately three miles south of the Waimea II Reservoir site. This plan requires the installation of a longer reservoir supply pipeline. It also includes the expansion of the irrigation distribution system to supply the proposed 270-acre Lalamilo Agricultural Park and a stockwater distribution system to service 265 ranchlots totaling 22,962 acres.
- ***Alternative 6, the Kauahi Reservoir Plan without Stockwater,*** *is similar to Alternative 5, except that no improvements to provide livestock drinking water from the WIS are included.*

5. SELECTED PLAN

Rationale for Plan Selection: The Sponsors designated Alternative 5, the Kauahi Reservoir Plan, as the "Selected Plan" for installation. Alternative 5 proposes an economically feasible plan that addresses the project purpose of alleviating the agricultural water shortage problems, with less potential adverse effects on properties surrounding the proposed reservoir.

Proposed Works of Improvement: The Selected Plan proposes the installation of the following structural measures to increase the capacity and reliability of the WIS:

- **Reservoir supply pipeline:** Install 19,200 feet of pipeline from a new intake structure on the Upper Hamakua Ditch to the proposed Kauahi Reservoir.
- **Reservoir:** Construct a 131-MG Kauahi Reservoir.
- **Irrigation water distribution system:** Install 13,300 feet of pipeline to service the State Department of Agriculture-proposed 270-acre Lalamilo Agricultural Park expansion area.
- **Stockwater distribution system:** Install 234,600 feet of pipeline, seven electric pumps, and two diesel pumps to provide stockwater to 265 ranchlots totaling 22,962 acres.

WIS Features (with improvements):

- **Total water storage:** Increased from 161 million gallons to 292 million gallons.
- **Total water supplied:** 4-million gallons per day.
- **Reliability of water supply:** Increased from 68 percent to 78 percent.
- **Service Areas:**
  - Farmlots: 167
  - Total cropland acres: 1,985
  - Irrigated cropland acres: 989
  - Ranchlots: 265
  - Grazing land acres: 22,962
  - Animal units 19,040

6. EFFECTS OF THE SELECTED PLAN

Economic Effects:

Table iii
ECONOMIC EFFECTS

Item	Cropland Irrigation Water ($)	Livestock Drinking Water ($)	Total ($)
Installation costs			
Federal (PL 83-566) cost-share	6,832,800	569,100	7,401,900
State Dept. of Agriculture cost-share	5,418,900	322,400	5,741,300
DHHL cost-share	157,200	4,076,200	4,233,400
Total installation costs	12,408,900	4,967,700	17,376,600
Average annual installation costs [1/]	970,800	388,600	1,359,400
Total average annual OM&R [2/] **costs**	101,500	94,600	196,100
Total average annual costs	1,072,300	483,200	1,555,500
Average annual benefits			
Reduction in losses due to water shortages	817,800	41,500	859,300
Reduction in limited expansion opportunities	517,600	207,700	725,300
Reduction in water pumping costs	46,600	0	46,600
Total average annual benefits	1,382,000	249,200	1,631,200
Average annual benefit : cost ratio	1.3 : 1.0	0.5 : 1.0	1.0 : 1.0

[1/] Installation costs amortized at 7.625% interest for 50 years (.07823).
[2/] Operation, maintenance, and replacement.

Environmental Effects:

Item	Effects	Proposed Mitigation Measures
Agriculture and Prime Agricultural Land	• Agricultural industry will be strengthened. • Additional potential Prime Agricultural will be supplied with irrigation water.	None required.
Air	• Temporary decrease in air quality will occur during construction due to equipment creating dust. • Temporary decrease in air quality will occur during construction due to equipment exhaust emissions.	• Dust control measures will be undertaken or installed. Remaining effects considered unavoidable. • None feasible for exhaust emissions. Effects considered unavoidable.
Cultural Resources	None anticipated.	None required.
Dam Breach	• One dwelling is located in the Kauahi Reservoir dam breach inundation area. The living area of the dwelling is above the estimated breach flow depth. • Dwelling garage, one open livestock shelter, one toolshed, livestock fences, and roads may be inundated and damaged by breach flow. • Erosion damage and sediment deposition may occur in the pasture areas. • Ponding may last for a week or more.	• Kauahi Reservoir located where no stream or introduced runoff will enter dam pool. • High-density polyethylene lining will be installed. • A chimney filter within the embankment will be installed. • Downstream embankment lowered to 3:1 slope to create a broader base and increased flow path. • An Emergency Preparedness Plan will be developed and implemented. • Remaining effects considered unavoidable.
Energy	• 82,900 kilowatt hours will be required to operate 7 stockwater pumps annually. • 3,000 gallons of diesel fuel will be required to operate 2 stockwater pumps annually.	None feasible. Considered an irreversible and irretrievable commitment of resources.
Flooplains	None anticipated.	None required.
Groundwater	None anticipated.	None required.
Hazardous Materials & Haz. Waste Sites	*None anticipated.*	*None required.*
Land Use	• 29 acres will be converted from grazing land to permanent Kauahi Reservoir site. • 270 acres will be converted from grazing land to cropland (Lalamilo Ag. Park).	None feasible. Considered a long-term, irreversible and irretrievable commitment of resources.
Population / Urban Growth	8 potentially new farmers. Urban growth not affected.	None required.
Soil	Temporary increase in soil erosion and sedimentation potential will occur during construction.	Erosion and sediment control measures will be undertaken or installed. Remaining effects considered unavoidable.
Streams	Reduced overflow from UHD will reduce average streamflow of Lalakea Steam by 5% per year. Naturally occurring fluctuations in streamflow will override overflow effects.	None required.
Threatened and Endangered Species	None anticipated.	None required.
Visual	Kauahi Reservoir will be visible from about 300 properties.	Kauahi Reservoir embankment slope grassed to blend in with the surrounding grazing land.
Water Rights	None anticipated.	None required.
Wetlands	Minimal effects due to stockwater pipelines.	Pipelines will be placed to avoid wetlands, buried, and/or best management practices followed.

Relationship Between Local Short-term Uses and Enhancement of Long-term Productivity: The present and most likely continued short-term use of the 29-acre Kauahi Reservoir site, seven-acre stockwater distribution system right-of-way area, is grazing land. The long-term commitment of this grazing land for the installation of the works of improvement will result in a more reliable and expanded source of agricultural water that will enhance long-term productivity on 1,985 acres of cropland and 22,962 acres of grazing land.

Unresolved Issues:

- None were identified.

Relationship to Other Plans, Policies and Controls:

- **State Land Use Districts:** The land use changes proposed by the Selected Plan will take place on land located in an Agriculture District and will conform with allowable uses.
- **The Hawaii State Plan and State Agricultural Functional Plan:** Several objectives, policies, and actions stated in the plans support the implementation of the Selected Plan.
- **Hawaii County General Plan:** Several goals, policies, and courses of action stated in the plan support the implementation of the Selected Plan.
- **Hawaii County Water Use and Development Plan (WUDP):** The plan recognizes the need for additional water supply to handle new irrigation requirements.
- **Department of Hawaiian Home Lands Plans:** The Selected Plan supports the efforts of the DHHL to provide infrastructure, including an agricultural water supply, to allow native Hawaiian homesteaders so that they may farm and ranch.
- **Department of Transportation:** The proposed bypass highway can be compatible with the Selected Plan with the installation of pipeline crossings.
- **Waimea Water Roundtable:** This group has been informed about the Waimea-Paauilo Watershed project and continues provide input to assure wise use of the water resources in the Waimea area.
- **Parker Ranch 2020 Plan:** The 2020 Plan applies to urban-zoned property and does not affect any of the agricultural or pastoral parcels in the project service area.
- ***County Zoning Code:*** *Project installation will conform with land uses designated by the County Zoning Code.*
- ***Hawaii Coastal Zone Management Program:*** *Project installation will have no effect or positive effect on the ten policy areas of the CZM program.*
- ***Ceded Lands Trust:*** *The use of ceded lands for project improvements conforms with the eligible purposes set forth in Section 5(f) of the Admissions Act.*

Permits and Compliance:

- *Grading, Grubbing, Excavating, and Stockpiling Permit*
- *Building Permit*
- *State Land Use Approval*
- *Conservation District Use Approval*
- *Dam Construction Permit*
- *State Highways Permit*
- *Department of Army (404) Permit*

Consultation and Public Participation:

The general public, as well as federal, state and county agencies, have been provided numerous opportunities to participate in the development of both the Waimea-Paauilo Watershed Plan-Environmental Assessment and Environmental Impact Statement. Efforts were made to ensure a wide review of the Draft Plan-Environmental Impact Statement including: the mailing of copies to approximately 90 parties, the holding of a public meeting, and the publication of notices of availability in local newspapers. Thirty-three sets of written comments were received during the 45-day review period.

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1. INTRODUCTION

All changes to the text of the draft Plan-EIS appearing in this document as a result of comments received during the interagency review period are italicized to allow the reader to distinguish the revisions.

1.1 GENERAL

The purpose of the Waimea-Paauilo Watershed project is to alleviate the agricultural water shortage problems caused by the inadequate quantity and distribution of water for crop irrigation and livestock drinking water in the Waimea area of the island of Hawaii, County of Hawaii.

Project planning began on July 5, 1983 with the authorization of funds by the Chief, Natural Resources Conservation Service (NRCS). The planning process included the identification and quantification of the problems, an inventory of resources, and the formulation and comparison of alternative plans. The results of project planning were described in a combined Watershed Plan and Environmental Assessment (Plan-EA) which was completed in September 1989. Three plans were considered as Candidate Plans and one was selected by the Sponsors as the Recommended Plan for implementation. The Recommended Plan in the Plan-EA proposed improvements to the existing agricultural water system, the WIS, including the construction of a 133-million-gallon reservoir, referred to as the Waimea II Reservoir. Subsequent community opposition to the plan based on concerns about dam safety and possible economic effects on homes adjacent to the proposed Waimea II Reservoir site, prompted further planning efforts which resulted in new alternatives and the preparation of this combined Watershed Plan and Environmental Impact Statement (Plan-EIS). Environmental Impact Statements require a more detailed analysis of the environmental consequences of proposed actions, than do Environmental Assessments.

The further planning efforts included the updating of the information presented in the original Plan-EA, the re-evaluation of the three original Candidate Plans included in the Plan-EA, and the formulation and evaluation of *three* new alternative plans. The plans were compared and one of the new plans, Alternative 5, the Kauahi Reservoir Plan, was selected by the Sponsors as the plan they would like implemented

The Waimea-Paauilo Watershed project was undertaken by the U. S. Department of Agriculture (USDA), NRCS, formerly known as the Soil Conservation Service, at the request of the following local sponsoring organizations (Sponsors): 1) the Mauna Kea Soil and Water Conservation District (SWCD); 2) the State of Hawaii, Department of Agriculture (DOA); and 3) the State of Hawaii, Department of Hawaiian Home Lands (DHHL). The State of Hawaii, Department of Land and Natural Resources (DLNR) was replaced by DOA as a project sponsor, when DOA, pursuant to Act 306, SLH 1987, was granted jurisdiction over the State's agricultural water systems in 1987. Project planning and the preparation of the Plan-EA and Plan-EIS was led by the NRCS with assistance from the Sponsors. Other

federal, state, and county agencies, groups, and individuals also assisted with project planning by providing information and reviewing draft plans.

The Waimea-Paauilo Watershed project is planned and implemented under the authority of the Watershed Protection and Flood Prevention Act, Public Law 83-566 (PL 83-566), as amended (16 U.S.C. 1001-1008). Project planning was conducted and this Plan-EIS was prepared to fulfill the requirements of: 1) the National Environmental Policy Act of 1969 (NEPA), as amended, Public Law 91-190, 42 U.S.C. 4321- et seq.; 2) the requirements of the Hawaii environmental review process as defined in Chapter 343, Hawaii Revised Statutes (HRS), including Act 241, SLH 1992 revisions, and Title 11, Chapter 200, Hawaii Administrative Rules, Department of Health; 3) the Water Resources Council's Economic and Environmental Principles and Guidelines for Water and Related Land Resources Implementation Studies; and 4) the NRCS's National Watershed Manual.

Three versions of this Plan-EIS have been prepared: 1) Technical Review; 2) Draft; and 3) Final. The Technical Review Plan-EIS was reviewed by the NRCS technical and program specialist and by the Sponsors. Comments from this review will be considered and modifications to the Plan-EIS will be made accordingly to produce the Draft version. The Draft Plan-EIS was made available for public review and comment for a 45-day period. The availability of the Draft Plan-EIS was publicized in the local media and copies were widely distributed to governmental agencies, organizations, and interested individuals. All comments were considered and modifications made to produce the Final Plan-EIS. All comments were responded to in writing and both the comments and responses are included in the Final Plan-EIS. *Notices of availability of the Final Plan-EIS will appear in both the Environmental Bulletin and Federal Register.* A copy will be sent to each individual, agency, or group providing substantive comments on the Draft Plan-EIS. Following the acceptance of the Final Plan-EIS by the Governor of the State of Hawaii *and publication of the Notice of Acceptance in OEQC's Environmental Notice, there will be a 60-day period for an aggrieved party to file suit in circuit court. For the federal process, a 30-day no action period following the publication of the Notice of Availability in the Federal Register will be observed after which a Notice of Intent (to proceed with project implementation) can be issued by the NRCS. The availability of the Notice of Intent will be widely-published and the Notice will be sent to recipients of the Final Plan-EIS.*

NRCS will use this Plan-EIS to request funds for the federal share of the installation cost of the Selected Plan. The Sponsors will be responsible for obtaining the necessary local funding from the state legislature or other sources. It is anticipated that appropriations will be requested in increments. The implementation of the Selected Plan will depend on the acquisition of both federal and local funding.

1.2 READER'S GUIDE

This reader's guide briefly describes the contents of this Plan-EIS.

A **Table of Contents, List of Tables, List of Figures, Glossary of Abbreviations,** and a **Metric Conversion Table** are provided to make reading and using the Plan-EIS easier.

The **Summary** describes the plan in brief. Other sections should be consulted if specific details of the project are desired.

Section 1. INTRODUCTION, provides background information about the Waimea-Paauilo Watershed project and includes this Reader's Guide.

Section 2. PROJECT SETTING, begins the body of the Plan-EIS. It describes pertinent environmental, social, and economic information about the watershed area.

Section 3. PROJECT PURPOSE AND NEED, describes the purpose of the project and demonstrates the need for the watershed project by describing and quantifying the problems that need to be solved as well as the opportunities for enhancing the quality of life in the watershed area, based on public concerns and desires. **Table F, SUMMARY OF PROBLEMS AND OPPORTUNITIES,** provides a summary tabulation.

Section 4. FORMULATION AND COMPARISON OF ALTERNATIVES, describes the formulation and comparison of the alternative plans and rationale for the selection of the Selected Plan. **Table L, SUMMARY AND COMPARISON OF CANDIDATE PLANS,** presents a tabular comparison of the plans considered as the Selected Plan.

Section 5. SELECTED PLAN, describes the measures to be installed as proposed by the Selected Plan. The following tables are included in this section (on blue paper for ready reference):

Table 1 - Estimated Installation Costs

Table 2 - Estimated Cost Distribution

Table 3.A - Structural Data - Pipelines

Table 3.B - Structural Data - Kauahi Dam and Reservoir

Table 4 - Estimated Average Annual Costs

Table 6 - Comparison of Benefits and Costs

Section 6. ENVIRONMENTAL SETTING, EFFECTS, AND MITIGATION MEASURES, describes the economic, environmental, and social effects of the Selected Plan and any planned mitigation measures.

Section 7. CONSULTATION AND PUBLIC PARTICIPATION, documents the opportunities provided for public participation and agency consultation throughout the planning process.

Section 8. PLAN-EIS PREPARERS, is a table listing the names and qualifications of the persons involved in preparing the various drafts of the Plan-EIS.

Section 9. INDEX, is available to make finding information about a particular subject easier.

Section 10. REFERENCES, list the reports used in preparation of this Plan-EIS.

The **Appendices** consist of the following:

Appendix A - WATER RESTRICTION PERIODS, lists the water restriction periods experienced by users of the WIS from 1965 to January 1997.

Appendix B - COMMENTS AND RESPONSES, includes written comments received regarding the Draft Plan-EIS and letters of response.

Separate documentation with additional information regarding the environmental evaluations conducted for the project have been prepared and are available for review by request from the NRCS contact person listed below.

Comments or questions regarding the contents of this Plan-EIS may be referred to:

Kenneth M. Kaneshiro, State Conservationist
USDA, Natural Resources Conservation Service
Mailing address: P.O. Box 50004
300 Ala Moana Blvd., Room 4316
Honolulu, HI 96850-0050
Telephone number: (808) 541-2601
FAX number: (808) 541-1335.

2. PROJECT SETTING

2.1 LOCATION AND SIZE

The 143,900-acre Waimea-Paauilo Watershed is located on the northeast part of the island of Hawaii, commonly referred to as the Big Island, which comprises the County of Hawaii (Figure A). The watershed area is bounded by Highway 19 to the north and the town of Paauilo to the east. The watershed area extends to the 8,000-foot level of Mauna Kea to the south and to the Waikoloa Stream drainage to the west. The watershed area is located in the following Tax Map Key (TMK) areas: 3rd Tax Division; 4-4-various, 4-6-various, 4-7-various, 4-9-various, 6-3-various, 6-4 various, 6-5 various, 6-6 various, and 6-7 various.

2.2 LAND USE

Land use in the watershed area is strongly influenced by past and present agricultural activity. A large majority of the land is used for grazing cattle (Table A). Approximately 12,200 acres along the Hamakua coastline were used for growing sugarcane until the closing of the Hamakua Sugar Company in 1995. There are several forest reserves located partially or wholly within the watershed area. A portion of the Kohala Forest Reserve is located in the watershed area north of Waimea, the major population center in the watershed area as well as the northern part of the island of Hawaii. Truck crops are grown on approximately 1,300 acres in the Lalamilo and Puukapu areas of Waimea.

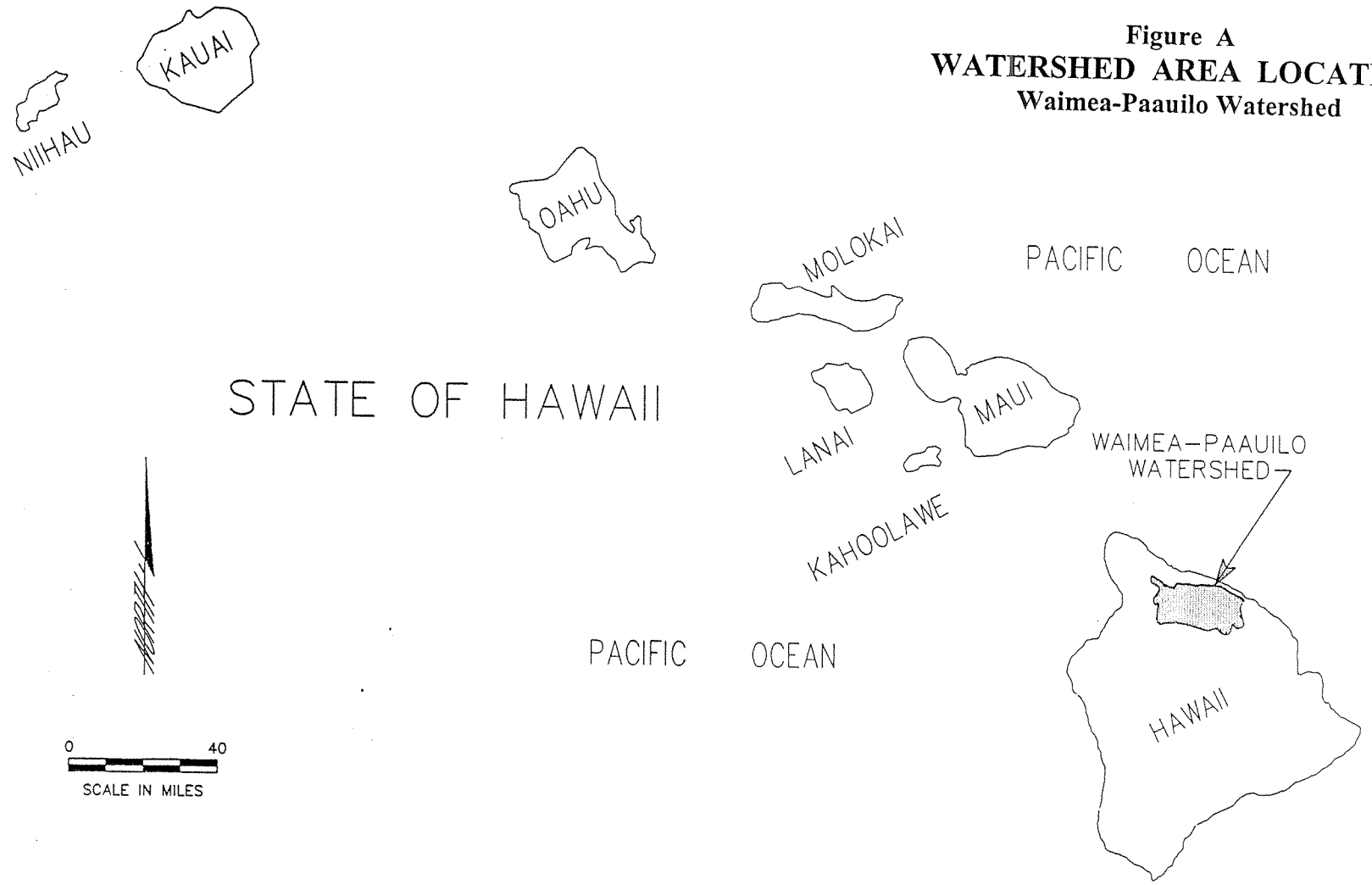
Table A
PRESENT LAND USE
Waimea-Paauilo Watershed

Land Use	Acres	Percent
Grazing	115,492	80
Former sugarcane	12,200	8
Forest reserve	8,140	6
Urban and built-up	3,142	2
Cropland (truck crops)	1,324	1
Other	3,602	3
Total	143,900	100

Land use as designated by the 1989 County of Hawaii, General Plan Land Use Pattern Allocation Guide Map is shown in Table B and Figure B (County Landuse Districts). The map was developed to assist county planners in making future land use determinations. Land in the watershed area fall in seven out of the twelve possible designations, as described below.

Intensive Agriculture: Sugar, orchard, diversified agriculture, and floriculture.

Figure A
WATERSHED AREA LOCATION
Waimea-Paauilo Watershed



Extensive Agriculture: Pasturage and range lands.

Urban and Rural - Medium Density: Village and neighborhood commercial and residential and related functions (3-story commercial; residential - up to 35 units per acre).

Urban and Rural - Low Density: Single family residential in character, ancillary community and public uses, and convenience type commercial uses.

Urban Expansion Area: Allows for a mix of high density, medium density, low density, industrial and/or open designations in areas where new settlements may be desirable, but where the specific settlement pattern and mix of uses have not yet been determined. Within areas designated for development as resorts, portions of the resort area may be included in the urban expansion area.

Industrial Area: These areas include uses such as manufacturing and processing, wholesaling, large storage and transportation facilities, and light industrial uses.

Conservation Area: Forest and water reserves, natural and scientific preserves, open, lands within the State Land Use Conservation District.

The watershed area does not include any land designated Urban and Rural - High Density (commercial and multiple residential); Resort Area (hotels); Orchard (rocky land suitable of orchards); University; or Open (parks and historic sites).

Table B
LAND USE PATTERN ALLOCATION
Waimea-Paauilo Watershed

Designation	Acres	Percent
Intensive Agriculture	64,900	45
Extensive Agriculture	66,300	46
Urban and Rural - Medium Density	340	< 1
Urban and Rural - Low Density	3,200	2
Urban Expansion Area	660	< 1
Industrial Area	360	< 1
Conservation Area	8,140	6
Total	143,900	100

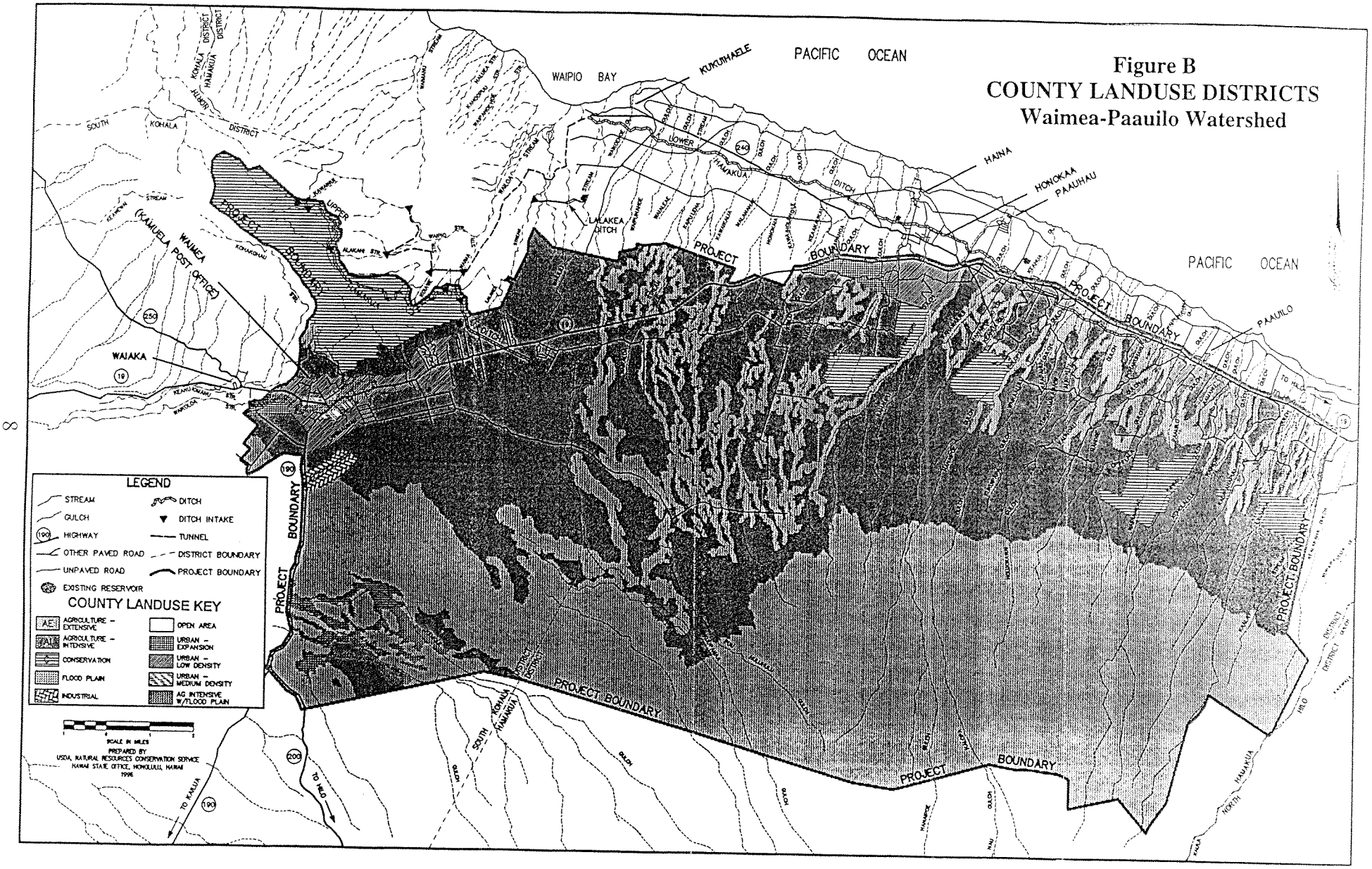


Figure B
COUNTY LANDUSE DISTRICTS
Waimea-Paauilo Watershed

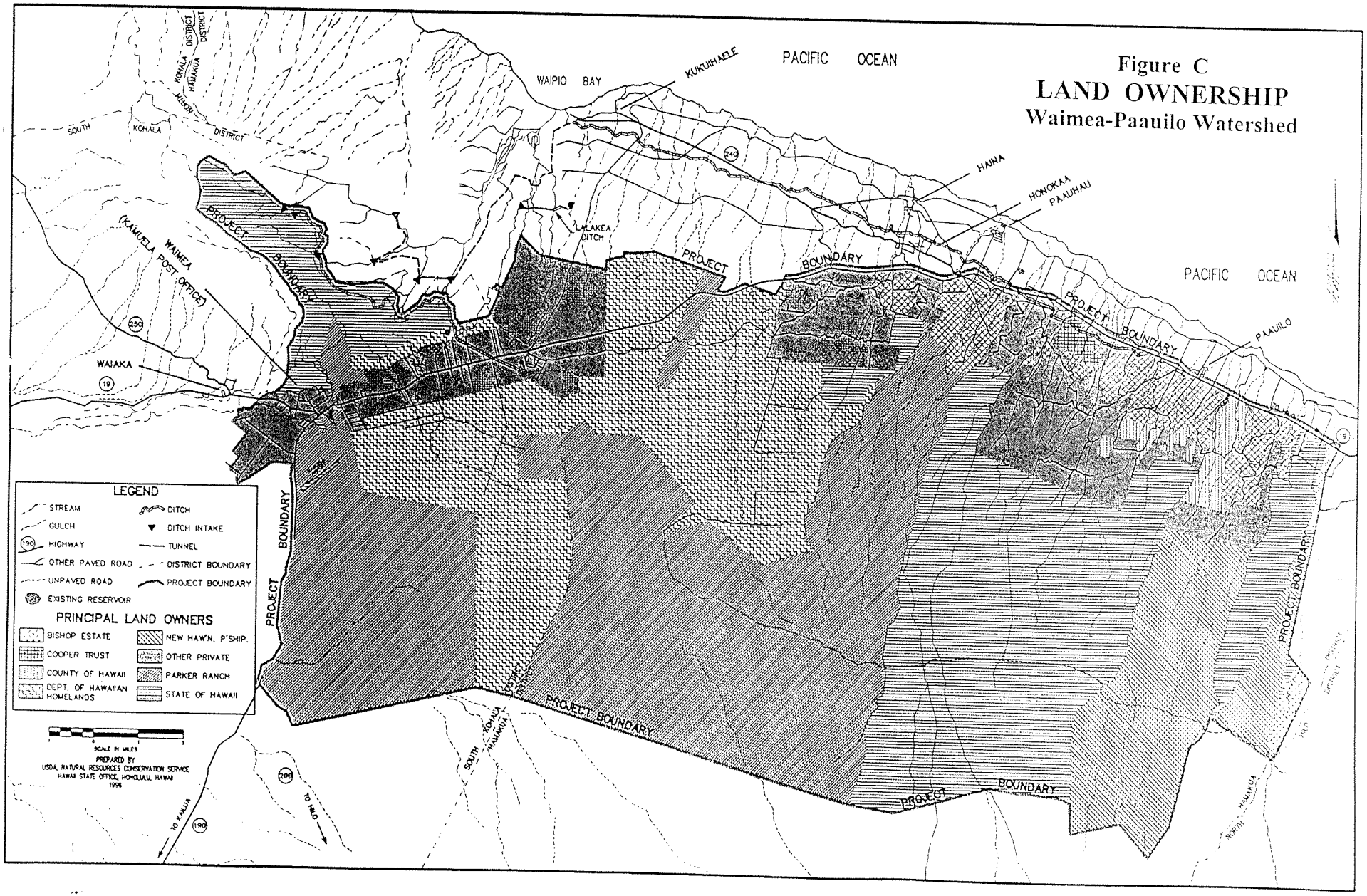


Figure C
LAND OWNERSHIP
Waimea-Paauilo Watershed
PACIFIC OCEAN
WAIPIO BAY
KUKUIHAELE
HAINA
HONOKAA
PAAUHAU
PAAUILO
LALAKEA DITCH
WAIMEA
(KAMUELA POST OFFICE)
WAIAKA
SOUTH KOHALA DISTRICT
NORTH KOHALA DISTRICT
HAMAKUA DISTRICT
PROJECT BOUNDARY
TO KAWAIHAE
TO HILO
LEGEND
STREAM
GULCH
HIGHWAY
OTHER PAVED ROAD
UNPAVED ROAD
EXISTING RESERVOIR
DITCH
DITCH INTAKE
TUNNEL
DISTRICT BOUNDARY
PROJECT BOUNDARY
PRINCIPAL LAND OWNERS
BISHOP ESTATE
COOPER TRUST
COUNTY OF HAWAII
DEPT. OF HAWAIIAN HOMELANDS
NEW HAWN. P'SHIP.
OTHER PRIVATE
PARKER RANCH
STATE OF HAWAII
SCALE IN MILES
PREPARED BY
USDA, NATURAL RESOURCES CONSERVATION SERVICE
HAWAII STATE OFFICE, HONOLULU, HAWAII
1996

2.3 LAND OWNERSHIP

The following table lists land ownership acreage and percentages in the watershed area. Figure C illustrates land ownership in the watershed area.

Table C
LAND OWNERSHIP
Waimea-Paauilo Watershed

Landowner	Acres	Percent
Private	88,629	61
State of Hawaii (*not* including DHHL)	*29,840*	*21*
Department of Hawaiian Home Lands	*25,406*	*18*
County of Hawaii	25	<1
Total	143,900	100

All Department of Hawaiian Home Land parcels and State roadways are ceded lands which were conveyed to the State from the federal government through Sections 5(b) and 5(e) of the Admissions Act. Many of the non-DHHL parcels owned by the State of Hawaii, including road rights-of-way and public facility sites are ceded lands. Approximately 1.75 million acres of Government and Crown Lands were ceded to the United States, when Hawaii was annexed in 1898.

2.4 POPULATION AND ECONOMY

The resident population of the island of Hawaii was about 120,000 based on the 1990 census. The major industries on Hawaii are tourism and agriculture.

The resident population in the watershed area was estimated at about 8,800 based on the 1990 census. This includes the residents of three communities, Waimea (Kamuela), Honokaa, and Paauilo which lie wholly or partially within the watershed area boundaries. Although Waimea Town is the major population and business center in the watershed area, as well as the entire northern region of the island, it remains a rural farming and ranching community. An area undergoing rapid growth, the resident population of Waimea grew from 1,179 in 1980 to 5,972 in 1990, an increase of about 500 percent. Honokaa and Paauilo are predominantly agricultural communities which are in transition from sugarcane growing and processing to diversified agriculture production.

2.5 AGRICULTURE

Total value of crop and livestock sales for the island of Hawaii topped $159 million in 1994, over 30% of the approximately $502 million in sales statewide.

Agriculture is the major source of employment and income in the watershed area. Until recently, sugarcane production was the major agricultural industry in the watershed area, with about 12,200 acres of sugarcane grown along the Hamakua coast region.

Dwindling profits caused the closing of the area's major sugarcane plantation in 1995. The State of Hawaii and private enterprises are looking for alternative agricultural uses for the former sugarcane lands.

The primary agricultural industries in the watershed area at the present time are the production of irrigated truck crops and cattle ranching on open pasture lands. The watershed area is one of the most important agricultural areas in the State of Hawaii.

2.5.1 Irrigated Truck Crops

The Waimea area is one of the major truck crop producing areas in the State of Hawaii. The value of crops grown with water from the WIS is estimated at over $2 million and includes nearly two-thirds of the Chinese cabbage, celery, head lettuce and romaine lettuce grown in the State. Broccoli, cauliflower, head cabbage, romaine lettuce, burdock and daikon are also commonly grown. Several farms in the area grow flowers such as roses and carnations in greenhouses and tuberoses in fields.

At the present time, there are about 1,324 acres of cropland used for the production of truck crops in the watershed served by the State-run Waimea Irrigation System (WIS). The cropland is concentrated in three main areas: Lalamilo, Puukapu, and Department of Hawaiian Home Lands (DHHL) farmlots. Average farmlot size is about 16 acres. The farmlots are intensively farmed, with crops grown year-round and several crops produced per year. The Lalamilo and Puukapu farmlots are privately-owned by individual farmers. Farmers must be of native Hawaiian descent in order to lease and farm a DHHL lot.

Of the total 1,324 acres, 892 acres are cultivated, with the remaining acres being used for farm roads, windbreaks, and buildings. Of the 892 acres, approximately 624 acres are irrigated at any one time, allowing for non-irrigated periods between crops and during harvesting. Sprinkler irrigation systems are commonly used. Table D shows the cropland acreage and number of farmlots in each area.

When planning for the Plan-EA was being conducted in the late 1980's, three new areas were designated as future cropland expansion areas. These areas were the Lalamilo Agricultural Park, DHHL Farmlots Phase I, and the DHHL Farmlots Phase II. Expansion of the WIS distribution system to serve DHHL Phase I and II farmlots is currently underway. Total cropland acreage for these two areas is 391, of which an estimated 301 acres will be cultivated and 211 acres actively irrigated. Irrigated acreage in the existing Puukapu farmlots is also expected to increase by 39 acres based on applications on file with the WIS. These acres are expected to be in production under Future Without Project Conditions (Figure D).

The remaining cropland expansion area is the Lalamilo Agricultural Park. The state-operated agricultural park has been tentatively sited in an area between the existing Lalamilo farmlots and the Puukapu/DHHL farmlots. The development of the site is pending the availability of irrigation water and the acquisition of the land. Total cropland area is 270 acres, of which an estimated 163 acres can potentially be cultivated and 115 acres can potentially be irrigated.

Table D
WAIMEA IRRIGATION SYSTEM -
CROPLAND SERVICE AREA
Waimea-Paauilo Watershed

Condition/Area	Farmlots	Total Acres	Cultivated Acres	Irrigated Acres
PRESENT				
Lalamilo	28	2870	443	310
Puukapu	24	370	230	161
DHHL	29	284	219	153
TOTAL PRESENT	81	1,324	892	624
FUTURE WITHOUT PROJECT				
Lalamilo	28	670	443	310
Puukapu	24	370	285	200
DHHL	29	284	219	153
DHHL - Phase I	45	226	174	122
DHHL - Phase II	33	165	127	89
TOTAL FUTURE WITHOUT PROJECT	159	1,715	1,248	874
POTENTIAL EXPANSION AREA				
Lalamilo Agricultural Park	8	270	163	115
TOTAL (FUTURE + EXPANSION)	167	1,985	1,411	989

2.5.2 Cattle Ranching

Cattle ranching is the other important agricultural industry in the project area. There are approximately 115,500 acres of grazing land in the watershed area used for cattle ranching (Table E).

A large portion of the 225,000-acre Parker Ranch is located in the watershed. Parker Ranch has approximately 23,608 animal units on the 50,400 acres located in the watershed area. The ranch is a cow-calf operation on rangeland, with cattle being shipped to the mainland for finishing.

DHHL and privately-owned ranchlots make up the remaining grazing land. As with the DHHL farmlots, individuals must be of native Hawaiian descent in order to lease a DHHL ranchlot. Smaller DHHL ranchlots or ranches are subsistence type, with larger ranches being commercial cow-calf operations. The privately-owned ranches are mostly commercial cow-calf operations. *One 239-acre parcel in the private ranch area was recently converted to golf course.*

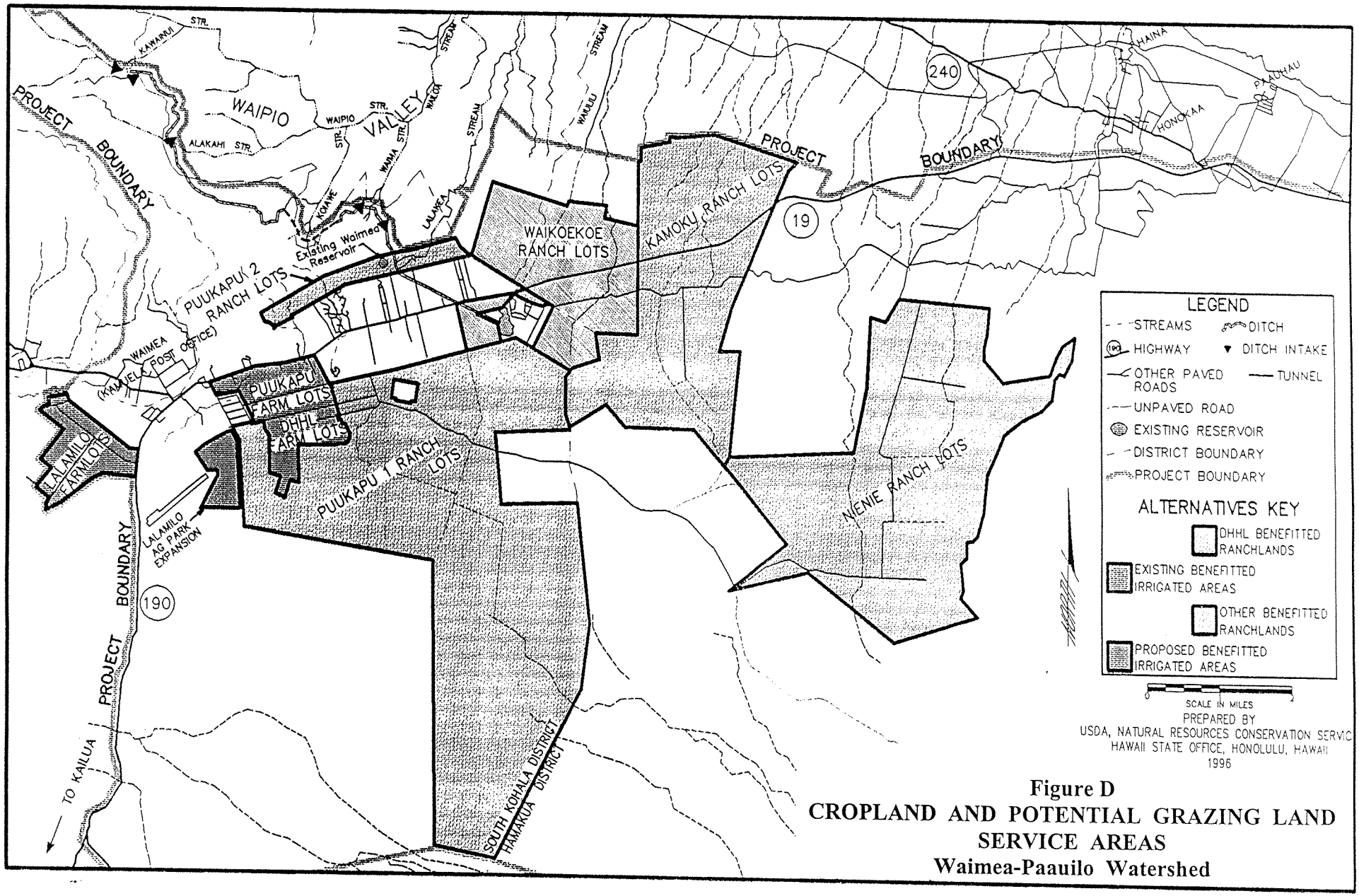


Figure D
CROPLAND AND POTENTIAL GRAZING LAND SERVICE AREAS
Waimea-Paauilo Watershed

The DHHL and some private ranchlots have been identified as potential areas which can be serviced by the WIS (Table F). With an adequate supply of stockwater, ranchers could increase their livestock herds because they could more efficiently manage their operations and because they would be able to implement intensive grazing methods. See Figure D for location of the potential grazing land service areas.

Intensive grazing methods are based on proper distribution of animals in pasture. Through management techniques and practices to optimize the production of forage plants and assure full utilization of the forage, ranchers can increase their herd size during most periods. Management practices will be included in the Conservation Plans that are prepared for each ranch.

Practices that will be recommended to improve distribution of livestock for efficient forage use include the following. Fencing to reduce pasture size allowing a concentration of animals to graze for short periods between long rest periods. Concentrated grazing will allow full and uniform utilization of the forage. Installation of livestock water facilities in locations distributed so optimum travel distances from pasture to water are not exceeded.

Soil erosion from grazing land will be reduced as a result of improved vegetative cover.

Table E
GRAZING LAND AND LIVESTOCK
Waimea-Paauilo Watershed

Condition	Ranchlots	Acres	Animal Units
PRESENT & FUTURE WITHOUT PROJECT			
Parker Ranch	1	50,400	23,608
DHHL	239	20,582	9,862
Other private	70	44,510	10,327
TOTAL	310	115,492	43,797

Table F
POTENTIAL GRAZING LAND SERVICE AREAS
AND LIVESTOCK PRODUCTION
Waimea-Paauilo Watershed

Condition	Ranchlots	Acres	Animal Units
PRESENT & FUTURE WITHOUT PROJECT			
DHHL	239	20,582	9,862
Other private	26	2,380	988
TOTAL	265	22,962	10,850
POTENTIAL WITH LIVESTOCK WATER SUPPLY			
DHHL	239	20,582	17,447
Other private	26	2,380	1,593
TOTAL	265	22,962	19,040
INCREASE	0	0	8,190

2.6 CLIMATE

The climate in the watershed area is characterized by moderate variations in annual temperature, and significant variations in average annual rainfall. The average annual temperature varies from 75° F. at the coastline to 40° F. on the upper slopes of Mauna Kea (Figure E). The average annual rainfall varies from over 175 inches in the Kohala Mountains to 20 inches south of Waimea. This variation occurs in a distance of about 4 miles. Rainfall is not uniform throughout the year. Rainfall is highly dependent on trade wind patterns which occur in island regimes. One major deficiency of this regime is that occasionally, the trade wind pattern is disrupted. When this happens, rainfall diminishes over the island mountain ranges and should such occurrence last over an extended period longer that several weeks, then the surface flows are depleted which causes severe drought conditions that last from 30 to 90 days or more.

2.7 WATER SUPPLY SYSTEMS

There are three major water supply systems in the Waimea-Paauilo Watershed area, the WIS, the Parker Ranch System, and the County Department of Water Supply domestic water system.

2.7.1 Waimea Irrigation System

At the present time the State-operated Waimea Irrigation System (WIS) provides irrigation water to the existing cropland areas of Lalamilo, Puukapu, and DHHL. The WIS was put into operation in 1961 with the construction of the 60-mg Waimea Reservoir. In

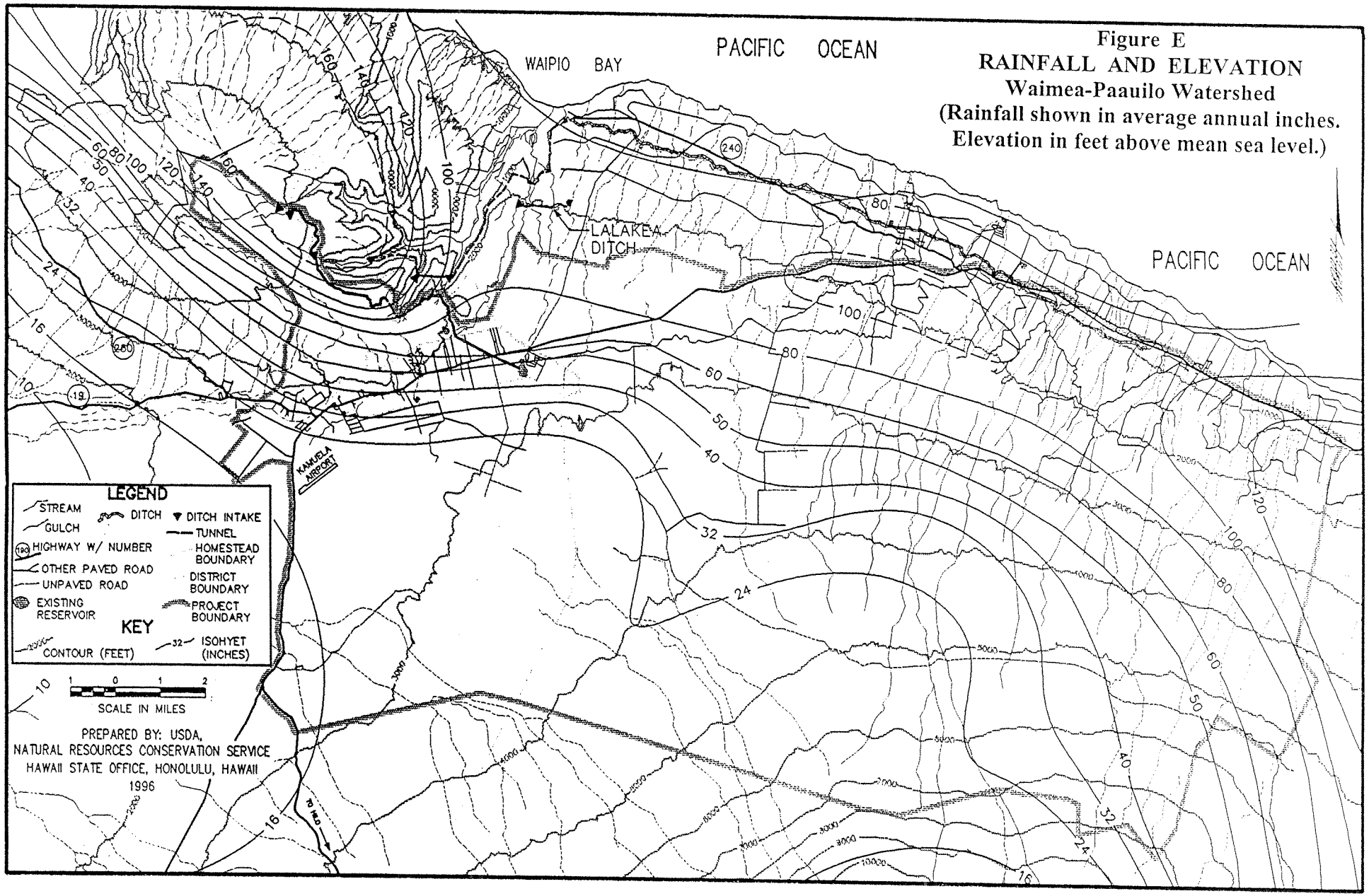


Figure E
RAINFALL AND ELEVATION
Waimea-Paauilo Watershed
(Rainfall shown in average annual inches. Elevation in feet above mean sea level.)

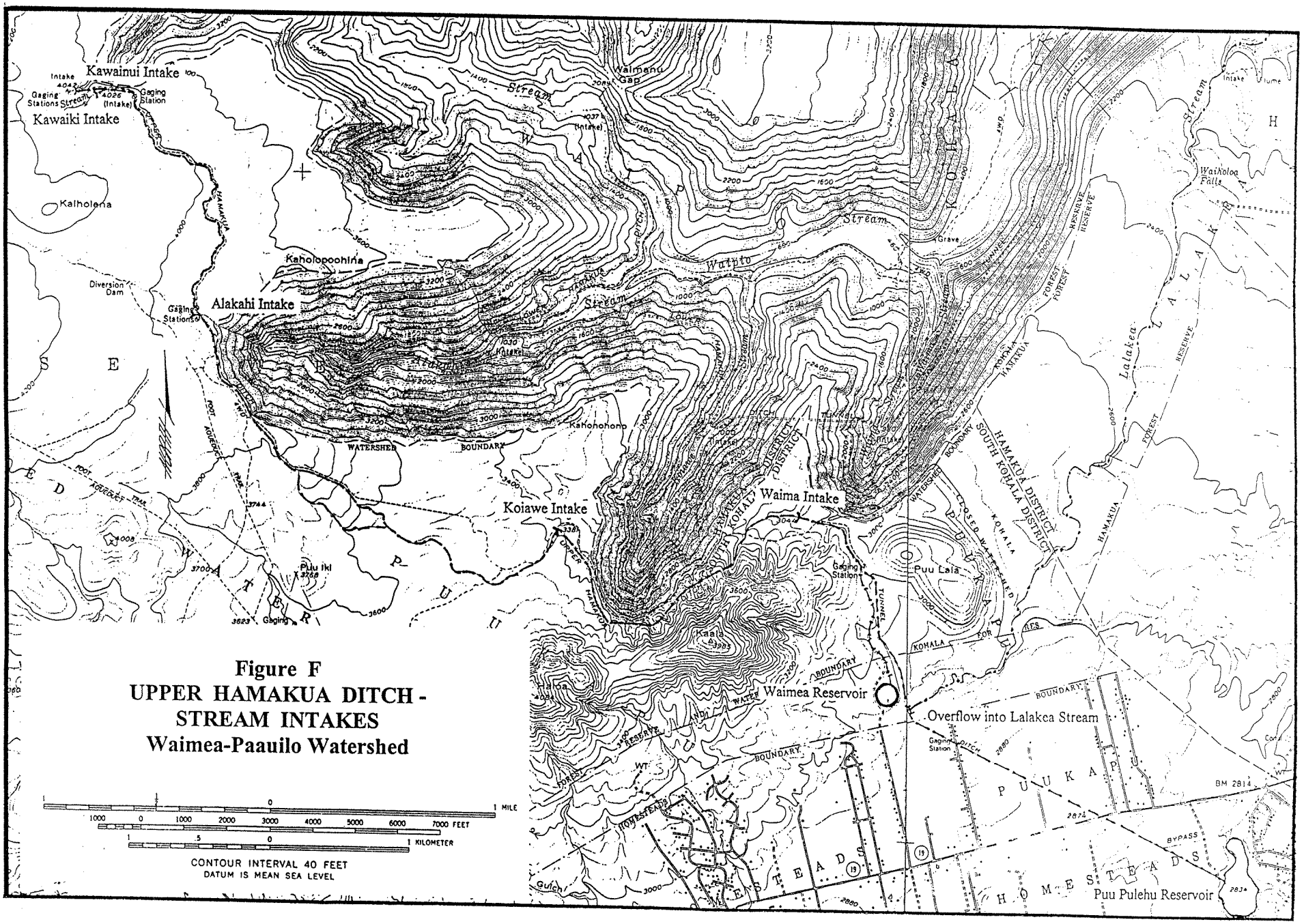


Figure F
UPPER HAMAKUA DITCH - STREAM INTAKES
Waimea-Paauilo Watershed

1963 the WIS served 99 irrigated acres with approximately 86 millions gallons. By 1986 the WIS served 487 irrigated acres with 368 million-gallons. From July 1995 to June 1996 the WIS served about 514 acres with 432 million gallons. Farmers currently pay 16 cents per 1,000 gallons plus a $2.25 per acre per month service charge on each irrigated acres. At the present time, no stockwater is provided by the WIS. The WIS will soon service the DHHL Phase I and II cropland expansion areas.

The source of water for the WIS is five perennial surface water streams located on State-owned land in the Kohala Forest Reserve. The Upper Hamakua Ditch (UHD) serves as the WIS collection system, with intake structures on five of the streams. The major streams, Kawainui, Kawaiki, and Alakahi, contribute most of the flow, with Waima and Koiawe Streams providing lesser amounts. See Figure F.

The UHD was constructed in the early 1900's by the Hawaiian Irrigation company to flume cut sugarcane to the coastal processing mills and to later irrigate the sugarcane fields of the Honokaa Sugar Plantation. The ditch was extended during the period of 1915 to 1922 to supply the Puu Pulehu Reservoir. The UHD consists of man-made open ditches, tunnels, stream diversion works, and natural stream sections. During the peak of its use the UHD was 23 miles long. On August 1, 1948, the Hawaiian Irrigation Company surrendered the license for the ditch system to the government. When Hawaii attained statehood in 1959, the responsibility for the UHD and 4,547 acres of the Kohala Forest Reserve water source was absorbed by the DLNR. At the present time, 8 miles of the ditch is being used as the collection system for the WIS and the 15 miles of ditch beyond the Puu Pulehu Reservoir is not being used and has been covered up or destroyed for the most part. Operational control of WIS was transferred to DOA, but under agreement, DLNR continues to assist with improvement projects.

The State DLNR is rehabilitating the UHD based on the 1986 investigation and evaluation report (Report R-77). The report estimated that during low flows of 4 million gallons per day or less, an estimated 50 to 75 percent of collected water was being lost in transport. Repairs to four of the five man-made sections of the UHD have been completed. Repairs to the remaining man-made section, Kawainui, is pending acquisition of State funding. No improvements are planned for any of the natural stream sections of the ditch. The completion of the UHD repairs should result in a high efficiency retention of 90 to 95 percent of the flows below 4 million gallons per day.

Table G displays the historic monthly flows at USGS Station 16726000 located above the Waimea Reservoir intake. While period of record extends from 1975 to the present, due to problems related to retrieval of the data, the records for this gage station are rated "poor" by USGS. Records from 1984 to 1990 are unreliable and are not used. Only instantaneous discharge measurements are available for the 1992 to 1994 water years. Table H indicates the variability of flow in the Upper Hamakua Ditch by displaying the monthly flow rate which will be exceeded for percentages of time.

Table G
UPPER HAMAKUA DITCH FLOW RECORD
Waimea-Paauilo Watershed

Water Year	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Annual
						MG/month							MG
1975	23	172	184	173	207	378	301	201	136	270	292	72	2,412
1976	259	162	81	174	145	368	352	230	160	243	194	104	2,472
1977	150	336	173	20	57	296	421	191	180	460	385	130	2,797
1978	192	120	122	199	25	303	180	188	302	522	394	242	2,789
1979	218	256	253	191	187	188	107	139	97	115	45	72	1,866
1980	58	164	108	58	45	320	316	242	159	187	173	158	1,990
1981	165	168	16	6	84	80	53	53	59	57	100	57	897
1982	115	209	205	190	126	394	349	378	168	518	355	326	3,334
1983	130	176	246	22	24	73	339	404	302	322	259	322	2,620
1995	118	220	170	101	11	72	171	200	211	240	246	101	1,861

Table H
UPPER HAMAKUA DITCH FLOW FREQUENCY
Waimea-Paauilo Watershed

Excee-dence	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Annual
						MG/month							MG
80%	112	155	122	89	71	193	202	174	139	229	191	124	1,800
50%	140	194	152	111	89	242	253	218	173	286	239	155	2,250
20%	174	241	189	138	111	301	315	271	215	357	297	193	2,800

The WIS storage system consists of two reservoirs with a combined storage of 161 million-gallons (MG). The Waimea Reservoir is a concrete-lined earthen dam, located three miles northeast of Waimea Town. It has a design capacity of 60 MG, of which 51 is usable. The Waimea Reservoir, with its bottom elevation at 2,935 feet, provides gravity flow to the currently served farming areas. The second reservoir, Puu Pulehu (formerly known as the Puukapu Reservoir) was enlarged from 40 MG to 110 MG in 1986 and lined with watertight geomembrane in 1994. Water stored in the Puu Pulehu Reservoir, at an elevation of 2,830 feet, is pumped into Waimea Reservoir before distribution to farms. The 4.5-million-gallon Lalamilo Reservoir is connected to the WIS distribution system but is not used in normal operations due to its low elevation.

A concrete inlet structure which diverts water from the UHD to the Waimea Reservoir is located in the Waima Section of the UHD approximately seven miles from the first diversion at Kawainui Stream. A 2,830-foot-long 24-inch ductile iron pipeline conveys water from the inlet to the Waimea Reservoir.

Below the Waimea Reservoir inlet, the UHD uses a section of natural stream (Lalakea Stream) which subsequently connects to the final operational section of the UHD, the Puu Pulehu Section which leads to the 110-MG Puu Pulehu Reservoir. The Puu Pulehu Section was constructed in the 1920s and is newer than the other four UHD sections. Recent DLNR

repairs to the Puu Pulehu Section have been completed. Water enters the Puu Pulehu Section of the UHD only sporadically, when heavy rains in the mauka areas increase the UHD flow substantially. When the Puu Pulehu Reservoir is full, a control gate located where the natural stream meets the Puu Pulehu Section diverts the excess flow into a headwater tributary of the Lalakea Stream at about the 2,920-foot elevation. The Lalakea Stream flows seaward and joins Hiilawe stream at about the 200-foot elevation. Hiilawe Stream in turn flows into Wailoa Stream, the major stream in Waipio Valley.

The main distribution system from the Waimea Reservoir consists of nearly two miles of 24-inch diameter ductile iron pipeline to the Puukapu and DHHL farmlots and an additional two miles of 18-inch diameter ductile iron pipeline to the Lalamilo farmlots. Pipeline diameters within the service areas vary between 18-inches and 8-inches.

The State Department of Agriculture presently owns one fully developed well completed by the DLNR in spring of 1996. It is located approximately 2,000 feet north of the Waimea Reservoir. The well is 1,200 feet deep with a capacity of 1,000 gpm using a 600-hp motor. The cost of pumping water from the well is estimated to be $0.75 to $1.00 per 1,000 gallons. The well is not normally in use and has been retained for emergency backup supply by the Department of Agriculture. The County Department of Water Supply has also requested and received permission to connect to the well for emergency domestic water supply. A shallow well was also tested at the site but *remains undeveloped awaiting legislative appropriation. The shallow well is used as a monitoring well.*

2.7.2 Parker Ranch System

The Parker Ranch has a private water system which diverts surface water from the upper reaches of the Alakahi, Kohakohau, and Waikoloa streams, upstream from the corresponding WIS and domestic water system intakes. Water is carried by pipelines to storage tanks and reservoirs for exclusive use by Parker Ranch livestock operations located south and southeast of Waimea.

2.7.3 Department of Water Supply System

The Department of Water Supply (DWS) system is a domestic water system operated by the County of Hawaii. It takes flow from the Waikoloa and Kohakohau streams and stores the discharges in *three* 50-MG and one 8-MG reservoirs before treatment and distribution of the water to its customers.

In emergency drought situations in the past, water was drawn from the UHD to supplement the domestic water system.

The DWS system services all the households in Waimea and also provides livestock drinking water to many private and DHHL ranches in the watershed area. The domestic system now provides approximately 42 million gallons per year to 11,600 animal units on about 26,000 acres.

2.8 GEOLOGY AND SOILS

The Island of Hawaii, the largest in the Hawaiian Archipelago, was built by five major volcanoes. Kohala Mountains, a long-extinct shield volcano, forms the north end of the island and the upper watershed.

The Waimea Plain area of the watershed was also influenced by eruptions and associated deposits from Mauna Kea immediately southeast of the project. While Mauna Kea has not been active within historical times, ashfalls and cinder deposits originating form this volcano are the parent materials for many of the soils in the watershed. Volcanism continues to occur on the Island of Hawaii, most notably at Mauna Loa and Kilauea Volcanoes to the south of the watershed. Figure G is a map showing the general soils families present in the watershed area. Following is a description of the soil families.

1. Typic Hydrudands and 3. Hydrudands are typically deep to very deep soils derived from volcanic ash. These soils are in higher rainfall areas that seldom allow soil drying except in the surface few inches. The ash is highly weathered and textures are fine. Strength when moist is low and have poor trafficability. Total water holding capacity is very high and available water holding capacity is high. Traffic pans can seriously restrict water movement and root penetration. Uncompacted cultivated soils have a moderate to moderately slow water permeability. Organic matter amounts are very high, pH values are slightly to strongly acid and liming rates can be high for acid sensitive crops. Phosphorous fixation can be very high. Nitrogen leaching can be high due to high precipitation but may be sequestered below the root zone due to high anion exchange capacity. Nitrates can still reach the water table after several years.

2. Acrudoxic Hydrudands have properties similar to Soil Family 1 except have lower cation exchange capacity (CEC) under field conditions. These soils have less calcium, magnesium and potassium holding capacity requiring more careful monitoring unless limed (which increase the CEC).

4. Hydric Hapludands hold somewhat less total and available water than soils in Group 1 or 2 and should be slightly more trafficable in most areas. Other properties are similar to Families 1 and 2.

5. Aquic Placudands are highly weathered volcanic ash soils with properties similar to Families 1 and 2 except that they have a perched water table and a thin ironstone sheet shallow to the surface.

6. Dystric Haplustands have a dry season. They have moderately low base cation content, acid, and are of higher strength than soil in Group 1 or 2. P-fixation is slightly lower.

7. Calcic Haplustands have high base status, a distinct dry season, are deep to moderately deep to rock, and have moderately high wind erodibility if bare.

8. Humic Haplustands are deep to moderately deep volcanic ash soils and have very fine sandy loam to silt loam textures. They have moderate to high base cation status and organic matter content. They have a distinct dry season, are well-drained, fix moderately high amounts of phosphorous, and have a moderately high to high wind erodibility potential.

Water holding capacity is high, but can form traffic pans. Trafficability is good, if not too moist.

9. Typic Vitritorrands are moderately deep to deep sandy loam and loamy sand volcanic ash soils under an aridic climate. They are droughty, wind erosive, and have a high leaching potential if irrigated.

10. Typic Ustivitrand soils are like Soil Family 10 but have enough seasonal moisture in most years to grow one short season crop although supplemental irrigation should be available.

11. Histic Placaquepts are soils with organic surface layers underlain by weathered ash and bedrock and are moderately deep and wet throughout the year. They occur in the highland fog forest of the Kohala Mountains.

12. Vitrands are volcanic ash soils comprised dominantly of cinders. They are usually deep, stratified, well drained, and less productive than surrounding finer textured soils. Also included are arid area sandy loam soils that may be stony.

13. Cinder land consists of deposits of cinders with some larger and smaller size materials that are sparsely vegetated or base. These deposits are relatively young and soils have not formed.

14. Lava is made up of a'a and pahoehoe flows with inclusions of shallow typically sparsely vegetated soils or Typic Tropofolists are shallow organic soils on uplands that formed in a'a flows and are well drained. Some areas are over pahoehoe. Because they are shallow, they are droughty and susceptible to leaching nitrogen, phosphorous, other nutrients and pesticides. They can be well suited to crops such as coffee, papaya, and avocados if properly managed.

The major cropland soils in the Waimea area are Kikoni silt loam, very fine sandy loam, and Waimea very fine sandy loam. Both of these soils are in soil family 8. Humic Haplustands. These are deep, well drained soils on nearly level uplands. They are formed in volcanic ash. Wind erodibility of these soils is moderate and wind velocities are erosive on most sites. Wind breaks are recommended. Water erosion hazard is moderate. A primary difference between these two soils is the effective rooting depth, which is 40 to 60 inches for Waimea and 60 inches or more for Kikoni.

Both soils are considered "prime agricultural soils" and when irrigated, 86 percent can be classified as "Prime Farmland" nationally and "Prime Agricultural Land" in Hawaii. Figure H shows the location of the prime agricultural soils in the watershed area. According to the NRCS Hawaii land classification system, "Prime Agricultural Land" is land best suited for the production of food, feed, forage, and fiber crops. The land has the soil quality, growing season, and moisture supply needed to produce sustained high yields of crops economically when treated and managed, including water management, according to modern farming methods.

With 624 acres of irrigated cropland in the watershed area at the present time, approximately 537 acres can be classified as Prime Agricultural Land. Under Future Without Project Conditions, irrigated cropland acres will increase to 874 acres with 752 acres classified as Prime Agricultural Land.

