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Deputy Planning Director

COUNTY OF MAUI
PLANNING DEPARTMENT

200 S. HIGH STREET
WAILUKU, MAUI, HAWAII 96793

July 27, 1977

Dr. Albert Q. Y. Tom, Chairman
Environmental Quality Commission
550 Halekauwila Street, Rm. 301
Honolulu, Hawaii 96813

Dear Mr. Tom:

Re: Waiale Development Plan - Environmental Impact
Statement

The Maui Planning Commission at its meeting of July 26, 1977 unanimously voted to accept the final environmental impact statement of the Waiale Development Plan submitted by Mr. Robert K. Sasaki, President, A&B Properties, Inc. In accepting the environmental impact statement, the Commission concurred with staff's opinion that the subject document was adequately prepared in accordance with Chapter 343 of the Hawaii Revised Statutes. It was understood by members of the Commission that acceptance did not indicate approval of the proposed project but that it would serve as a base for consultation, review and approval of the project at various implementation levels.

We are transmitting to the Environmental Quality Commission a copy of the final environmental impact statement with appended comments by various agencies and applicant responses to those comments. Applicant responses to late agency comments are transmitted for your information also.

Should there be any questions, please contact me at any time.

Yours very truly,


TOSH ISHIKAWA
Planning Director

cc Mr. Robert K. Sasaki, A&B

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Office of the Governor
550 Halekauwila Street
Tani Office Building, Third Floor
Honolulu, Hawaii 96813

Environmental Impact Statement

Waiale Development Plan

A & B Properties, Inc.

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Office of Environmental Quality Control
Office of the Governor
550 Halekauwila Street
Tani Office Building, Third Floor
Honolulu, Hawaii 96813

July 6, 1977

Honorable Chairman and Members
Maui County Planning Commission
County of Maui
200 South High Street
Wailuku, Maui, HI 96793

Gentlemen:

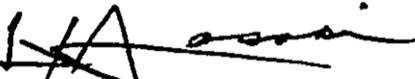
We are pleased to submit the attached final Environmental Impact Statement for the Waiale Development Plan. It is being submitted in conjunction with our request for an amendment to the Wailuku-Kahului General Plan.

The need for an environmental impact statement was determined by the Maui County Planning Commission on October 5, 1976. The preparation of the attached statement has followed the Regulations established by the Environmental Quality Commission of the State of Hawaii pursuant to Chapter 343, Hawaii Revised Statutes. Every effort has been made to contact potentially affected agencies, organizations and individuals, and to resolve all environmentally sensitive issues in this initial planning stage.

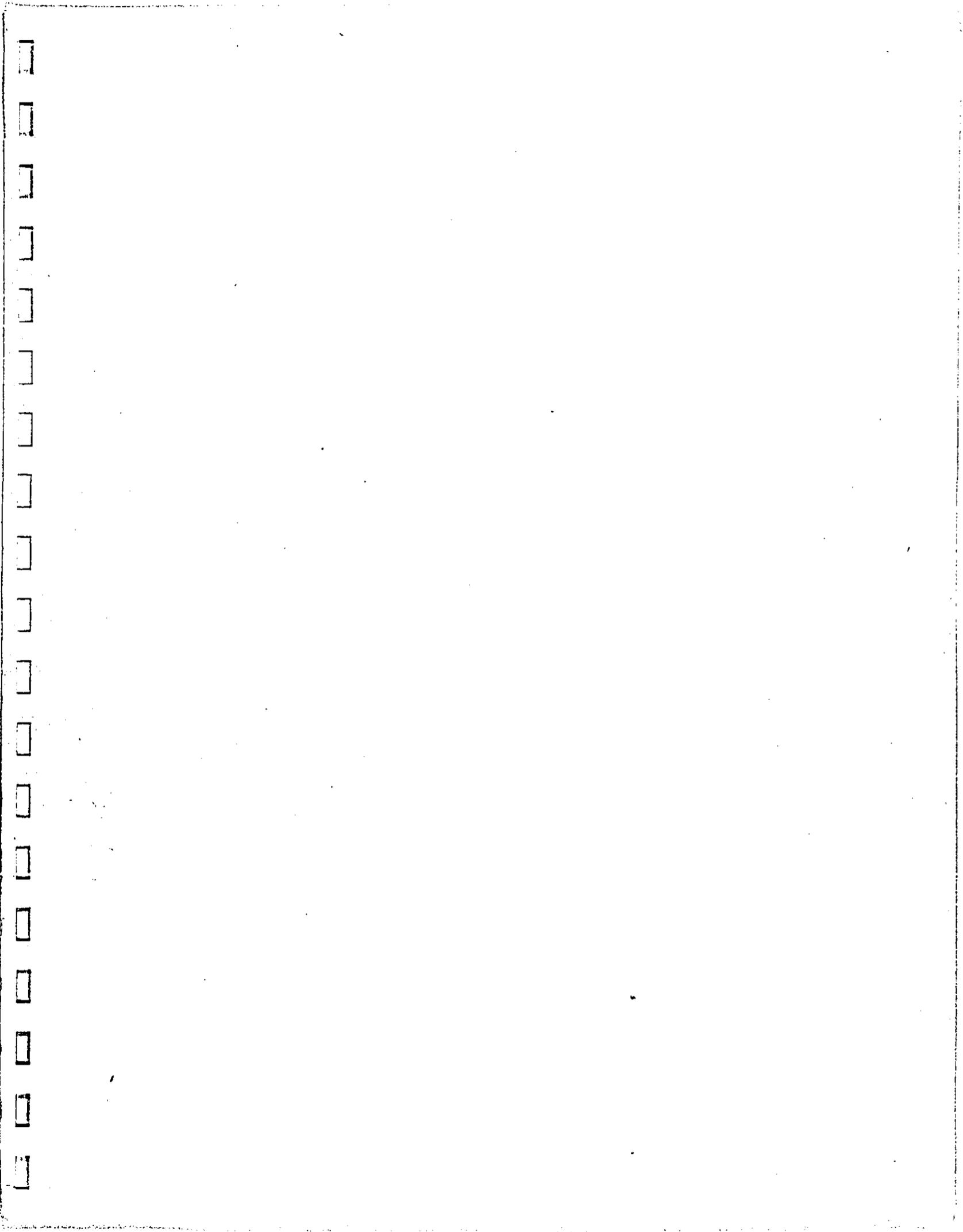
Should you or your staff have any questions regarding the attached material, please do not hesitate to contact me.

Sincerely,

A&B PROPERTIES, INC.


R. K. Sasaki, President

RKS:si
Enclosure



ENVIRONMENTAL IMPACT STATEMENT
FOR
WAIALE DEVELOPMENT PLAN

Prepared For
A & B Properties, Inc.

By
Belt, Collins and Associates, Ltd.
and
Howard K. Nakamura
in conjunction with
A & B Properties, Inc.

JULY, 1977

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I
SUMMARY

I SUMMARY

The Waiale Project is a proposed planned residential development situated between Wailuku and Kahului on the island of Maui. A & B Properties, Inc. will be developing the ± 1015 acre site to include 2710 units of single-family residential housing, 130 units of low income residential housing, and 225 units of low income apartment housing. The gross overall density will be about 3 units per acre, with the actual densities within each housing area being slightly greater. Over 1/3 of the project site will remain in open space or be developed for some type of recreational amenity. Included in the latter category are a golf course, a recreation/park complex, various smaller parks, and a nursery. Community facilities, such as schools and a village center are also planned. The construction phase of the project will be initiated in 1978, and will be completed sometime between 1990 and 2001.

Adequate infrastructure has been designed to accommodate the requirements of the proposed development. This includes water, sewer, drainage, power, and communications.

The site can be characterized as partially hilly and dry, covered by a sandy soil with low potential for agricultural productivity. Constant wind is experienced over the project site, characteristic of the entire Maui Isthmus. None of the flora or fauna inhabiting the project site is considered to be valuable or endangered. However, the Waiale Reservoir, which is a man-made irrigation facility owned by HC&S, may be subject to dredging and alteration. This could effect the reservoir's banks, which are occasionally used by the Hawaiian stilt for feeding. There are no known archaeological sites on the subject area; however, reasonable measures will be taken to preserve any potential sites, which might be discovered during the site preparation phase of construction, for examination by archaeologists.

The proposed project will abide by the land use policies of the State of Hawaii and the County of Maui. This includes the County General Plan, the State Land Use Districts, and the County Zoning Ordinance.

The proposed project will cause some impacts on the existing surrounding communities. The most important impact will be the in-migration to the project area of nearly 9300 new residents. Associated with this new influx of people will be increased traffic on major corridors, additional airborne emissions, more noise generation, and greater demands for services from public utilities and facilities. With respect to the proposed site, site preparation activity and construction of buildings will alter the physical and visual character of the area. Grading and landscaping may actually enhance these qualities.

The purposes of this Environmental Impact Statement are to present the existing conditions of the proposed project site, to describe the project to examine land use constraints, to analyze probable impacts as a result of this action, and finally, to answer any questions which may arise relevant to the proposed project. It is felt that these conditions are adequately fulfilled in this document.

12 11 10 9 8 7 6 5 4 3 2 1

II
PROJECT DESCRIPTION

II PROJECT DESCRIPTION

INTRODUCTION AND LOCATION MAP

Introduction

The purpose of this Environmental Impact Statement (EIS) is to provide decision-making bodies and the County of Maui with data and analysis required for an evaluation of the General Plan Amendment proposed by A&B Properties, Inc. for a planned residential development known as Waiale, at Wailuku/Kahului, County of Maui.

Chapter 343 H.R.S. requires the preparation of an EIS for projects involving an amendment to any existing County General Plan, and the County of Maui has assessed that such an EIS will be necessary./1/ The proposed General Plan Amendment would change land presently designated Open Space, Public/Quasi Public and Light Industrial into a Project District status.

The planned Waiale development may bring about varying degrees of both beneficial and adverse impacts on the physical, economic, and cultural aspects of the land, its regional setting and population.

The EIS presents the results of an evaluation and assessment of the physical, economic, aesthetic, social and environmental impacts associated with the Waiale Project, and sets forth the means by which A&B Properties, Inc. will attempt to maximize the beneficial effects of the project and to reduce or mitigate the adverse effects.

Location

The location of the + 1,000-acre Waiale site in relation to the major population centers and features on Maui is shown in Figure II-1. The communities of

1/ Toshio Ishikawa, County of Maui; Kahului, Maui; Letter, 10/5/76.
(See Section XIII.)

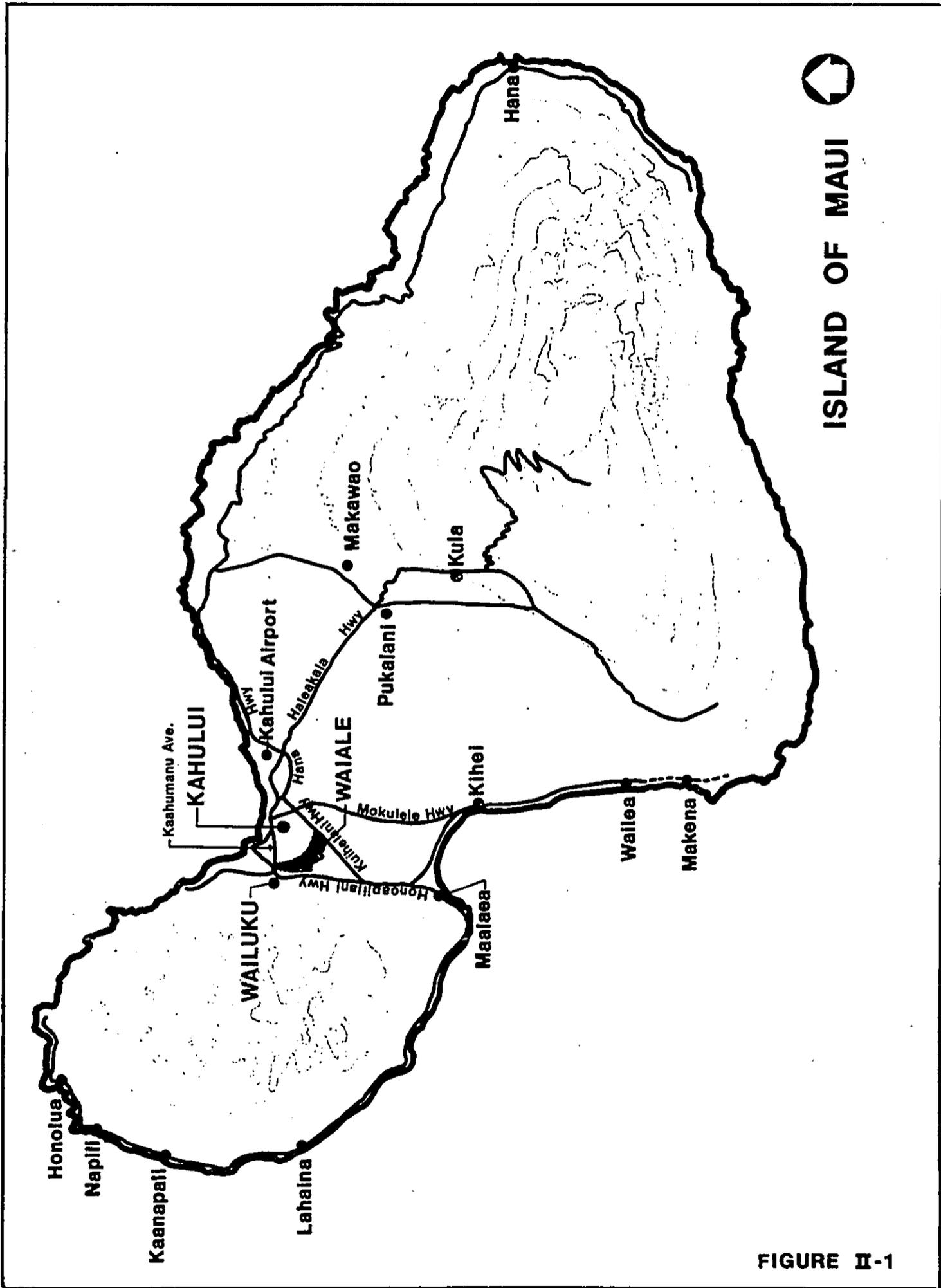


FIGURE II-1



of Wailuku, Kahului, Puunene and Waikapu are all within one mile of the site. The Kahului Airport is four miles away. The resort communities of Lahaina and Kaanapali are thirty-three and thirty-seven miles away. Wailea is thirteen miles away, Kihei and Maalaea are six miles away. Hana is fifty-seven miles away, and Pukalani and Makawao are twelve and fourteen miles away. The site is generally bounded by Kaahumanu Avenue to the north, Kuihelani Highway to the southeast and Honoapiilani Highway to the west.

The Wailuku/Kahului area is centrally located to the various population clusters on the Island and is recognized as the primary population center for the Island of Maui. It contains Maui's primary harbor, airport, sugar mills, pineapple processing plant, warehouses, shopping centers, government offices and most of the residential population. A map of the site in relation to Wailuku/Kahului is shown in Figure II-2.

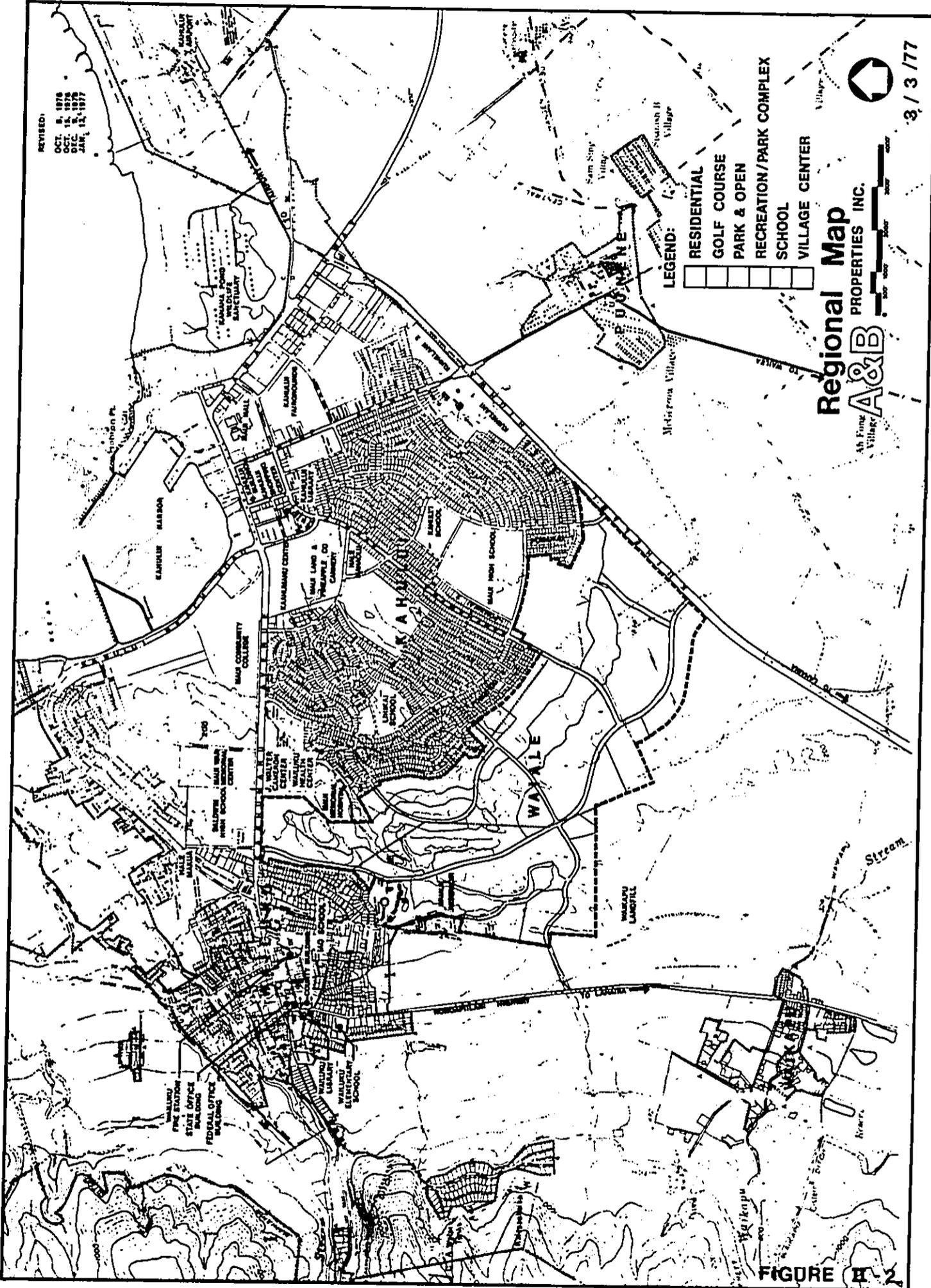
HISTORIC PERSPECTIVE OF CENTRAL MAUI DEVELOPMENT

For the past thirty years, A&B has planned and developed the community of Kahului (Dream City). Workers residing in scattered plantation camps were provided special opportunities at substantial financial discounts and priorities to purchase a home of their own on a fee simple lot. The record of this experience can be accurately and fairly termed a success. Over 3,000 lots were sold under the building program of 13 increments. More than 2,000 lots were sold to employees and pensioners of A&B. As a result, most plantation camps have diminished in size and importance or have been phased out, and, in their places, stands an integrated, modern community. Additionally, the Wailuku/ Kahului region has become an established, healthy, Island-wide regional growth center which has an inventory of commercial, industrial, housing and recreational opportunities.

FUTURE NEEDS OF THE CENTRAL MAUI REGION

In the past, A&B has played a major role in the active development of the region by virtue of its extensive land ownership. Future growth here will also take place in this context.

REVISED:
OCT. 8, 1976
OCT. 15, 1976
DEC. 8, 1976
JAN. 13, 1977



LEGEND:

- RESIDENTIAL
- GOLF COURSE
- PARK & OPEN
- RECREATION/PARK COMPLEX
- SCHOOL
- VILLAGE CENTER

Regional Map
A&B PROPERTIES INC.



3/3/77

FIGURE B-2

New concerns and responsibilities have replaced the former goals.

Rather than the specific goal of furnishing fee simple land for plantation employees, A&B is faced today with the goal of broadening the base of housing and recreational opportunities to meet the more diversified population demand.

Families now live in Wailuku and Kahului who have the means and desire to upgrade their residence. Families are demanding different residential unit types and different ownership arrangements. Certain representatives of social age groups are asking for housing and recreation alternatives which don't exist or are currently limited.

Additionally, because there is so little land owned by other parties in the immediate vicinity of Wailuku/Kahului (which is not in an important agricultural use), and because A&B's land can be developed economically (being in close proximity to an existing network of utilities), there is a feeling of responsibility at A&B to make land available for future development.

STATEMENT OF DEVELOPMENT OBJECTIVES

The provision of housing and recreational opportunities by private industry is a recognized and important community function. The housing inventory must be constantly replaced as it wears out; families continually change size; community taste and styles of living change with different phases of the life cycle; economic situations fluctuate; and populations shift due to changing conditions and preferences.

Preparations are being made at A&B to fulfill these development responsibilities during the next twenty-four years. Extensive experience in planning and providing land development opportunities more than qualifies A&B management to execute these plans.

A&B's interest and primary objective is to provide needed housing and recreational opportunities in this region for existing and future residents of Maui and the State, while receiving a fair return.

GENERAL DESCRIPTION OF THE PROPOSED ACTION

Technical

LAND USE

Map and Description of Land Uses

A map of the proposed project is shown in Figure II-3.

The total site would consist of approximately 1,015 acres, integrating the land uses of a 746-acre parcel with the present 270-acre Project District II parcel. The land uses proposed on the map are indicated in Table II-1.

Density

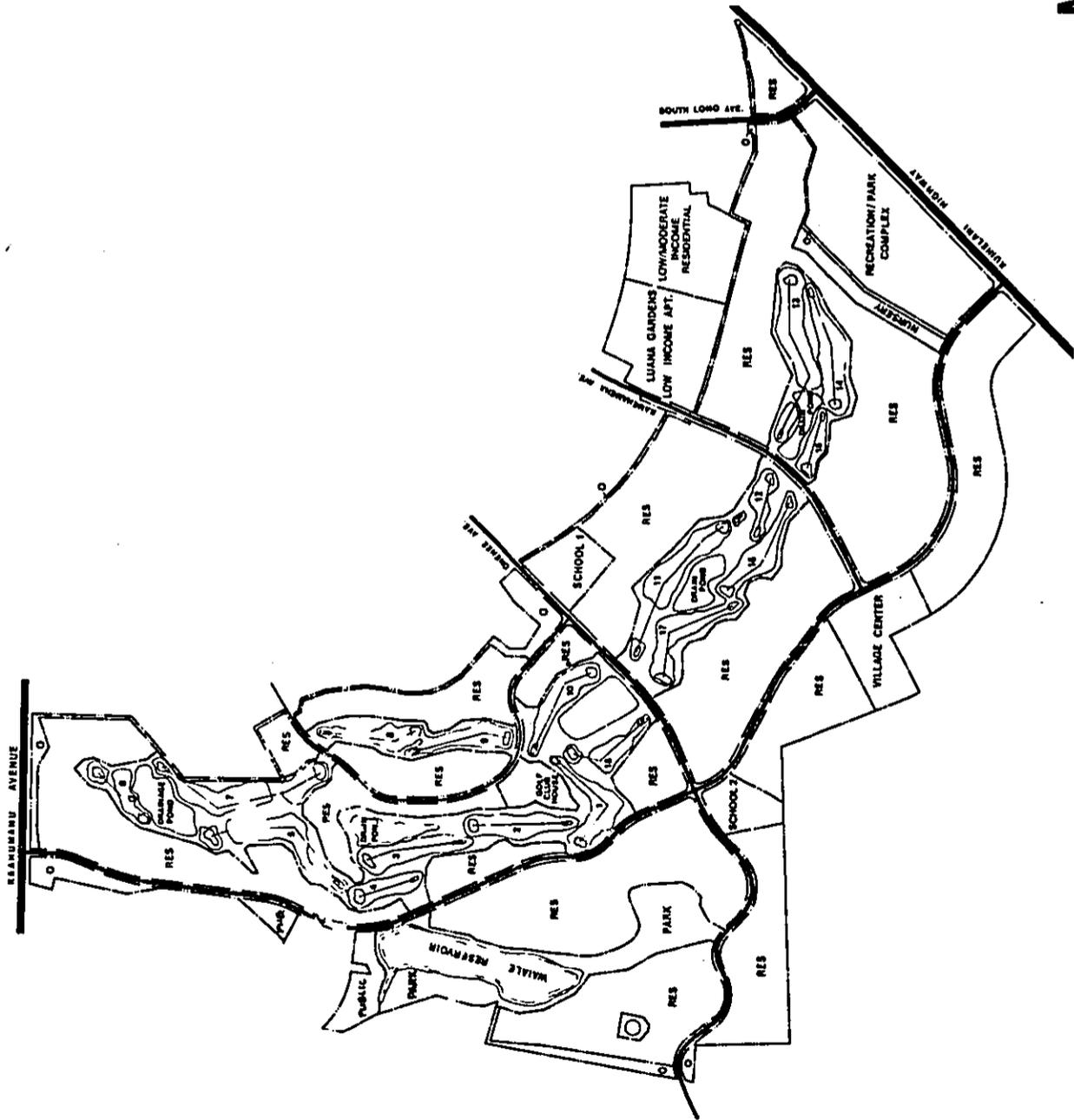
The project would provide a maximum of approximately 3,100 residential lots and/or units of housing in phases, keyed to demand over a period of 13 to 24 years, beginning in 1978 and ending between 1990 and 2001. This breaks down to a maximum average of approximately 240 residential lots and units per year and a minimum of 130 per year over the 13 to 24 year period.

The density of the project on a gross acre basis for this amount of units is 3.0 units per acre (3,065 units divided by 1,015 acre.) On a net acre basis (residential lands only), the density is as follows:

	<u>Acres</u>	<u>Density In Units/Acre</u>	<u>Units</u>
Luana Gardens Low Income Apartments	29	7.8	225
Low/moderate Income Residential	27	4.8	130
Single-Family Resi- dential	<u>527</u>	<u>5.1</u>	<u>2,710</u>
TOTAL	583	5.3	3,065

The density of each specific residential site would vary slightly.

REVISED:
 OCT. 8, 1976
 OCT. 15, 1976
 DEC. 9, 1976
 JAN. 15, 1977



WAIALE LAND USE	ACRES
RESIDENTIAL	553
LUANA GARDENS	29
GOLF COURSE	203
PARK & OPEN	58
NURSERY	7
RECREATION / PARK COMPLEX	51
SCHOOL & PUBLIC	27
VILLAGE CENTER	18
RESERVOIR	20
MAJOR ROADS	49
TOTAL AREA	1,015

Map of Waiale Plan
 A&B PROPERTIES INC.