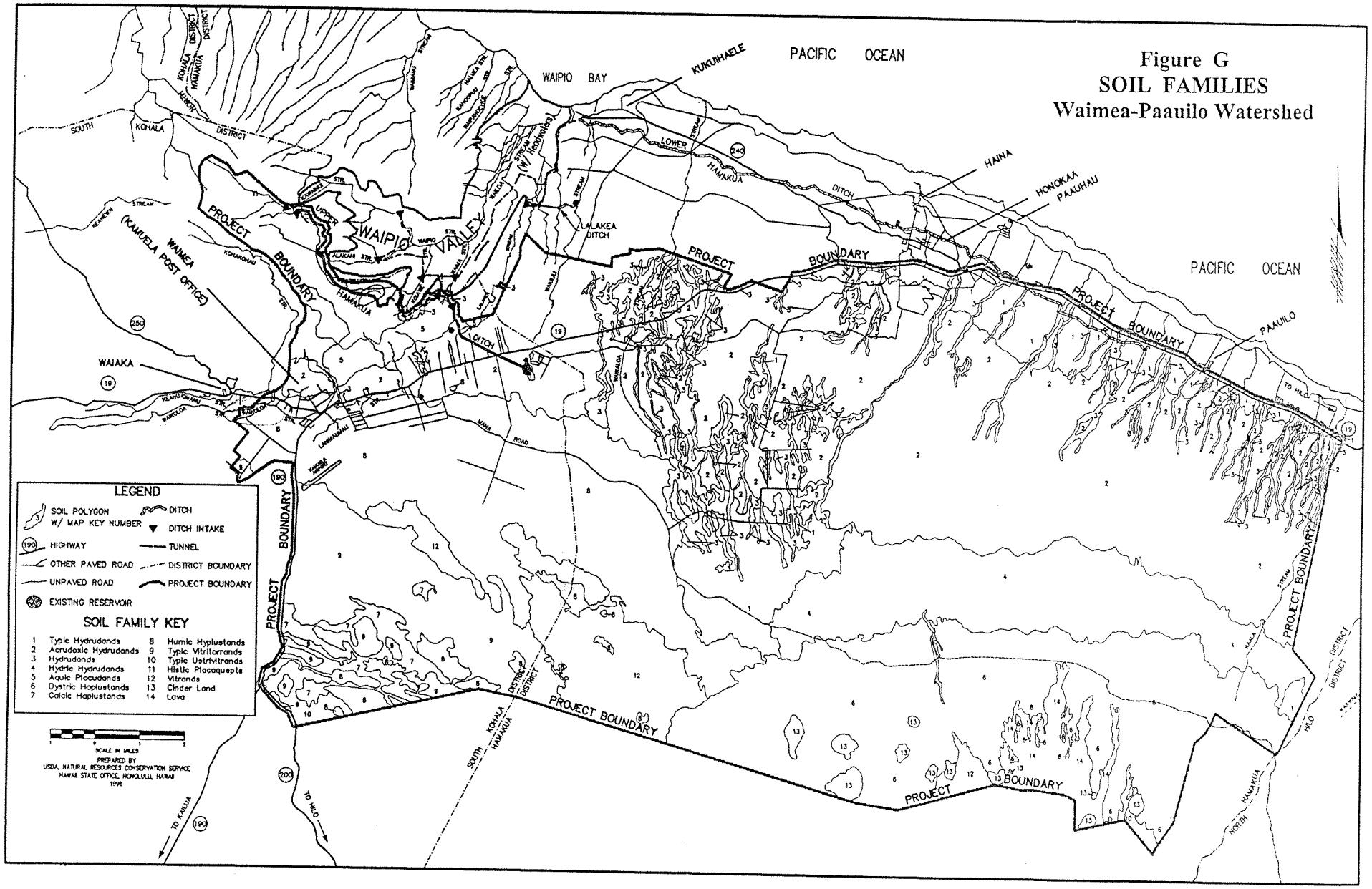


Figure G
SOIL FAMILIES
Waimea-Paauilo Watershed
PACIFIC OCEAN
WAIPIO BAY
KUKUIHAELE
HAINA
HONOKAA
PAAUHAU
PAAUILO
WAIPIO VALLEY
UPPER
LOWER
HAMAKUA
DITCH
LALAKEA DITCH
WAIMEA (KAMUELA POST OFFICE)
WAIAKA
PROJECT BOUNDARY
SOUTH KOHALA DISTRICT
HAMAKUA DISTRICT
TO KAILUA
TO HILO
LEGEND
SOIL POLYGON W/ MAP KEY NUMBER
HIGHWAY
OTHER PAVED ROAD
UNPAVED ROAD
EXISTING RESERVOIR
DITCH
DITCH INTAKE
TUNNEL
DISTRICT BOUNDARY
PROJECT BOUNDARY
SOIL FAMILY KEY
1 Typic Hydrudands
2 Acrudoxic Hydrudands
3 Hydrudands
4 Hydric Hydrudands
5 Aquic Placudands
6 Dystric Haplustands
7 Calcic Haplustands
8 Humic Hyplustands
9 Typic Vitritorrands
10 Typic Ustrivitrands
11 Histic Placoquepts
12 Vitrands
13 Cinder Land
14 Lava
SCALE IN MILES
PREPARED BY
USDA, NATURAL RESOURCES CONSERVATION SERVICE
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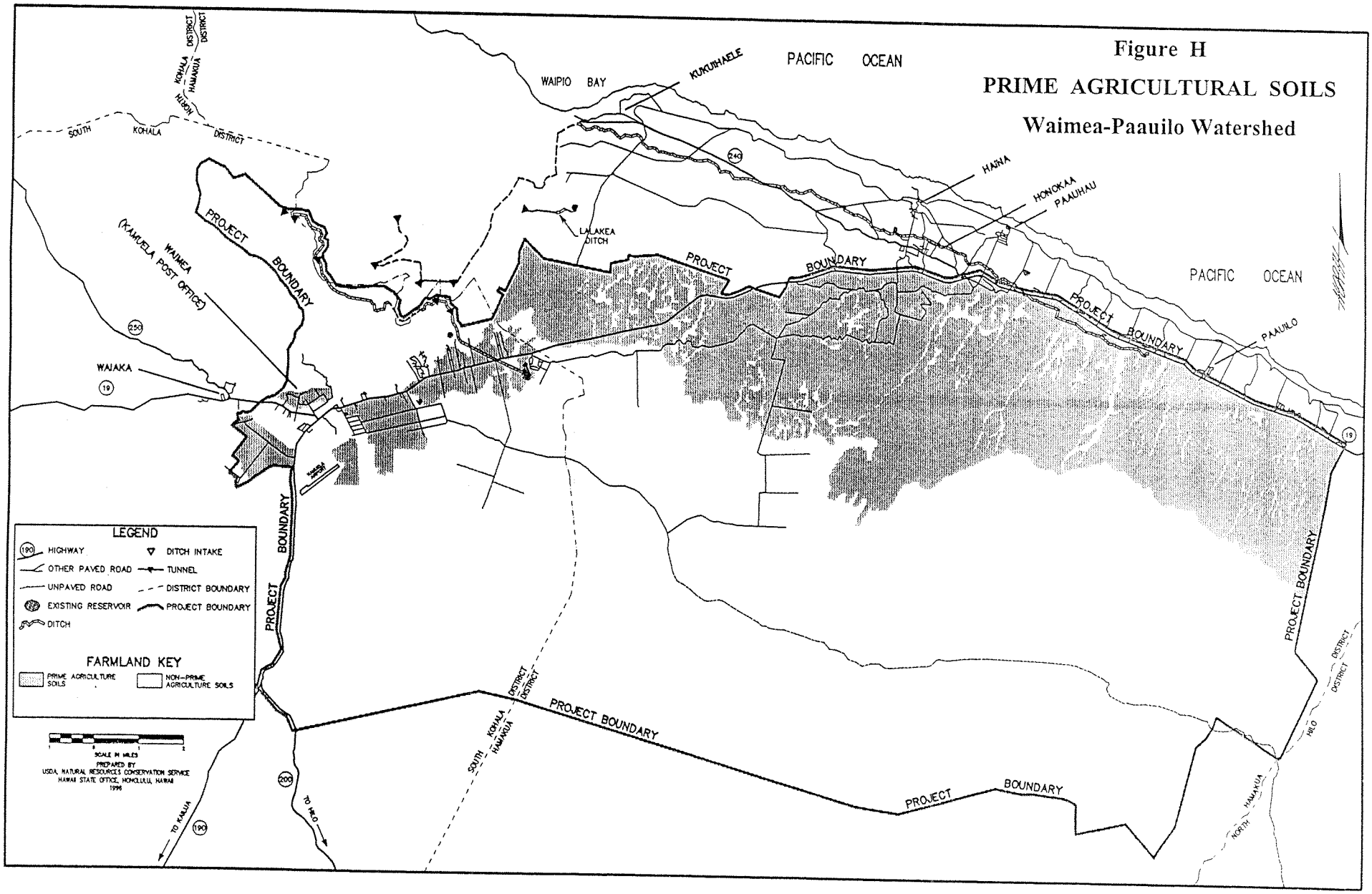
Figure H
PRIME AGRICULTURAL SOILS
Waimea-Paauilo Watershed
PACIFIC OCEAN
WAIPIO BAY
KUKUIHAELE
HAINA
HONOKAA
PAAUHAU
PAAULO
LALAKEA DITCH
WAIMEA (KAMUELA POST OFFICE)
WAIAKA
PROJECT BOUNDARY
SOUTH KOHALA DISTRICT
NORTH KOHALA DISTRICT
SOUTH HAMAKUA DISTRICT
NORTH HAMAKUA DISTRICT
HILO DISTRICT
TO KAILUA
TO HILO
LEGEND
HIGHWAY
OTHER PAVED ROAD
UNPAVED ROAD
EXISTING RESERVOIR
DITCH
DITCH INTAKE
TUNNEL
DISTRICT BOUNDARY
PROJECT BOUNDARY
FARMLAND KEY
PRIME AGRICULTURE SOILS
NON-PRIME AGRICULTURE SOILS
SCALE IN MILES
PREPARED BY
USDA, NATURAL RESOURCES CONSERVATION SERVICE
HAWAII STATE OFFICE, HONOLULU, HAWAII
1996

Both soils are very fertile with liming not normally necessary except for the most acid sensitive crops where prior fertilization has acidified the upper part of the soil. These soils can fix moderately large amounts of phosphorous. Truck crop production may benefit from banding of phosphorous which reduces application rates. Permeability is moderately rapid and the leaching potential of nitrates and potassium could be high during rainfall or irrigation events that exceed the available water holding capacity of the root zone. Smaller, more frequent applications of nitrogen fertilizer is recommended during the rainy season.

Irrigation is required due to seasonal rainfall, short droughts during the rainy season, low available water holding capacity and high wind velocities. Smaller, more frequent applications are recommended along with careful field moisture monitoring. Tillage pans have been noted in these soils. Probe rods should be used to detect restricting layers. These should be removed by subsoiling.

2.9 HAWAIIAN HOME LANDS

Through the Hawaiian Homes Commission Act of 1920, the United States government assumed a trust responsibility to benefit and rehabilitate native Hawaiians. The Act was intended to improve the well-being of the socially and economically disenfranchised native people and reverse the precipitous decline in the native Hawaiian population. The cornerstone of the Act set aside approximately 188,000 acres of government-held land for leasehold homesteading by native Hawaiians. In 1959, when Hawaii attained statehood, most of the trust obligation was transferred to the State of Hawaii. The Hawaiian Homes Commission and the Department of Hawaiian Home Lands (DHHL) were established to administer the provisions of the Hawaiian Homes Commission Act and Admission Act.

The Department of Hawaiian Home Lands administers approximately 23,800 acres of homestead land in the watershed area. The homestead leases include 114 residential lots between 1/4 acre and one acre in size, 104 agricultural lots between 5 and 30 acres in size, and 202 pastoral lots ranging in size from 10 to 300 acres.

The DHHL is responsible to secure legislative funding to provide infrastructure improvements and service to the homestead areas. The lack of infrastructure, such as agricultural water supply, in some of the homestead areas contributes to a low level of farming and ranching activity. Other impediments to full economic development of the homestead lots include lack of sufficient capital for on-farm improvements and insufficient opportunities to obtain necessary skills. The DHHL has recently accelerated their program for infrastructure development and making funds available to homesteaders. The DHHL has also begun to assert its rights to water for DHHL development.

The community group representing the interests of the Hawaiian homesteaders in the watershed area is Waimea Hawaiian Homesteaders' Association.

2.10 RARE AND UNIQUE ENVIRONMENTAL RESOURCES

The General Plan for Hawaii County (1989) describes the economic, energy, environmental quality, flood control and drainage, historic sites, natural beauty, natural resources and shoreline, housing, public facilities, public utilities, recreation, transportation, and land use resources and controls of the nine districts of the island of Hawaii, including South Kohala.

The Waimea region is associated with cattle ranching, conjuring images of paniolo, horses and cows. While there are other areas of the state where ranching takes place, the predominance of the Parker Ranch, the long history of cattle ranching in the area, and the wide open rangeland of the Waimea Plain have created a strong association of cattle ranching with Waimea.

Waimea is one of the most productive areas for vegetable crops in the state. Many cool weather crops that cannot be grown elsewhere in Hawaii are grown, including cabbage, celery, and lettuce.

The nearby landforms that are culturally important are the Kohala Mountains, Mauna Kea, and Waipio Valley. The cinder cone hills, especially Puu Laelae, Puu Hokuula, and Puuiki, have significant natural beauty.

For significant archaeological resources see Section 6.3.4 Cultural Resources. For significant unique or rare plant and wildlife resources see Section 6.3.13 Threatened and Endangered Species.

3. PROJECT PURPOSE AND NEED

3.1 PROJECT PURPOSE

The purpose of the Waimea-Paauilo Watershed project is to alleviate the agricultural water shortage problems caused by the inadequate quantity and distribution of water for crop irrigation and livestock drinking water (stockwater) in the watershed area. The project purpose under PL83-566 is agricultural water management.

Specifically the Sponsors requested that the project provide an adequate and consistent supply of irrigation water to the Lalamilo, Puukapu, DHHL farmlots (including the Phase I and II expansion areas), and the proposed Lalamilo Ag. Park farmlots and also stockwater to existing DHHL and other small non-DHHL ranchlot areas shown in Table F. These farmlot and ranchlot areas are here after referred to as the "service area," as opposed to the entire 143,900 acre "watershed area."

3.2 PROBLEMS AND OPPORTUNITIES

The inadequate quantity and distribution of crop irrigation and livestock drinking water in the service area cause an estimated $1,670,400 in agricultural losses, measured as average annual net income losses for farmers and ranchers in the service area. Agricultural losses are expected to increase to an estimated $3,750,000 in the future as more land is brought into production with no additional water supplies. The following table summarizes these losses.

Table I
SUMMARY OF PROBLEMS AND OPPORTUNITIES
Waimea-Paauilo Watershed

Problem or Opportunity	Estimated Average Annual Losses					
	Present Conditions			Future Without Project Conditions		
	Crop	Livestock	Total	Crop	Livestock	Total
	($)	($)	($)	($)	($)	($)
Losses due to water shortages	572,400	53,200	625,600	2,616,900	53,200	2,670,100
Limited expansion opportunities	663,600	266,300	929,900	663,600	266,300	929,900
Water pumping costs	114,900	0	114,900	150,000	0	150,000
Total	1,350,900	319,900	1,670,400	3,430,500	319,500	3,750,000

3.2.1 Crop Losses Due to Water Shortages

Service area truck crop farmers have been plagued by water shortage problems which have been exacerbated by droughts since the 1960's. Often the WIS cannot supply adequate irrigation water to farmers in the existing service areas of the Lalamilo, Puukapu, and the DHHL farmlots.

The most readily available source of agricultural water in the watershed area has been the surface water streams of the Kohala Mountains, which provide water to the WIS via the UHD. The Kohala Mountain streams are flashy, with the tendency to have high flows in the streams and in the UHD only during heavy rainfall periods.

Rainfall in the Kohala Mountains is dependent on trade wind patterns. When the trade wind pattern is disrupted, rainfall diminishes over the island mountain ranges. Should such occurrence last over an extended period longer that several weeks, then the surface flows are depleted which causes severe drought conditions which can last for 90 days or more.

During drought periods, when the water levels in the two existing WIS reservoirs decrease, voluntary and sometimes mandatory water use restrictions are imposed on farmers. See Appendix A for a listing of water restriction periods for the WIS. Water use restriction periods have lasted for over half a year. Inadequate water supply cause reductions in crop quality and yield, total crop losses, reductions in new plantings, and disruptions in marketing patterns. Agricultural losses, measured as net income losses for the affected farmers, have been estimated at $572,400 on an average annual basis under present conditions.

Although the DLNR rehabilitation of the UHD will reduce ditch leakage, the present storage capacity afforded by the Waimea and Puu Pulehu reservoirs will continue to limit the ability of the WIS to supply adequate irrigation water during dry periods. This is evidenced by recent water restrictions imposed on WIS customers. A water conservation notice was issued in February 1995 and not lifted until August 1995. A notice was issued again in September 1995, with a reminder to conserve water issued in December 1995, and critical water status reached in January 1996. The restriction was not lifted until March 1996.

When the DHHL Phase I and Phase II expansion areas come into production in the near future, water shortages and agricultural losses will be become even more acute. The reliability of water supply from the WIS will drop to 68 percent and water restrictions will become more frequent and severe. Reliability is an indicator of the annual frequency of providing an adequate water supply. Farmers will experience further reductions in crop quality and yield, total crop losses, reductions in new plantings, and disruptions in marketing patterns. Agricultural losses, measured as net income losses for the affected farmers, will increase to an estimated at $2,616,900 on an average annual basis under Future Without Project Conditions.

The water shortages and water restrictions not only affect the farmers, but also result in farm employees' wage and/or job losses. Agriculture-related businesses and tax revenues are also adversely affected. The greenery and open-space setting provided by the agricultural industry benefits tourism. Because the truck crop and livestock industries in the watershed area are such an important part of the region's economy their continued viability is essential.

3.2.2 Limited Cropland Expansion Opportunities

The inadequate quantity and distribution of irrigation water limits opportunities to expand crop production into new areas.

Increasing the production of truck crops is a desired goal of both the State of Hawaii and County of Hawaii governments. See section 6.5 Relationship to Other Plans, Policies, and Controls. According to the Statistics of Hawaiian Agriculture, 1994, Hawaii's farmers produced approximately 29 percent of the fresh vegetables consumed in the State in 1994. The remaining 71 percent was imported. The climate and fertile soils of the Waimea make it ideal for growing truck crops, if irrigation water is available.

In an effort to increase local crop production, the State of Hawaii plans to develop the Lalamilo Ag. Park to provide farmlots which can be leased at affordable rates. The inadequate storage capacity of the WIS prevents the expansion of irrigation water distribution system and crop production in the 270-acre Lalamilo Ag. Park.

Of the total cropland in the Lalamilo Ag. Park, potential irrigated acres have been estimated at 115 acres. The net income that could be generated from these acres has estimated at as $663,600 on an average annual basis under present conditions, assuming a 100% reliable water supply. The Ag. Park is not expected to be developed under Future Without Project Conditions.

3.2.3 Livestock Losses Due to Water Shortages

Ranchers in the potential service area experience income losses due to the higher cost of using treated domestic water for stockwater. Most of the DHHL and private ranchers must rely on the County DWS domestic water system for livestock drinking water (stockwater) because a source of agricultural water is not available to them. Current WIS policy prohibits providing stockwater to ranchers. Domestic water rates are high in comparison to agricultural water rates charged by the WIS. DWS customers pay about $1.50 per thousand gallons in comparison to $0.16 per thousand gallons, plus an acreage fee for WIS water. An estimated 40 million gallons per year of domestic water is used for stockwater in the potential service area.

Like the WIS, the DWS system is dependent on rainfall and streamflow in the Kohala Mountains. The DWS system is likewise subject to water shortages and water use restrictions when water levels in its reservoirs are low. During water short periods, livestock consumption is the first to be curtailed. The efficient management of livestock operations is hampered because ranchers must sometimes move their cattle to other areas, haul in water in tanks, or sell their cattle prematurely. During severe droughts, cattle have died due the lack of both drinking water and forage.

Income losses for the affected ranchers have been estimated at $53,200 on an average annual basis under present conditions. This amount is not expected to change under Future Without Project Conditions.

3.2.4 Limited Livestock Expansion Opportunities

The inadequate quantity and distribution of stockwater limits opportunities to expand or increase livestock production on existing grazing lands.

Island ranchers are unable to help reduce the amount of beef imports into the State of Hawaii. Of the total amount of beef and veal consumed in the State during 1994, only 31 percent was raised locally. The main supply came from the mainland U.S. (54 percent) and foreign sources (15 percent).

With an adequate supply of stockwater, ranchers could increase their livestock herds because they could more efficiently manage their operations and because they would be able to implement intensive grazing methods. Potential grazing land service areas and livestock production is shown in Table F. The net income that could be generated from the additional animal units that could be produced, are considered "agricultural losses" and have estimated at $266,300 on an average annual basis under present conditions. This amount is not expected to change under Future Without Project Conditions.

3.2.5 Water Pumping Costs

At the present time, water is pumped from the 110-MG Puu Pulehu Reservoir, located at the 2,830-foot elevation, to the 60-MG Waimea Reservoir, located at the 2,935-foot elevation, before distribution to the existing farms serviced by the WIS. Water pumping costs have been estimated at $114,900 per year under present conditions. The cost is expected to increase to an estimated $150,000 per year under Future Without Project Conditions as more water will have to be pumped in order to service the additional irrigated acres in DHHL Phase I and Phase II farmlots presently being developed.

3.2.6 Natural Resources Conservation and Protection

There is a need to continue ongoing conservation planning efforts to attain the sound use and management of natural resources, particularly soil and water, in the Waimea-Paauilo Watershed area.

The projected increase in farming and ranching activity will increase the potential for higher soil erosion rates and poor water management. Inexperienced operators may implement farming practices that degrade the soil and water resource base. Well-established irrigation technology may be directly transferred to new cropland without consideration of water conserving irrigation systems that may also provide economic advantages.

On existing farms and ranches, additional water conservation measures need to be considered as a means of alleviating the water shortage problems.

The NRCS provides technical assistance to farmers and ranchers to develop conservation plans through conservation districts such as the Mauna Kea Soil and Water Conservation District. Conservation plans prescribe practices such as cross-slope farming, terraces, crop rotation, cover crops, grassed waterways, and field diversions to conserve soil on farms. Water conservation practices for cropland include irrigation scheduling, drip irrigation, windbreaks, and mulching. Livestock management practices such as paddock rotation, cross fencing, water trough management, noxious weed control, and tree plantings for wind protection and shade serve to raise productivity by caring for plant, soil and water resources.

Operators of DHHL lots are required to have a conservation plan for their farms and ranches. Many other non-DHHL farmers and ranchers in the service area also have conservation plans.

Incentive payments and cost-sharing for the implementation of conservation practices is available through the Environmental Quality Incentives Program, a USDA program administered by the NRCS with assistance from the Farm Service Agency (FSA). Other potential sources of USDA financial assistance include the Wetlands Reserve Program, Wildlife Habitat Incentives Program, and Forestry Incentives Program.

3.2.7 Hawaiian Homes Commission Act

An opportunity exists to support the goals of the Hawaiian Homes Commission Act. The Act was passed by the U.S. Congress in 1921 to improve social and economic conditions of native Hawaiians. Under the Act, about 188,000 acres of public land was made available, through the jurisdiction of the Hawaiian Homes Commission, to be leased out to native Hawaiians with 50 percent or more native blood, at a nominal fee for 99 years. Following statehood, administration of the program was transferred to the Department of Hawaiian Home Lands.

Through this Act and other actions the federal government, and later the state government, affirmed the trust responsibility to the native Hawaiian people. Much of the land set aside for agricultural use was marginally suited due to rockiness and low rainfall. The development of agricultural water supply to make such lands, as in the Waimea area, more productive conforms to the trust responsibility of the federal and state governments.

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4. FORMULATION AND COMPARISON OF ALTERNATIVES

4.1 FORMULATION OF ALTERNATIVES

A wide range of alternative plans have been formulated and evaluated during the two planning phases - Environmental Assessment (Plan-EA) and Environmental Impact Statement (Plan-EIS) - of the Waimea-Paauilo Watershed project.

The alternative plans were formulated to alleviate the agricultural water shortage problems, with minimal adverse environmental and social effects. Expansion and improvement of the existing agricultural water supply system, the Waimea Irrigation System (WIS), was identified to be the most feasible means to alleviate the problems. A major consideration in the formulation of the alternative plans was the location of a new storage reservoir.

The feasibility of providing agricultural water supply to all areas within the watershed area was evaluated during project planning, but was determined to be infeasible. The smaller, feasibility-determined service area remained unchanged during the two planning phases. During the development of the Plan-EA in the late 1980s, non-irrigated sugarcane was grown on approximately 12,000 acres in the Paauilo mauka lands by the Hamakua Sugar Company. Annual rainfall in this area averages 80 to 120 inches a year. It was determined, at that time, that there was not a critical need for agricultural water supply improvement in Paauilo mauka and that the absence of nearby water sources would make any water supply improvement very costly. There was little interest by the sponsors to expand the WIS service area to Paauilo mauka. Since the closing of Hamakua Sugar Company in March 1993, the former sugarcane land has been idle and is being converted to other agricultural uses, including forestry. While the new agricultural activities may benefit from the more consistent water provided by an agricultural water system, the costs of implementing such a system would be prohibitive.

4.1.1 Other Studies and Reports

This watershed plan builds upon and complements other efforts taken to improve the agricultural water supply in this region of the island of Hawaii. The Hamakua Area Agricultural Water Study (HAAWS), conducted in the late 1970s and early 1980s by the NRCS (then the Soil Conservation Service) identified the need for improved agricultural water supply in Waimea, assessed the area's natural and economic resources, and developed preliminary solutions. During the mid-1980s the State DLNR, responding to a series of droughts, embarked on an effort to repair and restore the capacity of the Upper Hamakua Ditch.

HAAWS identified three potential reservoir storage alternatives to provide additional water storage for the WIS. All three alternatives were considered during preparation of the Plan-EIS, but dropped from further consideration for the various reasons described below.

Alternative A proposed constructing a new reservoir in the Kohala Forest Reserve just west of Puu Iki, approximately one-half mile south of the Upper Hamakua Ditch between the Alakahi and Koiawe intakes. Alternative A was dropped from further consideration because it would require a Conservation District Use Application and because the State Division of Forestry and Wildlife expressed reservations about the construction of a reservoir within the Kohala Forest Reserve due to possible adverse effects on native forest communities.

Alternative B proposed expanding the existing Puukapu Reservoir (formerly know as the Paiakuli Reservoir), which is located two miles due east of Waimea town. This alternative was dropped from further consideration because the elevation of the reservoir is too low to provide pressure needed for water distribution without pumping.

Alternative C proposed constructing a new reservoir at Holoholoku, approximately 3.5 miles southeast of Waimea town. Alternative C was dropped from further consideration because the high cost of installing a pipeline from the Upper Hamakua Ditch (UHD) to the reservoir site.

The DLNR has been rehabilitating the UHD based on the 1986 investigation and evaluation report (Report R-77). The report estimated that during low flows of 4 million gallons per day or less, an estimated 50 to 75 percent of collected water was being lost in transport. Repairs to four of the five man-made sections of the UHD have been completed and were limited to work to restore transmission efficiency. Repairs to the remaining man-made section, Kawainui, is pending acquisition of State funding. No improvements are planned for any of the natural stream sections of the ditch. The completion of the UHD repairs should result in retention of 90 to 95 percent of the flows below 4 million gallons per day.

4.1.2 Plan-EA

Development of the Watershed Plan-Environmental Assessment (Plan-EA) took place between 1983 and 1989. The final Plan-EA was published in September 1989. During the planning conducted in preparation of the watershed plan-environmental assessment, the four areas of improvement to the WIS were identified: 1) improvement of the Upper Hamakua Ditch; 2) increase reservoir storage capacity; 3) expand irrigation water distribution system; and 4) install dedicated stockwater distribution system.

<u>Upper Hamakua Ditch</u>

Further improvement of the Upper Hamakua Ditch, beyond what was planned by the State, was recommended in the 1989 Watershed Plan-EA. Pipelines to bypass two natural stream sections of the UHD were included in the Plan-EA alternatives. This recommendation was based on a geologic reconnaissance survey in the mid-1980s of the sections on Koiawe and Waima streams, which showed the stream bottom to be permeable lava and cinder with several apparent "losing" reaches. "Gaining" reaches were also observed. A gaged streamflow balance was suggested but not conducted.

Storage Reservoirs

As part of planning for the Plan-EA, several reservoir storage locations in addition to the HAAWS alternatives, were evaluated. Geological investigations, including boring, penetrometer testing, and geophone soundings, were conducted at most of the sites.

Three potential reservoir sites were evaluated in the vicinity of the three existing Department of Water Supply Waikoloa Reservoirs. These sites were found to be less desirable because of costly rock excavation, lengthy reservoir supply pipeline requirements through the Kohala Forest Reserve or from the Waimea Reservoir, concerns about native forest impacts, hazards posed to Waimea town, and remoteness from the ranchlots to be served.

A reservoir site in the Kohala Forest Reserve near Puu Ohu, one and one-half miles north of Waimea town was evaluated and dropped from further consideration after geological tests indicated unsuitable foundation conditions and because of concerns about possible adverse effects on native forest communities.

A stockwater reservoir on the Hauani Stream at a site north of Puu Kakanihia was evaluated, but dropped from further consideration because of its limited storage volume and insufficient yield/supply from its watershed.

Enlargement and lining of the existing Puu Pulehu Reservoir was evaluated but dropped from further consideration because the reservoir cannot be sufficiently enlarged to provide the needed additional storage and would require considerable pumping to service the cropland areas.

A stockwater reservoir at Puu Io, approximately 7.2 miles southeast of Waimea town, was evaluated, but dropped from further consideration because of high reservoir and reservoir supply pipeline construction, and excessive pump operating costs. Water would have to be pumped up 900 feet in elevation from Puu Pulehu Reservoir to the Puu Io Reservoir through 4.5 miles of pipeline.

The Plan-EA planning efforts concluded that the best site for the construction of a new reservoir was a site adjacent to the existing 60-MG Waimea Reservoir. The site, referred to as Waimea II, provided sufficient area to develop the required storage capacity, minimized reservoir supply pipeline costs, and provided sufficient elevation head for gravity operation of the irrigation water distribution systems.

Irrigation Distribution System

The expansion of the WIS system to supply irrigation water to the three cropland expansion areas as originally planned would require 21,800 feet of pipeline and a pumping station. Replacement of existing pipeline would not be necessary. Pipe flow analysis indicated that the existing WIS pipelines met the project criteria of distributing the peak daily irrigation demand, including the expansion areas, in a 12-hour period. Approximately 900 feet of 24-inch diameter ductile iron pipe would connect the proposed Waimea II Reservoir to the existing distribution system leading from the Waimea Reservoir. Approximately 9,500 feet of PVC pipeline between 4- and 12-inches in diameter was required for the Lalamilo Ag. Park expansion area. Approximately 15,300 feet of PVC pipeline between 4- and 14-inches in diameter and a 25-horsepower pumping plant were required for the DHHL Phase I and

Phase II expansion areas. DHHL Phase I and Phase II expansion areas are currently being developed by the State.

Stockwater Distribution System

A separate livestock water distribution system to service 22,962 acres of grazing land from the Waimea II Reservoir was proposed in the Plan-EA. The distribution system would require installation of 184,400 feet of 3/4- to 6-inch diameter high-density polyethylene pipeline and 11 pumping stations. WIS policy will have to be changed to allow providing stockwater to ranchers.

The benefit to cost analysis indicated that the stockwater distribution system would not result in positive net economic benefits and was not eligible for PL 83-566 financial assistance. Technical assistance for planning and design could be provided by NRCS, however.

Alternatives

The Plan-EA presented three "candidate" alternative plans: 1) Future Without Project or No Action Plan; 2) National Economic Development (NED) Plan; and 3) Agricultural Water Management Plan.

The Future Without Project alternative was included as a candidate plan so that the conditions that could be expected in the future, if no action is taken to solve the problems, are described and quantified. It also served as the baseline against which the effects of the implementation alternatives could be measured.

Alternatives 2 and 3 proposed structural improvements to the WIS. Both alternatives proposed the installation of structural measures to increase the capacity and reliability of the WIS. Both alternatives proposed 1) installing 8,000 feet of pipelines to bypass or replace the two natural stream sections of the UHD to improve efficiency; 2) installing a reservoir supply pipeline from the UHD to the proposed reservoir; 3) constructing a 133-million-gallon reservoir (Waimea II Reservoir) to increase water storage; and 4) installing additional irrigation pipeline to service the expansion areas of Lalamilo Ag. Park, DHHL Phase I and DHHL Phase II. Alternative 3 also included installing a stockwater distribution system to service DHHL ranchlots and private ranchlots.

Concerns regarding the location of the Waimea II Reservoir have surfaced since the publication of the Plan-EA. Residents of a subdivision located adjacent to the proposed Waimea II Reservoir are concerned about potential economic effects as well as about dam safety. These concerns prompted further planning efforts and the preparation of this Plan-EIS.

4.1.3 Plan-EIS

This most recent planning phase began with the published notices of preparation of an environmental impact statement for the Waimea-Paauilo Watershed project in both the Federal Register and the OEQC Bulletin in late 1994. The alternatives earlier formulated were re-evaluated and new alternatives were developed. Again, the four areas of improvement that were addressed were the increased efficiency of the UHD, additional reservoir storage capacity, expansion of the irrigation water distribution system, and installation of a stockwater distribution system.

Upper Hamakua Ditch

The repair of the UHD by the State DLNR based on Report R-77 is nearly complete with only the Kawainui Section remaining to be funded and repaired. Repair of the Kawainui Section is expected within the next two years. After completion of the repairs, the WIS staff will continue to maintain the UHD.

The proposal to install bypass pipelines to replace the two natural stream sections of the UHD was re-evaluated. The records of two streamflow surveys conducted during low-flow periods in 1962 and 1985 indicate that the two natural stream sections did not contribute significantly to the total transmission losses of the UHD. The manager of the WIS who is responsible for maintaining the UHD and possesses the best "first-hand" knowledge of the system agrees that significant water losses do not occur at the natural stream sections. In addition, Waipio Valley residents/farmers were concerned that bypassing the natural stream sections may reduce the amount of water flowing into their valley. The bypass pipeline component included in the Plan-EA was therefore dropped from further consideration.

Storage Reservoirs

During this most recent planning phase, four additional reservoir sites were evaluated, as well as a re-design of the Waimea II Reservoir. The conversion of existing reservoirs from domestic water supply to agricultural use was also considered.

A reservoir within the Kohala Forest Reserve immediately south of Puu Lala and 1,500 feet north of the existing Waimea Reservoir was considered but dropped from further consideration due to potential environmental impacts.

A reservoir constructed at a natural depression located 3.8 miles east of Waimea town, between the Puukapu and Puu Pulehu reservoirs, was dropped from consideration after it was learned that the planned state highway may pass through the site. Development of a reservoir at the site would have also required pumping for the Puukapu farmlots.

A reservoir site on Parker Ranch land near the Poo Kanaka historic site was evaluated but shelved due to cultural resource concerns expressed by the DLNR, Historic Preservation Division and the need to acquire private lands for the reservoir site.

A reservoir site on a Department of Hawaiian Home Lands pastoral parcel, less than one mile from the prospective Parker Ranch site, was evaluated. The site, hereafter referred to as the Kauahi Reservoir site, allows construction of a reservoir large enough to meet the storage requirements for the project and gravity operation nearly all of the irrigation water distribution system. However, nearly four miles of pipeline to transmit water from the UHD to the reservoir would be needed.

As part of planning for the Plan-EIS, different configurations of the Waimea II Reservoir were evaluated in an effort to mitigate potential dam reservoir breach effects and reduce the visual impact of the reservoir embankment. A redesign of the Waimea II Reservoir dam to a less steep slope for the downstream embankment of 3:1 instead of 2:1 to increase structural stability was evaluated. This 3:1 slope Waimea II Reservoir would be larger in area and store only 120-MG, instead of 131-MG possible with the 2:1 slope.

The conversion of the existing Department of Water Supply Waikoloa reservoirs for use as agricultural water storage in exchange for project funding to develop well sources for domestic water supply was evaluated, as suggested by a local County Council member. Federal Safe Drinking Water Act law requirements call for surface water sources for domestic supply to be treated and monitored more intensively than groundwater sources. The Waimea water treatment plant is not in compliance with the 1994 state rules relating to potable water systems. The conversion of the source to groundwater could have reduced the treatment needs while stabilizing the seasonal supply of water. However, the development of the deep wells and the operation of well pumps are costly. This alternative was dropped from further consideration because the Department of Water Supply was unable to provide support due to the uncertainty of the groundwater aquifer's long-term sustainable yield of high quality water. Although the DWS has embarked on a groundwater development program, the management of the DWS sees a need to retain the Waikoloa reservoirs for interim and backup water supply. A detailed investigation of the sustainable yield of the aquifers in the Waimea area has not been conducted.

Wells

Wells were considered as a potential source of agricultural water, but not pursued because of the high cost of developing wells to the depths of the sustainable aquifers and the high cost of pumping water. The Department of Agriculture owns a well recently constructed by the DLNR. It is located 2,000 feet north of the Waimea Reservoir. The WIS well is 1,200 feet deep with a capacity of 1,000 gpm using a 600-hp motor. The cost of pumping water from the well is estimated to be $0.75 to $1.00 per 1,000 gallons. The well is not normally used and has been retained for emergency backup supply by the Department of Agriculture and the County Department of Water Supply.

Irrigation Distribution System

The Department of Hawaiian Home Lands and the Department of Agriculture have elected to install pipelines to service the DHHL Phase I and Phase II expansion areas. They have done so in response to State policy to more quickly provide infrastructure and services to Hawaiian Homes beneficiaries. The Phase I and Phase II farmers will share the water presently available from the WIS. Although the Phase I and Phase II distribution systems will be deleted from the Plan-EIS alternative plans, additional water storage capacity is needed to assure an adequate and consistent water to these and other WIS farmers.

Stockwater Distribution System

Installing pipelines to DHHL ranchlots and private ranchlots as originally planned was included in the alternatives developed for the Plan-EIS.

Natural Resources Conservation and Protection

No additional technical or financial assistance to plan and implement conservation plans and practices is included in the alternative plans. The full "build-out" of farm and ranch production under with project conditions is expected to occur over a 20-year period. The projected annual demand for technical assistance from the SWCD and NRCS to develop conservation plans appears to be within the capacity of the ongoing programs. Incentive payments and cost-sharing for the implementation of needed conservation practices will be

available through ongoing programs, however obtaining funding from these programs is based on meeting program objectives and eligibility requirements.

The implementation of the Waimea-Paauilo Watershed project will offer opportunities to increase the awareness of the need for conservation practices and the availability of assistance.

4.2 CANDIDATE PLANS

Five alternative plans were considered as "Candidate Plans" and are presented in this Plan-EIS. They are as follows:

Alternative 1 - No Action Alternative

Alternative 2 - National Economic Development (NED) Plan

Alternative 3 - Waimea II Reservoir Plan

Alternative 4 - Modified Waimea II Reservoir Plan

Alternative 5 - Kauahi Reservoir Plan

Alternative 6 - Kauahi Reservoir without Livestock Drinking Water

Alternative 1, the No Action Alternative, describes and quantifies the expected conditions under "future without project" conditions or if no action is taken to solve the water shortage problems. The conditions serve as the baseline against which the effects of the implementation alternatives are measured.

Alternatives 2, 3, 4, 5, and *6* are implementation alternatives which propose structural improvements to increase the storage and distribution capacity of the WIS. The alternatives differ in reservoir design, reservoir site, and/or service areas.

Alternative 2, the NED Plan, maximizes net national economic benefits. It proposes the following improvements to the WIS to provide an irrigation water supply: 1) installing a 3,100-foot-long reservoir supply pipeline from the UHD to the proposed reservoir; 2) constructing a 131-million-gallon Waimea II Reservoir with a 2:1 embankment downslope and 3) installing additional irrigation pipeline to service the planned Lalamilo Ag. Park expansion area. It does not include any improvements to provide a stockwater supply.

Alternative 3, the Waimea II Reservoir Plan, is similar to Alternative 2, except that it proposes installing a stockwater distribution system to service DHHL and some private ranchlots.

Alternative 4, the Modified Waimea II Reservoir Plan, is similar to Alternative 3, except for the Waimea II Reservoir design. It proposes constructing a 120-million-gallon Waimea II Reservoir with reduced embankment height and a 3:1 embankment downslope.

Alternative 5, the Kauahi Reservoir Plan, proposes the following: 1) installing a 19,200-foot-long pipeline from the UHD to supply the proposed reservoir; 2) constructing a 131-million-gallon reservoir at the Kauahi site; 3) installing additional irrigation pipeline to service the planned Lalamilo Ag. Park expansion area; and 4) installing a stockwater distribution system to service DHHL and some private ranchlots.

Alternative 6, the Kauahi Reservoir without Livestock Drinking Water, is similar to Alternative 5 with the exception of the elimination of the stockwater distribution system.

The *six* Candidate Plans are described in more detail in the following section. The significant economic, environmental, and social effects of each of the alternatives are also described and/or quantified. Table L provides a summary and comparison of the candidate plans.

4.3 RISK AND UNCERTAINTY

Throughout the planning process the best available data was used to minimize risks and uncertainties. However, the uncertainty inherent in data and assumptions of future economic, social, and environmental conditions will create risks in projecting the costs and benefits of the alternative plans. The major areas of risk and uncertainty are discussed below.

4.3.1 Hydrologic Assumptions

Projection for water availability from the Upper Hamakua Ditch are based on WIS and U.S. Geologic Survey (USGS) records of streamflow gages. The relatively short period of record, approximately 20 to 30 years for most gages, in relation to some long-period hydrometeorogical cycles may affect the accuracy of water availability projections. A compounding factor is the determination by the USGS that much of the data collected in the 1975 to 1990 period in watershed area is poor or unusable. *The reliable records at the ditch gage near the inlet to the Waimea Reservoir, USGS Station 16726000, has been reduced to ten years.*

4.3.2 Economic Analysis

The installation cost of the alternative plans are estimates based on previous bids for similar work, national estimating guides, and estimates of work item quantities. The omission of cost considerations and changes in pricing will affect the accuracy of the estimates.

The economic benefits of the alternative plans are estimates of the increase in net income for the affected farmers and ranchers that would be generated, once the alternative is implemented. The estimates of net income are based on cost-return budgets which represent "typical" or "average" farm and ranch operations. Actual benefits to individuals will vary from farmer to farmer, or rancher to rancher and will change if production input and/or prices received change in the future.

4.3.3 Future Agricultural Conditions

Project analysis assumes that build-out, that is, the near complete utilization of all the agricultural land within the areas served by the project, will take place within the next 10 to 20 years. Benefits estimated for the project over its 50-year life are based on fuller utilization of the cropland and grazing land acres than at the present time.

4.3.4 Water Rights

The plan assumes that continuation of the current water rights situation through the life of the project. Streamflow restoration issues may affect the diversion of water by the Upper Hamakua Ditch. Affirmation of native Hawaiian water rights claims may affect the allocation of the water to native Hawaiian and non-native Hawaiian users.

The DOA and the DHHL will enter into an agreement, approved by both the State Board of Agriculture and the Hawaiian Homes Commission, on those issues that require interagency coordination during implementation and operation of the project improvements. The agreement will include WIS water rate structure and water allocation for DHHL customers and the priority for water use. The agreement will be completed before the completion of any Project Agreements.

4.4 ALTERNATIVE 1 - NO ACTION ALTERNATIVE

Alternative 1, the No Action Alternative, describes and quantifies the conditions that are expected in the future, if no action is taken to solve the identified problems. This alternative serves as the baseline against which the effects of the other implementation alternatives are measured. See Table L for a summary and comparison of the Candidate Plans.

4.4.1 Proposed Works of Improvement

- None

4.4.2 WIS Features

- **Total water storage:** 161-million gallons
- **Total water supplied:** 3.2-million gallons per day
- **Reliability of water supply:** 68 percent
- **Service areas:**
  - Farmlots: 159
  - Total cropland acres: 1,715
  - Irrigated cropland acres: 633
  - Ranchlots: 0
  - Grazing land acres: 0
  - Animal units: 0

4.4.3 Economic Effects

Crop and livestock losses with continue as shown in the following table.

Table J
ALTERNATIVE 1 - ECONOMIC EFFECTS
Waimea-Paauilo Watershed

Item	Cropland Irrigation Water	Livestock Drinking Water	Total
	($)	($)	($)
Average annual losses			
Losses due to water shortages	2,616,900	53,200	2,670,100
Limited expansion opportunities	663,600	266,300	929,900
Water pumping costs	150,000	0	150,000
Total average annual losses	3,430,500	319,500	3,750,000

4.5 ALTERNATIVE 2 - NATIONAL ECONOMIC DEVELOPMENT (NED) PLAN

Alternative 2, the NED Plan, provides the highest economic benefits after the cost expenditure is considered (average annual net benefits). Alternative 2 proposes structural improvements to increase the storage and distribution capacity of the WIS to provide crop irrigation water. It does not include improvements to provide stockwater.

4.5.1 Proposed Works of Improvement

- **Reservoir supply pipeline:** Install 3,100 feet of 30-inch diameter ductile iron pipeline (DIP) from a new intake structure on the Upper Hamakua Ditch to the proposed Waimea II Reservoir. See Figure I, Alternatives 2, 3, and 4 - Irrigation Improvements.
- **Reservoir:** Construct one reservoir (Waimea II Reservoir) with storage of 131-million gallons and an embankment height of 62 feet and downslope of 2:1.
- **Irrigation water distribution system:** Install a total of 10,400 feet of pipeline, including: 900 feet of 24-inch diameter DIP from the proposed Waimea II Reservoir to the existing WIS distribution system and 9,500 feet of 4-inch to 12-inch diameter polyvinyl chloride (PVC) pipeline to service the planned 270-acre Lalamilo Ag. Park expansion area.

4.5.2 WIS Features

- **Total water storage:** 292-million gallons
- **Total water supplied:** 3.8-million gallons per day
- **Reliability of water supply:** 82 percent
- **Service areas:**
  - Farmlots: 167
  - Total cropland acres: 1,985
  - Irrigated cropland acres: 989
  - Ranchlots: 0
  - Grazing land acres: 0
  - Animal units: 0

4.5.3 Economic Effects

Table K
ALTERNATIVE 2 - ECONOMIC EFFECTS
Waimea-Paauilo Watershed

Item	Cropland Irrigation Water	Livestock Drinking Water	Total
	($)	($)	($)
Average annual benefits			
Reduction in losses due to water shortages	1,144,900	0	1,144,900
Reduction in limited expansion opportunities	544,100	0	544,100
Reduction in water pumping costs	51,800	0	51,800
Total average annual benefits	1,740,800	0	1,740,800
Installation costs			
Federal (PL 83-566) cost-share	7,007,300	0	7,007,300
State Dept. of Agriculture cost-share	5,685,800	0	5,685,800
DHHL cost-share	0	0	0
Total installation costs	12,693,100	0	12,693,100
Average annual installation costs [1/]			
Federal (PL 83-566) cost-share	548,200	0	548,200
State Dept. of Agriculture cost-share	444,800	0	444,800
DHHL cost-share	0	0	0
Total average annual installation costs	993,000	0	993,000
Average annual OM&R [2/] **costs**			
Federal (PL 83-566) cost-share	0	0	0
State Dept. of Agriculture cost-share	71,800	0	71,800
DHHL cost-share	0	0	0
Total average annual OM&R [1/] **costs**	71,800	0	71,800
Total average annual costs			
Federal (PL 83-566) cost-share	548,200	0	548,200
State Dept. of Agriculture cost-share	516,600	0	516,600
DHHL cost-share	0	0	0
Total average annual costs	1,064,800	0	1,064,800
Average annual net benefits	676,000	0	676,000
Benefit to cost ratio	1.6 : 1.0	N/A	1.6 : 1.0

[1/] Installation costs amortized at 7.625% interest for 50 years (.07823).
[2/] Operation, maintenance, and replacement.

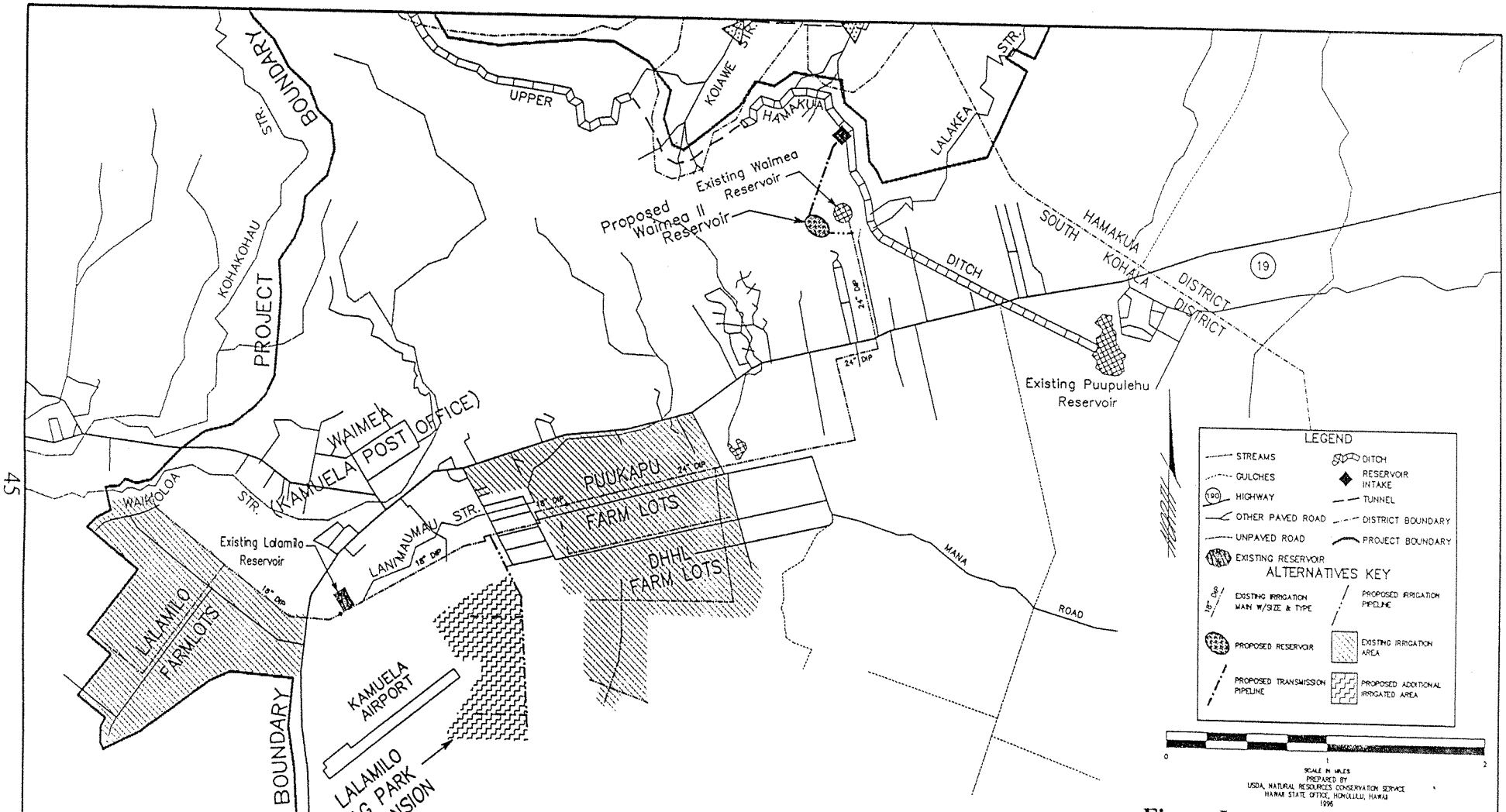

Figure I
ALTERNATIVES 2, 3, AND 4
IRRIGATION IMPROVEMENTS
Waimea-Paauilo Watershed

4.6 ALTERNATIVE 3 - WAIMEA II RESERVOIR PLAN

Alternative 3 proposes structural improvements to increase the storage and distribution capacity of the WIS to provide crop irrigation water, as well as livestock drinking water. The reservoir supply pipeline, reservoir, and irrigation water distribution system are unchanged from Alternative 2.

4.6.1 Proposed Works of Improvement

- **Reservoir supply pipeline:** Install 3,100 feet of 30-inch diameter DIP from a new intake structure on the Upper Hamakua Ditch to the proposed Waimea II Reservoir. See Figure I.
- **Reservoir:** Construct one reservoir (Waimea II Reservoir) with storage of 131-million gallons and an embankment height of 62 feet and downslope of 2:1.
- **Irrigation water distribution system:** Install a total of 10,400 feet of pipeline, including: 900 feet of 24-inch diameter DIP from the Waimea II Reservoir to the existing WIS distribution system and 9,500 feet of 4-inch to 12-inch diameter PVC pipeline to service the planned 270-acre Lalamilo Ag. Park expansion area.
- **Stockwater distribution system:** Install 232,250 feet of 3/4-inch to 6-inch diameter high density polyethylene (HDPE) pipeline, three electric pumps, and eight diesel pumps to provide stockwater to 265 ranchlots totaling 22,962 acres. See Figure J.

4.6.2 WIS Features

- **Total water storage:** 292-million gallons
- **Total water supplied:** 4-million gallons per day
- **Reliability of water supply:** 78 percent
- **Service areas:**
  - Farmlots: 167
  - Total cropland acres: 1,985
  - Irrigated cropland acres: 989
  - Ranchlots: 265
  - Grazing land acres: 22,962
  - Animal units: 19,040

4.6.3 Economic Effects

Table L
ALTERNATIVE 3 - ECONOMIC EFFECTS
Waimea-Paauilo Watershed

Item	Cropland Irrigation Water	Livestock Drinking Water	Total
	($)	($)	($)
Average annual benefits			
Reduction in losses due to water shortages	817,800	41,500	859,300
Reduction in limited expansion opportunities	517,600	207,700	725,300
Reduction in water pumping costs	46,600	0	46,600
Total average annual benefits	1,382,000	249,200	1,631,200
Installation costs			
Federal (PL 83-566) cost-share	6,811,900	628,300	7,440,200
State Dept. of Agriculture cost-share	5,441,300	300,000	5,741,300
DHHL cost-share	0	4,479,900	4,479,900
Total installation costs	12,253,200	5,408,200	17,661,400
Average annual installation costs [1/]			
Federal (PL 83-566) cost-share	532,900	49,100	582,000
State Dept. of Agriculture cost-share	425,700	23,500	449,200
DHHL cost-share	0	350,500	350,500
Total average annual installation costs	958,600	423,100	1,381,700
Average annual OM&R [2/] **costs**			
Federal (PL 83-566) cost-share	0	0	0
State Dept. of Agriculture cost-share	74,800	0	74,800
DHHL cost-share	0	107,300	107,300
Total average annual OM&R [1/] **costs**	74,800	107,300	182,100
Total average annual costs			
Federal (PL 83-566) cost-share	532,900	49,100	582,000
State Dept. of Agriculture cost-share	500,500	23,500	524,000
DHHL cost-share	0	457,800	457,800
Total average annual costs	1,033,400	530,400	1,563,800
Average annual net benefits	348,600	-281,200	67,400
Benefit to cost ratio	1.3 : 1.0	0.5 : 1.0	1.0 : 1.0

[1/] Installation costs amortized at 7.625% interest for 50 years (.07823).
[2/] Operation, maintenance, and replacement.

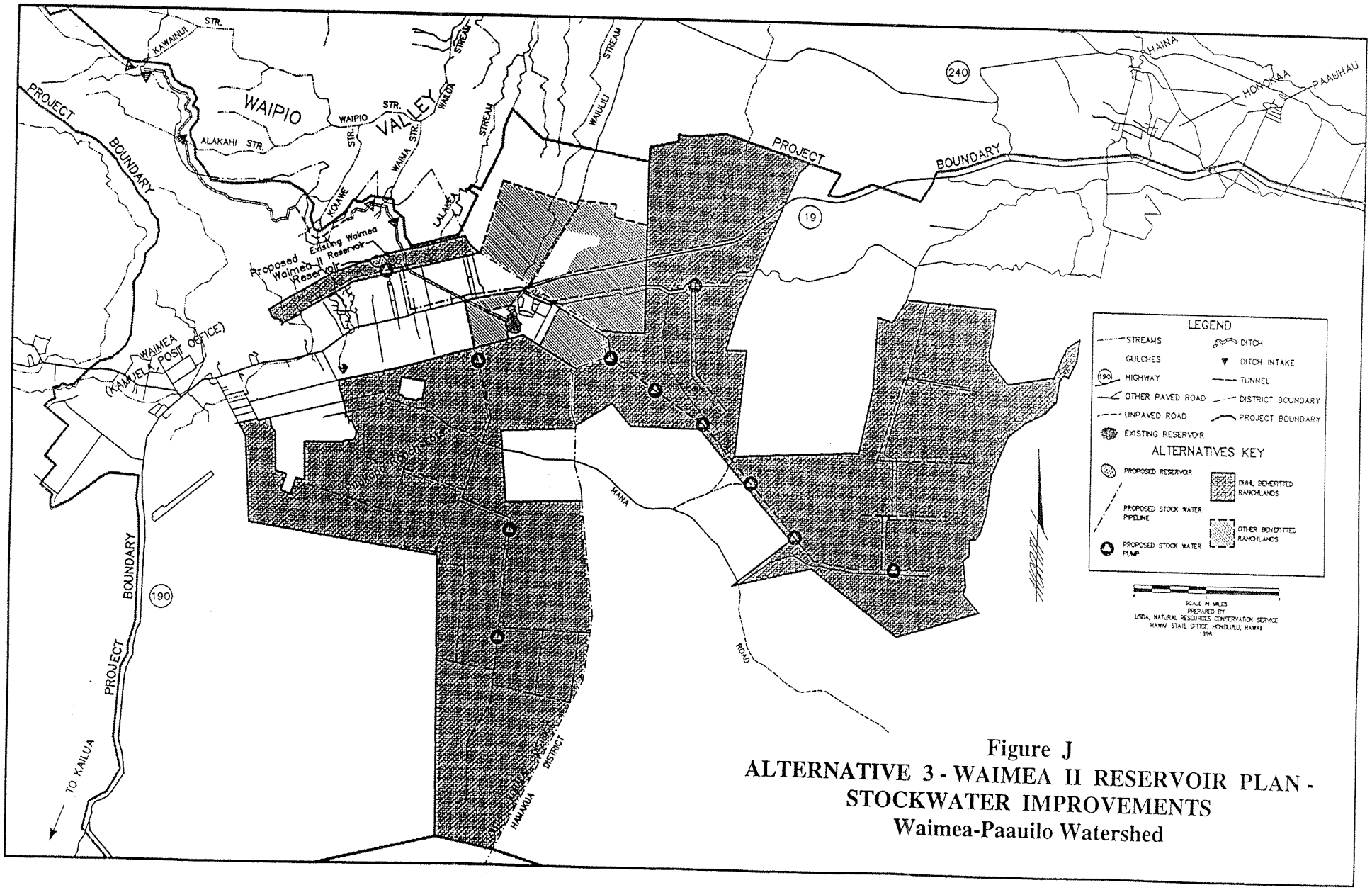

Figure J
ALTERNATIVE 3 - WAIMEA II RESERVOIR PLAN - STOCKWATER IMPROVEMENTS
Waimea-Paauilo Watershed

4.7 ALTERNATIVE 4 - MODIFIED WAIMEA II RESERVOIR PLAN

Alternative 4 is similar to Alternative 3, except that it proposes constructing a modified Waimea II Reservoir which incorporates design features to increase the structural stability of the reservoir's embankment, including a lower embankment height and 3:1 downslope. These modifications will lower the storage capacity of the reservoir to 120-million gallons.

4.7.1 Proposed Works of Improvement

- **Reservoir supply pipeline:** Install 3,100 feet of 30-inch diameter DIP from a new intake structure on the Upper Hamakua Ditch to the proposed Waimea II Reservoir. See Figure I.
- **Reservoir:** Construct one reservoir (Waimea II Reservoir) with storage of 120-million gallons and an embankment height of 52 feet and downslope of 3:1.
- **Irrigation water distribution system:** Install at total of 10,400 feet of pipeline, including: 900 feet of 24-inch diameter DIP from the Waimea II Reservoir to the existing WIS distribution system and 9,500 feet of 4-inch to 12-inch diameter PVC pipeline to service the planned 270-acre Lalamilo Ag. Park expansion area.
- **Stockwater distribution system:** Install 256,250 feet of 3/4-inch to 6-inch diameter HDPE pipeline, six electric pumps, and three diesel pumps to provide stockwater to 265 ranchlots totaling 22,962 acres. See Figure K.

4.7.2 WIS Features

- **Total water storage:** 292-million gallons
- **Total water supplied:** 4-million gallons per day
- **Reliability of water supply:** 75 percent
- **Service areas:**
  - Farmlots: 167
  - Total cropland acres: 1,985
  - Irrigated cropland acres: 989
  - Ranchlots: 265
  - Grazing land acres: 22,962
  - Animal units: 19,040

4.7.3 Economic Effects

Table M
ALTERNATIVE 4 - ECONOMIC EFFECTS
Waimea-Paauilo Watershed

Item	Cropland Irrigation Water	Livestock Drinking Water	Total
	($)	($)	($)
Average annual benefits			
Reduction in losses due to water shortages	572,400	39,900	612,300
Reduction in limited expansion opportunities	497,700	199,800	697,500
Reduction in water pumping costs	42,600	0	42,600
Total average annual benefits	1,112,700	239,700	1,352,400
Installation costs			
Federal (PL 83-566) cost-share	6,513,400	663,300	7,176,700
State Dept. of Agriculture cost-share	5,210,800	300,000	5,510,800
DHHL cost-share	0	4,696,600	4,696,600
Total installation costs	11,724,200	5,659,900	17,384,100
Average annual installation costs [1/]			
Federal (PL 83-566) cost-share	509,600	51,900	561,500
State Dept. of Agriculture cost-share	407,600	23,500	431,100
DHHL cost-share	0	367,400	367,400
Total average annual installation costs	917,200	442,800	1,360,00
Average annual OM&R [2/] **costs**			
Federal (PL 83-566) cost-share	0	0	0
State Dept. of Agriculture cost-share	72,700	0	72,700
DHHL cost-share	0	96,800	96,800
Total average annual OM&R [2/] **costs**	72,700	96,800	169,500
Total average annual costs			
Federal (PL 83-566) cost-share	509,600	51,900	561,500
State Dept. of Agriculture cost-share	480,300	23,500	503,800
DHHL cost-share	0	464,200	464,200
Total average annual costs	989,900	539,600	1,529.500
Average annual net benefits	122,800	-229,900	-177,100
Benefit to cost ratio	1.1 : 1.0	0.4 : 1.0	0.9 : 1.0

[1/] Installation costs amortized at 7.625% interest for 50 years (.07823).
[2/] Operation, maintenance, and replacement.

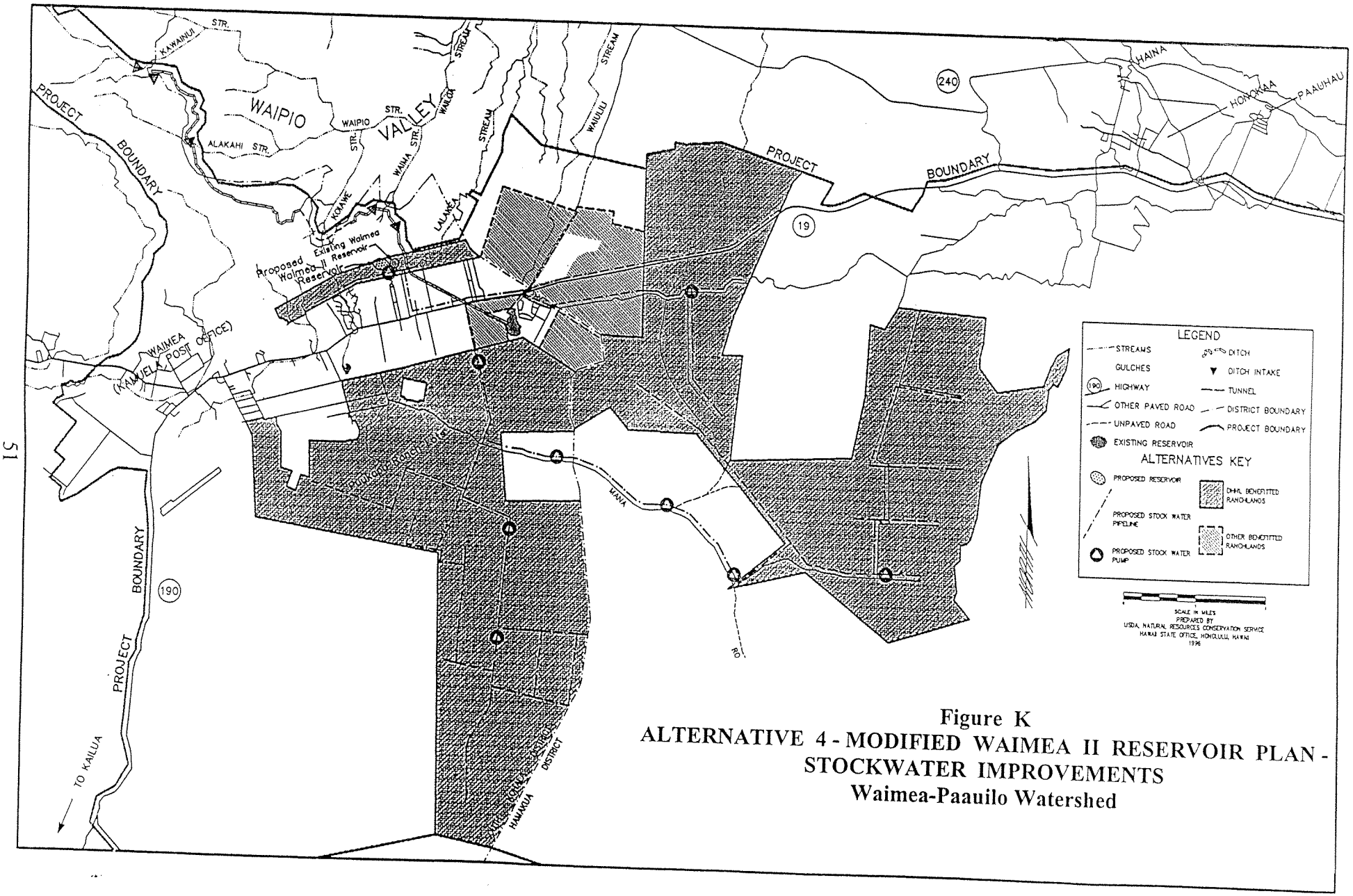

Figure K
ALTERNATIVE 4 - MODIFIED WAIMEA II RESERVOIR PLAN - STOCKWATER IMPROVEMENTS
Waimea-Paauilo Watershed

4.8 ALTERNATIVE 5 - KAUAHI RESERVOIR PLAN

Alternative 5 proposes structural improvements to increase the storage and distribution capacity of the WIS to provide crop irrigation water, as well as livestock drinking water. It differs from the other alternatives, in that it proposes the installation of reservoir at the Kauahi site, which is approximately three miles south of the Waimea II Reservoir site.

4.8.1 Proposed Works of Improvement

- **Reservoir supply pipeline:** Install 19,200 feet of 30-inch diameter DIP from a new intake structure on the Upper Hamakua Ditch to the proposed Kauahi Reservoir. See Figure L.
- **Reservoir:** Construct one reservoir (Kauahi Reservoir) with storage of 131-million gallons and an embankment height of 26 feet and downslope of 3:1.
- **Irrigation water distribution system:** Install a total of 13,300 feet of pipeline, including: 3,800 feet of 30-inch diameter DIP from the proposed 30-inch diameter reservoir supply pipeline to the existing distribution system and 9,500 feet of 4-inch to 12-inch diameter PVC pipeline to service the planned 270-acre Lalamilo Ag. Park expansion area.
- **Stockwater distribution system:** Install 234,600 feet of 1-inch to 6-inch diameter HDPE pipeline, seven electric pumps, and two diesel pumps to provide stockwater to 265 ranchlots totaling 22,962 acres. See Figure M.

4.6.2 WIS Features

- **Total water storage:** 292-million gallons
- **Total water supplied:** 4-million gallons per day
- **Reliability of water supply:** 78 percent
- **Service areas:**
  - Farmlots: 167
  - Total cropland acres: 1,985
  - Irrigated cropland acres: 989
  - Ranchlots: 265
  - Grazing land acres: 22,962
  - Animal units: 19,040

4.8.3 Economic Effects

Table N
ALTERNATIVE 5 - ECONOMIC EFFECTS
Waimea-Paauilo Watershed

Item	Cropland Irrigation Water	Livestock Drinking Water	Total
	($)	($)	($)
Average annual benefits			
Reduction in losses due to water shortages	817,800	41,500	859,300
Reduction in limited expansion opportunities	517,600	207,700	725,300
Reduction in water pumping costs	46,600	0	46,600
Total average annual benefits	1,382,000	249,200	1,631,200
Installation costs			
Federal (PL 83-566) cost-share	*6,832,800*	569,100	*7,401,900*
State Dept. of Agriculture cost-share	*5,576,100*	322,400	*5,898,500*
DHHL cost-share	0	*4,076,200*	*4,076,200*
Total installation costs	*12,408,900*	*4,967,700*	17,376,600
Average annual installation costs [1/]			
Federal (PL 83-566) cost-share	*534,600*	44,500	*579,100*
State Dept. of Agriculture cost-share	*436,200*	25,200	*416,400*
DHHL cost-share	0	*318,900*	318,900
Total average annual installation costs	*970,800*	*388,600*	1,314,400
Average annual OM&R [2/] **costs**			
Federal (PL 83-566) cost-share	0	0	0
State Dept. of Agriculture cost-share	101,500	0	101,500
DHHL cost-share	0	94,600	94,600
Total average annual OM&R [2/] **costs**	101,500	94,600	196,100
Total average annual costs			
Federal (PL 83-566) cost-share	*534,600*	4,395,100	*579,100*
State Dept. of Agriculture cost-share	*537,700*	5,356,300	*562,900*
DHHL cost-share	0	*413,500*	*413,500*
Total average annual costs	*1,072,300*	*482,200*	1,555,500
Average annual net benefits	*309,700*	*-233,000*	75,700
Benefit to cost ratio	1.3 : 1.0	0.5 : 1.0	1.0 : 1.0

[1/] Installation costs amortized at 7.625% interest for 50 years (.07823).
[2/] Operation, maintenance, and replacement.

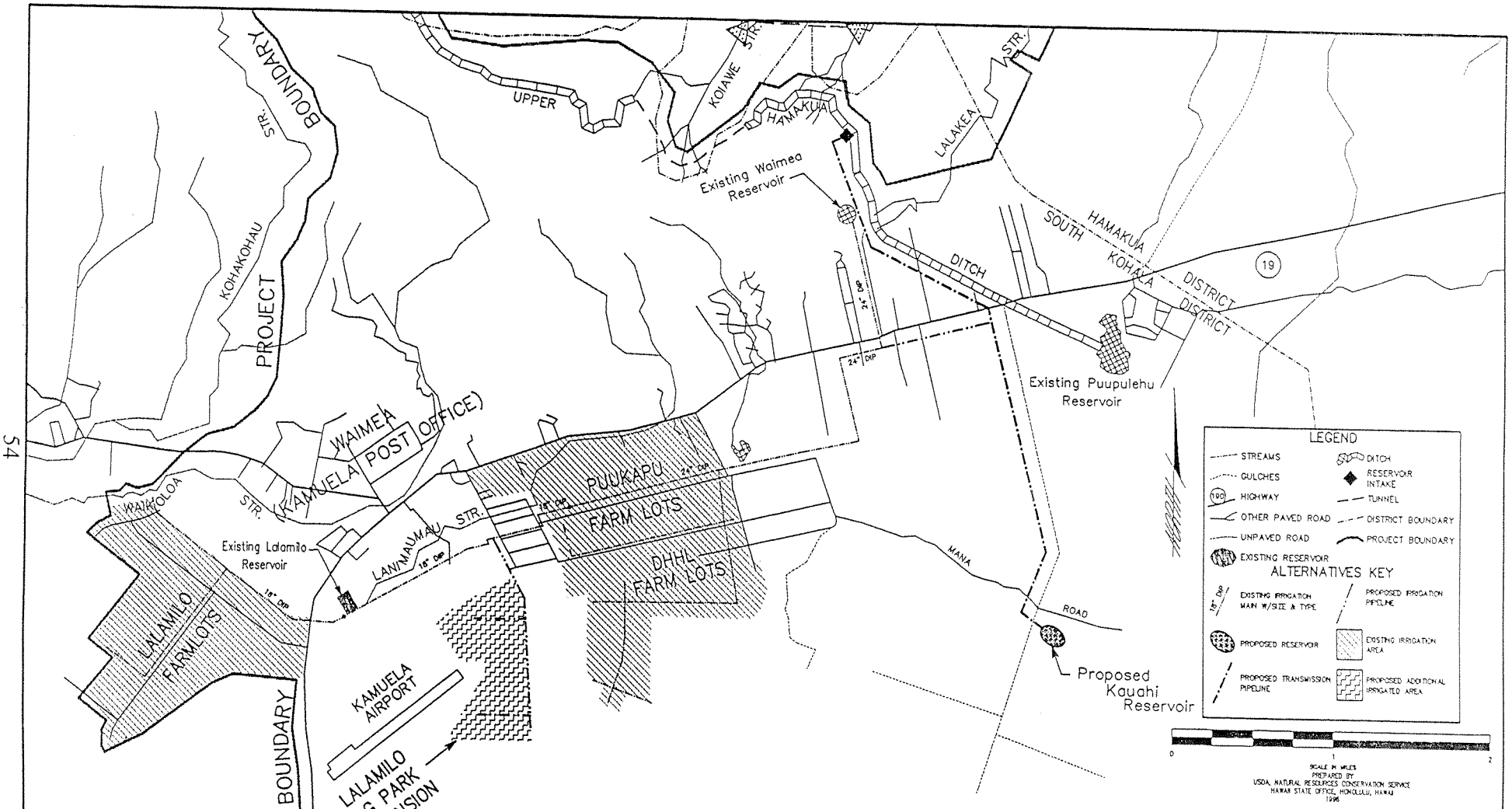

Figure L
ALTERNATIVE 5 and 6 - KAUAHI RESERVOIR PLAN - IRRIGATION IMPROVEMENTS
Waimea-Paauilo Watershed

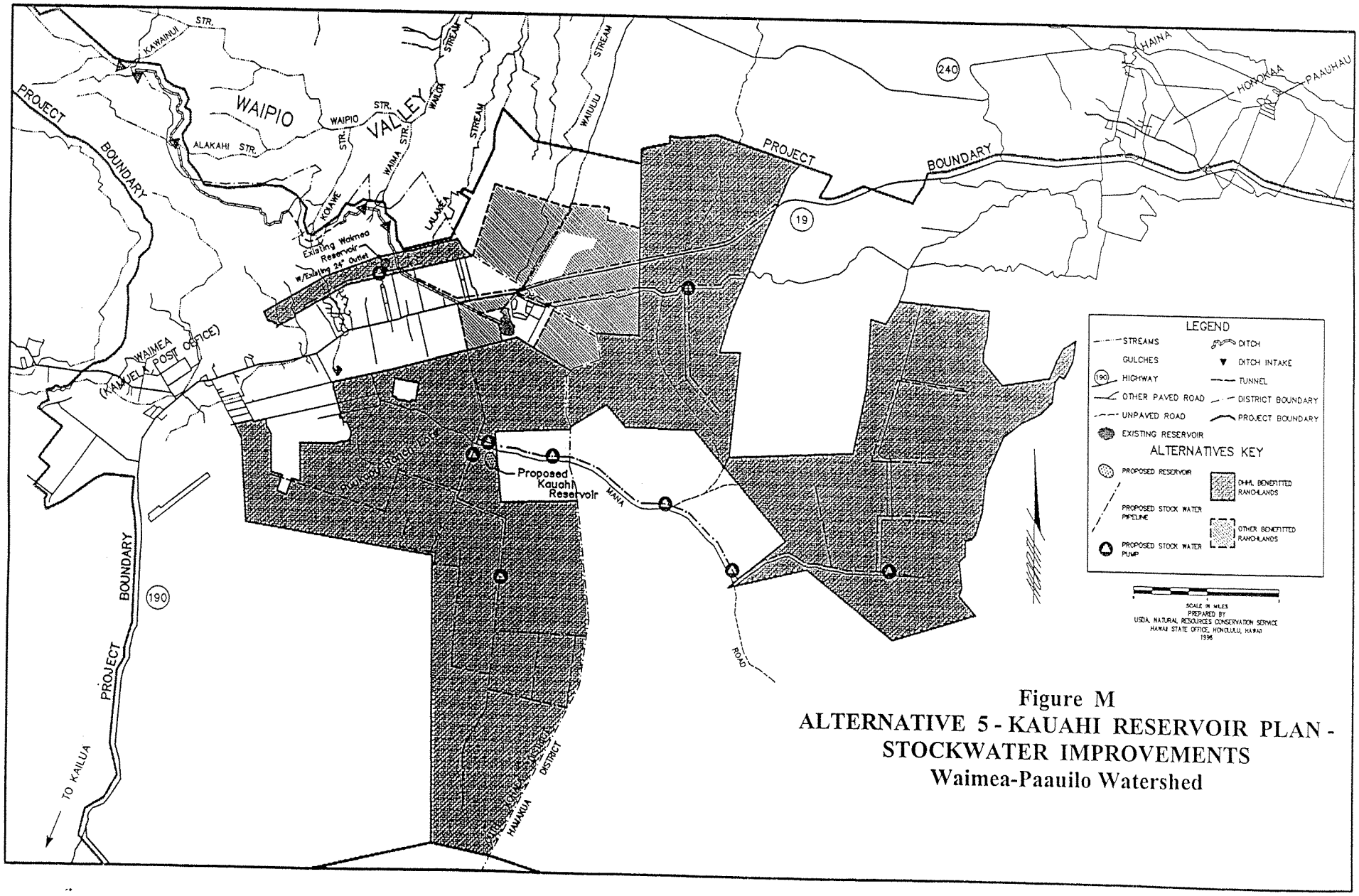

Figure M
ALTERNATIVE 5 - KAUAHI RESERVOIR PLAN - STOCKWATER IMPROVEMENTS
Waimea-Paauilo Watershed

4.9 ALTERNATIVE 6 - KAUAHI RESERVOIR PLAN WITHOUT STOCKWATER

Alternative 6 proposes the installation of the Kauahi Reservoir and irrigation distribution system improvements without implementation of a livestock drinking water distribution system. The reliability of water supply to cropland irrigators is improved by elimination of the livestock water demand. The inclusion of this alternative in the FEIS was requested by EPA.

4.9.1 Proposed Works of Improvement

- ***Reservoir supply pipeline*** *- Install 19,200 feet of 30-inch diameter ductile iron pipeline (DIP) from a new intake structure on the Upper Hamakua Ditch to the proposed Kauahi Reservoir. See Figure L*
- ***Reservoir*** *- Construct a 131-million-gallon Kauahi Reservoir with storage of 131-million gallons, embankment height of 26 feet and 3:1 downstream embankment slope.*
- ***Irrigation water distribution pipeline*** *- Install a total of 13,300 feet of pipeline, including: 3,800 feet of 24-inch DIP from the proposed 30-inch diameter reservoir supply pipeline to the existing WIS distribution pipeline and 9,500 feet of 4-inch to 12-inch polyvinyl chloride (PVC) pipeline to service the planned 270-acre Lalamilo Ag. Park expansion area.*

4.9.2 WIS Features

- ***Total water storage:*** *292 million gallons*
- ***Total water supplied:*** *3.8 million gallons per day*
- ***Reliability of water supply:*** *82 percent*
- ***Service areas:***
  - *Farmlots: 167*
  - *Total cropland acres: 1,985*
  - *Irrigated cropland acres: 989*
  - *Ranchlots: 0*
  - *Grazing land acres: 0*
  - *Animal units: 0*

4.9.3 Economic Effects

Table N
ALTERNATIVE 6 - ECONOMIC EFFECTS
Waimea-Paauilo Watershed

Item	Cropland Irrigation Water	Livestock Drinking Water	Total
	$)	($)	($)
Average annual benefits			
Reduction in income losses	1,144,900	0	1,144,900
Reduction in limited expansion opportunities	544,100	0	544,100
Reduction in water pumping costs	51,800	0	51,800
Total average annual benefits	1,740,800	0	1,740,800
Installation costs			
Federal (PL 83-566) cost-share	7,028,500	0	7,028,500
State Dept. of Agriculture cost-share	5,832,400	0	5,832,400
DHHL cost-share	0	0	0
Total installation costs	12,860,900	0	12,860,900
Average annual installation costs [1/]			
Federal (PL 83-566) cost-share	549,800	0	549,800
State Dept. of Agriculture cost-share	456,300	0	456,300
DHHL cost-share	0	0	0
Total average annual installation costs	1,006,100	0	1,006,900
Average annual OM&R [2/] **costs**			
Federal (PL 83-566) cost-share	0	0	0
State Dept. of Agriculture cost-share	101,400	0	101,400
DHHL cost-share	0	0	0
Total average annual OM&R [1/] **costs**	101,400	0	101,400
Total average annual costs			
Federal (PL 83-566) cost-share	549,800	0	549,800
State Dept. of Agriculture cost-share	557,700	0	557,700
DHHL cost-share	0	0	0
Total average annual costs	1,107,500	0	1,107,500
Average annual net benefits	633,300	0	633,300
Benefit : cost ratio	1.6 : 1.0	N/A	1.6 : 1.0

[1/] *Installation costs amortized at 7.625% interest for 50 years (.07823).*
[2/] *Operation, maintenance, and replacement.*

Table P
SUMMARY AND COMPARISON OF CANDIDATE PLANS
Waimea-Paauilo Watershed
(Page 1 of 4)

Item	Unit	Alt. 1 No Action	Alt. 2 NED Plan	Alt. 3 Waimea II Reservoir Plan	Alt. 4 Modified Waimea II Reservoir Plan	Alt. 5 Kauahi Reservoir Plan	*Alt. 6 Kauahi Reservoir w/o Stockwater Plan*
PROPOSED WORKS OF IMPROVEMENT TO WIS							
Reservoir supply pipeline	feet	0	3,100	3,100	3,100	19,200	*19,200*
Reservoir	number	None	1	1	1	1	*1*
	storage capcty	N/A	131 MG	131 MG	120 MG	131 MG	*131 MG*
	site	N/A	Waimea II	Waimea II	Waimea II	Kauahi	*Kauahi*
	embkmnt hght	N/A	62	62	52	26	*26*
	downslope	N/A	2:1	2:1	3:1	3:1	*3:1*
Irrigation water distribution system	feet	0	10,400	10,400	10,400	13,300	*13,300*
Stockwater distribution system	feet	0	0	232,250	256,250	234,600	*0*
	electric pumps	0	0	3	6	7	*0*
	diesel pumps	0	0	8	3	2	*0*
WIS CAPABILITY							
Total water storage	MG	161	292	292	281	292	*292*
Total water supplied	mgd	3.2	3.8	4	4	4	*3.8*
Reliability of water supply	%	68	82	78	75	78	*82*
Cropland areas serviced	FW/O	Lalamilo, Puukapu, DHHL, DHHL Phase I, DHHL Phase II	Lalamilo, Puukapu, DHHL, DHHL Phase I, DHHL Phase II	Lalamilo, Puukapu, DHHL, DHHL Phase I, DHHL Phase II	Lalamilo, Puukapu, DHHL, DHHL Phase I, DHHL Phase II	Lalamilo, Puukapu, DHHL, DHHL Phase I, DHHL Phase II	*Lalamilo, Puukapu, DHHL, DHHL Phase I, DHHL Phase II*
	additional	None	Lalamilo Ag Park	Lalamilo Ag Park	Lalamilo Ag Park	Lalamilo Ag Park	*Lalamilo Ag Park*
Farmlots serviced	# FW/O	159	159	159	159	159	*159*
	# additional	0	8	8	8	8	*8*
	# total	159	167	167	167	167	*167*
Total cropland acres serviced	# FW/O	1,715	1,715	1,715	1,715	1,715	*1,715*
	# additional	0	270	270	270	270	*270*
	# total	1,715	1,985	1,985	1,985	1,985	*1,985*
Irrigated cropland acres	# FW/O	874	874	874	870	870	*870*
	# additional	0	115	115	115	115	*115*
	# total	874	874	874	989	989	*989*
Ranchlots serviced	number	0	0	265	265	265	*0*
Grazing land acres serviced	number	0	0	22,962	22,962	22,962	*0*
Animal units serviced	# FW/O	0	0	10,850	10,850	10,850	*0*
	# additional	0	0	8,190	8,190	8,190	*0*
	# total	0	0	48,434	48,434	19,040	*0*

Table P
SUMMARY AND COMPARISON OF CANDIDATE PLANS
Waimea-Paauilo Watershed
(Page 2 of 4)

Item	Alt. 1 No Action	Alt. 2 NED Plan	Alt. 3 Waimea II Reservoir Plan	Alt. 4 Modified Waimea II Reservoir Plan	Alt. 5 Kauahi Reservoir Plan	*Alt.6 Kauahi Reservoir w/o Stockwater Plan*
ECONOMIC EFFECTS	($)	($)	($)	($)	($)	*($)*
Beneficial Economic Effects / Benefits						
Total average annual irrigation water benefits	0	1,740,800	1,382,000	1,112,700	1,382,000	*1,740,800*
Total avg. ann. livestock drinking water benefits	0	0	249,200	239,700	249,200	*0*
Total Average Annual Benefits	**0**	**1,740,800**	**1,631,200**	**1,352,400**	**1,631,200**	***1,740,800***
Adverse Economic Effects / Costs						
Installation costs						
Federal (PL 83-566) cost-share	0	7,007,300	7,440,200	7,176,700	7,401,900	*7,028,500*
State Dept. of Agriculture cost-share	0	5,685,800	5,741,300	5,510,800	*5,741,300*	*5,832,400*
DHHL cost-share	0	0	4,479,900	4,696,600	*4,233,400*	*0*
Total installation costs	**0**	**12,693,100**	**17,661,400**	**17,384,100**	**17,376,600**	***12,860,900***
Total average annual installation costs	**0**	**933,000**	**1,381,700**	**1,360,000**	**1,359,400**	***1,006,900***
Total average annual OM&R	**0**	**71,800**	**182,100**	**169,500**	**196,100**	***101,400***
Total average annual costs	**0**	**1,064,800**	**1,563,800**	**1,529,500**	**1,555,500**	***1,107,500***
Total average annual net benefits	**0**	**676,000**	**67,400**	**-177,100**	**75,700**	***633,300***
Benefit to cost ratio	**N/A**	**1.6 : 1.0**	**1.0 : 1.0**	**0.9 : 1.0**	**1.0 : 1.0**	***1.6:1.0***

Table P
SUMMARY AND COMPARISON OF CANDIDATE PLANS
Waimea-Paauilo Watershed
(Page 3 of 4)

Item	Alt. 1 No Action	Alt. 2 NED Plan	Alt. 3 Waimea II Reservoir Plan	Alt. 4 Modified Waimea II Reservoir Plan	Alt. 5 Kauahi Reservoir Plan	*Alt. 6 Kauahi Reservoir w/o Stockwater Plan*
ENVIRONMENTAL EFFECTS						
Agriculture and Prime Agricultural Land	None anticipated.	• Agricultural industry will be strengthened. • 99 acres of Prime Agricultural Land will be created (Lalamilo Ag. Park).	• Agricultural industry will be strengthened. • 99 acres of Prime Agricultural Land will be created (Lalamilo Ag. Park).	• Agricultural industry will be strengthened. • 99 acres of Prime Agricultural Land will be created (Lalamilo Ag. Park).	• Agricultural industry will be strengthened. • 99 acres of Prime Agricultural Land will be created (Lalamilo Ag. Park).	*• Agricultural industry will be strengthened.* *• 99 acres of Prime Agricultural Land will be created (Lalamilo Ag. Park).*
Air	None anticipated.	Temporary decrease in air quality will occur during construction.	Temporary decrease in air quality will occur during construction.	Temporary decrease in air quality will occur during construction.	Temporary decrease in air quality will occur during construction.	*Temporary decrease in air quality will occur during construction.*
Cultural Resources	None anticipated.	None anticipated.	None anticipated.	None anticipated.	None anticipated.	*None anticipated.*
Dam Breach	None anticipated.	7 dwellings are located in Waimea II Reservoir dam breach inundation area.	7 dwellings are located in Waimea II Reservoir dam breach inundation area.	7 dwellings are located in Waimea II Reservoir dam breach inundation area.	1 dwelling is located in Kauahi Reservoir dam breach inundation area. The living are of the dwelling is above the estimated breach flow depth.	*1 dwelling is located in Kauahi Reservoir dam breach inundation area. The living are of the dwelling is above the estimated breach flow depth.*
Energy	None anticipated.	None anticipated.	• 29,300 kilowatt hours required to operated 3 stockwater pumps annually. • 12,000 gallons of diesel fuel required to operate 8 stockwater pumps annually.	• 82,100 kilowatt hours required to operated 6 stockwater pumps annually. • 4,500 gallons of diesel fuel required to operate 3 stockwater pumps annually.	• 82,900 kilowatt hours required to operated 7 stockwater pumps annually. • 3,000 gallons of diesel fuel required to operate 2 stockwater pumps annually. • 37,000 kilowatt hours required to operate one irrigation water pump annually.	*• 37,000 kilowatt hours required to operate one irrigation water pump annually.*
Flooplains	None anticipated.	None anticipated.	None anticipated.	None anticipated.	None anticipated.	*None anticipated.*
Groundwater	None anticipated.	None anticipated.	None anticipated.	None anticipated.	None anticipated.	*None anticipated.*
Hazardous Materials & Hazardous Waste Sites	*None anticipated.*	*None anticipated.*	*None anticipated.*	*None anticipated.*	*None anticipated.*	*None anticipated.*

Table P
SUMMARY AND COMPARISON OF CANDIDATE PLANS
Waimea-Paauilo Watershed
(Page 4 of 4)

Item	Alt. 1 No Action	Alt. 2 NED Plan	Alt. 3 Waimea II Reservoir Plan	Alt. 4 Modified Waimea II Reservoir Plan	Alt. 5 Kauahi Reservoir Plan	*Alt. 6 Kauahi Reservoir w/o Stockwater Plan*
ENVIRONMENTAL EFFECTS						
Land Use	None anticipated.	• 16 acres will be converted from grazing land to reservoir site. • 270 acres will be converted from grazing land to cropland.	• 16 acres will be converted from grazing land to reservoir site. • 270 acres will be converted from grazing land to cropland .	• 16 acres will be converted from grazing land to reservoir site. • 270 acres will be converted from grazing land to cropland .	• 29 acres will be converted from grazing land to reservoir site. • 270 acres will be converted from grazing land to cropland.	*• 29 acres will be converted from grazing land to reservoir site.* *• 270 acres will be converted from grazing land to cropland.*
Population / Urban Growth	None anticipated.	• 8 potentially new farmers. • Urban growth not affected.	• 8 potentially new farmers. • Urban growth not affected.	• 8 potentially new farmers. • Urban growth not affected.	• 8 potentially new farmers. • Urban growth not affected.	*• 8 potentially new farmers.* *• Urban growth not affected.*
Soil	None anticipated.	Temporary increase in soil erosion and sedimentation potential will occur during construction.	Temporary increase in soil erosion and sedimentation potential will occur during construction.	Temporary increase in soil erosion and sedimentation potential will occur during construction.	Temporary increase in soil erosion and sedimentation potential will occur during construction.	*Temporary increase in soil erosion and sedimentation potential will occur during construction.*
Streams	None anticipated.	Reduced overflow from UHD will reduce average streamflow of Lalakea Stream by 5% per year. Naturally occurring fluctuations in streamflow will override overflow effects.	Reduced overflow from UHD will reduce average streamflow of Lalakea Stream by 5% per year. Naturally occurring fluctuations in streamflow will override overflow effects.	Reduced overflow from UHD will reduce average streamflow of Lalakea Stream by 5% per year. Naturally occurring fluctuations in streamflow will override overflow effects.	Reduced overflow from UHD will reduce average streamflow of Lalakea Stream by 5% per year. Naturally occurring fluctuations in streamflow will override overflow effects.	*Reduced overflow from UHD will reduce average streamflow of Lalakea Stream by 5% per year. Naturally occurring fluctuations in streamflow will override overflow effects.*
T&E Species	None anticipated.	None anticipated.	None anticipated.	None anticipated.	None anticipated.	*None anticipated.*
Visual	None anticipated.	Waimea II Reservoir will be visible from about 170 properties.	Waimea II Reservoir will be visible from about 170 properties.	Waimea II Reservoir will be visible from about 170 properties.	Kauahi Reservoir will be visible from about 300 properties.	*Kauahi Reservoir will be visible from about 300 properties.*
Water Rights Contests	None anticipated.	None anticipated.	None anticipated.	None anticipated.	None anticipated.	*None anticipated.*
Wetlands	None anticipated.	None anticipated.	Minimal.	Minimal.	Minimal.	*Minimal.*

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5. SELECTED PLAN

5.1 RATIONALE FOR PLAN SELECTION

While Alternative 2, the National Economic Development Plan, proposes the most efficient plan in terms of average annual net benefits and benefit to cost ratio, the Sponsors have selected Alternative 5, as the "Selected Plan" for implementation. Alternative 5 proposes an economically feasible plan that addresses the project purpose of alleviating the agricultural water shortage problems, with less potential adverse effects on properties surrounding the proposed reservoir. See Table L - Summary and Comparison of Candidate Plans, Economic Effects for a comparison of the net benefits and benefit to cost ratios for the alternatives.

5.2 PROPOSED WORKS OF IMPROVEMENT

This section of the Plan-EIS contains a detailed description of the works of improvement (structural measures) proposed by the Selected Plan, including financing, methods of installation, and operation and maintenance requirements. The Selected Plan does not propose project-funded installation of any land treatment measures and relies on the ongoing conservation program to provide complementary soil and water conservation measures.

The Selected Plan proposes structural measures to increase the capacity and reliability of the WIS, including the following:

- **Reservoir supply pipeline:** Install 19,200 feet of 30-inch diameter DIP from a new intake structure on the Upper Hamakua Ditch to the proposed Kauahi Reservoir.
- **Reservoir:** Construct one reservoir (Kauahi Reservoir) with storage of 131-million gallons and an embankment height of 26 feet and downslope of 3:1.
- **Irrigation water distribution system:** Install a total of 13,300 feet of pipeline, including: 3,800 feet of 30-inch diameter DIP from the proposed 30-inch diameter reservoir supply pipeline to the existing distribution system and 9,500 feet of 4-inch to 12-inch diameter PVC pipeline to service the planned 270-acre Lalamilo Ag. Park expansion area.
- **Stockwater distribution system:** Install 234,600 feet of 1-inch to 6-inch diameter HDPE pipeline, seven electric pumps, and two diesel pumps to provide stockwater to 265 ranchlots totaling 22,803 acres.

5.2.1 Reservoir Supply Pipeline

The existing UHD inlet structure for the Waimea Reservoir will be reconstructed and enlarged to accommodate both the proposed 30-inch diameter and the existing 24-inch diameter ductile iron reservoir supply pipeline (Figure N). The elevation of the inlet invert will be the same as the existing inlet for the Waimea Reservoir, 3032 feet mean sea level (MSL).

Construction of the inlet structure will require a Conservation District Use Application and approval to conduct construction activity in the Kohala Forest Reserve and may also require a Department of the Army Section 404 permit. Approximately 2,000 feet of the pipeline will be within the State-owned Kohala Forest Reserve. The pipeline will be buried within the existing corridor for the Waimea Reservoir pipeline to the Department of Hawaiian Home Lands-owned parcel (TMK 6-4-02:125) where the Waimea Reservoir is located. One major gulch crossing will be constructed along this section. Approximately 1,500 feet of pipeline on Hawaiian Homes Lands will pass through easements "C" and "B" on TMK 6-4-02:137 and the Waimea Reservoir site. Approximately 4,500 feet of pipeline will be installed within the existing 40-foot wide right-of-way (TMK 6-4-17:6) for the Upper Hamakua Ditch leading to Puu Pulehu reservoir. The pipeline will cross under Mamalahoa Highway through the existing tunnel for the New Hamakua Ditch.

On the south side of Mamalahoa Highway the pipeline will extend west to a small State of Hawaii-owned parcel (TMK 6-4-02:21). A valved tee will be installed at station 84+00, on the state parcel, for the connection to the existing irrigation water distribution system. The ground elevation at the tee is 2,874 feet MSL. The remaining 10,500 feet of pipeline to the Kauahi Reservoir will be installed within the right-of-way of the unnamed road which runs north-south and crosses Mana Road at the northwest corner of the parcel leased to Clarence Kauahi (TMK 6-4-04:12).

Approximately 8.8 acres of construction easements will be required. Nearly all easements will be existing road right-of-way or WIS-used easements. The estimated installation cost for the inlet and reservoir supply pipeline is $5,104,500.

Pipeline controls and layouts for both the supply and irrigation pipelines will be further evaluated during the design phase to provide an effective combination of ease of operation, low maintenance, low pumping requirement, efficient transfer of water from the Upper Hamakua Ditch to the reservoirs and between the reservoirs, and minimum risk to irrigation efficiency due to component failure or operation error.

5.2.2 Kauahi Reservoir

The proposed Kauahi Reservoir will be located on the southeastern side of the Mana Road/DHHL road intersection on the DHHL pastoral lot (TMK 6-4-04:12) leased to Clarence Kauahi (Figures O and P). The proposed reservoir will have a high-density polyethylene lining, be partially excavated and partially embanked, trapezoidal in plan, approximately 1,400 feet by 800 feet along its sides, and will have a capacity of 131-million gallons. The reservoir bottom will be at elevation 2,*935* feet and the top of the embankment will be at elevation 2,966 feet. The top of the water surface, at capacity, will be at elevation 2,960 feet. When full, water depth will be *25* feet.

On the west side of the reservoir, along the DHHL road, a compacted earth embankment approximately 800 feet long with a maximum height of 26 feet will be constructed. The embankment will have a top width of 20 feet and upstream and downstream slopes of 3:1. On the north side of the reservoir, a smaller embankment approximately 500 feet long with a maximum height of six feet will be constructed.

The soil at the site is Kikoni Series which is a sandy loam. A'a (lava) can be expected at an average depth of four feet. Approximately 550,000 cubic yards of excavation and 73,800 cubic yards of embankment fill will be required.

A emergency spillway leading north will be vegetated earth with a reinforced concrete crest control structure. A diversion channel will divert all runoff from upstream of the reservoir around the reservoir. The reservoir area will be fenced for safety and all earth surfaces vegetated to minimize erosion and for aesthetic purposes.

Approximately 29 acres of pastureland will be acquired for the reservoir site. Post-project expansion of the reservoir is possible at the site and may require acquisition of additional land. The installation cost of the Kauahi Reservoir is $6,067,300.

5.2.3 Irrigation Water Distribution System

The existing WIS will be expanded with 13,300 feet of pipeline to connect the Kauahi Reservoir to the system and to serve additional cropland acreage in the proposed Lalamilo Ag. Park. Approximately 3,800 feet of 30-inch diameter ductile iron pipeline will connect the Kauahi Reservoir supply pipeline to the existing 24-inch diameter ductile iron pipeline leading from Waimea Reservoir at Mamalahoa Highway. The new pipeline will be placed within the highway right-of-way and will parallel the existing 16-inch diameter pipeline from Puu Pulehu reservoir. The 30-inch diameter pipeline will allow use of gravity flow into the distribution system from Kauahi Reservoir without excessive pressure loss.

The WIS will serve 874 acres of irrigated cropland located in the existing Lalamilo Farmlots, Puukapu Farmlots and the DHHL Puukapu Farmlots. The WIS will be expanded with 9,500 feet of 4-inch to 12-inch diameter PVC pipeline to service the 270-acre planned Lalamilo Ag. Park expansion area.

When fully developed in irrigated cropland, the average annual gross irrigation demand for the future with project condition will be 3.8 MGD. This will serve an estimated area of 1,985 acres of cropland , of which 989 acres will be in irrigation.. The peak daily gross irrigation demand will be 6.4 MGD. The distribution system will be capable of providing 10 MGD from the Kauahi Reservoir. A booster pump will be installed at the submain to the DHHL Puukapu farmlots to provide adequate pressure to irrigators. The project improvements do not include water meters and assistance with on-farm irrigation systems.

The installation cost for the irrigation water distribution system is estimated to be $1,689,100. Installation will take place on existing road rights-of-way and dedicated easements when the Lalamilo Ag. Park is designed.

5.2.4 Stockwater Distribution System

A new, separate livestock water distribution system will be constructed to provide stockwater to approximately 19,040 animals on an estimated 239 DHHL and 26 private ranchlots (Figure Q). The total length of the stockwater pipeline is 234,600 feet. The stockwater pipeline will be buried high-density polyethylene (HDPE) pipe ranging in diameter from 1 inch to 6 inches. Seven electric and two diesel pumps will be required to provide water to higher elevations beyond the effective reach of gravity pressure. Storage

tanks will reduce pressure fluctuation and allow for repairs, electrical failure, and other shutdowns. Storage tank level and pipeline pressure sensors will automate pump operation. The details of the automated pumping system and exact pump and storage tank locations will be made during final design.

The distribution system is planned to provide stockwater to a boundary of each ranchlot in the service area. The average consumption is assumed to be 10 gallons per animal per day. The distribution system capacity is 30 gallons per animal per day. Meters and assistance with on-ranch systems will not be provided by the project.

The stockwater distribution system will be serviced by two reservoirs. The northern stockwater distribution system, servicing approximately 6,800 acres in the Puukapu, Waikoekoe, and Kamoku areas, will be supplied by the existing Waimea Reservoir. The southern stockwater distribution system, servicing 16,200 acres in Puukapu 1 and Nienie, will be supplied by the Kauahi Reservoir.

The total installation cost of the stockwater distribution system is $4,515,700, of which $4,145,900 is for DHHL ranchlots.

Nearly all of the stockwater distribution system will be installed on road rights of way and existing pipeline easements. Approximately 14,100 feet of pipeline will be installed across pastureland requiring acquisition of easements. The easements, necessary for construction and maintenance activity, will be 20-feet in width. All of the 6.5 acres of required pipeline right-of-way will be on DHHL ranchlots. An additional one-half acre of easement will be needed for several of the pump stations. Total required right-of-way is 7.0 acres

5.2.5 System Water Budget

A simplified reservoir water budget is presented below. The total capacity of the three reservoirs - Waimea Reservoir, Puu Pulehu, and the proposed Kauahi Reservoir - is 291 MG. Inflow into the reservoir system will be diversion from the Upper Hamakua Ditch and rainfall into the reservoirs. Outflow from the reservoir system will be irrigation water supply, livestock drinking water supply, and evaporation from the surface of the reservoir. No leakage from the reservoirs is assumed.

The ditchflow and irrigation demand below are estimated for a "dry" year or low rainfall condition which is assumed to be exceeded 80 percent of the time. It is near this frequency, 78 percent, that water shortages are estimated to begin to occur. While the reservoir water budget below does not indicate the reservoirs going empty, a low initial storage volume together with a couple of months of low ditchflow can exhaust the water supply stored in the reservoirs.

Overflow from the Upper Hamakua Ditch into Lalakea Stream is expected to occur even in the "dry" years when instantaneous flow rates exceed the transmission rates to the reservoirs and once the reservoirs are filled. Overflow will be less frequent and reduced in volume during "dry" years. The average annual overflow to Lalakea Stream has been estimated to be 863 MG per year.

The average daily and annual flow rates in the Upper Hamakua Ditch were calculated using stream flow records from USGS Station 16726000 located on the ditch above the Waimea Reservoir. While records from this station exist from 1974 to present, USGS has discovered inaccuracies in the data. Records from 1975 to 1983 have been recently revised by USGS. Records from 1984 to 1990 have been deemed unreliable and unusable. Records from 1991 to 1994 are incomplete. For the analysis for this project the nine years of revised record from 1974 to 1983 and the record for 1995 were used. Monthly flow volumes were used to develop an average distribution of ditchflow throughout the year. A annual flow volume vs. frequency analysis was conducted using the ten years of record.

Agricultural demand is based on the average gross annual irrigation requirement for the 989 acres of cropland located in the WIS service area and livestock drinking water requirement for 19,040 animal units. The irrigation requirement analysis was originally prepared for the Hamakua Area Agricultural Water Study (1981) and was updated for increased irrigation efficiency gained by using drip and trickle irrigation methods. The average gross annual irrigation requirement is estimated to be 1.4 MG/acre/year. The gross livestock drinking water demand is assumed to be 15 gallons/animal unit/day.

Table Q
INFLOW TO WIS RESERVOIRS
Waimea-Paauilo Watershed
(million gallons)

	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Annual
UHD	112	155	122	89	71	193	202	174	139	229	191	124	1801
Rainfall	5	7	11	9	9	11	10	7	4	6	6	4	89
Total	117	162	133	98	80	204	212	181	143	235	197	128	1890

Table R
OUTFLOW FROM WIS RESERVOIRS
Waimea-Paauilo Watershed
(million gallons)

	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Annual
Irrigation	122	82	52	51	81	102	123	143	172	163	141	153	1385
Livestock	9	9	9	9	9	9	9	9	9	9	9	9	108
Evaporation	5	4	4	4	4	4	4	5	5	4	5	5	53
Total	136	95	65	64	93	115	136	157	186	176	155	167	1545

Table S
MONTHLY WIS RESERVOIR WATER BUDGET
Waimea-Paauilo Watershed
(MG/Month)

	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
Initial	291	272	291	291	291	278	291	291	291	247	291	291
Inflow	291	272	291	291	291	204	212	181	143	235	197	128
Outflow	136	95	65	64	93	115	136	157	186	176	155	167
End	272	291	291	291	278	291	291	291	247	291	291	252

Table T
OVERFLOW FROM UHD TO LALAKEA STREAM
Waimea-Paauilo Watershed
(MG/Month)

Overflow	0	48	67	34	0	76	77	24	0	16	42	0	385

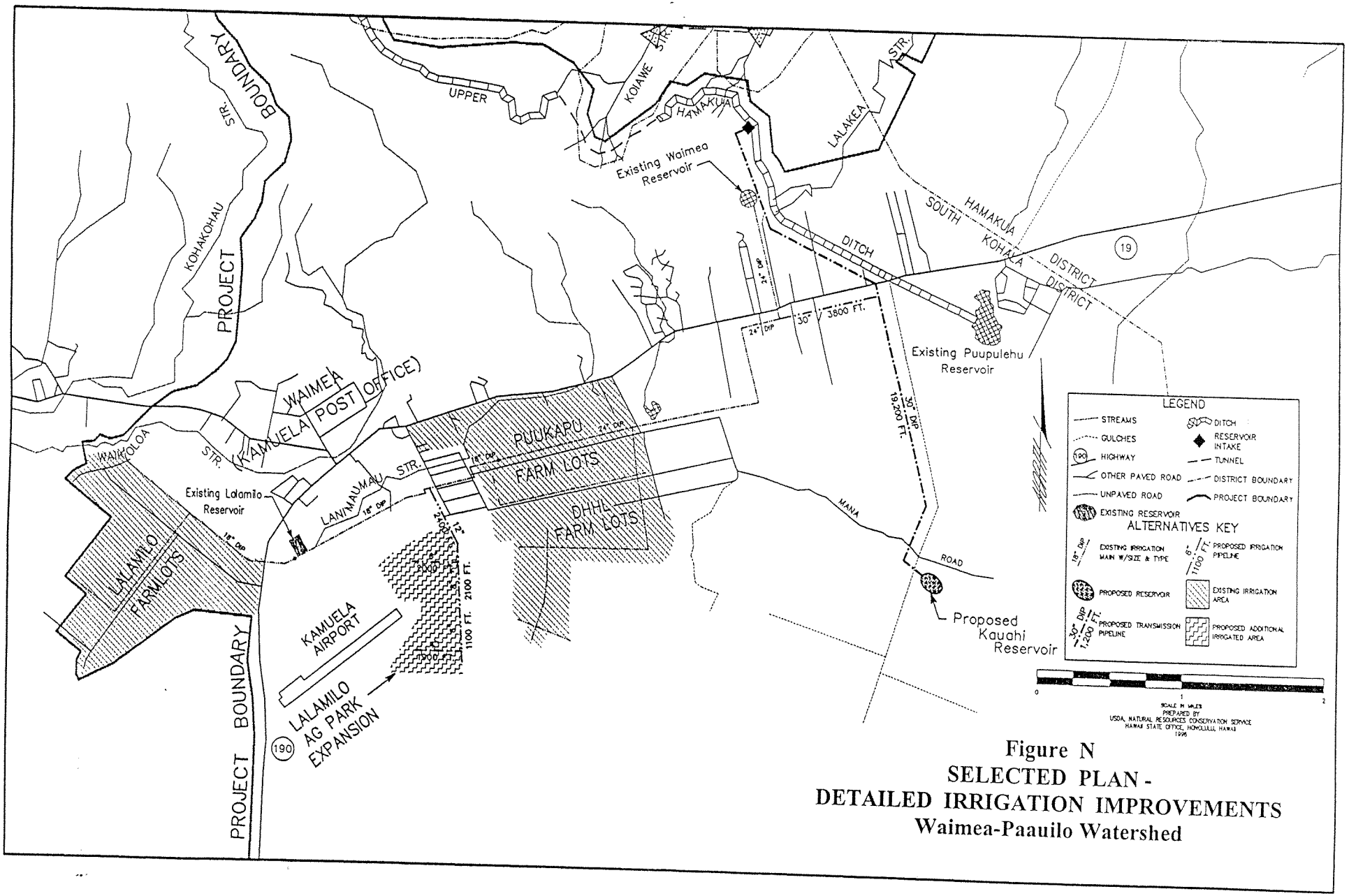


Figure N
SELECTED PLAN -
DETAILED IRRIGATION IMPROVEMENTS
Waimea-Paauilo Watershed

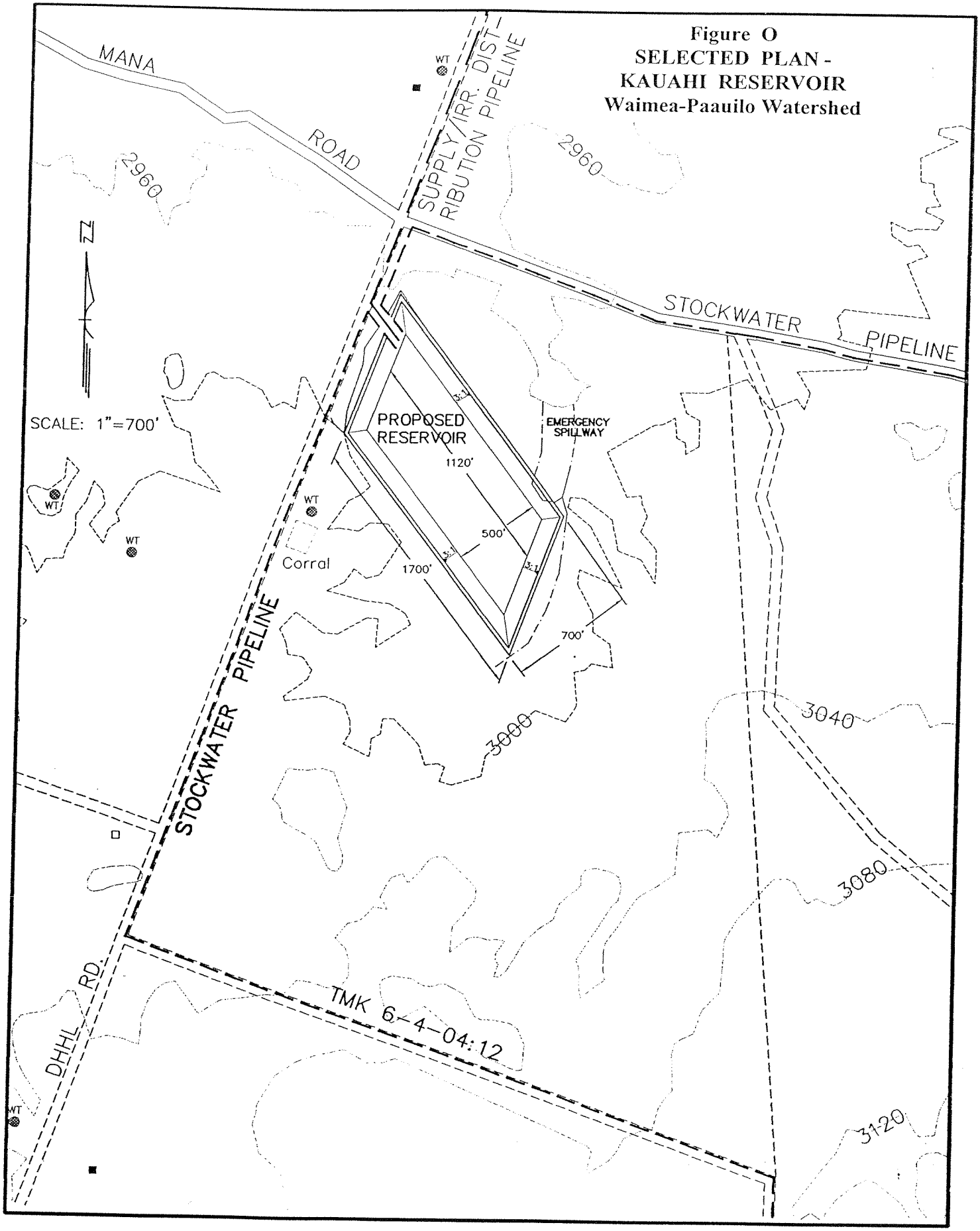
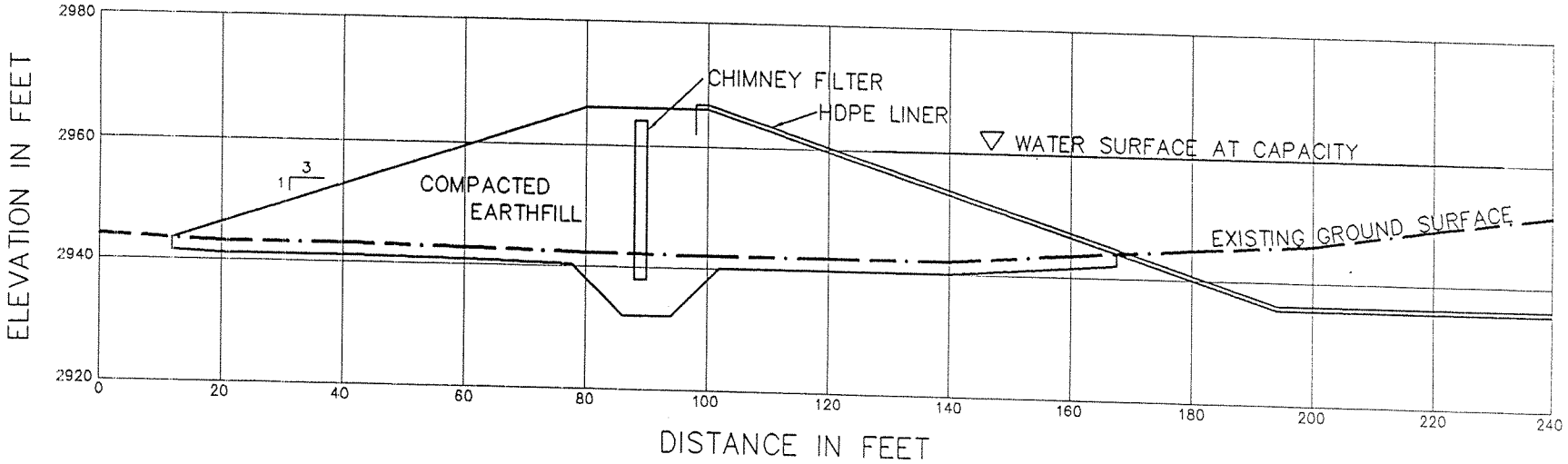


Figure O
SELECTED PLAN -
KAUAHI RESERVOIR
Waimea-Paauilo Watershed

Figure P
SELECTED PLAN -
KAUAHI RESERVOIR EMBANKMENT CROSS-SECTION
Waimea-Paauilo Watershed



EMBANKMENT CROSS-SECTION

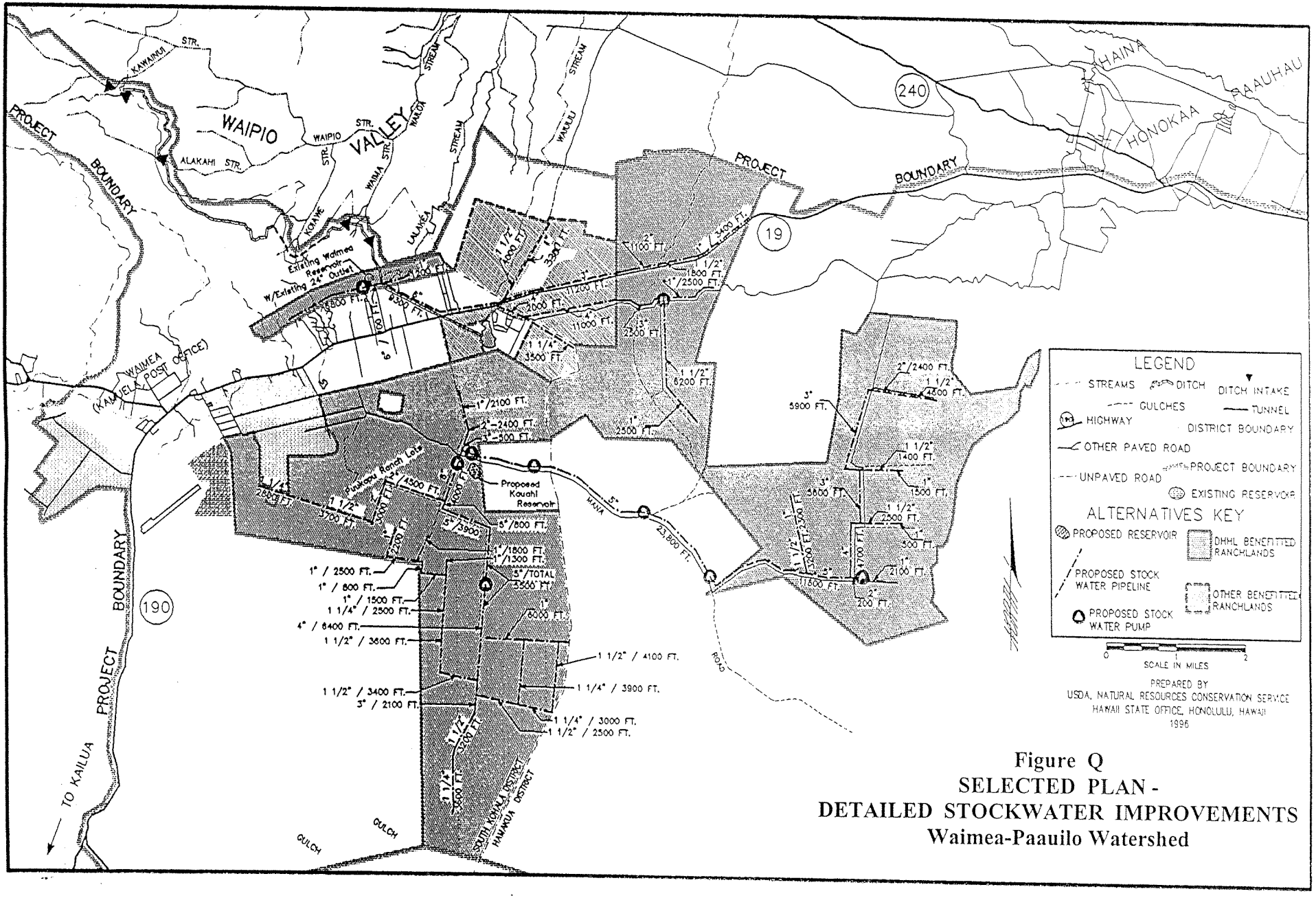


Figure Q
SELECTED PLAN -
DETAILED STOCKWATER IMPROVEMENTS
Waimea-Paauilo Watershed

5.3 COSTS

This section describes the cost elements of the watershed project displays, quantifies major project components, and displays project costs and benefits in tabular form.

Installation cost includes construction, engineering services, project administration, and land rights costs for each work of improvement. Table 1 -Estimated Installation Cost displays the installation cost of each improvement and the funding obligation of each agency by purpose (irrigation water versus stockwater supply). For the Selected Plan, all works of improvement are structural measures to be installed on non-federal land. Cost-sharing arrangements will be set forth in a Watershed Agreement. The estimated total installation cost for the Selected Plan is $17,376,600 in 1996 dollars.

Construction costs include the material, equipment, labor, and any other direct costs of installing or constructing each of the proposed improvements. Construction costs associated with providing irrigation water can be cost-shared up to 50 percent by PL 83-566 funds, with the remaining 50 percent to be borne by local sponsors. The economic analysis conducted by NRCS indicated that providing stockwater is not incrementally feasible, thus the construction costs associated with providing stockwater cannot be cost-shared by PL 83-566 funds and must be funded totally by local sponsors. (See Section 5.1 Rationale for Plan Selection.) The Department of Agriculture and the DHHL will be responsible for funding stockwater improvements for non-DHHL and DHHL ranchlots, respectively.

Engineering services costs are an estimate of the cost associated with survey, investigation and final design of the proposed structures; preparation of specifications and plans; preparation of operation and maintenance plans; and inspection during construction. Engineering services costs, for both irrigation water and stockwater supply, can be cost-shared up to 100 percent with PL 83-566 funds.

Project administration costs include costs of preparing invitations to bid, administrating contracts, providing government representatives, conducting acceptance inspections, relocation assistance, permit acquisitions, legal opinions, and other overhead costs. Project administration costs will be funded by each agency as they occur.

Land rights costs include acquisition of land through purchase, permanent and temporary land easements, and rights-of-way needed for the installation of the works of improvement. Associated surveys, legal costs, and modifications to existing road and utility infrastructure are also included as land rights costs. Land rights costs cannot be cost-shared by PL 83-566 funds and must be funded by local sponsors.

Table 2 - Estimated Cost Distribution displays the estimated construction, engineering services, project administration, and land rights costs for each work of improvement by funding and purpose.

A benefit to cost analysis conforming to the Economic and Environmental Principles and Guidelines for Water and Related Land Resources Implementation Studies (U.S. Resources Council, 1983) was required for this Plan-EIS by PL 83-566 policy. Costs and benefits were annualized to provide a basis for comparison. Table 4 - Estimated Average Annual Costs displays the average annual total installation costs, consisting of the amortized installation cost and the average annual operation, maintenance, and replacement costs by

project purpose. Total installation costs were amortized at 7.625 percent interest for the estimated project life of 50 years (factor .07823) as directed by NRCS policy. The interest rate of 7.625 percent is the discount rate for fiscal year 1996 which should be used by the NRCS in the formulation and evaluation of water and related land resource plans.

Table 6 - Comparison of Benefits and Costs displays the average annual benefits and costs by purpose (irrigation water versus stockwater supply). Providing an irrigation water supply is economically feasible, with economic benefits exceeding economic costs and a 1.3 : 1.0 benefit to cost ratio. Providing stockwater is not economically feasible, with economic benefits not exceeding economic costs and a 0.5 : 1.0 benefit to cost ratio. The Selected Plan in its entirety, is economically feasible, with total economic benefits exceeding total economic costs and a 1.0 to 1.0 benefit to cost ratio.

5.4 INSTALLATION AND FINANCING

The following section describes the planned sequence of installation, responsibilities for installation, contracting procedures, real property acquisition and relocations, financing, and conditions for providing assistance.

5.4.1 Planned Sequence of Installation

The installation period for the Selected Plan is estimated to be six years. Construction of each work of improvement will be preceded by one year during which surveys, design, land rights acquisition, and permit acquisition will take place. The sequence of installation proceeds from the Kauahi Reservoir to the reservoir supply pipeline, then, to the irrigation water distribution system.

The installation of the stockwater distribution system will take place throughout the six year installation period. As approximately one-third of the stockwater pipeline will be supplied from the existing Waimea Reservoir, those subsystems can be constructed and put into operation before the Kauahi Reservoir is operational.

Table T, Sequence of Installation and Schedule of Obligations displays an estimated timeline for installation of the works of improvement over a six year period. Approximate costs for the phases of installation by funding source are shown.

Table U
SEQUENCE OF INSTALLATION AND SCHEDULE OF OBLIGATIONS
Waimea-Paauilo Watershed
(Dollars)

Year	Cost Item	FUND SOURCE			
		Federal (PL 83-566)	DOA	DHHL	Total
1	Technical Assistance				
	Engineering Services				
	Reservoir supply pipeline	300,000	0	0	300,000
	Stockwater distribution system	100,000	0	0	100,000
	Project Administration				
	Reservoir supply pipeline	30,000	30,000	*2,500*	*62,500*
	Stockwater distribution system	6,000	0	50,000	56,000
	Land Rights				
	Kauahi Reservoir	0	*9,200*	*800*	10,000
	Stockwater distribution system	0	0	35,000	35,000
	Total Year 1	436,000	*39,200*	*88,300*	*563,500*
2	Technical Assistance				
	Engineering Services				
	Reservoir supply pipeline	311,300	0	0	311,300
	Kauahi Reservoir	500,000	0	0	500,000
	Stockwater distribution system	100,000	0	0	100,000
	Project Administration				
	Reservoir supply pipeline	173,800	*157,000*	*14,300*	*345,100*
	Kauahi Reservoir	75,000	70,000	7,000	152,000
	Stockwater distribution system	6,000	0	50,000	56,000
	Land Rights				
	Kauahi Reservoir	0	266,100	23,900	290,000
	Stockwater distribution system	0	0	35,000	35,000
	Construction				
	Reservoir supply pipeline	2,037,800	*1,946,100*	*183,400*	4,075,600
	Stockwater distribution system	0	0	800,000	800,000
	Total Year 2	3,203,900	*2,439,200*	*1,113,600*	*6,665,000*
3	Technical Assistance				
	Engineering Services				
	Kauahi Reservoir	193,300	0	0	193,300
	Irrigation water dist. system	100,000	0	0	100,000
	Stockwater distribution system	100,000	0	0	100,000
	Project Administration				
	Kauahi Reservoir	156,100	142,000	12,100	310,200
	Irrigation water dist. system	20,000	20,000	*4,100*	*44,100*
	Stockwater distribution system	6,000	0	50,000	56,000
	Land Rights				
	Irrigation water dist. system	0	*7,900*	*2,100*	10,000
	Construction				
	Kauahi Reservoir	2,206,900	2,206,900	208,000	4,621,800
	Stockwater distribution system	0	0	800,000	800,000
	Total Year 3	2,782,300	*2,376,800*	*1,076,300*	*6,235,400*

Table U
SEQUENCE OF INSTALLATION AND SCHEDULE OF OBLIGATIONS
Waimea-Paauilo Watershed
(Dollars)
(Continued)

Year	Cost Item	FUND SOURCE			
		Federal (PL 83-566)	DOA	DHHL	Total
4	Technical Assistance				
	Engineering Services				
	Stockwater distribution system	100,000	0	0	100,000
	Irrigation water dist. system	101,500	0	0	100,000
	Project Administration				
	Stockwater distribution system	6,000	0	50,000	56,000
	Irrigation water dist. system	47,200	*33,100*	*10,000*	90,300
	Construction				
	Stockwater distribution system	0	0	800,000	800,000
	Irrigation water dist. system	671,600	*530,600*	*141,000*	1,343,200
	Total Year 4	926,300	*563,700*	*1,001,000*	*2,491,000*
5	Technical Assistance				
	Engineering Services				
	Stockwater distribution system	100,000	0	0	100,000
	Project Administration				
	Stockwater distribution system	6,000	10,000	50,000	66,000
	Construction				
	Stockwater distribution system	0	0	800,000	800,000
	Total Year 5	106,000	10,000	850,000	966,000
6	Technical Assistance				
	Engineering Services				
	Stockwater distribution system	33,500	0	0	33,500
	Project Administration				
	Stockwater distribution system	5,600	16,600	43,500	65,700
	Construction				
	Stockwater distribution system	0	295,800	60,700	356,400
	Total Year 6	39,100	312,400	104,200	455,700
	Total Project	**7,493,600**	***5,741,300***	***4,233,400***	**17,376,600**

5.4.2 Responsibilities

The NRCS, Hawaii Department of Agriculture, Department of Hawaiian Home Lands, and the Mauna Kea Soil and Water Conservation District will be responsible for carrying out the following actions and functions in order to implement the Selected Plan. Each agency's responsibilities will be specified in the Watershed Agreement and in subsequently executed Project Agreements for each phase of installation.

The Natural Resources Conservation Service (NRCS) will be responsible for the following:

1. Acquiring funds for the installation cost items shown in the tables under "PL 83-566 Funds."
2. Ensuring compliance with federal environmental laws.
3. Designing all works of improvement.
4. Performing construction inspections as necessary.

The Department of Agriculture (DOA) will be responsible for the following:

1. Acquiring funds for the installation cost items shown in the tables under "Other Funds - DOA."
2. Acquiring the necessary permits and approvals the installation of the reservoir supply pipeline, Kauahi Reservoir, irrigation water distribution system, and the stockwater distribution system for non-DHHL ranchlots.
3. Ensuring compliance with state and county laws and policies.
4. Acquiring the land rights needed through purchase, easements, or approvals of use of existing rights-of-way and easements, to install the reservoir supply pipeline, Kauahi Reservoir, irrigation water distribution system, and the stockwater distribution system for non-DHHL ranchlots.
5. Performing land rights-related tasks such as modification or relocation of existing road and utility infrastructure affected by project installation.
6. Administering construction contracts through an agreement with the Department of Land and Natural Resources for the reservoir supply pipeline, Kauahi Reservoir, irrigation water distribution system, and the stockwater distribution system for non-DHHL ranchlots.
7. Performing construction inspections for the reservoir supply pipeline, Kauahi reservoir, irrigation water distribution system, and the stockwater distribution system for non-DHHL ranchlots.
8. Accepting and operating and maintaining the all the works of improvement, including the stockwater distribution system for DHHL ranchlots, as part of the WIS.
9. Funding operation, maintenance, and replacement (OM&R) work on the reservoir supply pipeline, Kauahi Reservoir, irrigation water distribution system, and the stockwater distribution system for non-DHHL ranchlots throughout the 50-year project life, as described in section 5.4.
10. Developing an operational policy for the improved/expanded Waimea Irrigation System.
11. Developing, maintaining, and implementing an Emergency Preparedness Plan for the Kauahi Reservoir (dam).
12. Changing WIS policy to allow the provision of stockwater to ranchers.

The Department of Hawaiian Homelands (DHHL) will be responsible for the following:

1. Acquiring funds for the reservoir stockwater storage and the stockwater distribution system shown in the tables under "Other Funds - DHHL."
2. Acquiring the necessary permits and approvals for the installation of the stockwater distribution system for DHHL ranchlots.
3. Acquiring the land rights needed through purchase, easements, or approvals of use of existing rights-of-way and easements, to install the stockwater distribution system for DHHL ranchlots.
4. Administering construction contracts for the stockwater distribution system for DHHL ranchlots.
5. Performing construction inspections for the stockwater distribution system for DHHL ranchlots.
6. Providing funds to the WIS/DOA to cover the OM&R costs of the stockwater distribution system for DHHL ranchlots.
7. Participating in the development of an operational policy for the improved/expanded WIS.

The Mauna Kea Soil and Water Conservation District will be responsible for the following:

1. Providing opportunities for the public to participate during installation by developing and distributing information/articles and conducting meetings to keep the public informed.
2. Participating in the development of an operational policy for the improved/expanded WIS.

The DOA and the DHHL will enter into an agreement, approved by both the State Board of Agriculture and the Hawaiian Homes Commission, on those issues that require interagency coordination during implementation and operation of the project improvements. The agreement will include WIS water rate structure and water allocation for DHHL customers and the priority for water use. The agreement will be completed before the completion of any Project Agreements.

The implementation of practices on farms and ranches to conserve and protect the natural resource base is needed to complement the expansion of agricultural water supply and to assure sustainable agricultural activity in the service area. The ongoing conservation program offered by the SWCD, NRCS, and Farm Service Agency (FSA) will provide technical and financial assistance to farmers and ranchers.

The DHHL will ensure that each agricultural lessee develops and implements a conservation plan as required by the lease agreement. Staff at the DHHL West Hawaii District Office should be familiar with the SWCD, NRCS, and FSA conservation programs to be able to direct lessees to appropriate assistance. In addition, the development of DHHL staff capability to provide conservation planning assistance on DHHL parcels could increase

the effectiveness of the natural resources conservation effort and provide for more unified and consistent application of soil and water conservation over all of the DHHL parcels.

The DOA will ensure that operators of state-owned agricultural parcels develop and implement conservation plans. The requirement for all users of the WIS to prepare and implement conservation plans should be considered by the Board of Agriculture.

The SWCD and NRCS will continue to provide conservation planning assistance to area ranchers and farmers. Efforts will be made to have farmers install water conserving irrigation systems and practices. Technical and economic analysis to promote implementation of water conservation practices will be developed to assist NRCS conservation planners. The SWCD and the public affairs function of NRCS will publicize, through various media, the need for natural resource conservation and protection and the availability of technical and financial assistance.

5.4.3 Permits and Compliance

Installation of the Selected Plan will be performed in full compliance with applicable laws and policies of the County of Hawaii, State of Hawaii, and the federal government. The following permits and approvals may be required for project installation.

County of Hawaii Requirements

GRADING, GRUBBING, EXCAVATING AND STOCKPILING PERMIT
Department of Public Works
25 Aupuni Street
Hilo, Hawaii 96720

BUILDING PERMIT
Department of Public Works
25 Aupuni Street
Hilo, Hawaii 96720

State of Hawaii Requirements

STATE LAND USE APPROVAL
Department of Land and Natural Resources
1151 Punchbowl Street
Honolulu, Hawaii 96809

CONSERVATION DISTRICT USE APPLICATION
Department of Land and Natural Resources
1151 Punchbowl Street
Honolulu, Hawaii 96809

DAM CONSTRUCTION PERMIT
Department of Land and Natural Resources
1151 Punchbowl Street
Honolulu, Hawaii 96809

STATE HIGHWAYS PERMIT
Department of Transportation
869 Punchbowl Street
Honolulu, Hawaii 96813

Federal Requirements

DEPARTMENT OF THE ARMY (404) PERMIT
U.S. Army Corps of Engineers
Pacific Ocean Division
Building 230
Fort Shafter, Hawaii 96858

Compliance With Federal Environmental Laws

Installation of the Selected Plan will be performed in full compliance with applicable federal environmental laws as designated by the Water Resource Council and as shown in the following table.

Table V
COMPLIANCE WITH DESIGNATED FEDERAL ENVIRONMENTAL LAWS
Waimea-Paauilo Watershed

	Federal Law	Applicability
1.	Archeological and Historic Preservation Act, 16 U.S.C. 469, et seq.	Applicable
2.	Clean Air Act, as amended, 42 U.S.C. 1857h-7, et seq.	Applicable
3.	Clean Water Act (Federal Water Pollution Control Act), 33 U.S.C. 1251, et seq.	Applicable
4.	Coastal Zone Management Act, 16 U.S.C. 1451, et seq.	Applicable
5.	Endangered Species Act, 16 U.S.C. 1531, et seq.	Applicable
6.	Estuary Protection Act, 16 U.S.C. 1221, et seq.	Not Applicable
7.	Federal Water Project Recreation Act, 16 U.S.C. 4601-1(12), et seq.	Not Applicable
8.	Fish and Wildlife Coordination Act, 16 U.S.C. 661, et seq.	Applicable
9.	Land and Water Conservation Fund Act, 16 U.S.C. 4601 - 4601-11, et seq.	Not Applicable
10.	Marine Protection, Research and Sanctuary Act, 33 U.S.C. 1401, et seq.	Not Applicable
11.	National Environmental Policy Act, 42 U.S.C. 4321, et seq.	Applicable
12.	National Historic Preservation Act, 16 U.S.C. 470a, et seq.	Applicable
13.	Rivers and Harbors Act, 33 U.S.C. 403, et seq.	Not Applicable
14.	Watershed Protection and Flood Prevention Act, 16 U.S.C. 1001, et seq.	Applicable
15.	National Wild and Scenic Rivers System Act, 16 U.S.C. 1271, et seq.	Not Applicable
16.	Farmland Protection Policy Act, 7 U.S.C. 4201, et seq.	Applicable

5.4.4 Contracting

Formal contracts for the construction of the proposed works of improvement will be let by competitive bid. The Hawaii Department of Agriculture will be responsible for administering the construction contracts for the reservoir supply pipeline, Kauahi reservoir, irrigation water distribution system, and the stockwater distribution system for non-DHHL ranchlots. The Department of Land and Natural Resources will provide contract administration services to the DOA through an interdepartmental agreement. The DHHL will be responsible for administering construction contracts for the stockwater distribution system for DHHL ranchlots.