3/3/77

FIGURE II-3

TABLE II-I
PROPOSED LAND USES

	Present Project District	Present + Public	Proposed Project + District	Proposed + Public	=	Project Total	%
1. Park and Open Space							
a. Golf Course	54	-	149	-		203	
b. Park & Open	38	-	19	-		57	
c. Recreation Park Complex	-	-	51	-		51	
d. Reservoir	20	-	-	-		20	
e. Nursery	-	-	7	-		7	
						<u>338</u>	33
Sub-Total							
2. Schools and Public							
a. School 1	-	-	10	-		10	
b. School 2	8	-	-	-		8	
c. Public	-	2	-	7		9	
						<u>27</u>	3
Sub-Total							
3. Neighborhood Commercial							
a. Village Center	-	-	18	-		<u>18</u>	
						18	2
Sub-Total							
4. Residential Use (Incl. A11 Roads)							
a. Luana Gardens - Low Income Apts.	-	-	29	-		29	
b. Low Income Residential	-	-	27	-		27	
c. Single-Family Lots	150	-	426	-		<u>576</u>	
						632	62
Sub-Total							
	<u>270</u>	<u>2</u>	<u>736</u>	<u>7</u>		<u>1,015</u>	<u>100</u>
TOTAL ACRES							

Anticipated Market

The project is planned to meet the needs of local residents, primarily in the middle income and upper middle income range. Low and moderate income apartment units would be offered to elderly and low income families within the context of the Luana Gardens project. Residential house and lot packages for low and moderate income people would be offered to qualified residents in an early phase of the project.

Proposed Housing Product

A&B is planning to offer residential, single-family house lots for sale for the majority of the project; however, house and lot packages or special projects may be offered at the time of development should they be financially feasible. By offering lots-only for sale, potential owners have the advantage of reducing construction costs by utilizing their own labor, if desired. A&B is planning to offer lots of varying sizes, ranging from 6,000 to 14,000 square feet.

Present Leases at Waiale

R. J. REYNOLDS LEASE

A&B, Inc. presently leases 297 acres of land to R.J. Reynolds, Inc. for the purpose of passion fruit farming. Approximately 167 acres are presently within the planned Waiale boundaries.

Should the Waiale project go ahead on its present schedule, A&B, Inc. would have to use approximately 73 acres (of the 167 acres within the Waiale boundaries prior to termination of the lease for purposes of constructing the proposed golf course, nursery, recreation park complex and the initial phases of the residential development. A&B, Inc. would then relocate this within approximately 50 acres of land outside of the Waiale boundaries, contiguous to the passion fruit farm.

The remaining 94 acres of farmland within the Waiale boundaries would not be needed for development for a minimum of four years beyond the lease termination and possibly twelve years. The existing processing facility may be relocated before the lease termination. Discussions between RJR, Inc. and A&B have been continuing on this matter and progressing favorably. Correspondence on this matter has been attached and shows a willingness of both parties to find a mutually satisfactory solution./1/ RJR cultivates the passion fruit exclusively for its own use in order to insure a stable supply for processing. Marginal crop yields and economic returns have plagued RJR in this area, however, due to adverse growing conditions. Because of this, A&B and RJR are mutually seeking a permanent long-term location for passion fruit farming in a location with more favorable growing conditions.

OTHER USES

Other leases on 57 acres of the property are on a short-term basis and will expire far in advance of the need to use the land for development purposes.

Proposed Parks, Buffer Zones and Open Space - 338 Acres

One-third of the Waiale community (33%) is planned to be allocated to park, buffer and open space uses. This space would function to organize land uses, maintain high land values, provide visual and psychological relief and provide a long-term inventory of recreation space.

GOLF COURSE - 203 ACRES The Waiale golf course would be open to the public and oriented to local golfers. The operation of the golf course would be contracted to an independent management organization. A&B estimates that the golf course may attract about 52,000 rounds per year and may provide employment for about 25 people.

1/ G. H. Ivey, Jr., Maui Manager, A&B Properties, Inc., letter 2/28/77; and Orrin Gilbert, Manager RJR Foods, Inc., letter 3/4/77. (See Section XIII.)

PARK & OPEN SPACE - 57 ACRES Approximately 6% of the site has been allocated to park and open space uses. A major community park and playfield is proposed on the site of the existing overflow reservoir south of the Waiale Reservoir. A continuous 30-foot buffer zone between Kahului and Waiale would act as a major windbreak and physical/visual separation.

RECREATION/PARK COMPLEX - 51 ACRES Approximately 50 acres has been allocated for a County recreation/park complex, or about 5% of the total site. This area would be planned by the County for regional scale recreation space.

EXISTING WAIALE RESERVOIR - 20 ACRES The Waiale Reservoir would continue to function as a primary facility for sugar cane irrigation at HC&S (it provides water for approximately 4,500 acres.) The reservoir would be cleaned and reshaped to fulfill this function, as well as providing a pleasing open space for Waiale. Some of the land surrounding the reservoir may be dedicated to the County for park purposes.

NURSERY SITE - 7 ACRES A small 7-acre nursery site is planned for Waiale. A feasibility study is presently under way. Should the nursery site be constructed in its presently proposed location, it would function as a buffer between the recreation/park complex and the proposed residential zones. The nursery may employ about eleven people when it becomes fully operational.

Proposed School Sites and Public Space - 27 Acres

Two elementary and/or intermediate school sites of 8 and 10 acres in size are presently planned and may be located within the project boundaries during the development period. This allocation is not definite due to the uncertainty of State Department of Education projections and policies over the development period./1/ Their recommendation to provide for two possible sites is being followed at this time. Nine acres of land for public uses has been allocated for possible cemetery uses adjacent to the existing Maui Memorial Park.

1/ Koichi H. Tokushige, Asst. Superintendent, Office of Business Services, State Department of Education, letter 12/8/76. (See Section XIII.)

Proposed Village Center - 18 Acres

Midway in the project life, the growing Waiale community will have a need for a center of social, service and commercial activity.

The Waiale Village Center is envisioned to be a 16-acre (2 acres in Kamehameha Avenue extension) public service and convenience center developed to serve a projected population at Waiale of over 3,000 families (9,900 people @ 3.2 persons per family) and populations extending beyond Waiale towards Waikapu in later years. The Center would be built in phases beginning sometime between the seventh and tenth years of development and continuing to the end of the project.

Besides conveniently serving the future residents of Waiale, a primary purpose of the Center is to give the overall Waiale development a distinctive and unique identity and character. Buildings and site would be carefully planned and tastefully designed in a comprehensive effort, and the opening of each facility would be closely coordinated with other facility plans in Wailuku, Kahului, Waikapu and Puunene.

The Center may have several churches, a branch post office, a day care center, automotive service stations, a commercial district containing approximately 60,000 square feet of convenience stores, professional office space for medical, dental, legal and realty services and three or four acres of parking and circulation space. The scale and character of the Center is envisioned to be like the Mililani Town or Niu Valley centers on the Island of Oahu. The site was selected to be located at the intersection of two major collector streets, central to the Waiale site for easy accessibility and convenience. Many of the community residents would be able to walk to the Center for convenience items. Three-fourths of the Waiale site would be within a mile of the Center. The Center itself would be located over two miles from the Wailuku and Kahului Centers.

As a convenience to Waiale residents, the Village Center would serve to reduce short trip traffic out of the area, which would conserve energy and reduce congestion and air pollution on the major highways surrounding the community. Easy accessibility to needed medical, library, day care centers, food stores and laundromats would add to a high quality of life.

Proposed Residential Use - 632 Acres

LUANA GARDENS LOW INCOME APARTMENTS - 29 ACRES A&B is proposing to make a charitable donation of a 29-acre site for the development of a low-cost elderly and family housing project under the Farmers Home Administration Section 515 Rental Housing Program. The preliminary plans for this project include 225 rental housing units comprised of 165 elderly and 60 family units. The Luana Gardens project may be the first project to be planned and constructed as part of the overall project, if Federal funding is obtained.

LOW/MODERATE INCOME RESIDENTIAL PROJECT - 27 ACRES For the low income residential project mentioned earlier, A&B plans to develop and sell to qualified A&B pensioners and employees presently residing in A&B-owned housing approximately 130 moderate income, fee simple house-and-lot packages. These 130 fee simple house-and-lot packages would be developed in such a manner as to meet the requirements of the Farmers Home Administration Section 502 program.

SINGLE-FAMILY RESIDENTIAL LOTS - 576 ACRES Approximately 20% of the proposed lots would be fronting the golf course and another 30% would have exceptional views of the mountains, golf course, or other open spaces. Most of the remaining 50% of the lots would have good views of the distant mountains.

INFRASTRUCTURE

Proposed Circulation

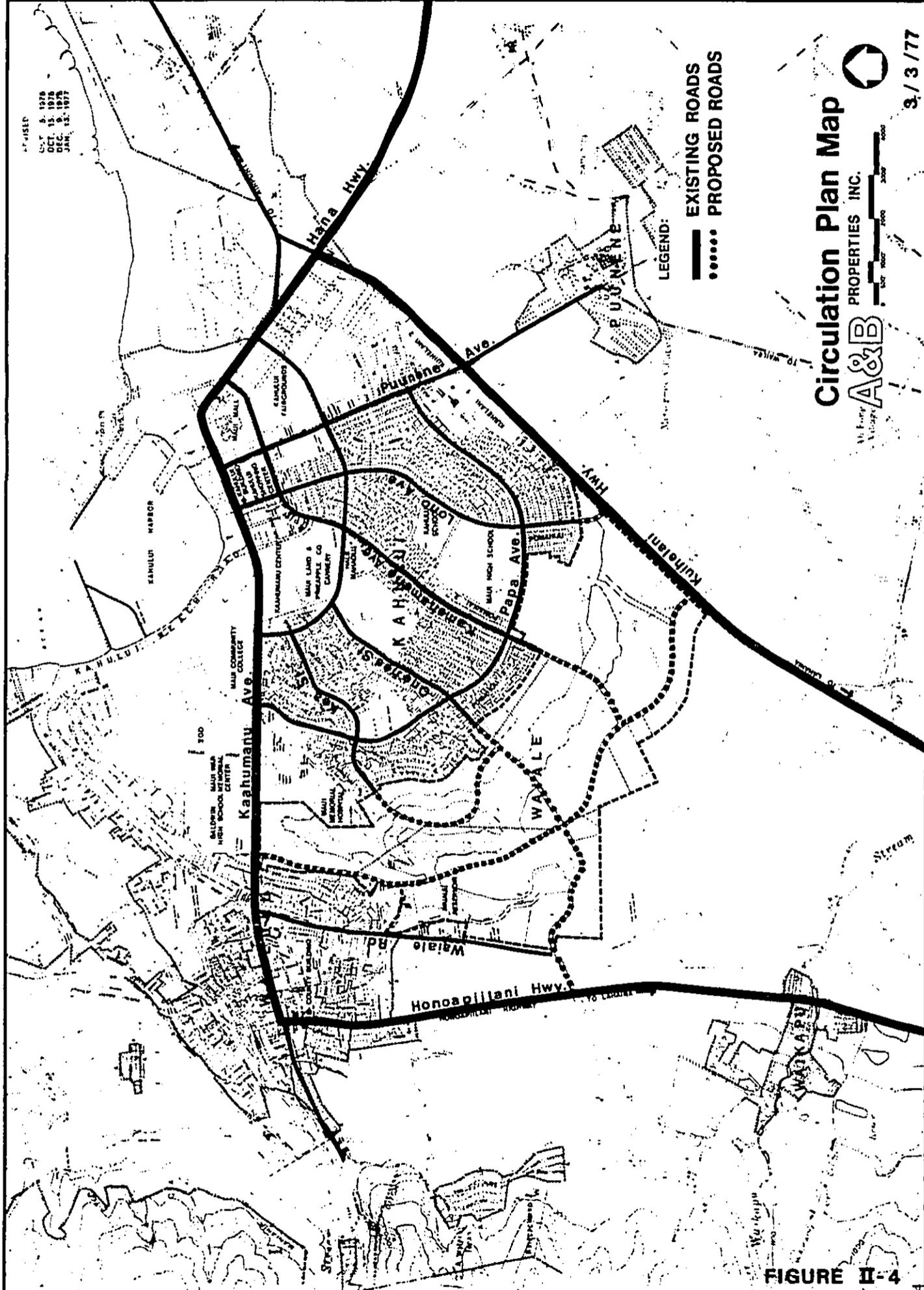
The proposed circulation network would link with all major roads and highways in the vicinity of the site, including Kaahumanu Avenue, Kuihelani Highway, Honoapiilani Highway, Kamehameha Avenue, Onehee Avenue, Lono Avenue and Kea Street (See Figure II-4). All roads would be designed and constructed to County standards and dedicated to the County upon completion. Private driveways from single-family homes would be restricted on all arterial and collector streets.

Proposed Domestic Water Plan

The proposed system consists of high level and low level service systems. The low level system is an extension of the present service system to serve up to approximately an elevation of 200 feet. The high level system would serve all areas above elevation 200. The high level system would be served from the proposed Kihei 36" transmission line, although a reservoir above the site may be required. As an alternative, high level service could be obtained from the existing system but would require a booster pump station and a reservoir above the site. Expansion of existing reservoirs would be accomplished as required for fire and domestic service.

Development of additional source capacity at either Mokuhou or Waihee as reported in "Central Maui Water Study for the Development of the Sources, Transmission Lines and Storage Reservoirs" by Norman Saito and Associates, Engineering Consultants, Inc., CH₂M Hill, Inc., and Dr. Harold Stearns, will be required to serve the project.

REVISED
AUG. 8, 1976
OCT. 15, 1976
DEC. 9, 1976
JAN. 13, 1977



LEGEND:
— EXISTING ROADS
..... PROPOSED ROADS

Circulation Plan Map
A&B
PROPERTIES INC.
3/3/77

FIGURE II-4

Irrigation of the golf course would be accomplished from the proposed extension of the County water system or would be from the on-site wells. Irrigation of parks, nursery and other recreation areas would be served from the extension of the County system.

The water system would be designed and constructed to the Maui County Department of Water Supply standards and would be dedicated to the County.

Proposed Sewerage Plan.

The proposed sewer system consists of improvements in three phases. The first phase consists of installing a gravity relief sewer along Wakea Avenue and two short segments from the site to existing lines on Kamehameha and Lono Avenues.

The Wakea line would be a 12-inch sewer running from Onehee to Kaahumanu Avenues and would intercept the flows from the existing development west of Onehee and Wakea Avenues. This would allow the existing 18-inch line along Wakea Avenue to handle additional flows from the project. To collect the flows from the project area a 10-inch line along Kamehameha Avenue and a 15-inch sewer line to Lono Avenue would have to be constructed to feed into the existing system.

The second phase of the development would be to install a 15-inch gravity sewer from the project area along Papa and Kaahumanu Avenues to the existing 30-inch gravity sewer. A 12-inch gravity sewer would be installed at a later time along Kaahumanu Avenue connecting to the 15-inch gravity sewer.

To further develop the project beyond this second phase would require the sewage to be diverted to the Kahului Pump Station. An 18-inch gravity sewer line along Lono Avenue and the eastern portion of Kamehameha Avenue to the Kahului Pump Station would be required.

The proposed sewerage system would be designed and constructed in conformance with the Standards of the County of Maui Department of Public Works.

Proposed Drainage Plan

The proposed drainage system has been developed to direct all runoff generated from the project site to major depressed ponding areas and to discharge storm waters into the ground using surface infiltration and infiltration wells. Four major ponding and infiltration well fields are proposed within the golf course area. The two northern fields are located within natural ground depressions. The other two require grading of the golf course and adjacent residential areas to create the ponding fields. The development plan, particularly the golf course, was predicted on this drainage concept.

Smaller drainage areas southwest of Kahului Town would be drained to ponding and infiltration well fields of about the size of 3 lots each.

Proposed Power and Communications

Based on an average of 1,000 kwh per dwelling unit per month for Maui, the Waiale project would require about 3 mwh per month, with a maximum demand of 5.4 mw. This would be phased in gradually in conjunction with Maui Electric Company's plans for expansion.

Telephone and cable television conduit along with street lighting facilities would also be phased in as the project is developed.

Economic

ANTICIPATED COSTS AND PRICES

A&B Properties, Inc. will be financially able to undertake the full costs of development.

Total costs have been estimated in excess of 45 million dollars (1976), exclusive of all residential or commercial structures.

As a result of a recent financial analysis, average lot prices (in 1976 dollars) would probably range between \$3.48 per square foot and \$4.52 per square foot based on A&B's assumptions of development costs (costs have been increasing between 8% and 12% per year for A&B's Maui projects). Lot price differentials will be based on golf course frontage, view quality and accessibility. These prices are comparable to present developments in Makawao, Waiehu, Wailuku and Kahului, as was revealed in a recent in-house market study. Comparable lot prices found are shown below:

<u>Name</u>	<u>Status</u>	<u>Price Range or Overall Avg.</u>	<u>1976 Avg.</u>	<u>1975 Avg.</u>	<u>1974 Avg.</u>
Waiehu	Now Selling (view lots are priced highest)	\$2.81-3.93	\$ 3.73	-	-
Koa Venture	Sold out	3.55	3.57	\$3.47	-
Kahului Area	Sold out	3.38	3.43	3.66	\$3.15
Kahului Area	Sold out	3.24	3.29	3.14	-
Pukalani Terrace & Country Club	Resales	3.24	3.29	3.14	-
Pukalani Terrace & Country Club	Golf Course Lots	4.25	4.25	-	-

Projected lot prices at Waiale are directly comparable to present market prices. However, Waiale would offer more value in many situations than these subdivisions, since golf course frontage and prime view lots will make up at least 50% of the salable site area. These lots are planned to be offered at price premiums, reflecting their greater desirability. The fact that the Waiale Golf Course would be the only course so convenient to the primary population centers of Wailuku and Kahului also enhances its value.

The 130-unit low income house-and-lot packages offered to qualified A&B pensioners and employees presently residing at A&B-owned housing (HC&S) would probably range in price from \$35,000 to \$45,000 under Farmers Home Administration

(FmHA) Section 502 financing (based on 1976 prices and currently accepted FmHA house and lot package price ranges.)

SPECULATION CONTROLS AND TIME TO ERECT RESIDENCES

In the past, A&B has established conditions on the time to erect a residence, buy-back provisions and other similar means to discourage land speculation, in response to the community's need for primary housing. It is A&B's intent that the proposed Waiale project continue to provide primary housing for residents of Maui, and that speculation on lot sales and re-sales be discouraged. It is A&B's intent to proposed specific measures with each subdivision increment, in order that these measures be appropriate to conditions existing at the time of the subdivision.

LOW AND LOW/MODERATE INCOME HOUSING

At the present time, Farmers Home Loan financing would be available from the Federal Government for the Luana Gardens and the low/moderate income residential projects. A preliminary economic analysis of these projects indicates that the low/moderate income residential units would probably sell within the Farmers Home Administration cost limit which is presently \$39,000 and that the Luana Gardens rental portion would be offered within acceptable and comparable public cost guidelines.

Social

HOUSING

The Waiale Project would provide housing and recreational opportunities for a wide spectrum of primarily local people from low income to higher income situations in a variety of age groups and social situations. Over 3,000 units of housing are proposed to be built in the next 13 to 24 years, beginning with the Luana Gardens low income apartment project for qualified elderly and low income people. This would be followed by a low income, single-family residential project and many other middle income and upper income projects.

RECREATION

Approximately 450 acres of open space for recreation and buffers are planned to be incorporated into the project, offering a wide range of recreational and aesthetic opportunities at a variety of scales, from small dense buffers to regionally oriented facilities for people residing beyond the Waiale Project boundaries.

LOCATION OF PROPOSED SITE IN RELATION TO EXISTING PUBLIC SERVICES

Police and fire protection services are located in Wailuku, approximately 1-2 miles away. The Kahului Post Office is located approximately 1 mile away. Refuse is picked up by the County. Commercial support areas, churches, parks and social clubs are all within 1 and 2 miles of the site. Two elementary schools are within 1 mile of the site. (However, as described previously, many of these facilities would also be provided within the project as the needs are generated.)

Environmental

PRESENT SITE USE, SOIL, SLOPE, RAINFALL, AND TOPOGRAPHY

At present, most of the land at Waiale is lying dormant or is used for grazing, with kiawe and lantana as the primary vegetation. A small portion is being used for growing passion fruit and seed cane. General soil conditions are primarily sandy with good drainage and high structural capacity. The site is predominantly classified E by the former Land Study Bureau, meaning that, for the most part, it is poorly suited for agriculture production. The Land Study Bureau also made the evaluation that the land is poorly suited for machine tillability; it is non-stony; the soil is over 30 inches deep, its average slope varies from 11% to 20% in dune conditions; the soil has a medium texture which drains excessively; and the mean annual rainfall is 10 to 30 inches.

The topography of the site varies widely from the hill and valley terrain of ancient sand dunes near the reservoir area to a very flat condition near Kuihelani Highway and the proposed recreation/park complex.

ENVIRONMENTAL SUITABILITY FOR PROPOSED USES

Environmentally, the subject area is favorably located for housing and recreation. At an average elevation of 175 feet above sea level, temperatures are moderate and rainfall is low. At the weather station in Kahului (elevation 40 feet), an average annual temperature of 74.9 degrees Fahrenheit, and an average annual rainfall of 18.9 inches compare favorably with the rest of the State. The trade winds average 13 miles per hour from the northeast. Days are sunny or partly sunny 71% of the year.

SHORELINE MANAGEMENT ACT

The project area is not within the shoreline management area, so conformance with the Environmental Shoreline Protection Act, Act 176, SLH 1975, is not applicable.

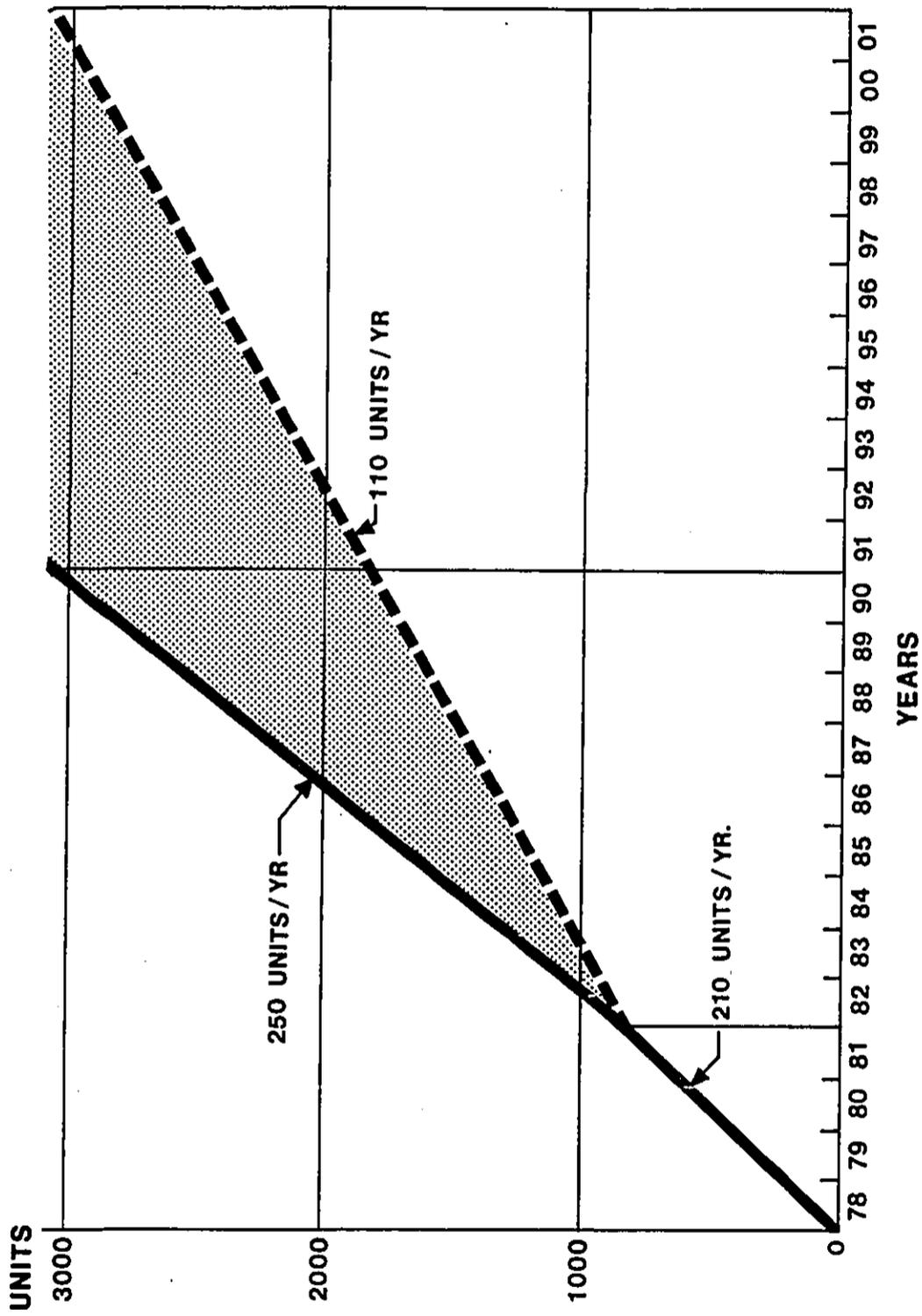
PHASING AND TIMING OF ACTION

Residential

As indicated previously, the project is expected to take from 13 to 24 years to complete. This project is based on the approximate maximum and minimum anticipated demand for housing in Central Maui. Figure II-5 indicates a known demand for approximately 210 units per year up through 1981. Beyond 1981, the anticipated demand varies from a minimum of 110 units per year to a maximum of 250 units per year. Project completion is projected for sometime between 1990 and 2001 based on these demands. Table II-2 and Figure II-6 show the phasing and location of each residential development area.