The DOA will also be responsible for coordinating the administration of all contracts with the NRCS. .

The construction contracts involving PL 83-566 funds will be prepared in conformance with OMB Circular A-102 and the National Contracts and Grants and Cooperative Agreements Manual.

5.4.5 Real Property Acquisition and Relocations

The DOA is responsible for acquiring the land rights needed through purchase, easements, or approvals of use of existing rights-of-way and easements, to install the reservoir supply pipeline, Kauahi Reservoir, irrigation water distribution system, and the stockwater distribution system for non-DHHL ranchlots. The DHHL is responsible for acquiring the necessary permits and approvals for the installation of the stockwater distribution system for DHHL ranchlots.

Acquisition of all lands, easements, or rights-of-way shall be made in compliance with the Uniform Relocation Assistance and Real Property Acquisition policies Act of 1970, Public Law 91-646, and appropriate USDA and federal regulations. These provide that in cases where land rights are not obtained by donation or land exchange, every reasonable effort will be made to acquire real property rights by negotiation. Prior to the initiation of negotiations, an appraisal of the fair market value of the real property interest will be made by a qualified land appraiser. No relocations of houses or businesses are known to be required by this project.

Both buried and above-ground utility lines exist in the installation area. Most notable are water, electrical, and telephone lines. Care will be taken during construction to prevent danger to workers and avoid excessive disruption of service. The Sponsors and the installing contractors will be responsible for obtaining the necessary cooperation and assistance from the appropriate utility companies. The Sponsors will also be responsible for costs associated with modification or relocation of road and utility infrastructure.

5.4.6 Cultural Resources

Any changes to design or location of project features will be coordinated with the State Historical Preservation Officer to obtain concurrence.

In the event that any unanticipated sites or remains such as artifacts, shell, bone or charcoal deposits; human burials; rock or coral alignment, pavings, or walls are encountered during construction, work will be stopped and the State Historic Preservation Officer and the

U.S. Secretary of the Interior will be contacted in accordance with the procedures outlined in the NRCS General Manual, Title 420, Part 401, October 1983, as amended. NRCS will take actions to protect or recover, or both, any significant cultural resources discovered during construction.

5.4.7 Financing

Federal assistance for installing the works of improvement as described in this plan will be provided under the authority of the Watershed Protection and Flood Prevention Act, PL83-566, 83rd Congress, 68 Stat. 666, as amended.

DOA and DHHL are legally constituted agencies of state government and will finance their part of the project costs with funds appropriated by state legislature.

5.4.8 Conditions for Providing Assistance

Financial or other assistance to be furnished by NRCS for installing the Selected Plan is contingent on the fulfillment of the Sponsors' obligations as described in the Watershed Agreement and in Section 5.3.2 of this Plan-EIS and is contingent on congressional approval of funds for the PL 83-566 program.

Neither the Watershed Agreement nor this Plan-EIS constitute documents for the obligation of PL 83-566 or other funds.

The following conditions shall be met before the issuance of invitations to bid:

1. The Project Agreement will developed and signed.
2. The necessary permits and approvals will be acquired and compliance with federal, state, and county laws and regulations will be obtained. Reasonable evidence of each such shall be provided to the mutual satisfaction of all parties.
3. The needed land rights (purchase, easements, and rights-of-way) will be acquired.
4. Funding in the cost-sharing proportions stated in the Watershed Agreement must be provided by the state and federal governments.
5. The Operation, Maintenance, and Replacement Agreement will be developed and signed.
6. An Emergency Preparedness Plan will be developed for the Kauahi Reservoir (dam).

5.5 OPERATION, MAINTENANCE, AND REPLACEMENT

Operation, maintenance, and replacement (OM&R) will be provided to the works of improvement to ensure that the projected beneficial effects of project installation will continue to occur throughout the 50-year project life. No federal PL 83-566 funds will be used for OM&R.

The DOA, *pursuant to authority under Chapters 167 and 168, Hawaii Revised Statutes*, will be responsible for 1) funding operation, maintenance, and replacement (OM&R) activities on the reservoir supply pipeline, Kauahi Reservoir, irrigation water

distribution system, and the stockwater distribution system for non-DHHL ranchlots; 2) developing an operational policy for the improved/expanded WIS; and 3) developing, maintaining, and implementing an Emergency Preparedness Plan for the Kauahi Reservoir (dam).

The DHHL will be responsible for 1) providing funds to the WIS/DOA to cover the OM&R costs of the stockwater distribution system for DHHL ranchlots and 2) participating in the development of an operational policy for the improved/expanded WIS.

The DOA, with assistance from the DHHL, will be responsible to ensure that the agricultural water supply is used for the highest value use. Irrigation of commercial truck and flower crops and livestock drinking water have been identified as high value use. Pasture irrigation is not considered to be highest value use and should not be allowed except during periods of excess water supply.

An OM&R Agreement outlining DOA and DHHL responsibilities will be prepared and entered into before the issuance of invitations to bid on any portion of construction.. The OM&R Agreement will include specific provisions for retention and disposal of property acquired or improved with PL 83-566 financial assistance. The Agreement will be based on the NRCS National Operation and Maintenance Manual and will include an operation and maintenance plan for each structural measure.

All works of improvement will be inspected annually and after unusually severe events or conditions to determine the need for maintenance and/or repair. The inspection party should consist of representatives from each of the Sponsor organizations. An NRCS representative will participate in the annual inspection during the first five years of project operation. The DOA will prepare an annual OM&R report describing the inspection and operation for the year and submit a copy to NRCS.

Following is a description of the essential OM&R responsibilities of the DOA:

1. Operate the improved/expanded WIS in a responsible manner to provide a consistent water supply to farmers and ranchers. Control water levels in the system's reservoirs to optimize storage capability.
2. Inspect pipelines for leaks, damage, and unauthorized connections. Check appurtenant devices for proper operation.
3. Inspect and clear the Upper Hamakua Ditch intakes.
4. Inspect and assure proper operation of system pumps and storage tanks.
5. Maintain access roads to ensure timely correction of pipeline problems.
6. Collect and analyze water supply and customer water use to adjust operating policy, identify wasteful water use, and assure efficient delivery with minimal system loss.
7. Disseminate safety information regarding health hazards of cross-connections to the domestic water system and household use of untreated agricultural water.
8. Assess customers a service charge to recover the cost of OM&R.

OM&R costs include increased WIS staff for administration and operations functions, electrical and diesel power costs for distribution system pumping, maintenance and repair of structures, and replacement of components.

The estimated yearly OM&R costs for the various structural elements are shown in the table below. The values shown below are then converted to average annual values and aggregated into the various evaluation units, the results of which are shown in Table 4 - Annualized Adverse NED Effects.

Table W
ANNUAL OM&R COSTS
Waimea-Paulo Watershed

OM&R Item	Average Annual Cost
	($)
Irrigation water supply	
System operation and administration	20,300
Reservoir supply pipeline	37,100
Kauahi Reservoir	21,000
Irrigation water distribution system	23,100
Total irrigation water supply	101,500
Stockwater supply	
System operation and administration	20,200
Stockwater distribution system	
DHHL ranchlots	71,600
Non-DHHL ranchlots	2,800
Total stockwater supply	94,600
Grand total	~~169,000~~ 196,100

5.6 TABLES

The tables on the following six pages are to assist the NRCS and Sponsors to evaluate the economic efficiency of the project and allocation of funding. These tables, and their numbering are in conformance with the NRCS National Watershed Manual.

Table 1
ESTIMATED INSTALLATION COST
Waimea-Paauilo Watershed

Installation Cost Item	Units	Number (Nonfederal Land)	Estimated Installation Cost (Dollars[1/])				
			Federal (PL 83-566) Funds	Other Funds			Grand Total
				State Department of Agriculture	Department of Hawaiian Home Lands	Total Other Funds	
STRUCTURAL MEASURES			($)	($)	($)	($)	($)
Cropland irrigation water supply							
Reservoir supply pipeline	feet	19,200	*2,761,200*	*2,142,300*	0	*2,142,300*	*4,903,500*
Kauahi Reservoir [2/]	MG	131	**3,131,300**	2,685,000	0	**2,685,000**	**5,816,300**
Irrigation water dist. system	feet	13,300	**940,300**	*591,600*	*157,200*	**748,800**	**1,689,100**
Total irrigation water supply	N/A	N/A	***6,832,800***	*5,418,900*	*157,200*	***5,576,100***	***12,408,900***
Livestock drinking water supply							
Reservoir Supply Pipeline [2/]			***0***	*0*	*201,000*	***201,000***	***201,000***
Kauahi Reservoir [2/]			**0**	0	251,000	**251,000**	**251,000**
Stockwater distribution system							
DHHL ranchlots	feet	213,400	**521,700**	0	3,624,200	**3,324,200**	**4,145,900**
Non-DHHL ranchlots	feet	21,200	**47,400**	322,400	0	**322,400**	**369,800**
Total stockwater dist. system	feet	234,600	**569,100**	322,400	3,624,200	**3,946,600**	**4,515,700**
Total livestock water supply	N/A	N/A	**569,100**	322,400	*4,076,200*	***4,398,600***	***4,967,700***
GRAND TOTAL	N/A	N/A	***7,401,900***	*5,741,300*	*4,233,400*	***9,974,700***	***17,376,600***

[1/] Price base 1996.

Table prepared: August 1997

[2/] The *Reservoir Supply Pipeline* and Kauahi Reservoir prorated as follows: irrigation water approximately 96% and stockwater approximately 4%, based on total water requirements.

Table 2
ESTIMATED COST DISTRIBUTION
Waimea-Paauilo Watershed

Installation Cost Item	Installation Costs - Federal (PL 83-566) Funds [1/]				Installation Costs - Other Funds [1/]					Grand Total
	Construction	Engineering	Project Admin.	Total	Construction	Project Admin.	Land Rights	Total	Responsible Party	
	($)	($)	($)	($)	($)	($)	($)	($)	($)	($)
STRUCTURAL MEASURES										
Cropland irrigation water supply										
Reservoir supply pipeline	*1,946,100*	611,300	203,800	***2,761,200***	*1,946,100*	*187,000*	*9,200*	***2,142,300***	DOA	*4,903,500*
Kauahi Reservoir [2/]	2,206,900	693,300	231,100	**3,131,300**	2,206,900	212,000	266,100	**2,685,000**	DOA	**5,816,300**
Irrigation water distribution system	671,600	201,500	67,200	**940,300**	*530,600*	*53,100*	*7,900*	***591,600***	DOA	**1,531,900**
					141,000	*14,100*	*2,100*	***157,200***	*DHHL*	*included above*
Total irrigation water supply	*4,824,600*	1,506,100	502,100	***6,832,800***	*4,824,600*	*466,200*	*285,300*	***5,556,100***	N/A	***12,408,900***
Livestock drinking water supply										
Reservoir Supply Pipeline [2/]	*0*	*0*	*0*	***0***	*183,400*	*16,800*	*800*	***201,000***	*DHHL*	*201,000*
Kauahi Reservoir [2/]	0	0	0	**0**	208,000	19,100	23,900	**251,000**	DHHL	**251,000**
Stockwater distribution system										
DHHL ranchlots	0	489,100	32,600	**521,700**	3,260,700	293,500	70,000	**3,624,200**	DHHL	**4,145,900**
Non-DHHL ranchlots	0	44,400	3,000	**47,400**	295,800	26,600	0	**322,400**	DOA	**369,800**
Total stockwater distribution system	0	533,500	35,600	**569,100**	3,556,500	310,100	70,000	**3,946,600**	N/A	**4,515,700**
Total livestock water supply	0	533,500	35,600	**569,100**	*3,947,900*	*356,000*	*94,700*	***4,398,600***	N/A	***4,967,700***
GRAND TOTAL	4,824,600	2,039,600	537,700	**7,401,900**	8,772,500	822,200	380,000	**9,974,700**	N/A	**17,376,600**

[1/] Price base 1996.

Table prepared: August 1997

[2/] The *Reservoir Supply Pipeline* and Kauahi Reservoir prorated as follows: irrigation water approximately 96% and stockwater approximately 4%, based on total water requirements.

Table 3.A
STRUCTURAL DATA - PIPELINES
Waimea-Paauilo Watershed
(Page 1 of 2)

Item	Capacity	Quantity
RESERVOIR SUPPLY PIPELINE		
Pipe, ductile iron, 30-inch diameter	15 MGD	19,200 feet
IRRIGATION WATER DISTRIBUTION SYSTEM		
KAUAHI RESERVOIR CONNECTION		
Pipe, ductile iron, 30-inch diameter	15 MGD	3,800 feet
LALAMILO AG. PARK		
Pipe, PVC, 12-inch diameter	2.4 MGD	2,400 feet
Pipe, PVC, 8-inch diameter	1.1 MGD	2,100 feet
Pipe, PVC, 6-inch diameter	0.66 MGD	3,100 feet
Pipe, PVC, 4-inch diameter	0.30 MGD	1,900 feet
Pump Station, 25 hp, electric		1 each
STOCKWATER DISTRIBUTION SYSTEM		
DHHL PUUKAPU 1 RANCHLOTS		
Pipe, HDPE, 6-inch diameter	0.52 MGD	4,000 feet
Pipe, HDPE, 5-inch diameter	0.36 MGD	10,200 feet
Pipe, HDPE, 4-inch diameter	0.24 MGD	6,400 feet
Pipe, HDPE, 3-inch diameter	0.14 MGD	2.600 feet
Pipe, HDPE, 2-inch diameter	0.07 MGD	11,900 feet
Pipe, HDPE, 1 1/2-inch diameter	0.04 MGD	16,900 feet
Pipe, HDPE, 1 1/4-inch diameter	0.03 MGD	19,400 feet
Pipe, HDPE, 1-inch diameter	0.02 MGD	18,200 feet
Pump Station, 20-hp, electric		1 each
Pump Station, 10-hp, diesel		1 each
DHHL PUUKAPU 2 RANCHLOTS		
Pipe, HDPE, 6-inch diameter	0.52 MGD	700 feet
Pipe, HDPE, 1-inch diameter	0.02 MGD	8,000 feet
Pump Station, 0.5-hp, electric		1 each

Table 3.A
STRUCTURAL DATA - PIPELINES
Waimea-Paauilo Watershed
(Page 2 of 2)

Item	Capacity	Quantity
DHHL NIENIE RANCHLOTS		
Pipe, HDPE, 5-inch diameter	0.36	35,600 feet
Pipe, HDPE, 4-inch diameter	0.24	4,700 feet
Pipe, HDPE, 3-inch diameter	0.14	11,500 feet
Pipe, HDPE, 2-inch diameter	0.07	2,400 feet
Pipe, HDPE, 1 1/2-inch diameter	0.04	9,900 feet
Pipe, HDPE, 1-inch diameter	0.02	6,400 feet
Pump Station, 15-hp, electric		4 each
Pump Station, 5-hp, diesel		1 each
DHHL KAMOKU RANCHLOTS		
Pipe, HDPE, 6-inch diameter	0.52 MGD	6,200 feet
Pipe, HDPE, 4-inch diameter	0.24 MGD	7,400 feet
Pipe, HDPE, 3-inch diameter	0.14 MGD	10,000 feet
Pipe, HDPE, 2-inch diameter	0.07 MGD	1,100 feet
Pipe, HDPE, 1 1/2-inch diameter	0.04 MGD	8,000 feet
Pipe, HDPE, 1 1/4-inch diameter	0.03 MGD	1,000 feet
Pipe, HDPE, 1-inch diameter	0.02 MGD	10,900 feet
Pump Station, 5-hp, electric		1 each
OTHER RANCHLOTS (PRIVATE)		
Pipe, HDPE, 6-inch diameter	0.52 MGD	3,100 feet
Pipe, HDPE, 4-inch diameter	0.24 MGD	3,600 feet
Pipe, HDPE, 3-inch diameter	0.14 MGD	3,700 feet
Pipe, HDPE, 1 1/2-inch diameter	0.04 MGD	4,000 feet
Pipe, HDPE, 1 1/4-inch diameter	0.03 MGD	3,500 feet
Pipe, HDPE, 1-inch diameter	0.02 MGD	3,300 feet

Table prepared: August 1997

Table 3.B
STRUCTURAL DATA - KAUAHI DAM AND RESERVOIR
Waimea-Paauilo Watershed

Item	Unit	Quantity
Class of structure	N/A	B
Seismic zone	N/A	3
Uncontrolled drainage area	sq. mile	0.03
Controlled drainage area	sq. mile	0
Total drainage area	sq. mile	0.03
Maximum height of dam	feet	26.0
Volume of fill	cubic yard	71,000
Elevation at top of dam	ft. MSL	2,966.0
Elevation at top of emergency spillway	ft. MSL	2,960.0
Emergency spillway type	N/A	vegetated
Emergency spillway bottom width	feet	20.0
Emergency spillway exit slope	%	5.5
Total capacity (crest of spillway)	acre feet	400.6
Sediment submerged	acre feet	0
Beneficial use pool (irrigation & stockwater)	acre feet	400.6
Surface area	N/A	N/A
Sediment pool	acres	0
Beneficial use pool (irrigation & stockwater)	acres	19.2
Frequency operation-emergency spillway	% chance	<1.0
Emergency spillway hydrograph	N/A	N/A
Rainfall volume	inches	15.0
Runoff volume	inches	15.0
Storm duration	hours	24
Maximum reservoir water surface elevation	ft. MSL	2,960.6
Freeboard hydrograph	N/A	N/A
Rainfall volume	inches	32.0
Runoff volume	inches	32.0
Storm duration	hours	24
Maximum reservoir water surface elevation	ft. MSL	2,961.1

Table prepared: August 1997

Table 4
ESTIMATED AVERAGE ANNUAL COSTS
Waimea-Paauilo Watershed

Evaluation Unit	Project Outlays [1/]		
	Average Annual Installation Costs [2/]	Average Annual Operation, Maintenance & Replacement Costs	Total Average Annual Costs
	($)	($)	($)
Crop irrigation water supply	970,800	101,500	1,072,300
Livestock drinking water supply	388,600	94,600	483,200
TOTAL	1,359,400	196,100	1,555,500

[1/] Price base 1996. Table prepared: August 1997
[2/] Total installation costs amortized at 7.625% interest for 50 years (.07823).

Table 6
COMPARISON OF BENEFITS AND COSTS
Waimea-Paauilo Watershed

Evaluation Unit	Agriculture-related Average Annual Benefits [1/]			Total Average Annual Costs [6/]	Benefit: Cost Ratio
	Damage Reduction	Intensification	Total Average Annual Benefits		
	($)	($)	($)	($)	
Crop irrigation water supply	864,400 [2/]	517,600 [4/]	1,382,000	1,072,300	1.3 : 1.0
Livestock drinking water supply	41,500 [3/]	207,700 [5/]	249,200	483,200	0.5 : 1.0
TOTAL	905,900	725,300	1,631,200	1,555,500	1.0 : 1.0

[1/] Price base 1996. Table prepared: August 1997
[2/] Benefits are the reduction in crop losses due to water shortages and the reduction in water pumping costs. See page 37, Alternative 5 Economic Effects.
[3/] Benefits are the reduction in livestock losses due to water shortages.
[4/] Benefits are the reduction in crop limited expansion opportunities.
[5/] Benefits are the reduction in livestock limited expansion opportunities.
[6/] Figure from Table 4, Estimated Average Annual Costs.

6. EFFECTS OF THE SELECTED PLAN

6.1 GENERAL

This section describes the effects of the Selected Plan on the identified problems and opportunities, natural resources, and human health, safety, and welfare.

Under each effect category a "Setting" is included to provide the background information necessary to understand what is presented under "Effects." Under "Effects," beneficial or adverse effects are described in terms of significance and/or whether the effects are temporary/short-term or permanent/long-term. The "Mitigation" section describes measures that will be included in the Selected Plan to reduce or eliminate any negative effects caused by the Selected Plan. The effects of other alternatives are also discussed when important for comparison sake.

This section also includes information under the following separate headings, as required by federal and/or state law: 1) Relationship Between Local Short-term Uses and Enhancement of Long-term Productivity; 2) Unresolved Issues; and 3) Relationship to Other Plans, Policies, and Controls.

6.2 ECONOMIC EFFECTS

This section includes a description and estimation of the effects of the Selected Plan on the identified problems and opportunities. The reduction in agricultural losses are beneficial economic effects and installation costs are adverse economic effects. Potential or indirect economic effects are included in section 6.3 Environmental Effects.

Beneficial economic effects or benefits of the Selected Plan were measured as the reduction in net income losses for the affected farmers and ranchers due to the installation of the Selected Plan. Income losses under "Future With Project Conditions," were measured against income losses under "Future Without Project Conditions," with the reduction in losses considered benefits. Total economic benefits for the Selected Plan have been estimated at $1,631,200 on an average annual basis. See the Table O for a summary of Economic Benefits.

6.2.1 Reduction in Crop Losses Due to Water Shortages

Setting

Waimea Irrigation System water restrictions result in reductions in crop quality and yield, total crop losses, reductions in new plantings, and disruptions in marketing patterns. Agricultural losses measured as net income losses for the affected farmers have been estimated at $2,616,900 under FW/O Project Conditions.

Effects

The Selected Plan proposes the installation of the 131-million-gallon Kauahi Reservoir, which will increase the total storage capacity of the WIS from 161 to 292 -million-gallons. System reliability will increase from 68 percent under Future Without Project Conditions to 78 percent with the Selected Plan. Reliability is an indicator of the annual frequency of providing adequate water supply to users. The additional storage capacity of the WIS will reduce water restrictions and subsequent crop losses by an estimated $817,800 on an average annual basis.

An estimated 159 existing farmers will have a more reliable irrigation water supply, including 107 native Hawaiians.

Mitigation

None required.

6.2.2 Reduction in Crop Limited Expansion Opportunities

Setting

The inadequate storage capacity of the WIS prevents the expansion of the irrigation water distribution system and crop production in the DOA-proposed 270-acre Lalamilo Agricultural. Park.

Effects

The installation of the Kauahi Reservoir and expansion of the irrigation water distribution system will allow crop production in the Lalamilo Agricultural Park. An estimated $517,600 in net income could be generated in the Park with the installation of the Selected Plan.

As currently planned, the 270-acre Agricultural Park will be divided into eight lots. Thus, eight potential new farmers will benefited from a source of irrigation water.

Mitigation

None required.

6.2.3 Reduction in Livestock Losses Due to Water Shortages

Setting

Ranchers in the potential service area experience income losses due to the higher cost of using treated domestic water for stockwater. Most of the DHHL and private ranchers must rely on the County DWS domestic water system for livestock drinking water (stockwater) because a source of agricultural water is not available to them. Income losses for the affected ranchers have been estimated at $53,200 on an average annual basis under FW/O Project Conditions.

Effects

The installation of the Kauahi Reservoir and a stockwater distribution system will allow ranchers to use less expensive agricultural water from the WIS instead of domestic water. Economic benefits are attributable to a reduction in water costs and have been estimated at $41,500 on an average annual basis.

The amount of domestic water used for agricultural purposes will be decreased by an estimated 40 million gallons annually. This released domestic water can be used to alleviate the domestic water shortage problems in the Waimea area.

An estimated 265 existing ranchers, including 239 native Hawaiians, will have an agricultural water supply for stockwater.

Mitigation

None required.

6.2.4 Reduction in Livestock Limited Expansion Opportunities

Setting

Livestock production is limited by the inadequate quantity and distribution of stockwater making it difficult for ranchers to efficiently manage their operations. An estimated additional 8,190 animal units could be raised if stockwater were available and intensive grazing methods were employed. See Table X. The net income that could be generated with the additional animal units have been estimated at $266,300 under Future Without Project Conditions.

Effects

The installation of the Kauahi Reservoir and a stockwater distribution system will not improve the range or pasture, but adequate and properly located water will make it possible to apply good grazing management, one of several "facilitating" practices that enable good grazing management to be applied. Carrying capacity in the grazing land service area can be increased by an estimated 8,190 animal units. The net income that could be generated from the animal units are considered benefits and been estimated at as $207,700 on an average annual basis. (Table W)

Mitigation

None required.

6.2.5 Reduction in Water Pumping Costs

Setting

Water must be pumped from the WIS Puu Pulehu Reservoir to the Waimea Reservoir when supplies in the Waimea reservoir are low. Water pumping costs have been estimated at $150,000 under Future Without Project Conditions.

Effects

With the installation of the Kauahi Reservoir, less water will have to be pumped from the Puu Pulehu Reservoir to the Waimea Reservoir. Water pumping costs will be reduced by an estimated $46,600 on an average annual basis under with project conditions.

Mitigation

None required.

6.2.6 Adverse Economic Effects / Costs

Setting

Costs associated with the installation and operation, maintenance and replacement of the Selected Plan are considered adverse economic effects.

Table X
ECONOMIC BENEFITS
Waimea-Paauilo Watershed

Problem or Opportunity	Estimated Average Annual Losses						Average Annual Benefits		
	Future Without Project Conditions [1/]			Future With Project Conditions (Alternative 5)					
	Crop	Livestock	Total	Crop	Livestock	Total	Crop	Livestock	Total
	($)	($)	($)	($)	($)	($)	($)	($)	($)
Losses due to water shortages	2,616,900	53,200	2,670,100	1,799,100	11,700	1,810,800	817,800	41,500	859,300
Limited expansion opportunities	663,600	266,300	929,900	146,000	58,600	204,600	517,600	207,700	725,300
Water pumping costs	150,000	0	150,000	103,400	0	103,400	46,600	0	46,600
Total	3,430,500	319,500	3,750,000	2,048,500	70,300	2,118,800	1,382,000	249,200	1,631,200

[1/] From Table F, Summary of Problems and Opportunities.

TABLE Y
GRAZING LAND AND LIVESTOCK SERVICED
Waimea-Paauilo Watershed

Condition/Area	Ranchlots	Acres	Animal Units
FUTURE WITHOUT CONDITIONS			
DHHL	239	20,582	9,862
Other private	26	2,380	988
TOTAL	265	22,962	10,850
POTENTIAL WITH STOCKWATER SUPPLY			
DHHL	239	20,582	17,447
Other private	26	2,380	1,593
TOTAL	265	22,962	19,040
INCREASE	0	0	8,190

Effects

The estimated cost of the Selected Plan is as follows:

Total installation costs:	$ 17,376,600
Average annual installation costs:	$ 1,359,400
Average annual OM&R costs:	$ 196,100
Total average annual costs:	$ 1,555,500

See Tables 1, 2, and 4 in section 5.5 for a more detailed cost breakdown.

Mitigation

None required.

6.3 ENVIRONMENTAL EFFECTS

This section describes the effects of the Selected Plan on natural resources such as air, water, soil, plants, and animals; social effects which consider effects on human health, safety, and welfare; and also potential or indirect economic effects.

6.3.1 Agriculture and Prime Agricultural Land

Setting

Waimea is predominately a rural farming and ranching community with the employment and income of most residents dependent, directly or indirectly, on agriculture. The expanding tourism sector also capitalizes on the agricultural setting of Waimea. Comments made by community members for the maintenance and expansion of agriculture and state and county policies and goals supporting agricultural activity in Waimea reflect the widespread desire to protect and expand the area's agricultural base.

The federal and state governments recognize the importance of the soil and other natural resources needed to support commercial agriculture. The federal government, through the Prime and Unique Farmland Policy and the USDA Farmland Protection Policy, and the State of Hawaii Board of Agriculture, through adoption of the Agricultural Lands of Importance to the State of Hawaii, have defined prime farmland as land best suited for the production of food, feed, forage, and fiber crops. The land has the soil quality, growing season, and moisture supply needed to sustain high yields of crops economically when treated and managed, including irrigation water management, according to modern farming methods.

Effects

The Selected Plan will provide an expanded and more consistent agricultural water supply to area farmers and ranchers creating a more stable and potentially more profitable environment for agricultural enterprise. Irrigated cropland acreage is expected to increase from 874 acres under Future Without Project Conditions to 989 acres under future with project conditions. The reliability

of the irrigation water supply will increase from 68 percent to 78 percent with the Selected Plan installed.

The development of the stockwater distribution system will provide water to many ranchlots that are not directly served by the existing DWS system. The proposed water system will also allow more intensely managed and more profitable livestock grazing operations. The improved viability of commercial livestock grazing will help maintain the agricultural character of Waimea.

The major soils in the cropland area are Kikoni silt loam and Waimea sandy loam. Both soils are considered prime agricultural soils and when irrigated 86 percent is classified as "Prime Farmland," nationally or "Prime Agricultural Land," in Hawaii. The Selected Plan will provide a more reliable supply of irrigation water to 752 acres of Prime Agricultural Land under Future Without Project Conditions.

The Selected Plan will provide irrigation water to 270 additional acres of cropland in the Lalamilo Ag. Park future expansion area, of which an additional 115 acres will be irrigated. Of the 115 irrigated acres, approximately 99 acres can be classified as Prime Agricultural Land.

Implementation of the Selected Plan will ensure that the most productive agricultural land will remain in crop production, thereby strengthening the agricultural industry and enabling it to better withstand pressure to urbanize.

Mitigation

None required.

6.3.2 Air

Setting

The watershed area has been subject to air pollution due to volcanic emission ("vog") from the erupting Kilauea Volcano located on the south-eastern side of the island of Hawaii, although not to the extent of the Hilo and Kona areas of the island. It is difficult to predict how long the Kilauea Volcano will continue to erupt. Other than vog, no other air quality problems in the watershed area were identified at the present time, none were expressed by the watershed area community, and none are anticipated in the future under without project conditions.

Effects

The Selected Plan will result in a temporary decrease in air quality during construction. Use of heavy equipment such as backhoes and bulldozers to construct the Kauahi Reservoir site will create dust and will produce emissions from engine exhausts. These effects will be limited to the immediate surrounding area, only during the actual conducting of these activities, and experienced only by the construction workers as well as the residents of the one house located in the vicinity of the Kauahi Reservoir site. Use of gasoline and diesel powered equipment in connection with conducting farming activities are a normal occurrence in the watershed area.

Other construction activities such as the installation of supply and distribution systems may also create dust and produce engine exhaust emissions, but not to the degree which reservoir construction will. Again effects will be limited to the immediate surrounding area only during the actual conducting of these activities and experienced only by construction workers and other persons in the immediate vicinity.

Mitigation

The contracts for the installation of the Selected Plan will stipulate that proper dust, erosion and sediment control measures be undertaken or installed during construction to meet the County of Hawaii's grading ordinance and to minimize dust to the extent possible. Remaining dust considered an unavoidable adverse environmental effect.

No mitigation measures for exhaust emission are feasible. Exhaust emissions due to construction activities are considered an unavoidable adverse environmental effect.

6.3.3 Coastal Zone

(content moved to Section 6.6.10)

6.3.4 Cultural Resources

Setting

Project improvements may affect existing historical, cultural, architectural and/or archaeological resources such those listed on the Hawaii Register and/or National Register of Historic Places.

Effects

No effects on cultural resources are anticipated due to the installation of works of improvement proposed by the Selected Plan.

Reservoir Supply Pipeline - The April 1988 report entitled " Environmental Assessment - Improvements to the Upper Hamakua Ditch," prepared by Hilo Engineering, Inc. for the Division of Water and Land Development, DLNR, concluded that "no significant archaeological features have been found or thought to exist within the potential project right-of-way," which included the entire length of the Upper Hamakua Ditch to Puu Pulehu Reservoir.

The 19,200-foot-long reservoir supply pipeline will be aligned within existing WIS pipeline easements or within existing road right-of-way. See section 5.1.1 for a more detailed description of the pipeline alignment. No significant archaeological features were identified to exist in this area by surveys and investigations conducted as part of the Waimea-Paauilo Watershed project.

Kauahi Reservoir - The NRCS contracted a consultant, William Bonk, to conduct an archeological reconnaissance survey of the Kauahi Reservoir site a land area of approximately 284,400 square yards. See section 5.2.2 for a more detailed description of the reservoir site. The results of the contracted work were published in May 1996 under the title "An Archaeological Survey of a Small Portion of Land in Pu'ukapu, South Kohala, County of Hawai'i, Hawai'i."

Transects uncovered nothing that can be attributed to humans of the prehistoric or historic periods. The report recommended that archaeological clearance to construct the Kauahi Reservoir be given on the basis of a lack of archaeological evidence to support requirements of further archaeological work, mitigation, or preservation.

Irrigation Water Distribution System - Alan C. Spencer, NRCS Cultural Resource Specialist, conducted archeological investigations for the Waimea-Paauilo Watershed project. The results of his investigations were included in a January 1989 report entitled "Archeological Investigations of the Lalamilo Agricultural Addition Irrigation Pipeline Corridor and the Livestock Water Distribution System and Management Area, Waimea-Paauilo Watershed, Hawaii County, Hawaii."

As part of the literature search conducted by Spencer, the National Register of Historic Places was consulted. Only one property, the Imiola Congregational Church, was listed in the watershed area. This was confirmed by a search of the National Register Information System (NRIS). Other properties that are eligible but not formally listed are: Parker Homestead, and the cemetery at Mana, and the Hind and Spencer Homes in Waimea.

One historic district, the Waimea Agricultural System, is located adjacent to the *proposed* Lalamilo Ag. Park expansion area. The Waimea Agricultural System is a subdistrict of the larger Kohala Field System. The Waimea Agricultural System is composed of four complexes. Field Complex 4 borders the Agricultural Park. It consists of mostly early and middle 19th century agricultural fields, irrigation ditches, boundary walls, and residential features. Some features of this complex may date to the 13th or 14th centuries. Although not nominated to the National Register of Historic Places, this historic district is eligible under several criteria.

The irrigation pipeline corridors for the Lalamilo Agricultural Park expansion area have been located to avoid the Waimea Agricultural System by approximately 500 feet.

The NRCS contracted a consultant, William Bonk, to conduct an archeological literature search, and an on-ground archaeological reconnaissance survey of the three potential reservoir sites and a land area of approximately 500 acres, about 278 of which are potential new cropland *areas in the State Department of Agriculture's proposed Lalamilo Agricultural Park.* The results of the contracted work were published in October 1985 under the title "An Archaeological Survey in the Waimea-Paauilo Watershed Area of Portions of the Districts of South Kohala and Hamakua, County of Hawaii, Hawaii."

Field investigations conducted as part of the above mentioned contract found nothing of archaeological significance within the bounds of any of the three potential reservoir sites or the 500 acres potential new cropland areas. *However, a more recent archaeological investigation conducted for the Parker Ranch Town Center has expanded the areal extent of the Waimea Agricultural System. Additional archaeological survey will be necessary if the State Department of Agriculture decides to proceed with development of the Agricultural Park at this site.*

Stockwater Distribution System - The January 1989 report entitled "Archaeological Investigations of the Lalamilo Agricultural Addition Irrigation Pipeline Corridor and the Livestock Water Distribution System and Management Area, Waimea-Paauilo Watershed, Hawaii County, Hawaii," identified no cultural resources along the proposed stockwater distribution system corridor.

The changes in the stockwater pipeline alignment required, by Alternative 5 were field surveyed by Carol Kawachi, NRCS Cultural Resources Specialist. No cultural resources were observed during the survey. The results of the survey were forwarded by letter to the State Historic Preservation Officer in January 1997 and concurrence was requested.

Mitigation

None required.

Any changes to design or location of project features will be coordinated with the State Historical Preservation Officer to obtain concurrence.

In the event that any unanticipated sites or remains such as artifacts, shell, bone or charcoal deposits; human burials; rock or coral alignment, pavings, or walls are encountered during construction, work will be stopped and the State Historic Preservation Officer and the U.S. Secretary of the Interior will be contacted in accordance with the procedures outlined in the NRCS General Manual, Title 420, Part 401, October 1983, as amended. NRCS will take actions to protect or recover, or both, any significant cultural resources discovered during construction.

6.3.5 Dam Breach

Setting

The location of the proposed reservoir was an issue because of the possibility of a dam breach.

Effects

Both the Kauahi Reservoir and the Waimea II Reservoir dams pose a hazard to properties and persons present in the identified breach inundation area, in the unlikely event of a dam breach.

The Kauahi Reservoir breach inundation area extends from the intersection of Mana Road and the unnamed DHHL road to the natural depression one mile north-northeast of the reservoir (Figure R). The estimated peak discharge from the breach is 7,600 cfs. As much as 100 million gallons will be discharged from the reservoir. Due to the rolling topography, the breach flow can be several hundred feet wide and divided into more than one channel. Maximum flow depths will be about five feet with an average velocity of seven feet per second. The water will settle in a pond approximately 4,000 feet long and 500 feet wide with an average depth of six feet.

The Kauahi Reservoir dam falls under the controls of HRS Chapter 13-190, Dams and Reservoirs due to its storage capacity exceeding 50 acre-feet. The Kauahi Reservoir dam is rated a "moderate hazard" meaning the dam's failure could possibly result in loss of life and appreciable property damage.

The identified breach inundation area for the Kauahi Reservoir affects five DHHL pastoral lots and three Puukapu Homestead agricultural subdivision lots. There are one ranch dwelling, one open livestock shelter, and one toolshed located within the breach inundation area. The ranch dwelling is located approximately 1,500 feet north of the reservoir at the eastern edge of the breach inundation area. The living area of the dwelling is above the estimated breach flow depth. The lower-level garage may receive damage. The two other structures and other improvements such as livestock fences and roads on the DHHL pastoral lots may be inundated and damaged by the breach flood. Erosion damage and sediment deposition may occur in the pasture areas. Ponding of the breach flood may last for a week or more before it completely percolates into the ground.

The identified breach inundation area for the Waimea II Reservoir affects fifteen properties adjacent to the proposed reservoir, 3 of which presently have houses built on them. Four houses located along Lalakea Stream on the floor of Waipio Valley would also be affected.

Mitigation

A Kauahi Reservoir dam breach caused by overtopping of the embankment by water will not occur because the dam will not be placed across a stream or drainageway which will introduce runoff into the reservoir.

The probability of a dam breach caused by "piping" or internal erosion within the embankment will be reduced significantly by the high-density polyethylene lining used throughout the reservoir, the installation of a chimney filter within the embankment to intercept seepage flows through the embankment, and the broader base and increased flow path created by the 3:1 downstream embankment slope.

The probability of a dam breach caused by an earthquake will be reduced significantly by the polyethylene lining, the flattened embankment slope, and the reservoir foundation which is unsaturated lava rock. No geologic faults are located near the reservoir. The nearest faults are located five miles to the north in the Kohala Mountains. The failure of an earth embankment due to an earthquake is exceedingly rare. An inventory conducted for the 1984 Symposium on Large Dams found that three of 27,255 significantly-sized compacted earth dams had failed worldwide due to earthquake damage during the 131-year period from 1853 to 1984. Another study, Observed Performance of Dams During Earthquakes, by the U.S. Committee on Large Dams in 1992, concluded that three of 61,411 compacted earth dams inventoried in the United States were collapsed or severely damaged by earthquakes during the 106-year period between 1886 and 1992.

An Emergency Preparedness Plan, as required for "high hazard" dams by HRS, Chapter 13-190, will be developed and implemented for the "moderate hazard" Kauahi Reservoir. The plan will include embankment monitoring, emergency notification and evacuation areas and procedures, and disaster response procedures and will be filed with the State Dam Safety Program.

Remaining risk after all mitigation measures undertaken, is considered an unavoidable adverse environmental effect.

The owner of the Kauahi Reservoir will be the State of Hawaii. In the event of a dam breach, damage liability will be assumed by the State. The USDA Natural Resources Conservation Service will assume responsibility if the dam design is determined to be technically deficient.

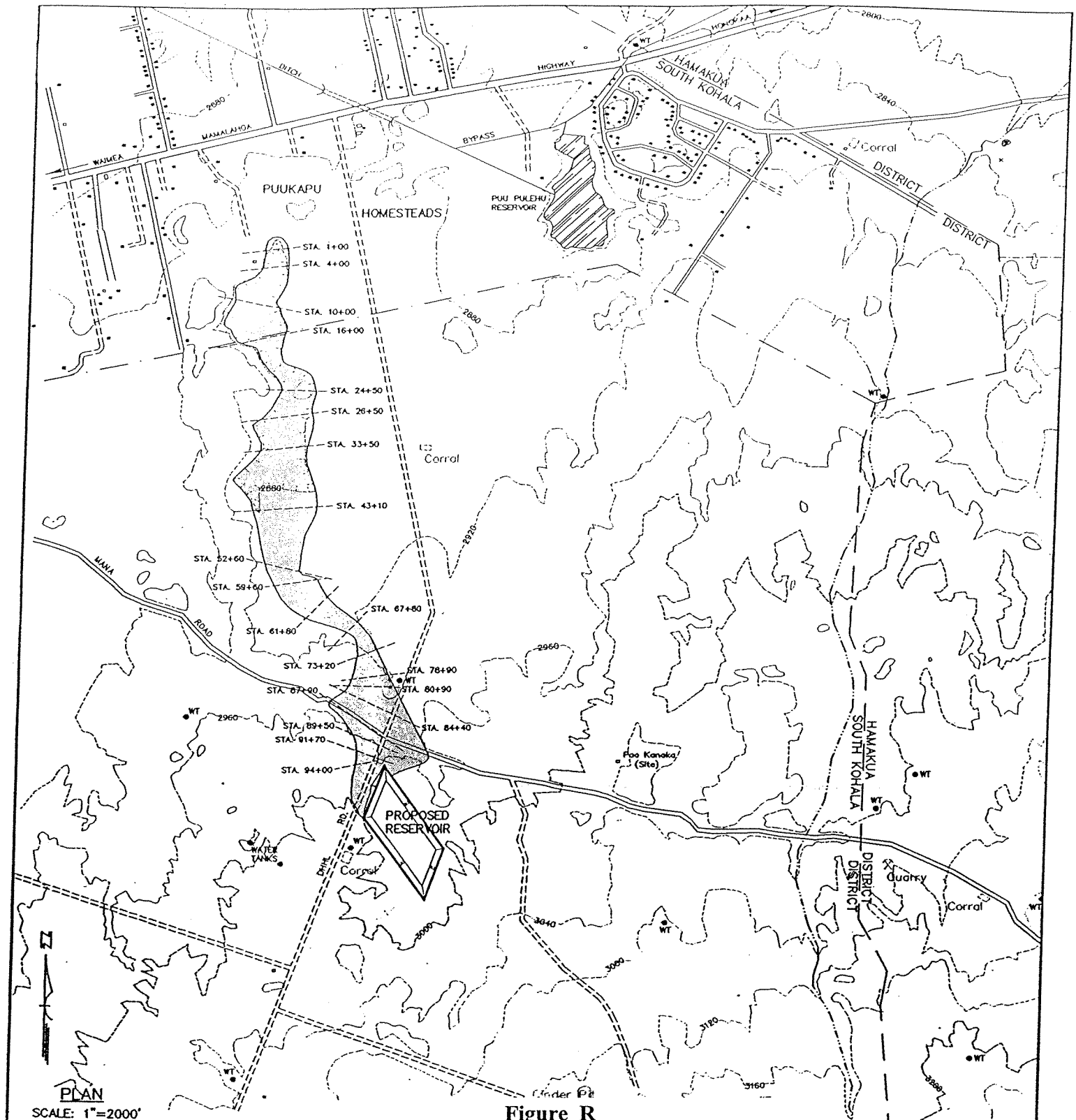


Figure R
KAUAHI RESERVOIR -
DAM BREACH INUNDATION AREA
Waimea-Paauilo Watershed

DRAWING NO.		SHEET 01 OF 01
FILE NAME PKPU--11: 30JUN26	U.S.D.A. NATURAL RESOUCES CONSERVATION SERVICE	

6.3.6 Energy

Setting

This section describes the energy requirements for the Selected Plan.

Effects

An estimated 82,900 kilowatt hours of electricity will be required to operate seven stockwater pumps annually. Approximately 60 percent of the electricity generated on the Island of Hawaii is produced using fossil fuel oil.

An estimated 3,000 gallons of diesel fuel will be required to operate two stockwater pumps annually.

Mitigation

None feasible. Energy requirements are considered an irreversible and irretrievable commitment of resources.

6.3.7 Floodplains

Setting

There is a national and local interest to manage floodplains to minimize economic and social losses and to allow natural processes to occur. The policy that federal programs and projects will avoid support of floodplain development (i.e. urbanization) is contained in Executive Order 11988, Floodplain Management.

Floodprone areas in the watershed area have been identified by the National Flood Insurance Program and are displayed on the Flood Insurance Rate Maps prepared by the Federal Emergency Management Agency. Little floodplain exists in the watershed. The floodprone areas identified in the watershed area are along Waikoloa and Lanimuamau streams as the cross through Waimea Town and south of the Puu Nani subdivision to the Puukapu (formerly Paiakuli) Reservoir and the Puukapu flood control basin.

Effects

The Selected Plan will not affect floodplains in the watershed. The installation of irrigation distribution pipeline along the roadway through the Puukapu floodplain area will not affect the operation of the Puukapu flood control basin. The Selected Plan will not directly or indirectly support increased development of floodplains.

Mitigation

None required.

6.3.8 Groundwater

Setting

Groundwater conditions within the watershed are extremely variable because of the nature of the volcanic bedrock. Lava flows in the upper watershed (Kohala Mountains area) frequently contain highly fractured zones or lava tubes. These conditions provide extremely high permeability, often reaching the point where entire streams percolate into/recharge the ground water system. Other sections of the watershed underlain by ash deposits have very slow permeability.

The use of groundwater as a potential source of agricultural water was considered, but not pursued because of the high cost of digging wells to the depths of the sustainable aquifers and the high cost of pumping water.

There are two means by which the alternative plan could potentially affect groundwater resources, with subsequent potential effects on human health, safety, and welfare. The first would be due to increased fertilizer and chemicals used on new cropland which would be provided water and brought into production via the Selected Plan affecting groundwater quality. The second would be increased water diversion, decreasing groundwater recharge or quantity.

Effects

The Selected Plan will increase the total amount of fertilizer and chemical use due to the new cropland, however no effects on groundwater quality and on human health, safety, and welfare are anticipated. The same can be said for Alternatives 2, 3, and 4.

The installation of the Selected Plan will increase irrigated cropland by 115 acres from 870 to 989 acres or by about 13 percent. Use of restricted agricultural chemicals is regulated by one of the project Sponsors; the State of Hawaii, Department of Agriculture, Division of Plant Industries; which requires that all purchasers and users of restricted agricultural chemicals attend and pass a certification course. The DOA also conducts periodic update courses for purchasers and users. The NRCS also provides assistance to farmers, through its ongoing conservation program, to design efficient irrigation systems which would lessen the chances of excess irrigation water carrying agricultural chemicals down to the groundwater lens.

The State of Hawaii, Department of Health's Safe Drinking Water Branch periodically tests all well sources of drinking water for chemical and microbiological contamination. No wells in the watershed area have ever shown such contamination.

The Selected Plan does not include any works of improvement to increase the diversion of surface waters from any streams, including the Kawainui, Kawaiki, Alakahi, Koiawe, and Waima streams. Nor do any of the alternatives include the installation of pipelines which would cause UHD ditch flows to by-pass stream sections of the UHD, as originally proposed by the Recommended Plan in the Plan-EA. The Selected Plan will therefore have no affect on the amount of water which percolates to the groundwater lens from the above mentioned streams or UHD stream sections.

Mitigation

None required.

6.3.9 Land Use

Setting

There is concern that the Selected Plan may cause land use changes due to the installation of the works of improvement. See also sections 6.3.1 Agriculture and Prime Agricultural Land and 6.3.10 Population / Urban Growth for related effects.

Effects

The Selected Plan will require the conversion of 29 acres of grazing land to permanent Kauahi Reservoir site and seven acres of grazing land for the stockwater distribution system right-of-way. The conversion of 270 acres of grazing land to cropland (Lalamilo Ag. Park) does not constitute a land use change because the land will remain in agricultural use. All other works of improvement will be installed on existing road or pipeline easements.

Mitigation

None required. Conversion of grazing land to reservoir site is considered an long-term, irreversible and irretrievable commitment of resources.

6.3.10 Population / Urban Growth

Setting

Although the Waimea area continues to increase in population and commercial activity, community members have commented that uncontrolled urban growth can diminish or destroy the "country" character of the Waimea area. State and local policies and goals also seek to maintain the agrarian character of the area. Concerns have been expressed that the increase in water supply will ultimately lead to more subdivisions and commercial development.

Effects

The project improvements to the Waimea Irrigation System consists of expanding water supply for cropland irrigation and livestock drinking water. All system water will be untreated and unsuitable for domestic drinking water purposes. No connections to the DWS domestic system will be made from the WIS.

With the project installed, the DWS water supply will only be increased by the amount, approximately 40 million gallons per year, that is currently being used for livestock drinking water. The return of the 40 million gallons per year can be seen as an improvement to the reliability of the domestic water supply rather than supply to be allocated to new users.

The improved outlook for agriculture in the Waimea area, as a result of implementation of this project, may restrain the subdivision and sale of larger parcels, support maintenance of areas in agricultural land use zoning, and provide opportunities for the community to direct commercial growth in areas that support the agricultural base.

The most important control of growth remains land use zoning at the county level. The hearings during general plan revision and those that accompany land use designation changes present opportunities for the community to direct urban growth and development.

The Selected Plan will provide a source of irrigation water for eight new farmlots in the planned Lalamilo Ag. Park. These new farmlots could potentially be operated by farmers new to the watershed area and thereby increase the population. The potential increase in population is not significant and will not affect urban growth.

Mitigation

None required.

6.3.11 Soil

Setting

See section 2.8, Geology and Soils, for a description of the soil resources in the watershed area. Of concern is soil erosion. A discussion of sedimentation effects are also included in this section.

Effects

The Selected Plan will cause a temporary increase in the soil erosion and sedimentation potential during construction. The major activity of concern is the use of heavy equipment such as backhoes to excavate the Kauahi Reservoir site. Other construction activities such as the installation of the reservoir supply and distribution systems will also increase the soil erosion potential, but not to the degree which reservoir excavation will.

Mitigation

The contract(s) for the installation of the Selected Plan will stipulate that proper erosion and sediment control measures be undertaken or installed during construction to meet the County of Hawaii's grading ordinance, *Chapter 10, Erosion and Sediment Control, Hawaii County Code.* The measures should minimize the soil erosion and sedimentation potential to the extent possible. Remaining erosion and sedimentation considered an unavoidable adverse environmental effect.

6.3.12 Streams

Setting

This section discusses effects on stream flow or quantity. Effects on stream water quality due to sedimentation are addressed in section 6.3.11 Soil. Effects on stream biota is discussed in section 6.3.13 Threatened and Endangered Species.

Much of the surface water and groundwater occurring in the region of the Upper Hamakua Ditch and Lalakea Stream later appears in Waipio Valley as it moves toward the ocean. Waipio Valley taro farmers, tour operators, and others require the continuance of the valley's abundant water resources.

Effects

The Selected Plan and the other alternative plans do not include any improvements to increase water diversion from any of the streams in the watershed, including the Kawainui, Kawaiki, Alakahi, Koiawe, and Waima streams. An earlier proposal to install pipelines around the natural stream reaches of the UHD to prevent seepage losses was eliminated from the

alternative that was selected. The DLNR-led repairs of the UHD will decrease seepage losses from the ditch by as much as 50 to 75 percent during periods when the ditch flow is less than 4 MGD. During higher flows in the ditch, the percentage increase in ditchflow will be considerably less.

The overflow from the UHD, once the reservoirs are filled to capacity, enters Lalakea Stream near its headwater to augment the naturally occurring streamflow. This overflow has taken the present form since, at least, 1960 when the Waimea Reservoir was constructed. The increase in agricultural water demand created by the project improvements over the future without project condition is approximately 377 million gallons per year. Overflow to Lalakea Stream from the UHD will be reduced from 1,240 million gallons per year to 863 million gallons per year. The combined annual streamflow in Lalakea Stream, measured at Hiilawe Falls, will be reduced by five percent from 7,080 million gallons per year to 6,703 million gallons per year (Table S).

The flow rate in the Upper Hamakua Ditch, agricultural water demand analysis, and data sources are discussed in Section 5.2.5 System Water Budget.

The reduction in overflow volume is distributed throughout the year (Table T). The base runoff from the 3.05 square mile drainage area is not affected. The naturally occurring fluctuations in the Lalakea streamflow will override the effects of the reduced overflow from the UHD. In addition, it is important to note that the overflow from UHD augments the naturally occurring streamflow of Lalakea Stream. Thus, even if the overflow were completely eliminated, the Selected Plan would not be affecting the natural condition of Lalakea Stream or Waipio Valley.

Lalakea Stream is diverted by the Lalakea Ditch at the 2,000-foot elevation. The diversion, which supplies a 30-MG reservoir is unused at present. All of the ditch, including the intakes and Lalakea Reservoir, is located on Kamehameha Schools/Bishop Estate (KS/BE) land. It is probable the KS/BE will someday utilize the Lalakea Ditch.

Mitigation

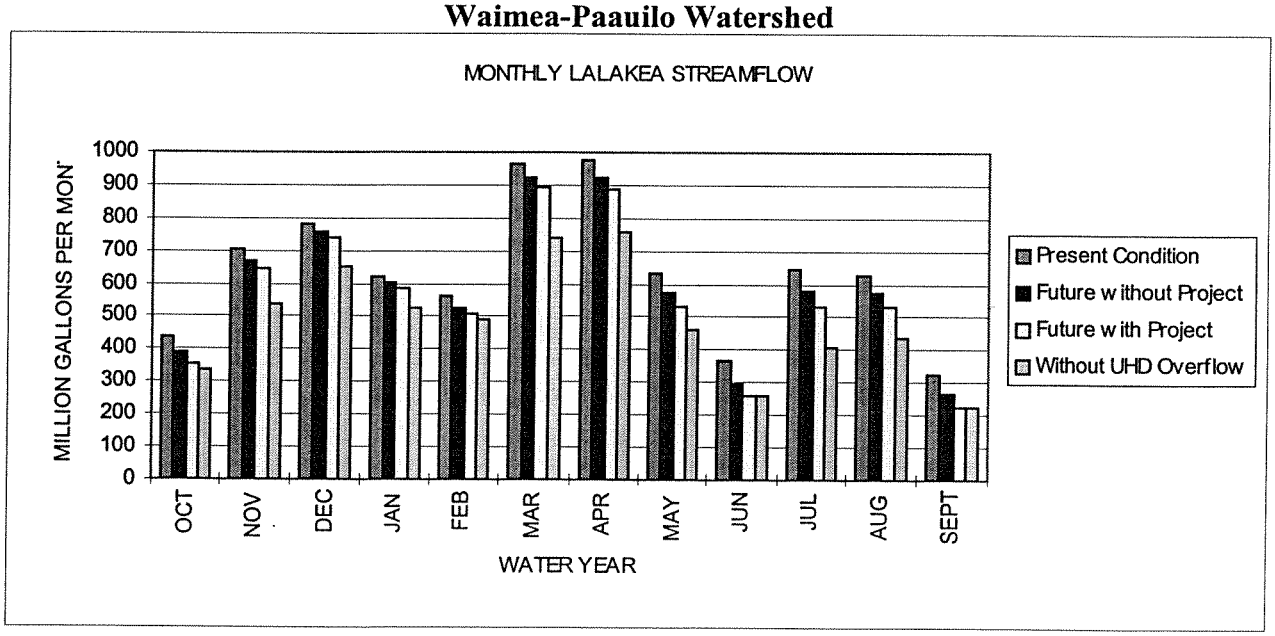
None required.

Table Z
EFFECT OF OVERFLOW REDUCTION FROM UPPER HAMAKUA DITCH
Waimea-Paauilo Watershed

Water Body	*Unit*	*Future without Project*	*Future with Project*
Upper Hamakua Ditch			
UHD average daily flow rate	*MG per day*	*6.4*	*6.4*
UHD average annual flow rate	*MG per year*	*2,351*	*2,351*
(-) Agricultural water demand from UHD	*MG per year*	*1,111*	*1,488*
(=) Overflow from UHD to Lalakea Stream	*MG per year*	*1,240*	*863*
Overflow reduction with project installed	*MG per year*	*N/A*	*377*
% Overflow reduction	*%*	*N/A*	*30*
Lalakea Stream			
Natural average flow rate Lalakea Stream @ Hiilawe Falls [1/]	*MG per year*	*5,840*	*5,840*
(+) Overflow from UHD	*MG per year*	*1,240*	*863*
(=) Total average flow rate	*MG per year*	*7,080*	*6,703*
% Streamflow reduction	*%*	*N/A*	*5*
Wailoa River			
Natural average flow rate into ocean [2/]	*MG per year*	*24,366*	*24,366*
(+) Overflow from UHD	*MG per year*	*1,240*	*863*
(=) Total average flow rate	*MG per year*	*25,606*	*25,229*
% Streamflow reduction	*%*	*N/A*	*1.5*

[1/] *Estimated through regional analysis using seven gaged streams in Hilo/Hamakua/Kohala area.*
[2/] *USGS Sta 16732200, 1965-1969, plus estimated streamflow from Lalakea Stream.*

Table AA
MONTHLY LALAKEA STREAMFLOW
Waimea-Paauilo Watershed



6.3.13 Threatened and Endangered Species

Setting

Of concern are the effects of Selected Plan's proposed works of improvement on fish and wildlife resources in accordance with provisions of the National Environmental Policy Act of 1969 (42 U.S.C. 4321 et seq.; 83 Stat. 852), as amended, the Fish and Wildlife Coordination Act of 1934 (42 U.S.C. 661 et seq.; State. 401), as amended, the Endangered Species Act of 1973 (16 U.S.C. 1531 et seq.; 87 Stat. 884), as amended, The Federal Clean Water Act (33 U.S.C. 1344), as amended, and other authorities mandating federal concern for environmental values.

The Selected Plan includes work in the following areas: (1) the reservoir supply pipeline connection site at UHD, (2) the reservoir supply pipeline alignment corridor from the UHD to the proposed Kauahi Reservoir, (3) the Kauahi Reservoir site, (4) the irrigation water distribution pipeline alignment corridor, (5) the planned Lalamilo Ag. Park, and (6) the stockwater distribution pipeline alignment corridor. Figures N and Q identifies these areas and pipeline corridors.

Botanical and wildlife assessment studies have been completed within the project area since the project's genesis in 1984.

There has been considerable correspondence between wildlife agencies and NRCS since 1984. The following is an additive list of threatened, endangered or rare species that were identified as potentially being found in the project area by USFWS and DLNR, or from reviews of former reports and surveys:

1984	1) Hawaii creeper (bird)	Loxops maculatus mana **(E)
	2) Hawaii akeapa (bird)	Loxops coccineus coccineus (E)
	3) O`u (bird)	Psittirostra psittacea (E)
	4) Akiapolaau (bird)	Hemignathus munroi (E)
	5) Hawaiian goose (nene)	Nesochen sandvicensis (E)
	6) Palila (bird)	Loxioides bailleui (E)
	7) Hawaiian hoary bat	Lasiurus cinereus semotus (E)
	8) Hawaiian Hawk or 'io	Buteo solitarius (E)
1985	9) O`opu alamo`o	Lentipes concolor (SOC)
1987	10) Hawaiian duck or koloa	Anas wyvilliana (E)
	11) Nukupuu (bird)	Hemignathus lucidus (E)
	12) Hawaiian creeper (bird)	Oreomystis mana (E)
	13) Oha (plant)	Clermontia drepanomorpha (E)
	14) Aku'Aku (plant)	Cyanea tritomantha (SOC)
	15) (plant)	Diplazium molokaiense (E)
	16) 'Aiea tree (plant)	Nothocestrum breviflorum (E)
	17) (plant)	Tetraplasandra kohalae (oahuensis) (SOC)
1994	18) Orangeblack HI damselfly	Megalagrion xanthomelas (C)
	19) Flying earwig HI damselfly	Megalagrion nesiotes (C)

**The current (Feb 97) status of the species: (E) = endangered, (T) = threatened, (C) = Candidate(SOC) = Species of Concern, taxa for which the FWS has on file enough substantial information on biological vulnerability and threat(s) to support proposals for listing as endangered or threatened species.

Existing Flora and Fauna

In February, 1987, Lani Stemmermann and Joyce Davis Jacobson completed the "Botanical Survey of the Upper Hamakua Ditch Improvements, Waimea-Paauilo Watershed, Island of Hawaii". This study included assessments of sections of the UHD that are no longer planned in the preferred alternative. The current plan only proposes work in section 6 of the UHD, not in sections 1-5. Traplasandra oahuensis, now a "Species of Concern", not endangered in (USFWS Plant Species List November 7, 1996) was found in 1987 by Stemmerman & Jocobson in sections 1 and 3 of the UHD; Clermontia spp. were found in sections 1, 2 and 5; Cyanea spp. were found in section 5; Diplazium molkaiense was found in section 2; Tetraplasandra kohalae (oahuensis) was found in section 1. None of these species were found within the current project boundaries--section 6 of the ditch. Section 6 was dominated by "exotic herbaceous and grass community found along roadsides and trails and within pasture" (Stemmerman 1987).

On August 6, 1996, Derral R. Herbst, Ph.D. prepared the "Botanical Survey of the Proposed Kauahi Reservoir Site, Waimea-Paauilo Watershed, Hawaii," under contract for the NRCS. The report concluded that no candidate, proposed, or listed threatened or endangered species as set forth in the Endangered Species Act of 1973, as amended (16 U.S.C. 1531-1543), were seen during the survey of the preferred reservoir site, and none are known historically from the proposed Kauahi Reservoir site. The dominant vegetation was identified as Kikuyu grass (Pennisetum clandestinum and rattail grass (Sporobolus africanus), with white clover (Trifolium repens), yellow wood sorrel (Oxalis corniculata), and hairy cat's ear (Hypochoeris radicata) as the common forbes.

Dr. Herbst also prepared the "Botanical Survey for the Proposed Kamuela Irrigation Pipeline System, Waimea-Pa'auilo Watershed, Hawaii" on January 27, 1997. This survey also concluded that there are no candidate, proposed or listed threatened or endangered species seen during the survey, and none are known historically from the proposed project sites. Furthermore, none of the trees on the sites are, nor could be considered Species of Concern for the county exceptional tree program. The vegetative community of the sites are not pristine nor unique; the dominant vegetation was separated into three different sub-communities: Pasture, gulch, and wetland associations. The dominant in all of the pasture areas was Kikuyu grass (Pennisetum clandestinum). The gulches contained a few native 'ohi'a (Metrosideros polymorpha), and other exotic species such as strawberry guava (Psidium cattleianum) and understory ferns and forbs. The wetlands at the bottom of the gulches could be classified as riparian wetlands around small permanent streams. The dominant species in these areas was honohono grass (Commelina diffusa). Very few native species were found within the pipeline boundaries.

No threatened or endangered birds have been sighted within the project boundaries. USFWS' bird survey data showed that the majority of sightings were of the Japanese white-eye, melodious laughing thrush, red-billed leiothrix, and *the native* common amakihi, Elepaio, and Apapane. (Marmelstein, USFWS, February 1985; Yuen, USFWS, June 1986,) Because the majority of the plants along the pipeline corridor are non-native, grass species, it is unlikely to be habitat for native forest birds. The 'io or the nene may use the grassland area, although none were seen during the recent plant and historic properties surveys.

In the last decade, the Hawaiian duck has been reintroduced to the Kohala Mountains because there is suitable habitat in the forest preserve. These birds normally restrict their activities to forest seeps, ponds, and streams. Members of this species occasionally use the slower section of the UHD for loafing or possibly for feeding (Griffin 1983). The value of the UHD as Hawaiian duck habitat is minimal. It lacks the quiet pools, shoreline vegetation, natural bottom and food items preferred by these birds. The Koloa duck may possibly use the small stream areas along the stockwater distribution pipeline alignment, but these areas are isolated systems and provide minimal habitat. No ducks were seen during past or recent surveys.

The Hawaiian hoary bat, Lasiurus cinereus semotus, potentially resides in the isolated gulch/stream systems that were found along the stockwater pipeline alignment. However, not much information is known about habitat requirements of the bat, and thus it is difficult to determine whether bats indeed frequent these areas. No night surveys of the project area were conducted.

In 1994, the USFWS indicated that two rare (now candidate) damselfly species may occur in the project area. Megalagrion xanthomelas is a lowland species that occurs most commonly in coastal wetland fed by basal springs, as seen in the Puna, Kau, and North Kona districts of Hawaii. It occasionally breeds along the terminal and lower midreaches of perennial streams and can exploit temporary habitats, as shown by its occupation of ephemeral side pools bordering flashy streams in Hawaii. Megalagrion nesitotes has yet to be recollected on Hawaii despite intensive recent surveys by the workers from the National Park Service at Volcano, where several long series were captured in the last century. This suggests that the Hawaii island populations may have been extirpated. (Hawaiian Damselflies, A Field Identification Guide, by Adam Asquith and Dan Polhemus, Hawaii Biological Survey Handbook, 1996,.

The USFWS recommended that surveys of these two species in the proposed project area be conducted. USFWS staff recently confirmed that they conducted insect surveys in the project area and did not find either species (Pers. Communication, Adam Asqueth, February 1997).

Much of the watershed is heavily grazed by cattle. Feral pigs (Sus Scrofa), range freely and disturb the floor by rooting and consuming plants, facilitating weed invasion and contributing to soil erosion. Feral dogs and cats and alien mongoose and rats also rove unencumbered within the watershed. These feral and alien mammals are considered detrimental to native ecosystems.

USFWS and DLNR raised concern about the cumulative impacts on streams within the watershed, which could be caused by the diversion of additional water. Changes in instream flow could affect endemic crustaceans, fish, and mollusks, which may be present in the middle reaches of Alakahi, Kawainui, and Koiawe streams and throughout Waipio Valley. Concern was also raised about the decreased overflow from the UHD to Lalakea Stream indirectly impacting the habitat of Lalakea Stream and Waipio Valley biota. The Hawaii Stream Assessment recommends Lalakea Stream as a candidate for protection due to the diversity of aquatic and cultural resources and "blue ribbon" cultural and recreational resources.

Effects

No effects on endangered or threatened plant species are anticipated because none were found within the preferred alternative project area. Few native plants will be disturbed by the project, since the majority of the area is dominated by alien grasses and forbs. Construction of the pipeline will entail trenching and replacing topsoil. It is likely that surrounding grasses will revegetate the area within months. Trenching and pipelaying in the two small gulches that contain 'ohi'a trees can likely avoid any impacts to this endemic species.

No adverse effects on the 'io (Hawaiian Hawk) or the nene are anticipated because 1) use of the UHD, reservoir site, and pipeline corridor areas by these species is apparently infrequent or rare; 2) construction activities will be concentrated in the open range land, which is dominated by nonnative vegetation ; and 3) construction effects will be temporary.

No adverse effects on the Hawaiian Duck are anticipated because 1) construction activities will be confined to Segment 6 of the UHD, which is not likely to be used by the duck for loafing or feeding because it is not one of the slower sections; 2) it is unlikely that the koloa use the upland reservoir site or open areas; 3) environmental impacts within the small gulches will be minimized by avoiding these areas, bridging the pipeline across them, and/or ensuring best management practices (as outlined in the Corps of Engineers Regional General Permit for Utility Line Crossings); and 4) construction effects will be temporary.

No adverse effects on the Hawaiian hoary bat are anticipated because 1) use of the majority of the area (grazed grasslands) by bats is apparently infrequent or rare; 2) construction will take place during the day, and bats are nocturnal; and 3) effects from the work within the gulches, the areas that are more likely than any other within the project site to be bat habitat, will be minimized.

No cumulative impacts on streams will be caused by the diversion of additional water are because the Selected Plan will not include any improvements to increase water diversion from any of the streams in the watershed.

No impacts on Lalakea Stream and Waipio Valley biota are anticipated because the naturally occurring fluctuations in streamflow will override the effects of the reduced overflow from the UHD (see section 6.3.12 Streams). In addition, the overflow from the UHD augments the natural streamflow of Lalakea Stream. Thus, even if the overflow were completely eliminated, the Selected Plan would not be affecting the natural condition of Lalakea Stream or Waipio Valley.

Mitigation

All necessary precautions will be taken to ensure that there are no adverse effects to any threatened or endangered species, in the unlikely event that any are encountered. The areas disturbed for the reservoir and for the supply pipeline will be the minimum area/width needed.

6.3.14 Visual

Setting

The following section describes the effects of the Selected Plan on the visual landscape.

Effects

The reservoir supply and distribution systems will not affect the visual landscape because they will be buried pipelines.

The Kauahi Reservoir will be visible from approximately 300 properties. The reservoir will not block any visual planes from any of properties. The reservoir will have a earthen berm embankment approximately 26 feet high and will create a surface pool of about 19 acres.

Mitigation

The embankment slopes of the Kauahi Reservoir will be grassed to blend in with the surrounding grazing land.

6.3.15 Water Rights

Setting

Water rights issues are becoming more politically sensitive as competition for the available water increases.

Concerns were expressed regarding the legal right to divert additional water from the Kohala Mountains via Upper Hamakua Ditch to supply the proposed Kauahi Reservoir.

Concerns were also expressed regarding the allocation of water from the WIS after the improvements proposed by the Selected Plan are installed. The native Hawaiian people with DHHL farmlots and ranchlots want to be assured that they will have a sufficient amount of water to meet their current and future needs.

Under provisions of the federal law known as the Hawaiian Homes Commission Act (HHCA) passed by the U.S. Congress in 1921, Section 221, provides first call to the DHHL for its native Hawaiian beneficiaries to any government-owned water statewide.

Under the mandate of the Admissions Act of 1959, Section 4, the HHCA was adopted in its entirety as part of the Hawaii State Constitution and says in part that the state and its people do further agree and declare that the spirit of the HHCA shall be faithfully carried out.

The State Water Code passed by the state legislature in 1987, under Section 174c-101 states that in part that decisions of the Commission on Water Resource Management (CWRM) shall incorporate and protect adequate reserves of water for current and foreseeable development and use of Hawaiian Home Lands. In addition, the appurtenant of water rights of kuleana and taro lands, along with traditional and customary gathering rights of ahupua's tenants who are descendants of native Hawaiians who inhabited the Hawaiian Islands prior to 1778, shall not be abridged or denied.

The State Water Code stipulates that any new construction or alteration of a stream diversion works or stream channel other than activities in the course of normal maintenance can only proceed by obtaining a permit from the CWRM. Also, new diversions of streamflow cannot be made without a waiver of the interim instream flow standard from the CWRM.

Act 325, SLH 1991, further buttressed and re-confirmed protections of water rights guaranteed by prior federal and state laws. Consistent with the above authorities, the CWRM has already acknowledged the first call rights of the DHHL by reserving water for native Hawaiians on the islands designated as water management areas, namely Oahu and Molokai.

Effects

The UHD presently diverts water from five streams on State-owned lands in the Kohala Mountains (Kawainui, Kawaiki, Alakahi, Koiawe, and Waima) to supply the two existing WIS reservoirs. Because the Upper Hamakua Ditch system has been in existence for over 80 years and no new stream diversion works are proposed by the Selected Plan, a permit and waiver of the interim instream flow standard from the CWRM are not required.

The Selected Plan is designed so that native Hawaiian farmers and ranchers will have the potential to be supplied the same amount of water as non-Hawaiian farmers and ranchers. Pipelines and water meters for native Hawaiian farm and ranch lots are and will be the same size as those for non-Hawaiians. At the present time, all farmers serviced by the WIS share equally in the available water, no group is cut off first, when water restrictions are imposed.

The waters flowing through the Upper Hamakua Ditch are considered government-owned waters and are therefore subject to the protections guaranteed by the laws cited above. If conflict arises among competing interests for the ditch waters, the DHHL on behalf of its native Hawaiian constituency is entitled to first call of unallocated water except in cases of disaster (Chapter 127, HRS) and fire protection (Chapter 185, HRS) which retains priority call.

Mitigation

The DOA and the DHHL will enter into an agreement, approved by both the State Board of Agriculture and the Hawaiian Homes Commission, on those issues that require interagency coordination during implementation and operation of the project improvements. The agreement will include WIS water rate structure and water allocation for DHHL customers and the priority for water use. The agreement will be completed before the completion of the Waimea-Paauilo Watershed Project Agreement.

6.3.16 Wetlands

Setting

Agricultural wetlands are defined as follows: Wetlands are lands that 1) have a predominance of hydric soil; and 2) are inundated or saturated by surface water or ground water at a frequency and duration sufficient to support a prevalence of hydrophytic vegetation typically adapted for like in saturated soil conditions; and 3) under normal circumstances do support a prevalence of hydrophytic vegetation (Subpart A, 513.11, National Food Security Act Manual, November 1996). The Corps of Engineers has jurisdiction over wetlands and other "waters of the U.S.", including intermittent or permanent streams, ponds, and natural drainageways where an "ordinary high water mark" is observed. Department of the Army (DA) permits are necessary for placement of fill materials into waters of the U.S.

The proposed project area was assessed to determine whether any "water of the U.S.", including wetlands, were found and would be affected by the project.

The existing UHD inlet structure for the Waimea Reservoir will be reconstructed and enlarged to accommodate two pipelines. This work within the ditch may possibly be defined as work within a jurisdictional water, and therefore may require a DA permit. The pipeline alignment from the ditch to the proposed reservoir does not have hydrophytic vegetation

In July, 1996, Dr. Herbst identified the dominant plant species at the proposed Kauahi reservoir site. The site clearly lacks hydrophytic vegetation and is not determined to be a wetland.

In December, 1996, NRCS surveyed the proposed stockwater distribution pipeline corridor to ascertain whether wetlands or other waters of the U.S. would be affected by the proposed project. Eight small, isolated drainageways and two large gulches were discovered along the southern boarder of TMK 6-4-04:137, 23. At the time of the survey, all of the areas had running water. The riparian areas in four of the small, isolated drainageways were confirmed to meet the criteria for wetlands: hydrophytic vegetation, hydric soils, and hydrology.

Effects

The effect of the installation of the one-inch diameter pipeline within the drainageways and gulches will be minimal.

Mitigation

Adverse effects to wetlands and other waters from construction of the 1" pipeline will first be avoided by 1) bridging the wetland and gulch crossings at 25+00, 30+00, 48+00, and by 2) shifting the proposed pipeline corridor away from the large gulches and wetland areas at 12+00, 22+00,. 59+00, 66+00. In three of the drainageways, 26+00, 3+00, 45+00, the best alternative will be to trench and bury the pipeline within the gulch corridors and wetland areas. To insure there are only minimal, temporary impacts to waters, the conditions and best management practices contained in the U.S. Army Corps of Engineers General Regional Permit for Utility Lines in, under, or above waters of the United States, including navigable waters, in the State of Hawaii (May 20, 1996) will be followed.

6.3.17 Hazardous Materials and Hazardous Waste Sites

Setting

Hazardous materials are defined as any solid, liquid, or contained gas that is ignitable, corrosive, reactive, and/or toxic. Hazardous wastes are hazardous materials that is discarded or being disposed of. While small amounts of hazardous materials and hazardous wastes exist in most businesses and residences, concentrations of hazardous materials and high volume hazardous waste streams fall under regulation by the State Department of Health.

Consultation with the State of Hawaii Department of Health's Hazardous Waste, Solid Waste, and Clean Water Branches and Hawaii County Department of Public Works' Solid Waste and Wastewater Divisions did not bring to light the existence of any known hazardous materials or hazardous waste sites in the project area. Two closed dump/landfill sites are located outside of the project area to the west. One site is at the location of the present refuse transfer station.

Effects

The installation of the recommended alternative will not require use hazardous materials nor will hazardous waste be generated. The project will have no effect on hazardous materials or hazardous waste sites.

Mitigation

None required.

6.4 RELATIONSHIP BETWEEN LOCAL SHORT-TERM USES AND ENHANCEMENT OF LONG-TERM PRODUCTIVITY

The present and most likely continued short-term use of the 29-acre Kauahi Reservoir site and the seven-acre stockwater distribution system right-of-way area, is grazing land. The long-term commitment of this grazing land for the installation of the works of improvement will result in a more reliable and expanded source of agricultural water that will enhance long-term productivity on 1,985 acres of cropland and 22,962 acres of grazing land.

6.5 UNRESOLVED ISSUES

None were identified.

6.6 RELATIONSHIP TO OTHER PLANS, POLICIES, AND CONTROLS

This section describes the relationship of the Selected Plan to federal, state, and local plans, policies, and controls for the watershed area.

6.6.1 State Land Use Districts

All lands in Hawaii are designated as one of four major land use categories by the State Land Use Commission as directed by Chapter 205, Hawaii Revised Statutes. The intent of the legislation is to provide land use controls at the state level in order to preserve, protect, and encourage best use of lands in the state for the benefit of all of the people of the State of Hawaii. The Land Use Districts are Urban, Rural, Agricultural, and Conservation.

The works of improvement (reservoir supply pipeline, reservoir, and distribution systems) proposed by the Selected Plan will be installed on land designated Agricultural. See following Figure S. The use of this land for such works of improvement is permitted in Agricultural districts.

The land use changes caused by the Selected Plan will also conform to the allowable uses in the Agricultural district (see section 6.9.2 Land Resources).

6.6.2 The Hawaii State Plan and State Agricultural Functional Plan

The Hawaii State Plan, established by Chapter 226, Hawaii Revised Statutes, provides goals, objectives, policies, and priorities to guide long-range development of the State of Hawaii. Twelve State Functional Plans develops in greater detail policies and priorities in twelve subject areas.

The 1991 State Agricultural Functional Plan states the following objective, policy, and action under water, which directly supports the implementation of the Selected Plan:

OBJECTIVE I: ACHIEVEMENT OF EFFICIENT AND EQUITABLE PROVISION OF ADEQUATE WATER FOR AGRICULTURAL USE.

POLICY I(1): Expand agricultural water resources statewide.

ACTION I(1)(a): Develop new, expanded, or improved water source and delivery systems in support of agriculture and aquaculture, as needed and economically feasible.

The 1991 State Agricultural Functional Plan states the following objective, policy, and action under land, which supports the implementation of the Selected Plan to enable the development of the Lalamilo Ag. Park:

OBJECTIVE H: ACHIEVEMENT OF PRODUCTIVE AGRICULTURAL USE OF LANDS MOST SUITABLE AND NEEDED FOR AGRICULTURE.

POLICY H(1): Provide suitable public lands at reasonable cost and with long-term tenure for commercial agricultural purposes.

ACTION H(1)(a): Complete agricultural park projects presently committed, and develop additional projects in accordance with the Ad Hoc Agricultural Park Site Selection Committee.

6.6.3 Hawaii County General Plan

The Hawaii County General Plan, 1989, outlines the goals, policies, and courses of action for the long-range comprehensive physical development of the county with respect to the most desirable use of land within the county. The following items support the implementation of the Selected Plan.

ECONOMIC - POLICIES: The County of Hawaii shall assist the expansion of the agriculture industry, especially diversified agriculture, through the protection of important agricultural lands, capital improvements and other programs, and continued cooperation with appropriate state and federal agencies.

Land Use - Agricultural Land

GOAL: To identify, protect and maintain important agricultural lands on the Island of Hawaii.

POLICY: The County shall assist in the development of basic resources such as water, roads, transportation and distribution facilities for the agricultural industry.

The Plan states the following as courses of action for the South Kohala District in which the watershed area is located:

ECONOMIC - Course of Action: The County shall assist the development of agriculture in South Kohala by protecting important agricultural land from urbanization, by providing or having provided the necessary capital improvements, such as water, and by working cooperatively with other agencies.

PUBLIC UTILITIES - WATER - Course of Action: Additional sources for the Waimea System (domestic water) shall be investigated. Encourage expansion of sources and storage capacity for both the agricultural and domestic water systems.

LAND USE - AGRICULTURE - Course of Action: Assist in the provision of water in agricultural areas.

6.6.4 Hawaii County Water Use and Development Plan (WUDP)

The Hawaii County WUDP is part of the Hawaii Water Plan required by the State Water Code (HRS Chapter 174C). The county-prepared plan includes an inventory of water sources, uses, and future water needs. The plan aids the State Commission on Water Resources Management and county planners in reviewing and granting approvals and permits for development and water use.

For the South Kohala region, the WUDP project the "present 2 to 3 mgd consumption [of Waimea farmers] will require up to an additional 2 mgd to handle the new irrigation requirements." (WUDP, draft 2/92) The Waimea-Paauilo Watershed project is described in Section 7.5.1 under the heading "Expansion of the Waimea Irrigation System."

6.6.5 Department of Hawaiian Home Lands Plans

The Selected Plan will support the efforts of the DHHL to provide infrastructure, including an agricultural water supply, to native Hawaiian homesteaders so they may farm and ranch. The Selected Plan will provide a more reliable source of irrigation water to DHHL farmers and will provide a stockwater distribution system that will service DHHL ranchlots.

6.6.6 Department of Transportation

The State of Hawaii, Department of Transportation is seeking an alignment for a bypass highway route to alleviate problems caused by the flow of through traffic through Waimea Town. Four alternatives were identified in the Waimea By-Pass Project Route Study (January 1995). As of this writing, a preferred route has not been selected. Two of the alternatives, R-1 and R-2, will place the by-pass highway adjacent to the Kauahi Reservoir and will utilize the same alignment as the reservoir supply pipeline for approximately 10,000 feet. At least four pipeline crossings of the by-pass highway will be required. Preliminary discussions indicate that even with the selection of alternative route R-1 or R-2, the two projects can be compatible.

6.6.7 Waimea Water Roundtable

The goal of the Waimea Water Roundtable is to achieve better coordination of the development and management of water resources in Waimea. Organized in 1996, the Roundtable is a diverse group of persons from the private sector, government, and the Waimea community with various water development and/or management interests. The group hopes to achieve it's goal by sharing information, working cooperatively, seeking input from, and establishing communication links among it's members, as well as with those in the community.

The Roundtable group has been briefed regarding the Waimea-Paauilo Watershed project.

6.6.8 Parker Ranch 2020 Plan

The Parker Ranch has developed a draft 2020 Plan for development of 338 acres near the Waimea Town core for public, commercial, industrial, and residential development. In response to community concerns, the plan was scaled back from the 580-acre plan which was approved by the county in 1992. In addition to a 72 acres of industrial and commercial area and 730 residential units, the Plan proposes over 45 acres of park and open space and enhancement of the visual character and beauty of Waimea through preservation of vistas and existing architectural styles. The plan will be implemented over a 15- to 25-year period beginning in 1997.

The 2020 Plan applies to urban-zoned property and does not affect any of the agricultural or pastoral areas served by the WIS. Parker Ranch lands have a proprietary water system and will not participate in the watershed project. Agricultural water supply and demand will not be affected by the Parker Ranch development.

6.6.9 County Zoning Code

The Kauahi Reservoir will be constructed on lands designated by the County Zoning Code as Agricultural-40 (A-40a). Its construction will be allowed by Sections 25-4-11(a) and (c) of the County Zoning Code which state that "Communication, transmission, and power lines of public and private utilities and government agencies are permitted uses within any district" and that "Public uses, structures and buildings and community buildings are permitted uses in any district . . .," respectively.

6.6.10 Hawaii Coastal Zone Management Program

The Hawaii Coastal Zone Management (CZM) Program is charged to balance marine and coastal resources protection and sustainable economic development. The CZM area encompasses the entire state, including the Waimea-Paauilo Watershed. The program is built upon ten policy areas: recreational resources, historic resources, scenic and open space resources, coastal ecosystems, economic uses, coastal hazards, managing development, public participation, beach protection, and marine resources.

The Waimea-Paauilo Watershed project will have no effect on recreational resources, coastal ecosystems, coastal hazards, beach protection, or marine resources.

Planning of the Waimea-Paauilo Watershed project has included historic and archaeological surveys of the affected area and has utilized a public participation process to discuss and raise awareness of resource development issues in the CZM area. Implementation of the Waimea-Paauilo Watershed project will improve agricultural conditions to maintain scenic and open space resources. The project will also result in fuller economic use of agriculturally-zoned lands in agricultural enterprise.

6.6.11 Ceded Lands Trust

When the United States annexed Hawaii in 1898, approximately 1.75 million acres of Government and Crown Lands were ceded to the United States. The Joint Resolution of Congress at the time of annexation and the Organic Act establishing Hawaii as a Territory in 1900, affirmed the trust responsibility to use the ceded lands "for the benefit of the inhabitants of the territory." When Hawaii became a State in 1959, the ceded lands were transferred to the state government.

The state's primary responsibilities with regard to ceded lands are established in Section 5 of the Admissions Act. Section 5(f) of the act provides that these lands and the income and proceeds derived from them are to be held by the state as public trust. The eligible uses of ceded lands are:

1. *Support of the public schools and other public educational institutions.*
2. *Betterment of the conditions of native Hawaiians as defined in the Hawaiian Homes Commission Act of 1920.*
3. *Development of farm and home ownership on as widespread a basis as possible.*
4. *Making of public improvements.*
5. *Provision of land for public use.*

The Selected Plan utilizes ceded lands for a reservoir site and installation alignments for the pipelines. The plan also provides agricultural water to agricultural operators of DHHL and other parcels on ceded land. The project's use of ceded land conforms to the eligible uses set forth in Section 5(f) of the Admissions Act. The expansion of the WIS is a public improvement providing beneficial service to all farmers and ranchers within the service area. The expansion of the WIS will especially benefit native Hawaiian farmers in the developing DHHL Puukapu farmlots and DHHL ranchers in Puukapu, Nienie, and Kamoku.

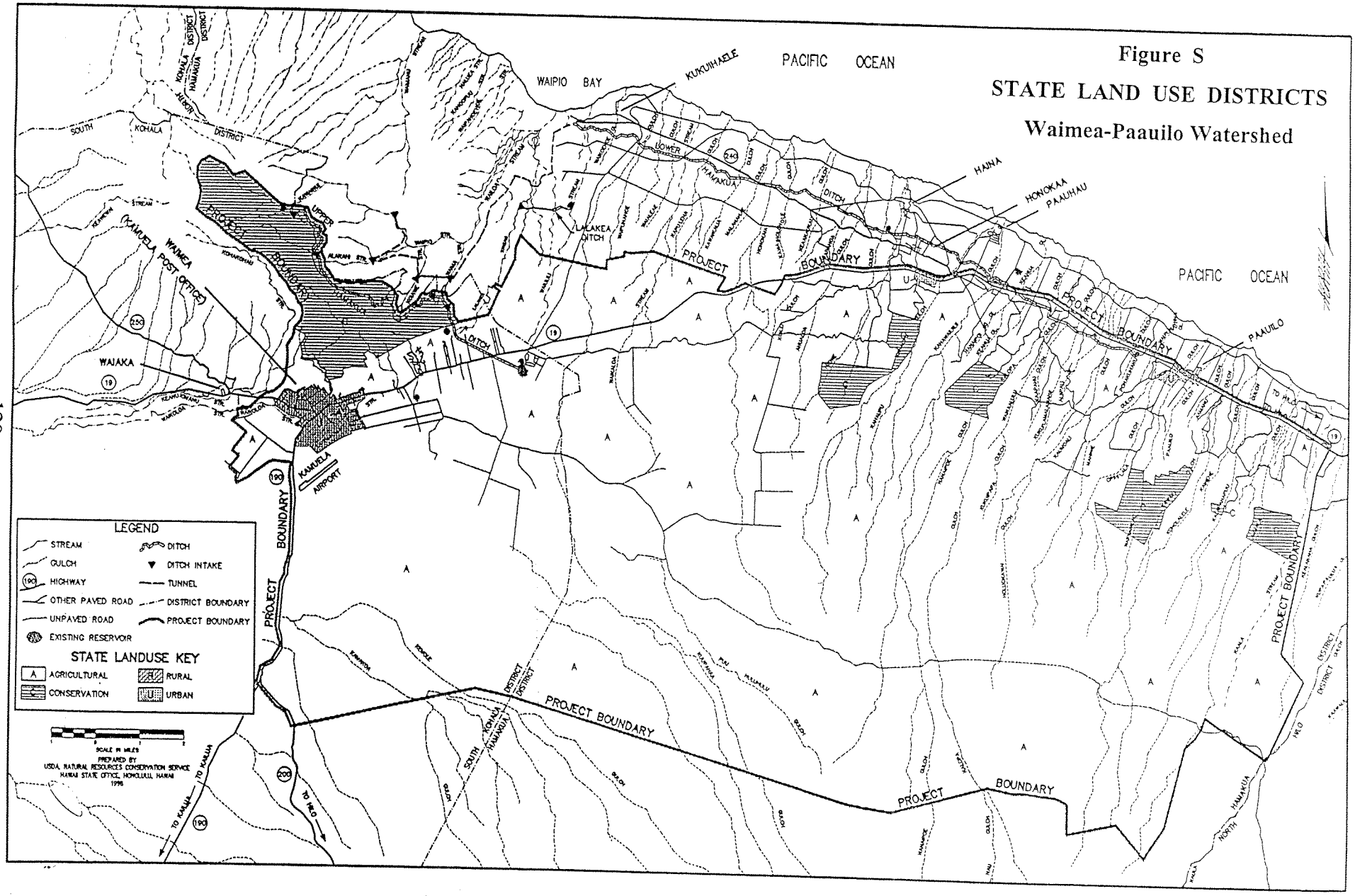


Figure S

STATE LAND USE DISTRICTS

Waimea-Paauilo Watershed

7. CONSULTATION AND PUBLIC PARTICIPATION

7.1 ACTIVITIES CONDUCTED

The following section describes the opportunities provided for the public's participation, as well as federal, state and county agencies, in developing both the Waimea-Paauilo Watershed Plan and Environmental Assessment and Watershed Plan and Environmental Impact Statement.

Following is a description of date, type, and purpose of the activities conducted to involve the public and agencies.

March 1982	Hamakua Area Agricultural Water Study (HAAWS) completed by NRCS. Study included the development of resource reports and potential alternatives to solve water shortage problems.
July 7, 1982	Sponsors (Department of Land and Natural Resources and the Mauna Kea Soil and Water Conservation District) filed a Preapplication for Federal Assistance indicating their intent to apply for federal assistance under PL 83-566 with the State Clearinghouse (Department of Land and Natural Resources). Copy sent to the State Conservationist for the USDA, NRCS.
March 28, 1983	Sponsors submitted Application for Assistance under PL 83-566 to prepare a watershed plan to the Secretary of Agriculture.
April 7, 1983	Approved Application submitted by the Sponsors to the NRCS.
April 22, 1983	Request for planning authorization submitted by NRCS Hawaii to NRCS National Headquarters in Washington, D.C.
July 5, 1983	Authorization for NRCS Hawaii to provide planning assistance to develop a watershed plan to provide irrigation water for the Waimea-Paauilo Watershed under the authority of PL 83-566 granted by the Chief of the NRCS. The Chief also notified Hawaii congressional delegation.
July 19, 1983	Letters sent by NRCS to 29 various agencies and individuals notifying them of the receipt of planning authorization.
August 3, 1983	Project assigned to NRCS West National Technical Center Planning Staff.
Dec. 7, 1984	Public meeting held to discuss future planning activities and to hear public concerns. Meeting notice sent to over 300 individuals or organizations, including all boxholders in the watershed area and to federal, state, and county agencies. Public service announcements sent to local radio stations, posters put up, news release sent to local newspapers, and a legal notice published in the local newspaper.
Feb. 21, 1985	FWS responded to request to become a cooperating agency with comments.
March 28, 1985	DHHL became a project Sponsor.

May 15, 1985	Public Participation Plan completed by the Mauna Kea SWCD, listing actions items to be taken and dates for completion. Action items included public and Sponsors' meetings, radio announcements, publication of new articles and/or notices of meetings in local newspapers, and mass mailings of meeting notices.
June 26, 1986	Public meeting held to present the Alternative Report "Cost & Benefit Summary" and to receive comments. Notice of meeting mailed to over 300 local farmers and ranchers, public agencies, local politicians, and Department of Water Supply domestic water customers, news release sent to local newspapers, and a legal notice published in the local newspaper. An article about the project and the public meeting was published in the local newspaper, Hawaii Tribune-Herald, on June 20, 1986.
Sept. 2, 1986	Letter sent by NRCS Hawaii to the NRCS Chief requesting an exception to the planning authorization to add stockwater, in addition to irrigation water, as a project purpose.
October 1, 1986	Letter sent by NRCS Chief to NRCS Hawaii authorizing the amendment of the planning authorization to provide for technical assistance only for the addition of stockwater development.
Feb. 4, 1987	Public Participation Plan update prepared which includes action items for stockwater "public participation."
April 1987	The Mauna Kea SWCD mailed 58 watershed area ranchers survey questionnaires to determine current status of stockwater use and future projections for stocking rates and stockwater needs. 22 questionnaires mailed back.
April 7, 1987	NRCS personnel invited to meeting of watershed area ranchers to present information regarding stockwater alternatives developed to date. A Stockwater Steering Committee was formed by the ranchers to assist with planning and to provide rancher input.
Sept. 20, 1988	Public Meeting held to discuss proposed actions and to receive comments. Notice of meeting mailed to over 300 local farmers and ranchers, public agencies, local politicians, and Department of Water Supply domestic water customers and a public meeting notice was published in two local newspapers, the Hawaii Tribune Herald and the West Hawaii Today.
April 17, 1989	Draft Plan-EA mailed to numerous federal, state, and county agencies; legislators, local farm groups, environmental groups, interested individuals, and local libraries (see section 7.2). The Draft was available for a 45-day review and comment period.
April 28, 1989	A Notice of a Finding of No Significant Impact (FONSI) published in the Federal Register.

July 1, 1989	DOA became a Sponsor instead of DLNR because DOA took over the operation and administration of the WIS.
Sept. 14, 1989	Letter received by NRCS from a party in the process of purchasing a home that abuts the proposed Waimea II Reservoir requesting that the Watershed Agreement not be signed due to their concerns about safety and negative effects on property values.
Sept. 20, 1989	Watershed Agreement signed.
Feb. 27, 1990	Final Plan-EA mailed to appropriate federal, state, and county agencies and those providing substantive comments on the Draft.
Sept. 27, 1992	Letter received by NRCS from the same party (who purchased the home abutting the proposed Waimea II Reservoir) voicing opposition to the reservoir because of concerns about safety and negative effects on property values.
January 1993	Topographic survey of the proposed Waimea II Reservoir site completed.
April 1993	NRCS began contracting for geologic and soils investigations of the proposed Waimea II Reservoir site.
June 4, 1993	Letter received by NRCS from same party again voicing opposition to the proposed Waimea II Reservoir. Party sent copies of letter to Hawaii U.S. congresspersons, local politicians, and other interested parties.
July 8, 1993	Letter received by NRCS from another party with home abutting the proposed Waimea II Reservoir voicing concerns about safety. Party sent copies of letter to Hawaii U.S. congresspersons, local politicians, and other interested parties.
July 26, 1993	Letter received by Secretary of Agriculture from Hawaii Congresswoman Patsy Mink regarding copies of letters from the two above mentioned parties inquiring whether an EIS could be prepared so that concerns about the Waimea II Reservoir could be addressed.
August 13, 1993	NRCS met with the two above mentioned parties to provide update of project planning and to hear their concerns.
Sept. 2, 1993	Informational meeting held by the Mauna Kea SWCD attended by Sponsors, farmers, ranchers, and the two parties with homes abutting the proposed Waimea II Reservoir. Overview, history, and update of project provided by NRCS and discussion of concerns was held.
September 1994	Decision made to prepare an EIS.
Sept.19, 1994	Notice of Intent to Prepare an Environmental Impact Statement published in the Federal Register. Also mentioned September 21, 1994 Public Scoping Meeting.
	In response to the notice, the following written correspondence was received:

Dr. Bruce S. Anderson, Interim Director, Office of Environmental Quality Control, State of Hawaii, Department of Health (DOH) recommended the submission of a Chapter 343 EIS Preparation Notice in order to prepare a single EIS that will meet both State and Federal requirements.

Sept. 21, 1994 — Public meeting held to discuss planning to date, future EIS planning activities, and to identify public concerns. Meeting notice sent to over 600 individuals or organizations, including all boxholders in the watershed area and to federal, state, and county agencies. Public service announcements sent to local radio stations, news release sent to local newspapers, and a legal notice published in the local newspaper. Article published in Hawaii Tribune-Herald, September 18, 1994 about the meeting. Approximately 85 persons attended the meeting.

Sept. 27, 1994 — *Residents for Relocating the Reservoir sent a letter to NRCS, through their attorney, with 22 specific concerns they want addressed in the EIS, including reservoir safety, hydrology, water rights, and construction traffic effects.*

Nov. 8, 1994 — Environmental Impact Statement Preparation Notice published in the State of Hawaii, Department of Health, Office of Environmental Quality Control (OEQC) Bulletin. The following written comments were received in response to the notice:

Mr. John H. Shaw requested to be a "consulted party" and receive a copy of the Draft Plan-EIS.

Dr. Bruce S. Anderson, requested a list of agencies to be consulted in preparation of the Plan-EIS.

Paul J. Schwind, Planning Program Administrator, State of Hawaii, DOA, requested that the matter of the location of the Lalamilo Ag. Park be resolved.

Department of Business, Economic Development & Tourism submitted a request from the Land Use Commission that the Plan-EIS include a map showing the project site in relation to the State Land Use Districts.

Leslie L. Harakawa, Attorney at Law, on behalf of Ardis Shaw-Kim, requested further information regarding the project.

Peter A. Sybinsky, Ph.D., Director of Health, State of Hawaii, DOH, had no comments to offer at the time, however requested to receive a copy of the Draft Plan-EIS.

Keith W. Ahue, Chairperson, State of Hawaii, Board/Department of Land and Natural Resources, submitted two letters. In response to numerous telephone calls the Division of Land Management (DLM) received from residents of the Kamuela area expressing their concerns and opposition regarding the development of water resources in the Kohala Forest Reserve, the DLM will reserves comments until they had an opportunity to review the Draft Plan-EIS.

Late 1995	Hawaii NRCS began project planning and preparation of the Plan-EIS.
June 4, 1996	*Residents to Relocate the Reservoir sent a letter to NRCS, through their attorney, reiterating the concerns included in the September 1994 letter and threatening legal action if implementation of the Waimea II Reservoir proceeded.*
Sept. 26, 1996	NRCS invited to a Waimea Hawaiian Homesteaders' Association, Inc. meeting to provide update of project planning.
October 1996	Technical Review Plan-EIS completed and sent to the Sponsors for review.
December 1996	Comments received from Sponsors.
March 1997	Draft Plan-EIS completed. A copy of the Draft Plan-EIS was mailed to the organizations/individuals listed in section 7.3, and comments were requested. A Notice of Availability was forwarded by EPA for publication in the Federal Register and to the State of Hawaii, Office of Environmental Quality Control (OEQC) for publication in its Bulletin. A 45-day review period was be allowed beginning on the date that the notice is published in the Federal Register by EPA. NRCS was publicized the availability of and invited comments on the Draft Plan-EIS through notices in local newspapers and other media.
April 23, 1997	A public meeting was held in Waimea to solicit comments on the Draft Plan-EIS. The meeting was widely publicized and meeting notices were mailed to the over 300 individuals or organizations on the mailing list.
October 1997	Final Plan-EIS completed. Comment and response letters on the Draft Plan-EIS are included in the Final Plan-EIS. Copies of the Final Plan-EIS were mailed to the EPA, the OEQC, and other appropriate agencies and to those providing substantive comments on the Draft. Following the acceptance of the Final-EIS by the Governor of the State of Hawaii, there will be a 30-day no action period during which objection to the project may be brought to the Hawaii Circuit Court. The NRCS Hawaii State Conservation will issue a Record of Decision which will be published in the Federal Register, Environmental Bulletin, and local newspapers.

Numerous activities were conducted to provide the appropriate agencies with an opportunity to comment on potential impacts on threatened and endangered species. The

U.S. Fish and Wildlife Service (FWS) (Pacific Islands Administrator) and the State of Hawaii, DLNR, Division of Forestry and Wildlife were specifically requested throughout project planning to provide information and/or comment. See section 6.3.13 Threatened and Endangered Species for a detailed account of the activities conducted.

Numerous activities were also conducted to provide the appropriate agencies with an opportunity to comment on potential impacts on cultural resources. The State Historic Preservation Officer was specifically requested throughout project planning to provide information and/or comment. See section 6.3.4 Cultural Resources for a detailed account of the activities conducted.

The Stockwater Committee, comprised of ranchers from the DHHL pastoral lots, was active during both phases of planning to promote and assure inclusion of the livestock drinking water component in the project plan. The Stockwater Committee assisted with data gathering and review of project alternatives. Their efforts were largely responsible for the decision of the DHHL to fund the livestock drinking water distribution system.

7.2 DRAFT PLAN-EA MAILING LIST

The Draft Plan-EA was mailed to the parties shown on the following list. Comments were received from those parties marked with a "*."

Federal

- Department of Agriculture
  - Office of Equal Opportunity
  - Agricultural Stabilization and Conservation Service (now Farm Service Agency), Hawaii State Office, State Executive Director
  - Rural Development (formerly Farmer Home Administration), Hawaii State Office
  - Soil Conservation Service (now NRCS), Waimea Field Office, District Conservationist
  - Soil Conservation Service (now NRCS), Big Island RC&D Office, RC&D Coordinator
  - Forest Service, Pacific Southwest, Regional Forester
- Department of the Army
  - U.S. Army Corps of Engineers, Honolulu, Planning Branch
- Department of Commerce
  - National Oceanic and Atmospheric Administration, Ecology and Conservation Division, Director
- Department of Energy
  - Secretary of Energy
- Department of Housing and Urban Development
  - Environmental Clearing Officer
  - Community Planning and Development Division, Honolulu Office, Director *
- Department of Health and Human Services
  - Center for Environmental Health and Injury Control, Environmental Health Specialist *
- Department of the Interior
  - Secretary of the Interior
  - Advisory Council on Historic Preservation
  - Fish and Wildlife Service, Pacific Islands Office, Supervisor *
  - Fish and Wildlife Service, Ecological Services Division, Field Supervisor
  - United States Geological Survey, Water Resources Division, District Chief
  - National Park Service, Pacific Island System Support Office, Superintendent
  - Office of Environmental Project Review, Director
- Advisory Council on Historic Preservation, Executive Director

Environmental Protection Agency
- Office of Federal Activities, Region 9, San Francisco , CA *
- Pacific Islands Contact Office, Manager *

Department of Transportation *
Hawaii Delegates to the U.S. House of Representatives and Senate

State of Hawaii

Department of Agriculture
- Board of Agriculture, Chairperson *

Department of Business and Economic Development (now DBEDT)
- Director

Department of Health
- Environmental Health Administration, Deputy Director *

Department of Land and Natural Resources
- Board of DLNR, Chairperson and State Historic Preservation Officer *
- Forestry and Wildlife Division, Administrator *
- State Parks Division, Outdoor Recreation and Historic Sites
- Division of Water and Land Development, Manager-Chief Engineer*
- Waimea Irrigation System, Manager
- Mauna Kea Soil and Water Conservation District

Department of Hawaiian Home Lands
- Hawaiian Homes Commission, Chairman
- Planning Office *

Department of Transportation, Director *
Office of the Governor
- Governor * (response via Administrative Director)
- Office of State Planning (now Office of Planning), Director *

Office of Environmental Quality Control, Director *
University of Hawaii
- Cooperative Extension Service
- Hamilton Library, Hawaiiana Collection

Hawaii State Archives, State Archivist
Department of Education
- Hawaii State Public Library System, Hawaii State Library
- Hawaii State Public Library System, Honokaa Library
- Hawaii State Public Library System, Thelma Parker (Waimea) Library

County of Hawaii

Planning Department, Director
Department of Water Supply, Manager

Others

Advisory Council on Historic Preservation, Executive Director
Alu Like, Executive Officer

American Society of University Women, Honolulu Branch, President
Audubon Society, Hawaii, President
Conservation Council of Hawaii
Hawaiian Botanical Society, President
Hawaiian Entomology Society, President
Hawaiian Historical Society, Administrative Director
Hawaii's Thousand Friends, President
League of Women Voters, President
Life of the Land, President
National Wildlife Federation, Legislative Representative
Natural Resources Defense Council, Inc., Executive Director
Nature Conservancy, Hawaii, Executive Director
Outdoor Circle, Hawaii, President
Sierra Club, Washington D.C.
Sierra Club, Hawaii Chapter, Chairperson
Stockwater Steering Committee
Waimea Farmers Association
Waipio Valley Taro Farmers Association
Wildlife Society, Hawaii Chapter, President

Comments were also received from the Mr. Terrance R. Shumaker representing the Waipio River Instream Users group, Mr. Christopher Rathbun, and Mr. Edward K. Kalama representing the Aged Hawaiians group. Copies of the comment letters and the written responses to those letters were included in the *1989* Plan-EA as Appendix A.

7.3 DRAFT PLAN-EIS MAILING LIST

A copy of the Draft Plan-EIS was mailed to the following organizations/individuals listed and comments were requested.

Federal

Department of Agriculture
- Secretary of Agriculture
- Office of Advocacy and Enterprise, Director
- Farm Service Agency, Hawaii State Office, State Executive Director
- Rural Development, Hawaii State Office
- Forest Service, Pacific Southwest Research Station, Director
- NRCS, Watersheds and Wetlands Division, Director
- NRCS, Kamuela Field Office, District Conservationist

Department of the Army
- U.S. Army Engineer District, Honolulu, Planning Branch, Chief, Engineering Division
- U.S. Army Support Command Hawaii, Environmental Management Office, Directorate of Facilities Engineer

Naval Base, Pearl Harbor, Commander
- Department of Commerce
  - National Oceanic and Atmospheric Administration, Administrator
- Department of Housing and Urban Development
  - Environmental Clearance Officer
- Department of Health and Human Services
  - Center for Environmental Health and Injury Control, Environmental Health Specialist
- Department of the Interior
  - Secretary of the Interior
  - Office of Environmental Project Review, Director
  - Fish and Wildlife Service, Pacific Islands Ecoregion, Manager
  - United States Geological Survey, Water Resources Division, District Chief
- Environmental Protection Agency
  - Office of Federal Activities (A-104), Director
  - Office of Federal Activities (E-3), Region 9, San Francisco , CA, Chief
- Department of Transportation
  - U.S. Coast Guard G-MPS1, Water Resources, Coordinator

<u>State of Hawaii</u>

- Department of Accounting and General Services
  - Comptroller
  - Archives Division, State Archivist
- Department of Agriculture, Board of Agriculture, Chairman
- Department of Budget and Finance, Housing Finance and Development Corporation
  - Executive Director
- Department of Business, Economic Development and Tourism
  - Director
  - Research and Economic Analysis Division, Head Librarian
  - Energy Division, Division Head
- Department of Defense, Adjutant General and Director of Civil Defense
- Department of Health, Director
- Department of Land and Natural Resources
  - Board of DLNR, Chairperson
  - State Historic Preservation Office
- Department of Hawaiian Home Lands, Hawaiian Homes Commission, Chairman
- Department of Transportation, Director
- Office of the Governor
- Office of Planning, Director
- Office of Environmental Quality Control, Director
- Office of the Legislative Reference Bureau, Director
- University of Hawaii
  - Environmental Center, Director
  - Water Resources Research Center, Director

Hilo Campus Library
Hamilton Library
Department of Education, Hawaii State Public Library System
Hawaii State Library
Bond Memorial (Kohala) Library
Honokaa Library
Thelma Parker (Waimea) Library
Kaimuki Regional Library
Kaneohe Regional Library
Pearl City Regional Library
Hilo Regional Library
Wailuku Regional Library
Kauai Regional Library
State Legislature Representatives (senators and house representatives for the watershed area)

County of Hawaii

Planning Department, Director
Department of Parks and Recreation, Director
Department of Public Works, Chief Engineer
Department of Research and Development, Director
Department of Water Supply, Manager
County Council, Chair
County Council, Member (representing watershed area)
Mayor
Civil Defense Agency, Administrator

Others

Alu Like, Executive Officer
American Lung Association
Audubon Society, Hawaii, President
Conservation Council of Hawaii
Ms. Teresa Espaniola
Hawaii Delegates to the U.S. Congress
Hawaii Tribune Herald
Hawaii's Thousand Friends, President
Hawaiian Botanical Society, President
Hawaiian Electric Company
Hawaiian Entomology Society, President
Hawaiian Historical Society, Administrative Director
Honolulu Advertiser
Honolulu Star Bulletin
Legal Aid Society of Hawaii
Life of the Land, President
Mauna Kea Soil and Water Conservation District

National Wildlife Federation, Legislative Representative
Natural Resources Defense Council, Inc., Executive Director
Nature Conservancy, Hawaii, Executive Director
Office of Hawaiian Affairs, Chair
Outdoor Circle, Hawaii, President
Mr. Christopher Rathbun c/o Honokaa Law Office
Residents for Relocating the Reservoir c/o Bays Dever Hiatt Kawachika Lezak, Attorneys at Law
Mrs. Ardis Shaw-Kim
Mr. John and Juanita H. Shaw
Mr. Brian Shaw
Mr. Terrance R. Shumaker, Attorney at Law
Sierra Club, Hawaii Chapter, Chairperson
Stockwater Steering Committee
Sun Press
The Aged Hawaiians, President
Waimea Farmers Association
Waimea Hawaiian Homesteaders' Association
Waimea Irrigators Association
Mr. and Mrs. Robert F. Walden
Waipio Valley Taro Farmers Association
West Hawaii Today

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8. PLAN-EIS PREPARERS

Table AB lists names and qualifications of NRCS staff who worked on the Plan-EIS.

Table AB
PLAN-EIS PREPARERS AND THEIR QUALIFICATIONS
Waimea-Paauilo Watershed

Name	Present Title (Years)	Previous Job Experience (Years)	Education Degree(s)	Other Qualifications
Hawaii State Office				
Glenn G. Ahuna	Hydrologist (16) [1/]	Civil Engineer (8)	BS-Civil Eng.	PE - HI [2/] PE - CA [2/]
Michael Hayama	Design Engineer (20)		BS-Civil Eng.	PE - HI [2/]
Fen Hunt	Economist (2) [1/]	Economist (2) University Instructor (4) Graduate Assistant (5)	BA-Economics MA-Economics Ph.D.-Economics	
Gail H. Ichikawa	Economist (12)	Planner (2)	BS-Agriculture	
Carol Kawachi	Cultural Resource Specialist (1)	Archeologist (10) Teacher (12)	BS-Education MA-Education MA-Anthropology	
Terrell Kelly	State Biologist (1)	Legislative Assistant (2) Environmental Planner (4) Environ. Protection Spec.(2) Ecologist (2)	BA-Political Sci. MS-Environ. Sci.	
Michael R. Kolman	Asst. St. Conservationist (6)	Asst. St. Con. (2) Staff Leader (6) Economist (6)	BA-Economics MA-Economics MA-Public Admin.	
Dudley Kubo	Planning Engineer (11)	Civil Engineer (2)	BA-History MA-History BS-Civil Eng.	PE - HI [2/]
Douglas Spencer	GIS/CAD Coordinator (5) [1/]	Eng. Tech/Surveyor (15)	AA-Liberal Arts	
Robin S. White	Planning Geologist (3) [1/]	Planning Geologist (7) Geophysical Tech/Supvr/Mgr (5)	BA-Geology MS-Geoscience	RG - NC [3/]
Kamuela Field Office				
Gary Kam	District Conservationist (13)	Soil Conservationist (7)	BS-Soil Science	
Jerome F. Williams	Soil Conservationist (18)	Arborist (4)	BS-Forest Resources Mgt.	

[1/] No longer working at the Hawaii State Office. Represents status at the time when work on the project was conducted.
[2/] Professional Engineer - state.
[3/] Registered Geologist - state.

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Appendix A

WAIMEA IRRIGATION SYSTEM WATER RESTRICTION HISTORY

WAIMEA IRRIGATION SYSTEM
WATER RESTRICTION PERIODS
1965 to 1986

Location	Date Started	Date Lifted	Length
Lalamilo	Sep 2, 1965	Nov 5, 1965	64 days
"	Jun 15, 1967	Jul 17, 1967	32 "
"	Oct 3, 1967	Nov 2, 1967	30
"	Nov 8, 1968	Dec 4, 1968	26 "
"	Oct 24, 1969	Nov 7, 1969	14 "
"	Sep 17, 1971	Oct 25, 1971	38 "
"	Mar 27, 1972	Apr 5, 1972	9 "
"	Jan 15, 1981	Feb 27, 1981	43 "
Lalamilo, Puukapu & HHL farms	Jul 2, 1981	Aug 26, 1981	55 "
"	Feb 10, 1983	Mar 31, 1983	49 "
"	Mar 24, 1984	Apr 2, 1984	9 "
"	Jul 28, 1984	Aug 13, 1984	16 "
"	Sep 13, 1984	Nov 21, 1984	38 "
"	Feb 12, 1985	Mar 1, 1985	17 "
"	Sep 18, 1985	Sep 20, 1985	2 "
"	Nov 15, 1985	Nov 20, 1985	5 "
"	Feb 5, 1986	Feb 18, 1986	13 "
"	Mar 7, 1986	Mar 24, 1986	17 "

SUMMARY OF RESTRICTIONS

Year	Total Days of Restrictions				
1965	64 days	(Lalamilo)			
1967	62 "	"			
1968	26 "	"			
1969	14 "	"			
1971	38 "	"			
1972	9 "	"			
1981	98 "	(Lalamilo,	Puukapu	&	HHL)
1983	49 "	"	"		"
1984	63 "	"	"		"
1985	24 "	"	"		"
1986 (5 mos.)	30 "	"	"		"

Source: State of Hawaii, Department of Land and Natural Resources, Division of Water and Land Development (April 1988). *Environmental Assessment - Improvements to the Upper Hamakua Ditch.*

WAIMEA IRRIGATION SYSTEM
WATER RESTRICTION PERIODS
1987 Through January 24, 1997

September 1, 1987	Issued conservation notice (requesting voluntary conservation).
September 4, 1987	Imposed water restriction (mandatory restriction - set water allocation)
October 5, 1987	Lifted water restriction.
October 16, 1987	Issued conservation notice.
August 30, 1988	Issued conservation notice.
September 2, 1988	Imposed water restriction.
September 12, 1988	Lifted water restriction.
September 26, 1989	Issued conservation notice.
October 4, 1989	Imposed water restriction.
October 9, 1989	Lifted water restriction.
November 7, 1989	Issued conservation notice.
November 14, 1989	Imposed water restriction.
January 11, 1990	Lifted water restriction.
February 21, 1990	Issued conservation notice.
November 9, 1990	Issued conservation notice.
September 26, 1991	Issued conservation notice.
October 1, 1991	Imposed water restriction.
November 26, 1991	Lifted water restriction.
March 7, 1992	Imposed water restriction.
March 26, 1992	Lifted water restriction.
April 11, 1992	Imposed water restriction.
May 7, 1992	Lifted water restriction.
May 20, 1992	Issued conservation notice.
August 7, 1992	Lifted water restriction.
October 22, 1992	Issued conservation notice.
November 10, 1992	Lifted water restriction.
October 7, 1994	Issued conservation notice.
November 1, 1994	Lifted water restriction.
February 23, 1995	Issued conservation notice.
August 10, 1995	Lifted water restriction.

September 27, 1995	Issued conservation notice.
December 7, 1995	Issued conservation notice reminder.
January 17, 1996	Reached critical water status. Issued irrigation water status report.
March 8, 1996	Lifted water restriction.
August 26, 1996	Issued conservation notice.
October 14, 1996	Issued irrigation water status report.
October 29, 1996	Imposed water restriction.
November 12, 1996	Lifted water restriction.
November 26, 1996	Lifted conservation notice.

Source: Waimea Irrigation System

Appendix B

LETTERS AND COMMENTS

This section contains letters and comments received during the review of the Draft Plan-EIS and responses to those comments. Notes from the Public Meeting held during the review period are included.

Written comments were received from thirty-three groups and individuals during the 45-day DEIS review. A written response was returned for every comment. The notes of the Public Meeting held during the DEIS are also included.

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DEPARTMENT OF BUSINESS,
ECONOMIC DEVELOPMENT & TOURISM

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235 South Beretania St., 5th Flr., Honolulu, Hawaii 96813
Mailing Address: P.O. Box 2359, Honolulu, Hawaii 96804

Tel.: (808) 587-3807
Fax: (808) 586-2536

March 24, 1997

MEMORANDUM

TO: Michael Kolman, NRCS Assistant State Conservationist
Natural Resources Conservation Service
United States Department of Agriculture

FROM: Maurice H. Kaya

SUBJECT: Waimea-Paauilo Watershed Project, Hamakua/South Kohala Districts

Thank you for the copy of the draft plan. The Energy, Resources, and Technology Division does not have any comments to offer.

B-3

USDA

United States
Department of
Agriculture

Natural
Resources
Conservation
Service

P.O. Box 50004
Honolulu, HI
96850

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

July 8, 1997

Maurice H. Kaya, Division Head
Energy, Resources, and Technology Division
Department of Business, Economic Development, and Tourism
P.O. Box 2359
Honolulu, Hawaii 96804

Dear Mr. Kaya:

Subject: Draft Watershed Plan and Environmental Impact Statement for the Waimea-Paauilo Watershed

Thank you for your letter of March 24, 1997 stating that the Energy, Resources, and Technology Division has no comments on the subject document.

Sincerely,

ACTING
KENNETH M. KANESHIRO
State Conservationist

STOCKWATER COMMITTEE
P. O. BOX 104
KAMUELA, HI 96743 885-6153

MARCH 24, 1997

ETHEL ANDRADE CHAIRMAN
DON WINTERS VICE CHAIRMAN
CLARENCE KAUAHI SECRETARY
MEMBERS:
PAT ASING
TEDDY BELL
MARLA FERGERSTROM
DAN KANIHO, JR.
SONNY KANIHO
MARK KEALAMAKIA
SHIRLEY KEALOHA
HARTWELL OLSEN
JIMMY WRIGHT
JIM DUPONT

MR. KENNETH M. KANESHIRO, STATE CONSERVATIONIST
USDA, NATURAL RESOURCES CONSERVATION SERVICE
P. O. BOX 50004
HONOLULU, HAWAII 96850-0050

DEAR KENNETH:

RE: DRAFT WATERSHED PLAN & ENVIRONMENTAL IMPACT STATEMENT

B4

MAHALO FOR YOUR LETTER OF MARCH 20, 1997 WITH ENCLOSURES AS ADVISED.

SINCE OUR COMMITTEE HAS BEEN INVOLVED WITH THIS SUBJECT MATTER FROM MARCH 31, 1987, WE WOULD APPRECIATE SUCH NOTIFICATION BE INCLUDED IN THIS STATEMENT WHEREVER APPLICABLE. MAHALO.

SECONDLY, WE ENCLOSE LES WISHARD JR. LETTER OF OCTOBER 14, 1994, WHICH WE BELIEVE SHOULD ALSO BE ADDED TO THIS STATEMENT.

THIRDLY, WOULD YOU BE KIND ENOUGH TO SEND A COPY OF THIS STATEMENT TO MR. NAHOA LUCAS, NATIVE HAWAIIAN LEGAL CORPORATION, 1164 BISHOP SUITE 1205, HONOLULU, HI 96813-2826. MAHALO.

IT HAS BEEN OUR DISTINCT PLEASURE WORKING WITH YOU OVER THESE PAST YEARS, AND YOUR KIND ATTENTION TO OUR HUMBLE REQUEST IS DEEPLY APPRECIATED. MAHALO.

SINCERELY YOURS,

Ethel Andrade

(MRS) ALFRED ANDRADE
ENCL.
XC - EACH MEMBER
NAHOA LUCAS, ESQUIRE

P.S. MEMBERS: PLEASE CALL ME IF YOU WANT TO READ THIS STATEMENT.

USDA

United States Department of Agriculture

Natural Resources Conservation Service

P.O. Box 50004
Honolulu, HI
96850

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

July 8, 1997

Ethel Andrade, Chairman
Stockwater Committee
P.O. Box 104
Kamuela, Hawaii 96743

Dear Ms. Andrade:

Subject: Draft Watershed Plan and Environmental Impact Statement for the Waimea-Paauilo Watershed

Thank you for your letter of March 24, 1997 with comments on the subject document. We wish to respond to your comments.

COMMENT: Our Committee has been involved with this project since March 31, 1987 and would appreciate recognition in the EIS wherever applicable.

RESPONSE: The inclusion of the livestock drinking water element of the Waimea-Paauilo Watershed project is largely through the perseverance and effort of the Stockwater Committee. Recognition will be included in the Public Participation section of the FEIS.

COMMENT: We enclose Les Wishard, Jr.'s letter of October 14, 1994, which we believe should also be added to the EIS.

RESPONSE: The Wishard letter will be reproduced as part of the Stockwater Committee's comments in the FEIS.

COMMENT: Please send a copy of the DEIS to Mr. Nahoa Lucas, Native Hawaiian Legal Corporation.

RESPONSE: The DEIS was sent to Mr. Lucas on March, 28, 1997, as requested.

Sincerely,

ACTING

KENNETH M. KANESHIRO
State Conservationist

The Natural Resources Conservation Service works hand-in-hand with the American people to conserve natural resources on private lands.

AN EQUAL OPPORTUNITY EMPLOYER

LES WISHARD, JR.
P. O. Box 1149
Kamuela, Hawaii 96743
Tel: (808) 880-1055

October 14, 1994

Mr. Michael Kolman
Assistant State Conservationist
U.S.D.A., Soil Conservation Service
P. O. Box 50004
Honolulu, Hawaii 96850-0001

Dear Mr. Kolman:

B-5 Re: Waimea-Paauilo Watershed Project,
Diversion of Water from Waipio Valley

At the E.I.S. Scoping Meeting September 21, 1994 in Kamuela, concerns were expressed regarding the diversion of water from Waipio Valley that the Waimea-Paauilo Watershed Project would collect.

To give a little background on myself, I spent most of my working career in Hamakua with the Plantations & Hawaiian Irrigation Company, Ltd. Also for many years I owned over an acre of land in Waipio Valley. I retired from Hamakua Sugar Co., Inc. during 1987.

There are presently three ditch systems, two above and one in, Waipio Valley. All three systems were constructed early in the 1900's and have been in use since then. A brief description follows:

1. Lalakea Ditch System, built by Pacific Sugar Mill, Ltd. (sold to Honokaa Sugar Co. 1928). Located mauka of Hilawe Falls east of Waipio Valley. System of lined tunnels and open ditch, of which I have walked and worked on, to a 20 million gallon reservoir, with a large pipeline discharging water into the Lower Hamakua Ditch east of Kukuihaela Village. During low water flow periods there is no water flowing into this system or over Hilawe Falls. Future ownership?

2. Upper Hamakua Ditch System, which is the source for the proposed Waimea-Paauilo Watershed Project, built by Hawaiian Irrigation Co., Ltd. Intakes are located mauka of Waipio Valley in the forest north of Waimea (Kamuela). Starting west in Kawainui Stream and traversing east thru tunnels and ditches to mauka Paauilo with numerous storage reservoirs along its route originally. During 1948 this system was taken over by the Territory of Hawaii from Hawaiian Irrigation Co., Ltd. During the 1950's Territory of Hawaii completed the existing Waimea Reservoir with transmission pipelines to Waimea farm lots. The balance of the ditch system east of Puu Pulehu Reservoir (Lakeland) to Paauilo mauka was abandoned when the Territory took over. In 1946 I rode horseback from Ahualoa to the first intake at Kawainui Stream, and more recently hiked from Kawainui intake to Waimea Reservoir many times. During low water flow periods, there is no water flowing into this sytem or over the waterfalls into Waipio Valley.

3. Lower Hamakua Ditch System, built by Hawaiian Irrigation Co., Ltd., and completed and in operation during 1910. Again, this ditch starts west in Waipio Valley at Kawainui Stream intake 1,030 feet elevation. Traversing east with three other stream intakes, thru seven miles of transporation tunnels, emerging at Kukuihaele Wier 945 feet elevation. Again traversing easterly to Paauilo Village thru open lined ditches, tunnels and flumes. In the past, this water was used by the Plantations for irrigation, industrial and domestic use. I am familiar with the four intakes in Waipio, worked in the transmission tunnels, and other system related projects. During low water flow periods Kawainui intake has a very meager flow into it, with the other three stream intakes yielding no water at all into this system.

Hawaiian Irrigation Co., Ltd., originally was owned by Parker Ranch, Pacific Sugar Mill, Ltd., Honokaa Sugar Co., Paauhau Sugar Co., Hamakua Mill Co., and other individuals. Final ownership of Hawaiian Irrigation Co., Ltd., was Hamakua Sugar Co., Inc., until bankruptcy. The State of Hawaii will probably be the future owner, or Bishop Estate?

Water for Waipio Taro Farmers during low flow periods is from water springs below the Lower Hamakua Ditch in Waipio Valley. During the extremely dry years of 1961 and 1962, I noted that water which had flowed thru taro patches in Waipio and discharging from Wailoa River into the ocean was below normal, but still a considerable amount of water.

Current conflicts over available water for Taro Farmers in Waipio is the result of long on-going fueds among farmers and new Federal and State water regulations which are in some cases not realistic for Waipio.

In summary, the water source for the Upper Hamakua Ditch (Waimea-Paauilo Watershed Project) will collect some water mauka of Waipio Valley during heavy and normal flow periods, with the balance of water flowing into Waipio Valley. However, during low flow periods there is NO water flowing into this system or over waterfalls into Waipio Valley. These intermittent flows are the reason that a large holding reservoir is proposed for a reliable agricultur water availability during dry periods. Also, the Upper Hamakua Ditch collection system has been in existence for many years*, therefore, the proposed system will not change flows into the valley.

B-6

I ask that my comments in this letter be included in the draft and final E.I.S. Please feel free to contact me should you have questions. Your cooperation is always appreciated.

Sincerely,.

Les Wishard Jr.

Les Wishard, Jr.

* = Completed January 24, 1906.
L.W.

DEPARTMENT OF WATER SUPPLY • COUNTY OF HAWAII
25 AUPUNI STREET • HILO, HAWAII 96720
TELEPHONE (808) 961-8660 • FAX (808) 961-8657

April 2, 1997

Mr. Kenneth M. Kaneshiro, State Conservationist
USDA, Natural Resources Conservation Service
P.O. Box 50004
Honolulu, HI 96850-0050

DRAFT WATERSHED PLAN AND ENVIRONMENTAL IMPACT STATEMENT
WAIMEA-PAAUILO WATERSHED PROJECT, HAMAKUA/SOUTH KOHALA DISTRICTS
TAX MAP KEY 3RD DIVISION; 4-4, 4-6, 4-9, 6-3, 6-4, 6-5, 6-6, & 6-7

B-7 Thank you for the opportunity to comment on the subject EIS. There is one correction that should be made on Line 21, Page 20. The Department of Water Supply (DWS) maintains three 50-MG reservoirs instead of "two" 50-MG reservoirs.

If you have any questions, please contact our Water Resources and Planning Branch at 961-8660.

Milton D. Pavao, P.E.
Manager

GGA:gms

... Water brings progress ...

USDA

United States Department of Agriculture

Natural Resources Conservation Service

P.O. Box 50004
Honolulu, HI
96850

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

July 8, 1997

Milton D. Pavao, P.E., Manager
Department of Water Supply
County of Hawaii
25 Aupuni Street
Hilo, Hawaii 96720

Dear Mr. Pavao:

Subject: Draft Watershed Plan and Environmental Impact Statement for the Waimea-Paauilo Watershed

Thank you for your letter of April 2, 1997 with the Department of Water Supply comments on the subject document.

Section 2.7.3 Department of Water Supply System will be corrected to reflect the existence of three 50-MG reservoirs in Waimea.

Sincerely,

ACTING
KENNETH M. KANESHIRO
State Conservationist

DANIEL K. AKAKA
HAWAII

WASHINGTON OFFICE:
720 HART SENATE OFFICE BUILDING
WASHINGTON, DC 20510
TELEPHONE: (202) 224-6361

HONOLULU OFFICE:
3104 PRINCE JONAH KUHIO KALANIANAOLE FEDERAL BUILDING
P.O. BOX 50144
HONOLULU, HI 96850
TELEPHONE: (808) 522-8970

United States Senate

WASHINGTON, DC 20510-1103

MEMBER:
COMMITTEE ON ENERGY AND NATURAL RESOURCES
COMMITTEE ON GOVERNMENTAL AFFAIRS
COMMITTEE ON INDIAN AFFAIRS
COMMITTEE ON VETERANS' AFFAIRS

March 31, 1997

Mr. Kenneth Kaneshiro
State Conservationist
USDA
Natural Resources Conservation Service
P.O. Box 5004
Honolulu, HI 96850-0050

Dear Ken:

Thank you for sharing a copy of the draft watershed plan and environmental impact statement for the Waimea-Paauilo Watershed project with me.

I know that the Waimea farmers and ranchers have struggled for years with water availability and distribution problems. I commend you for your efforts to address this problem through the federal watershed program.

Please do not hesitate to call on me if I can assist you in this project.

Aloha pumehana,

Danny

DANIEL K. AKAKA
U.S. Senator

PRINTED ON RECYCLED PAPER

B-8

United States Department of Agriculture

Natural Resources Conservation Service

P.O. Box 50004
Honolulu, HI
96850

USDA

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

July 8, 1997

Senator Daniel K. Akaka
United States Senate
720 Hart Senate Office Building
Washington, D.C. 20510

Dear Senator Akaka:

Subject: Draft Watershed Plan and Environmental Impact Statement for the Waimea-Paauilo Watershed

Thank you for your letter of March 31, 1997 with words of encouragement for the Waimea-Paauilo Watershed project. The project sponsors and beneficiaries look forward to your continued support.

Sincerely,

ACTING

KENNETH M. KANESHIRO
State Conservationist

The Natural Resources Conservation Service works hand-in-hand with the American people to conserve natural resources on private lands.

AN EQUAL OPPORTUNITY EMPLOYER

DEPARTMENT OF THE ARMY
PACIFIC OCEAN DIVISION, CORPS OF ENGINEERS
FORT SHAFTER, HAWAII 96858-5440

REPLY TO
ATTENTION OF

April 4, 1997

Planning and Operations Division

Mr. Kenneth M. Kaneshiro
State Conservationist
U.S. Department of Agriculture
Natural Resources Conservation Service
300 Ala Moana Boulevard, Room 4316
Honolulu, Hawaii 96850-0050

Dear Mr. Kaneshiro:

Thank you for the opportunity to review and comment on the Draft Watershed Plan and Environmental Impact Statement (EIS) for the Waimea-Paauilo Watershed Project, Hamakua/South Kohala Districts, Hawaii (TMK 4-4, 4-6, 4-9, 6-3, 6-4, 6-5, 6-6, and 6-7). The following comments are provided pursuant to Corps of Engineers authorities to disseminate flood hazard information under the Flood Control Act of 1960 and to issue Department of the Army (DA) permits under the Clean Water Act; the Rivers and Harbors Act of 1899; and the Marine Protection, Research and Sanctuaries Act.

a. As indicated on page 76 and more fully described in Section 63.16, a DA permit will be required for discharge of dredged or fill material into waters of the U.S. associated with installation of the stockwater distribution pipeline. Authorization from the Corps may also be needed for activities associated with intake structures and for the reservoir supply pipeline gulch crossing discussed on page 61. Please contact Ms. Kathy Dadey of our Regulatory Section at 438-9258 (extension 15) for further information and refer to file number 960000155.

b. The flood hazard information provided on page 102 of the EIS is correct.

Sincerely,

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

B-9

USDA

United States
Department of
Agriculture

Natural
Resources
Conservation
Service

P.O. Box 50004
Honolulu, HI
96850

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

July 8, 1997

Paul Mizue, P.E., Acting Chief
Planning and Operations Division
Pacific Ocean Division
U.S. Army Corps of Engineers
Fort Shafter, Hawaii 96858-5440

Dear Mr. Mizue:

Subject: Draft Watershed Plan and Environmental Impact Statement for the Waimea-Paauilo Watershed

Thank you for your letter of April 4, 1997 with comments on the subject document. We wish to respond to your comments.

COMMENT: A Department of Army permit will be required for discharge of dredged or fill material into waters of the U.S. associated with installation of the stock water distribution pipeline. Authorization from the Corps may also be needed for activities associated with intake structures and for the reservoir supply pipeline gulch crossing.

RESPONSE: When the designs of the livestock drinking water pipeline system and the supply pipeline are started, further consultation with the Corps' Regulatory Section will be conducted to secure proper permitting for construction.

COMMENT: The flood hazard information provided in the DEIS is correct.

RESPONSE: Thank you for affirming the flood hazard information contained in the DEIS.

Sincerely,

ACTING

KENNETH M. KANESHIRO
State Conservationist

April 5, 1997

Mr. James J. Nakatani, Chairperson
Board of Agriculture
State of Hawaii, Department of Agriculture
P.O. Box 22159
Honolulu, Hawaii 96823-2159

Dear Mr. Nakatani:

Draft Watershed Plan and Environmental Impact Statement
Waimea-Paauilo Watershed Project, Hamakua/South Kohala
Districts

This responds you your request for comment on the above-named document. Generally, I have no objection to the selected Alternative 5 but strongly opposed implementation of Alternatives 3 and 4.

I currently own a small house and lot in Lindsey Subdivision, within the project area. This property is within close proximity to the proposed Waimea II Reservoir, which is included as part of Alternatives 3 and 4. I anticipate that noise and dust from construction of the Waimea II Reservoir will be disruptive to the peaceful community near the reservoir site. More importantly, I believe that the presents of the 133 MG reservoir at that location would endanger properties and residents. The potential for a dam breach would create a stressful and worrisome environment. Beyond the psychological impact of this threat, is the actual damage that would occur in the event of a breach. Also of concern is the potential impact that leaking subterranean water might have on soil conditions and house foundations located down gradient from the reservoir.

Thank you for the opportunity to again participate in this planning effort. Please notify me of any informational meetings or public hearings which might be scheduled on this project. I also request that a copy of the Final Environmental Impact Statement be sent to me.

Sincerely,

Ardis Shaw-Kim
2076-A Mott-Smith Drive
Honolulu, Hawaii 96822

cc: Brian Shaw
John Shaw

B-10

United States
Department of
Agriculture

Natural
Resources
Conservation
Service

P.O. Box 50004
Honolulu, HI
96850

USDA

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

July 8, 1997

Ardis Shaw-Kim
2076-A Mott-Smith Drive
Honolulu, Hawaii 96822

Dear Ms. Shaw-Kim:

Subject: Draft Watershed Plan and Environmental Impact Statement for the Waimea-Paauilo Watershed

Thank you for your letter of April 5, 1997 to James J. Nakatani, Chairperson, Board of Agriculture with comments on the subject document. Through the intergovernmental partnership for this project with the state Department of Agriculture, the Natural Resources Conservation Service will respond to your comments. A separate response by the State Department of Agriculture will not be mailed.

COMMENT: I have no objection to the Selected Alternative (Alternative 5), but strongly oppose implementation of Alternatives 3 and 4. I own a house and lot in the Lindsey subdivision which is in close proximity to the Waimea II reservoir proposed in Alternatives 3 and 4. I anticipate noise and dust will be disruptive. More importantly, the reservoir in that location would endanger properties and residents. Beyond the psychological impact of this threat is the actual damage that would occur in the event of a breach. Also of concern is the potential impact that leaking subterranean water might have on soil conditions and house foundations.