Non-Residential

Also shown on Table II-2 are the major non-residential developments. Generally, the phasing of these projects coincides with the development of adjacent residential areas. All 18 holes of the golf course would be constructed at an early phase of the development. The Village Center would be constructed in two phases, the first of which would be at approximately half way through the



Phasing Absorption Graph

FIGURE II-5

TABLE II-2
PHASING SCHEDULE

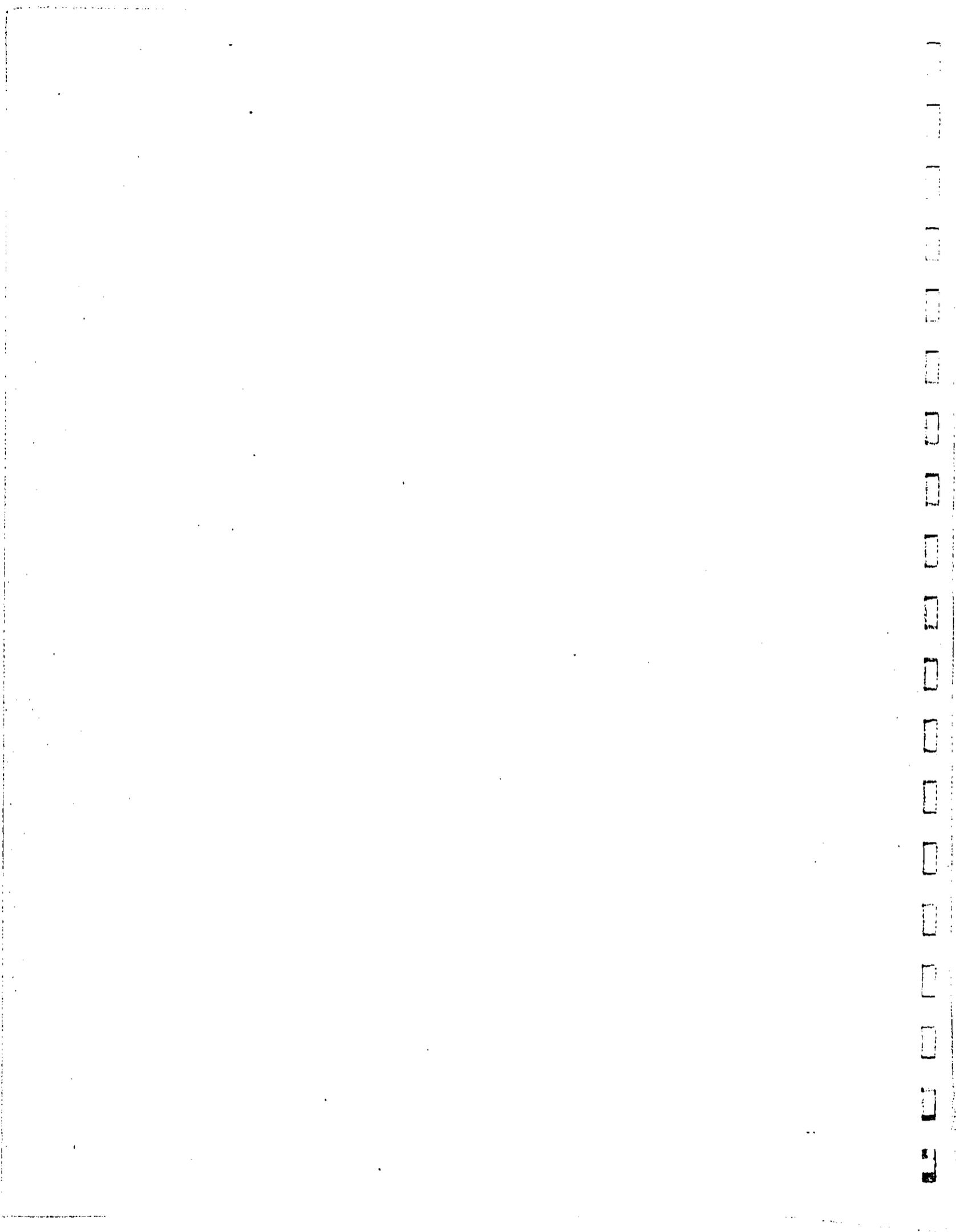
Development Areas	Residential Units	Year Initiated*			
		Minimum		Maximum	
		Start	Finish	Start	Finish
Low Income Apts.	225	1978	1979	1978	1979
Low Income Res.	130	1978	1979	1978	1979
Nursery	-	1978	1978	1978	1978
1a, b, c Residential	495	1979	1981	1979	1981
Recreation/Park Complex Site	-	1979	1979	1979	1979
Golf Course	-	1980	1980	1980	1980
School Site 1	-	1980	1980	1980	1980
2a, b, c, d, e Residential	270	1982	1982	1982	1983
3a, b, c Residential	460	1983	1984	1984	1987
Village Center (Phase I)	-	1984	1984	1987	1987
4a, b Residential	255	1985	1985	1988	1989
5a, b Residential	315	1986	1986	1990	1992
Community Park	-	1986	1986	1990	1990
6a, b, c Residential	340	1987	1987	1993	1995
School Site 2	-	1987	1987	1994	1994
7a, b, c Residential	575	1988	1990	1996	2001
Village Center (Phase II)	-	<u>1990</u>	<u>1990</u>	<u>2001</u>	<u>2001</u>
TOTAL	3,065	1978	1990	1978	2001

* Date indicates year in which development would be ready for use or occupancy.

overall development schedule, and the remainder near the completion of the total project. The school sites would be available when the access roads and utilities fronting them are constructed, but actual construction of school facilities would be dependent on D.O.E. demands. Because access to the proposed Recreation/ Park Complex is from Kuihelani Highway, the site would be available for County improvements at an early date.

Development Sequence

The primary reason for the phasing pattern shown in Figure II-6 is to take advantage of existing roads and utility systems. Alternate phasing studies have indicated that the proposed plan is the most economical sequence and therefore allows the lowest price structure for residential sales.



1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100

0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99

III
DESCRIPTION OF ENVIRONMENTAL SETTING

III DESCRIPTION OF ENVIRONMENTAL SETTING

PROJECT SITE

Natural Environment

TOPOGRAPHY AND VIEWS

The project site consists of \pm 1015 acres located south of Kahului and Wailuku, between Kaahumanu Avenue and Kuihelani Highway. The project site lies toward the western portion of the Maui Isthmus at the foot of the West Maui Mountains, southwest of Kahului Harbor. Because of this location, the project slopes generally upward from east to west. The minimum elevation on the site is approximately 95 feet above mean sea level, near the proposed extension of Onehee Street. The maximum elevation on the west of the project site is about 300 feet above mean level. Most of the site lies between the 150 to 250 foot elevations. The site has slopes varying from less than 5% to nearly vertical in the steepest areas. The predominant slopes on the Wailuku side vary between 10% and 20%, with flatter slopes of about 2% to 3% on the eastern half of the project. The topography can be characterized as hilly in the western portions and flat in the eastern areas.

From the project site views predominate toward Kahului, Haleakala and the West Maui Mountains. This is due to the general slope of the project site toward Kahului Harbor, and its location between these two major mountain masses.

GEOLOGY

The West Maui Mountains are predominantly comprised of olivine basalts originating from the Wailuku Volcanic Series. Within these formations is the principal aquifer for West Maui. The lava flows of the Wailuku Volcanic Series are mostly thin-bedded and scoriaceous, with various structural features (i.e., lava tubes, clinker beds, etc.), which means that they are highly permeable. The flows ranged up to 100 feet in depth; however, some of these formations have been weathered to that depth.

The Maui Isthmus was created primarily by a combination of both older and younger alluvium. After volcanic eruptions in West Maui terminated, a period of erosion created deep valleys in the lava formations at depths hundreds of feet below the present sea level. Gradually as the sea level rose, thick deposits of older alluvium accumulated in the valleys, and coalescing alluvial fans formed a sloping alluvial plain which extended from Waihee to Maalaea. The older alluvium is thickest along the axis of the valleys.

The older alluvium is poorly permeable and inhibits the flow of basal water seaward and eastward from the Wailuku Volcanic Series. This is because the alluvium is comprised of a poorly sorted, partly to completely consolidated conglomerate, variable in size from fine clay to large boulders.

Younger alluvium originates from stream action cutting through the older alluvium and leaving deposits of silt, sand, and gravel on plains at the bases of the alluvial fans. The younger alluvium is fairly permeable and contains an appreciable amount of fresh groundwater, except where the younger alluvium is deposited at the base of the older alluvial slopes. Near the shore, younger alluvium contains brackish water and is mixed with marine sand and silt. (Refer to Figure III-1.)

SOIL/1/

The soil which covers the project site is Puuone Sand (PZUE), which is derived from coral and shell materials and is associated with Iao and Jaucas soils. The typical cross-section for this soil is 20 inches of grayish-brown calcareous sand which is moderately alkaline, underlain by grayish-brown, cemented sand 20 to 40 inches thick. Above the cemented layer of sand permeability is rapid and runoff is slow. The available water capacity in this soil is about 0.7 inches per foot. Vegetation which is common to this soil is comprised of bermudagrass, kiawe, and lantana. Typical uses for this soil are for pasture and homesites.

1/ Soil Survey of Islands of Kauai, Oahu, Maui, Molokai, and Lanai, State of Hawaii; U. S. Department of Agriculture, Soil Conservation Service, August, 1972, P. 117.

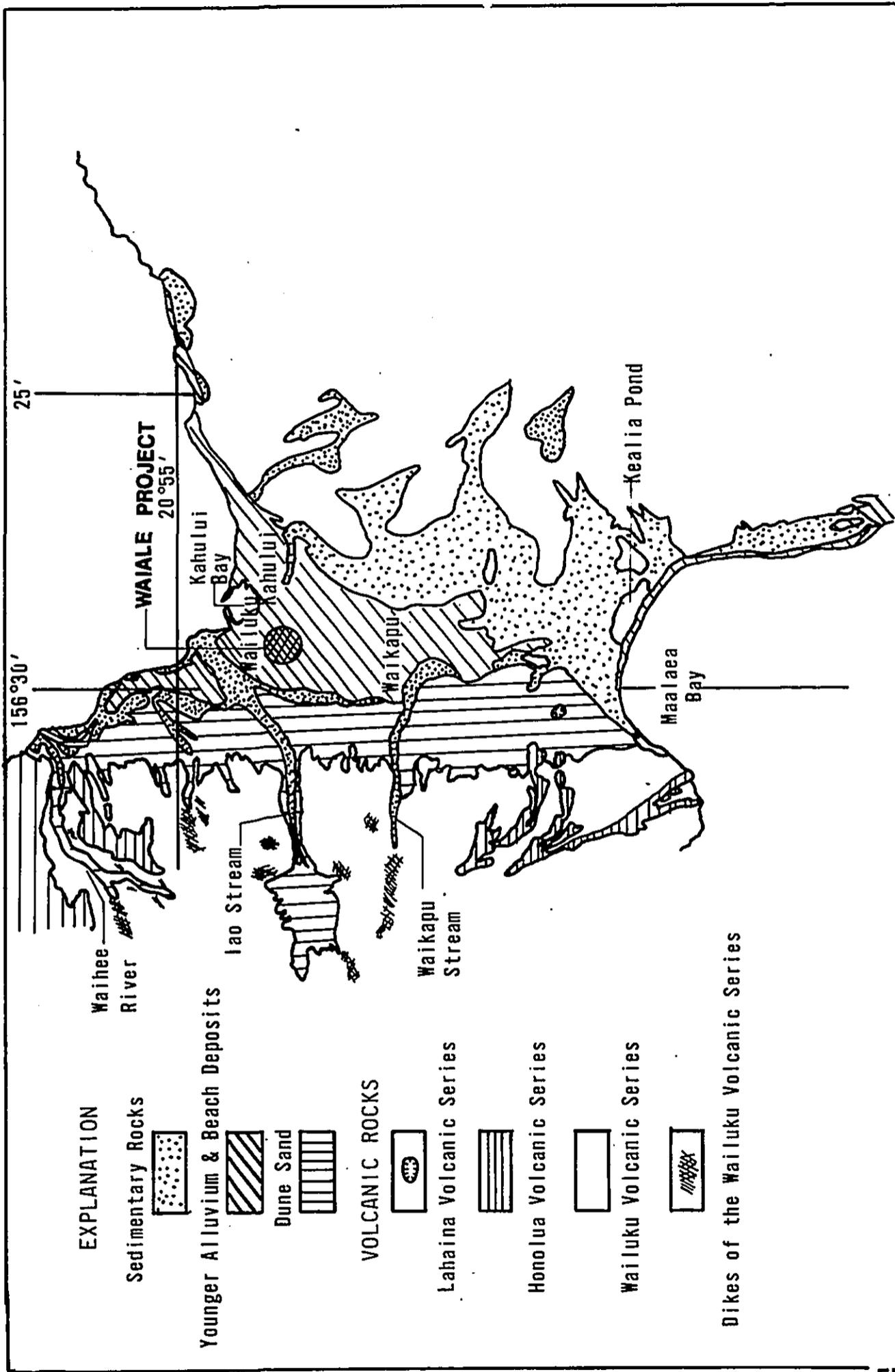


FIGURE III-1

Generalized Geologic Map of the Wailuku - Kahului Area

According to the Land Study Bureau of the University of Hawaii, now defunct, the soil on the Waiale site has an "E" productivity rating./1/ On the productivity rating scale, "A" productivity is the highest and "E" productivity is the lowest.

Table III-1 exhibits quantitatively the interpretation of the Land Study Bureau productivity ratings: Classes D and E soils are considered poorly suited or not suited for agricultural purposes, and agricultural development is not economically feasible.

HYDROLOGY

The primary source of fresh water is basal water found in the West Maui Mountains, which floats on sea water and lies seaward of dike-impounded water. The Wailuku Volcanic Series contains much of this basal water because of its high permeability. The Honolua Volcanic Series, which overlies much of the Wailuku Volcanic Series, is less permeable. The Honolua Volcanic Series has fewer cracks and is more dense than the Wailuku Volcanic Series.

The basal water table begins at an elevation of 1 foot above mean sea level (MSL) near the coast and rises at an average of 1.5 to 2.5 feet per mile for the first 2 to 3 miles inland. The basal water table ends 4 to 5 miles inland at an elevation of about 30 feet above MSL. The thickest part of the basal water supply, as well as the most important source of fresh-water development, lies between Waikapu and Waihee Valleys./2/ The water in the main basal lens is impeded by a thick wedge of older alluvium which extends from Waihee Valley to Maalaea.

Recharge of the basal water occurs primarily by underflow of high level water (i.e., dike or perched water). Also recharge occurs to a minor degree by rainfall and irrigation water percolation. Discharge occurs beneath or around the alluvial barrier and by pumping for domestic or irrigation usage.

-
- 1/ Detailed Land Classification - Island of Maui, L.S.B. Bulletin No. 7; Land Study Bureau, University of Hawaii; Honolulu, Hawaii; May, 1967; Maps 28, 31, 32 and P. 17-20.
 - 2/ Yamanaga, George; and Huxel, C. J., Jr.; Preliminary Report on the Water Resources of the Wailuku Area, Maui, U. S. Geological Survey; Honolulu, Hawaii, December, 1970, P. 26.

TABLE III-1 LAND STUDY BUREAU PRODUCTIVITY RATINGS

Crop	Productivity Rating				
	A	B	C	D	E
Pineapples (tons/ac/yr)	14	12 - 14	10 - 12	8 - 10	less than 8
Sugar (tons/ac/yr)	0.53	0.42 - 0.53	0.33 - 0.42	0.22 - 0.33	less than 0.22
Tomatoes (lbs/ac/crop)	more than 25,000	20,000 - 25,000	15,000 - 20,000	10,000 - 15,000	less than 10,000
Carrots (lb/ac/crop)	more than 11,000	9,500 - 11,000	8,000 - 9,500	6,500 - 8,000	less than 6,500
Potatoes (lbs/ac/crop)	more than 10,000	8,000 - 10,000	6,000 - 8,000	4,000 - 8,000	less than 4,000
Onions (lbs/ac/crop)	more than 17,000	15,000 - 17,000	13,500 - 15,000	10,000 - 13,500	less than 10,000
Hay-Alfalfa (tons/ac/yr)	more than 9	6 - 9	4 - 6	2 - 4	less than 2
Oranges (lbs/ac/yr)	more than 12,000	10,000 - 12,000	8,000 - 10,000	6,000 - 8,000	less than 1,000
Papayas (lbs/ac/yr)	more than 25,000	20,000 - 25,000	15,000 - 20,000	10,000 - 15,000	less than 10,000
Bananas (lbs/ac/yr)	more than 8500	6,500 - 8,500	5,000 - 6,500	4,000 - 5,000	less than 4,000

There are small supplies of perched water occurring in the younger alluvial sand and gravel of the Iao and Waihee Valleys and in the consolidated dune sand between Waihee and Wailuku. Their main source of recharge is through rainfall and stream seepage and, to some degree, infiltration by irrigation water. Discharge occurs by underflow or through developed tunnels.

Dike water is found in compartments of lava formed by intersecting dikes. It occurs in the central portion of the West Maui Mountain at elevations 700 feet to 3,500 feet above MSL. Dike water discharges from springs and seeps caused by stream valleys cutting across dikes, by flow over the dikes, by underflow, and developed tunnels. Refer to Figure III-2, which shows generalized hydrologic cross-sections for Maui.

CLIMATOLOGY

In the area of Wailuku and Kahului on the Central Maui Isthmus, the weather can be characterized as sunny and dry. This is in contrast to the windward slopes of the West Maui Mountains and East Maui (Haleakala), which receive as much as 400 and 300 inches of rain per year respectively. Table III-2 is a summary of temperature, rainfall, and evaporation data. The climatological data was supplied by Hawaiian Commercial and Sugar Company.

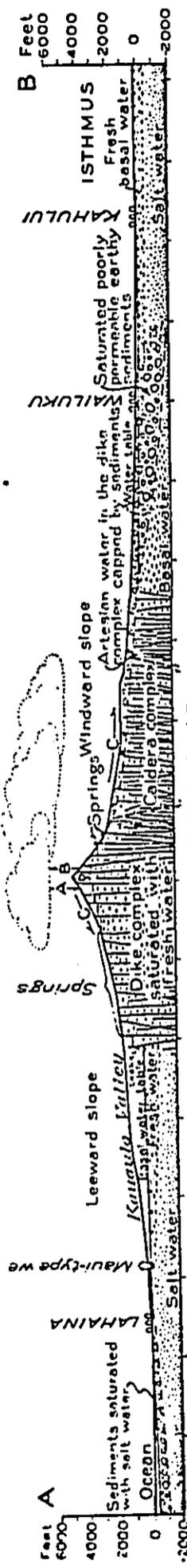
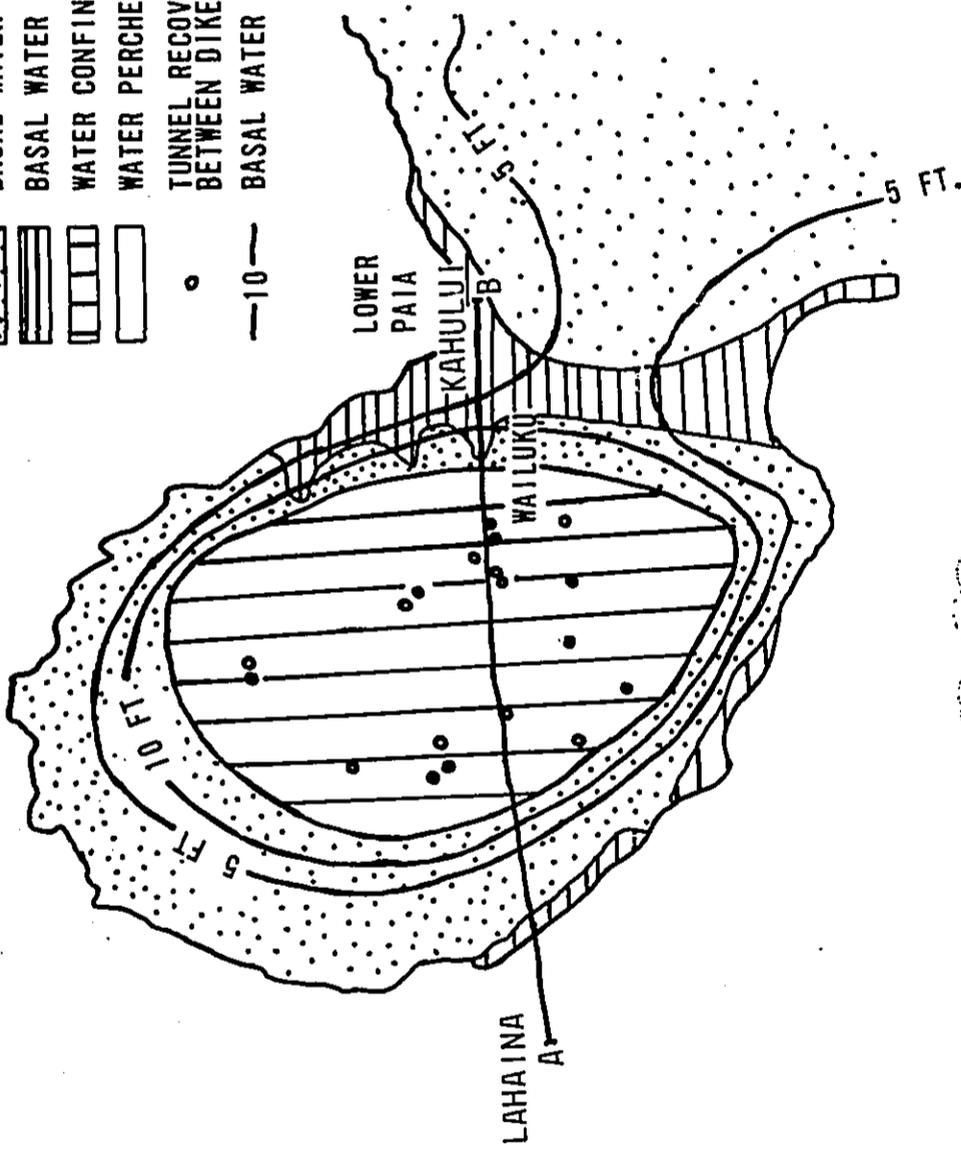
Temperature

It was determined that climatological Station 396 at Puunene reflects the conditions which are experienced on the proposed Waiale development site. The average annual maximum temperature experienced is about 83°F, with an average annual minimum temperature of about 65°F. Although the temperature is relatively constant, the hottest months are June through October.

Rainfall

Generally, this area receives less than 20 inches of rainfall per year. Besides orographic rainfall caused by moisture laden ocean air cooled on the mountains slopes, rainfall can also be expected from winter storms, Kona storms, and hurricane (tropical storms). Winter and Kona storms usually are accompanied by southerly winds and heavy rainfall. Hurricanes are a rarity in Hawaii.

-  BASAL WATER IN LAVAS
-  BASAL WATER IN SEDIMENTS
-  WATER CONFINED BY DIKES
-  WATER PERCHED ABOVE BASAL WATER
-  TUNNEL RECOVERING CONFINED WATER BETWEEN DIKES
-  -10- BASAL WATER TABLE CONTOUR



SECTION AB
SIMPLIFIED SECTIONS OF WEST MAUI (AB) SHOWING THE SOURCE AND DISPOSAL OF RAINFALL.
A. RAINFALL; B. FLY-OFF OR EVAPORATION AND TRANSPIRATION; C. RUN-OFF; D. RUN-IN OR RECHARGE TO ZONE OF SATURATION;
E. PERCOLATION FROM PERCHED ZONE OF SATURATION TO BASAL WATER TABLE. SHOWS THE VARIOUS HIGH-AND LOW-LEVEL SPRINGS
AND THE BODIES OF ROCK SATURATED WITH GROUND WATER

Generalized Hydrology and Hydrologic Cross-Sections

FIGURE III-2

Evaporation

As can be seen from Table III-2, the monthly pan evaporation rates far exceed the monthly rainfall. The most intense months are from June through August, when the evaporation rates are between 10 and 11 inches per month.

Wind

In the Kahului-Wailuku area, tradewinds which blow from a northerly direction are prevalent from spring to the fall. These winds are effected by the West Maui Mountains and Mt. Halekala, which create a venturi-like effect. The average wind speed varies between 8 and 18 miles per hour. Temperature fluctuations on the slopes of Mt. Haleakala create a southeasterly evening breeze.

TABLE III-2
CLIMATOLOGICAL DATA FOR THE WAIALE DEVELOPMENT, MAUI¹

Month	Average Temperature (°F)		Rainfall ³ (Inches)	Pan Evaporation ⁴ (Inches)
	Maximum	Minimum		
January	79.0	61.3	3.62	4.82
February	78.8	61.6	2.68	5.23
March	79.4	62.8	2.67	6.43
April	81.1	64.4	1.60	7.63
May	83.2	65.5	0.68	9.06
June	85.0	67.3	0.18	10.23
July	85.4	67.2	0.32	10.94
August	86.1	69.4	0.38	10.50
Sept.	86.3	68.2	0.36	9.31
October	85.1	67.2	0.87	8.00
November	82.2	65.4	1.99	6.32
December	79.6	63.3	3.11	5.26
Annual	82.6	65.3	18.46	93.73

¹Data from Climatological Station 396 at Puunene.

²42-year record, 1935 - 1976.

³75-year record, 1902 - 1976.

⁴23-year record, 1954 - 1976.

WILDLIFE

On the proposed project site are various types of animal and birdlife. The animal life at this particular location is generally not considered to be of great value. Many species were imported to Maui. The reptile life is limited to different varieties of geckos; frogs and toads are less common here due to the lack of standing fresh water.

Mammals

The following is a general list of mammals, which potentially could be found at the Waiale development site.

- o Brown rat (*Rattus norvegicus*) - common in Maui from low elevations.
- o Hawaiian rat (*Rattus exulans hawaiiensis*) - nocturnal, occurs in forested, grassed, and shrubby areas.
- o Mongoose (*Herpestes auropunctatus*) - the mongoose was imported to Hawaii, found from sea level to 10,000 ft. elevation, diurnal.
- o Black (roof) rat (*Rattus rattus rattus*)

Birds

The following is a list of birds, which are known to exist in the Central Maui region on or near the proposed development site. These birds are divided into three general groups: (1) endemic species - those bird species which are unique to Hawaii, (2) indigenous species - those bird species which are native to Hawaii, as well as other areas in the Pacific; and (3) exotic species - those species, which were introduced by man and were not from Hawaii originally. A number of these birds have been seen throughout the project site, particularly in those areas near the Waiale Reservoir. This list was confirmed by the Department of Land and Natural Resources./1/

1/ Ronald L. Walker, Chief - Wildlife Branch, Division of Fish and Game, Department of Land and Natural Resources; letter 11/23/76 (See Section XIII.)

Endemic Species

- o Hawaiian Stilt (Aeo) - *Himantopus himantopus knudseni*
- o Hawaiian Coot (Alae Keokeo) - *Fulica americana alai*
(both are on the endangered list)

Indigenous Species

- o Black-crowned night heron (Aukuu) - *Nycticorax nycticorax hoactli*
- o Pintail Duck (Koloa mapu) - *Anas acuta*
- o Lesser Scaup - *Aythya affinis*
- o Shoveler (koloa moha) - *Spatula clypeata*
- o American Golden plover (Kolea) - *Pluvialis dominica fulva*
- o Ruddy Turnstone (Akekeke) - *Arenaria interpres*
- o Sanderling (Huna kai) - *Calidris alba*
- o Wandering Tattler (Ulili) - *Heteroscelus incanus*

Exotic Species

- o Cattle egret - *Bubulcus ibis*
- o Ring-necked pheasant (Kolohala) - *Phasianus colchicus*
- o Grey Francolin - *Francolinus pondicerianus*
- o Rio Grande Turkey (Pelehu) - *Meleagris gallopavo intermedia*
- o Lace-necked dove - *Streptopelis chinensis*
- o Barred dove - *Geopelia striata striata*
- o Mockingbird - *Mimus polyglottos*
- o Common mynah - *Acridotheres tristis*
- o Japanese white-eye (Mejiro) - *Zosterops japonica japonica*
- o House Finch (Linnet) - *Carpodacus mexicanus frontalis*
- o Ricebird - *Lonchura punctulata*
- o House Sparrow - *Passer domesticus*
- o Cardinal - *Cardinalis cardinalis*

VEGETATION

The Waiale Development Site can be classified as dry grassland. The soil is of poor nutrient quality and receives little rainfall, which means that the primary types of vegetation existing on-site presently are various hardy weeds and scrub bushes. The following is a list of various weeds and bushes; note that none of these plants are of special value or rare./1/ This listing shows the major plants that can be found at the project site.

1/ Daniel T. Shigeta, County Extension Agent Chairman, Cooperative Extension Service, College of Tropical Agriculture, University of Hawaii; letter 11/16/76. (See Section XIII.)

- o Spanish Needle, Beggar Tick (Kookoolau) - *Bidens pilosa* L.
- o Lei Ilima - *Sida cordifolia* L.
- o Rhomboid Ilima - *Sida rhombifolia* L.
- o Lantana - *Lantana camara* L.
- o Klu - *Acacia farnesiana* L.
- o Natal Redtop - *Rhynchelytrum repens*.
- o Koa Haole - *Leucaena leucocephala*.
- o Spiny Amaranth (Pakai kuku) - *Amaranthus spinosus* L.
- o Hairy Abutilon- *Abutilon molle* Sweet

There are also a few tree species on the project site.

- o Kiawe - *Prosopis pallida*.
- o Java plum - *Eugenia cominii* L.