RESPONSE: Alternative 5, the Selected Alternative, proposes the construction of the reservoir approximately three miles to the south of the Waimea II site eliminating the adverse impacts to your Lindsey Subdivision property.

COMMENT: Please notify me of any public meetings or hearings that might be scheduled for this project. I also request a copy of the FEIS be sent to me.

RESPONSE: We will inform you of any meetings or hearings related to this project. A FEIS will be mailed to you when it is completed.

Sincerely,

ACTING

KENNETH M. KANESHIRO
State Conservationist

cc: James Nakatani, Chairperson, State of Hawaii Department of Agriculture

USDA United States Department of Agriculture

Farm Service Agency

Hawaii State & Pacific Basin FSA Office
Post Office Box 50008
Honolulu, Hawaii 96850
(808)541-2644 FAX #(808)541-2648

April 7, 1997

Mr. Ken Kaneshiro
State Conservationist
Natural Resources Conservation Service
P.O. Box 50004
Honolulu, HI 96850

Dear Mr. Kaneshiro:

The Farm Service Agency has reviewed the Draft Watershed Plan and EIS for Waimea-Paauilo and has no comment at this time.

Sincerely,

B-12

JoAnna Nakata
State Executive Director

USDA

United States Department of Agriculture

Natural Resources Conservation Service

P.O. Box 50004
Honolulu, HI
96850

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

July 8, 1997

JoAnna Nakata
State Executive Director
Farm Service Agency
P.O. Box 50008
Honolulu, Hawaii 96850

Dear Ms. Nakata:

Subject: Draft Watershed Plan and Environmental Impact Statement for the Waimea-Paauilo Watershed

Thank you for your letter of April 7, 1997 stating that the Farm Service Agency has no comments on the subject document.

Sincerely,

ACTING

KENNETH M. KANESHIRO
State Conservationist

DEPARTMENT OF BUSINESS,
ECONOMIC DEVELOPMENT & TOURISM

BENJAMIN J. CAYETANO
GOVERNOR
SEIJI F. NAYA
DIRECTOR
BRADLEY J. MOSSMAN
DEPUTY DIRECTOR
RICK EGGED
DIRECTOR, OFFICE OF PLANNING

OFFICE OF PLANNING
235 South Beretania Street, 6th Flr., Honolulu, Hawaii 96813
Mailing Address: P.O. Box 2359, Honolulu, Hawaii 96804

Tel.: (808) 587-2846
Fax: (808) 587-2824

Ref. No. P-6613

April 11, 1997

Mr. Kenneth M. Kaneshiro
State Conservationist
Natural Resources Conservation Service
U.S. Department of Agriculture
P.O. Box 50004
Honolulu, Hawaii 96850-0050

Dear Mr. Kaneshiro:

Subject: Draft Watershed Plan and Environmental Impact Statement (EIS), Waimea-Paauilo Watershed Project, Hamakua/South Kohala Districts, TMK: 3rd Div.; 4-4, 4-6, 4-9, 6-3, 6-4, 6-5, 6-6, 6-7

We have reviewed the above EIS and have the following comment. We recommend that the EIS include an assessment of the project's compliance with the Coastal Zone Management (CZM) objectives and policies in Chapter 6.6, Relationship to Other Plans, Policies and Controls, in the document. The statutory reference for this is Chapter 205A, Hawaii Revised Statutes.

If you have any questions about this, please contact Christina Meller of our CZM Program at 587-2845.

Sincerely,

Rick Egged
Director
Office of Planning

USDA

United States
Department of
Agriculture

Natural
Resources
Conservation
Service

P.O. Box 50004
Honolulu, HI
96850

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July 8, 1997

Rick Egged, Director
Office of Planning
Department of Business, Economic Development, and Tourism
P.O. Box 2359
Honolulu, Hawaii 96804

Dear Mr. Egged:

Subject: Draft Watershed Plan and Environmental Impact Statement for the Waimea-Paauilo Watershed

Thank you for your letter of April 11, 1997 with comments on the subject document. We wish to respond to your comments.

COMMENT: We recommend that the EIS include an assessment of the project's compliance with the Coastal Zone Management (CZM) objectives and policies in Chapter 6.6 Relationship to Other Plans, Policies, and Controls.

RESPONSE: The discussion of the interaction of the project with CZM program objectives will be reworded and moved from Section 6.3 Environmental Effects to Section 6.6 as recommended. The following will be included in the FEIS.

6.6.10 Hawaii Coastal Zone Management Program

The Hawaii Coastal Zone Management (CZM) Program is charged to balance marine and coastal resources protection and sustainable economic development. The CZM area encompasses the entire state, including the Waimea-Paauilo Watershed. The program is built upon ten policy areas: recreational resources, historic resources, scenic and open space resources, coastal ecosystems, economic uses, coastal hazards, managing development, public participation, beach protection, and marine resources.

The Waimea-Paauilo Watershed project will have no effect on recreational resources, coastal ecosystems, coastal hazards, beach protection, or marine resources.

Planning of the Waimea-Paauilo Watershed project has included historic and archaeological surveys of the affected area and has utilized a public participation

process to discuss and raise awareness of resource development issues in the CZM area. Implementation of the Waimea-Paauilo Watershed project will improve agricultural conditions to maintain scenic and open space resources. The project will also result in fuller economic use of agriculturally-zoned lands in agricultural enterprise.

Sincerely,

KENNETH M. KANESHIRO
State Conservationist

Stephen K. Yamashiro
Mayor

Donna Fay K. Kiyosaki
Chief Engineer

Jiro A. Sumada
Deputy Chief Engineer

County of Hawaii
DEPARTMENT OF PUBLIC WORKS
25 Aupuni Street, Room 202 • Hilo, Hawaii 96720-4252
(808) 961-8321 • Fax (808) 961-8630

April 18, 1997

KENNETH M KANESHIRO STATE CONSERVATIONIST
USDA NATURAL RESOURCES CONSERVATION SERVICE
P O BOX 50004
300 ALA MOANA BLVD ROOM 4316
HONOLULU HAWAII 96850-0050

B-15

SUBJECT : **DRAFT WATERSHED PLAN AND ENVIRONMENTAL IMPACT STATEMENT**
Waimea-Paauilo Watershed Project
Hamakua / South Kohala, Hawaii
TMK: 3 / 4-4, 4-6, 4-9, 6-3, 6-4, 6-5, 6-6, & 6-7

We acknowledge receipt of your letter concerning the subject matter, and provide you with our comments as follows:

1. All earthwork and grading shall be in conformance with Chapter 10, Erosion and Sediment Control, of the Hawaii County Code.

2. Any work within a County right-of-way shall be in conformance with Chapter 22, Streets and Sidewalks, of the Hawaii County Code.

3. Any construction within known watercourses shall be in conformance with Chapter 27, Flood Control, of the Hawaii County Code. A flood study maybe required to evaluate the effects to any streams and possibly other inundation areas.

Should there be any questions concerning this matter, please feel free to contact Mr. Casey Yanagihara in our Engineering Division at (808)961-8327.

DONNA FAY K. KIYOSAKI
Chief Engineer
Department of Public Works

CKY

USDA

United States Department of Agriculture

Natural Resources Conservation Service

P.O. Box 50004
Honolulu, HI
96850

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

July 8, 1997

Donna Fay K. Kiyosaki, Chief Engineer
Department of Public Works
County of Hawaii
25 Aupuni Street
Hilo, Hawaii 96720-4252

Dear Ms. Kiyosaki:

Subject: Draft Watershed Plan and Environmental Impact Statement for the Waimea-Paauilo Watershed

Thank you for your letter of April 18, 1997 with comments on the subject document. We wish to respond to your comments.

COMMENT: All earthwork and grading shall be in conformance with Chapter 10, Erosion and Sediment Control, of the Hawaii County Code.

RESPONSE: Reference to Chapter 10 of the Hawaii County Code will be made in Section 6.3.11 Soil in the chapter on project impacts.

COMMENT: Any work within a County right-of-way shall be in conformance with Chapter 22, Streets and Sidewalks, of the Hawaii County Code.

RESPONSE: While most of the work within road rights-of-way will involve state-owned property, if any work occurs within a county right-of-way, it will be in conformance with Chapter 22 of the Hawaii County Code.

COMMENT: Any construction within known watercourses shall be in conformance with Chapter 27, Flood Control, of the Hawaii County Code. A flood study may be required to evaluate the effects to any streams and possibly other inundation areas.

RESPONSE: This project will have no effect on drainageways or flooding as most of the project improvements, with the exception of the 131-MG reservoir, will be buried pipelines. The project will not impact floodplains identified in the Flood Insurance Rate

Maps. If any construction in waterscourses is necessary, it will be conducted in conformance with Chapter 27 of the Hawaii County Code.

Sincerely,

ACTING

KENNETH M. KANESHIRO
State Conservationist

PHONE (808) 594-1888

FAX (808) 594-1865

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

April 23, 1997

Mr. Kenneth M. Kaneshiro
USDA, Natural Resources Conservation Service
P.O. Box 50004
300 Ala Moana Blvd., Room 4316
Honolulu, HI 96850-0050

Subject: Watershed Plan and Draft Environmental Impact Statement (DEIS) for the Waimea-Paauilo Watershed, Island of Hawaii.

Dear Mr. Kaneshiro:

Thank you for the opportunity to review the Watershed Plan and Draft Environmental Impact Statement (DEIS) for the Waimea-Paauilo Watershed, Island of Hawaii. According to the United States Department of Agriculture (USDA), the purpose of the plan is to alleviate water shortage problems caused by inadequate quantity and distribution of water for agricultural purposes in the Waimea area.

The Office of Hawaiian Affairs (OHA) agrees with USDA on existing water inadequacies in the Waimea area. But OHA views these inadequacies as largely due to water allocations heavily skewed to large agricultural operations rather than to water shortage *per se*. OHA would strongly support USDA's effort in Waimea if the intent is to overhaul the system and develop an alternative for fair and equal access of water to all users. But after reviewing the DEIS, OHA views the proposed watershed plan (Alternative 2) as a response to increasing water demands without addressing existing inequalities in water distribution and use.

Given the critical role of water in the Waimea area, it is somewhat unclear why USDA does not include an overall water budget with current data on water needs of existing and/or potential agricultural activities. Without such a blueprint, it is virtually impossible to (i) picture water needs, (ii) understand the rationale for the proliferation of water supply systems, (iii) elucidate current water allocations , (iv) substantiate the increase in existing water demand by one third, (v) substantiate the need for an additional reservoir and distribution system, and (vi) justify the reduction of flow patterns in Lalakea Stream,. Furthermore, USDA fails to provide a detailed account of water sources in the area, namely surface streams, underground water bodies, and rainfall, and determine their role in the overall water budget.

According to the DEIS, Alternative 2 calls for an additional annual water demand of 377 million gallons, which is about an one third increase in current water demands. USDA claims that (i) no water diversions will be involved in the plan, and (ii) the additional 377 million gallons of water will be met by reducing overflow by 30% from the Upper Hamakua Ditch to Lalakea Stream. In plain terms, this means that during overflow periods, the Lalakea Stream flow will be reduced by 1.0 million gallons per day. USDA claims that such reduction will not affect Lalakea Stream but does not provide information to support otherwise. Also USDA does not provide with an alternative to cover the extra 377 million gallons of water in the event of a drought occurrence.

From the above review, OHA is seriously concerned about the lack of (i) baseline information on hydrological characteristics for all surface streams affected by Alternative 2, and (ii) in-depth detail to substantiate the feasibility of expanding water demands by one third without resorting to water diversion. Given the high variability and unpredictability of rainfall in the area, there is a high likelihood that the additional 377 million gallons of water will be eventually met by diverting water from streams supporting critical ecosystems, wildlife habitats, and local livelihood. Because of serious concerns about potential adverse impacts in the Upper Hamakua area and along Waipio Valley, OHA is not prepared to endorse Alternative 2.

On the subject of no adverse impacts on water rights, USDA simply fails to recognize that water rights is an unresolved issue which must be straightforwardly addressed. OHA views USDA's attempt to bypass the issue of water rights as a failure to grasp the realities of current times. Native Hawaiians are striving for sovereignty and control of their lands and natural resources. Thus, OHA finds it somewhat naive to disclose that no effects are anticipated from water rights and no mitigation is required. OHA strongly urges USDA to take a hard look to this issue again.

Please contact Lynn Lee, Acting Officer of the Land and Natural Resources Division, or Luis A. Manrique, should you have any questions on this matter.

Sincerely yours,

Martha Ross

Martha Ross
Deputy Administrator, Programs

LM:lm

ilted States
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vice

. Box 50004
olulu, HI
50

USDA

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

July 8, 1997

Martha Ross, Deputy Administrator, Programs
Office of Hawaiian Affairs
711 Kapiolani Blvd., Suite 500
Honolulu, Hawaii 96813

Subject: Draft Watershed Plan and Environmental Impact Statement for the Waimea-Paauilo Watershed

Thank you for your letter of April 23, 1997 with your comments on the subject document. We wish to respond to the comments.

First, as a matter of clarification, Alternative 5 was chosen by the sponsoring local organizations as the Selected Alternative, rather than Alternative 2 as stated in your comment letter. (see pg. 60, DEIS) The USDA Natural Resources Conservation Service serves in the role of "consultant" to the State of Hawaii Department of Agriculture, Department of Hawaiian Home Lands, and the Mauna Kea Soil and Water Conservation District in the preparation of the plan and EIS.

B-18

COMMENT: Water inadequacies are due to inequalities in water distribution and use.

RESPONSE: The Waimea Irrigation System currently provides agricultural water for commercial agricultural activity to all users, both on DHHL parcels and non-DHHL parcels. During droughts, such as that experienced in 1996, all users of the WIS suffered equally.

While the proposed project will not change the core purpose of the WIS, components of this project and native Hawaiian water rights issues may modify the allocation of water by the WIS. This project proposes the addition of livestock drinking water to the purposes of the WIS. The project recommends the participation of the DHHL and WIS users in operating policy discussions.

COMMENT: The USDA should provide an overall water budget with current data on water needs and water sources to (i) be able to picture water needs, (ii) understand the rationale for proliferation of water systems, (iii) elucidate current water allocations, (iv) substantiate the increase in existing water supply by one-third, (v) substantiate the need for an additional reservoir and distribution system, and (vi) justify the reduction of flow patterns in Lalakea Stream.

RESPONSE: While a comprehensive overall water budget, including rainfall, runoff, groundwater, natural and artificial storage, DWS demand and supply, and private water systems demand and supply for the Waimea region is beyond the scope of the evaluation for this project, a table displaying an average monthly water budget for the Upper Hamakua Ditch, irrigation demand, livestock drinking water demand, reservoir level, and effect on overflow to Lalakea Stream will be included in the FEIS.

An overall water budget for the South Kohala area is included in the Hawaii County Water Use and Development Plan (Draft, February 1992). The improvements proposed by this project are included in the projections for future water supply and demand made by the Water Use and Development Plan.

Some discussion about the project's background and tenets may address some of your concerns. The intent of this project and the Waimea Irrigation System is to provide untreated water as inexpensively as possible to farmers in the service area. The source of the water is the existing Upper Hamakua Ditch which diverts streamflow from Kawaiki, Kawainui, Alakahi, Koiawe, and Waima Streams at the 4,000 to 3,000-foot elevation. No alteration of the Upper Hamakua Ditch is proposed with the exception of reconstruction of the reservoir connection. Reliability of the water system to consistently provide water to users is improved with additional reservoir capacity. The projected water demand on the WIS is based on full agricultural development of the identified service area.

COMMENT: The project calls for an additional annual water demand of 377 million gallons, which is about a one-third increase in current water demands. Due to the reduction in overflow from the Upper Hamakua Ditch, Lalakea Stream flow will be reduced by 1.0 million gallons per day. USDA claims that such reduction will not affect Lalakea Stream but does not provide information to support the claim. USDA does not provide an alternative to cover the extra 377 million gallons in the event of drought.

RESPONSE: The expanded Waimea Irrigation System will reduce overflow from the Upper Hamakua Ditch by an average of 377 million gallons per year in the future with the project installed as compared to the future without the project installed. The average annual reduction amounts to 5 percent of the total streamflow as measured above Hiilawe Falls. This reduction is viewed as insignificant by reviewers, including the U.S. Fish and Wildlife Service, especially in light of its transfer into Lalakea Stream from other drainages.

The shortage of water from the Upper Hamakua Ditch during droughts will be made up by use of the Puukapu Well which is capable of providing 1.4 million gallons per day at an additional cost of $.75 to $1.00 per 1,000 gallons in pumping cost. Voluntary drought- period conservation will also be used to stretch existing water supply through dry periods.

COMMENT: OHA is seriously concerned about the lack of (i) baseline information about surface streams affected by the proposed plan and (ii) details to substantiate the feasibility of expanding the water demands by one-third without resorting to additional water diversions.

RESPONSE: The inclusion of baseline information on streams other than Lalakea Stream is beyond the scope of the EIS as no direct or indirect effect to other area streams is anticipated due to project installation. The diversion of Kawaiki, Kawainui, Alakahi, Koiawe, and Waima Streams by the Upper Hamakua Ditch, which has been in existence for nearly a century, will be unaffected by the project.

As stated earlier, no further diversion of surface streams is anticipated. Agricultural water shortages will be made up from ground water or will be managed through water conservation measures and use restrictions.

COMMENT: USDA simply fails to recognize that water rights is an unresolved issue that must be straight forwardly addressed. OHA finds it somewhat naive to disclose that no effects are anticipated from water rights and no mitigation is required.

RESPONSE: The USDA planners and project sponsors recognize the gravity of the water rights issues that surround this and other water resource systems. The DEIS discusses the issues of native Hawaiian water rights, DHHL water reservation rights, WIS allocation issues, and other State Water Code issues in Section 6.3.15. The water rights issues will be heard and settled in other venues where USDA has no influence.

Sincerely,

B-19

ACTING

KENNETH M. KANESHIRO
State Conservationist

BENJAMIN J. CAYETANO
GOVERNOR

STATE OF HAWAII
DEPARTMENT OF BUDGET AND FINANCE
HOUSING FINANCE AND DEVELOPMENT CORPORATION
677 QUEEN STREET, SUITE 300
HONOLULU, HAWAII 96813
FAX (808) 587-0600

ROY S. OSHIRO
EXECUTIVE DIRECTOR

IN REPLY REFER TO:

97:PPE/1456

April 24, 1997

Mr. Kenneth M. Kaneshiro
State Conservationist
USDA, Natural Resources Conservation
Service
P.O. Box 50004
Honolulu, Hawaii 96850-0050

B-20

Dear Mr. Kaneshiro:

Re: Draft Watershed Plan and Environmental Impact Statement for Waimea-Paauilo Watershed Project, Hamakua/South Kohala Districts

Thank you for the opportunity to review the subject draft EIS.

We have no housing related comments to offer at this time.

Sincerely,

ROY S. OSHIRO
Executive Director

HFDC

United States
Department of
Agriculture

Natural
Resources
Conservation
Service

P.O. Box 50004
Honolulu, HI
96850

USDA

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

July 8, 1997

Roy S. Oshiro, Executive Director
Housing Finance and Development Corporation
Department of Budget and Finance
677 Queen Street, Suite 300
Honolulu, Hawaii 96813

Dear Mr. Oshiro:

Subject: Draft Watershed Plan and Environmental Impact Statement for the Waimea-Paauilo Watershed

Thank you for your letter of April 24, 1997 stating that you have no comments at this time on the subject document.

Sincerely,

ACTING

KENNETH M. KANESHIRO
State Conservationist

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BENJAMIN J. CAYETANO
GOVERNOR OF HAWAII

LAWRENCE MIIKE
DIRECTOR OF HEALTH

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

In reply, please refer to:

April 25, 1997

94-188A/epo

Mr. Kenneth M. Kaneshiro, State Conservationist
USDA, Natural Resources Conservation Service
P.O. Box 50004
300 Ala Moana Boulevard, Room 4316
Honolulu, Hawaii 96850-0050

Dear Mr. Kaneshiro:

Subject: **Draft Watershed Plan and Environmental Impact Statement**
Project: Waimea-Paauilo Watershed
Location: Hamakua/South Kohala Districts, Hawaii
TMK: (3) 4-4, 4-6, 4-9, 6-3, 6-4, 6-5, 6-6, 6-7

B-21

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

Sincerely,

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

USDA

United States
Department of
Agriculture

Natural
Resources
Conservation
Service

P.O. Box 50004
Honolulu, HI
96850

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

July 8, 1997

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

Dear Dr. Anderson:

Subject: Draft Watershed Plan and Environmental Impact Statement for the Waimea-Paauilo Watershed

Thank you for your letter of April 25, 1997 stating that the Department of Health has no comments on the subject document at this time.

Sincerely,

ACTING
KENNETH M. KANESHIRO
State Conservationist

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UNITED STATES DEPARTMENT OF COMMERCE
The Under Secretary for
Oceans and Atmosphere
Washington, D.C. 20230

April 28, 1997

Kenneth M. Kaneshiro
State Conservationist
USDA, Natural Resources Conservation Service
300 Ala Moana Blvd., Room 4316
Honolulu, Hawaii 96850-0050

Dear Mr. Kaneshiro:

Enclosed are comments on the Draft Environmental Impact Statement for Watershed Plan Waimea-Paauilo Watershed County of Hawaii, Hawaii. We hope our comments will assist you. Thank you for giving us an opportunity to review this document.

Sincerely,

Susan B. Fruchter
Acting NEPA Coordinator

B-22

Enclosure

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THE ADMINISTRATOR

UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL OCEAN SERVICE
National Geodetic Survey
Silver Spring, Maryland 20910-3282

APR 24 1997

MEMORANDUM FOR: Donna Wieting
Acting Director, Ecology and Conservation Office

FROM: for Captain Lewis A. Lapine, NOAA
Director, National Geodetic Survey

SUBJECT: DEIS-9703-05--Watershed Plan Waimea-Paauilo Watershed County of Hawaii, Hawaii

The subject statement has been reviewed within the areas of the National Geodetic Survey's (NGS) responsibility and expertise and in terms of the impact of the proposed actions on NGS activities and projects.

All available geodetic control information about horizontal and vertical geodetic control monuments in the subject area is contained on the NGS home page at the following Internet World Wide Web address: http://www.ngs.noaa.gov. After entering the NGS home page, please access the topic "Products and Services" and then access the menu item "Data Sheet." This menu item will allow you to directly access geodetic control monument information from the NGS data base for the subject area project. This information should be reviewed for identifying the location and designation of any geodetic control monuments that may be affected by the proposed project.

If there are any planned activities which will disturb or destroy these monuments, NGS requires not less than 90 days' notification in advance of such activities in order to plan for their relocation. NGS recommends that funding for this project includes the cost of any relocation(s) required.

For further information about these monuments, please contact John Spencer; SSMC3, NOAA, N/NGS; 1315 East West Highway; Silver Spring, Maryland 20910; telephone: 301-713-3169; fax: 301-713-4175.

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July 8, 1997

Susan B. Fruchter, Acting NEPA Coordinator
Department of Commerce
The Under Secretary for Oceans and Atmosphere
Washington, D.C. 20230

Dear Ms. Fruchter:

Subject: Draft Watershed Plan and Environmental Impact Statement for the Waimea-Paauilo Watershed

Thank you for your letter dated April 28, 1997, with National Geodetic Survey comments on the subject document. The horizontal and vertical control monuments in the project area were identified through the NGS homepage on the World Wide Web. The monuments are:

Punohu 1867	TU2546
Puu Io reset	TU2547
East Tank	TU2548
West Tank	TU2549
Holoholoku reset	TU2555
Waimea East Base	TU2679
Waimea West Base	TU2682
MUE AP Sta A	AA3598
Green Tank	TU2681
Hawaii West Base	TU2683
Puuki	TU2684
Parker Ranch Tank	TU2685
Hokuula	TU2687
Hokuula 2	TU2688

None of the monuments above will be disturbed by the installation of the watershed project.

Sincerely,

ACTING

KENNETH M. KANESHIRO
State Conservationist

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Parker Ranch

April 30, 1997

Mr. Kenneth M. Kaneshiro, State Conservationist
USDA, Natural Resources Conservation Service
P.O. Box 50004
Honolulu, Hawaii 96850-0050

Via Facsimile: (808) 541-1335

RE: **Comments to Draft Watershed Plan and Environmental Impact Statement Waimea - Paauilo Watershed (February 1997)**

We have reviewed this document and have the following comments:

B-24

1. Many of your exhibits indicate a "Lalamilo Ag Park Expansion" area within Parker Ranch property, in the vicinity of the Kamuela Airport/Kuhio Village area. Although it is difficult to tell the exact location of this proposed expansion area, it is clear that a portion is within the Parker Ranch Town Center area which is currently zoned for residential and commercial development. This area is not available for expansion of the State Lalamilo Agricultural Park.

   For your information, we have discussed a possible expansion of the Lalamilo Agricultural Park within Parker Ranch lands in the vicinity of the West Hawaii Concrete office near the 6 mile marker of Mamalahoa Highway or possibly adjacent to the existing Lalamilo Ag Park. In our recent meeting with Paul Matsuo and Albert Kawabata of the State Department of Agriculture, it was felt that agriculturally suitable lands can be found in these areas. We intend to continue these talks and hope for selection of an appropriate site.

2. Although it was not anticipated that Parker Ranch be a customer of the proposed irrigation/stockwater distribution system, should the need arise, will Parker Ranch be able to obtain water for these purposes?

P.O. Box 458 • Kamuela, Hawaii 96743
Telephone: (808) 885-7311 • Facsimile: (808) 885-5602

We would appreciate receiving a response to the above concerns. Should you have any questions, please call me.

Sincerely,

Riley W. Smith, P.E.
Project Manager

cc: Paul Matsuo, Administrator/Chief Engineer (via fax: (808) 973-9467)
Albert Kawabata, Waimea Irrigation District Manager (via fax: 885-7634)
John Ray, Councilman (via fax: 969-3291)
Steve Bowles, Waimea Water Services (via fax: 885-7851)

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July 8, 1997

Riley W. Smith, P.E.
Project Manager
Parker Ranch
P.O. Box 458
Kamuela, Hawaii 96743

Dear Mr. Smith:

Subject: Draft Watershed Plan and Environmental Impact Statement for the Waimea-Paauilo Watershed

Thank you for your letter of April 30, 1997 with comments on the subject document. We wish to respond to your comments.

B-25

COMMENT: Many of your displays indicates a "Lalamilo Ag Park Expansion" area within Parker Ranch property. This area is not available for expansion of the State Lalamilo Agricultural Park. Parker Ranch and the State Department of Agriculture have discussed alternative sites for the Agricultural Park expansion.

RESPONSE: The "Lalamilo Ag Park Expansion" is shown at its formerly-considered location mainly to indicate a desire by the State Department of Agriculture to expand commercial farming activity in the Waimea area. As an alternate site for the Ag Park expansion had not yet been identified, the site near the Waimea Town Center was used in the displays.

The FEIS will continue to display the Lalamilo Ag Park Expansion in the same location as in the DEIS with a note on the display that the expansion area will likely be located elsewhere. The FEIS narrative will also be changed to explicitly state that the Lalamilo Agricultural Park Expansion is not a component of the Waimea-Paauilo Watershed Plan and is not covered by the present EIS.

COMMENT: Although it is not anticipated that Parker Ranch be a customer of the proposed irrigation/stockwater distribution system, should the need arise, will Parker Ranch be able to obtain water for these purposes?

RESPONSE: The allocation of water from the WIS will be managed by the State Department of Agriculture with input from the user community. While higher priority for water supply will be given to those service areas identified in this plan and sponsors who contributed financially to this plan to expand the WIS, there is no prohibition by the federal funding source for distribution of water to other areas as long as the water is used for agricultural purposes.

Sincerely,

ACTING

KENNETH M. KANESHIRO
State Conservationist

RESIDENTS TO RELOCATE THE RESERVOIR
P.O. Box 2229
Kamuela, HI 96743
(808) 885-2146

May 2, 1997

Mr. Ken Kaneshiro
State Conservationist
United States Department of Agriculture
Natural Resources Conservation Service
P.O. Box 50004
Honolulu, HI 96850-0001

Re: Waimea-Paauilo Watershed Draft EIS

Dear Mr. Kaneshiro:

On September 27, 1994 and on June 4, 1996 our legal representative, Mr. Jerry Hiatt, sent you letters pertaining to the Environmental Impact Statement for the Waimea-Paauilo Watershed. The letter of Septmeber 27th, 1994 was a formal request for the specific concerns of our organization to be included in both the draft E.I.S. and in the final E.I.S. Those concerns were listed in that letter. Neither of these these letters are included in or even referred to in anyway in the Draft E.I.S.. As both were sent following the Scoping Meeting of September, 1994 and both relate directly to the Environmental Impact Statement, we request that reference be made to those letters and that they, along with this letter be published as part of the final copy of the Environmental Impact Statement.

At the EIS presentation meeting held in Waimea on Wednesday, April 23rd, Michael Kolman assured us your office did have these letters on file.

Thank you for your consideration and the efforts of you and your staff in undertaking the completion of this EIS.

Sincerely,

Nancy Walden and Robert
Nancy Walden

Teresa Espaniola

Michael and Kealoha Nearman

Charles and Joan Brotman

cc: Jerry Hiatt, Bays Deaver Hiatt Lung Rose, Attorneys at Law
Daniel Kaniho, Chair, Mauna Kea SWCD

B-26

United States
Department of
Agriculture

Natural
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P.O. Box 50004
Honolulu, HI
96850

USDA

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July 8, 1997

Residents to Relocate the Reservoir
c/o Nancy Walden
P.O. Box 2229
Kamuela, Hawaii 96743

Dear Madams and Sirs:

Subject: Draft Watershed Plan and Environmental Impact Statement for the Waimea-Paauilo Watershed

Thank you for your letter of May 2, 1997 with comments on the subject document. We wish to respond to the comments.

COMMENT: Letters of September 27, 1994 and June 4, 1996 with requests for information and specific concerns about the Waimea-Paauilo project were not included in or referred to in the draft EIS. We request reference be made to those letters and that those letters with the May 2, 1997 letter be published in the final EIS.

RESPONSE: The three letters from the Residents to Relocate the Reservoir and NRCS response letters will be included in the final EIS.

Sincerely,

ACTING

KENNETH M. KANESHIRO
State Conservationist

BAYS
DEAVER
HIATT
LUNG
ROSE
Attorneys at Law

Suite 201 • Parker Square
65-1280 Kawaihae Road
Kamuela, Hawaii 96743

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Karen [illegible]
Paul M. Saito
Mahilani E. Kellett
Donald E. Fisher
Wendy J. Utsumi
Bruce D. Voss
Robert E. Badger, Jr.
Edward J. Corwin

June 4, 1996

Mr. Ken Kaneshiro
SCS State Conservationist
300 Ala Moana Boulevard, Room 4319
Honolulu, Hawaii 96850

Re: Residents to Relocate the Reservoir vs. State of Hawaii, et al.

Dear Mr. Kaneshiro:

As you know, our firm represents the Residents for Relocating the Reservoir ("Residents to Relocate"), a group of community residents who are opposed to the current planned location of this proposed reservoir. As you also know, on September 27, 1994, we wrote to you with a list of factors to be considered in both the draft and final Environmental Impact Statements ("EIS") which are to be prepared for the project.[1]

B-27

Please consider this letter as a demand by the Residents to Relocate that the State either abandon its plans for the reservoir or else choose another site where the reservoir's externalities will not have as negative an impact. As mentioned in our letter dated September 27, 1994, a copy of which is attached for your convenience, we had advised that the proposed project is objectionable for numerous reasons. In the event that the EIS is accepted by the responsible State and Federal agencies, the Residents will appeal the Notice of Final Determination accepting the EIS pursuant to Haw. Rev. Stat. § 343-7(c) and Haw. Rev. Admin. Rules §11-200-24. Given the obvious shortcomings and drawbacks of the proposed reservoir, no reasonable decision maker would accept or otherwise approve of an EIS containing the information that an EIS on this project would contain.

As a result, the Residents will be seeking to enjoin construction of the project because of the severe and negative

[1] On September 29, 1994, you wrote advising us that both the Federal and State EIS's would be forthcoming. To date, we have received neither a draft EIS nor a final EIS on the proposed project.

1182-001\A:96-689

Honolulu Office: 16th Floor • Alii Place • 1099 Alakea Street • Honolulu, Hawaii 96813 • Tel: (808) 523-9000 • Fax: (808) 533-[illegible]

impact the project will have on adjacent property owners and the subdivision as a whole. Certainly, any State action which directly, or indirectly, results in an impact such as the reservoir will have on the Residents to Relocate, constitutes a taking by way of inverse condemnation. Ruckelhaus v. Monsanto Co., 467 U.S. 986 (1984); Cloverport Sand & Gravel Co., Inc. v. U.S., 6 Cl. Ct. 178 (1984); Berenholz v. U.S., 1 Cl. Ct. 620 (1982); Rauser v. Tosten Irrigation Dist, 565 P.2d 632 (Mt. 1977). Specifically, a State funded or authorized project which is conducted under authority of the State and which has the affect of diminishing the value, or interfering with the use, of private property constitutes a taking under the Fifth Amendment of the U.S. Constitution and under Article I, § 20 of the Hawaii State Constitution.

In our case, the State's plan to build a 135,000,000 gallon reservoir in a residential neighborhood will damage each property by substantially reducing its value. The mere plans for it have already had a substantial affect on real estate values. Expert witnesses will be called in any litigation to confirm this.

Additionally, the construction of a large reservoir is not compatible to a residential neighborhood and would certainly constitute a nuisance and raise a well-founded fear of reservoir leakage and/or flooding.

In light of the above, the Residents to Relocate have authorized us to take the following actions:

1. Upon acceptance of the final EIS, we will appeal the Notice of Final Determination and file a Complaint in the Third Circuit seeking injunctive relief and immediately move for a preliminary injunction to halt the project;

2. The Complaint will also seek a recovery of damages under a nuisance theory. As the owner of the property, the Department of Hawaiian Homelands will necessarily be named as a defendant; and

3. The Complaint will seek compensation from the State, under a theory of inverse condemnation, for the resulting diminution in value of each and every piece of property affected by the reservoir. If the project is not enjoined, which seems unlikely, the proposing agencies will be liable for millions of dollars in damages for all the properties affected by it.

1182-001\A:96-689

Litigation in this matter can be avoided by the Department of Hawaiian Homelands and by the State of Hawaii by simply choosing another site for the reservoir which does not threaten to destroy a family oriented residential neighborhood. We therefore urge you to avoid years of costly litigation by reconsidering your decision to locate a reservoir in a residential neighborhood.

Should you have any questions or comments regarding the above, please do not hesitate to contact me.

Very truly yours,

for

Jerry M. Hiatt

JMH/MWT:rfc
Enclosure

cc: The Honorable Daniel Inouye
The Honorable Daniel Akaka
The Honorable Patsy Mink
The Honorable Richard Matsuura
The Honorable Malama Solomon
The Honorable Dwight Takamine
The Honorable Jerry Chang
The Honorable Robert Herkes
The Honorable Virginia Isbell
The Honorable Harvey Pajiri
The Honorable Steven Yamashiro
Councilman Takashi Domingo
Councilman Brian J. DeLima
Councilman James Y. Arakaki
Councilman Robert F. Rosehill
Councilwoman Helene H. Hale
Councilwoman Keiko Bonk-Abramson
Councilman Keola Childs
Councilman James M. Rath
Charles and Joan Brotman
Teresa Espaniola
Michael and Kealoha Nearman
Robert and Nancy Walden

9999-999\A:96-689

United States Department of Agriculture
Natural Resources Conservation Service
P. O. Box 50004
Honolulu, HI
96850-0001

June 20, 1996

Jerry M. Hiatt
Bays, Deaver, Hiatt, Lung, Rose, Attorneys at Law
Suite 204 Parker Square
65-1280 Kawaihae Road
Kamuela, Hawaii 96743

Dear Mr. Hiatt:

Subject: Residents to Relocate the Reservoir

We have received your letter of June 4, 1996, restating your client group's objection to the agricultural water reservoir proposed at the Waimea II site.

In September 1994, we did state that a federal and state EIS would be forthcoming. We are still in the process of analyzing alternatives and completing the draft EIS. The EIS will discuss and compare the impacts of installing the reservoir at the Waimea II location and other potential reservoir sites. The draft EIS should be completed by September 1, 1996.

If you have further questions, please contact Michael Kolman, Assistant State Conservationist, at 808-541-2602.

Sincerely,

KENNETH M. KANESHIRO
State Conservationist

cc: Paul Matsuo, Department of Agriculture
Daniel Kaniho, Department of Hawaiian Home Lands
Sam Araki, Chair, Mauna Kea SWCD

The Natural Resources Conservation Service formerly the Soil Conservation Service, works hand-in-hand with the American people to conserve natural resources on private lands.

AN EQUAL OPPORTUNITY EMPLOYER

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Elisabeth E. Snyder
Denise M. Norton
Mahilani E. Kellett
Gregory Y. P. Tom
Jon C. Yoshimura

September 27, 1994

Ken Kaneshiro,
SCS State Conservationist
300 Ala Moana Blvd., Rm. 4319
Honolulu, HI 96850

Re: Waimea-Paauilo Watershed Reservoir Two Site

Dear Mr. Kaneshiro:

Our firm represents Residents for Relocating the Reservoir, a group of community residents who are opposed to the current location of this proposed reservoir. As you know the reservoir will hold 133 million gallons of agricultural water and is located directly above a residential subdivision in the town of Kamuela on the Big Island. We appeared at the meeting September 21, 1994 at the Office of Hawaiian Homelands in Kamuela and voiced our objections to this project at the meeting. We also explained to those present that we would confirm those objections in writing. The purpose of this letter is to do that.

B-29

Please also accept these written comments as formal requests that each of the following matters be addressed in both the draft and final Environmental Impact Statement ("EIS") to be prepared for the project. Please also accept this as a formal request that a copy of the draft EIS be provided to me, as the representative of this group, as soon as it is produced. I understand that it is currently scheduled for February 1, 1995.

Finally, could you please also provide me with specific written notice of any further meetings scheduled to discuss this project, since we were advised at the meeting by both the facilitator for the meeting, Valarie Bright, and by Sam Arakaki, the chairman of Mauna Kea SWCD, that further public meetings would be held to gather further input from the community on this project before proceeding with it.

The specific concerns which we have which we believe must be addressed in the EIS are as follows:

1. The reservoir is located over an existing fault line and very near a crowded residential subdivision. We believe this to be extremely hazardous planning and request that the EIS

/94-851

address relocating the reservoir so that it is not over a fault line, or near a subdivision. The EIS must identify (and locate on a map) and then discuss every potential alternative site for the project, including those sites previously rejected.

2. We also request that the EIS address the history of this particular fault line, the likelihood that it will be the location of future earthquakes and the anticipated severity of these potential earthquakes. In that regard we would note that our own research shows that the reservoir as currently designed can withstand only a 7.2 earthquake whose epicenter is 30 miles away. If there is a 10% safety factor it could withstand a 7.5 scale from the same distance. However, based on our interview with the scientists at the Hawaii Volcano Observatory, the major earthquake in 1868 near this location may have been as high as 7.9 on the Richter Scale. Thus we believe the dam must be designed to withstand at least a 7.9 earthquake locally -- not one whose epicenter is 30 miles away.

3. This reservoir is built to be in close proximity to another existing 60,000,000 gallon reservoir. The EIS must evaluate the risk that both the new reservoir and the existing reservoir will fail at or near the same time. A leak in this reservoir may erode the bank of the second reservoir, causing a huge 60,000,000 gallon increase in the escaping water. This evaluation should also include the possibility that water from either, or both reservoirs, may back up, after the failure, because of deposits of earth, concrete or other debris in the mouth of the stream and that this will divert waters into the subdivision.

4. The EIS should address the fact that the earthquake analysis used as basis for the current engineering is the "static method" of analysis. That method is apparently out of date. All analysis of the earthquake risk should be redone using the dynamic method, as that is apparently

/94-851

the choice of consultants in this area at this point in time.

5. The inundation maps currently proposed appear to us to be very inaccurate. In some places the inundation map follows straight lines, which appear to be property lines, or fence lines, rather than the natural flow of the terrain.

6. The inundation map analysis has not been revised to account for a reservoir failure which occurs after a period of heavy rain and where the existing stream bed is already swollen with water.

7. We understand that the existing reservoir is now "piping". This is a situation where water in the reservoir is tunneling its own way through the embankment and is a prelude to possible failure of the reservoir. The EIS must discuss the risk that the new reservoir will "pipe" and fail also.

8. The EIS should also address whether, if the reservoir leaks it will create a bog or other drainage problems. Will that bog or drainage area encroach onto my clients' properties? What steps will be taken to prevent that from occurring?

9. The existing analysis is based on failure of the proposed reservoir only at the mouth of the reservoir. All analysis of the inundation maps, etc. is based upon this single point of failure. This approach appears to us to be reckless and the EIS should consider the risk that the reservoir might fail along the fault line or at any other point in its perimeter. Separate and alternative inundation maps should be developed for each such potential failure, indicating where the water would go if there was a failure at that point.

10. The EIS should specifically state the proposed cost to build the reservoir as designed and it should then evaluate the <u>additional</u> costs which would be imposed on the community given each of the following scenarios.

a. The existing inundation maps already show that inundation would flood three residences. The analysis called for above may show potential flooding of many more residences. All of the residences would certainly have a good claim for "inverse" condemnation -- that is for the governmental taking of their land -- since it will obviously become unsalable in the event the reservoir is built. There are <u>two hundred residences</u> in these affected subdivisions, each of which would have potential claims for the taking, or partial taking, of their land and homes, since they would each be affected by their close proximity to the reservoir and by the inundation threat. The EIS should evaluate the cost to the public of having to acquire some, or all, of these lands and homes and the cost to relocate some or all of these residents.

b. The EIS should also evaluate the cost that would be incurred if all those residents are left in place, but a breach still occurs. What are the risks of serious personal injury, deaths and/or property damage if there is a breach so near a densely populated residential area and what costs would be incurred for payment of the significant claims that would surely follow?

11. The EIS should evaluate the effects on taro production during low flow periods in Waipio Valley.

12. The EIS should evaluate the effects of diversion of water on all native species in Waipio Valley.

13. The EIS should evaluate the effects on the social infrastructure of taro farmers in Waipio Valley who apparently already have conflicts over the available water. That water would apparently be diverted to fill this reservoir.

14. The EIS should evaluate the accuracy of the rainfall estimates in the area of the reservoir

which were used as a basis for the current design. Apparently the current engineering is based on rainfall estimates of 75-80 inches per year. However, the reported actual average is 132.4 inches per year with a maximum rainfall of 216.8 inches per year.

15. The EIS should contain a complete discussion of the safety engineering of the reservoir proposal. This should include disclosure and discussion of the lining products, their estimated length of life and their susceptibility to failure. A similar discussion should be included for each major component of the reservoir system.

16. The EIS should state the period of construction for the proposed reservoir and should evaluate the effects of construction on the daily life of the surrounding residents.

17. The EIS should disclose the proposed access roads for ingress and egress for the construction and the effect on that using such roads will have on surrounding residents as well as the steps that will be taken to mitigate noise, dust and other pollution and hazards to children in the neighborhood during construction.

18. Last year, for a period of several months, trucks and light machinery traveled up and down Lindsey subdivision road to access the repair work being done on the Hamakua ditch. During this period, most residents incurred damage to their property and homes. The vibration of the trucks and equipment rumbling past the homes was perhaps intensified by the soil, which is constantly saturated by the rain. The damage was caused by the earth sinking and settling in various places on each lot. In some cases homes began slipping off their pilings, floors began to slant, walls and ceilings cracked, cesspools sank and began caving in, etc..

It is certain that, with construction vehicles accessing the proposed reservoir site over a period of years, most of the homes on the access

roads will sustain major damage. The EIS must address ways of compensating residents for this damage by evaluating the nearby homes before, during, and after construction. Any damage to homes and property must be assessed and paid for by the sponsors of the reservoir project. The estimated cost of repairs should be reflected in the project's budget.

19. Since the Lindsey subdivision road is a one lane road, cars must pass each other by pulling onto the shoulder of the road. During and after heavy rains, there are various places in Lindsey subdivision where the road floods. The mud on the shoulder of the road is several feet deep in places. Certainly this situation will be worsened by construction equipment. What steps will be taken to insure that the road will be maintained on a consistent basis and that residents will always be able to drive in and out of their homes? Also what steps will be taken to repair the road at the completion of the project. These issues should also be reflected in the project budget and discussed in the EIS.

20. The EIS should discuss whether there is any legal right to divert water from its current uses to the reservoir and on what basis that legal right exists.

21. The EIS should discuss whether and how children are going to be protected from the reservoir since it is an attractive nuisance to children in the subdivision who will be living less then 100 yards away. Will it be fenced or will access otherwise be discouraged? What costs will that add to the project?

22. The EIS should discuss an evacuation plan if the reservoir is breached. Will there be a warning system to signal a breach? What will that system cost? How reliable will it be? How will it function? Will existing roads be sufficient to accommodate a rapid departure of the local population? How much warning would be available in the event of a breach? Is the reservoir

located too close to the residential area to provide any sort of realistic warning of a breach which would allow a timely evacuation?

This is an initial list of our concerns, but we have just begun to have our consultants and engineers look at the current plan. We will provide you with updates as more concerns are identified.

At this point in time we do believe that sufficient concerns, including those listed above, have already been identified about the current site to show that it is the height of folly to proceed with a reservoir at this location. The use of the federal, state or county tax dollars, which will be spent for further planning at this site could be much better spent in identifying another location which is distant from a densely populated residential subdivision and where a failure, if it occurred, would not affect adjoining property with tragic consequences.

It does appear that the ranchers and farmers who were present at the meeting on September 21, 1994 share this view. I would like to stress that no member of the public in this community will be served if the reservoir is built, at huge additional cost, to a much higher degree of safety than would be required, if it were located in a more rural location.

For all these reasons we respectfully request that the current site for the reservoir be abandoned immediately. Copies of the letter are being provided to Senator Inouye, Senator Akaka, Congresswoman Mink, Senator Matsuura, Senator Malama Solomon, Representative Larry Tanimoto, Representative Dwight Takamine, Representative Jerry Chang, Representative Robert Herkes, Representative Virginia Isbell, Representative Harvey Pajiri, Mayor Yamashiro and each of the members of the Hawaii County Council so that they will all be aware of the strong opposition to this project in this location.

Congresswoman Mink has already been very helpful in noting that an EIS should be done for this project and my clients are grateful for that assistance. My clients also respectfully request that their other elected representatives look into this situation as well. If any of those representatives have comments, suggestions or questions, I would be glad to respond. We also invite each of them to visit this proposed site, to see for themselves how dangerous this project appears to be.

I would like to thank you and the representatives for all of your assistance. My clients do support the need for greater agricultural water in this community. They are confident that this need can be met with another appropriate site.

Thank you for your assistance.

Very truly yours,

Jerry M. Hiatt

JMH/krf

cc: The Honorable Daniel Inouye
The Honorable Daniel Akaka
The Honorable Patsy Mink
The Honorable Richard Matsuura
The Honorable Malama Solomon
The Honorable Larry Tanimoto
The Honorable Dwight Takamine
The Honorable Jerry Chang
The Honorable Robert Herkes
The Honorable Virginia Isbell
The Honorable Harvey Pajiri
The Honorable Steve Yamashiro
Councilman Spencer Kalani Shutte
Councilman Takashi Domingo
Councilman Brian J. De Lima
Councilman James Y. Arakaki
Councilman Robert F. Rosehill
Councilwoman Helene H. Hale
Councilman Keiko Bonk-Abramfon
Councilman Keola Childs
Councilman James M. Rath
Charles Brotman
Nancy Walden
Teresa Espaniola

United States
Department of
Agriculture

Soil
Conservation
Service

P. O. Box 50004
Honolulu, HI
96850-0001

September 29, 1994

Jerry Hiatt
Parker Square, Suite 204
P.O. Box 7049
Kamuela, HI 96743

Dear Mr. Hiatt:

This is to acknowledge receipt of your letter of September 27, 1994 regarding the Waimea-Paauilo Watershed Reservoir. The letter is very well written and will be useful in preparation of the EIS. We expect to begin work on the EIS within the next couple of months.

Your office had also made an inquiry as to whether a State EIS will be done. Yes, we will be complying with the State process as required by the Office of Environmental Quality Control.

Thank you for your interest in this important project.

B-33

Sincerely,

Kenneth M. Kaneshiro
State Conservationist

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BENJAMIN J. CAYETANO
GOVERNOR OF HAWAII

STATE OF HAWAII

DEPARTMENT OF LAND AND NATURAL RESOURCES

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

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

DEPUTIES

Gilbert Coloma-Agaran

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FORESTRY AND WILDLIFE
HISTORIC PRESERVATION DIVISION
LAND MANAGEMENT
STATE PARKS
WATER AND LAND DEVELOPMENT

REF:HP-AMK

MAY 6 1997

Mr. Kenneth M. Kanehsiro, State Conservationist
USDA, Natural Resources Conservation Service
P.O. Box 50004
300 Ala Moana Blvd., Room 4316
Honolulu, Hawaii 96850-0050

LOG NO: 19220
DOC NO: 9703PM18

Dear Mr. Kaneshiro:

SUBJECT: **Draft Watershed Plan and Environmental Impact Statement**
Waimea-Paauilo Watershed Project
Hamakua and South Kohala, Hawaii Island
TMK: 4-4, 4-6, 4-9, 6-3, 6-4, 6-5, 6-6 and 6-7: multiple

B-34

Thank you for your letter of March 20, 1997 to Don Hibbard and the opportunity to review and comment on the Draft Watershed Plan and Environmental Impact Statement for the proposed Waimea-Paauilo Watershed Project.

Based on the information provided in the Draft Watershed Plan and Environmental Impact Statement, supporting documents, and other information on file in our office we believe that the Reservoir Supply Pipeline and Kauahi Reservoir improvements of the "Selected Plan" (Alternative 5) will have "no effect" on significant historic sites.

The other proposed improvements of the "Selected Plan," including the Irrigation Water Distribution System, Stockwater Distribution System, and Lalamilo Agricultural Park Expansion, may have an "adverse effect" on what is sometimes loosely called the Waimea Agricultural System. This field system contains ruins of fields and associated sites (habitations, burials, etc.). It is clearly eligible for inclusion on the National Register of Historic Places under nearly all of its criteria. The Draft Watershed Plan and Environmental Impact Statement states that the Irrigation Water Distribution System and Lalamilo Agricultural Park Extension have both been designed to avoid this archaeological site complex. This clearly does not seem to be the case for the Lalamilo Agricultural Park Expansion, which is placed across part of the archaeological field system complex, as best as we can tell at this point. Parts of this field system have undergone archaeological data recovery work (salvage) and preservation for the Waimea Town Center

project of Parker Ranch. That project also found that the field system extended farther south toward and beyond the airport. Thus, clearly for the Ag Park Extension, archaeological analysis and possible archaeological survey is needed to establish if the field system spreads into the project area, the specific significance of the remnants needs evaluation (if remnants are present), and if significant sites are present, then acceptable mitigation plans need to be worked out. For the Irrigation Water Distribution System, a similar situation exists. It appears that the northern section of the Stockwater Distribution System areas has been surveyed and it may be within the field system. No survey has been conducted in the southern portion of the area selected for these improvements, east and south of the airport. Recent surveys indicate the high probability of significant historic sites in this general area, thus leading to our conclusion that these improvements will probably have an "adverse effect."

In summary, we believe that some components of the "Selected Plan" will have "no effect" on significant historic sites, while other components will very likely have an "adverse effect." To comply with the National Historic Preservation, your agency will need to evaluate the impacts of the Ag Park Expansion and Water Distribution System on the Waimea Field System District, and this may involve archaeological survey. Currently, insufficient information is available to evaluate impacts on these two project elements, and adverse impacts seem likely.

In addition to the obvious need for additional archaeological survey to further assess the question of adverse effect, we want to remind you of the need to also consult with Native Hawaiian organizations and individuals to determine the presence/absence of traditional cultural properties in the project area. As a Federal undertaking consultation is needed to fulfill the requirements of Section 106 of the National Historic Preservation Act of 1966 as amended in 1990 and 1992. Until the consultation process has been concluded we cannot agree that all significant historic sites in the project area have been identified.

If you should have any questions about our review comments please contact our Hawaii Island archaeologist, Patrick McCoy (587-0006).

Aloha,

for MICHAEL D. WILSON, Chairperson and
State Historic Preservation Officer

PM:amk

c. James Nakatani, State Dept. of Agriculture

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culture

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Box 50004
lulu, HI
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USDA

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

July 8, 1997

Michael D. Wilson, Chairperson and Historic Preservation Officer
Board of Land and Natural Resources
State Historic Preservation Division
33 South King Street, 6th Floor
Honolulu, Hawaii 96813

Dear Mr. Wilson:

Subject: Draft Watershed Plan and Environmental Impact Statement for the Waimea-Paauilo Watershed

Thank you for your letter of May 6, 1997 with State Historic Preservation Division's comments on the subject document. We wish to respond to your comments.

COMMENT: The Irrigation Water Distribution System, Stockwater Distribution System, and the Lalamilo Agricultural Park Expansion may have an adverse effect on the Waimea Agricultural System, which is clearly eligible for inclusion on the National Register of Historic Places. The DEIS states that the Irrigation Water Distribution System and the Lalamilo Agricultural Park Extension have been designed to avoid this agricultural site complex. This is clearly not the case for the Lalamilo Agricultural Park Extension, which is placed across part of the agricultural site complex.

RESPONSE: There is confusion that the Lalamilo Agricultural Park Extension is a part of the Waimea-Paauilo Watershed project. The FEIS will state explicitly that the Lalamilo Agricultural Park Extension is not an element of this project or covered by this EIS. The Lalamilo Agricultural Park Extension is a proposal by the Hawaii State Department of Agriculture (DOA) to expand commercial agricultural activity in Waimea. If the DOA is able obtain the land from Parker Ranch, the DOA will conduct the required environmental and archaeological investigations and consultations to develop the agricultural park extension.

The DEIS wrongly stated that the Lalamilo Agricultural Park Extension had been designed to avoid the Waimea Agricultural System complex. (DEIS, page 97) The statement should have said that the irrigation pipeline for the Lalamilo Agricultural Park extension had been realigned to avoid archaeological impacts. In 1988, during archaeological consultation with the Historic Preservation Division for the irrigation water distribution pipeline alignments, the lateral distribution pipeline for the agricultural park extension was moved 2,000 feet to the east to avoid impacts to the Agricultural Site Complex. We understand that more recent investigations of the Agricultural Site Complex expands the extent of the complex.

The irrigation water distribution pipeline to service the agricultural park extension will be installed only if the DOA acquires the appropriate approvals and develops the Lalamilo Agricultural Park Extension. Presently, land acquisition difficulties and the recently broadened archaeological concerns appear to dim the prospects of the development of the Lalamilo Agricultural Park Extension at the location east of the airport.

The livestock drinking water pipeline will terminate approximately 4,000 feet due east of the north end of the Kamuela Airport runway. The pipeline will be installed within the corridor of the east-west aligned road that is presently being constructed by the Department of Hawaiian Home Lands (DHHL) and should have no adverse effect on archaeological sites.

COMMENT: We want to remind you of the need to also consult Native Hawaiian organizations and individuals to determine the presence or absence of traditional cultural properties in the project area. As a federal undertaking, consultation is needed to fulfill the requirements of Section 106 of the Historic Preservation Act of 1966 as amended in 1990 and 1992. Until the consultation process has been concluded we cannot agree that all significant historic sites in the project area have been identified.

RESPONSE: No cultural resource not already identified by the Historic Preservation Division has been revealed through the project consultations which have included ongoing planning coordination with the Department of Hawaiian Home Lands, a project sponsor; numerous public meetings in the project area attended by Hawaiian Home Lands lessees and others from the Waimea community; meetings with the Waimea Hawaiian Homesteaders Association and the Stockwater Committee comprised of Hawaiian Home Lands ranchers; and project review by native Hawaiian groups including the Office of Hawaiian Affairs and the Native Hawaiian Legal Corporation. A additional consultation, specifically to address this comment, is being undertaken with Hawaiian groups, including Hawaiian Civic Clubs, Office of Hawaiian Affairs, and other Hawaiian organizations.

RECENT CONSULTATION: Following receipt of the SHPD comments, planners for the project took the opportunity to meet with Patrick McCoy, SHPD Hawaii island archaeologist, to discuss the concerns included in the comment letter and other issues related to the archaeological consultation process and compliance with the provisions of Section 106, HPA. The following actions, in addition to that discussed above, will be taken by NRCS and the sponsors to comply with the intent of the historic preservation law and policy.

Archaeological surveys previously done in the project area found no significant historic surface remains. Much of the project area has been in pasture for over one hundred and fifty years. Most of the pipelines will be placed in existing roadways. The most recent work (Erkelens, 1997) has uncovered buried archaeological remains just under the grass mat. These remains tend to be in the lee areas of hillocks rather than in the flat plains. A

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brief discussion of the Erkelens report will be included the FEIS in the section discussing the Lalamilo Agricultural Park Extension.

While the approximate alignments for the livestock drinking water distribution system that are not located on the disturbed road rights-of-way in the Puukapu and Nienie areas have been surveyed for archaeological concerns, an additional archaeological reconnaissance survey will be conducted and report prepared when the engineering survey for the pipeline is undertaken. The leeward areas of hilly features that may have provided shelter and other formations that SHPD feels have a strong likelihood of yielding cultural deposits will be given particular attention based on recent archaeological finds. Archaeological monitoring during pipeline and reservoir construction will be utilized at such locations. The additional survey and monitoring actions will be included in the FEIS.

We ask for your concurrence that the explanations above and the proposed actions satisfy the SHPD concerns related to the DEIS and will fulfill the requirements of Section 106 of the Historic Preservation Act.

If you should have need for additional information please contact Carol Kawachi, Cultural Resources Specialist, at (808)322-2484 or Dudley Kubo, Planning Engineer, at (808)541-2612.

Sincerely,

CTING

KENNETH M. KANESHIRO
State Conservationist

SEND COPIES TO
APPROPRIATE PARTIES

Anakoni Anjo
P.O. Box. 61871
Honolulu, HI 96839
May 7, 1995

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2 C
y Gill; Leslie Segundo
- S. Beretania St. #720
nolulu, HI 96813

ear Sirs:

This letter is a complaint in response to the proposed Waimea-Paauilo Watershed Reservoir that is to be paid for with Federal and state tax monies. Several points of argument opposing the Watershed project will be outlined in the statements to follow:

(1) Why is a 131 million-gallon reservoir, pipeline and water distribution system (pg. X – DEIS) being paid for with taxpayer monies for special interest groups usage (namely ranchers, farmers and DHHL)? My own family has DHHL lands, but we do not feel that the public is responsible to pay into a fund (to provide and) that selects only a limited population (ranchers + farmers of Waimea area) to benefit from this project. Ranching and farming has always been a risk-oriented business and it is not up to the public to provide a safety net for only a select few. If that is to be the case, then that is clearly discriminatory and unconstitutional and all business ventures could receive the same beneficial treatment (as the Waimea farmers, etc), but of course this would probably bankrupt both Federal and State governmen

B-37

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yearly budget allotments. The Watershed project should be paid for by those receiving benefits from the reservoir and payments could be done by implementing a plan that allows farmers and ranchers to pay off their costs much as a mortgage is paid off. In this manner, the project pays for itself and the farmers could also deduct their payments as the cost of doing business. This solution doesn't burden the taxpayer with a price tag of $17.37 million dollars of debt when the state and Federal governments are already in debt as it is.

(2) Regarding impact on streamflow at Lalakea Stream by 5% (pg xiv) how was this percentage derived? What is 5% in terms of MGD? Isn't Lalakea stream already impacted by a ditch that takes water to the Hamakua Ditch (map, DEIS p24) and further impac water flow to Hiilawe Falls (that supplies water to Waipio and the taro farmers of Waipio Valley)? It is further stated (DEIS pg. 40) that "A compounding factor is the determination by USGS that much of the data collected in the 1975 to 1990 period in watershed area is poor or unstable." If USGS is making this statement, then could it be further hypothesized that 5% of Lalakea stream could be adversely affected in years of inadequate rainfall pushing the 5% base-figure up to 10%, 15%, 20% or more because as streamflow diminishes, the 5% figure extrapolates upward to a ridiculous impact on the stream (Lalakea). Again, what about the water flow and its effects on Hiilawe Falls?

(3) Regarding costs of the project, on pg. 64 it is stated that because PL 83-566 cannot be implemented, construction costs must be totally funded by local sponsors, meaning DOA and DH.

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This means that Dept. of Agriculture and DHHL, both supported by Federal and State tax money, will be responsible for for funding stockwater improvements (DEIS, pg. 64). Again, the taxpayer gets the bill for a special interest project as stated in statement #1 of this letter.

(4) Property acquisition and relocation due to DOA acquiring land rights for the Waterhead project (DEIS, pg. 78) is not addressed in the costs of the project. How much extra, if anything, will it cost to acquire lands that may be needed to complete this project?

(5) The Hawaiian Burial Council needs to be involved if any historical sites [with human remains] may be found (DEIS, pg. 78). Further, why isn't Martha Yent, archaeologist for DLNR, not being utilized [DEIS, pg. 97] and who is Dr. William Bank to state that "they found nothing of archeological significance within the bounds of the three potential reservoir sites or the 500 acres potential new cropland areas." [DEIS, pg. 97] And, how is the Field Complex 4 that borders the Ag Park, going to be preserved and protected or will it be a victim of one culture's greed and desecration of yet another Native Hawaiian historic place - the Waimea Agricultural System [DEIS pg. 97].

B-38

) This letter could continue to point out flaws in the DEIS but that can come later. In summation, I would like to add that due to increased fertilizer and chemical use, how will it affect groundwater supplies (DEIS, pg. 103)? And, who cannot say that the impact on the Lalakea stream and other adjacent streams in the Waimea-Paauilo area will not adversely affect other stream in the Pololu-Awini-North Kohala area creating more negative effects on streams that help those of us growing taro in the Niulii, Halawa, Pololu land districts? Can any hydrologist

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guarantee that this project will not negatively impact Waipio Valley, Pololu, and other stream systems interconnected within the Waimea-North Kohala land districts. Or, is this another way that the state intends to destroy one culture (taro farming, stream restoration) to benefit a special interest group, namely ranchers and farmers at Waimea? Why can't another plan be implemented that benefits all parties involved, especially the taro farmers who are most dependendent on an untouched water system that was in place for over 800 years. Who are these newcomers to change what was already in place?

Thank You,

Anatoni Angio

Anatoni Angio
P.O. Box 61871
Honolulu, HI 96839
(808) 674-1711; 587-4430
or
P.O. Box 943
Kapaau, HI 96755
North Kohala

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Box 50004
lulu, HI
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USDA

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

July 8, 1997

Anakomi Anjo
P.O. Box 61871
Honolulu, Hawaii 96839

Dear Mr. Anjo:

Subject: Draft Watershed Plan and Environmental Impact Statement for the Waimea-Paauilo Watershed

Thank you for your letter of May 7, 1997 to the Office of Environmental Quality Control with your comments on the subject document. We wish to respond to your comments.

COMMENT: Why is the project being paid for with taxpayers' money for "special interest groups' usage (namely ranchers, farmers, and DHHL)." The project should be funded by groups benefiting.

RESPONSE: Government agencies, such as the Natural Resources Conservation Service, State Department of Agriculture, and the Department of Hawaiian Home Lands, are charged with providing improvements, such as this project, that communities or groups would be unable to develop on their own. This project is a social and economic investment designed to generate a positive economic return on investment as demonstrated by the positive benefit to cost ratio. This project will compete with other public improvement project for limited government funds. While the direct economic benefits will be felt mainly by farmers and ranchers in Waimea, indirect benefits such as increased produce availability, increased tax revenue, creation of jobs, and increased spending will affect everyone.

COMMENT: How was the five percent impact to Lalakea Stream derived? Isn't Lalakea Stream impacted by a ditch that takes water to Hamakua Ditch? Doesn't the poor condition of the USGS streamflow record between 1975 and 1990 mean that the five percent impact could be even higher than 20 percent? What are the effects on streamflow and Hiilawe Falls?

RESPONSE: The five percent reduction in average annual streamflow in Lalakea Stream at Hiilawe Falls was derived by comparing the natural runoff from the 3.05 square mile drainage area plus the overflow from the Upper Hamakua Ditch (6,703 MG) with the project installed to the runoff from the natural drainage area plus the overflow from the Upper Hamakua Ditch without the installation of the project (7,080 MG). (page 107 of the DEIS) While the contribution of the overflow from the ditch will be reduced by nearly one-third, when combined with the natural runoff from the Lalakea watershed the annual effect will be five percent.

Water from Lalakea Stream is not diverted by either the Upper Hamakua or Lower Hamakua Ditches. The Lalakea Ditch, which is outside of the project area as is the Lower Hamakua Ditch, was developed and used by Hamakua Sugar Company but is presently abandoned.

While the poor condition of the USGS records may introduce additional uncertainty into these projections, the variability will not be as great as reducing the Lalakea streamflow by 20 percent. The complete cessation of overflow from the Upper Hamakua Ditch will decrease Lalakea streamflow by 17 percent. The worst of the records for the Upper Hamakua Ditch above Waimea Reservoir, from 1984-1990, which were deemed unusable by the USGS, were not used in our analysis.

The five percent reduction in flow in Lalakea Stream and over Hiilawe Falls will have no significant effect as the overflow reduction is spread over the year and the natural Lalakea watershed runoff function is unimpaired by this project.

COMMENT: Because the livestock drinking water component cannot be implemented under PL83-566, the DOA and DHHL will be responsible for the funding. Again the taxpayer gets the bill for a special interest project.

RESPONSE: The livestock drinking water component was shown to derive less economic benefits than costs. Therefore, the federal program could not participate in its funding. However, the State of Hawaii determined that the social benefits of such a system outweighed the economic cost of providing stockwater distribution. Furthermore, the stockwater is needed for pastoral homesteaders to make more productive use of their land, consistent with the trust responsibility created by the Hawaiian Homes Commission Act.

COMMENT: Property acquisition and relocation costs are not addressed in the costs of the project. How much extra will it cost to acquire the lands needed?

RESPONSE: The cost for land acquisition is shown as Land Rights on Table 2 - Estimated Cost Distribution on Page 83 of the DEIS. Approximately $380,000 in land value for land currently owned by the state and DHHL will be converted to project use. Legal survey and conveyance costs are included in the figure above. No business or residential relocations will be required.

COMMENT: The Hawaiian Burial Council needs to be involved. Why isn't Martha Yent, archaeologist for DLNR, being utilized? Who is Dr. William Bonk? How will Field Complex 4, bordering the proposed Agricultural Park, be preserved or protected?

RESPONSE: The Hawaii Island Burial Council will be notified and consulted upon discovery of probable graves. No probable grave sites were indicated by the archaeological surveys or during consultation with the State Historic Preservation Division.

Martha Yent is an archaeologist with the Division of State Parks, DLNR. No State Park land is involved in the Waimea-Paauilo Watershed project.

William Bonk, retired Professor of Archaeology, UH-Hilo, trained with Drs. Emory and Sinoto of the Bishop Museum.

The Lalamilo Agricultural Park Expansion is not a component of this project or covered by this EIS. The final location of this State Department of Agriculture project is still uncertain due land acquisition and archaeological concerns. When a final location is identified, the site will be surveyed for impacts to archaeological and historic sites by the State Department of Agriculture.

COMMENT: How will increased fertilizer and chemical usage affect groundwater supplies? Can any hydrologist guarantee that this project will not negatively impact Waipio Valley, Pololu, and other stream systems? Why can't another plan be implemented that benefits all parties, including Waipio Valley taro growers?

RESPONSE: Installation of the watershed project should have no effect on groundwater and stream quantity or quality, except for the reduction in overflow from the Upper Hamakua Ditch to Lalakea Stream discussed earlier. The issue of groundwater quantity and quality is discussed on pages 102-103 of the DEIS. The issue of streamflow quantity is discussed on pages 106-107 of the DEIS.