Man-Made Environment

HISTORIC SITES

On August 23rd and 24th, 1976, a walk-through survey of the proposed Waiale development site was conducted. 1/ Approximately, one day was spent investigating areas, which had been previously disturbed due to earthmoving and other site preparation. Another day was used to inspect undisturbed areas in kiawe and lantana.

There were no ancient Hawaiian structural remains found on-site. However, a piece of flaked basalt was found in the vicinity of the Maui Memorial Hospital, and a possible hammerstone was found on the grounds of Passion Acres. Because human skeletal material has been found in areas south of the project site, it is possible that human interments have occurred on the project site.

Due to the location and physiographic nature of the development site, a large scale surface survey was not recommended. However, two alternative archaeological survey methods were suggested. The first method is the excavation of one meter square test pits at different locations by archaeologists. The

1/ William Barrera, Jr.; Archaeologist, Chiniago Enterprises, survey report 8/25/76. (See Section XIII.)

second method suggested is the monitoring of construction activities by archaeologists, so that any archaeological remains, which might be unearthed during the construction phase can be located and inspected. Alternate construction sites would be necessary to minimize any work slowdown due to possible archaeological excavation. The second alternative was strongly recommended, as it was felt that this would be the most efficient way of dealing with any potential archaeological remains./1/

HISTORIC BACKGROUND

In pre-European contact history, the Waiale area was probably the site of the "Battle of the Sandhills," which occurred about 1776-1777. This battle was fought between the armies of Kalani'opu'u, King of Hawaii (island), and Kahekili-nui 'Ahumanu the Second, the last ruler of Maui. The invaders from the Big Island, known as the Alapa and Piip'ii Regiments, landed at Ma'alaea and Kiheipukoa Bays, then marched across the Maui Isthmus to do battle with the Maui defenders. Many warriors were slain; however, Maui with the aid of warriors from Oahu was victorious in this battle. During that time, the Sandhills below Wailuku were called Kakanilua./2/

The Waikapu, Wailuku, Waiehu, and Waihe'e Valleys were the agricultural centers of the Maui Kingdom, while many temples and other building structures were located in the drier areas. However, most of these structures were lost or destroyed by pioneer sugar growers and agriculture from the time of King Kamehameha III. Since that time the Waiale Project site has been partially under agriculture, and in recent years was left under cattle grazing./3/

EXISTING IMPROVEMENTS

Land Uses

Lands within the proposed Waiale Project are generally undeveloped at the present time. The only existing agricultural uses are along the east side

- 1/ Jane L. Silverman, State of Hawaii Historic Preservation Officer, letter 4/26/77. (See Section XIII.)
- 2/ Westervelt, W.D., - Hawaiian Historical Legends; Fleming H. Revell Company; New York; 1926, p. 125-142.
- 3/ Inez Ashdown, County of Maui Planning Department, letter 10/26/76. (See Section XIII.)

of the project where approximately 167 acres are being cultivated in passion fruit on lands leased from A&B and approximately 64 acres are being used for seed cane by HC&S. No other portions of the site have been used for agricultural purposes in modern history, although 50 acres of land near the kiawe groves around the reservoirs are used for cattle grazing.

There are two irrigation reservoirs on the project site, both created in natural depressions by HC&S many years ago. The larger of the two always contains water, although the level drops considerably during heavy use periods. The smaller reservoir serves basically as an overflow area during the rainy season but is dry the remainder of the year due to high seepage. Both reservoirs are fed by ditches with water collected in the West Maui Mountains. The water is used to irrigate 4,500 acres of HC&S sugar land in the Puunene to Kihei region.

Other existing uses within the project site include a small junkyard and equipment storage yard adjacent to the northwest corner of the large reservoir. The old County dump site southwest of the Maui Memorial Hospital was replaced by a new dump site south of the project site several years ago. Although the old dump has been closed off and covered over with dirt, it is probably structurally unstable in many areas due to excessive depths of waste material.

Infrastructure

There are no public roadways within the project site at the present time; however, a number of major public roads border the site and provide access to it. These include Kuihelani Highway, Kaahumanu Avenue and Papa Avenue. In addition, Kamehameha Avenue, Lono Avenue, Onehee Street and Kea Street all dead-end at the project boundary and could be extended to serve the development. The only roads within the project site at the present time are dirt roads which serve the reservoirs and the water lines in the area.

Both irrigation lines and domestic water lines cross the project site. The oldest and largest of these is the 42-inch irrigation line running from the Waiale Reservoirs to the HC&S cane fields on the east side of Kuihelani Highway. Two domestic water reservoirs are located near the western project boundaries. One is a 2-million gallon tank adjacent to the Maui Memorial Park and the other is a 3-million gallon tank just south of the County Base Yard site. Water lines from both of these tanks cross the site to serve the existing Kahului urban area. In addition, the proposed 36-inch Kihei water line will cross the site adjacent to the existing Waiale irrigation line.

At the present time, there are no other major utilities within the project site with the exception of a small Maui Electric substation just north of the large Waiale Reservoir.

THE REGION

Social-Economic Setting

POPULATION CHARACTERISTICS

Population trends for the County of Maui, as well as Maui Island, have been most recently published by the Department of Planning and Economic Development in the State of Hawaii Data Book -- 1976, as follows:

	<u>1940</u>	<u>1960</u>	<u>1970</u>	<u>1975</u>
Island of Maui	46,919	35,717	38,691	46,300
County of Maui	55,980	42,855	46,156	53,900

As can be seen, the population of both Maui Island and the County of Maui declined from 1940 through 1960. Subsequently, resident population has been increasing steadily, particularly on Maui Island.

In February, 1976, Maui Economic Opportunity, Inc. published the OEO 1975 Census Update Survey--Maui County, prepared by Survey and Marketing Services, Inc. This study established the 1975 population of Maui Island as 51,396

and Maui County as 59,661. As can be seen, both estimates are approximately 11% higher than comparable estimates by the Department of Planning and Economic Development (DPED).

Subsequently, Survey and Marketing Services, Inc. has recommended that DPED's 1975 estimates be used for government planning purposes, due to a possible bias towards large families resulting from the sampling methods used./1/ However, Survey and Marketing Services, Inc. indicates that the information generated in terms of socio-economic and demographic characteristics of the population are valid, particularly in terms of percentages. The data generated in MEO's 1975 Census Update will be modified using a correction factor, to further describe the characteristics of the study area.

The data presented will represent the Wailuku-Waikapu and Kahului Districts established in MEO's 1975 Census Update. These two districts approximately include the study area considered in the Wailuku-Kahului General Plan. A corrective factor of 53,900 (DPED) ÷ 59,661 (MEO) or 0.90344 will be applied, in accordance with the recommendations of Survey and Marketing Services, Inc.

1975
POPULATION CHARACTERISTICS
WAILUKU-KAHULUI

	<u>Number</u>	<u>Percentage (%)</u>	
		<u>Maui Island</u>	<u>Maui County</u>
Households	5,822	41.3	36.3
Population	19,872	42.7	36.8

Based upon the adjusted information, the present area population is almost equally divided between males (9,924) and females (9,948). An overwhelming percentage (99.75%) are permanent residents of Hawaii.

1/ Lee Weigle, Executive Director, Survey and Marketing Services, Inc.
Letter 10/11/76. (See Section XIII.)

Regarding ethnicity, Japanese constitutes the largest single group (39.78%), followed by Filipino (17.18%) and Part-Hawaiian (15.88%). No other ethnic groups exceed 10%, although Mixed (9.72%) and Caucasians (9.30%) are relatively close. (See Appendix III-A.)

It is also significant to note that over 66% of the area residents were born on the Island of Maui. Further, over 66% also lived in the same house five years ago. Additionally, over 18% lived on the Island of Maui five years ago. Therefore, over 84% of the residents either lived in the same house, or on the island of Maui, five years ago. This indicates that the Wailuku-Kahului area is a very stable residential community, with a high orientation towards local families. (See Appendixes III-B and III-C.)

HOUSING CHARACTERISTICS

Within the Wailuku-Kahului area, a substantial percentage of residents own their own homes or condominiums (4,884 units or 75.79%). Most of the housing units are single-family detached units (5,601 or 86.92%). Of those units owned by the residents, virtually all (98.71%) land is owned in fee simple, with only a small percentage being on leasehold lands. (See Appendix III-D.)

According to the MEO Survey, only 1.40% of the housing units in the area were rated as being in poor condition. Although the exact method of evaluation is not known, this figure seems somewhat low, particularly since it is even less than the number of units presently existing within the plantation camps.

The only indicator available in the 1970 Census of Housing relative to condition is the year the structure was built. This information is as follows:

YEAR STRUCTURE BUILT

	<u>Kahului</u>	<u>Wailuku</u>	<u>Total</u>	<u>(Wailuku-Kahului)</u>
1969 to March 1970	331 (14.3%)	94 (3.8%)	425	(8.9%)
1965 to 1968	372 (16.1%)	321 (13.0%)	693	(14.5%)
1960 to 1964	694 (30.1%)	193 (7.8%)	887	(18.6%)
1950 to 1959	795 (34.5%)	336 (13.6%)	1,131	(23.7%)
1940 to 1949	4 (0.2%)	380 (15.4%)	384	(8.0%)
1939 to earlier	111 (4.8%)	1,145 (46.4%)	1,256	(26.3%)
TOTAL	2,307	2,469	4,776	

Unfortunately, this information does not include the plantation camps in Puunene. Nevertheless, it is significant to note the high percentage (and number) of dwelling units in Wailuku built prior to 1940, and therefore a minimum of 37 years old.

For owner-occupied units, nearly half of the population incurs monthly housing costs of more than \$200. There is, however, a relatively high percentage of persons (32.85%) paying less than \$100. It is likely that many of these households are located in Wailuku, or early increments of development in Kahului. Nearly 75% of the area residents occupying rental units pay more than \$150 per month. Less than 10% pay more than \$300 monthly. (See Appendix III-E.)

HOUSEHOLD INCOME

Figures regarding household income within the Wailuku-Kahului area indicate that both mean and median annual household incomes are approximately \$15,000. Information regarding household incomes and incomes as a function of family size are included in the Appendix. (See Appendix III-F.)

EMPLOYMENT CHARACTERISTICS

Employment levels within the Wailuku-Kahului area are relatively high. This is to be expected, considering that this area includes a substantial percentage

of the employment opportunities on the island of Maui. Unemployment among persons 16 years or older in the labor force looking for work is less than 5%.

The industries employing the greatest number of area residents are Service (20.40%); Government (15.62%); Manufacturing (14.11%); Retail (13.03%) and Construction (11.21%). (See Appendix III-G.)

Among persons unemployed and looking for work, employment opportunities are most desired in the Retail (19.95%); Service (18.56%); Government (11.91%); Construction (10.94%) and Manufacturing (10.80%) sectors. (See Appendix III-H.)

Public Facilities

The Wailuku-Kahului area includes many public facilities which serve the entire Island (and in certain respects, County) of Maui. These include the following (see Figure II-2 for locations):

- a. Maui Memorial Hospital, Wailuku Health Center, Cameron Center and Hale Makua.
- b. Maui Community College (two year liberal arts and vocational curriculum)
- c. Maui Zoo
- d. Various County, State and Federal offices
- e. Kahului Harbor
- f. Kahului Airport
- g. Kanaha Pond Wildlife Sanctuary
- h. Waiehu Municipal Golf Course
- i. Maui War Memorial Recreational Complex (football stadium, baseball stadium, gymnasium, swimming pool)
- j. Wailuku and Kahului Libraries
- k. Wailuku Fire and Police Stations

EDUCATIONAL FACILITIES

Two public high schools, Baldwin High and Maui High serve the area. Intermediate and elementary schools include Iao Intermediate (6-8), Wailuku

Elementary (K-5), Lihikai (K-8) and Waihee (K-8), which "feed" Baldwin; and Puunene (K-8) and Kahului (K-8), which "feed" Maui High.

FIRE AND POLICE PROTECTION

The Wailuku-Kahului area is currently provided with 24-hour protection from the Wailuku Fire Station. Back-up may be provided from Lower Paia and Kihei, if required.

Police protection for the Wailuku District is provided from the Wailuku Station, which also houses the administrative functions for the entire County.

HEALTH SERVICES

Provision of health services is the basic responsibility of the State Department of Health. Located in the Wailuku-Kahului area are Maui Memorial Hospital (the island's only intensive care medical facility), the Maui Mental Health Center, and other offices and facilities of the Department of Health. Also located in Wailuku-Kahului are Hale Makua (providing long-term convalescent care) and the Cameron Center, which houses a variety of community health-related agencies.

SOLID WASTE

Solid waste is collected once a week by the County's Department of Public Works. Disposal is at the County's sanitary landfill at Waikapu, which is licensed by the Department of Health through the end of 1977. It is estimated that approximately 7 pounds per capita per day of refuse are generated by area residents.

Since the life of the existing landfill site is limited, the County of Maui is presently seeking alternative sites, as well as exploring other potential means of collection and disposal. However, no positive solutions have been arrived as yet.

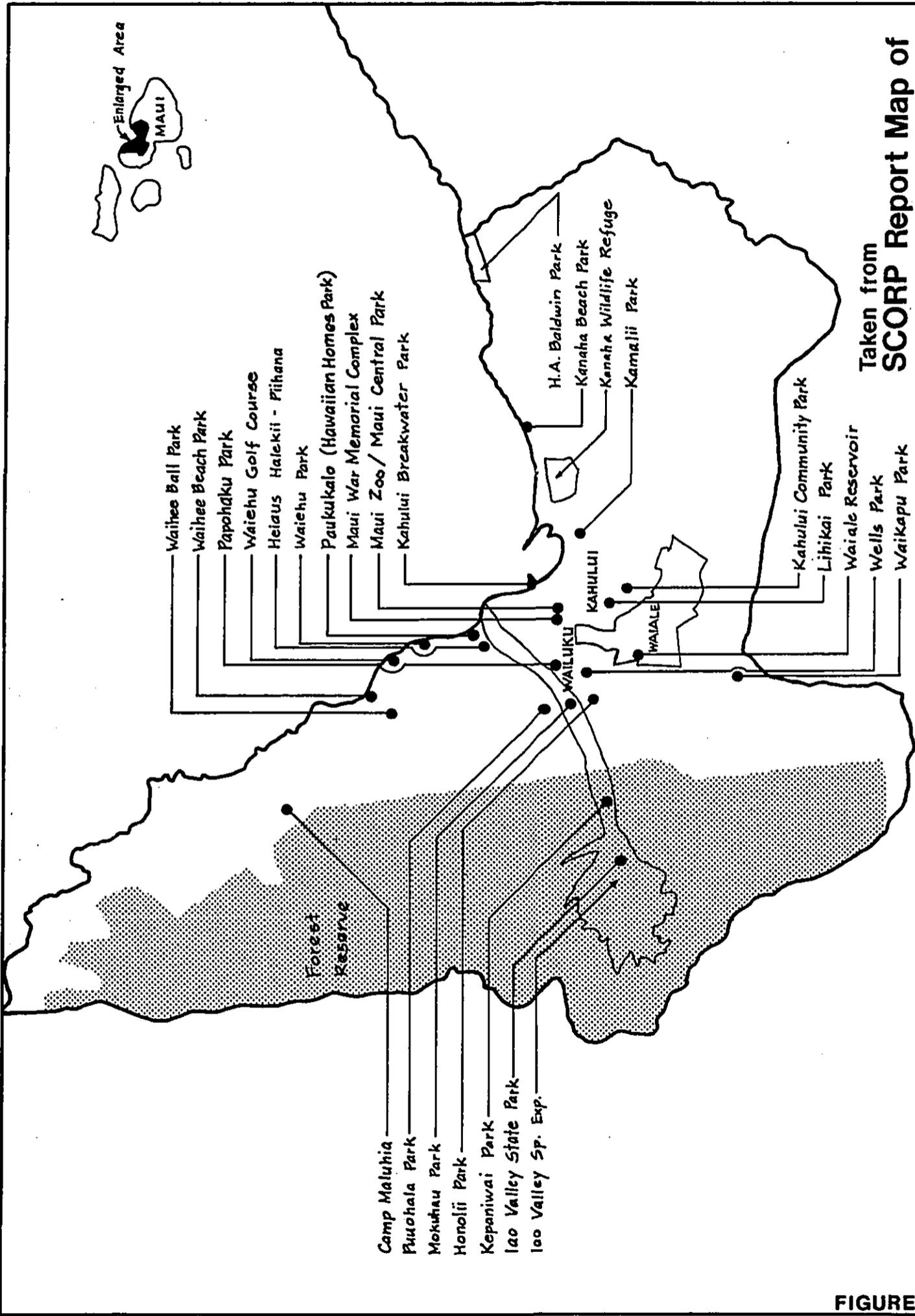
RECREATIONAL FACILITIES

Numerous State and County recreational facilities serve the area, including the following which are also shown on Figure III-3):

State: Iao Valley State Park
Kahului Boat Launching Ramp
Halekii/Piihana Historical Park

County: Kahului Community Park
Kanaha Beach Park
Waiehu Beach Park & Pavilion
Waihee Park
Paukukalo (Hawaiian Homes) Park
Waihee Beach Park
Puuhala Park
Mokuhau Park
Waikapu Park
Wells Park (including tennis facilities)
Kamalii Park
Papohaku Park
Lihikai Park
Kepaniwai Park
Honolii Park

In addition to operating and maintaining the above County facilities, various recreational, educational and cultural programs are conducted by the Department of Parks and Recreation of the County.



Taken from
SCORP Report Map of
Wailuku - Kahului

A&B PROPERTIES INC. 

0 1 2 3 MILES 3/3/77

FIGURE III 3

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100

IV

THE RELATIONSHIP OF THE PROPOSED ACTION TO LAND
USE PLANS, POLICIES AND CONTROLS FOR THE AFFECTED AREA

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100

IV THE RELATIONSHIP OF THE PROPOSED ACTION TO LAND USE PLANS
POLICIES AND CONTROLS FOR THE AFFECTED AREA

EXISTING OWNERSHIP AND LEASING AGREEMENTS FOR THE PROJECT SITE

The entire 1015 acres which make up the proposed project district are owned by Alexander & Baldwin with the exception of a 20-acre parcel which was deeded to the County by A&B a number of years ago for a new base yard. However, the base yard was never constructed, and A&B is now negotiating with the County to exchange the parcel for a similar one in an alternate location.

Of the remaining area 224 acres (22%) are under short-term leases to other companies or individuals, and the remaining 771 acres (76%) are under the control of A&B, Inc. (See Table IV-1.) The largest lease within the project area is 167 acres used for passion fruit farming. Negotiations are currently underway to make other adjacent lands available for this use as the present agricultural lands are needed for the project.

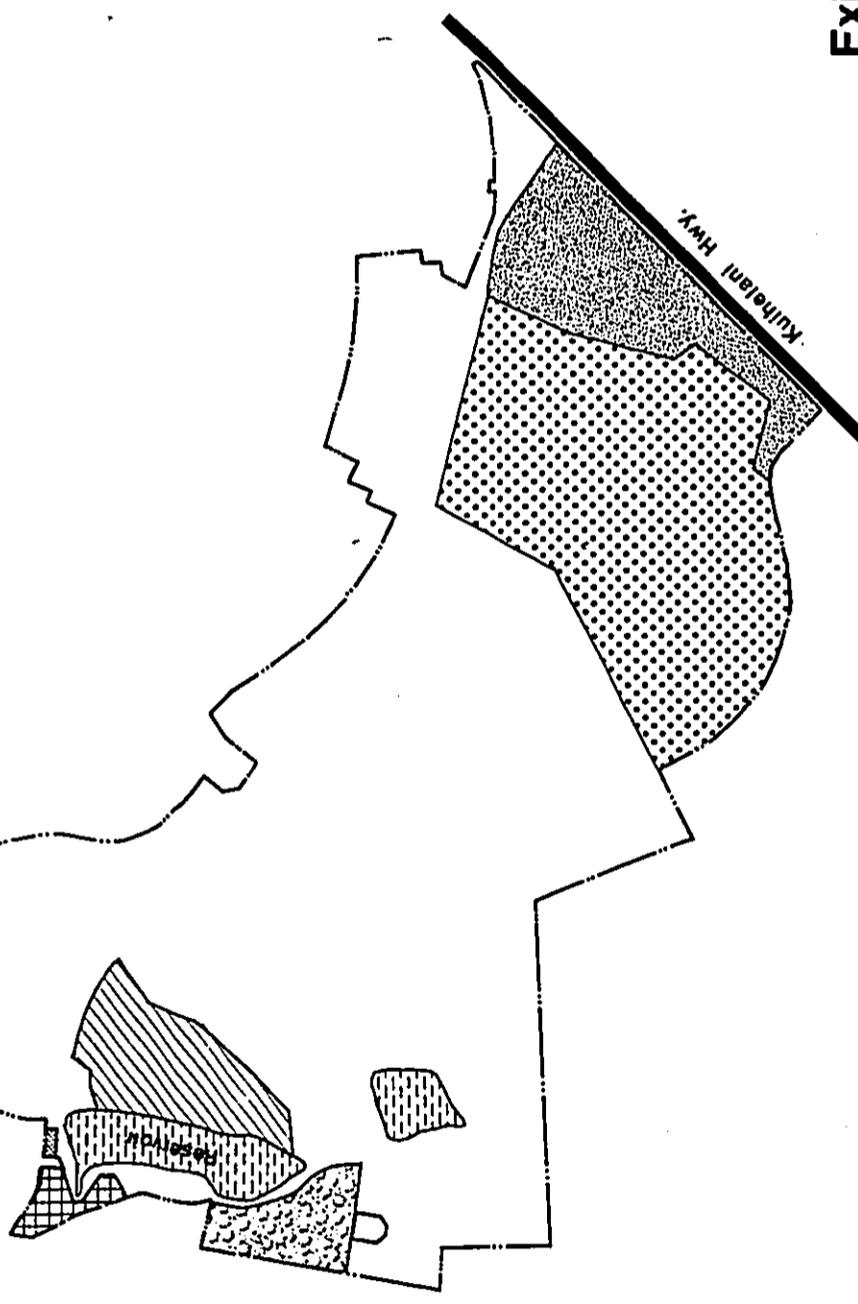
The only other leases are a 50-acre pasture lease and two small open storage yards. Figure IV-1 shows the location of these leases.

TABLE IV-1
LAND OWNERSHIP AND LEASES IN THE PROJECT AREA

<u>Owner/Use</u>	<u>Aprox. Area in Acres</u>
A&B, Inc.	
Passion Fruit Farm*	167
Junk Yard*	6
Heavy Equipment Base Yard*	1
Pasture*	50
Seed Cane	64
Reservoir and Open	37
Vacant	670
County of Maui	
Vacant (farmer base yard site)	20
TOTAL	1015

* Leased from A&B, Inc. (224 ac.)

Kaahumanu Ave.



WAIALE			
	PASSION FRUIT FARM	ACRES	167
	SEED CANE		64
	PASTURE		50
	RESERVOIR & OPEN		37
	JUNK YARD		6
	HEAVY EQUIP. BASE YARD		1
	VACANT		670
COUNTY OF MAUI LAND			
	BASE YARD		20
TOTAL WAIALE			1,015

Existing Use

A & B PROPERTIES INC.



0 300' 600' 1200' 2400'

3/3/77

FIGURE IV -1

COUNTY GENERAL PLAN

The General Plan for Wailuku, Kahului and surrounding areas was adopted by the County on July 6, 1973. The adopted plan was based upon a comprehensive study of the area in 1972 by the consultant firm of Eckbo, Dean, Austin and Williams.

On the County's general plan, the area proposed for development falls basically into two land use designations, Project District and Open Space.

The spatial and use allocations recommended for the Project District were as follows:

Total Area	270 acres
Residential Use	190 acres
Parks, buffer zones and open space	65 acres
Elementary School	10 acres
Neighborhood Commercial	5 acres
Total Number of Units	760

Open Space

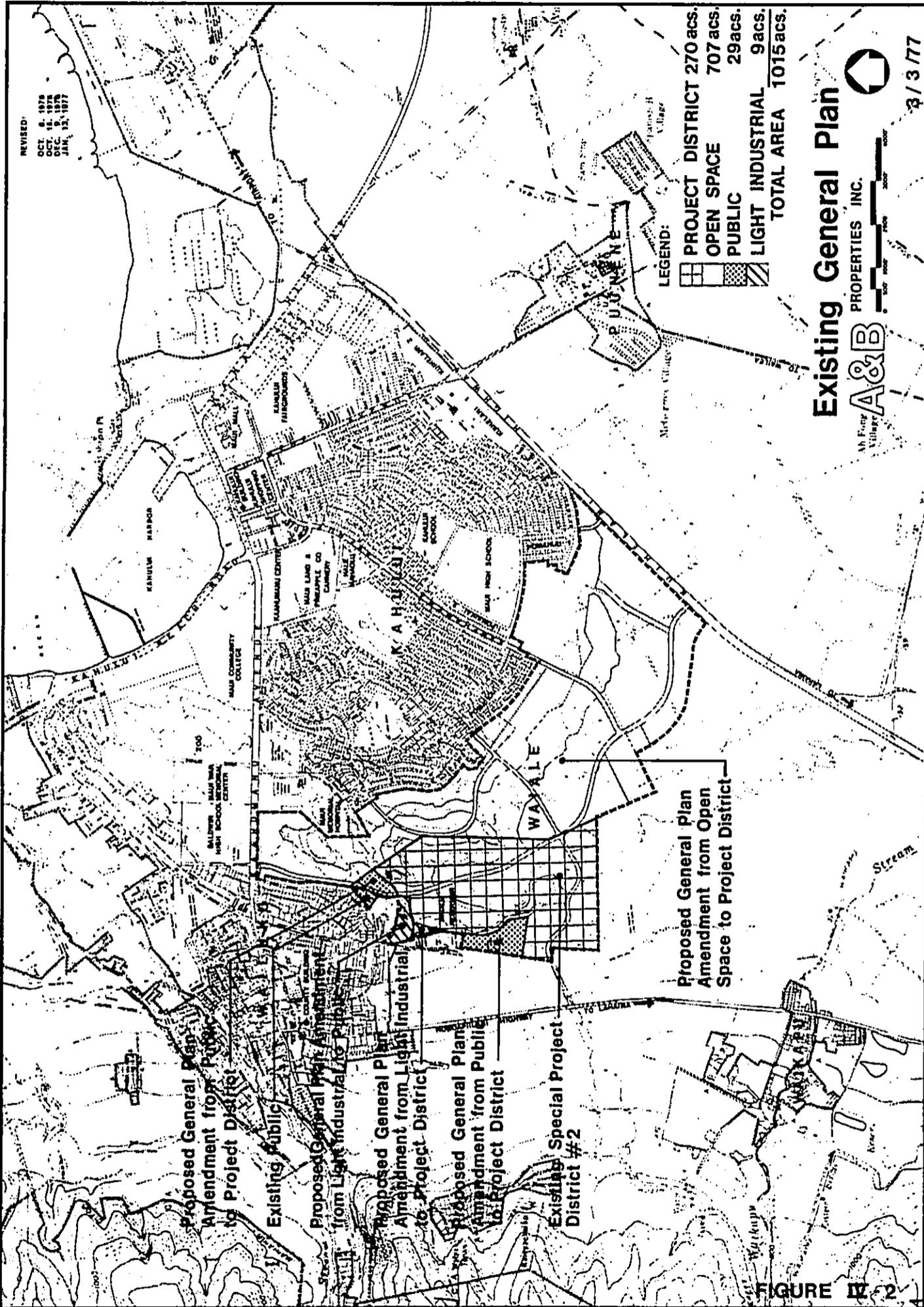
The general plan study recommended the further breakdown of open space areas into three sub-categories based upon intensity of use -- high, medium and low. The area under consideration includes all three open space categories.