While this project does not provide a direct benefit to Waipio Valley taro growers, no adverse impacts to Waipio Valley taro growers are created by installation of the project.

Sincerely,

KENNETH M. KANESHIRO
State Conservationist

cc: Gary Gill, Director, OEQC

BENJAMIN J. CAYETANO
GOVERNOR

GARY GILL
DIRECTOR

STATE OF HAWAII
OFFICE OF ENVIRONMENTAL QUALITY CONTROL

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

May 7, 1997

The Honorable James J. Nakatani, Chairperson
Board of Agriculture, State of Hawai'i
P.O. Box 22159
Honolulu, Hawai'i 96823-2159

ATTENTION: Mr. Paul Matsuo

Dear Mr. Nakatani:

The Office of Environmental Quality Control submits the following comments on the Draft Watershed Plan and Environmental Impact Statement (DEIS), Waimea-Paauilo Watershed Project Statement Hamakua/South Kohala Districts, TMK: 3rd Division; 4-4, 4-6, 4-9, 6-3, 6-4, 6-5, 6-6, 6-7.

B-41

CEDED LANDS: Page 9, Table C, identifies landowners. Please consult with the Office of Hawaiian Affairs and disclose what, if any, of the lands identified in Table C are ceded lands under Section 5 of the Admission Act.

RARE OR UNIQUE ENVIRONMENTAL RESOURCES: In the section on project setting, please include a discussion of rare or unique environmental resources (including natural or man-made resources of historic, archaeological or aesthetic significance) within the project boundaries (see, Section 11-200-17(g), EIS Rules). If these items are discussed elsewhere in the text (such as the discussion of cultural resources on pp. 96-98), please make appropriate reference to them.

POTENTIAL INDIRECT VISUAL EFFECTS TO LALAKEA STREAM AT HI'ILAWE FALLS: Hi'ilawe Falls is considered by many to be an important historical/cultural resource. The diversion of stream water into both upper and lower Hamakua ditches in the past had significantly reduced the volume at Hi'ilawe.

- Please describe historical flow levels at Hi'ilawe Falls during times of maximum stream diversion.
- Please compare these historical flows with the streamflows presented in Table T on page 107.
- Please discuss any visual impacts that would result from reducing streamflow to Hi'ilawe Falls.

Thank you for the opportunity to comment. If there are any questions, please call Mr. Leslie Segundo, Environmental Health Specialist at 586-4185.

Sincerely,

GARY GILL
Director of Environmental Quality Control

c: Mr. Kenneth M. Kaneshiro, State Conservationist, U. S. Department of Agriculture, National Resources Conservation Service

USDA

United States
Department of
Agriculture

Natural
Resources
Conservation
Service

P.O. Box 50004
Honolulu, HI
96850

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

July 8, 1997

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

Dear Mr. Gill:

Subject: Draft Watershed Plan and Environmental Impact Statement for the Waimea-Paauilo Watershed

Thank you for your letter of May 7, 1997 to James J. Nakatani, Chairperson, Board of Agriculture with comments on the subject document. Through the intergovernmental partnership for this project with the state Department of Agriculture, the Natural Resources Conservation Service will respond to your comments. A separate response by the State Department of Agriculture will not be mailed.

COMMENT: Please consult with the Office of Hawaiian Affairs and disclose what, if any, of the lands identified in table C are ceded lands under Section 5 of the Admissions Act.

RESPONSE: We have consulted with the Office of Hawaiian Affairs and the DLNR Land Management Division and have identified ceded lands within the project area. The Department of Hawaiian Home Lands parcels, in addition to several non-DHHL parcels owned by the State of Hawaii are considered ceded. As the project improvements will be made on ceded lands and because many of the project beneficiaries utilize ceded lands, a discussion of the ceded land uses set forth in Section 5(f) of the Admissions Act has been included as Section 6.6.11

COMMENT: Include in the section on project setting a discussion or rare or unique environmental resources (including natural or man-made resources of historic, archaeological, or aesthetic significance) within the project boundaries.

RESPONSE: Section 2.10 Rare and Unique Environmental Resources will be included in the FEIS.

The General Plan for Hawaii County (1989) describes the economic, energy, environmental quality, flood control and drainage, historic sites, natural beauty,

natural resources and shoreline, housing, public facilities, public utilities, recreation, transportation, and land use resources and controls of the nine districts of the island of Hawaii, including South Kohala.

The Waimea region is associated with cattle ranching, conjuring images of paniolo, horses and cows. While there are other areas of the state where ranching takes place, the predominance of the Parker Ranch, the long history of cattle ranching in the area, and the wide open rangeland of the Waimea Plain have created a strong association of cattle ranching with Waimea.

Waimea is one of the most productive areas for vegetable crops in the state. Many cool weather crops that cannot be grown elsewhere in Hawaii are grown, including cabbage, celery, and lettuce.

The nearby landforms that are culturally important are the Kohala Mountains, Mauna Kea, and Waipio Valley. The cinder cone hills, especially Puu Laelae, Puu Hokuula, and Puuiki, have significant natural beauty.

For significant archaeological resources see Section 6.3.4 Cultural Resources. For significant unique or rare plant and wildlife resources see Section 6.3.13 Threatened and Endangered Species.

COMMENT: Hi'ilawe Falls is considered by many to be an important historical/cultural resource. The diversion of stream water into both upper and lower Hamakua Ditches in the past had significantly reduced the volume at Hi'ilawe. Please describe historical flow levels at Hi'ilawe Falls during times of maximum diversion. Please compare these historical flows with the streamflows presented in Table T on page 107. Please discuss any visual impacts that would result from reducing streamflow to Hiilawe Falls.

RESPONSE: None of the streams that contribute flow to Hi'ilawe Falls is diverted by either the Upper Hamakua or Lower Hamakua Ditches. The Lalakea Ditch, with a diversion on Lalakea Stream approximately 3,000 feet upstream of Hiilawe Falls, is the only diversion above Hi'ilawe Falls. The Lalakea Ditch, once operated by Hamakua Sugar Company, is currently abandoned.

Overflow from the Upper Hamakua Ditch spills into the Lalakea Stream drainage area. The amount of overflow will be reduced by implementation of this project. The natural runoff from the drainage area for Hi'ilawe Falls is not affected by this project.

The cultural and visual importance of Hi'ilawe Falls derives largely from its pairing with Hakalaoa Falls immediately to the east. The twin falls structure has been disrupted since 1989 when an emergency diversion of Hakalaoa Stream was made to protect a temporary repair to the Lower Hamakua Ditch tunnel. Restoration of Hakalaoa Falls is being addressed by other efforts and is not affected by this project.

No stream record exists for Hiilawe Falls or Lalakea Stream. An estimate of the average monthly flow in Lalakea Stream, that is shown in Table T, was made through an analysis using seven gaged streams in the Hilo-Hamakua-Kohala region and the monthly rainfall distribution at the Lalakea rain gage (202.00). Lalakea Ditch diversion was not included in the analysis.

Sincerely,

ACTING

KENNETH M. KANESHIRO
State Conservationist

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION IX
75 Hawthorne Street
San Francisco, CA 94105-3901

May 7, 1997

Kenneth M. Kaneshiro
Natural Resources Conservation Service
P.O. Box 50004
300 Ala Moana Blvd., Room 4316
Honolulu, HI 96850-0050

Dear Mr. Kaneshiro:

The Environmental Protection Agency (EPA) has reviewed the Draft Watershed Plan and Environmental Impact Statement (DEIS) for the project entitled **Waimea-Paauilo Watershed.** Our review is pursuant to the National Environmental Policy Act (NEPA), Council on Environmental Quality (CEQ) regulations (40 CFR Parts 1500-1508), and Section 309 of the Clean Air Act.

The DEIS evaluates five alternatives for managing the distribution of water for agricultural and livestock uses in the project area, including a no action alternative. The four action alternatives outline various proposals for water management, including plans to construct a reservoir, an irrigation distribution system, and a stockwater distribution system. The preferred alternative, Alternative 5, proposes to construct a reservoir at the Kauahi site.

B-43

EPA rates this DEIS as category EC-2, Environmental Concerns--Insufficient Information. For an explanation of EPA's rating system, please see the attached "Summary of the EPA Rating System." EPA's primary concern is the lack of economic and environmental justification for the proposed stockwater distribution system outlined in various management alternatives, including the preferred alternative. 40 CFR 1502.13 states that an EIS "shall briefly specify the underlying purpose and need to which the agency is responding in proposing the alternatives including the proposed action." This EIS fails to adequately develop the purpose and need for the stockwater distribution system. Although we recognize that construction of a stockwater distribution would potentially increase the productivity of grazing land in the watershed, thereby reducing future economic losses resulting from ranching within the watershed, we note that the DEIS states that "installation of the Kauahi Reservoir and a stockwater distribution system will not improve the range or pasture." (DEIS Page 90) Furthermore, the economic figures included in the DEIS indicate that the stockwater distribution component of the preferred alternative would operate at a net loss.

In addition, EPA finds the "rationale for plan selection" paragraph at Page 60 particularly misleading. This paragraph states that Alternative 5 is preferred over Alternative 2 because it "addresses the project purpose of alleviating agricultural water shortage problems, with less potential adverse effects on properties surrounding the proposed reservoir." Although this statement provides the rationale for selecting the Kauahi reservoir location over the Waimea reservoir location, it fails to address cost/benefit issues related to the stockwater distribution system.

NEPA requires that federal agencies "rigorously explore and objectively evaluate all reasonable alternatives" in an EIS. (40 CFR 1502.14(a)) In order to draw a fair comparison between alternatives, NRCS should evaluate an alternative which includes the Kauahi reservoir and irrigation distribution system outlined in Alternative 5, but omits the stockwater distribution system. EPA recommends that NRCS evaluate this alternative and include it in future iterations of the EIS prepared for this project.

We appreciate the opportunity to review this DEIS. Please send a copy of the Supplemental DEIS or Final EIS to this office at the same time it is filed with our Washington, D.C. office. If you have questions, please call Leonidas Payne of my staff at (415) 744-1571.

Sincerely,

David J. Farrel, Chief
Federal Activities Office

SUMMARY OF RATING DEFINITIONS AND FOLLOW-UP ACTION

Environmental Impact of the Action

LO-Lack of Objections

The EPA review has not identified any potential environmental impacts requiring substantive changes to the proposal. The review may have disclosed opportunities for application of mitigation measures that could be accomplished with no more than minor changes to the proposal.

EC-Environmental Concerns

The EPA review has identified environmental impacts that should be avoided in order to fully protect the environment. Corrective measures may require changes to the preferred alternative or application of mitigation measures that can reduce the environmental impact. EPA would like to work with the lead agency to reduce these impacts.

EO-Environmental Objections

The EPA review has identified significant environmental impacts that must be avoided in order to provide adequate protection for the environment. Corrective measures may require substantial changes to the preferred alternative or consideration of some other project alternative (including the no action alternative or a new alternative). EPA intends to work with the lead agency to reduce these impacts.

EU-Environmentally Unsatisfactory

The EPA review has identified adverse environmental impacts that are of sufficient magnitude that they are unsatisfactory from the standpoint of environmental quality, public health or welfare. EPA intends to work with the lead agency to reduce these impacts. If the potential unsatisfactory impacts are not corrected at the final EIS stage, this proposal will be recommend for referral to the Council on Environmental Quality (CEQ).

Adequacy of the Impact Statement

Category 1-Adequate

EPA believes the draft EIS adequately sets forth the environmental impact(s) of the preferred alternative and those of the alternatives reasonably available to the project or action. No further analysis or data collection is necessary, but the reviewer may suggest the addition of clarifying language or information.

Category 2-Insufficient Information

The draft EIS does not contain sufficient information for EPA to fully assess environmental impacts that should be avoided in order to fully protect the environment, or the EPA reviewer has identified new reasonably available alternatives that are within the spectrum of alternatives analyzed in the draft EIS, which could reduce the environmental impacts of the action. The identified additional information, data, analyses, or discussion should be included in the final EIS.

Category 3-Inadequate

EPA does not believe that the draft EIS adequately assesses potentially significant environmental impacts of the action, or the EPA reviewer has identified new, reasonably available alternatives that are outside of the spectrum of alternatives analyzed in the draft EIS, which should be analyzed in order to reduce the potentially significant environmental impacts. EPA believes that the identified additional information, data, analyses, or discussions are of such a magnitude that they should have full public review at a draft stage. EPA does not believe that the draft EIS is adequate for the purposes of the NEPA and/or Section 309 review, and thus should be formally revised and made available for public comment in a supplemental or revised draft EIS. On the basis of the potential significant impacts involved, this proposal could be a candidate for referral to the CEQ.

*From: EPA Manual 1640, "Policy and Procedures for the Review of Federal Actions Impacting the Environment."

USDA

United States
Department of
Agriculture

Natural
Resources
Conservation
Service

P.O. Box 50004
Honolulu, HI
96850

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

July 8, 1997

David J. Farrel, Chief
Federal Activities Office
U.S. Environmental Protection Agency, Region IX
75 Hawthorne Street
San Francisco, California 94105-3901

Dear Mr. Farrel:

Subject: Draft Watershed Plan and Environmental Impact Statement for the Waimea Paauilo Watershed

Thank you for your letter of May 1, 1997 with your comments on the subject document. We wish to respond to your comments.

COMMENT: EPA Rates this DEIS as category EC-2, Environmental Concerns -- Insufficient Information. The DEIS lacks economic and environmental justification for the proposed livestock water distribution system which the DEIS indicates would operate at a net loss.

RESPONSE: Corrective changes suggested in comments form EPA and others will be incorporated in the FEIS to provide fuller information about the impacts of the selected alternative and to reduce adverse environmental impacts.

The livestock drinking water distribution system is not economically feasible with an annualized benefit to cost ratio, including installation costs, of 0.5:1.0. The federal program is unable to participate in the construction of this component, except to provide technical assistance.

The local sponsoring agencies, however, wish to implement the livestock drinking water distribution system which is needed for pastoral homesteaders to make more productive use of their land. This is consistent with the trust responsibility under the Hawaiian Homes Commission Act which was originally created by the U.S. Congress in 1920 and is now administered by the State of Hawaii. The cornerstone of the Hawaiian Homes Commission Act is the awarding of homestead leases to native Hawaiians for residential, agricultural, pastoral, and aquaculture purposes. Off-farm infrastructure to sustain those activities including irrigation and stock water, is needed.

The Natural Resources Conservation Service works hand-in-hand with the American people to conserve natural resources on private lands.

AN EQUAL OPPORTUNITY EMPLOYER

An discussion of the trust responsibility of the state and federal governments to the native Hawaiian people created by the Hawaiian Homes Commission Act is included in Section 2.9. An expanded discussion of the purposes for which "ceded lands", including DHHL parcels, can be used is included in Section 6.6.10. Discussion of the effect of the livestock drinking water component on fulfillment of the trust responsibility will be included in the description and comparison of alternatives.

No direct or indirect adverse effect to the environment, except for usual impacts that can be expected during installation, were identified during planning of the project.

COMMENT: In order to draw a fair comparison between alternatives, NRCS should evaluate an alternative which includes the Kauahi Reservoir and irrigation distribution system outlined in Alternative 5, but omits the stockwater distribution system.

RESPONSE: An Alternative 6 will be developed which will omit the livestock drinking water distribution system from the Selected Alternative.

A Final EIS will be filed with your office at the same time it is filed with the Washington, D.C. EPA office.

Sincerely,

ACTING

KENNETH M. KANESHIRO
State Conservationist

JOHN RAY
Councilman

COUNTY COUNCIL
County of Hawaii
Hawaii County Building
25 Aupuni Street
Hilo, Hawaii 96720

Hilo Phone: (808) 961-8265
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Waimea Phone: (808) 885-5875
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May 9, 1997

Kenneth Kaneshiro
USDA, Natural Resources Conservation Service
P.O. Box 50004
Honolulu, HI 96850-0050

RE: WAIMEA PAAUILO WATERSHED PROJECT
COMMENTS ON THE DRAFT EIS

Dear Mr. Kaneshiro:

The Waimea Water Roundtable (WWR) was created and endorsed by Resolution's in the State House of Representatives and the Hawaii County Council. The mission of the Roundtable was to gather a diverse and experienced group to examine the development and utilization of Waimea's water resources. It was Representative David Tarnas' and Councilman John Ray's hope that this team effort would bring a cooperative understanding of the challenges we all face and a unified approach to overcoming those challenges. For the past year, WWR has been meeting to fulfill that mission and has made great progress in bringing together the various individuals and agencies that deal with water issues in the Waimea area. As you can see from the attached member list, the WWR is made up of a diverse and experienced group of individuals and agencies.

At our last meeting, we reviewed and discussed the draft Environmental Impact Statement(EIS) for the Waimea Paauilo Watershed Project at great length. After thoughtful discussion and analysis, the group developed a list of questions that should be considered when evaluating the draft EIS. Please find attached those questions that we would like to submit as comments for consideration.

Thank you for your assistance in this matter. If you have any questions, please feel free to contact me.

Sincerely,

John Ray, Councilman
County of Hawaii

attachments

WAIMEA WATER ROUNDTABLE
COMMENTS ON THE WAIMEA PAAUILO WATERSHED PROJECT EIS

A. Funding

How soon can funding be expected for each share of contribution?

What is the likelihood of State and Federal contributions actually being available?

B. Stockwater system

Will the homesteaders be drinking the water? If likely, or yes, shouldn't improvements of the existing DWS system be considered as an alternative?

Does the proposed system depend on construction of the irrigation component, i.e. the large diameter pipeline and reservoir?

How are the livestock in AU determined?

Can the carrying capacities listed be demonstrated in fact?

C. Irrigation system

Has the State acquired or discussed acquiring the lands shown for ag park expansion?

How much will the capital investment per new irrigated acre be?

What will the per acre service charge be for irrigated land?

D. Losses

How are the estimated crop losses determined and verified?

Are the farmers making crop loss claims?

E. Surface water

Are the preparers aware that the stream flow reporting was inaccurate?

F. Ground water

Was the alternative of wells in the high level newly defined aquifer seriously and adequately considered as a substitute to storage?

Were the 1995 HELCO power rate changes studied in evaluating pumping?

Why weren't recent (since 1985) DLNR and USGS publications referring to ground water in the source area of Waimea cited as references?

What were the actual operating costs of the Puukapu well in 1996 drought?

Are the alternatives considered in the Draft EIS timely in view of the 18-year life of the planning period?

F. Groundwater (continued)

Was any consideration given to reallocation of water resources in view of the recent (1990's) discovery of high level ground water?

How would this project fit into the larger picture as it relates to the State's Water Plan?

G. Irrigated crop lands

When designing the crop land options, was consideration given to setting aside adequate crop lands adjacent to the irrigation system for the future expansion needed in the next century?

What are the limits of high elevation crop lands throughout the State?

Are the present lands adjacent to the existing pipeline fully utilized in crop production?

That is, might land trades be more effective as an alternative to building new irrigation systems?

Are modern irrigation techniques considered in calculating agricultural water needs? If not, why?

H. Environmental impacts

Have the potential impacts to ground water or stream contamination been thoroughly addressed in regard to the ag lot expansion and nutrient management

WAIMEA WATER ROUNDTABLE
MEMBER LIST

NAME	ORGANIZATION
Sam Araki	Mauna Kea Soil & Water Conservation District
Kenneth Boche	Community Member
Steve Bowles	Waimea Water Services
Jim Dupont	Department of Hawaiian Home Lands
Charlie Ewart	United States Geological Survey
Murray Gardner	Community Member
Roy Hardy	DLNR - State Commission on Water Resource Management
Harold Hart	Department of Water Supply
Gary Kam	Natural Resources Conservation Service
Dan Kaniho Jr.	Waimea Hawaiian Homestead Association
Albert Kawabata	Department of Agriculture - Waimea Irrigation System
Paul Matsuo	Department of Agriculture
David Oshiro	Kohala County Farm Bureau
Milton Pavao	Department of Water Supply
John Ray	County of Hawaii
Riley Smith	Parker Ranch
David Tarnas	State of Hawaii House of Representatives
Peter Young	Waimea Community Association

USDA

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Box 50004
lulu, HI
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Our People...Our Islands...In Harmony

July 8, 1997

Waimea Water Roundtable
c/o John Ray, Councilman
County of Hawaii
25 Aupuni Street
Hilo, Hawaii 96720

Dear Councilman Ray:

Subject: Draft Watershed Plan and Environmental Impact Statement for the Waimea-Paauilo Watershed

Thank you for the letter of May 9, 1997 with the comments of the Waimea Water Roundtable on the subject document. We wish to respond to your comments and questions.

COMMENT: How soon can funding be expected for each share of contribution?

RESPONSE: Funds must be acquired before construction of each component of the project. An estimated installation schedule over a period of six years is shown as Table N in the DEIS. The most optimistic date for start of construction would be Fall 1998. This assumes completion of the final EIS, acquisition of needed permits and landrights, and completion of technical investigations and design. Funding for this increment will be requested from the state legislature and NRCS once the final EIS is completed and Watershed Agreement signed.

COMMENT: What is the likelihood of state and federal contributions actually being available?

RESPONSE: With the cutbacks in both state and federal budgets, the likelihood of immediate funding of the Waimea-Paauilo Watershed has diminished. However, limited funds are currently still available and restoration of fuller funding of state and federal water resources programs is a distinct possibility with recovery of the state and national economies. Implementation of the irrigation water component will provide a positive return on construction investment to the state economy.

COMMENT: Will the homesteaders be drinking the water? If likely, or yes, shouldn't improvements of the existing DWS system be considered as an alternative?

RESPONSE: The water provided by the WIS through this project will not be treated. Homesteaders and others will be warned against human consumption of the agricultural water. Many farm and ranchlots will have both DWS and WIS service. Educational efforts to prevent cross-connection of the systems and consumption of untreated agricultural water will be conducted.

The decision to provide livestock drinking water from the agricultural system rather than expand the DWS system was based primarily on the low priority of livestock drinking water on the DWS system. During drought periods, the likelihood of the availability of livestock drinking water is greater on the expanded WIS than from the DWS. The cost to expand the DWS to serve all of the ranchlots that were identified for a connection by this project has not been calculated.

COMMENT: Does the proposed [livestock drinking water] system depend on construction of the irrigation component, i.e., the large diameter pipeline and reservoir?

RESPONSE: Yes, transmission and storage capability is needed to be able to provide water through dry periods when flow in the Upper Hamakua Ditch diminishes below the daily demand for both livestock drinking water and irrigation. The implementation of transmission and storage infrastructure dedicated just to livestock drinking water would be more costly than as a part of the expanded WIS

COMMENT: How are the livestock in AU [animal units] determined?

RESPONSE: The NRCS National Range Handbook defines an animal unit (AU) as "a mature cow of approximately 1,000 pounds and a calf as old as six months of age or their equivalent." As a guide, a mature bull is 1.25 AU equivalents, while one-year old cattle are 0.60 AU equivalents.

The average stocking rate for conventional grazing methods was determined to be 2.3 acres per AU, through interviews with ranchers, including Parker Ranch, in the mid-1980s.

COMMENT: Can the carrying capacities listed be demonstrated in fact?

RESPONSE: The carrying capacities listed are estimates of the full production potential based on interviews with area ranchers. The increase assumes that intensive grazing systems will be used. A 1984 report entitled "Economics of Intensive Grazing: A Case in Hawaii" by Leung and Smith recorded a three-fold production increase from 250 pound of beef per acre under conventional methods to 725 pounds per acre with intensive grazing. This increase was achieved without fertilization of pastures, with very little legume in the paddocks, and during four months of drought in the study year.

COMMENT: Has the state acquired or discussed acquiring the lands shown for Ag Park expansion?

RESPONSE: No, the land shown in the displays as the Lalamilo Ag Park Expansion has not been acquired by the state. Since the late 1980s, the state has been discussing the acquisition of the land with the owner, Parker Ranch. Parker Ranch is opposed to relinquishing that area for agricultural park development but is willing to make available alternate sites for the Ag Park expansion. The State Department of Agriculture continues to negotiate with Parker Ranch for alternate sites for the agricultural park.

The Lalamilo Agricultural Park Expansion is not a component of this project and is not covered by this EIS.

COMMENT: How much will the capital investment per new irrigated acre be?

RESPONSE: The "new irrigated acres" are assumed to be the 115 acres of irrigated cropland in the proposed 270-acre Ag Park. The capital investment will be the installation cost of the lateral distribution pipeline for the Ag Park and the proportion of the reservoir and pipeline costs attributable to the Ag Park expansion. The total irrigated acreage in the project area, with project installation, is 989 acres.

The cost of the lateral distribution system is $493,400 and the proportional cost of the reservoir and other pipeline improvements is $1,392,000, for a total capital investment cost of $1,885,400. For 115 acres of irrigated cropland, the cost per acre to provide irrigation water to the parcel boundary is $16,400.

COMMENT: What will the per acre service charge be for irrigated land?

RESPONSE: The current acreage charge for the WIS, which is charged in addition to $0.16 per 1,000 gallons of water, is $2.25 per acre per month. While the acreage charge is not expected to increase, the Department of Agriculture is in the process of securing a rate increase for the gallonage charge.

COMMENT: How are the estimated crop losses determined and verified?

RESPONSE: NRCS procedures for determining crop losses and benefits based on the federal Water Resource Council's "Economic and Environmental Principles and Guidelines for Water and Related Land Resources Implementation Studies" were followed. Crop budgets, which are cost return estimates for the crops commonly grown in the area, were prepared. Benefits, which are increases in net income, were estimated for differing levels of irrigation water availability. The ability of various combinations of improvements to the WIS to consistently provide water to users was evaluated using existing streamflow records to determine the water supply reliability of each alternative. The calculated net income to farmers for the existing condition, for conditions with 100 percent reliability of water supply, and for conditions with implementation of the project alternatives was compared. Estimated crop losses is the difference in net income between the existing condition and that with 100 percent reliability of irrigation water supply.

Verification of estimated crop losses relied on interviews with area farmers. No financial records were requested for verification of past crop losses as is NRCS policy.

COMMENT: Are the farmers making crop loss claims?

RESPONSE: The evaluation for the project estimates that an average of nearly $.6 million in net income is lost yearly on existing cropland due to inconsistent and inadequate water supply. Losses include crop failures during prolonged droughts, as well as, decreased number of planting cycles due to uncertainty of water supply, reduced produce quality and quantity due to fluctuations in water supply, and increased effort and cost, such as for night irrigation.

While newspaper clippings indicate that state and federal programs to provide disaster relief have been utilized by Waimea farmers during droughts, the need for a declaration of emergency by the government and program restrictions, especially in the federal program excluding much of the types of farming activity taking place in Hawaii, make crop loss claims a poor source of data about water shortage losses suffered by Waimea farmers.

COMMENT: Are the preparers aware that the streamflow reporting was inaccurate?

RESPONSE: Yes. The U.S. Geological Survey streamflow data has been used judiciously. Data that was deemed unreliable by the USGS, such as the 1984-1990 for the Upper Hamakua Ditch above Waimea Reservoir, was not used.

COMMENT: Was the alternative of wells in the high level newly defined aquifer seriously and adequately considered as a substitute to storage?

RESPONSE: The use of wells, such as the existing 1,000-gpm, 1,200-foot deep Puukapu Well, to augment the Waimea Reservoir supply for expansion of the WIS was considered, but not in great detail. A principal tenet of the Waimea-Paauilo Watershed project and other agricultural water projects undertaken by the State Department of Agriculture and NRCS is to reserve groundwater resources for domestic supply and to protect and make more efficient use of the already developed surface water sources. Wells are used only as a backup to surface sources. To this end, the suggestion of acquiring the DWS's surface water sources and storage in exchange for financial assistance to develop domestic supply wells was pursued by project planners.

COMMENT: Were the 1995 HELCO power rate changes studied in evaluating pumping?

RESPONSE: The rate change referred to is assumed to be the Night Rate offered at $0.035 per Kwh between 9:00 PM and 7:00 AM plus a $200 monthly fee. Power usage must only be during this period.

The Night Rate was not considered in detail for well operation due to the tenet that ground water should be reserved for domestic supplies. While the Night Rate would considerably reduce operating costs for wells, reliance on the rate will require the installation of 1.4 additional wells to provide the same volume of water as one well operating continuously.

The small sizes of the booster pumps in the distribution systems, mostly 5-hp, make the Night Rate, with its $200 monthly fee, often more expensive than the General Service Rate at $0.17 per Kwh and $45 (three phase) monthly fee. A distinct disadvantage of the Night Rate would be the requirement to pump only during night hours requiring considerable storage facilities rather than pumping "on demand."

COMMENT: Why weren't recent (since 1985) DLNR and USGS publications referring to groundwater in the source area of Waimea cited as references?

RESPONSE: Here, again, the focus was on better utilization of the surface water sources. DLNR Circular C-116 (Nance and Bowles, 1985) discusses groundwater drilling sites in the Kohala Mountains above Waimea for perched water bodies at a depth on the order of 1,000 feet.. The work makes a strong case for the wells as an alternative to large reservoir projects. USGS Water Resources Investigations Reports 95-4113 (Underwood, Meyer, and Souza, 1995) discusses basal groundwater availability from the Hawi aquifer outside of the Waimea-Paauilo Watershed. USGS Water Resources Investigations Reports 95-4114 (Shade, 1995) discusses a generalized water budget for the Kohala area and shows that the highest percentage of rainfall goes to aquifer recharge.

COMMENT: What were the actual operating costs of the Puukapu well in the 1996 drought?

RESPONSE: The Puukapu well was not utilized by the Department of Agriculture during the 1996 drought.

COMMENT: Are the alternatives considered in the Draft EIS timely in view of the 18-year life of the planning period?

RESPONSE: Yes, the improvements to the WIS water storage and distribution capabilities are presently needed due to the steady growth of agricultural activity, extension of the WIS system into the DHHL Puukapu farmlots, and desire for ranchers to establish productive economic units. The Watershed project authority allows considerable flexibility as to agricultural use of the improvements, thereby, allowing the project to meet the needs of farmers and ranchers in Waimea.

COMMENT: Was any consideration given to reallocation of water resources in view of the recent (1990s) discovery of high level ground water?

RESPONSE: No. The only reallocation of water that was considered in light of the groundwater situation was the exchange of the DWS surface sources and reservoirs for financial assistance to develop well sources for domestic supply.

COMMENT: How would this project fit into the larger picture as it relates to the State's Water Code.

RESPONSE: This project complies with the policy stated in the State Water Code (Section 174C-2(c)) that maximum beneficial use of the water for purposes, including irrigation and other agricultural uses, should be made while protecting environmental and cultural values. The Waimea Paauilo Watershed project expands use of an already developed surface water source, which is not desirable for potable water supply, for agricultural purposes without unmitigated adverse environmental or cultural impacts.

The Hawaii County Water Use and Development Plan (1992), which is required of Hawaii County by the State Water Code, anticipates the installation of this project to meet the water needs of Waimea's farmers and ranchers.

COMMENT: When designing the cropland options, was consideration given to setting aside adequate croplands adjacent to the irrigation system for future expansion needed in the next century?

RESPONSE: No. Nearly all of the land adjacent to the irrigation system is presently designated for agricultural use, as shown on Figure B - County Landuse Districts. An abundance of land for expansion of irrigated crops exists in the project area.

COMMENT: What are the limits of high elevation croplands throughout the state?

RESPONSE: The two main regions for high elevation crops in Hawaii are Waimea, Hawaii and Kula, Maui. Both regions have the land area to allow for expansion of cropland if conditions for profitable agricultural activity, such as adequate and consistent water supply, are provided.

COMMENT: Are the present lands adjacent to the existing pipeline fully utilized in crop production?

RESPONSE: No. While high rates of cropland utilization exist in the Lalamilo and Puukapu Farmlots, the DHHL Puukapu farmlots are still being developed.

COMMENT: That is, might trades be more effective as an alternative to building new irrigation systems?

RESPONSE: The location of the Agricultural Park proposed by the DOA is still uncertain. For display purposes, the Lalamilo Ag Park expansion was shown in its initially proposed location, just east of the Kamuela Airport. Other locations will also be

evaluated by the DOA as locations to develop the Agricultural Park. It is unlikely that lands adjacent to the existing distribution system can be acquired due to the many smaller, individually-held land parcels and higher land costs nearer the Waimea Town core.

COMMENT: Are modern irrigation techniques considered in calculating agricultural water needs? If not, why?

RESPONSE: Yes, irrigation water use efficiencies reflecting widespread use of drip/trickle irrigation methods was used to determine future irrigation water needs. The natural resource conservation program administered by the Mauna Kea SWCD and the NRCS will encourage and assist farmers to implement water-conserving irrigation methods.

COMMENT: Have the potential impacts to ground water or stream contamination been thoroughly addressed in regard to the agricultural lot expansion and nutrient management?

RESPONSE: A discussion of potential impacts of increased agricultural chemical use is included in Section 6.3.8 Groundwater in the DEIS. Impacts to stream systems by agricultural chemicals was not closely evaluated as surface runoff and soil erosion are not major problems in the Puukapu and Lalamilo cropland areas.

Sincerely,

ACTING

KENNETH M. KANESHIRO
State Conservationist

Stephen K. Yamashiro
Mayor

Virginia Goldstein
Director

Norman Olesen
Deputy Director

County of Hawaii

PLANNING DEPARTMENT
25 Aupuni Street, Room 109 • Hilo, Hawaii 96720-4252
(808) 961-8288 • Fax (808) 961-9615

May 12, 1997

Mr. Kenneth M. Kaneshiro, State Conservationalist
USDA, Natural Resources Conservation Service
P.O. Box 50004
300 Ala Moana Blvd., Room 4316
Honolulu, HI 96850-0050

Dear Mr. Kaneshiro:

Draft Watershed Plan and Environmental Impact Statement for the
Waimea-Paauilo Watershed Project
Hamakua and South Kohala Districts, Island of Hawaii

B-52 Thank you for your letter dated March 20, 1997, requesting our review and comment of the above-described document.

Our only comment is that Section 6.6 Relationship to Other Plans, Policies, and Controls should include a discussion on county zoning requirements. The Selected Plan identifies the construction of the proposed Kauahi Reservoir on lands designated Agricultural-40 acres (A-40a) by the County Zoning Code. Section 25-4-11(a) & (c) of the Zoning Code states that "Communication, transmission, and power lines of public and private utilities and governmental agencies are permitted uses within any district" and that "Public uses, structures and buildings and community buildings are permitted uses in any district . . . .", respectively.

We appreciate the opportunity to be included in the review of this document. We look forward to reviewing the Final Environmental Impact Statement. Please contact Daryn Arai of this office should you have any questions.

Sincerely,

VIRGINIA GOLDSTEIN
Planning Director

DSA:mlm
f:\wp60\czm\Ch343\LWaime01.dsa
xc: West Hawaii Office

USDA

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

United States
Department of
Agriculture

Natural
Resources
Conservation
Service

P.O. Box 50004
Honolulu, HI
96850

July 8, 1997

Virginia Goldstein, Planning Director
Department of Planning
County of Hawaii
25 Aupuni Street, Room 109
Hilo, Hawaii 96720-4252

Dear Ms. Goldstein:

Subject: Draft Watershed Plan and Environmental Impact Statement for the
Waimea Paauilo Watershed

Thank you for your letter of May 12, 1997 with comments on the subject document. We wish to respond to your comments.

COMMENT: Section 6.6 Relationship to Other Plans, Policies, and Controls should include a discussion on county zoning requirements. The Selected Plan identifies the construction of the proposed Kauahi Reservoir on lands designated Agricultural-40 by the County Zoning Code. Section 25-4-11(a) and (c) of the Zoning Code states that "Communication, transmission, and power lines of public and private utilities and government agencies are permitted uses within any district" and that "Public uses, structures, and buildings and community buildings are permitted uses in any district...", respectively.

RESPONSE: A discussion of county zoning requirements, as set forth in your comment, will be included as Section 6.6.9 County Zoning Code.

Sincerely,

KENNETH M. KANESHIRO
State Conservationist

BENJAMIN J. CAYETANO
GOVERNOR

STATE OF HAWAII
DEPARTMENT OF ACCOUNTING AND GENERAL SERVICES
P. O. BOX 119, HONOLULU, HAWAII 96810

SAM CALLEJO
COMPTROLLER

MARY PATRICIA WATERHOUSE
DEPUTY COMPTROLLER

LETTER NO. (P)1334.7

MAY 12 1997

Mr. Kenneth M. Kaneshiro, State Conservationist
Natural Resources Conservation Service
United States Department of Agriculture
P. O. Box 50004
300 Ala Moana Blvd., Room 4316
Honolulu, Hawaii 96850-0050

Dear Mr. Kaneshiro:

Subject: Waimea-Paauilo Watershed
Hamakua/South Kohala Districts
Draft Plan and EIS

Thank you for the opportunity to review the subject document. The proposed project will have no impact on our facilities. Therefore, we have no comments to offer.

If there are any questions, please have your staff contact Mr. Ronald Ching of the Planning Branch at 586-0490.

Very truly yours,

GORDON MATSUOKA
State Public Works Engineer

RC:jy
c: Mr. James J. Nakatani
OEQC

B-53

United States
Department of
Agriculture

Natural
Resources
Conservation
Service

P.O. Box 50004
Honolulu, HI
96850

USDA

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

July 8, 1997

Gordon Matsuoka, State Public Works Engineer
Department of Accounting and General Services
State of Hawaii
P.O. Box 119
Honolulu, Hawaii 96810

Dear Mr. Matsuoka

Subject: Draft Watershed Plan and Environmental Impact Statement for the Waimea-Paauilo Watershed

Thank you for your letter of May 12, 1997 stating that the Department of Accounting and General Services has no comments on the subject document.

Sincerely,

KENNETH M. KANESHIRO
State Conservationist

The Natural Resources Conservation Service works hand-in-hand with the American people to conserve natural resources on private lands.

AN EQUAL OPPORTUNITY EMPLOYER

May 12, 1997

A and S Farms
Spencer Akana
Box 1988
Kamuela, HI. 96743

Kenneth M. Kaneshiro
State Conservationist,
Natural Resources Conservation Service
Box 50004, Honolulu, HI. 96850

Dear Sir,

I attended the April 23, 1997 public meeting regarding the Waimea - Paauilo Watershed Project. I represent a committee developing a proposal for irrigation of a portion of pastorial land located within Puukapu Pastorial Lots Phase II.

The recent improvements, location, and availability of these lots provide a unique opportunity to develop a Community Resource Center for cattle marketing from the DHHL lands in the Plan area.

Unfortunately, the Draft EIS recommends against pasture irrigation. Further review indicated the reasoning was the annual net return failed to yield an acceptable cost to benefit ratio. The value was stated on page 91 of the Draft as $207,700.00 for 8190 animal units or $25.00 per. head per. year. These figures were explained as, " the net return for livestock production (after costs for production were subtracted)."

These numbers were developed in 1989. The industry has not been static for the last 8 years and in fairness to the 200 plus ranchers who will be affected by this report, perhaps a current review of the cattle market is required.

A recent program sponsored by the academic segment of the industry called Forage Field Days, featured Grass Finished Beef and the product was well received. Encouraging progress has been made in the "niche" market with Hawaii Natural Meats opening for business in January of this year. A high value, naturally produced, alternative to imported beef is a reality and current data should be available to provide a more timely assessment of our livestocks' value.

The committees' proposal seeks to develop two 100 acre pastorial lots into an intensively managed production facility. The lots are numbers 21 and 22 , located in Puukapu Pastorial Lots Phase II, (map included).

These lots are currently available. They are unique among pastorial lots because one has access to utilities (DWS, WIS, HELCO) and paved roads. The proposal incorporates irrigation of a centralized, high protein, feed bunk, around which the animals will rotate. The current availability of WIS water allows the proposal to commence immediately. The Kauahi Reservoir is not required for the proposal.

The benefit to the DHHL ranching community is the coordination of assets in a unified approach to the market. The facility would centralize the development and marketing of DHHL herds in the area and provide consistency to the marketplace. The proposal is intended to serve as a working model for current and future lessees. We are in competition with large operations and need to coordinate our resources.

We appreciate the effort the WIS has consumed to date and we are in support of a reliable watersource for agriculture in this area. We believe that cattle have a place in the long term development of agriculture and seek support for the proposal described above to facilitate that goal. The proposal seeks to demonstrate that increased value can be derived from our production with irrigation and modern management. The unique opportunity afforded by these lots and their amenities should be given careful consideration before recommending against pasture irrigation.

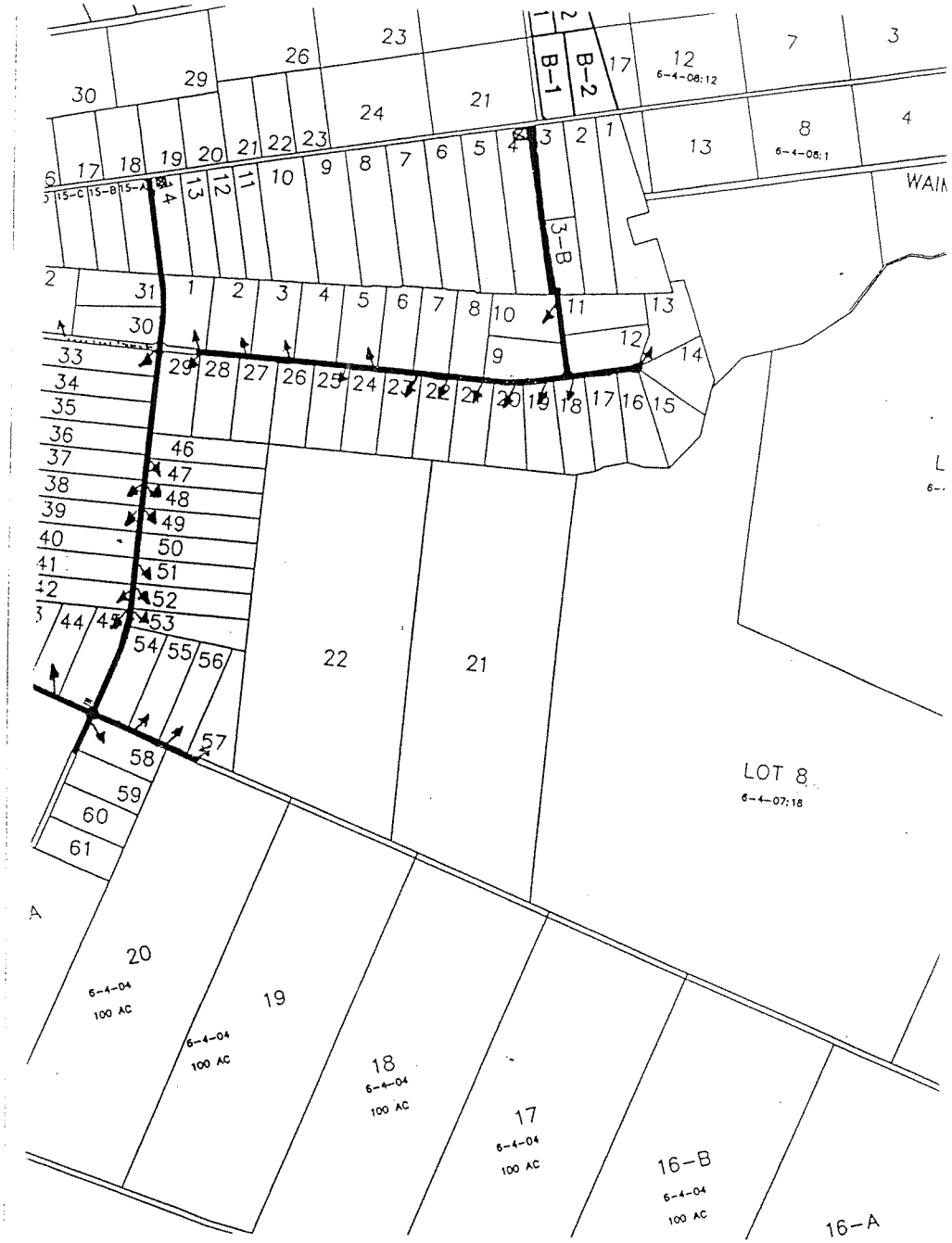
The highest value priority for water development is good policy. Our position is that the cattle industry should not suffer the indignity of having our water shut off during times of stress but allow vegetables and flowers to be irrigated. I don't propose to challenge the farmer for his water but rather to assign a fair value to our "crop" to justify our share. I believe the process will be beneficial to all agricultural interests in the area.

We have received support from the DHHL community for the concept, and enlisted the services of Dr. Burt Smith to help with the development of a reliable business plan. Education of current and prospective lessees provided by this proposal should shorten the interval from start-up to production and assist currently operating farms with direction. The industry is changing constantly and good opportunities are available for our product today that did not exist yesterday. The visitor industry is less than 20 miles away from this production center and the Global nature of that industry can positively influence the value of our herds.

I would appreciate an opportunity to discuss the matter with your staff. We have discussed the proposal with Jerry Williams and Gary Kam of the Kamuela NRCS field office and are anticipating assistance with planning and education as the proposal moves forward. Thank you for your time and consideration in this matter.

Sincerely,

Spencer N. Akana



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Box 50004
lulu, HI
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USDA

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

July 8, 1997

Spencer Akana
A and S Farms
P.O. Box 1988
Kamuela, Hawaii 96743

Dear Mr. Akana:

Subject: Draft Watershed Plan and Environmental Impact Statement for the Waimea-Paauilo Watershed

Thank you for your letter of May 12, 1997 with comments on the subject document. We wish to respond to your comments.

B-57

COMMENT: A committee has been formed to develop a proposal for irrigation of portions of lots 21 and 22 of the Puukapu Pastoral Lots Phase II in an intensively managed production facility. The facility would coordinate the DHHL ranching resources, provide a unified approach to marketing, and serve as a working model for DHHL ranchers.

RESPONSE: The committee is commended on their efforts to develop a technically-advanced, business-oriented ranching enterprise that can be a model to other ranchers.

COMMENT: The draft EIS recommends against pasture irrigation due to annual net return failing to [exceed annual net cost] and yielding an unacceptable benefit to cost ratio.

RESPONSE: As a clarification, the draft plan-EIS stated that federal funds could not be used for construction of the livestock drinking water system due to average annual costs exceeding annual benefits. Irrigation of pastureland was not considered or recommended due to the high water requirement. The manager of the WIS will need to develop a policy addressing water supply for pasture irrigation.

COMMENT: The values for cattle developed in 1989 may not reflect the current value of cattle. A current review of the cattle market is required.

RESPONSE: The 1989 value of cattle was updated to current prices to estimate the economic benefits of the project for the DEIS. The issue of current economic return to Waimea ranchers was discussed with Dr. Burt Smith in 1996. It appears, from that conversation, that the market for Waimea cattle is more tenuous than it had been in 1989. While lucrative "niche" markets may exist for some beef cattle in Waimea, the majority of the Waimea herd will still need to be shipped to distant finishing facilities.

Thank you for your interest in the watershed project. A meeting with project planners can be arranged through Gary Kam, District Conservationist, NRCS Kamuela Field Office, telephone (808) 885-6602.

We also recommend that you contact Ron Harben, NRCS Grazing Land Specialist, who may be able to provide technical assistance to your project. Ron can also be reached at the NRCS Kamuela Field Office, telephone (808) 885-6602.

Sincerely,

ACTING

KENNETH M. KANESHIRO
State Conservationist

WAIMEA HAWAIIAN HOMESTEADERS' ASSOCIATION, INC.
P. O. Box 6753
Kamuela, Hawaii 96743
May 13, 1997

M KANANI KAPUNIAI
Pu'ukapu-Pastoral '90+
Director- President

MARK KEALAMAKIA
Pu'ukapu-Pastoral -'90
Director - Vice-President

DIEDRA BERTELMANN
Kuhio Village
Director - Secretary

THELMA KANIHO
Pauahi-Pastoral
Director - Treasurer

TEDDY BELL
Kuhio Village-Residential
Director

ERIC EDSMAN
Pu'ukapu -Agricultural-'85
Director

IRENE TORREY
Pu'ukapu-Agricultural'85+
Director

DANIEL KANIHO JR
Pu'ukapu-Pastoral '90+
Director

ETHEL ANDRADE
Nienie (Pastoral)
Director

N DUKE KAPUNIAI
Kamoku-Waikoloa
Director

SONNY KANIHO
Pu'ukapu-Agricultural'85
Director

Pu'u Pulehu
Director

Kenneth M Kaneshiro, State Conservationist
USDA, Natural Resources Conservation Service
P. O. Box 50004
300 Ala Moana Blvd., Rm 4316
Honolulu, Hawaii 96850-0050

RE: Draft Watershed Plan and Environmental Impact Statement

Dear Mr. Kaneshiro:

We support improvements to the Waimea-Paauilo Watershed Plan. We recommend that the Environmental Impact Statement address the following concerns:

1) We anticipate a change of classification of lands designated as pastoral to farm/pastoral or farm (pastoral awards of 5, 10, 15, 20, 100, and 200 ✓ acres, none of which are ranch economic units).
Therefore, the 10 gallons per acre the Department of Agriculture assumes we may need is inadequate and grossly incorrect.

2) We would like to stipulate that the bid proposal for the general contractor include provisions for sub-contractors of Hawaiian ancestry.

We appreciate the opportunity to participate in this process.

Cordially,

M Kapuniai

M Kapuniai
President

Phone: 885-8336
Fax: 885-4998

✓ DHHL Puukapu 1 Pruchilate 9.746 acres no longer stockwater, to be irrigation

United States Department of Agriculture

Natural Resources Conservation Service

P.O. Box 50004
Honolulu, HI
96850

USDA

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July 8, 1997

M. Kanani Kapuniai, President
Waimea Hawaiian Homesteaders' Association, Inc.
P.O. Box 6753
Kamuela, Hawaii 96743

Dear Ms. Kapuniai:

Subject: Draft Watershed Plan and Environmental Impact Statement for the Waimea-Paauilo Watershed

Thank you for your letter of May 13, 1997 with comments on the draft Waimea-Paauilo Watershed Plan and Environmental Impact Statement. We appreciate your support for the project. We offer the following responses to your other comments.

COMMENT: We anticipate a change of classification of lands designated as pastoral to farm/pastoral or farm.

RESPONSE: DHHL Title 10 Administrative Rules, Section 10-3-27(b) states:

> "Lessees with pastoral lots may raise crops for fodder to be used only for animals on the lot. A Portion of such lot may be utilized to raise vegetables or fruit crops for consumption by lessee's immediate family."

Homestead pastoral leases permit certain uses to increase the carrying capacity of your lot and expand into subsistence farming. This can be accomplished without a change in the classification of your homestead pastoral lease. Issues of future water allocation changes will be addressed by the management of the Waimea Irrigation System.

COMMENT: We would like to stipulate that the bid proposal for the general contractor include provisions for sub-contractors of Hawaiian ancestry.

RESPONSE: While the federal government's contracting regulations do not allow the stipulation for contractors of a specific ethnic group, a provision for the employment of small and minority contractors may be used advantageously by contractors of Hawaiian ancestry. The construction of the livestock drinking water pipeline system will be wholly financed by the State of Hawaii. The stipulation for contractors of Hawaiian ancestry

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may be made for that segment of the project if state contracting laws and regulations allow.

Sincerely,

KENNETH M. KANESHIRO
State Conservationist

May 15, 1997

Mr. Kenneth M. Kaneshiro, State Conservationist
USDA, Natural Resources Conservation Service
P.O. Box 50004
300 Ala Moana Blvd., Room 4316
Honolulu, Hawaii. 96850-0050

Dear Mr. Kaneshiro:

Re: Draft Watershed Plan and Environmental Impact Statement
Waimea-Paauilo Watershed
County of Hawaii, Hawaii

I have reviewed the draft EIS for the subject project and have numerous concerns and matters that I recommend be addressed in the final EIS.

As you know, environmental effects associated with any type of reservoir development have potentially adverse impacts. Specifically—and within the context of this project—a number of issues concerning land use, stream flow, threatened/endangered species and wetlands require a more through discussion to assess indirect and cumulative impacts. Also, the use of flow charts to demonstrate the technical processes of the project would be helpful.

B-60

To begin with, your agency states that when stockwater becomes available for cattle consumption ranchers can increase their livestock herds, in turn, pursuing more intensive grazing methods. Please describe in greater depth the grazing methods that will be employed, including the potential for increases in soil erosion. Furthermore, within the cost : benefit ratio listed for cattle ranching please factor in the costs associated with importing beef from the mainland (i.e., following the shipment of cattle to the mainland for finishing). How do the costs of subsidized water and grain and beef importation prices compare to those of maintaining and expanding ranching operations?

Additionally, while the reservoir project does not call for direct increases in existing water collections the water budget will indeed be altered by an additional reservoir and collection system. Important and possible indirect and cumulative impacts that need greater analysis include: reduced flow to the Lalakea, Hiilawe and Wailoa streams—the last of which flows into Waipio Valley, in turn, potentially impacting taro farmers; decreases in native stream biota and riparian vegetation; reduced overflow from UHD to Lalakea Stream which would help alleviate future impacts from diversion of water by Lalakea Ditch and wetlands associated with the four small drainageways. Likewise, please note that a buffer zone, circumventing the wetland areas, is needed to minimize impacts associated with the installation of the 1" pipeline. To trench and bury the pipeline within the gulch corridors and wetland areas (described as the best alternative) implies a major amount of disturbance, and will necessitate restoration of the area after

construction is completed. Also, the affected streams should be assessed for qualification as Heritage or Candidate streams.

Lastly, regarding cultural resources and endangered/threatened (E/T) species, several matters need clarification. Please state weather subsurface trench lines were conducted for the reservoir supply pipeline. Concerning E/T species surveys, there seems to be a number of discrepancies. The Elepaio and Apapane are endangered (not alien), implying that US FWS surveys did identify them within the project boundaries. Please clarify this. Moreover, the frequency and timing of bird surveys is an important part of assessing the presence of these species. Thus, my question is how often and when were these surveys performed for both forests birds and the 'Io and Nene? The same can be said for the lack of night surveys for the Hawaiian hoary bat—which need to be conducted by the USDA prior to the commencement of this project. Similarly, the fact that the UHD provides minimal habitat for the Hawaiian duck does not preclude this waterbird's presence. It is precisely because of diminishing habitat that one finds E/T species existing within marginal habitat types. The presence of the Koloa and possible impacts to it requires a more through assessment. Furthermore, buffer zones should be implemented for all sensitive areas which afford habitat for significant resources located in sections 1-5 of the former project area, as identified by Stemmermann's and Jacobson's 1987 survey.

Thank-you for the opportunity to review this document. Should you have any questions, please contact me at 733-4265.

Sincerely,

Hedy Hager

cc: OEQC

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Box 50004
olulu, HI
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USDA

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

July 8, 1997

Hedy Hager
P.O. Box 61461
Honolulu, Hawaii 96839

Dear Ms. Hager:

Subject: Draft Watershed Plan and Environmental Impact Statement for the Waimea-Paauilo Watershed

Thank you for your letter of May 15, 1997 with comments on the subject document. We wish to respond to your comments.

COMMENT: The DEIS states that when stockwater becomes available ranchers can pursue more intensive grazing methods. Describe in greater depth the grazing methods and the potential for increased soil erosion.

RESPONSE: Section 2.5.2 Cattle Ranching will be expanded to include a discussion of management methods to increase herd size while protecting productivity of grazing land.

Intensive grazing methods are based proper distribution of animals in pastures. Through management techniques and practices to optimize the production of forage plants and assure full utilization of the forage, ranchers can increase their herd size during most periods. Management practices will be included in the Conservation Plans that are prepared for each ranch.

Practices that will be recommended to improve distribution of livestock for efficient forage use include the following. Fencing to reduce pasture size allowing a concentration of animals to graze for short periods between long rest periods. Concentrated grazing will allow full and uniform utilization of the forage. Installation of livestock water facilities in locations distributed so optimum travel distances from pasture to water are not exceeded.

Soil erosion from grazing land will be reduced as a result of improved vegetative cover.

COMMENT: Factor the costs associated with importation of beef from the mainland into the benefit to cost analysis. How do the costs of subsidized water and grain and beef importation prices compare to those of maintaining and expanding ranching operations?

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RESPONSE: The benefit to cost analysis for beef cattle production in the Waimea area completed for the 1989 plan-environmental assessment demonstrated the low profitability of ranching in the watershed. A recent updating of production costs shows that the situation has not changed. While costs of importation of mainland beef may be high, the transportation cost of feed and other products needed for beef production are equally high. A factor making island beef even less competitive on the local market is the importation of inexpensive beef from Australia and New Zealand.

While the federal program is unable to provide construction funding for the livestock drinking water distribution system due to the low benefit to cost ratio, the Department of Hawaiian Homes has elected to fully fund the construction of the livestock drinking water system to fulfill their trust responsibility and to provide social benefits to native Hawaiians.

COMMENT: Greater analysis of indirect and cumulative impacts of reduced flow to Lalakea, Hiilawe, and Wailoa Streams is needed. The affected streams should be assessed for qualification as Heritage or Candidate Streams.

RESPONSE: The only direct effect on streamflow due to installation of this project is the reduction of the overflow of the Upper Hamakua Ditch into the Lalakea Stream system which is displayed in table and graph forms in the DEIS on page 107. There are no indirect or cumulative effects on the collection capacity of the Upper Hamakua Ditch as a result of the installation of this project.

The change in flow rate in Hiilawe Stream, on the floor of Waipio Valley, will be very near the five percent reduction projected for its major contributor, Lalakea Stream. Table 5 will be expanded to include the change in flow rate in Wailoa Stream using the average flow rate from 1964 to 1969 at a gage site approximately 2.5 miles inland, well above the confluence of Hiilawe Stream. The average discharge during that period was 74.5 cfs or 48.1 million gallons per day and 17,574 million gallons per year. The change in overflow from the Upper Hamakua Ditch will reduce the calculated average annual streamflow at the shoreline from 24,654 million gallons per year to 24,277 million gallons per year, a 1.5 percent reduction.

Both Lalakea and Wailoa Streams are included in the Hawaii Stream Assessment (1990) as Candidate Streams for Protection. Lalakea Stream may meet the criteria for designation as a Heritage Stream when the program is implemented. The installation of the Waimea-Paauilo Watershed project will have no effect on the stream resources considered by either designation.

COMMENT: A buffer zone, circumventing the wetland areas, is needed to minimize impacts associated with the installation of the 1 inch pipeline.

RESPONSE: The one inch diameter pipeline will traverse small gulches and wetland areas. Where practicable, these areas will be avoided by routing around them (leaving a buffer of at least 20 feet) or, where avoidance is not possible, the pipeline will be elevated over these areas. In some areas, because of the gentle slopes, bridging will not be

possible and all impacts will be minimized by following the conditions in the Army Corps permit.

COMMENT: To trench and bury the pipeline within the gulch corridors and wetland areas implies a major amount of disturbance, and will necessitate restoration of the area after construction is needed.

RESPONSE: When unavoidable, the trench for the 1 inch pipeline will be approximately one foot wide by 3 feet deep, which we do not envision creating a "major amount" of disturbance. During construction, we plan to follow the Corps permit conditions in compliance with water quality standards, and appropriate erosion and siltation controls will be used and maintained in effective operating condition. We agree with your recommendation that the area be restored after construction. Per the Army Corps permit, we will be restoring the site to pre-construction contours. If necessary, any exposed streambanks and upland areas will be revegetated to minimize erosion and control siltation.

COMMENT: Concerning E/T species survey, there seems to be a number of discrepancies. The Elepaio and Apapane are endangered (not alien), implying that USFWS surveys did identify them within the project boundaries. How often and when were these surveys performed for both forest birds and the 'Io and Nene?

RESPONSE: First, we did not mean to imply that the Elepaio and Apapane are alien. They are native and very important species. They are not listed on the most recent E/T list (March 1, 1996, USFWS), although the Elepaio is a "candidate" for listing. Second, the USFWS surveys were done for an area much larger than the project site, and detailed information about the exact locations of sightings were not given in their reports. Therefore, we listed them in the EIS although it is highly unlikely that they would use the project site. The project will not impact Mamane, Koa, or Ohi'a Forests where these birds are most likely to be found The majority of the project site is grazed, non-native pasture land.

The threatened and endangered forest bird surveys were conducted in mid-1980s, primarily by the U.S. Fish and Wildlife Service. The results of the surveys were summarized in the 1987 Biological Assessment for the Waimea-Paauilo Environmental Assessment. Since that time, improvement elements on segments of the Upper Hamakua Ditch in sensitive forest areas have been eliminated from the project and no new information increasing the areal extent or species of threatened or endangered forest birds in the project area has been brought forth during consultations with the USFWS and others. When design of the pipeline and Upper Hamakua Ditch inlet begins, NRCS will again consult with the USFWS and consider their recommendations.

The survey dates for the Nene and 'Io are uncertain. When design of the pipeline and Upper Hamakua Ditch inlet begins, NRCS will again consult with the USFWS and consider their recommendations.

COMMENT: The same can be said for the lack of night surveys for the Hawaiian hoary bat -- which need to be conducted by the USDA prior to the commencement of this project.

RESPONSE: When we discussed with USFWS the potential impacts of the project on the bat, we were told that the bat may be in the gulch areas, but that this pipeline project will likely have minimal impacts on them. The trenching will be conducted during the day and will be short-term. Regarding your suggestion about conducting night surveys, we will consult with USFWS during the design phase and consider their recommendation.

COMMENT: The presence of the Koloa and possible impacts to it requires a more thorough assessment.

RESPONSE: As we mentioned above, no Koloa or any other T/E species were observed during the recent vegetation surveys. However, the duck may occasionally use the waterways. As with potential impacts to the bats, temporary disturbance during construction should have minimal impact on the Koloa. We will consult with USFWS to ensure all appropriate measures are taken prior to construction, including possibly further surveys, if necessary.

COMMENT: Were subsurface trench lines conducted for the archaeological survey for the reservoir supply pipeline?

RESPONSE: No features warranting subsurface trenching were identified during the cultural resources survey for the reservoir supply pipeline. An additional archaeological evaluation of the pipeline alignments will be made once the designs are completed and the alignments are laid out on the ground. Archaeological monitoring at potentially sensitive sites will be conducted during excavation and pipeline installation.

Sincerely,

KENNETH M. KANESHIRO
State Conservationist

BENJAMIN J. CAYETANO
GOVERNOR

KAZU HAYASHIDA
DIRECTOR

DEPUTY DIRECTORS
JERRY M. MATSUDA
GLENN M. OKIMOTO

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
869 PUNCHBOWL STREET
HONOLULU, HAWAII 96813-5097

IN REPLY REFER TO:
STP 8.7889

May 6, 1997

TO: THE HONORABLE JAMES J. NAKATANI, CHAIRPERSON
BOARD OF AGRICULTURE
DEPARTMENT OF AGRICULTURE

FROM: KAZU HAYASHIDA
DIRECTOR OF TRANSPORTATION

SUBJECT: DRAFT WATERSHED PLAN AND DRAFT ENVIRONMENTAL IMPACT STATEMENT (DEIS)
TMK: 4-4, 4-6, 4-9, 6-3, 6-4, 6-5, 6-6, 6-7

Thank you for your transmittal of March 20, 1997, requesting review of the subject document.

B-93 As noted in the Draft EIS, the proposed development may conflict with two of the four alternative alignments identified in the Waimea By-pass project route study. Please coordinate the implementation of the development with our Highways Division.

We appreciate the opportunity to provide comments.

~~Kenneth M. Kaneshiro, USDA, Natural Resources Conservation Service~~
Gary Gill, Office of Environmental Quality Control

USDA

United States
Department of
Agriculture

Natural
Resources
Conservation
Service

P.O. Box 50004
Honolulu, HI
96850

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July 8, 1997

Kazu Hayashida, Director
Department of Transportation
State of Hawaii
869 Punchbowl Street
Honolulu, Hawaii 96813-5097

Dear Mr. Hayashida:

Subject: Draft Watershed Plan and Environmental Impact Statement for the Waimea-Paauilo Watershed

Thank you for your letter of May 6, 1997 to James J. Nakatani, Chairperson, Board of Agriculture with comments on the subject document. Through the intergovernmental partnership for this project with the state Department of Agriculture, the Natural Resources Conservation Service will respond to your comments. A separate response by the State Department of Agriculture will not be mailed.

COMMENT: As noted in the DEIS, the proposed development may conflict with two of the four alternative alignments identified in the Waimea By-pass project route study. Please coordinate the implementation of the development with our Highways Division.

RESPONSE: NRCS will continue to communicate with the Highways Division, Hawaii Island office as this project progresses to the design phase.

Sincerely,

ACTING

KENNETH M. KANESHIRO
State Conservationist

cc: James Nakatani, Chairperson, State of Hawaii Department of Agriculture

The Natural Resources Conservation Service works hand-in-hand with the American people to conserve natural resources on private lands.

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United States Department of the Interior

OFFICE OF THE SECRETARY
Office of Environmental Policy and Compliance
600 Harrison Street, Suite 515
San Francisco, California 94107-1376

May 8, 1997

ER 97/0175

James J. Nakatani, Chairperson
Board of Agriculture
State of Hawaii, Department of Agriculture
P.O. Box 22159
Honolulu, Hawaii 96823-2159

Dear Mr. Nakatani:

The Department of the Interior (Department) has reviewed the Draft Watershed Plan and Draft Environmental Impact Statement (DEIS) for the Waimea-Paauilo Watershed, County of Hawaii, Hawaii. The following comments are provided for your use and information when preparing the Final Environmental Impact Statement (FEIS). B-64

GENERAL COMMENTS

The DEIS provides limited discussion on the water availability that would supply the new reservoir and the existing Waimea reservoir. According to the U.S. Geological Survey (USGS), the discussion on page 40, 4.3.1 briefly describes: 1) the problem of short record periods and long term hydrometeorological cycles and 2) states that much of the data collected between 1975-1990 is poor or unusable. Thus, the FEIS needs to provide a hydrologic analysis, based on the best available data, to estimate the availability of surface water for the project. Analyses on water availability and cited references should also be included.

The Department suggests that a simple monthly mass balance for the system should be prepared, using the best available data. This will show inflow, draft, direct rainfall on the reservoirs, and losses from evaporation. According to USGS records, 25 percent of the 130 months of record had a flow substantially less than the desired draft of 4 million gallons per day.

The proposed project would increase the reliability of the water supply from 68 percent with no project to 78 percent with the project. We suggest this 10 percent difference in reliability may possibly be made up by the use of groundwater. The alternative for using groundwater should be explored in the FEIS.

SPECIFIC COMMENTS

Page 107, Tables S and T: The FEIS should reference to the streamflow data used to prepare Tables S and T, and include information on the length accuracy of the records used.

We appreciate the opportunity to comment.

Sincerely,

Patricia Sanderson Port
Regional Environmental Officer

cc:
Director, OEPC, w/original incoming
Regional Director, FWS, Region I
Chief, Environmental Affairs Program, USGS

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Box 50004
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July 8, 1997

Patricia Sanderson Port, Regional Environmental Officer
U.S. Department of the Interior
Office of Environmental Policy and Compliance
600 Harrison Street, Suite 515
San Francisco, California 94107-1376

Dear Ms. Port:

Subject: Draft Watershed Plan and Environmental Impact Statement for the Waimea-Paauilo Watershed

Thank you for your letter of May 8, 1997 with comments on the subject document. We wish to respond to your comments.

COMMENT: The FEIS needs to provide a hydrologic analysis, based on best available data, to estimate the availability of surface water for the project. Analysis on water availability and cited references should also be included.

RESPONSE: The ten years of reliable record from the USGS gaging station (Sta 16270000) on the Upper Hamakua Ditch adjacent to the inlet to the Waimea Reservoir will be shown in a monthly format in Section 2.7.1 of the DEIS.

COMMENT: The Department suggests that a simple monthly mass balance for the system should be prepared. This will show inflow, draft, direct rainfall on the reservoirs and losses from evaporation.