The functions and classifications of the various intensity levels, as recommended by the Plan, are as follows:

LOW INTENSITY

- A. Open space for managed resource production
 - o Lands for water supply
 - Ground water recharge areas
 - Watershed areas
 - Reservoir sites
 - Energy production

REVISED:
 OCT. 6, 1976
 OCT. 19, 1976
 DEC. 9, 1976
 JAN. 13, 1977



LEGEND:
 PROJECT DISTRICT 270 acs.
 OPEN SPACE 707 acs.
 PUBLIC 29 acs.
 LIGHT INDUSTRIAL 9 acs.
 TOTAL AREA 1015 acs.

Existing General Plan
 AN FINE VILLAGE
A&B PROPERTIES, INC.
 3/3/77

Proposed General Plan Amendment from Public Space to Project District
 Existing Public
 Proposed General Plan Amendment from Light Industrial to Public
 Proposed General Plan Amendment from Light Industrial to Project District
 Proposed General Plan Amendment from Public to Project District
 Existing Special Project District #2

Proposed General Plan Amendment from Open Space to Project District

FIGURE II-2

B. Open space for preservation of natural and human resources

- o Water, tideland and marsh land areas for fish and wildlife habitats
- o Forest and wood for wildlife refuges
- o Geological features of note
 - Cliffs, headlands, promontories and rock outcroppings
 - Landslide areas
 - Beaches and sand dunes
- o Historic and cultural sites and places

C. Open space for health, welfare and well-being

- o Areas to provide visual amenity
 - Hillsides, hilltops, mountains, valleys, bays, inlets and lakes that provide visual and physical relief to the cityscape in the form of natural contrast to the built-up man-made scene
 - Other open space of any kind or use close in to community areas to provide variety and orientation
 - Hilltops and mountain tops from which inspiring panoramas can be seen

D. Open space for public safety

- o Flood control reservoirs, flood plains, drainage channels
- o Unstable soil areas
 - Slide areas
 - Areas too steep for intensive development
- o Airport flight path zones
- o Fire zones

E. Open space for corridors

- o Power transmission line ways
- o Canals, conduit and aquaduct ways
- o Transportation and transit ways (as differentiated from recreation travel ways)

F. Open space for urban expansion

- o Areas for commerce, industry, housing and public service facilities, etc.

MEDIUM INTENSITY

A. Open space for health, welfare and well-being

- o Land to protect the quality of ground water
- o Open space for disposal (sewage, garbage, etc.)
- o Open areas to improve airshed quality (anti-smog)

- o Areas for recreational travel
 - Walks and trails for hiking, riding and bicycling
 - Scenic highways, highways and freeways with areas providing scenic views from same
 - Waterways
- o Areas to shape and guide development
 - Open spaces that provide neighborhood, district and city identity
 - Open spaces that provide separations between conflicting land uses

B. Open space for urban expansion

- o Areas for commerce, industry, housing and public service facilities, etc.

HIGH INTENSITY

A. Open space for managed resource production

- o Lands for forestry
- o Lands for agriculture
 - Highly fertile lands
 - Lands for special crops (passion fruit, etc.)
 - Floriculture
- o Lands for mineral production
 - Unusual or short supply minerals
 - Local Consumption Minerals (sand, gravel, etc.)
- o Lands for animal products (meat, milk, etc.)
- o Water areas for (commercial and recreation) fish and marine life production--spawning areas, tidal areas

B. Open space for health, welfare and well-being

- o Areas for recreation and education
 - Neighborhood parks
 - Community parks
 - City-wide parks
 - Regional parks and reservations
 - Schools

C. Open space for urban expansion

- o Areas for commerce, industry, housing and public service facilities, etc.

Conceptually, there are certain similarities between the County's adopted Plan and the applicant's development concept, as follows:

- o The applicant's proposal will continue to provide an open space element separating the distinct communities of Wailuku and Kahului. The open space element includes an 18-hole golf course, parks, a major recreational complex and drainage areas.
- o The development concept is to create a basically residential community, including areas allotted for recreational, educational and commercial uses.
- o The basic concept of a well-planned and generally distinct community in the Waiale areas has been maintained. The development concept will expand a previously created project district.
- o The County's Plan suggested that the land in the South Wailuku and Waiale area be utilized for development, since the land "is not physically suited for agriculture and, therefore, should be made available for more productive use."

Differences in the proposed project are primarily those of size and scale, as indicated in the following table:

	<u>Wailuku-Kahului General Plan</u>	<u>Proposed Waiale Project</u>
Total Area (acres)	270	1015
Residential Use (Acres)	190 (70%)	632 (62%)
Parks, Buffer Zones and Open Space (Acres)	65 (24%)	338 (33%)
School Sites & Public (Acres)	10 (4%)	27 (3%)
Commercial (Acres)	5 (2%)	18 (2%) (Village Center)
Number of Residential Units	760	3065

As mentioned previously, although the size and scale of the project has increased significantly, it is interesting to note the following:

- o The percentage of land allocated for parks, buffer zones and open space has increased from 24% to 33%.
- o The percentage of land allocated for residential use has decreased from 70% to 62%.

- o The overall density has remained almost the same (2.8 dwelling units per acre to 3.0 dwelling units per acre.)

STATE LAND USE DISTRICTS

The establishment and implementation of policies to regulate and guide urban development in Hawaii on a state-wide basis is the responsibility of the State Land Use Commission.

The Hawaii State Legislature in 1975, mandated the preparation of a land use guidance policy, to be submitted for legislative review in 1977. It is anticipated that these policies will ultimately provide the major guide for the direction of urban growth, insofar as the State of Hawaii is concerned.

In the meantime, however, a review of the State Land Use Commission Regulations provides some insight as to the present policies and guidelines for Urban districting (or zoning). In determining the boundaries for Urban Districts, the Regulations provide that the following standards shall be used:

- o It shall include lands characterized by city-like concentrations of people, structures, streets, urban level of services and other related land uses.
- o It shall take into consideration the following specific factors:
 - Proximity to centers of trading and employment facilities except where the development would generate new centers of trading and employment.
 - Substantiation of economic feasibility by the petitioner.
 - Proximity to basic services such as sewers, water, sanitation, schools, parks, and police and fire protection.
 - Sufficient reserve areas for urban growth in appropriate locations based on a ten (10) year projection.

- o Lands included shall be those with satisfactory topography and drainage and reasonably free from the danger of floods, tsunami and unstable soil conditions and other adverse environmental effects.
- o In determining urban growth for the next ten years, or in amending the boundary, lands contiguous with existing urban areas shall be given more consideration than noncontiguous lands, and particularly when indicated for future urban use on State or County General Plans.
- o It shall include lands in appropriate locations for new urban concentrations and shall give consideration to areas of urban growth as shown on the State and County General Plans.
- o Lands which do not conform to the above standards may be included within this District:
 - When surrounded by or adjacent to existing urban development; and
 - Only when such lands represent a minor portion of this District.
- o It shall not include lands, the urbanization of which will contribute towards scattered spot urban development, necessitating unreasonable investment in public supportive services.
- o It may include lands with a general slope of 20% or more which do not provide open space amenities and/or scenic values if the Commission finds that such lands are desirable and suitable for urban purposes and that official design and construction controls are adequate to protect the public health, welfare and safety, and the public's interests in the aesthetic quality of the landscape."

The proposed project is substantially in accordance with the above standards, and hence, in basic conformance with the current land use policies of the State of Hawaii.

- o The proposed project will be an urban residential community, including services and facilities associated with such use.
- o Wailuku-Kahului is the major center of commerce and industry on the island of Maui. Major recreational facilities, educational institutions, governmental and financial institutions, police and fire protection and utility services exist in the area.
- o The land is suitable for urban development. Adequate provision will be made for drainage and other developmental criteria. The project site is not subject to tsunami or major flooding.
- o The proposed project is based upon a comprehensive, long-range development plan. The project is a logical extension of existing residential development in Wailuku and Kahului.
- o Portions of the proposed development are consistent with the County's adopted general plan. The other areas are the subject of the particular application for general plan amendment.
- o The proposed development cannot be characterized as being spot urban development. Rather, it is an extension of existing urban uses, in an area where public services and facilities can be provided logically and economically.
- o In its present state, the land has no particular aesthetic or scenic values. The proposed project is designed to harmonize with existing topographical features, rather than to drastically alter them.

Of the approximately 743 acres included in the present application for general plan amendment, approximately 115 acres are presently classified as Urban. Additionally, the 272 acres contained within the existing Project District 2 and adjacent public use are also included within the present Urban District.

COUNTY ZONING

Should the subject application for general plan amendment be approved by the County of Maui, it is the intent of the applicant to implement the proposed project in accordance with Section 8.6 (Ordinance #787) of the Permanent Ordinances of the County of Maui.

The provisions of Section 8.6 have been established to "implement the findings and recommendations of the Wailuku-Kahului General Plan, and to implement similar findings and recommendations for other areas subsequently designated as 'project districts' by the County of Maui."

The concept of project districts was initially developed as part of the Wailuku-Kahului General Plan Study. The objective of such a concept was to provide for flexible planning and creative design, primarily for large parcels of land under single ownership. The study report stated as follows:

"An inherent flaw in the traditional long-range planning process is the inability to provide for the flexible and creative design of large parcels of land under single ownership that lie in a logical path of expansion. General Plan establishment of use relationships, and resultant land use patterns within these parcels are usually premature and lacking in adequate development detail. This preclusion of design flexibility becomes even more unsatisfactory in the light of recent State Supreme Court decision relative to General Plan amendments.

The lack of positive General Plan direction for the location of such single parcel large scale developments limits pre-planning of utilities, transport and other public services and facilities. The General Plan should indicate the most desirable location for potential large scale developments to allow efficient planning of public service and facilities rather than waiting for the owners to initiate such projects in locations of their choice and ask that the public facilities be adjusted in accordance.

To resolve these deficiencies in general planning technique, the establishment of Project Districts 1 and 2 is recommended. The districts are located and defined within the context of the overall Land Use Plan. Within the Project District the

REVISED:
 OCT. 8, 1976
 OCT. 15, 1976
 DEC. 9, 1976
 JAN. 12, 1977

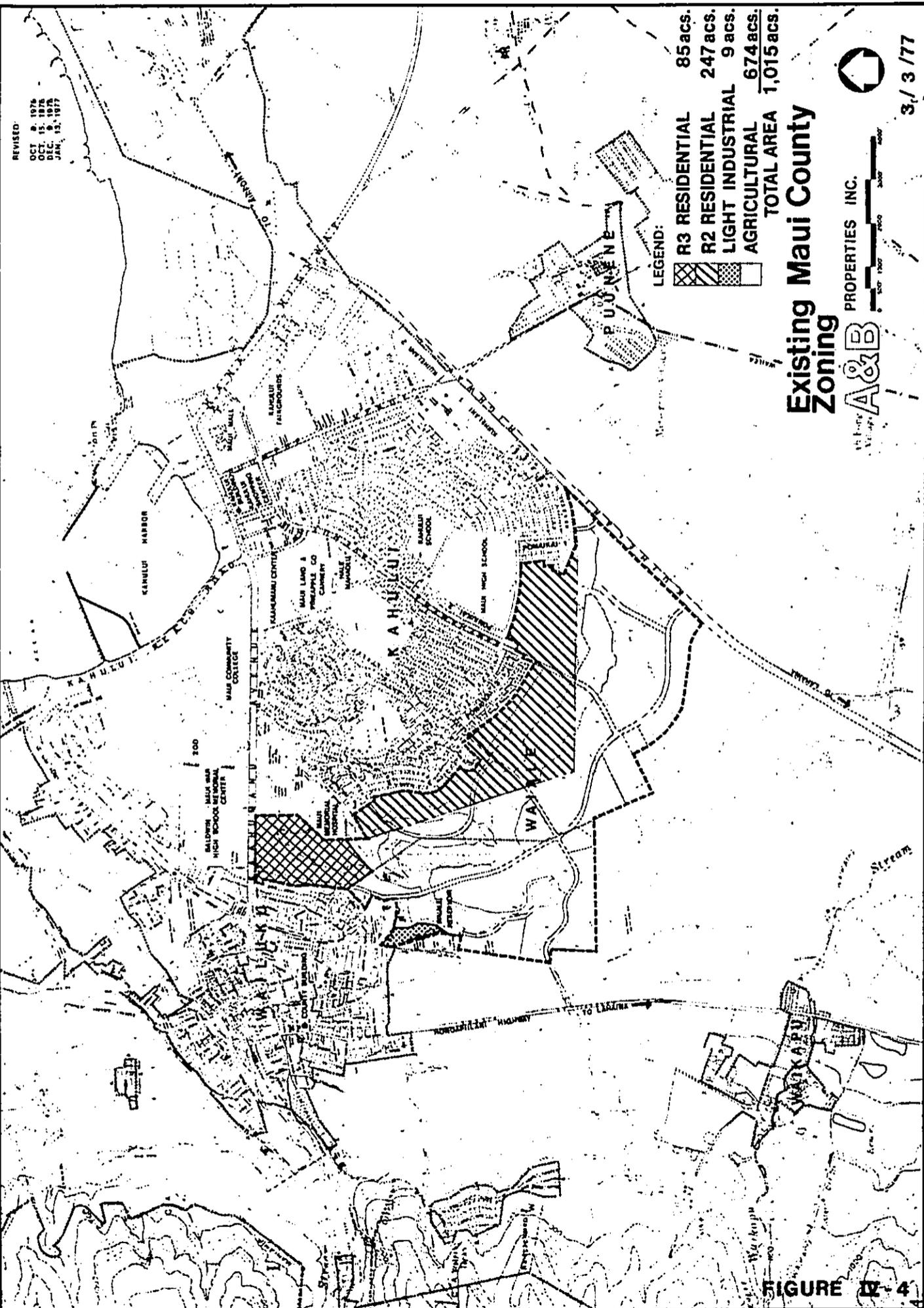


FIGURE IV-4

the actual physical configuration would be determined by design submission, review and approval process according to pre-established parameters necessary to integrate the project into the overall Plan and the attendant public service systems and facilities. The Land Use Plan, in addition to locating and defining the boundaries of each Project District, establishes program criteria indicating amount and type of permitted and conditional uses, proportions of open space, public facilities to be included such as schools, etc., regardless of the physical configuration by which the program is satisfied."

Section 8-6.3 and 8-6.4 of the ordinance relating to project districts establish specific requirements concerning permitted uses and standards of development, as follows:

Sec. 8-6.3 Use Regulations

No land or building shall be used nor any building shall be erected or structurally altered within a project district, except for the following:

- (1) Single family dwelling
- (2) Greenhouses
- (3) Parks and playgrounds (non-commercial)
- (4) Schools (public or privately owned)
- (5) Publicly owned buildings or premises
- (6) Accessory buildings located on the same lot, the uses of which is customary and incidental, usual and necessary to that of the main building or to the use of the land.
- (7) Special Uses: The following are declared special uses and approval of the Planning Commission shall be obtained:
 - (a) Churches, together with accessory buildings
 - (b) Day care centers
 - (c) Nursing or convalescent facilities
 - (d) Public utilities facilities
 - (e) Domestic type businesses (such as sewing, piano playing, etc., which are normal functions of the home)
 - (f) Residential planned developments
 - (g) Neighborhood commercial facilities

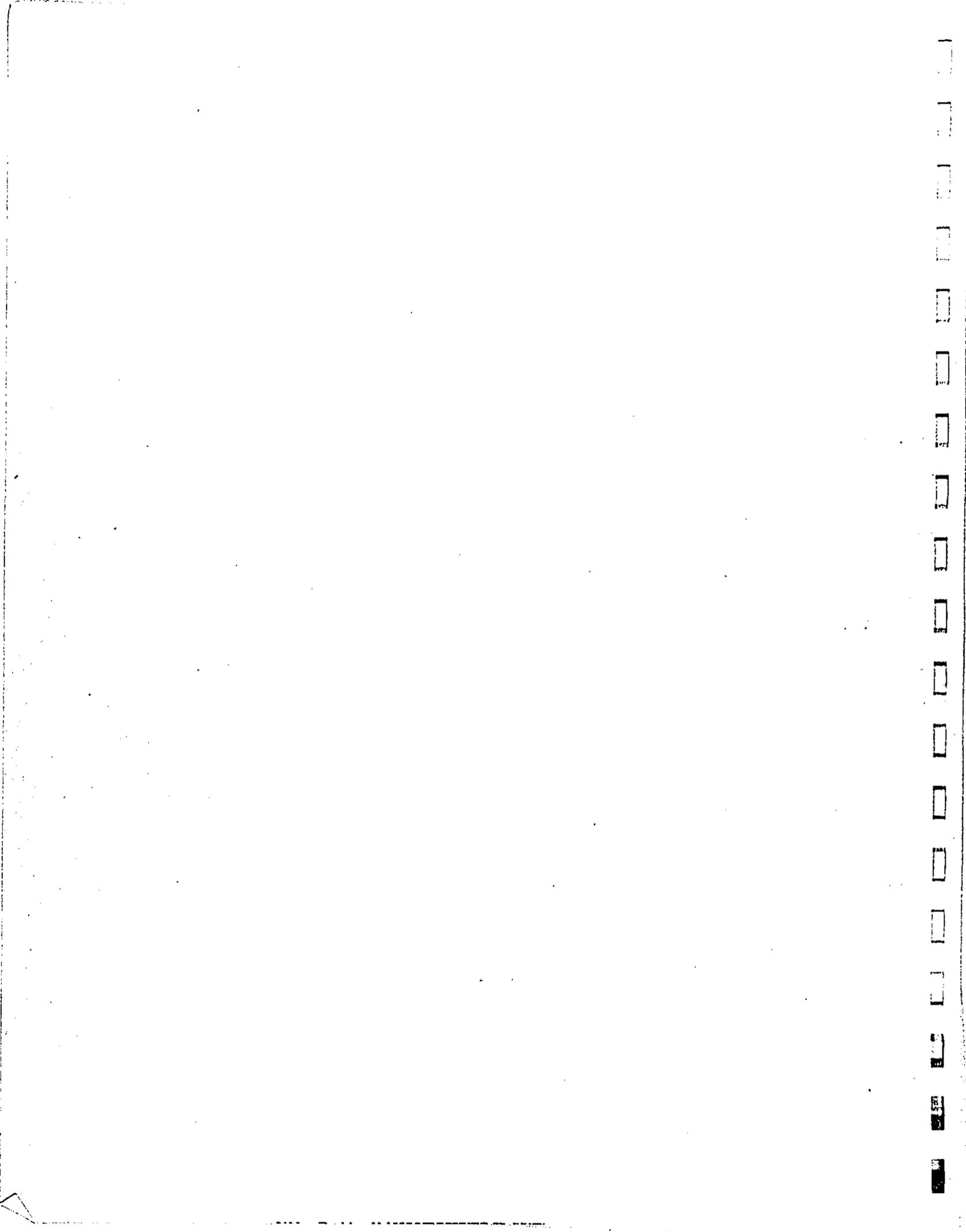
Sec. 8-6.4 Development Standards

- (a) Area regulations: The minimum lot area shall be six thousand (6,000) square feet and the minimum lot frontage shall be sixty (60) feet. Further, a mixture of lot sizes may be permitted, provided that the overall density or dwelling units permitted is not exceeded.

The overall density or total dwelling units permitted shall be approved by the Council and Mayor, in accordance with development plans which shall first be submitted to the Commission for review and recommendation. The Wailuku-Kahului General Plan, or subsequently adopted plan, shall serve as a guideline for the overall density or total dwelling units to be permitted, unless modification can be justified by the applicant on the basis of physical, social, economic and environmental studies.

- (b) Height regulations: No building shall exceed two stories and twenty-five (25) feet in height.
- (c) Yard spacing: There shall be a front yard of fifteen (15) feet, side yard of six (6) feet, and rear yard of six (6) feet for all residential and commercial areas. Side and rear yard for two-story buildings shall be ten (10) feet in all residential and commercial areas.

The applicant believes that the proposed development is consistent with the project district concept, as it provides for flexible planning, creative design, and the long-range programming of public services and facilities. Further, the proposed uses and standards of development are basically in accordance with the provisions of appropriate portions of the Project District Ordinance.



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PHYSICAL IMPACTS

Land Transformation and Construction

EXTENT OF DEVELOPED AREA

The Waiale Project will be built upon land which is presently undeveloped open space and is used primarily for minimal agricultural purposes (i.e., grazing). In order to analyze the impacts of development on this land, it is necessary to determine the percentages and acreages of the different land uses that will occur. From this type of analysis, it can be determined: (1) how much of the site will be covered by impervious surface, (2) how much will remain unaltered, (3) how much topsoil or soil mix may be required; and (4) what the potential visual impact of the site will be.

Table V-1 gives an approximation of percentages and acreages of land transformation. These figures are the best current estimates but may be subject to some change when the project plan is finalized and construction commences. The general character of the site will be residential with the golf course and the recreation/park complex as focal points. The amount of impervious space, which includes all paved surfaces, sidewalks, residential structures, commercial structures, schools, and golf clubhouse buildings, was estimated to be about 19.1% of the total project site or about 194 acres. This percentage may change upon the size determination of structures and parking areas for the recreational/park complex. The amount of pervious space will be substantial with 32.4% or 329 acres of the golf course, parks, recreation/park complex, nursery, buffers and open space areas; and another 44.8% or 455 acres of open space in residential, commercial, and school areas. Drainage ponds and reservoirs will account for 3.6% or 37 acres of the project. This acreage may also be regarded as open space.

Table V-1
Extent of Land Transformation

<u>Land Use</u>	<u>Pervious Surfaces Acreage</u>	<u>Impervious Surfaces Acreage</u>	<u>Percentage</u>
(1) Open Space Development			
Golf Course	185		18.2
Golf Clubhouse Facilities & Parking		2	0.2
Parks			
Community	35		3.4
Recreation Park Complex	51		5.0
Reservoirs	20		2.0
Golf Course Drainage Ponds	16		1.6
Nursery	7		0.7
Major Roadway			
Buffer	19		2.0
Pavement		29	2.8
General Open Space	<u>32</u>		<u>3.1</u>
Subtotal (1)	365	31	39.0
(2) Residential Development			
Residential Structures (including carports)		99	9.7
Paved Surfaces (minor roadways and driveways)		37	3.7
Sidewalks		17	1.7
Drainage Ponds	1		0.1
Open Space in Residential Areas	<u>429</u>		<u>42.2</u>
Subtotal (2)	430	153	57.4
(3) Village Center			
Covered Areas (buildings & pavement)		8	0.8
Open Areas	10		1.0
(4) Schools			
School 1 Structure		1	0.1
School 1 Open Space	9		0.9
School 2 Structure		1	0.1
School 2 Open Space	<u>7</u>		<u>0.7</u>
Subtotal (3) and (4)	26	10	3.6
 TOTAL (1015 Ac.)	 821	 194	 100.0

EXTENT OF EARTHWORK

The Waiale Project site will require extensive earthwork for the roads, building pads, and golf course. Presently, there is no definitive drainage pattern. The grading of the site will therefore improve its drainage capabilities. The golf course will serve as the primary drainage basin for the Waiale Project. This means that the two northern depressions must be enlarged and improved, and the two proposed southern drainage ponds must be created by mass grading procedures. This should not pose a problem due to the sandy composition of the soil. (See discussion on drainage). Grading will occur in the increments according to the project phasing plan as shown on Table V-2. This incremental grading schedule was developed from cross-sections taken for the project area and is a preliminary estimation of excavation and embankment quantities. In the first phase, which includes the golf course, there will be an excess of fill, which will be transported to other areas on the site in preparation for future earthwork. From this projection, it appears that overall there will be an excess of fill material although the amount of earthwork for Area 4 has not been determined.

Table V-2
Projected Earthwork for the Waiale Project

<u>Phasing Area</u>	<u>Excavation (CY)</u>	<u>Embankment (CY)</u>
1*	2,862,850	1,520,000
2	206,180	551,530
3	748,610	1,211,810
4**	---	---
5	724,900	1,200,830
6	111,110	144,440
7	<u>50,000</u>	<u>19,440</u>
Preliminary Total	4,703,650	4,648,050

* Includes golf course, low income apartments and residential.

** Grading plan not completed.

Due to the extreme permeability and lack of nutrients in the existing surface soil layer (sandy), the question of the importation of topsoil to the project site has arisen. Landscape architects at Belt, Collins and Associates, Ltd. have stated that in the Wailuku-Kahului area, the use of topsoil by home owners is not widespread. Instead, extensive fertilization and irrigation is the common practice of these Maui residents. The establishment of vegetation on this soil allows the root systems to retain some of the moisture, and the fast draining characteristics of this soil are good for most plants and ornamentals. Where a different composition of soil is desired, soil mix is combined with the existing soil to create a "sponge-like" quality of soil for greater moisture and nutrient retention capabilities.

It is anticipated that the only areas requiring soil mix will be on the tees and greens of the golf course. Parks and other open areas will be dependent upon fertilization and irrigation to achieve vegetative growth. Table V-3 is a summary of the potential amount of soil mix which will be required on the golf course tees and greens. The projected total amount is about 6000 cubic yards.

Table V-3
Golf Course/Soil Mix Requirements

<u>Use</u>	<u>Number</u>	<u>Area of Each Use</u>	<u>Total Area (SF)</u>	<u>Mix Depth (ft)</u>	<u>Mix Require. (CY)</u>
Tees	18	3200	57,600	0.5	1067
Greens	19	700	133,000	1.0	<u>4926</u>
Total					5993 or about 6000

REQUIRED ROAD CONSTRUCTION MATERIALS

Preliminary estimates can be made as to the amount of base course, asphalt cement, and concrete which will be used for major and minor roads, and sidewalks. the pavement widths for major roads, minor roads, and sidewalks are 42 feet, 28 feet, and 4 feet, respectively.

The composition of the major and minor roads will be 6 inches of base course covered by 2 inches of asphalt cement. The sidewalks will be on both sides of the roadways, and comprised of 4 inches of concrete. In addition, all roadways will have concrete curb-and-gutters on both sides, requiring 0.12 cubic yards of concrete per linear foot per side. On Table V-4 is a summary of the requirements for these materials.

Table V-4
Approximate Required Road Construction Materials (CY)

<u>Type</u>	<u>Total length (ft)</u>	<u>Base Course</u>	<u>Asphalt Cement</u>	<u>Concrete</u>
Major Roadway	31,600	23,400	7,770	7,580
Minor Roadway	57,600	29,900	9,920	13,820
Sidewalk	185,100	-	-	<u>2,260</u>
TOTALS		53,300	17,690	23,660

Water Resources

The impacts of the Waiale Project on the existing water resources in the area will be discussed in a qualitative manner. These impacts are: (1) increase runoff due to increases in impervious surfaces, (2) possible degradation of the basal ground water; and (3) potential impact on the ocean waters in the vicinity of Kahului Harbor.

Nearly 20% of the project site will be covered with some kind of impervious surface (roadways, buildings), which will increase the runoff tendencies of the area. This effect will be mitigated to some degree by landscaping, with the planting of grasses, ornamentals, and trees, which will have better moisture retention capabilities than the existing scrub vegetation. Also, in the event

of heavy rainfall, the golf course will contain four major drainage ponds which will feed runoff into injection wells. Should these ponds overflow, the golf course itself is designed to act as a ponding area. It should be pointed out that, at most, the Maui Isthmus experiences only 2 or 3 major storms which produce runoff during the entire year. The high permeability of the soil usually can accommodate any minor runoff.

The injection wells will be drilled and cased to a depth of 180 to 200 feet below mean sea level. The purpose of this is twofold. First, the runoff will be injected into the transitional zone below a layer of caprock which contains primarily brackish water and sea water. This will allow the runoff to diffuse throughout this layer, thereby killing whatever coliforms exist in the runoff. Then this runoff and brackish water will mix with the ocean at some distance from the shore, where the transitional zone meets the ocean. Secondly, the overlying caprock is relatively impermeable which means that the small freshwater lens above the caprock will be minimally effected by the runoff. This thin layer of freshwater is used primarily for irrigation and pineapple cannery industrial processes. All of the domestic quality water originates from the West Maui Mountains.

The increased fertilization and irrigation practices at the project site will cause some impact, by increasing the amount of nutrients percolating to the basal lens. It is felt that nitrates will cause the most concern because they are readily soluble and will be carried to the ocean. Potassium and phosphates are not expected to pose a problem because the former is found in high concentrations in the ocean, and the latter is insoluble and is fixed in the soil. It should be noted that although a portion of Kahului Harbor is classified Class A water, the measured concentrations of nutrients consistently exceed that classification. In addition, the application of both fertilization and irrigation will be considerably less than that of adjoining land under sugar cane cultivation.

Traffic Generation

The Waiale Project will cause a substantial increase in the traffic on the major highways and road corridors in the Wailuku-Kahului area. This is

understandable considering that at project completion, (1990 to 2001), there will be an additional + 3000 units of housing, and over 9900 new residents, who will be moving into the Waiale Project area. The average daily traffic (A.D.T.) and the peak hour traffic from the development will have the greatest impact on Kaahumanu Avenue, Kuihelani Avenue, Kamehameha Avenue and Papa Avenue. The development may have some affect to the traffic on Honoapiilani Highway, as there will also be an access way connecting that corridor to the development. However, the additional traffic impact to Honoapiilani Highway is expected to be minimal because those persons travelling to Wailuku or Kahului would prefer to use Kaahumanu Avenue, and those persons travelling to Kihei or Lahaina would prefer to use Kuihelani Highway, due to its higher speed and limited access.

The existing conditions on the aforementioned highway corridors, including the right-of-way and pavement widths, 1970 A.D.T., percentage of heavy-duty vehicles, hourly capacity, and adjustments to determine the estimated 1990 ADT and peak hour traffic were tabulated on Table V-5./1/

By using a desire model for traffic generation, volumes of ADT and peak hour traffic which will be generated by the Waiale Project were projected. The desire model was correlated with a dwelling-unit density model /2/ to justify the assumptions made in the first model. These projected volumes of traffic were then split by percentages over the various corridors. (See Appendix V-A.) Two different traffic split analyses were examined, based upon the minimum and maximum buildout schedules. These were then compared with the State of Hawaii projections for peak hour traffic growth, and with the capacity of each corridor. Note that if the maximum build-out schedule is followed, the impact at 1990 on the existing corridors will be less than the minimum build-out schedule. Other potential developments in the area were not included in this projection. Table V-6 shows that by 1990, traffic increases on Kaahumanu Avenue, Kamehameha Avenue, and Papa Avenue will surpass the State Department of Transportation growth projections. However, none of these corridors is projected to exceed its capacity.

- 1/ Companion Study-Maui County, Inventory of Highway Needs - Highway Functional Classification and Needs Study, 1970-1990; prepared by Belt, Collins & Associates, Ltd./Wilbur Smith & Associates for the Department of Transportation, Highways Division, Highway Planning Branch, State of Hawaii, 1971.
- 2/ Seibu Makena Master Plan Environmental Impact Statement, Neighbor Island Consultants: Hilo, Hawaii; July, 1974, p. V 24-29.

TABLE V-5 CORRIDOR ANALYSIS													
Corridor	Total* Pavement Width (ft)*	Road Pavement Width (ft)	Exist. ROW (ft)	Total ROW (ft)	1970 ADT.	% Trucks	(VPH) Hourly Capacity	June 1974 24-Hr. Ct.	Est. 1990 A.D.T.	% Est. Ann. Tr. Growth	Adj. 1990 A.D.T.**	Peak Hr. Peak Hr. (%)	Est. Peak Hour Count 1990
Honoapiilani Hwy. (Maikapu-Ma'iluku)	34	24	38	60	6,244	7	1000	5,325	12,928	3.5	9,232	10.6	979
Kaahumanu Avenue (Overpass to Kahului Beach Rd.)	58	48	125	125	18,791	3	3600	22,492	27,596	1.8	29,925	10.8	3232
Kaahumanu Avenue (Kahului Beach Rd. to Puunene Avenue)	58	48	123	123	20,836	4	3200	24,873	30,600	1.8	33,090	9.4	3110
Kuihelani Hwy. (Honoapiilani Hwy. to Puunene Avenue)	30	24	150-220	150-220	2,146 (1971)	8	1800	4,023	2,765	5.5	9,473	10.1	957
Kamehameha Avenue (Papa Avenue to Makea Avenue)	36	24	100	100	1,680	0	1200	-	2,240	1.3	-	10.1***	226
Papa Avenue (Kaahumanu Avenue to Kam Avenue)	36	24	72	72	2,100	0	1200	-	3,056	1.8	-	10.1***	309

* Includes paved shoulder.

** Adjusted ADT based on 1974 counts and Est. Avg. Annual Growth assuming that 1974 count is more indicative of the existing situation.

*** Estimated.

TABLE V-6

CONTRIBUTION OF WAIALE DEVELOPMENT TRAFFIC TO
FUTURE PEAK HOUR TRAFFIC PROJECTIONS AT 1990

Time Period	To Honoapiilani Highway			To Kaahumanu Avenue			To Kamehameha Avenue			To Kuihelani Highway			To Papa Avenue		
	Proj ¹	Min ²	Max ³	P	N	X	P	N	X	P	N	X	P	N	X
1977 Peak Hour	626			2,563			186			477			240		
1978 - 1980	69	0	0	100	46	46	8	46	46	72	27	27	13	18	18
1981 - 1985	130	45	23	214	370	178	15	155	99	177	89	46	37	224	140
1986 - 1990	154	67	22	233	218	192	17	154	56	231	81	43	29	139	84
1990 Peak Hour Totals	979	738	671	3,110	3,197	2,979	226	541	387	957	674	593	309	621	482
Peak Hour Capacity	1,000			3,600			1,200			1,800			1,200		

(1) P - projected from Inventory of Highway Needs - Highway Functional Classification and Needs Study; 1970-1990; prepared by Belt, Collins & Associates, Ltd./Wilbur Smith & Associates for the Department of Transportation, Highways Division, Highway Planning Branch, State of Hawaii, 1971.

(2) Min-N; Incremental traffic increase based upon minimum build-out schedule.

(3) Max-M; Incremental traffic increase based upon maximum build-out schedule.

Airborne Emissions

The Waiale Project will generate airborne emissions, which will be discussed here in two segments. First, during the construction period, airborne emissions will be created from heavy-duty construction and supply moving vehicles, removal of the grubbed material, and wind-blown dust from site preparation activity. Second, when the project has been completed, the passenger vehicles of the Waiale Project residents will be the primary generators of airborne emissions.

CONSTRUCTION PERIOD

The construction period of the Waiale Project will probably occur from 1978 to 1990, under the minimum build-out schedule or to 2001 under the maximum build-out schedule, as separate phases of the development are built. For this discussion, the minimum build-out schedule will be assumed because no post-1990 emission standards are available. Because the soil which predominates the site is loose and sandy, removal of existing scrub vegetation during site preparation activity may create dust problems due to the constantly windy conditions experienced in this area. To minimize this potential problem, the Maui County Grading Ordinance No. 816, Bill No. 14 (1975)/1/ recommends various precautions which might be adopted: limiting the area which may be grubbed or graded at one time, the cessation of grubbing or grading operations during high wind conditions, sprinkling water on graded or grubbed areas to minimize dust, and planting of grass or other ground cover (temporary or permanent). An erosion control program is also required by the grading ordinance.

In Maui County, no open burning is permitted unless the subsequent development of the land after the open burning is agriculture. This statute pertains primarily to sugar cane. Therefore, all of the grubbed material from the Waiale Project will be removed to the County of Maui landfill dump site, located west and south of the project area. The removal of the grubbed material must take place within three months of the displacement of the affected vegetation.

1/ "Ordinance No. 816, Bill No. 14 (1975)", County of Maui, 1975, p. 4.

During the construction phase of the project, heavy-duty vehicles will be used to transport fill material, construction equipment and building supplies, as well as for site preparation purposes. The number of trucks trips which will be required daily throughout the development of the Waiale Project has been estimated at 20 per day, that is 10 truck trips for earthwork and 10 truck trips for supplies. Table V-7 is an incremental emissions tabulation for heavy-duty, diesel-powered vehicles for the years 1980, 1985, and 1990. Each truck trip is estimated to be 5 miles.

Table V-7
Emission Factors for
Heavy-Duty Diesel-Powered Vehicles
By Calendar/1/ (MG/MI)

	<u>Carbon Monoxide</u>	<u>Hydrocarbon</u>	<u>Nitrogen Oxides</u>
1980	28.7	4.6	19.9
1985	28.7	4.6	20.3
1990	28.7	4.6	20.3

The emissions from heavy-duty vehicles will be minimal, compared to future automobile emissions, at 6.3 pounds of CO, 1 pound of HC, and 4.8 pounds of NO_x. It is assumed that these emission levels will hold fairly constant for the construction period.

1/ AP-42 - Supplement No. 5 for Compilation of Air Pollutant Emission Factors, Edition; U. S. Environmental Protection Agency, Office of Air and Waste Management, Office of Air Quality Planning and Standards; Research Triangle Park, North Carolina; December 1975, P. D. 5-2.

PROJECT COMPLETION

Based upon previous calculations, it was projected that there would be about 9930 full-time residents living in the project area at its completion. In 1975, there was a ratio of 0.66 vehicles per person./1/ Assuming that this ratio will hold true in the future, this means that there will be approximately 6620 vehicles generated from the completed Waiale Project. The total number of project generated vehicle trips per day was estimated to be 16,550. By dividing vehicle trips per day by total vehicles, it was determined that the Waiale Project will generate about 2.5 trips per vehicle per day. Assuming a 1990 project completion, the total number of cars was split by model year from 1977 - to - 1990, and then the trips per vehicle per day factor was applied to determine the trips per vehicle type per day. The distance for an average one-way trip was assumed to be five miles.

Table V-8 is a tabulation of exhaust emission factors for light-duty, gasoline-powered vehicles for the calendar year 1990. These figures show anticipated emissions of carbon monoxide, hydrocarbons, and nitrogen oxides for various year models of vehicles, which will be operating in 1990. Two factors should be observed. First, emissions for subsequent years decrease due to assumptions of improved technology and more severe emission standards. Second, this projection will be conservative if the project is not completed until after 1990.

Once the number of miles travelled per vehicle type per day was estimated, the pounds of emittants could be calculated. Using the 1990 project completion date resulted in an estimated 1130 pounds of carbon monoxide, 164 pounds of hydrocarbons and 200 pounds of nitrogen oxides being emitted daily as a result of the Waiale Project. (See Appendix V-B.)

1/ The State of Hawaii Data Book - 1975, Department of Planning and Economic Development, State of Hawaii, November 1975, p. 207.

Table V-8

Carbon Monoxide, Hydrocarbon, and Nitrogen Oxides Exhaust Emission Factors for Light-duty, Gasoline-powered Vehicles--excluding California--for Calendar Year 1990 (based on 1975 federal test procedure) (gm/mi). /1/*

<u>Model Year</u>	<u>Carbon Monoxide</u>	<u>Hydro-carbons</u>	<u>Nitrogen Oxides</u>
1977	18.0	3.0	2.6
1978	5.6	0.81	1.70
1979	5.6	0.81	1.70
1980	5.6	0.81	1.70
1981	5.3	0.76	1.50
1982	5.0	0.70	1.30
1983	4.8	0.65	1.10
1984	4.5	0.59	0.90
1985	4.2	0.54	0.73
1986	3.9	0.49	0.56
1987	3.6	0.43	0.40
1988	3.4	0.38	0.34
1989	3.1	0.32	0.29
1990	2.8	0.27	0.24

* To convert to pounds divided by 453.6 grams per pound.

It is important to determine the effect that these increased emissions will have on the ambient air, particularly at varying distances from each corridor that will be experiencing increased emission levels. Carbon monoxide levels are more frequently modeled, since CO remains relatively inert in the atmosphere for an appreciable length of time, and can be measured. A dispersion model by the U. S. Environmental Protection Agency was used in projecting levels of carbon monoxide which could be anticipated from Kaahumanu Avenue, Kuihelani Highway, Kamehameha Avenue, and Papa Avenue./2/ This model assumes a wind speed of 1 meter per second (about 2.2 miles per hour),

- 1/ Supplement No. 5 for Compilation of Air pollutant Emission Factors, Second Edition, U. S. Environmental Protection Agency, Research Triangle Park, North Carolina: December, 1975; Appendix D, pp. D.1-11.
- 2/ Guidelines for Air Quality Maintenance Planning and Analysis, Volume 9: Evaluating Indirect Sources, U. S. Environmental Protection Agency, Office of Air and Waste Management, Office of Air Quality Planning and Standard, Research Triangle Park, North Carolina, January 1975; and James W. Morrow, Director of Environmental Health, American Lung Association of Hawaii, letter 11/22/76. (See Section XIII.)

wind direction to the road of 10°, a Pasquill-Gifford Stability Class D, and fairly constant meteorological conditions during the peak traffic hour. Also, the composition of the traffic is assumed to be 88% light-duty vehicles 12% light duty trucks. This means that this model projects the "worst" case conditions. For each corridor, the sum of each traffic lane's contribution of CO determines the total CO concentration level which can be expected from that corridor during the peak traffic hour. All corridors were assumed to be free flowing.

The projections for the dispersion of CO were calculated for 1990, the minimum build-out schedule completion date of the Waiale Project. To show the effects of improved (more efficient) automotive power plant technology and more stringent emissions standards, a factor of 0.2 for 1990 was derived to be multiplied against the 1975 base line calculations./1/ Note that after 1990, emissions will increase again with increases in traffic because after 1990, the technology and standards are expected to have been maximized and emissions per vehicle will level off. The results of this analysis are shown on Table V-9. (See Appendix V-C for sample calculation.)

TABLE V-9
1990 Projected Dispersion of Carbon Monoxide - Worst Case for
Corridors Effected by the Waiale Project (PPM)

Distance from Corridor (m)	Kaahumanu Avenue	Kuihelani Highway	Honoapiilani Highway	Kamehameha Avenue	Papa Avenue
at R.O.W.	5.6	0.7	2.7	0.5	0.7
10	4.2	0.5	1.8	0.3	0.5
30	2.7	0.4	1.0	0.2	0.3
150	0.7	0.1	0.3	0.1	0.1

Tabulations show that approximation of CO levels were calculated at the edge of the corridor right-of-ways, and then at increasing distances from the right-of-ways. The 0.2 factor, used for the 1990 projections, reduced the concentra-

1/ Supplement No. 5 for Compilation of Air Pollutant Emission Factors, Second Edition (to AP-42); U. S. Environmental Protection Agency, Office of Air and Waste Management, Office of Air Quality Planning and Standards; Research Triangle Park, North Carolina; December 1975, Appendix D.

tions substantially from the projections which based upon 1974 data. The greatest impact on the ambient air will be from Kaahumanu Avenue, which will experience a large increase in traffic.

It should be noted that this is a "worst" case projection. In an average case, the wind on the Maui Isthmus is primarily from the north to east-northeast (54%), and the wind speed average between 4 to 16 knots, or 2 to 8 meters per second (66%).^{1/} Both of these factors will serve to diminish the actual average concentrations of carbon monoxide levels which are experienced due to traffic. Also winter concentrations of CO are expected to be higher than those in the summer, due to lower average wind speeds in the winter. The levels of CO are not expected to exceed the State Ambient Air Quality Standards for one hour of 10 mg/m³ or 8.4 ppm of CO (at 760 mm Hg, 25°C.), except possibly during abnormal wind conditions.

Noise Generation

Noise, which will be generated as a result of the Waiale Project, will emanate from two sources of activity. During the construction phase of the development from 1978 to project completion, noise as a result of construction activity will affect nearby areas. In addition, as the population of the project grows with each new increment, there will be increases in traffic noise accompanying increases in traffic volumes on the major corridors.

There has been some concern about noise from aircraft approaching runway 2 at Kahului Airport. This should not cause significant impact because aircraft are required by the FAA to fly a corridor between Wailuku and Wailuku Heights gradually descending from an altitude of 2500 feet/^{2/} (see Figure V-1). From an on-site inspection by Belt, Collins and Associates, Ltd., the overhead noise was determined to be unobstrusive.

1/ "Surface Wind Data - Kahului, Maui, Hawaii", FAA, WBAS: 1967.

2/ F.A.A., Kahului Airport Office.

CONSTRUCTION ACTIVITY

The primary source of noise during the construction of any project can be broken down by activity: (1) clearing, grubbing, demolition, other site preparation, (2) excavation, (3) placing foundations (4) frame erection, floors and roofs, walls and windows, and (5) finishing work and cleanup. The most obtrusive noise will occur during the first three phases of construction because of the necessity to employ heavy-duty, earth and material moving equipment. Figure V-2 shows various types of construction equipment and the respective noise levels which can be expected at 50 feet in dBA./1/ Due to the nature of the sandy soil on the project site, and the type of low-rise, single-family residential development, it is not likely that any impact equipment will be used on the project site. All building foundations are expected to be slab-on-grade.

However, at a distance of 50 feet, noise levels between 80 to 90 dBA can be expected from heavy-duty construction vehicles sound diminishes at a rate of 6 dBA per each doubling of distance on a direct transmission path from point sources of noise. This means that at a distance of 200 yards, the noise level from construction activity would decrease to a range of 58 to 68 dBA. This range of noise is considered intrusive, but tolerable. See Figure V-3. The level of noise which may be experienced is also dependent upon wind conditions, vegetation, buildings, topography, etc.

It should be noted that at the present time (1977), there are no comprehensive noise standards for Maui or the other Neighbor Islands. This type of legislation is at least three to four years away from being enacted./2/

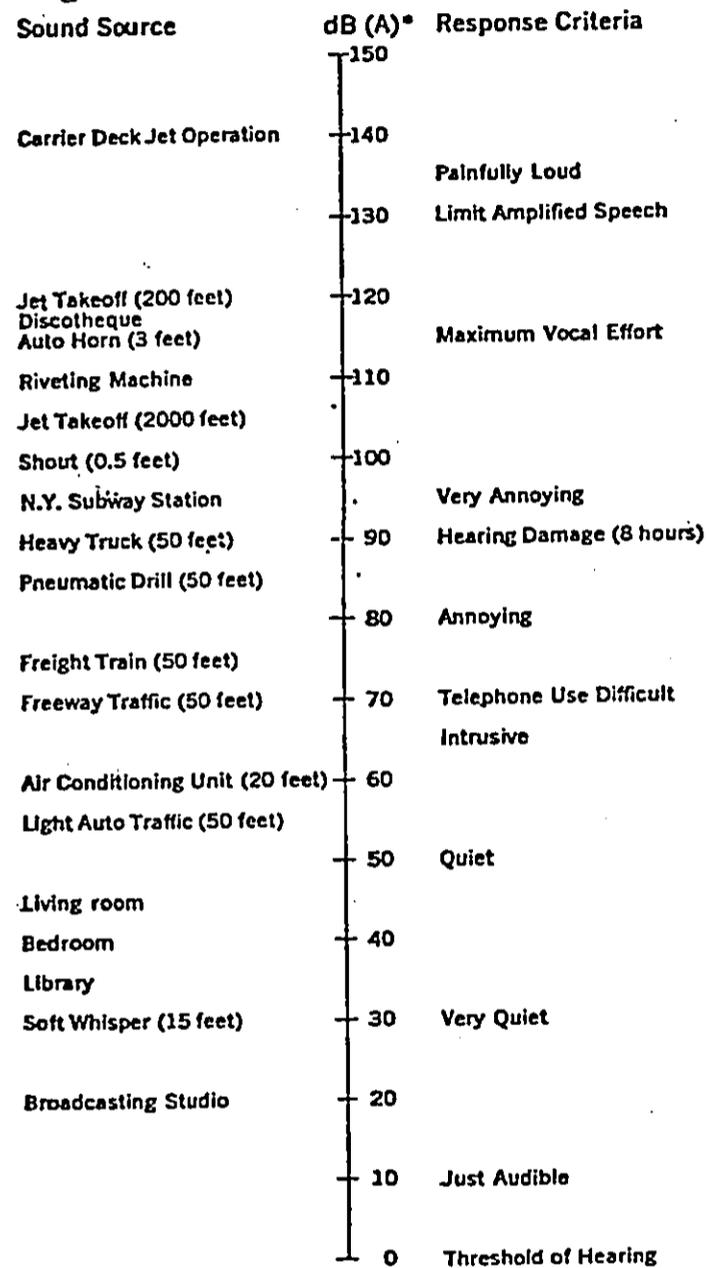
-
- 1/ dBA or A-weighted Sound Level - A quantity, in decibels, read from a standard sound-level meter that is switched to the weighting network labeled "A". The A-weighted network discriminates against the lower frequencies according to a relationship approximating the auditory sensitivity of the human ear at moderate sound levels. The A-weighted sound-level measures approximately the relative "noisiness" of "annoyance" of many common sounds.
 - 2/ Jerry Haruna; Noise and Radiation, State of Hawaii, Department of Health; discussion 11/16/76.

CONSTRUCTION EQUIPMENT NOISE - RANGES

		NOISE LEVEL (dBA) AT 50 FT.					
		60	70	80	90	100	110
EQUIPMENT POWERED BY INTERNAL COMBUSTION ENGINES	EARTH MOVING	COMPACTERS (ROLLERS)		H			
	FRONT LOADERS		-----				
	BACKHOES		-----				
	TRACTORS		-----				
	SCRAPERS, GRADERS			-----			
	PAVERS			H			
	TRUCKS			-----			
STATIONARY	MATERIALS HANDLING	CONCRETE MIXERS		-----			
	CONCRETE PUMPS			H			
	CRANES (MOVABLE)		-----				
	CRANES (DERRICK)			H			
IMPACT EQUIPMENT	PUMPS		H				
	GENERATORS		-----				
	COMPRESSORS		-----				
OTHER	PNEUMATIC WRENCHES			-----			
	JACK HAMMERS AND ROCK DRILLS			-----			
	PILE DRIVERS (PEAKS)				-----		
OTHER	VIBRATOR		-----				
	SAWS		-----				

NOTE: BASED ON LIMITED AVAILABLE DATA SAMPLES

Weighted Sound Levels and Human Response



*Typical A—Weighted sound levels taken with a sound-level meter and expressed as decibels on the scale. The "A" scale approximates the frequency response of the human ear.
Source: Department of Transportation.

TRAFFIC NOISE

Traffic generated noise will create the greatest impact to the surrounding communities over the long-run. The corridors, which will experience the greatest volumes of traffic (Kaahumanu Avenue, Kuihelani Highway, Honoapiilani Highway, Kamehameha Avenue, Papa Avenue), will also generate the greatest noise impact.

By using the cumulative peak hour traffic calculated for the previously mentioned corridors, and the method described in the National Cooperative Highway Research Program (NCHRP) Report 117 for projecting noise levels on highway corridors, the results on Table V-10 were obtained. (See Appendix V-D.)

From these calculations, Kaahumanu Avenue, Kuihelani Avenue, and Honoapiilani Highway will be the major sources of peak hour traffic noise. If the houses along those corridors are adversely affected, earthen or vegetative barriers may be implemented. Also, the elevations of the residential units with respect to the roadway elevations and distances of housing setbacks will also be major factors in the determination of potential noise impacts. Non-peak hour noise levels should be unobtrusive.

TABLE V-10
TRAFFIC NOISE COMPUTED FOR MAJOR
CORRIDORS AFFECTING THE WAIALE PROJECT - 1990 (dBA)/1/

Corridor Data	Kaahumanu Avenue	Kuihelani Hwy.	Honoapiilani Hwy.	Kamehameha Avenue	Papa Avenue
Traffic Speed (mph)	45	55	45	25	25
Autos/peak hour	3101	880	910	541	621
Trucks/peak hour	96	77	69	-	-
Highway width (ft)	48	24	24	24	24
<u>Distances of Noise Calculations</u>					
At 50 ft	78	78	78	64	65
100 ft	73	74	74	58	59
500 ft	61	60	58	46	47
1000 ft	55	53	53	41	42

1/ Highway Noise - A Design Guide for Highway Engineers, National Cooperative Highway Research Program Report (NCHRP) 117; Highway Research Board Division of Engineering, National Research Council, National Academy of Science-National Academy of Engineering; 1971.

Biological Impacts

IMPACT ON TERRESTRIAL PLANT LIFE

It has been determined that there are no rare or endangered plant species existing on the Waiale project site./1/ During the construction phase of the project, much of the scrub vegetation and weeds will be grubbed, and the land will be extensively developed. This means that grading for buildings, landscaping, and roads will change the entire vegetative nature of the site.

The existing vegetation will give way to increased fertilization and irrigation, and various types of turf grasses and lawn grasses will be grown on the golf course and residential areas. Trees will be spared if they are considered to have natural and visual value. Also, many ornamental plants can be expected near buildings, such as plumerias, bougainvillea, ginger, hibiscus, mock orange, etc.

Generally, the vegetation improvements to the site will enhance the visual aspects of this development and allow the area to be more usable for human habitation and recreation.

IMPACT ON TERRESTRIAL ANIMAL LIFE

The major concern voiced by the State Department of Land and Natural Resources, Division of Fish and Game, is the impact that the Waiale Project will have on the Waiale Reservoir./2/ Due to the fact that the reservoir is one of many in the central isthmus used by Hawaiian stilts for minor feeding (not nesting) during limited seasons of the year, the Department recommends that the reservoir be left intact. It also feels that it would be undesirable for development to encroach upon the reservoir, and that a buffer should be created between the residential housing and the reservoir using natural vegetation or fencing. In addition, precautions should be taken during the

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- 1/ Daniel T. Shigeta, County Extension Agent Chairman, Cooperative Extension Service - Maui County, letter 11/16/76 (See Section XIII.)
 - 2/ Ronald L. Walker, Chief, Wildlife Branch, Division of Fish and Game, State Department of Land and Natural Resources; letter 11/23/76. (See Section XIII.)

construction phase of the project to guard against the contamination of the reservoir by spoil materials or fossil fuels.

It should be noted, however, that the Waiale Reservoir is a man-made facility, whose primary function is the irrigation of sugar cane lands maintained by HC&S. As such, this facility requires periodic cleaning and dredging. In addition, future demands for more irrigation water may require additional dredging to increase the capacity of the reservoir. As indicated on the plan, there will be a park and open space buffer surrounding the reservoir which will lessen the impact on the existing bird life.

Other areas adjacent to the project site can accommodate existing on-site wildlife because all other mammals and birdlife are not considered endangered and are highly mobile. Many of these species will be attracted to return to the site after the construction phase, due to the improved vegetation and the additional man-made bodies of water for the golf course and drainage areas.

Archaeological Impacts

As stated in the previous discussion, it is not likely that the Waiale Project has much archaeological significance because past agricultural practices destroyed any ancient Hawaiian structures which may have existed on-site. However, fragments of human skeletal remains, flaked basalt, and a possible hammerstone were found on the project site. Therefore, the construction activity will be monitored to insure that any potential archaeological finds will be preserved for inspection by archaeologists.