RESPONSE: A table displaying the reservoir operation water budget in monthly increments will be included in Section 5.2.5.

COMMENT: The 10 percent difference in reliability provided by the project may possibly be made up by the use of groundwater. The alternative for using ground water should be explored in the FEIS.

RESPONSE: Groundwater has been evaluated as an additional source of agricultural water for the Waimea Irrigation System. Discussion of the 1,200-foot deep Puukapu backup well is included in sections 2.7.1 and 4.1.3. The 10 percent difference in reliability between the future without project and future with project conditions also includes water for an additional 115 irrigated acres and the stock water system. In rough figures, an additional 414 million gallons per year is required. At a cost of $.75 per 1,000 gallons to pump water from the well, $310,000 per year in energy costs will be required. The water rate for irrigation use is $.16 per 1,000 gallons plus $2.25 per acre per month, considerably less than the cost for pumping.

A principal tenet of the Waimea-Paauilo Watershed project and other agricultural water projects undertaken by the State Department of Agriculture and NRCS is to reserve groundwater resources for domestic supply and to protect and make more efficient use of the already developed surface water sources.

COMMENT: The FEIS should reference the streamflow data used to prepare Tables S and T and include information on the length and accuracy of the records used.

RESPONSE: The references used to develop Tables S and T as well as a discussion of the length and accuracy if the records will be included in the FEIS.

Sincerely,

ACTING

KENNETH M. KANESHIRO
State Conservationist

The Natural Resources Conservation Service works hand-in-hand with the American people to conserve natural resources on private lands.

AN EQUAL OPPORTUNITY EMPLOYER

May 13, 1997

Kenneth M. Kaneshiro, State Conservationist
USDA, Natural Resources Conservation Service
P. O. Box 50004
Honolulu, HI 96850-0050

Subject: Waimea-Paauilo Watershed Project
Breach Inundation Map & Discussion and Draft Environmental Impact Statement

Dear Mr. Kaneshiro:

Approximately fifty percent of my 80 acre property (TMK 3/6-4-02:03) is located in the proposed Breach Inundation Map prepared by the United States Department of Agriculture, Natural Resources Conservation Service. I am extremely concerned about several things mentioned in the Draft EIS and Breach Inundation Map and Discussion and request they be clarified to my satisfaction.

My property is currently in the Flood Zone "x" the most favorable of the flood zone designations with flood insurance not being required. I request clarification that this flood zone designation will not change now or in the future as a result of building the reservoir. A change in flood zone would have a severe negative economic impact upon me and I request a satisfactory response as to how that would be mitigated.

The Breach Inundation Map shows three elevation stations on my property and a fourth elevation station at my property boundary line; these are apparently used to calculate the depth of flood waters at these different elevations. Today I requested flood water depth calculations of these 4 stations from the NRCS Kamuela Field Office and was informed, after they checked with the Oahu office, that only one of the stations shown on their map had actually been calculated. I would like these water depth calculations as well as detailed survey and topographical maps of all my property in the proposed Flood Breach Inundation Area, and a written explanation of their impact on my property. I would like written clarification that none of my improvements of any kind are in the Breach Inundation Area.

B-96

My property is located in Seismic Zone 3 which is currently in the process of being changed to Zone 4 (the 1997 edition of the Uniform Building Code for Hawaii County has adopted Zone 4 requirements). There are four seismic zones on the Big Island, ranging from zones 1 to 4. Zone 4 is the greatest seismic hazard level assigned. Quoting from the "Kauahi Reservoir Dam Breach Discussion", page 1: "The Kauahi Reservoir dam would be conservatively rated a "moderate Hazard" meaning the dam's failure would possibly result in loss of life and appreciable property damage." Has the change in Seismic Zone been taken into consideration? Please provide me with a complete current study of earthquakes as they relate to this project. Given the two statements above and since fifty percent of my property is in the proposed Breach Inundation area, how would the negative emotional and financial impacts be mitigated? Who bears financial responsibility in the event of a breach and how do you propose to compensate for the "possible loss of life and appreciable property damage"?

There are other concerns I will comment upon at a future date as my research in incomplete.

Please direct all correspondence to: Dianne Feeney
P. O. Box 1116
Kamuela, Hawaii 96743

Sincerely,
Dianne Feeney

cc: Office of Environmental Quality Control
Robert Triantos, Esq., Carlsmith Ball Wichman Case & Ichiki

USDA

United States Department of Agriculture

Natural Resources Conservation Service

P.O. Box 50004
Honolulu, HI 96850

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

July 8, 1997

Dianne Feeney
P.O. Box 1116
Kamuela, Hawaii 96743

Dear Ms. Feeney:

Subject: Draft Watershed Plan and Environmental Impact Statement for the Waimea-Paauilo Watershed

Thank you for your letter of May 13, 1997 with comments on the subject document. We wish to respond to your comments.

COMMENT: My property is located in the Breach Inundation Area for the proposed Kauahi Reservoir. My property is currently in Flood Zone "X", with no flood insurance required. I request clarification that this flood designation will not change as a result of installation of the reservoir. A change in flood zone will have a severe negative economic impact on me.

RESPONSE: The National Flood Insurance Program, as well as the State of Hawaii floodplain management program, uses the "100-year" flood standard to delineate special flood hazard area, which includes Zones A, AO, AH, AE, or VE. Zone X is outside of the "special flood hazard" area, within which mortgage lenders require flood insurance.

A review of the National Flood Insurance Program regulations (44 CFR, Parts 50-77) and an inquiry with the State of Hawaii Flood Control and Dam Safety manager at DLNR produced no indication that delineation of a dam breach inundation area would have any effect on Flood Insurance Map zoning. The construction of the Kauahi Reservoir will have no effect on the 100-year floodplain. No revision of the existing Flood Insurance Rating Map will be required and the flood insurance status of your property will remain unchanged.

COMMENT: The Breach Inundation Map shows three elevation Stations on my property and a fourth at my property boundary line. I requested water depth calculations at these four stations and was told that only one of these stations had actually been calculated. I would like these water depth calculations as well as detailed survey and topographic maps of all my property in the proposed Breach Inundation Area and a written explanation of their impact on my property. I would like written clarification that none of my improvements of any kind are in the Breach Inundation Area.

RESPONSE: The maximum water surface elevation for all cross sections shown on Figure R - Kauahi Reservoir Breach Inundation Area were calculated to develop the map. Separate cross section plots were drawn on an "as needed" basis. The cross section plots for the four cross sections on your property were transmitted to you in our May 14, 1997 correspondence.

The final design of the Kauahi Reservoir is yet to be completed. Following approval of the design, the final breach inundation area map and Emergency Preparedness Plan will be prepared. The inundation area should not change considerably from that displayed in the DEIS. NRCS intends to work with affected landowners, following reservoir design, to delineate the extent of inundation, discuss measures that can be taken minimize damage in the unlikely event of a dam breach, and to discuss the elements of the Emergency Preparedness Plan. At this time, we are unable to provide a detailed survey of your property or written assurance that no improvements on your property are within the breach inundation area.

COMMENT: The 1997 edition of the Uniform Building Code recommends Hawaii County to be elevated from Seismic Zone 3 to Seismic Zone 4. Seismic Zone 4 is the greatest seismic hazard assigned. The "Kauahi Reservoir Dam Breach Discussion" states, "The Kauahi Reservoir Dam would be conservatively rated a 'moderate hazard' meaning the dam's failure would possibly result in loss of life and appreciable property damage." Has the seismic zone been taken into consideration? Please provide me with a complete current study of earthquakes as they relate to this project. How will the negative emotional and financial impacts be mitigated? Who bears financial responsibility in the event of a breach and how do you propose to compensate for the "possible loss of life and appreciable property damage?"

RESPONSE: In the year 2000, Hawaii County will likely adopt the 1997 Uniform Building Code. The decision to elevate the Seismic Zone for the island from 3 to 4 will be made at that time. The phrase "moderate hazard", in the context of Hawaii Revised Statutes Chapter 13-190, Dams and Reservoirs, refers to potential for damage and loss of life downstream of the dam and does not refer to the likelihood of dam break or environmental factors, such as seismicity, that might affect the likelihood of dam break.

Both the Seismic Zone and Hazard Class criteria are implemented during design of the dam. The embankment will be designed to maintain slope stability during the lateral acceleration mandated by seismic zone designation. The hazard classes, designated by the State Dam Safety Program and by NRCS policy, mandate the safety and emergency notification requirements of the dam owner and set guidelines for the hydrologic design of the dam freeboard and emergency spillway.

The Geologic Investigation report for the Kauahi Reservoir is enclosed which contains the current seismic analysis for the project.

If a dam breach occurs the State of Hawaii, owners of the dam, will be liable for any damage caused by the breach flood. The USDA Natural Resources Conservation Service will assume responsibility if the dam design is found to be technically deficient. No compensation is anticipated for claims of emotional and financial distress without the occurrence of a dam failure.

Sincerely,

ACTING

KENNETH M. KANESHIRO
State Conservationist

Enclosure

BENJAMIN J. CAYETANO
GOVERNOR OF HAWAII

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

MICHAEL D. WILSON
CHAIRPERSON
BOARD OF LAND AND NATURAL RESOURCES

DEPUTY
GILBERT S. COLOMA-AGARAN

AQUACULTURE DEVELOPMENT PROGRAM
AQUATIC RESOURCES
BOATING AND OCEAN RECREATION
CONSERVATION AND RESOURCES ENFORCEMENT
CONVEYANCES
FORESTRY AND WILDLIFE
HISTORIC PRESERVATION
LAND DIVISION
STATE PARKS
WATER RESOURCE MANAGEMENT

MAY 14 1997

REF:LD-AJ
FILE NO. A164

Kenneth M. Kaneshiro, State Conservationist
USDA, Natural Resources Conservation Service
P.O. Box 50004
300 Ala Moana Blvd., Room 4316
Honolulu, Hawaii 96850-0050

Dear Mr. Kaneshiro:

SUBJECT: Draft Watershed Plan and Environmental Impact Statement
Waimea-Paauilo Watershed Project, Hamakua/S. Kohala Districts
Tax Map Key :3rd/ 4-4, 4-6, 4-9, 6-3, 6-4, 6-5, 6-6, 6-7

We have reviewed the subject application and would like to offer the following comments:

Engineering Branch:

A dam construction permit is required to construct the proposed Kauahi reservoir as part of the Waimea-Paauilo project.

Thank you for the opportunity to review the subject application. We have no further comments to offer at this time. If you have any questions, please contact Al Jodar of the Land Division at 587-0424.

HAWAII: Earth's Best!

Aloha,

MICHAEL D. WILSON

C: James J. Nakatani, DOA
Gary Gill, OEQC
Hawaii Land Board Member
Hawaii District Land Office

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B-68

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

AQUACULTURE DEVELOPMENT PROGRAM
AQUATIC RESOURCES
BOATING AND OCEAN RECREATION
CONSERVATION AND ENVIRONMENTAL AFFAIRS
CONSERVATION AND RESOURCES ENFORCEMENT
CONVEYANCES
FORESTRY AND WILDLIFE
HISTORIC PRESERVATION
LAND MANAGEMENT
STATE PARKS
WATER AND LAND DEVELOPMENT
WATER RESOURCE MANAGEMENT

JUN 25 1997

REF:LD-AJ
FILE NO. A164

Kenneth M. Kaneshiro, State Conservationist
USDA, Natural Resources Conservation Service
P.O. Box 50004
300 Ala Moana Blvd., Room 4316
Honolulu, Hawaii 96850-0050

Dear Mr. Kaneshiro:

SUBJECT: Draft Watershed Plan and Environmental Impact Statement
Waimea-Paauilo Watershed Project, Hamakua/S. Kohala Districts
Tax Map Key :3rd/ 4-4, 4-6, 4-9, 6-3, 6-4, 6-5, 6-6, 6-7

Reference is made to our letter of May 14, 1997. We have the following additional comments to offer:

Aquatic Resources Division:

Although the proposed project will reduce flow into Lalakea Stream by 5%, this reduction will be compensated by natural fluctuations. Our primary concern is the diversion on Lalakea Stream, originally designed as a temporary measure to divert water while repairing the ditch, this structure has yet to be removed. The final EIS should address this matter.

Thank you for the opportunity to review the subject application. We have no further comments to offer at this time. If you have any questions, please contact Al Jodar of the Land Division at 587-0424.

HAWAII: Earth's Best!

Aloha,

for MICHAEL D. WILSON

C: Hawaii Land Board Member
Hawaii District Land Office
Honorable James J. Nakatani
Gary Gill

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Box 50004
lulu, HI
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USDA

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July 8, 1997

Michael D. Wilson, Director
Department of Land and Natural Resources
P.O. Box 621
Honolulu, Hawaii 96809

Dear Mr. Wilson:

Subject: Draft Watershed Plan and Environmental Impact Statement for the Waimea-Paauilo Watershed

Thank you for the letters of May 14, 1997 and June 25, 1997 with DLNR comments on the subject document. We wish to respond to your comments.

COMMENT: A dam construction permit is required to construct the proposed Kauahi Reservoir as part of the Waimea-Paauilo project.

RESPONSE: A Dam Permit will be acquired by the State Department of Agriculture before construction of the Kauahi Reservoir. The requirement for a Dam Permit will be added to the permit list shown in Section 5.4.3 Permits and Compliance of the FEIS.

COMMENT: Although the proposed project will reduce flow in Lalakea Stream by five percent, this reduction will be compensated by natural fluctuations.

RESPONSE: Thank you for concurring that the five percent reduction in Lalakea Stream flow due to the reduction in overflow from the Upper Hamakua Ditch is within the normal streamflow fluctuation.

COMMENT: Our primary concern is the diversion on Lalakea Stream, originally designed as a temporary measure to divert water while repairing the ditch. This structure has yet to be removed.

RESPONSE: The diversion on Lalakea Stream, constructed in 1989 by the Hamakua Sugar Company to protect temporary repairs to the Lower Hamakua Ditch, is outside of the Waimea-Paauilo Watershed and will be unaffected by this project. Permanent repair of the Lower Hamakua Ditch and removal of the diversion on Lalakea Stream are included in the Lower Hamakua Ditch Watershed project which is also being planned by the State of Hawaii Department of Agriculture and the Natural Resources Conservation Service. A final EIS for the Lower Hamakua Ditch Watershed is currently being prepared.

Sincerely,

ACTING

KENNETH M. KANESHIRO
State Conservationist

The Natural Resources Conservation Service works hand-in-hand with the American people to conserve natural resources on private lands.

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DEPARTMENT OF HEALTH & HUMAN SERVICES

Public Health Service

Centers for Disease Control
and Prevention (CDC)
Atlanta GA 30333

May 14, 1997

Kenneth M. Kaneshiro, State Conservationist
USDA, Natural Resources Conservation Service
P.O. Box 50004
300 Ala Moana Blvd., Room 4316
Honolulu, Hawaii 96850-0050

Dear Mr. Kaneshiro:

We have completed our review of the Draft Environmental Impact Statement (DEIS) for the Waimea-Paauilo Watershed, County of Hawaii, Hawaii. We are responding on behalf of the U.S. Public Health Service.

We believe this DEIS has generally addressed all of our potential concerns, with one exception. Our review did not reveal any discussion on any existing hazardous materials or hazardous waste sites within the project area. The final statement should address the presence or absence of hazardous waste/materials identified on the project site that may need mitigation.

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Thank you for the opportunity to review and comment on this DEIS. We would appreciate receiving a copy of the Final EIS, and any future environmental impact statements which may indicate potential public health impact and are developed under the National Environmental Policy Act (NEPA).

Sincerely,

Kenneth W. Holt

Kenneth W. Holt, M.S.E.H
Special Programs Group (F29)
National Center for Environmental Health

The Nation's Prevention Agency
CDC50
Centers for Disease Control and Prevention

United States
Department of
Agriculture

Natural
Resources
Conservation
Service

P.O. Box 50004
Honolulu, HI
96850

USDA

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

July 8, 1997

Kenneth W. Holt, M.S.E.H.
Special Programs Group (F29)
National Center for Environmental Health, CDC
U.S. Public Health Service
Atlanta, Georgia 30333

Dear Mr. Holt:

Subject: Draft Watershed Plan and Environmental Impact Statement for the Waimea-Paauilo Watershed

Thank you for your letter of May 14, 1997 with the U.S. Public Health Service's comments on the subject document. We wish to respond to your comment.

COMMENT: The DEIS does not contain discussion on existing hazardous materials or hazardous waste sites in the project area. The FEIS should address the presence or absence of hazardous waste/materials identified on the project site that may need mitigation.

RESPONSE: Consultations with the State of Hawaii, Department of Health's Hazardous Waste, Solid Waste, and Clean Water Branch and Hawaii County Department of Public Works' Solid Waste and Wastewater Divisions did not bring to light the existence of any known hazardous materials or hazardous waste sites in the project area. Two closed dump/landfill sites are located outside of the project area to the west. One site is at the location of the present refuse transfer station.

A discussion of hazardous waste/materials will be included in Section 6.3.17 of the FEIS.

Sincerely,

ACTING

KENNETH M. KANESHIRO
State Conservationist

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Kahala Elementary School, Waialae High School, and Koko Head Elementary School on the island of Oahu.

Sec. 2. The lands received in the exchange authorized by section 1 shall, except as otherwise provided, have the same status and be subject to the same laws as the lands given in the exchange.

Sec. 3. This Act shall take effect upon its approval.

Approved June 18, 1954.

HAWAIIAN HOMES COMMISSION—LEASE OF IRRIGATED LANDS FOR GRAZING

954

See Legislative History, p. 2402

CHAPTER 321—PUBLIC LAW 417

[H. R. 6888]

An Act to amend sections 201 (a) and 207 (a) of the Hawaiian Homes Commission Act.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That:

Subsection (a) of section 207 of the Hawaiian Homes Commission Act, 1920, as amended,[1] is hereby amended to read as follows:

"(a) The Commission is authorized to lease to native Hawaiians the right to the use and occupancy of a tract or tracts of Hawaiian home lands within the following acreage limits per each lessee: (1) not less than one nor more than forty acres of agricultural lands; or (2) not less than one hundred nor more than five hundred acres of first-class pastoral lands; or (3) not less than two hundred and fifty nor more than one thousand acres of second-class pastoral lands; or (4) not less than forty nor more than one hundred acres of irrigated pastoral lands; (5) not more than one acre of any class of land to be used as a residence lot: *Provided, however,* That in the case of any existing lease of a farm lot in the Kalanianaole Settlement on Molokai, a residence lot may exceed one acre but shall not exceed four acres in area, the location of such area to be selected by the lessee concerned: *Provided further,* That a lease granted to any lessee may include two detached farm lots located on the same island and within a reasonable distance of each other, one of which, to be designated by the Commission, shall be occupied by the lessee as his home, the gross acreage of both lots not to exceed the maximum acreage of an agricultural or pastoral lot, as the case may be, as provided in this section."

Sec. 2. Subsection (a) of section 201 of the Hawaiian Homes Commission Act, 1920,[2] is hereby amended by adding a paragraph (8) to read as follows:

"(8) The term 'irrigated pastoral land' means land not in the description of agricultural land but which, through irrigation, is capable of carrying more livestock the year through than first-class pastoral land."

1. 48 U.S.C.A. § 191.
2. 48 U.S.C.A. § 652.

Sec. 3. This Act shall take effect upon its approval.

Approved June 18, 1954.

HAWAII—ELECTRIC LIGHT AND POWER FRANCHISE—EXTENSION TO DISTRICTS OF WAIMEA AND KOLOA, ISLAND OF KAUAI

CHAPTER 322—PUBLIC LAW 418

[H. R. 6598]

An Act to approve Act Numbered 27 of the Session Laws of 1951 of the Territory of Hawaii, entitled "An Act to amend Act 24 of the Session Laws of Hawaii 1927, as ratified by the Act of Congress of March 2, 1928, so as to extend the electric light and power franchise granted by said Act to cover the entire districts of Waimea and Koloa on the Island of Kauai, Territory of Hawaii".

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That:

Act Numbered 27 of the Session Laws of 1951 of the Territory of Hawaii, entitled "An Act to amend Act 24 of the Session Laws of Hawaii 1927, as ratified by the Act of Congress of March 2, 1928, so as to extend the electric light and power franchise granted by said Act to cover the entire districts of Waimea and Koloa on the Island of Kauai, Territory of Hawaii," passed by the Legislature of the Territory of Hawaii and approved by the Governor of the Territory of Hawaii on May 4, 1951, is hereby approved.

Approved June 18, 1954.

PHILIPPINE TRADERS—ENTRY

See Legislative History, p. 2404

CHAPTER 323—PUBLIC LAW 419

[H. R. 8092]

An Act to facilitate the entry of Philippine traders.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That:

Upon a basis of reciprocity secured by agreement entered into by the President of the United States and the President of the Philippines, a national of the Philippines, and the spouse and children of any such national if accompanying or following to join him, may, if otherwise eligible for a visa and if otherwise admissible into the United States under the Immigration and Nationality Act (66 Stat. 163), be considered to be classifiable as a nonimmigrant under section 101(a) (15) (E) of said Act[1] if entering solely for the purposes specified in subsection (i) or (ii) of said section.

Approved June 18, 1954.

1. 8 U.S.C.A. § 1101(a) (15) (E).

NATIVE HAWAIIAN LEGAL CORPORATION
1164 BISHOP STREET • SUITE 1205 • HONOLULU, HAWAII 96813 • TELEPHONE (808) 521-2302 • FAX (808) 537-4268

May 16, 1997

Mr. Kenneth M. Kaneshiro
State Conservationist
Natural Resources Conservation Service
P.O. Box 50004
Honolulu, Hawai'i 96850

Re: Draft Waimea-Paauilo Watershed Plan

Dear Mr. Kaneshiro:

These comments are submitted on behalf of Mr. James P. Akiona Sr. and the Aged Hawaiians. Mr. Akiona currently occupies a 100 acre pastoral homestead leasehold in Pu'ukapu, Waimea. Mr. Akiona seeks to become economically self-sufficient on his pastoral lease by conducting commercial ranching.

The Draft Plan currently provides that livestock water will be supplied to Mr. Akiona's lot. Under §207(a) of the Hawaiian Homes Commission Act (HHCA), Mr. Akiona is entitled to irrigate his pastoral lot in order to achieve his dream of becoming self-sufficient. As you can see by the enclosed legislative history, the HHCA was amended in 1954 to specifically provide for irrigated lots to enable homestead ranchers to become economically self-sufficient. Accordingly, we would like the Plan to reflect that homestead lessees who received 100 acres and who desire to become economically self-sufficient on their homestead lot like Mr. Akiona, are not precluded from irrigating their pastoral lot during those months when rainfall is insufficient to adequately irrigate their lot.

We thank you for the opportunity to review and comment on your Draft Plan.

Sincerely,

Paul F. Nahoa Lucas
Staff Attorney

PFNL:clc
Enclosures
f:(clc)\kanihol\kaneshiro

Nioka. Upright, straight, stately, tall and straight as a tree without branches, sharply peaked, as mountains. Fig., righteous, correct

LEGISLATIVE HISTORY

Since a considerable portion of the land under the jurisdiction of the commission is isolated and noncontiguous, enactment of H.R. 5831 would permit more effective management by the Hawaiian Homes Commission. The Legislature of the Territory of Hawaii by joint resolution has requested enactment of legislation similar to H.R. 5831.

There is pending before the Senate Committee on Interior and Insular Affairs H.R. 2839, which is similar to H.R. 5831, except that it is restricted to the Waimanalo area of the island of Oahu and does not require approval of exchanges by the Commissioner of Public Lands and two-thirds of the members of the board of public lands.

Three perfecting amendments are suggested:

1. Strike out the word "public" in the title of the bill and insert in lieu thereof "publicly owned".
2. Page 2, line 2, strike out the word "lands" and insert in lieu thereof "land".
3. Page 2, line 9, add the word "to" before "the".

The Bureau of the Budget has advised that there is no objection to the submission of this report.

Sincerely yours,

ORME LEWIS,
Assistant Secretary of the Interior.

The committee has adopted the perfecting amendments mentioned in the Department's report. The committee also has corrected section 1 to reflect the provisions of Public Law 207, 83d Congress, 2d session, which extended specific authority to the Hawaiian Homes Commission to exchange lands at Waimanalo on the island of Oahu.

HAWAIIAN HOMES COMMISSION—LEASE OF IRRIGATED LANDS FOR GRAZING

For text of Act see p., 322

Senate Report No. 1492, June 2, 1954 [To accompany H.R. 6888]

House Report No. 1587, May 11, 1954 [To accompany H.R. 6888]

The Senate Report repeats in substance the House Report.

Senate Report No. 1492

THE Committee on Interior and Insular Affairs, to whom was referred the bill (H. R. 6888) to amend sections 201(a) and 207(a) of the Hawaiian Homes Commission Act, having considered the same, report favorably thereon without amendment, and with the recommendation that the bill do pass.

PURPOSE OF THE BILL

The purpose of this bill is to permit the Hawaiian Homes Commission, as a part of its program of making lands available to native Hawaiians, to lease irrigated lands suitable for grazing but not for crop production, in tracts of between 40 and 100 acres. Under existing law pastoral lands may be leased to such native Hawaiians, but not in tracts of less than 100 acres. Since certain of the lands of the Commission are suitable for irrigated pastures, and such pastures have a carrying capacity greater than other pastoral lands under the jurisdiction of the Commission, a smaller area is required to meet the needs of a single family.

HAWAIIAN HOMES COMMISSION

The bill is approved by the Department of the Interior, and there is no objection by the Bureau of the Budget. The report of the House committee, which gives full details on the situation and includes the report of the Interior Department, is as follows:

H.R. 6888 amends the Hawaiian Homes Commission Act of 1920, as amended, by adding a new category of "not less than 40 nor more than 100 acres of irrigated pastoral lands" that may be granted a lessee. No expenditure of Federal funds is involved.

Section 207 of the Hawaiian Homes Commission Act (48 U.S.C. 701) presently authorizes the Commission to lease to native Hawaiians the right to the use and occupancy of Hawaiian homelands within the following acreage limits per lessee:

(1) Not less than 1 nor more than 40 acres of agricultural lands;
(2) Not less than 100 nor more than 500 acres of first-class pastoral lands;
(3) Not less than 250 nor more than 1,000 acres of second-class pastoral lands; or
(4) Not more than 1 acre of any class of land to be used as a residence lot.

The additional category proposed in H.R. 6888 is requested by the Governor and by the Legislature of the Territory of Hawaii. The Department of the Interior has submitted a favorable report which is set forth below in full.

DEPARTMENT OF THE INTERIOR,
OFFICE OF THE SECRETARY,
Washington, D. C., April 22, 1954.

Hon. A. L. MILLER,
Chairman, House Committee on Interior and Insular Affairs,
House of Representatives, Washington, D. C.

MY DEAR DR. MILLER: Further reference is made to your letter to me dated January 18, 1954, requesting a report on H.R. 6888, the bill to amend section 207(a) of the Hawaiian Homes Commission Act, 1920.

The bill has been approved by the Hawaiian Homes Commission, and I recommend its enactment as written, subject to the amendments hereinafter suggested.

This bill was introduced pursuant to Joint Resolution No. 32, Hawaii Session Laws, 1953, approved by the Governor on May 19, 1953. It amends section 207(a) of the Hawaiian Homes Commission Act of 1920 (48 U.S.C.A. par. 701) by granting to the Hawaiian Homes Commission the additional right to lease "not less than 40 nor more than 100 acres of irrigated pastoral lands."

The Hawaiian Homes Commission has under its jurisdiction available lands which are suitable for irrigated pastures, and it has been found in the development of the cattle industry that pasturage of cattle on irrigated pastures is economically feasible and advisable. The carrying capacity of such pastures is greater than pastoral land, and therefore, to meet the needs of a single family, a smaller area is required than that provided for pastoral land.

Since the bill, as introduced, does not define the term "irrigated pastoral lands," it is suggested that the following amendments be adopted:

1. The title should be changed to read: "To amend sections 201(a) and 207(a) of the Hawaiian Homes Commission Act."
2. On page 2, after line 16 (but before sec. 2), the following should be inserted:

"Sec. 2. Subsection (a) of section 201 of the Hawaiian Homes Commission Act, 1920, is hereby amended by adding a paragraph (8) to read as follows:

"(8) The term 'irrigated pastoral land' means land not in the description of agricultural land but which, through irrigation, is capable of carrying more livestock the year through than first-class pastoral land."

for land, publicly owned, of an equal value. All lands so acquired by the commission shall assume the status of available lands as though the same were originally designated as such under section 203 hereof, and all land so conveyed by the commission shall assume the status of the land for which it was exchanged. The limitation imposed by section 73 (1) of the Hawaiian Organic Act and the land laws of Hawaii as to the area and value of land that may be conveyed by way of exchange shall not apply to exchanges made pursuant hereto. No such exchange shall be made without the approval of the commissioner of public lands and of two-thirds of the members of the board of public lands.'

Section 2. This Act shall take effect upon its approval."

SECTION 2. That certified copies of this Joint Resolution shall be transmitted to the President of the United States, to the President of the Senate and the Speaker of the House of Representatives of the Congress of the United States, to the Secretary of the Interior, and to the Delegate to Congress from Hawaii.

SECTION 3. This Joint Resolution shall take effect upon its approval.

(Approved May 18, 1953.) H. J. R. 97, J. R. 31.

J. R. 32

Joint Resolution Requesting Congress to Amend the Hawaiian Homes Commission Act, 1920, to Provide Irrigated Pastoral Areas on Homes Commission Lands.

WHEREAS, in the development of the cattle industry throughout the United States, it has been found that the pasturage of cattle on irrigated pastures is both economically feasible and advisable; and

WHEREAS, this practice has also been found to be most advisable in the Territory of Hawaii; and

WHEREAS, there are several areas of available lands under the Hawaiian Homes Commission that are most suitable to this type of agriculture; now, therefore,

Be it Enacted by the Legislature of the Territory of Hawaii:

SECTION 1. The Congress of the United States is hereby requested to amend section 207 (LEASES TO HAWAIIANS, LICENSES), subsection (a) to read as follows:

"(a) The Commission is authorized to lease to native Hawaiians the right to the use of occupancy of a tract or tracts of Hawaiian home lands within the following acreage limits per each lessee; (1) not less than one nor more than forty acres of agricultural lands; or (2) not less than one hundred nor more than five hundred acres of first-class pastoral lands; or (3) not less than two hundred and fifty nor more than one thousand acres of second-class pastoral lands; or (4) not more than one acre of any class of land to be used as a residence lot; (5) not less than 40 nor more than 100 acres of irrigated pastoral lands: Provided, however, that, in the case of any existing lease of a farm lot in the Kalanianaole Settlement on Molokai, a residence lot may exceed one acre but shall not exceed four acres in area, the location of such area to be selected by the lessee concerned: Provided, further, that a lease granted to any lessee may include two detached farm lots located on the same island and within a reasonable distance of each other, one of which to be designated by the Commission, shall be occupied by the lessee as his home, the gross acreage of both lots not to exceed the maximum acreage of an agricultural or pastoral lot, as the case may be, as provided in this section."

Sess Lo
H
Sess of 195

SECTION 2. Copies of this Joint Resolution shall be forwarded to the President of the United States, the Secretary of the Interior, the President of the Senate and the Speaker of the House of Representatives of the Congress of the United States, and to the Delegate to Congress from Hawaii.

SECTION 3. This Joint Resolution shall take effect upon its approval.

(Approved May 19, 1953.) H. J. R. 98, J. R. 32.

J. R. 33

Joint Resolution Requesting Congress of the United States to Authorize the Commissioner of Public Lands to Exchange Certain Public Lands for Private Lands of Equal Value Required by the City and County of Honolulu for School Purposes.

WHEREAS, certain privately owned lands are required by the city and county of Honolulu for school sites; and

WHEREAS, other lands of equal value, owned by the Territory, are available for exchanges with the owners of such privately owned lands; and

LEGISLATIVE HISTORY

3. On page 2, line 17, delete "2" and substitute "3" therefor.
The Bureau of the Budget has advised that there is no objection to the submission of this report.
Sincerely yours,

FRED G. AANDAHL,
Assistant Secretary of the Interior.

The corresponding amendments proposed by the Department have been adopted by the committee.

This bill implements a policy of long standing with regard to leasing of Territorial lands and should not be confused with the committee's recognized policy of patenting public domain lands within the continental United States under reclamation, desert land, or other entry.

PHILIPPINE TRADERS—ENTRY

For text of Act see p. 323

Senate Report No. 1464, May 27, 1954 [To accompany H.R. 8092]
House Report No. 1306, Mar. 4, 1954 [To accompany H.R. 8092]
The Senate Report repeats in substance the House Report.

Senate Report No. 1464

THE Committee on the Judiciary, to which was referred the bill (H. R. 8092) to facilitate the entry of Philippine traders, having considered the same, reports favorably thereon with amendments and recommends that the bill, as amended, do pass.

PURPOSE OF BILL

The purpose of the bill, as amended, is to provide for the temporary admission into the United States, upon the basis of reciprocity, of certain nationals of the Republic of the Philippines for the purpose of (1) carrying on substantial trade principally between the United States and the Philippines or (2) developing and directing the operations of an enterprise in which they have invested, or an enterprise in which they are actively in the process of investing, a substantial amount of capital.

The purpose of the amendments is to conform the language of the bill to the firmly established policy of the committee against the direction of the issuance of a visa by special legislation.

STATEMENT OF THE FACTS

The persons embraced in the proposed legislation are those who would normally be permitted to enter the United States temporarily as nonimmigrants under the classification of "treaty traders" but for the fact that there is not in existence a treaty of commerce and navigation between the United States and the Republic of the Philippines. Under section 101 (a) (15) (E) of the Immigration and Nationality Act the classes of aliens eligible for admission to the United States as nonimmigrants include—

an alien entitled to enter the United States under and in pursuance of the provisions of a treaty of commerce and navigation between the United States and the foreign state of which he is a national, and the spouse

pounding thereof and penalties for the violation of the provisions in said bill.

Your Committee is well aware of the fact that some feed products sold in the Territory have had harmful and injurious effects when fed to domestic animals and adulterations or misbranding of feed products have resulted in losses to live stock throughout the Territory.

1953

The bill empowers the Board of Agriculture and Forestry (1) to prescribe rules and regulations governing the sale, distribution, and labelling of adulterated or misbranded simple feeding stuffs, (2) to impound any simple feeding stuff believed to be adulterated or misbranded for the purpose of determining whether such feed is adulterated or misbranded, (3) to perform all such tests as may be necessary to determine the type and extent of the adulteration or misbranding, and (4) to conduct hearings to evaluate the findings of such tests or investigations and to decide what disposition shall be made of such feed.

This bill provides for certain prohibited acts in connection with simple feeding stuffs. Section 6 provides for the impounding procedure and Section 7 relates to the processing of adulterated or misbranded simple feeding stuff and destruction of same under certain conditions.

Due process of law is provided for by entitling an aggrieved person to appeal to the circuit court, and such court on appeal may set aside, amend, or affirm such order as may be entered by the Board of Agriculture and Forestry. All fees and charges collected pursuant to the provisions of this Act, when enacted, shall be used for the administration and enforcement thereof and are appropriated for such purpose. Section 10 of this bill provides for penalties for violation of the provisions contained in this bill.

Your Committee recommends passage of this bill.

Signed by all members of the Committee

SCRep. 374 Lands on H. J. R. No. 98

The purpose of this Joint Resolution is to request the Congress of the United States to amend Section 207 (LEASES TO HAWAIIANS, LICENSES) of the Hawaiian Homes Commission Act, 1920, to provide irrigated pastoral areas on Hawaiian Homes Commission Lands.

The proposed amendment would permit the Hawaiian Homes Commission to lease to native Hawaiians "not less than 40 nor more than 100 acres of irrigated pastoral lands".

There are presently available Hawaiian Homes Commission lands which can be utilized for the pastorage of cattle on irrigated pastures. More native Hawaiians could be granted homesteads if this amendment is enacted into law, as the current practice is not to lease less than 300 acres for pastoral purposes.

The pasturage of cattle on irrigated pasture is both economically feasible and advisable and has been practiced extensively in the development of the cattle industry throughout the United States.

Your Committee is in accord with the purpose and intent of this resolution and recommends its passage, with the following amendment: Correct Section 2 to read "Section 3" and Section 3 to read "Section 2".

Signed by all members of the Committee

SCRep. 375 Lands on H. J. R. No. 99

The purpose of this Joint Resolution is to request the Congress of the United States to enact legislation permitting the City and County of Honolulu, with the approval of the Commissioner of Public Lands of the Territory of Hawaii, to exchange available public lands for private lands for school sites.

The City and County of Honolulu is desirous of acquiring certain lands for school purposes on the Island of Oahu. These lands, however, are privately owned.

Though the City and County of Honolulu desires effecting an exchange of certain public lands, with the approval of the Commissioner of Public Lands, for privately owned lands it is prohibited therefrom by reason of the limitations contained in the Hawaiian Organic Act.

This Joint Resolution states that school sites are needed for the Kahala Elementary School, Waialae High School and Koko Head Elementary School on the Island of Oahu.

Your Committee is in accord with the intent and purpose of this Joint Resolution and recommends its passage.

Signed by all members of the Committee

SCRep. 376 Civil Service on H. J. R. No. 101

Purpose of the Joint Resolution is expressed in its title, and facts relating to the situation are expressed in the preamble. In brief, Congress is requested and urged to enact legislation which will require the various departments of the Federal government to deduct and pay over into the annuity savings fund of the Territorial Retirement System, the contribution due from civilian employees of the Hawaii National Guard.

B-74

USDA

United States Department of Agriculture

Natural Resources Conservation Service

P.O. Box 50004
Honolulu, HI
96850

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

July 8, 1997

Paul F. Lucas, Staff Attorney
Native Hawaiian Legal Corporation
1164 Bishop Street, Suite 1205
Honolulu, Hawaii 96813

Dear Mr. Lucas:

Subject: Draft Watershed Plan and Environmental Impact Statement for the Waimea-Paauilo Watershed

Thank you for your letter of May 16, 1997 with comments submitted on the behalf of Mr. James P. Akiona and the Aged Hawaiians. We wish to respond to the comments.

COMMENT: Mr. Akiona occupies a 100-acre pastoral homestead parcel in Puukapu and seeks to become economically self-sufficient by irrigating his pasture and conducting commercial ranching. The DEIS states that only livestock drinking water will be provided and that irrigation water for pastures will not be provided.

Under Section 207(a) of the Hawaiian Homes Commission Act, homesteaders are entitled to irrigate certain pastoral lands as set forth in the 1954 amendment to the HHCA. We would like the plan to reflect that homestead lessees that received 100 acres and who desire to become economically self-sufficient are not precluded from irrigating their pastoral lot.

RESPONSE: Section 207(a) has been amended since 1954 and the Hawaiian Homes Commission Act of 1920, as amended, now states in pertinent part:

> "(a) The department is authorized to lease to native Hawaiians the right to the use and occupancy of a tract or tracts of Hawaiian home lands within the following acreage limits per each lessee: . . . (2) not more than one hundred acres of irrigated pastoral lands and not more than one thousand acres of other pastoral lands: . . .".

It is our understanding that your client has a homestead pastoral lease without any commitment to provide water for the purpose of irrigating his pastoral land.

DHHL Title 10 Administrative Rules, Section 10-3-27(b) states:

> "Lessees with pastoral lots may raise crops for fodder to be used only for animals on the lot. A portion of such lot may be utilized to raise vegetables or fruit crops for consumption by the lessee's immediate family."

Homestead pastoral leases permit certain uses to increase the carrying capacity of the lot and expand into subsistence farming. Issues of future water allocation changes will be addressed by the management of the Waimea Irrigation System. Considerations will include the supply of water available, system capital and operating costs, and fee rate structure.

Sincerely,

ACTING

KENNETH M. KANESHIRO
State Conservationist

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

IN REPLY REFER TO:
11000
Ser N4(23)/4376
30 May 97

Mr. Kenneth M. Kaneshiro, State Conservationist
USDA, Natural Resources Conservation Service
P.O. Box 50004
300 Ala Moana Blvd., Room 4316
Honolulu, HI 96850-0050

Dear Mr. Kaneshiro:

Subj: DRAFT WATERSHED PLAN AND ENVIRONMENTAL IMPACT STATEMENT (EIS) WAIMEA-PAAUILO WATERSHED OF FEBRUARY 1997

Thank you for the opportunity to review the Draft Watershed Plan and EIS for the Waimea-Paauilo Watershed Project of February 1997.

The Navy has no comments to offer at this time and appreciates the opportunity to participate in your review process.

The Navy's point of contact is Mr. Stanford Yuen at 474-0439.

Sincerely,

S. B. Yuen
S.B. Yuen, P.E.
By direction

Copy to:
Mr. James J. Nakatani, Chairperson
Board of Agriculture
State of Hawaii, Department of Agriculture
P.O. Box 22159
Honolulu, HI 96823-2159

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

USDA

United States Department of Agriculture

Natural Resources Conservation Service

P.O. Box 50004
Honolulu, HI
96850

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

July 8, 1997

Stanford B. Yuen, P.E.
Department of the Navy
Commander, Naval Base Pearl Harbor
Box 110
Pearl Harbor, Hawaii 96860-5020

Dear Mr. Yuen:

Subject: Draft Watershed Plan and Environmental Impact Statement for the Waimea-Paauilo Watershed

Thank you for your letter of May 30, 1997 stating that the Navy has no comments on the subject document at this time.

Sincerely,

ACTING

KENNETH M. KANESHIRO
State Conservationist

The Natural Resources Conservation Service works hand-in-hand with the American people to conserve natural resources on private lands.

AN EQUAL OPPORTUNITY EMPLOYER

Land Court Award (LCA) claims by native Hawaiians presented by Mr. William P. Kalawaianui at the Public Meeting held on April 23, 1997 in Waimea, Hawaii.

William P. Kalawaianui
WILLIAM P. KALAWAIANUI
Post Office Box 235
Kamuela, Hawaii 96743

FACT SHEET

(April 1997)

Project Name/Location: Waimea-Paauilo Watershed, Hawaii County, Hawaii

Participating Agencies:
Mauna Kea Soil and Water Conservation District
State of Hawaii, Department of Agriculture
State of Hawaii, Department of Hawaiian Home Lands
USDA Natural Resources Conservation Service

Project Description: The project proposes a plan to alleviate the agricultural water shortage problems experienced by farmers and ranchers in the Waimea area by increasing the storage and distribution capacity of the Waimea Irrigation System.

Proposed Improvements:
1) 19,200-foot long supply pipeline from the Upper Hamakua Ditch to a new reservoir.
2) 131 million-gallon reservoir located on the Kauahi DHHL parcel.
3) 13,300 feet of additional irrigation distribution pipeline and one booster pump to connect Kauahi reservoir to the WIS and expand into the proposed Lalamilo Agricultural Park.
4) 234,600 feet of pipeline and nine booster pumps for a livestock drinking water distribution system

Service Areas:

Cropland		Ranchland	
Lalamilo Farmlots	670 acres	DHHL Puukapu 1 Ranchlots	9,746 acres
Puukapu Farmlots	370 acres	DHHL Nienie Ranchlots	6,457 acres
DHHL Farmlots (Puukapu)	284 acres	DHHL Puukapu 2 Ranchlots	405 acres
DHHL - Phase I	226 acres	DHHL Kamoku Ranchlots	3,974 acres
DHHL - Phase II	165 acres	Other ranchlots	2,380 acres
Lalamilo Ag. Park	270 acres		
Total	1,985 acres	Total	22,962 acres

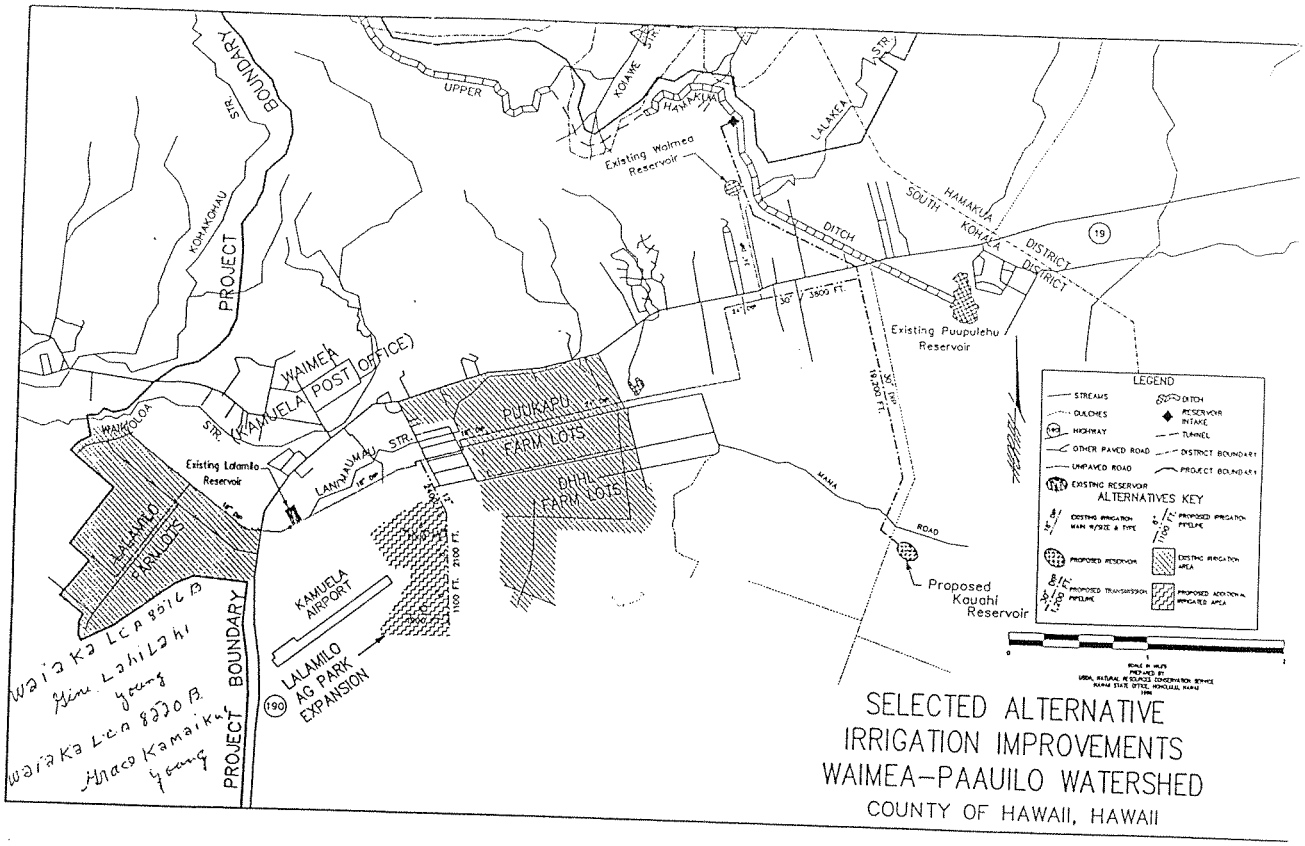
Installation Cost:

Improvement	Federal	Dept of Ag.	DHHL	Total
Supply pipeline	$2,852,900	$2,251,600	$ 0	$5,104,500
131-MG reservoir	3,131,300	2,685,000	251,000	6,067,300
Irrigation system	940,300	748,800	0	1,689,100
Stockwater system	569,100	322,400	3,624,200	4,515,700
Total	$7,493,600	$6,007,800	$3,875,200	$17,376,600

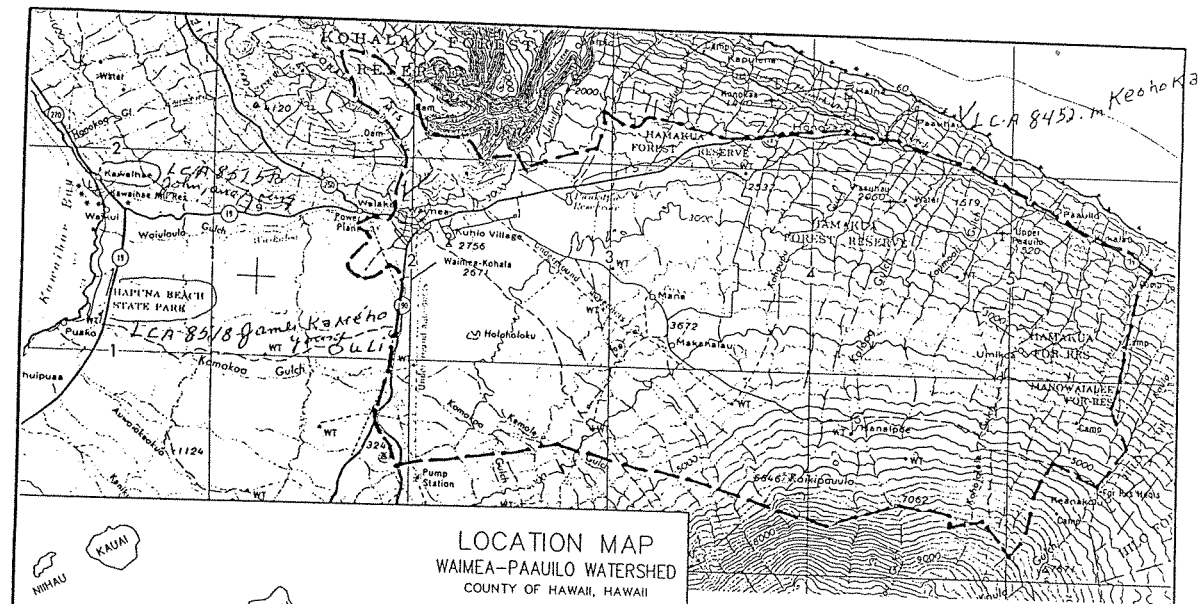
Time Table:

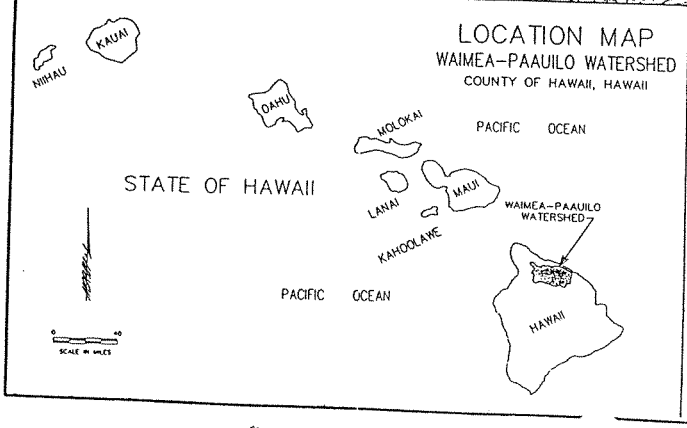
Comments on draft Plan-EIS due by	May 15, 1996
Final Plan-EIS and Watershed Agreement	Fall 1997
Project Installation*	1998-2003

* Dependent on availability of federal and state funding.



SELECTED ALTERNATIVE
IRRIGATION IMPROVEMENTS
WAIMEA–PAAUILO WATERSHED
COUNTY OF HAWAII, HAWAII





PROJECT AREA LOCATION
WAIMEA-PAAUILO WATERSHED
COUNTY OF HAWAII, HAWAII

NORTH

Scale: 1:100,000
Map Source: USGS

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O. Box 50004
nolulu, HI
850

USDA

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

July 22, 1997

William P. Kalaiwaianui
P.O. Box 235
Kamuela, HI 96743

Dear Mr. Kalaiwaianui:

Subject: Draft Watershed Plan and Environmental Impact Statement for the Waimea-Paauilo Watershed

Thank you for your comments at the Public Meeting held on April 23, 1997 and the transmittal with Land Court Award recipients and numbers. We apologize for the delay in responding to your concerns.

COMMENT: Some of the land in and adjacent to the DHHL land served by the watershed project belongs to Hawaiians whose families were awarded the parcels during the Mahele and Kuleana Act period.

RESPONSE: The issue of ownership claims to Hawaiian home lands was reviewed by the DHHL attorney who stated:

> All information we have from reliable documents support State ownership of the land which was designated for management by DHHL. If you disagree with this position, you may provide complete documentation to DHHL for review.

Sincerely,

KENNETH M. KANESHIRO
State Conservationist

cc: Darrell Yagodich, Planning Office, DHHL, Honolulu, HI

The Natural Resources Conservation Service works hand-in-hand with the American people to conserve natural resources on private lands.

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PUBLIC MEETING NOTES

Waimea-Paauilo Watershed Project
April 23, 1997, 6:30 PM
Kuhio Hale, DHHL West Hawaii District Office
Mamalahoa Highway, Waimea

A public meeting was held to discuss and comment on the draft Watershed Plan and Environmental Impact Statement (Plan-EIS) for the Waimea-Paauilo Watershed. The meeting was publicized through articles in the Big Island newspapers and through a mailed announcement to nearly 900 addresses. The meeting was attended by approximately 50 persons.

BACKGROUND

The meeting was opened by Daniel Kaniho, Chairman of the Mauna Kea Soil and Water Conservation District (SWCD). Kaniho welcomed the attendees and introduced personnel from the other participating agencies - State of Hawaii Department of Agriculture (DOA), Department of Hawaiian Home Lands (DHHL), and the USDA Natural Resources Conservation Service (NRCS).

Michael Kolman, NRCS, described the background of the project. The project was begun in the mid-1980s and a Plan and Environmental Assessment was completed in 1989. During the design of the Waimea II reservoir, which would be located next to the existing Waimea reservoir, concerns were expressed by adjacent residents about decline in of property values and dam safety. Opposition to the Waimea II reservoir grew until 1994, when the sponsors of the project requested the NRCS to evaluate alternate reservoir locations. The NRCS determined that an Environmental Impact Statement would be prepared for the re-evaluation of the reservoir sites and for other improvements of the project.

The draft Watershed Plan and Environmental Impact Statement has been completed and is in the public review period which extends to May 15, 1997. This meeting is a part of the draft EIS review process to provide information about the plan and its effects to the community and to receive comments back from the community.

PROJECT DESCRIPTION

Dudley Kubo, NRCS, presented a description of the watershed plan's proposed improvements and the economic, social, and environmental effects of the project.

The purpose of the project is to provide adequate and consistent irrigation water to established farmers, provide water for expansion of farming, and provide livestock drinking water to area ranchers by expanding the capacity of the Waimea Irrigation System (WIS).

The existing WIS pipeline system serves farmers in the Puukapu and Lalamilo areas with agricultural water. The water source is the Upper Hamakua Ditch. The two reservoirs used for storage are the 60-million gallon (MG) Waimea Reservoir and the 110-MG Puu Pulehu Reservoir. A 1.4-million gallons per day (MGD) deep well near the Waimea Reservoir is held in standby and has not yet been used to supplement the agricultural water supply.

Additional reservoir storage and expansion of the distribution pipeline systems could improve water reliability for existing users, provide opportunities for expansion of irrigated cropland, and provide livestock drinking water. A plan to expand the WIS is contained in the draft Plan-EIS.

The plan is only a plan. Structural and mechanical design of the improvements, acquisition of permits and approvals, acquisition of landrights, and acquisition of construction funding are still yet to be done. Details of the plan may change as the process moves toward construction.

There are four major components to the watershed plan - an additional reservoir, a supply pipeline from the Upper Hamakua Ditch, irrigation system improvements, and a livestock drinking water distribution system.

A number of potential reservoir sites were evaluated. The major considerations were elevation to provide gravity pressure, distance from the Upper Hamakua Ditch, and environmental and social impacts. Sites were discounted because of locations in the forest reserve, low elevations requiring extensive pumping, and long distances from the Upper Hamakua Ditch. A reservoir site at the intersection of Mana Road and Mealani Road was selected for the 131-MG reservoir. The reservoir will be located on the DHHL pastoral parcel leased by Clarence Kauahi and is referred to as the Kauahi Reservoir.

A 19,200-foot long, 30-inch diameter supply pipeline will transfer water from the inlet on the Upper Hamakua Ditch to the new reservoir. The route of the buried pipeline will run along the open ditch section leading to Puu Pulehu Reservoir, cross Mamalahoa Highway, then along Mealani Road to the Kauahi Reservoir. The major consideration for the alignment is the use of existing ditch and road rights-of-way.

The improvements to the irrigation system consist of a 30-inch diameter connection pipeline from the supply pipeline where it crosses Mamalahoa Highway to the existing distribution pipeline and additional lateral distribution pipeline at the proposed Lalamilo Agricultural Park. The average daily use of irrigation water is expected to reach 3.8 MGD.

The livestock drinking water distribution system will consist of 45 miles of distribution pipeline and nine pumping stations to serve untreated livestock drinking water to 22,500 acres, most of which is DHHL pasture land.. The water will be provided from both Waimea and Kauahi Reservoirs. Average daily use of livestock drinking water is expected to be 0.2 million gallons.

The estimated installation costs of the improvements are: Kauahi Reservoir, $6.1 million; supply pipeline, $5.1 million; irrigation system improvements, $1.7 million; and livestock water system, $4.5 million.

The DOA and NRCS will fund near equal shares of the reservoir and supply and irrigation system costs. Nearly all of the livestock drinking water improvement costs will be funded by DHHL.

The annual costs for operating, maintaining, and repairing the improvements to the WIS is estimated to be nearly $200,000. Most of the cost is for operation of pumps.

The installation of the project will occur over several years. The most optimistic date for construction to start is within two years.

EFFECTS OF THE PROJECT

The environmental impact review process requires the disclosure of the economic, social, and environmental effects of the watershed project

The major beneficial economic impacts are: reduction in crop damage and loss due to drought, opportunity to expand crop acreage, reduction in livestock losses due to drought, opportunity to expand livestock industry, and reduction in treatment cost for water used for livestock. The major adverse economic impact are the installation cost and the on-going operation and maintenance costs.

No effect to archaeological and historic sites is expected. Four archaeological surveys were conducted for the project.

No effect to threatened and endangered species is expected. All improvements, except for a portion of the supply pipeline will be located outside of the forest reserve.

The sudden collapse of the dam at the proposed reservoir was evaluated. A preliminary dam breach inundation map was developed and shows one dwelling and two other structures on eight properties to be affected. Although a catastrophic breach of the Kauahi Reservoir dam is highly unlikely, the dam will be designed to minimize the potential for failure and an Emergency Preparedness Plan complying with state guidelines will be developed and implemented.

The installation of the project will encourage the maintenance of prime and other important agricultural land in agricultural land use. However, more than 29 acres of pasture land will be needed for installation of the reservoir and pipelines.

Streamflow in Lalakea Stream, measured at Hiilawe Falls, will be reduced in volume by five percent by the reduction in overflow from the Upper Hamakua Ditch into Lalakea Stream. The project will not affect the natural drainage to Lalakea Stream.

The watershed project supports the goals of the Hawaii State Plan to provide water for agricultural use and to make the most productive use of the land best suited for agriculture.

The watershed project supports the Hawaii County Plan in its economic, land use, and public utility goals.

The watershed project implements the DHHL goal of providing infrastructure to homestead farmers and ranchers.

The watershed project can be compatible with the State Department of Transportation's Waimea Bypass Highway alternatives.

The sponsors of the watershed project are aware of the many issues concerning water rights, including the trust obligations to native Hawaiians affirmed in the Hawaiian Homes Commission Act and the Statehood Admissions Act. The decisions regarding the water issues will be made by others and the impacts on the project are still unclear. The operating policies of the WIS developed by the DOA, with input from DHHL and others, will be continually updated and will conform to changes in state water rights policies and laws.

AGENCY RESPONSIBILITIES

The NRCS will be responsible for funding of the federal cost-share, compliance with federal laws and policies, and design of improvements.

The DOA will be responsible for funding of the state cost-share; compliance with state environmental laws and policies; acquisition of permits and approvals; acquisition of land rights, administering contracts; accepting, operating and maintaining improvements, developing operating policy for WIS, including livestock drinking water; and developing maintaining, and implementing an Emergency Preparedness Plan for the reservoir dam.

DHHL is responsible for funding livestock drinking water improvements for DHHL ranchers, acquiring permits and approvals for livestock drinking water improvements on DHHL land, acquiring landrights for livestock drinking water improvements on DHHL land, contract administration for stock water improvements on DHHL land, providing operation and maintenance funding for the DHHL livestock drinking water component, and participating in developing operational policy for WIS.

The Mauna Kea SWCD is responsible for assuring public participation during implementation and participating in developing operating policy for WIS.

An agreement for interagency cooperation between DOA and DHHL, covering installation and operation of the project improvements, is being developed and will be completed before construction.

The SWCD and NRCS will continue to develop conservation plans for soil and water conservation on individual farms and ranches.

QUESTIONS AND COMMENTS BY ATTENDEES

Question: What is the size of the pipeline along the Mamalahoa Highway that crosses Kalake Street?

Response: The buried pipeline will be 30-inch diameter. It was mistakenly stated that the pipeline would be 24-inch diameter at the meeting.

Question: Why was Mealani Road chosen as the route of 30-inch supply pipeline?

Response: As much as possible, improvements are located on existing rights-of-way, such as roads, and government land to minimize the amount of private or leased lands that needs to be acquired for the rights-of-way.

Question: What happens if a resident refuses to let pipeline be constructed on or near their land, and thus delay the construction of the project?

Response: The DOA and the DHHL will be responsible for working with landowners to obtain land rights. They will try to come to a satisfactory agreement with the landowner. The possibility of moving pipelines and other structures can be investigated.

Question: Would you consider the use of eminent domain?

Response: That is an option available to the state agencies. Its use would depend on how successful less drastic means of acquiring the needed landrights are.

Question: Does DHHL have ceded land records? The commentor claimed that land within and adjacent to the project area rightfully belongs to Hawaiians who received the land during the Mahele. (He transmitted a mailed meeting announcement and fact sheet on which he written the names of the pertinent Land Court Award recipients and numbers.)

Response: This question and comment has been referred to DHHL. DHHL will confer with the State Attorney General's office to judge the validity of the claim and determine its effects on the watershed project.

Question: Will installation of the 30-inch buried pipeline kill or affect trees along Mealani Road? What is the pressure in the pipeline?

Response: We may be able to bury the pipeline without affecting the trees. That will be determined during design and the landrights process. Forestry experts may be consulted. The maximum pressure in the pipeline will be approximately 70 psi.

Question: Page 18 of draft Plan-EIS says water for the grazing land service area will be for livestock drinking water only. Will project allow the water to be used for irrigating pasture? Ranchers can get more return from increasing forage.

Response: Due to the limitations on water supply, priorities were established for competing uses. Because of such priorities and federal guidelines for the project requiring the highest value use of the water, the intent is for the project to provide irrigation water for truck crops and flower production and livestock drinking water. Irrigation water for pasture is not included. The project was planned and the pipelines were designed to provide livestock drinking water only.

Comment: The benefits for livestock are low as shown on page 87, Table 6. Selling price for cattle should make figure much higher.

Response: The benefits for livestock were based on net returns for livestock production, after the costs for production were subtracted, not gross returns or selling price.

Question: How was the increase in animal units with the project determined? The commentor felt that the carrying capacity in acres per animal unit was too low. And that the project analysis was too optimistic in livestock increase.

Response: The increase in animal units was determined for the analysis for the original 1989 Plan-Environmental Assessment document and was used unchanged. The rates were based on interviews with benefited ranchers and assumes ranchers will implement intensive grazing methods.

Question: What effect does the Waimea-Paauilo Watershed project have on the Paauilo area?

Response: None. When the project began in the mid-1980s, providing water along the Hamakua Coast to Paauilo for livestock drinking water and sugarcane irrigation was considered, thus the watershed project name "Waimea-Paauilo." However, with the shutdown of sugarcane production and the low economic feasibility of providing livestock drinking water, the project was scaled back to the Waimea area. The name of the project was not changed.

Question: Have easements through Parker Ranch been obtained for the livestock drinking water pipeline to Nienie?

Response: No. The pipeline from the reservoir to Nienie will be installed along the existing Mana Road right-of way. Easements from Parker Ranch for the booster pump locations will probably be required, however.

Question: Will DHHL be responsible for funding operating costs for the livestock drinking water system? What will the livestock drinking water cost be?

Response: DHHL will be primarily responsible for the operation and maintenance costs for the livestock drinking water distribution system. However, the DOA will be responsible for the entire WIS. An operating agreement with details on the manner in which operating costs are shared and the rate schedules for livestock drinking water is currently being developed. Until its completion

and acceptance, neither the operating costs to DHHL or the water charge to DHHL ranchers is known.

Question: What is the relationship between the Department of Water Supply (DWS) system and the WIS? Is the DWS aware of the project's plans.

Response: The DWS system and the WIS are completely separate from source to final user. All water provided by DWS is treated to U.S. drinking water standards. The WIS provides untreated water that is not intended for human consumption. The DWS is aware of the watershed project and supports its implementation to remove livestock drinking water use from the treated system.

Comment: Many homesteaders want to maximize the economic potential of their lots but will be unable to because of the restriction that water can only be used for livestock drinking. Was a benefit:cost analysis done for livestock drinking water?

Response: A benefit:cost analysis was conducted but showed that providing livestock drinking water was economically unjustifiable. However, there are social and cultural benefits that are not quantifiable. DHHL decided to fund the livestock drinking water system without federal cost-sharing assistance.

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Question: Will the farmers in Waipio Valley be affected because of decreased streamflow caused by the project?

Response: No. The only effect to streamflow will be a five percent decrease in the flow of Lalakea Stream. Lalakea Stream enters Waipio Valley over Hiilawe Falls near the mouth to the ocean. Although some taro is grown on Hiilawe (Lalakea) Stream in Waipio Valley, most of the taro production takes place along Wailoa Stream above the confluence of Hiilawe Stream. The five percent reduction in Lalakea Stream should not be significant to taro production.

Question: Does this project impact the Hiilawe twin falls restoration project (Lower Hamakua Ditch Watershed Project)?

Response: In an engineering sense, the two projects are not connected. However, NRCS and the DOA are involved in both projects. Funding for both projects need to be sought from the same sources. The Waimea-Paauilo Watershed project is much further advanced in the planning timeline.

Question: Who is responsible for the maintenance of the Upper Hamakua Ditch and the Lower Hamakua Ditch?

Response: Currently, the DOA is responsible for both systems. The State has had control of the Upper Hamakua Ditch since the late 1940s and has operated the ditch since the early 1960s. The DOA has had the interim responsibility to maintain the Lower Hamakua Ditch since the collapse of Hamakua Sugar in 1995. The Doe's operating agreement expires in October 1997.

Question: Does this plan mean that the Waimea II site is no longer considered?

Response: For the purposes of this project, the Kauahi Reservoir is the preferred reservoir site. If the plan is accepted and approved by the sponsors and NRCS, then the Waimea II site will not be used for this project.

Question: Will the livestock drinking water supply have safeguards against contaminants?

Response: The livestock drinking water system will take water from the upper Kohala Watershed where there is no human activity to introduce unnatural contaminants to the water. The water will not be filtered. Detention time in the reservoir will reduce suspended sediments. Some monitoring of the water will take place, although not as frequently and as thoroughly as for human consumption.

WHAT'S NEXT

Michael Kolman, NRCS, described the next steps toward implementation of the project. Responses will be prepared for written comments made on the draft Plan-EIS during the review period. Modifications and clarifications will be found in the final Plan-EIS. Written comments and responses and the notes from this public meeting will be reproduced in the final plan-EIS.

The funding agencies will use the final Plan-EIS and the signed Watershed Agreement to secure funding. Final design and permit and landrights acquisition will be completed before any funds are obligated by signing of the Project Agreement for construction of each phase of the project.

Gary Kam, District Conservationist, NRCS Kamuela Field Office was introduced. He is the local point-of-contact for information about the project. He can be reached at 808-885-6602.

Written comments on the draft Plan-EIS should be sent to Kenneth M. Kaneshiro, State Conservationist, Natural Resources Conservation Service, P.O. Box 50004, Honolulu, HI 96850, by May 15, 1997.

The meeting was closed by Dan Kaniho at 8:15 PM.

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