Visual Character

The Waiale Project site can be characterized as dry. Monthly pan evaporation data exceeds monthly rainfall in every month; and the soil is of poor quality with low water retention capability. Therefore, most of the project site, with the exception of the area near the reservoir can only support very low value weed and scrub vegetation. Without irrigation and adequate rainfall most of this vegetation is "dried" out, and the general appearance of the site is dull brown.

The Waiale Project will change the visual appearance of the site in a number of ways: . removal of most of the existing vegetation; regrading many areas

for the golf course, drainage ponds, roads, and building pads; construction of buildings, streets, sidewalks, and lighting; and extensive landscaping. Before site preparation can commence, development areas will be stripped of the existing vegetation. Erosion will be avoided by using standard grading procedures as established in the Maui grading ordinance. Grading of the site will be on a project by project basis, although initial grading of the golf course and drainage areas will cover a large segment of the site.

The construction of roads and houses, with streetlighting and utilities, will give an appearance similar to the newer single-family residential development which exists to the east of the site. Some of these new houses and roads will be visible outside the project because they will be on the sloped areas of the site facing Kahului Harbor.

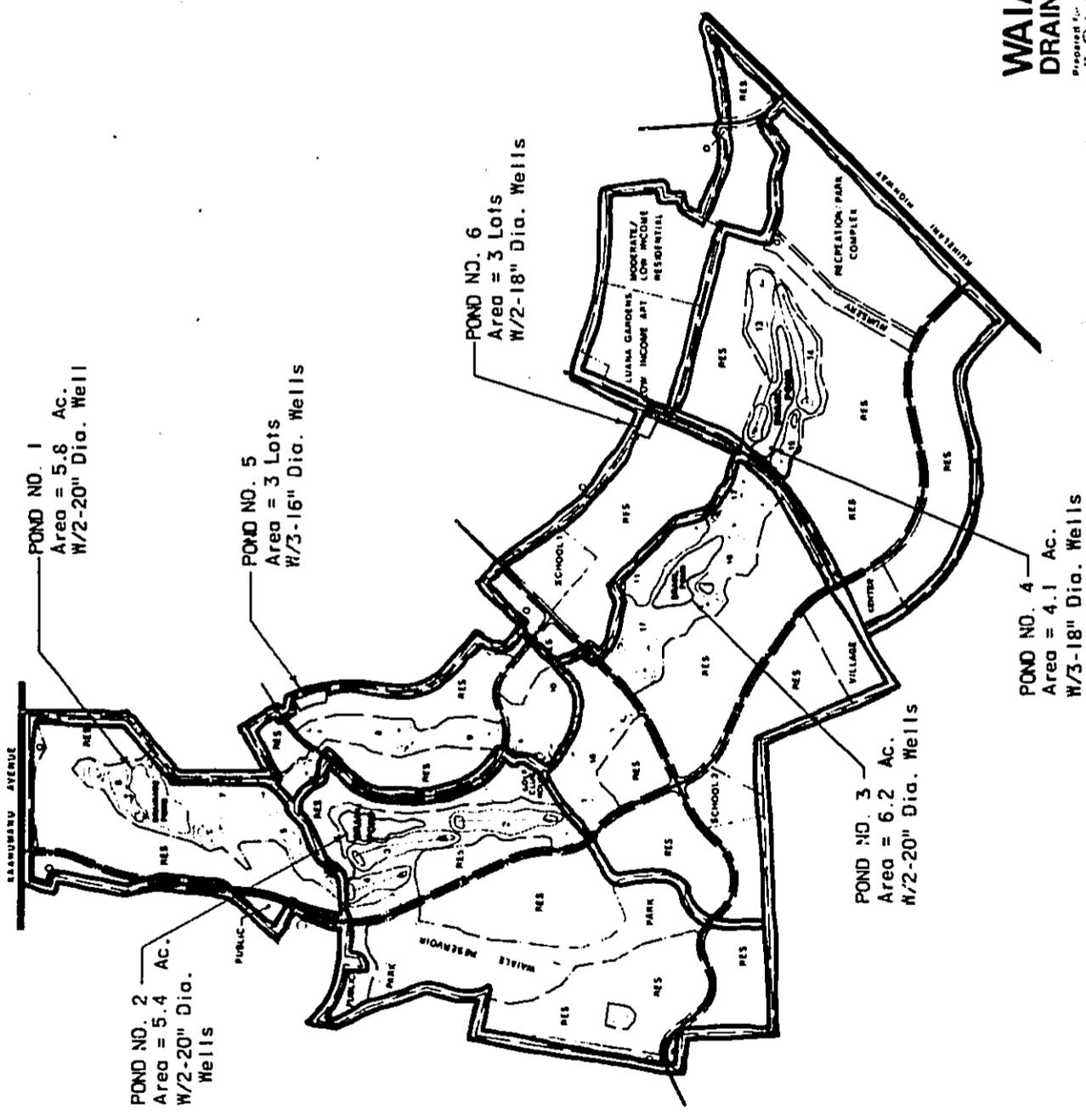
Landscaping will be used extensively throughout the project to create a better quality of life for the Waiale Project residents. This will be particularly true in the case of the golf course, which will form a green belt in the central portion of the development, and a focal point for outside visitors and residents. In addition, a tree-lined buffer will separate the existing Kahului development from the new Waiale homesites.

Infrastructure Requirements

DRAINAGE

The existing drainage system for Kahului was only designed to accommodate the runoff from the areas within the present urban boundaries. Essentially no runoff occurs from the project area at present, because the soil is comprised of sand. However, development of the site will increase the amount of impervious surfaces, and runoff will occur. Any additional runoff will have to be retained on-site or discharged by a new system to Kahului Harbor. The latter alternative is not considered to be feasible due to environmental concerns and prohibitive costs related to the construction of a new drainage system. It has been proposed that runoff be disposed on-site because there

REVISED
JAN 13, 1977



WAIALE PROJECT DRAINAGE PLAN

Prepared by
A&A PROPERTIES INC
BELT, COLLINS & ASSOCIATES, LTD.

OCTOBER 14, 1976

1

FIGURE V-4

are two large natural ground depressions on the project site, and because Kahului has been successful in operating a drainage ponding and infiltration well field for the past five years. Four major ponding and infiltration well fields are proposed within the golf course areas as shown on Figure V-4. The two northern ponding fields are located within natural ground depressions. The other two ponding fields will be created by the grading of the golf course and adjacent residential areas. The development plan, particularly the golf course plan, was predicted on this drainage concept. Flooding of the golf course may occur at the golf course ponding areas during major storms.

Runoff from smaller drainage areas within the project, directly above Kahului Town will be channeled to two ponding and infiltration well fields about the size of 3 lots each.

WATER SYSTEM

Table V-11 shows the average water demand in gallons per day (GPD) for the Waiale Project. The water system will be designed and constructed to the Maui County Department of Water Supply standards and will be dedicated to the County.

TABLE V-11
AVERAGE DAILY WATER DEMAND FOR THE WAIALE PROJECT

Land Use	Area (Ac.)	Unit Demand (GPD/Ac.)	Average Daily Demand (GPD)
Parks and buffers	57	1,000	57,000
Rec./Park Complex	51	4,500	230,000
Nursery	7	4,500	32,000
Schools and Public	27	3,000	81,000
Village Center	18	4,000	72,000
Residential (include all roads)	632	2,304*	1,456,000
Reservoirs	20	-	-
TOTAL	812		1,928,000
Golf Course**	203	4,500	914,000
GRAND TOTAL	1015		2,842,000

* 4.8 units acre x 150 gallons/person/day x 3.2 persons/unit.
** Supply for golf course may be independent.

The proposed water system, as shown on Figure V-5, consists of high elevation and low elevation service systems. The low elevation system will be an extension of the existing system, and will serve development up to an elevation of 200 feet. The high elevation system will serve all areas above the 200-foot elevation, and obtain its water from the proposed 36-inch Kihei water transmission line. The water system will be sized to accommodate the peak hourly fire flow demand plus 50% of the average daily water demand. Expansion of existing reservoirs will occur as required. Also, development of additional source capacity at either Mokuhou or Waihee will be required.^{1/} As an alternative, a booster pump station and an additional reservoir above the site could be constructed in order that the existing system could be used for high elevation service.

Irrigation water for the golf course will be obtained from on-site wells, or from the proposed extension of the County water system. The County water system will serve as a source of irrigation water for the project's parks, nursery and other open recreation areas.

SEWERAGE SYSTEM

Table V-12 shows the projected average daily sewage demand for the Waiale Project. The proposed sewerage system will be designed and constructed in conformance with the County of Maui Department of Public Works standards.

As discussed in the earlier section on infrastructure, the initial phases of the Waiale Project will make use of the existing Wailuku Wastewater Pump Station. When the capacity of this facility has been met, additional sewage will be diverted to the Kahului Wastewater Pump Station via either a new pump station and force main, or a new gravity sewer.

The proposed sewer system as shown on Figure V-6 will be implemented in three phases. The first phase consists of the installation of three

1/ Central Maui Water Study for the Development of Sources, Transmission Lines, and Storage Reservoirs; Norman Saito Engineering Consultants, Inc., CH₂M Hill Inc.; Stearns, Harold T. (Dr.); March 1974.

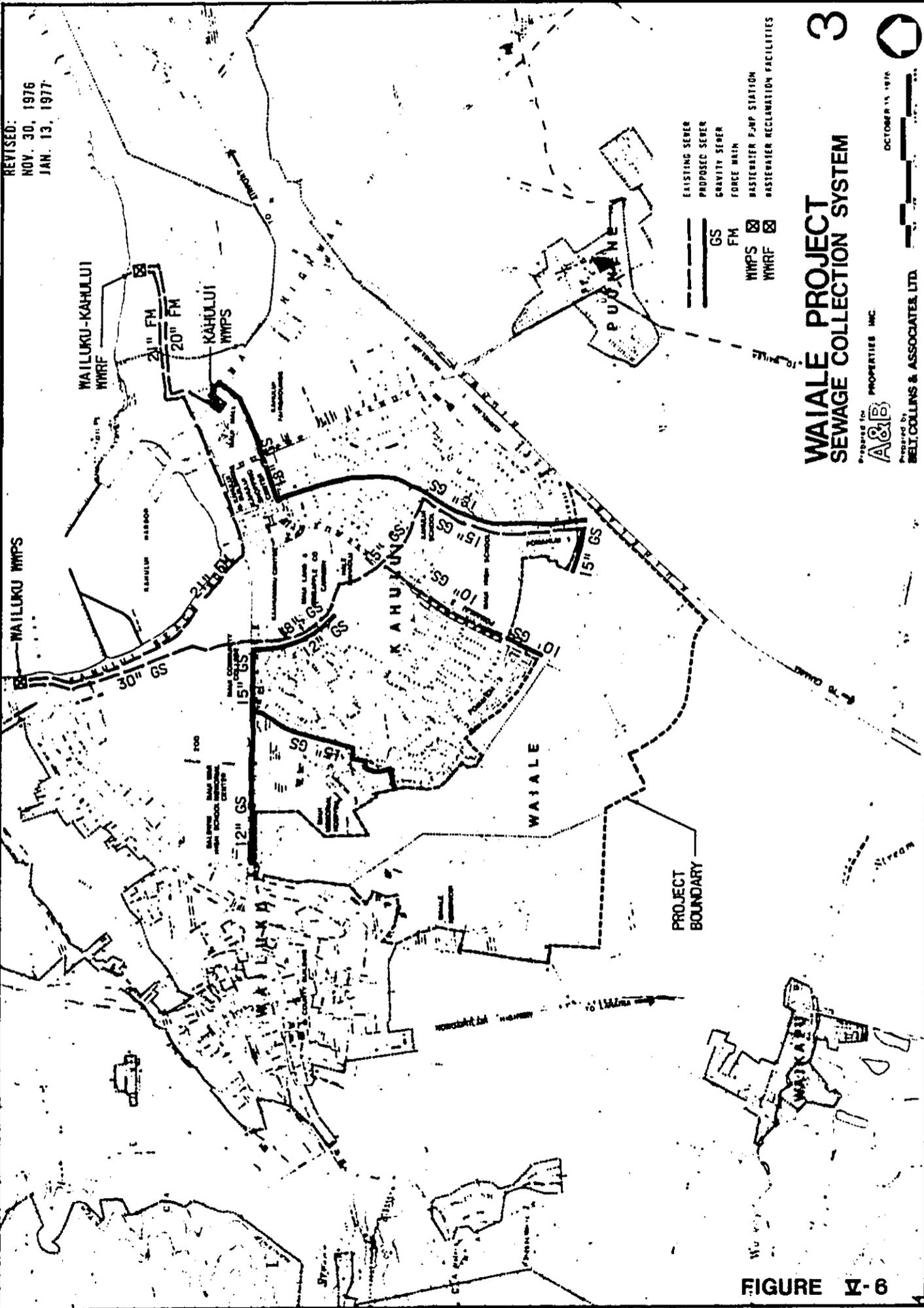
separate gravity relief sewer lines. A 12-inch sewer line, extending from Onehee Street to Kaahumanu Avenue, would intercept the sewage flows of the existing development west of Onehee Street and Wakea Avenue and allow the existing 18-inch sewer line along Wakea Avenue to accommodate sewage flows from the initial increments of the Waiale Project. A 10-inch sewer line along Kamehameha Avenue and a 15-inch sewer line to Lono Avenue from the project connecting to the existing line would be constructed for this purpose. All of the flows from these lines would eventually feed into the existing 30-inch gravity sewer line to the Wailuku Wastewater Pump Station.

Table V-12
Average Daily Sewage Demand for the Waiale Project

<u>Land Use</u>	<u>Area (Ac.)</u>	<u>Unit Demand (GPD/Ac.)</u>	<u>Average Daily Demand (GPD)</u>
Parks and Public	37	200	7,000
Rec./Park Complex	51	600	31,000
Nursery & Buffer	36	-	-
Schools	18	2500	45,000
Village Center	18	3000	54,000
Residential	632	1552	981,000
Reservoirs	20	-	-
Golf Course	<u>203</u>	-	<u>-</u>
TOTAL	1015		1,118,000

Schools = 1800 students x 25 gallons/student/day.

Residential Flow = 3065 units x 100 gallons/person/day x 3.2 persons/unit.



REVISED:
 NOV. 30, 1976
 JAN. 13, 1977

WAIALE PROJECT
SEWAGE COLLECTION SYSTEM **3**

PREPARED BY
A&B PROPERTIES INC.
 PREPARED BY
 BELT COLLINS & ASSOCIATES, LTD.

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 ENGINEERS
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OCTOBER 11, 1976

FIGURE K-6

The second phase of the proposed sewer system would be to construct a 15-inch gravity sewer line from the project along Papa and Kaahumanu Avenue to the existing 30-inch gravity sewer line. Subsequent development would require the installation of a 12-inch gravity sewer line along Kaahumanu Avenue to connect to the aforementioned 15-inch gravity sewer line.

The third phase of the proposed sewer system would be to construct an 18-inch gravity sewer line along Lono Avenue and the eastern portion of Kamehameha Avenue to the Kahului Pump Station.

ELECTRICAL/1/

It is felt that the existing electrical power system is sufficient to service the proposed Waiale Project. The total capacity of the Maui electric power system at present is approximately 85.9 megawatts (MW), which is the sum of the existing utility capacity (72.9 MW) and the contracted capacity (13 MW). The spare capacity is approximately 10.4 MW, which equals the total capacity minus the largest generating unit (71.4 MW) minus the existing estimated peak demand (61. MW). The projected maximum demand for the Waiale Development equals 5.4 MW. The following shows how the demand for the proposed project was derived.

1/ Tom Goya, Hawaiian Electric.

a) Typical Unit Monthly Electrical Consumption (Kilowatt hours)
month

Lighting	70
Refrigerator	150
Range	100
Hotwater	400
T.V.	35
Washer	10
Dryer	80
Dishwasher	30
Miscellaneous	25
Allowance	<u>100</u>
TOTAL	1,000 kwh-unit/month

b) Project Consumption

About 3,000 units (2,914)

$$(3000) \times (1000 \text{ kwh-unit/month}) = 3,000,000 \text{ kwh/month.}$$

c) Demand = $\frac{\text{Maximum Consumption}}{555 \text{ kwh/kw/month}}$

= $\frac{(3,000,000 \text{ kwh/month})}{5,405 \text{ kw/1000 kwh/month}}$

= 5.4 MW

Therefore, the existing system should be capable of accommodating the additional 5.4 MW demand from the Waiale Development. New lines, transformers, poles, switching stations, meters, etc., will be required.

SOCIO-ECONOMIC IMPACTS

Development of the proposed project will result in certain secondary impacts, many of which are socio-economic in nature. These include:

- o An increase in population within the Wailuku-Kahului urban area, as well as possible changes regarding the demographic characteristics of the area's population.
- o Creation of permanent employment opportunities within the community, together with construction-related employment during the duration of the project (currently estimated to be approximately 13 to 24 years).
- o An increase in Maui County's property tax base, and a corresponding increase in revenues accruing to the County.
- o An increased demand for public services, including educational, cultural and recreational facilities; police and fire protection; and provision of water, sewerage and solid waste disposal systems.
- o An increase in available housing stock for Central Maui, together with the elimination of present sub-standard housing, particularly within the existing plantation camps.

Population Changes

There have been a number of projections for population growth made for the County and Island of Maui. The Wailuku-Kahului General Plan, completed in October, 1972, indicated minimum and maximum projections for both the County and the island. In 1976, the State Department of Planning and Economic Development prepared a series of projections and adopted one of these (Series E-2) for agency use./1/ A comparison of these for the whole County is as follows:

1/ Hideto Kono, Director, Department of Planning and Economic Development, memorandum 5/5/76. (See Section XIII.)

	<u>1985</u>	<u>1990</u>	<u>1995</u>
G. P. (Minimum)	54,700	57,200	59,700
G. P. (Maximum)	62,600	66,900	71,800
DPED E-2	69,900	81,200	93,000

Note that even the maximum County projections contained in the General Plan Report are substantially exceeded by the E-2 projections. The County's most recent general plan study (Makawao-Pukalani-Kula) in December, 1974, contained updated population projections for the Island of Maui only. It is difficult to draw direct comparisons on a County-wide basis with the E-2 projections; however, comparison with the Wailuku-Kahului General Plan for the Island of Maui are as follows:

	<u>1985</u>	<u>1990</u>	<u>1995</u>
Wailuku-Kahului G.P. (Min)	45,200	47,100	49,000
Wailuku-Kahului G.P. (Max)	51,700	55,100	58,900
Makawao-Pukalani-Kula G.P.	57,030	62,966	69,519

The average household size within the present Wailuku-Kahului community is approximately 3.4 persons. It is reasonable to assume that the average household size within the Waiale Project may be reduced if current trends continue. Based upon 3.2 persons/household, approximately 9,900 residents can be anticipated within the project area, over the life of the project. Annually, the increase would be approximately 400 to 800 residents per year.

Based upon an analysis of current and future market trends carried out for the applicant, it is anticipated that the probable purchasers of Waiale lots will be young families who are permanent Maui residents. Their annual household income will be above \$18,000. For many, this will be a first-time home purchase, and assistance from parents or relatives may be required to meet down payment requirements.

It is not expected that the characteristics of the community will differ significantly from the present Kahului community, in terms of age and ethnicity. It is likely that both husband and wife will be employed, and that the average family will be in the middle and upper middle income range.

Employment Opportunities

Since the proposed project is almost exclusively oriented towards single-family residential use, permanent employment opportunities to be generated will be somewhat limited.

- o It is currently estimated that the proposed golf course would provide permanent employment for 25 people upon full development, not including clubhouse related employment. The proposed nursery would provide employment for approximately 11 people.
- o The village center facilities, clubhouse would provide additional employment opportunities. Since the exact nature of these facilities is unknown at this time, no employment estimates are currently available.
- o Employment opportunities within the construction industry would be generated throughout the period of project implementation, which is scheduled to occur on a long-range basis through 1990. Based upon current dollars, improvement costs associated with the proposed project are estimated as follows:

Golf Course and Clubhouse	\$ 2,500,000
Off-site Improvements	\$17,210,000
On-site Improvements	<u>\$25,380,000</u>
TOTAL CONSTRUCTION	\$45,090,000

These estimates do not include the cost of the actual homes to be built within the project, either by individual owners or as part of a total

development package. If we assume a relatively conservative figure of \$30,000 per dwelling, the estimated value of home construction within the project is approximately \$92 million, for a total of over \$137 million in improvement costs.

Assuming that direct labor costs constitute 20% of the total, approximately \$27 million in disposable income (wages to construction workers) will be generated through the project. When a multiplier effect of the infusion of capital into the community of this magnitude is considered, the economic benefits can be seen to be substantial.

Real Property Tax Revenues

Based upon existing tax legislation, housing costs based upon current dollars, and the County's existing real property tax rate of \$12.50 per \$1,000, it is estimated that approximately \$650,000 annually will be generated to the County of Maui upon full development of the Waiale project. This estimate does not include any anticipated revenue from Luana Gardens, which will probably be exempt from real property taxes.

Real property taxes are the County's single largest source of revenue, amounting to \$11,503,000 in 1976-77. Based upon the minimum projections, therefore, the completed Waiale project represents a potential increase of 5.7 over existing property tax revenues to the County of Maui.

Public Services and Facilities

The proposed project would have major impact in terms of elementary and intermediate school facilities, since it is projected that young families will make up a significant proportion of the residents. Upon full development, either two new elementary schools or possibly one elementary and one intermediate school, would be required to serve the population within the project. The final decision would depend on Department of Education policies regarding school organization./1/ Therefore, the applicant has provided two school sites, centrally located within the proposed project to meet the projected needs.

1/ Koichi H. Tokushige, Asst. Superintendent, Office of Business Services, Dept. of Education, letter 12/8/76. (See Section XIII.)

The proposed development would also generate the need for neighborhood recreational facilities as development occurs./1/ Such facilities would be provided in accordance with the subdivision requirements of the County. The proposed project plan also includes the provision of a site for a regional recreational complex of approximately 50 acres (detailed planning to be carried out by the County) and a golf course, open to the public and oriented towards local golfers. As indicated previously, there is a major need for an additional golf course to relieve the current demands at Waiehu.

It has been a long-standing policy of the applicant to work closely with the County of Maui to meet the recreational needs of the community. A major example is the dedication to the County of 55 acres of land in the heart of Kahului, presently developed as the Kahului Community Park. In developing the Waiale Project, the applicant intends to continue such a cooperative effort, oriented primarily towards the proposed golf course and the 50-acre major recreational complex site proposed near Kuihelani Highway.

In addition, other open space areas within the project, including a major community park, will be designated for active and passive recreational use. Police and fire protection will be provided by the County of Maui in accordance with its on-going program for public safety./2/

Sewer, water, drainage and power facilities would be provided by the developer in accordance with all applicable requirements. Relative to water, the applicant has entered into a joint venture with the County's Department of Water supply and other parties, to provide for the long-range needs of the Central Maui area for water source development and transmission.

Solid waste generated by the proposed project would be collected and disposed of by the County of Maui. The County of Maui presently leases 30.037 acres from Alexander and Baldwin, Inc. for operation of the Waikapu Sanitary Landfill. The landfill is located to the southwest of the project site. The lease to the County runs to February, 1990, although the site may not be adequate in size through that period. Some discussion regarding alternate landfill sites has taken place with the County.

1/ Howard K. Nakamura, Planning Consultant, memorandum 1/13/77. (See Section XIII.)

2/ ibid, memorandum 1/3/77. (See Section XIII.)

Increase in Housing Stock

The Wailuku-Kahului General Plan study projected a minimum of 7,420 and a maximum of 9,280 housing units to meet the needs of the study area by 1990-95. In 1970, existing housing units were estimated to be 5,422. MEO's 1975 Census Update indicated that the comparable figure for 1975 was 5,822. Based upon the Wailuku-Kahului General Plan, therefore, a minimum of 1,598 and a maximum of 3,458 housing units would be required to meet projected needs.

In addition, these figures do not include replacement housing for the phase-out of substandard plantation housing (approximately 350 units), nor do they reflect the desires of a limited portion of the area's population which seeks to upgrade its current housing standard.

In anticipating future housing demands, the market survey conducted for the applicant projected that 10,385 additional primary housing units, or 692 units per year, would be required within the County of Maui through 1990.

Based upon the applicant's proposed timetable, between 1900 and 3000 units, representing 18% to 29% of the projected county-wide demand, would be provided by the Waiale Project by 1990. This appears to be reasonable, considering that Waiale is a desirable location and its developer has both the land and financial resources to undertake a major housing project.

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100

VI
PROBABLE ADVERSE ENVIRONMENTAL
EFFECTS WHICH CANNOT BE AVOIDED

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100

VI PROBABLE ADVERSE ENVIRONMENTAL EFFECTS WHICH CANNOT BE AVOIDED

The following discussion is a brief summarization of the adverse environmental effects which may be generated by the Waiale Project. These adverse effects will be divided into two portions, that is, during the construction phase and at project completion. For a more in-depth discussion of these impacts, refer to Section V.

CONSTRUCTION PHASE

The construction phase will increase the traffic both on- and off-site, as a result of construction vehicles moving supplies, men, equipment, and waste material. As a direct result of this traffic increase, emissions of airborne pollutants and noise will also increase.

The actual site preparation will result in the removal of existing ground cover, which in turn may cause some problems of dust and erosion. Additionally, the existing flora and fauna will be disturbed. To create a site drainage pattern, existing contours and elevations in some areas will be changed. Noise will be generated by equipment on-site during the site preparation and the construction phase.

PROJECT COMPLETION

At project completion there will be a number of physical impacts. Additional traffic will be generated from residents, visitors, and people who wish to use the golf course and other recreational areas. Again, airborne emissions and noise will accompany the traffic increase. Run-off will be increased due to an increase in impervious surface area. The general area will change visually from undeveloped to a residential development.

There will be a substantial increase in population. This in turn will create additional demands on roads, water, sewer, electricity, and other

associated infrastructure requirements. From a social standpoint, there will be an increase demand for public facilities and services such as schools, recreation, solid waste collection, telephone service, police and fire protection. There will also be a need for an expanded employment base in all sectors to support the increase in population.

VII
ALTERNATIVES TO THE PROPOSED ACTION

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VII ALTERNATIVES TO THE PROPOSED ACTION

There are five alternative uses of the land, other than the proposed project, which have been considered. These include the following:

- o Leave the land basically in the use existing today (low intensity grazing on the bulk of the lands; some intensive agricultural use on the remainder, particularly the raising of passion fruit).
- o Develop the area for cultivation of sugar cane or other intensive agricultural usage.
- o Develop the area as proposed in the current Wailuku-Kahului General Plan (270 acre Project District, with the remainder in Open Space).
- o Develop a smaller area adjacent to existing development in Kahului (including Luana Gardens).
- o Sell various portions of the property to other parties for development.

Before the various alternatives can be discussed, it is necessary to review the policies and directions of the County of Maui, primarily as they relate to residential and agricultural development.

The Wailuku-Kahului General Plan, adopted by the County of Maui on July 6, 1973, states as follows:

"Presently, Wailuku can be considered the civic, financial and cultural hub of the County, while Kahului has developed as the major commercial, transportation and industrial center on the island. Viewed together, the Wailuku-Kahului area is the one dominant center of the County of Maui and will have no competition for this role in the future."

Therefore, it is necessary that residential development be conveniently located with respect to existing residential areas, possess the amenities for a healthy community, and have available utilities and services to meet increasing needs.

The future employment base at the major resort areas of Lahaina-Kaanapali and Kihei-Wailea will expand because of the continued growth of the visitor industry. These jobs will be filled by Maui residents, which in turn will create a demand for additional housing. Housing development near major resort areas is not likely to occur because of the high cost of land near resort areas.

The Wailuku-Kahului area, as indicated in the Wailuku-Kahului General Plan, is the logical location to be developed to meet the increasing needs of the community.

Other areas which may be considered include Makawao-Pukalani and smaller satellite communities in areas such as Lower Paia and Waihee.

Recently, the County of Maui adopted the Makawao-Pukalani-Kula General Plan. This Plan indicates that the study area should be basically rural in orientation, with major emphasis on diversified agriculture and low-density residential uses. Residential uses are recommended to be centralized in "country towns", primarily the existing communities of Pukalani and Makawao. Through 1995, the Plan projects a minimum population of 10,500 and a maximum population of 11,800 within the study area. This can be compared to the 1975 estimate of between 7,000 and 7,500, and indicates a maximum population growth in the study area of between 3,500 to 4,300.

The philosophy of smaller satellite communities, such as proposed at Lower Paia and Waihee, also emphasizes that these communities should be relatively small in size, accommodating between 1,500 to 2,500 persons.

Based upon these general policies dealing with residential development on the island of Maui, it would appear that the Wailuku-Kahului area is logically where major expansion for local residential uses should occur.

In dealing with agriculture, particularly diversified agriculture, the Makawao-Kula-Pukalani General Plan also provides significant insights into the County's policies relative to this subject. The Plan provides for the enhancement and protection of present and future agricultural lands within the study area, and seeks to discourage scattered residential development and land speculation which would threaten the existence of agriculture. The Plan further acknowledges that the major emphasis for diversified agriculture should occur in the lower Kula and Omaopio areas, where the County of Maui is presently in the process of planning for a major agricultural park project.

As these policies are implemented, it is clear that the Kula area will remain as the major center of diversified agriculture in the County of Maui, and perhaps in the State of Hawaii. Although the recent trend has been for the abandonment of small farms and the subsequent subdivision of these lands, the County of Maui is making an aggressive effort to reverse this trend to maintain diversified agriculture as a major component of Maui's future economy.

Studies conducted in conjunction with the Makawao-Kula-Pukalani General Plan and the preliminary study for the Kula Agricultural Park, indicate that the Kula area is the logical place for such emphasis on diversified agriculture, and that major development of this type should not occur in other areas of the island, particularly in view of the limited market for agricultural products in Hawaii.

As a result, the remaining agricultural uses which can be considered for the subject lands include the cultivation of sugar cane and low-intensity grazing.

In its present state, the land is not suitable for significant livestock grazing. The pasture rating is 30 acres per animal unit year. The land does not support adequate vegetative growth, due primarily to the sandy soil and the lack of rainfall. The terrain is uneven and hilly. Other than

isolated small ranching operations which utilize portions of the area on an intermittent basis, there has been little interest expressed for livestock raising.

In the light of this discussion, then, we will examine the various alternatives considered.

- o Leave the land in its present use

This alternative has several drawbacks associated with it. First, the existing use is a very uneconomic use of the land, both from public and private standpoint. Only a small percentage of the land is used in such a way as to benefit the community, including the 167 acres in passion fruit. The remainder of the land is used only marginally. The carrying capacity for cattle raising is very low. Annual revenues accruing to the property owner as a result of existing leases are estimated to be \$29,280 annually; property taxes paid to the State of Hawaii and to the County of Maui for the subject acreage are estimated to be \$38,395. As can be seen, the landowner is paying more in taxes than it is receiving in revenue.

Second, leaving the land in its present state would mean that the increasing demand for residential development would have to be accommodated elsewhere, possibly adversely affecting lands better suited for other uses including agriculture. Major development in other areas may not be as compatible, taking into account the desires of potential residents; the accessibility of educational, recreational, cultural and other similar amenities; and the existence of adequate utilities to accommodate growth.

As a result, the needs of Maui's residents for housing may not be adequately met, both on a short-term and long-term basis.

- o Develop the area for intensive agricultural uses, including sugar cane

In evaluating the possibilities for intensive agricultural use of the subject property, particular attention was paid to the cultivation of sugar and horticultural crops.

Relative to cultivation of sugar cane, the attached communication from Mr. William S. Haines, Manager of Hawaiian Commercial and Sugar Company, indicates the following:/1/

- Although the soil is relatively poor and not considered prime agricultural land, sugar cane could probably be cultivated through the use of drip irrigation.
- Expansion into the area by Hawaiian Commercial and Sugar Company is not part of the company's long range plans. The capital cost involved in developing irrigation water and the drip irrigation system required for this particular site is a major limiting factor.
- Other lands more suitable for expansion are available to Hawaiian Commercial and Sugar Company, and are being put into production as adequate irrigation water is made available.

It should also be noted that Hawaii's sugar industry is currently undergoing other well-publicized problems, and major increases in sugar production are extremely unlikely at this time.

The raising of horticultural crops in the Waiale area was evaluated by Mr. Daniel T. Shigeta, Agricultural Extension Agent for the County of Maui./2/ Problems cited in growing diversified crops are as follows:

- Low available water capacity of 0.7 inches per foot (Kula soils have a capacity of 1.8 inches per foot). Shallow rooted crops must be irrigated daily. Drainage is excessive.
- Very high pH (7.8 to 8.3). Most horticultural crops grow best in pH of 6.5
- Minor element deficiencies, especially iron, zinc and magnesium. This causes poor growth and greatly reduced yields.

1/ W. S. Haines, Manager, Hawaiian Commercial and Sugar Company, letter 11/23/76. (See Section XIII.)

2/ Daniel T. Shigeta, Agricultural Extension Agent, County of Maui, memorandum. (See Section XIII.)

- Warm temperature and strong winds. These factors increase loss of water to evaporation and plant transpiration. More water must be applied to overcome this loss.
- Lack of organic matter in the soil. This is related to soil moisture, texture and fertility.

In order to grow quality crops, substantial improvements and agricultural practices would be required. These include:

- Addition of 6 to 10 tons of manure or compost per acre. This will improve moisture and mineral retention in the soil.
- Regular applications of minor element fertilizers to the plants or to the soil.
- Drip irrigation for maximum utilization of water.
- Growing or constructing of windbreaks to protect the crops.

The present passion fruit crop yield is considered to be very low. It is unlikely that these yields would sustain a viable commercial operation. However, since R. J. Reynolds Foods cultivates the passion fruit exclusively for its own use in order to insure a stable supply for processing, the situation differs substantially from that which would be encountered by an independent farmer seeking to cultivate the product. The economic consideration becomes somewhat less important under the existing situation.

In summary, although a variety of agricultural crops could probably be grown on the site, given sufficient irrigation, soil preparation and crop protection, it is very unlikely that such activities could be sustained over a period of time on an economically viable basis.

- o Develop the area as proposed in the current Wailuku-Kahului General Plan

Subsequent to the adoption of the present Wailuku-Kahului General Plan, the applicant gave serious consideration to proceeding with a development program in accordance with the standards established for Project District II. Preliminary plans were prepared and evaluated, particularly concerning the economic feasibility of proceeding with the project.

It was determined that the cost of development, particularly relating to on and off-site improvements, were such that the project could not be economically justified, considering the number of lots which would be permitted.

There was a further problem, which related to utilization of the areas designated as "Open Space." The Wailuku-Kahului General Plan envisioned this open space as a means of maintaining a buffer between the communities of Wailuku and Kahului, and to prevent the physical joining of the two towns. However, the Plan did not specify what type of usage would be desirable for this open space. In discussing this matter with County officials, it became apparent that provision of a golf course between Wailuku and Kahului would provide significant benefits to the community. A golf course, in addition to serving as an open space buffer as envisioned in the Plan, would further serve to alleviate the heavy demands placed upon the County's Waiehu Golf Course by both residents and visitors.

The number of rounds played monthly at Waiehu Golf Course is consistently heavy, currently averaging over 200 rounds daily (annual average). During months of particularly heavy play, the daily average exceeded 260 rounds in February 1976 and 250 rounds in November 1976. (See Appendix VII-A.)

The need for additional golf facilities to serve the public is apparent. Provision of such a facility within the Waiale development, however, does compound the problem of proceeding with an economically viable project.

It is the desire of the applicant that development costs associated with the Waiale Project be kept to a reasonable level. It is recognized that much of the demand will be generated by local families, in contrast to the visitor-oriented market which exists in Kihei-Wailea. Therefore, it is believed that development in accordance with the existing Wailuku-Kahului General Plan, particularly with the inclusion of a golf course, could not be reasonably undertaken in light of the following:

- The unfavorable economics of the project, based upon the limited acreage and concurrently, the limited number of houselots, and the high cost of providing utilities to a somewhat isolated location. It is estimated that lot prices would have to be in excess of \$5.00 per square foot (1975 prices), in order to make the project viable.
 - Anticipated needs for houselots in the Central Maui area were anticipated to be in excess of that projected in 1972 by the Wailuku-Kahului General Plan.
- o Develop a smaller area adjacent to existing development in Kahului (including Luana Gardens)

This alternative would involve basically "filling in" areas of Kahului, where the existing roadways and utilities could accommodate development. This alternative, however, was deemed undesirable in that:

- There would be limited housing opportunities for many Maui residents, particularly those who would not fall within the eligibility requirements for Luana Gardens.
- It is unlikely that the golf course, which is a much needed recreational amenity for Central Maui, could be included within the project scope.
- Residential opportunities would be limited solely to Kahului, in contrast to the County's desire to also encourage growth in the Wailuku area.

- o Sell various portions of the property to other parties for development

This alternative, which has not been seriously considered by the applicant, will be discussed only briefly.

Selling off the property to third-party developers would probably result in a project which is uncoordinated and lacking in harmony. Design opportunities would be limited, together with the possibility of major amenities such as a golf course. It is unlikely that the County's objective of encouraging "flexible and creative design of large parcels of land under single ownership" could be achieved.

The applicant believes that quality development can best be achieved through the implementation of a long-range plan carried out by responsible parties with a direct, long-term interest in the community. Since A&B has been successful in the residential development business for 30 years and desires to continue these operations, selling property to other parties would defeat this objective.

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VIII

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

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

In this section, trade-offs between the existing short-term uses of the Waiale Project site versus the consequences of the proposed development, especially the commitment of this area to a particular land use, will be dealt with.

CONTINUED GRAZING OR ALTERNATIVE AGRICULTURAL USE VERSUS RESIDENTIAL DEVELOPMENT

The Waiale Project site is presently inaccessible to the general public behind a locked gate on the western boundary, an earthen mound near Maui Memorial Hospital on the eastern boundary, and an obscured entranceway from Kuihelani Highway. Most of the land remains in its natural state; minimal grazing and cultivation of passion fruit (Passion Acres) are the major land uses.

The agricultural potential of the soil which predominates the site is poor. The development of any agriculture would require extensive grubbing, an inordinate amount of soil preparation, development of a water source including an irrigation system, acquisition of fertilizers, seed, and machinery, construction of agriculture related structures, and employing agriculture specialists. Considering the low quality of the existing soil, the development of agriculture at the project site is not considered to be an economically sound proposition.

The implementation of the proposed Waiale Project is pending an approval by the County of Maui for A&B Properties to upgrade the project site to residential use. This will be a major commitment of this land and its resources to development, since land is rarely downgraded once it is redesignated for urban use.

This project will change the physical nature of the site through grading, grubbing, construction, and landscaping. In addition, the entire area will become readily accessible to all residents of Maui, and will contain visual and recreational amenities, such as the proposed golf course and the recreational/park complex.

HOUSING, POPULATION AND ECONOMICS

If the Waiale Project grows to its fullest potential, the impact to the Wailuku-Kahului area will be substantial. The postal vacancy rates from 1967 to 1976 show that percentage of available housing units has been below 3%, although the housing inventory has been gradually increasing./1/ The Waiale Project will add more than 3000 new housing units at completion, including 290 units of low income housing before 1980. This will increase the residential housing inventory in the Wailuku-Kahului area by presenting the people who live in older residences with the opportunity to move to the Waiale Project, leaving their former houses available on the market. There will also be ample opportunity for an incoming or a new family to obtain a new home in the Waiale Project.

The Waiale Project will contain 9,900 residents at completion, which will be a considerable increase over the existing population of this urban area. This increase of population will require a proportional increase in services, and infrastructure provided by the County of Maui, State of Hawaii, and Federal governments. To support this population also means that additional employment must be available.

The economy of this area will be stimulated both directly and indirectly. The direct purchases of good, services, and food supplies will stimulate the trade industry, and the commercial sector will benefit. The various governments will accrue revenue from taxes on wholesale and retail sales, and from land and building taxes. As a result of this economic stimulation, additional indirect employment opportunities may arise.

1/ The State of Hawaii Data Book, 1976, Department of Planning and Economic Development; Honolulu, Hawaii; November, 1976; p. 263.

With the advent of increased population and economy, various environmental effects will be incurred, some of which may be detrimental. These effects and their mitigating measures are discussed in other sections. However, generally, it is felt that this area is appropriate for the type of residential/recreational development which the Waiale Project proposes.

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IX

MITIGATION MEASURES PROPOSED TO MINIMIZE IMPACTS

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IX MITIGATION MEASURES PROPOSED TO MINIMIZE IMPACTS

This section is a brief summary of mitigation measures and justifications of actions presented in Section V. It is felt that the proposed residential housing development is the best use of the site area in light of discussions presented in this document.

In the construction phase of the Waiale Project, all laws pertaining to the mitigation of any adverse impacts, that is, erosion, dust generation, noise, air pollution, water pollution, and solid waste will be abided by. This includes all County of Maui statutes related to grading, building, fire, plumbing and electrical considerations. The State of Hawaii Department of Health has set standards for water quality, water pollution, air quality, and is presently preparing statewide noise standards.

The developers, planners, and engineers are preparing thorough studies and design to insure that there is adequate drainage, sewerage, water, and related infrastructure on the project site. Traffic, noise generation, and visual impacts from the completed project are not expected to cause any large-scale detrimental effects on the surrounding environment, due to the project's predominant single-family residential nature. It has also been shown that the project will not generate enough traffic to exceed the design capacities of any of the nearby corridors. Generally, the visual character of the project site will be enhanced by the golf course and landscaping which will occur. Foliage, setback distances, and grading will mitigate much of the noise generated from traffic.

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X

IRREVERSIBLE AND IRRETRIEVABLE COMMITMENTS
OF RESOURCES IF THE PROPOSED PROJECT IS IMPLEMENTED

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X IRREVERSIBLE AND IRRETRIEVABLE COMMITMENTS OF RESOURCES IF
THE PROPOSED PROJECT IS IMPLEMENTED

The primary irreversible and irretrievable commitment of resources is that of the project site undergoing change from an undeveloped and basically unused parcel of land to a suburban, single-family residential area with recreational amenities. When an area is developed for more intensive usage, it is rare for that land to ever be downzoned, due to development and an increased valuation of the land. However, as stated previously, this site's agricultural potential is low, and its proximity to the existing urban developments of Wailuku and Kahului warrants full consideration as the logical area for urban expansion.

In addition, there are the obvious irretrievable expenditures of materials, which includes vegetation to be removed and construction materials; time used by the workers for construction of the project; and labor in planning design, engineering, and construction. Related to the previously discussed topics is the long-term commitment of funds. These commitments of resources can be expected in any type of building development.

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XI

AN INDICATION OF WHAT OTHER INTERESTS AND CONSIDERATIONS
OF GOVERNMENTAL POLICIES ARE THOUGHT TO OFFSET THE ADVERSE
ENVIRONMENTAL EFFECTS OF THE PROPOSED ACTION

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XI AN INDICATION OF WHAT OTHER INTERESTS AND CONSIDERATIONS OF GOVERNMENTAL POLICIES ARE THOUGHT TO OFFSET THE ADVERSE ENVIRONMENTAL EFFECTS OF THE PROPOSED ACTION

Although the proposed project will cause certain associated physical, social and environmental impacts, many of these can be mitigated by measures discussed in Section IX.

However, it is apparent that all impacts cannot be completely eliminated or mitigated. Despite this, it is believed that the benefits of the project significantly outweigh disadvantageous environmental effects, and that the project is generally consistent with the growth policies of the County and State. Some of the major considerations are as follows:

- o The proposed project would provide for urban growth to occur on lands which are not well-suited for agriculture. The lands carry an overall productivity rating of "E" (lowest on the scale), primarily due to the low water capacity, high pH, lack of nutrients and low organic matter content. It is generally consistent with the policies of both the State and County to encourage urban development on lands of this nature.
- o The proposed project is adjacent to, and represents a logical extension of, the Wailuku-Kahului urban area. It would not contribute to, and would in fact discourage, the scatterization of urban development on the island of Maui.
- o Urban development would be encouraged in an area where services, facilities and amenities either already exist, or can be readily provided. These include water and sewerage systems, police and fire protection, recreational facilities, educational institutions (including the Maui Community College) and commercial and other service centers.

- o The proposed project is conveniently located with respect to major employment centers on the island of Maui, particularly Wailuku-Kahului and Kihei-Wailea. It is also anticipated that some of the area's potential residents will be employed in Maui's third major employment center, Lahaina-Kaanapali.

- o The proposed project would make home sites available for Maui's growing population, many of whom prefer to live in the Central Maui area. The Luana Gardens project will provide the opportunity for low-income families presently residing in sub-standard dwellings to obtain safe, decent and healthy housing. A significant number of the sub-standard dwellings in the area are presently located within the remaining plantation camps owned by Hawaiian Commercial and Sugar Company.

- o As the proposed project will be more closely oriented to the town of Wailuku, it is probable that some impetus will be provided to the upgrading of downtown Wailuku. Since the County is no longer seeking major federal funding for Wailuku redevelopment, private projects such as Waiale, can provide some assistance in stimulating economic advances, particularly in commercial areas.

XII
ORGANIZATIONS AND PERSONS CONSULTED

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100

XII ORGANIZATIONS AND PERSONS CONSULTED

FEDERAL GOVERNMENT

Donald Matsumoto, County Supervisor, Farmers Home Administration,
Department of Agriculture

Robert Delzell, District Conservationist, Soil Conservation Service,
Dept. of Agriculture

Ernest Robello, Soil Conservation Service, Dept. of Agriculture

STATE OF HAWAII

Daniel T. Shigeta, County Extension Agent Chairman, Cooperative
Extension Service, University of Hawaii

Ronald L. Walker, Chief, Wildlife Branch, Dept. of Land and
Natural Resources

Joseph Medeiros, Maui District Wildlife Biologist, Dept of Land
and Natural Resources

Wesley Wong, Regional Forester, Dept. of Land and Natural Resources

Jane L. Silverman, Historic Preservation Office, Dept. of Land and
Natural Resources

Koichi H. Tokushige, Asst. Superintendent, Office of Business
Services, Dept. of Education

Darrell Oishi, District Superintendent, Dept of Education

Michael Hazama, Deputy District Superintendent, Dept. of Education

Joyce Van Zwalenburg, District Librarian, Office of Library Services,
Dept. of Education

COUNTY OF MAUI

The Honorable Elmer Cravalho, Mayor

Toshio Ishikawa, Director, Planning Dept.

Ines Ashdown, Planning Dept.

Jeff Chang, Planning Dept.

Wayne Uemae, Director, Dept of Public Works

Felix Pascual, Deputy Director, Dept of Public Works

Hulu Nakasone, Administrator, Land Use and Codes, Dept. of Public Works

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Ken Kong, Dept. of Public Works

Edwin Okubo, Housing Coordinator

Jan Dapitan, Acting Director, Dept of Parks and Recreation

John San Diego, Chief, Police Dept.

Sugiichi Hiraga, Chief, Fire Dept.

OTHERS

William Haines, Manager, Hawaiian Commercial and Sugar Company

Phil Scott, Asst. Manager, Hawaiian Commercial and Sugar Company

Orrin Gilbert, Manager, RJR Foods, Inc.

James Morrow, Director, Environmental Health, American Lung Association of Hawaii

Edward Wilson, Jr., Hawaii Visitors Bureau

Larry Wada and Ken Luke, Hawaii Telephone Company

Bonnie Tuell, Maui Electric Co.

Michael Akiyama, Manager, Honolulu Federal Savings & Loan Association

Roger MacArthur, Manager, First Hawaiian Bank

Ronald Texeira, Manager, Pioneer Federal Savings & Loan

Donna Ting, Tri-Isle Realty & Development Co., Inc.

Kay Abdul, Kay Abdul Realty

Douglas Sodetani, Maui Realty Co., Inc.

Alvin Amaral, Amaral-Cole Realty

Butch Arisumi, Arisumi Brothers, Inc.

Haruo Fujitomo, F & M Contractors, Inc.

Al Covic, Hicks Construction Co., Inc.

Rich Lowe, Manager of Land Planning, Wailea Development Company

Charles Streets, C. Brewer

ORGANIZATIONS AND PERSONS INVOLVED IN THE GENERAL PLAN APPLICATION AND
EIS PREPARATION

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Wilbur Morin

Howard K. Nakamura

Howard Nakamura

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Gerald Daly

Chiniago Enterprises (Archeological Survey)

William Barrera, Jr.

Steven P. Bowles (Hydrologic Study)

Steven Bowles

Dames & Moore (Soils Investigation)

Howard Schirmer, Jr.

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100

XIII
COMMENTS AND RESPONSES MADE DURING
THE CONSULTATION PROCESS

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100

October 5, 1976

Dr. Albert Q. Y. Tom, Chairman
Environmental Quality Commission
550 Halekauwila Street, Rm. 301
Honolulu, Hawaii 96813

Dear Dr. Tom:

Re: Notice of Determination for General Plan Amendment
by R. K. Sasaki, President, on behalf of
A & B Properties, Inc.

The Maui Planning Commission at its meeting of October 5, 1976, reviewed the Environmental Assessment/Determination and voted unanimously to approve the recommendation that an environmental impact statement be required for the general plan amendment request.

Attached for your use is a copy of the determination.

Should you have any questions, please contact Ralph Masuda of our Planning staff.

Yours very truly,

TOSH ISHIKAWA
Planning Director

Encl.

cc Mr. Robert K. Sasaki, President, A&B Properties, Inc.
cc Mr. Hannibal Tavares

October 5, 1976

TO: PLANNING COMMISSION
FROM: Planning Staff
SUBJECT: Environmental Assessment/Determination General Plan
Amendment - A & B Properties, Inc.

I. AUTHORITY

This Environmental Assessment/Determination is prepared in accordance with Chapter 343, HRS and the Rules and Regulations for Environmental Impact Statement of the Environmental Quality Commission, State of Hawaii.

II. APPROVING AGENCY

Maui County Planning Commission
200 S. High Street
Wailuku, Maui 96793

III. APPLICANT

R. K. Sasaki, President on behalf of A & B Properties, Inc.
822 Bishop Street
P.O. Box 3440
Honolulu, Hawaii 96801

IV. PROJECT DESCRIPTION

The proposed general plan amendment is to change approximately 1,000 acres of land designated as Open Space and project District No. 2 by the Wailuku-Kahului General Plan to urban uses which includes but not limited to:

1. Residential
2. Public Use
3. Golf Course
4. Commercial

Preliminary development plans envision approximately 3,000 single family homes, elderly housing projects, 18-hole public golf course, schools, neighborhood shopping areas, and community's recreational complex and other amenities.

The proposed will be known as "Waiale" and is generally bounded by Kaahumanu Avenue on the north, Kuihelani Highway on the east and Honoapiilani Highway on the West.

V. IMPACT OF PROJECT ON ENVIRONMENT

The proposed project may have significant impact on the following environmental concerns:

1. Educational facilities
2. Employment
3. Commercial facilities
4. Health care/social services
5. Sewage collection and disposal
6. Solid waste collection and disposal
7. Water supply
8. Storm water drainage
9. Police protection
10. Fire protection
11. Recreation
12. Roads and traffic

13. Energy requirements
14. Agriculture
15. Historic and cultural resources
16. Endangered species of plants and animals.
17. Housing and population changes
18. Air and water quality and ambient noise levels.

VI. DETERMINATION

In review of the proposed General Plan Amendment and subsequent project proposal it is determined that the proposed action will have a significant effect on the environment.

Therefore, it is recommended that an environmental impact statement be prepared.

February 28, 1977

Mr. Orrin Gilbert
RJR Foods, Inc.
P. O. Box 457
Kahului, Maui, HI 96732

Dear Mr. Gilbert:

As you are aware, A&B Properties, Inc. is presently planning the development of the Waiale residential project. This development will be a long term program and will affect a portion of the area under lease for your passion fruit operation.

Your lease presently covers 200+ acres with the term expiring in seven years on March 31, 1984. Our present development schedule indicates that approximately 72 acres of the property will be required prior to the termination of your lease. We would be able to provide you with an additional 50+ acres of adjoining land to replace the 72 acres (see attached map). Additionally, we would be willing to immediately extend your present lease for five years to 1989.

You have previously expressed concern over the operational problems of this area and we would be willing to explore other areas which might be more suitable to your needs and provide a more permanent location.

Finally, we feel it would be mutually desirable to consider the relocation of the existing factory.

Mr. Oxrin Gilbert
February 28, 1977
Page 2

We look forward to hearing from you so that we may be able to finalize an arrangement which would be mutually beneficial to R. J. Reynolds Food operations as well as to Alexander & Baldwin, Inc.

Very truly yours,

PROPERTIES GROUP

drum
G. H. Ivey, Jr.
MAUI MANAGER

att.
In duplicate

cc: A&B-Properties Group, Hon. w/att.

HJH Foods, Inc.
P. O. Box 457
Kahului, Maui, Hawaii 96732
Telephone Kahului 337-14

RJR Foods

March 4, 1977

Mr. G. H. Ivey, Jr.
Maui Manager
A & B Properties Group
P. O. Box 156
Kahului, Maui 96732

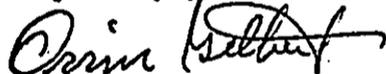
Dear Mr. Ivey:

Received your letter of February 28, 1977 regarding RJR Foods, Inc. lease from Alexander & Baldwin, Inc.

As you may recall, in the past we have worked with you on all leasehold changes you requested.

I am sure that we will continue do so in the future as long as terms are mutually acceptable.

Very truly yours,



Orrin Gilbert
Manager

OG:jf



STATE OF HAWAII
DEPARTMENT OF EDUCATION
P. O. BOX 2380
HONOLULU, HAWAII 96804

OFFICE OF BUSINESS SERVICES

December 8, 1976

Mr. R. K. Sasaki
Alexander & Baldwin, Inc.
822 Bishop Street
P. O. Box 3440
Honolulu, Hawaii 96801

Dear Mr. Sasaki:

Subject: Waiale Project

Thank you for providing detailed site maps and phasing plans for the subject development. The following comments are provided for your consideration:

ENROLLMENT PROJECTIONS

We anticipate that 3000 units (2775 single family and 225 low-income rental apartments) will result in the following:

<u>Grades</u>	<u>Approx. Enrollment</u>
K-8	1800-2000
9-12	500- 600

Grades K-8

The projected enrollment cannot be accommodated with existing school facilities adjoining the development area. There is no excess capacity at Lihikai or Kahului Elementary Schools. Although enrollment at these two schools should decline in the next 6-10 years, it is unlikely that more than 300-400 students could be accommodated.

Puunene School has some excess capacity; however, because of the location, the small enrollment and the age and condition of the facilities, the Department of Education has no plans to retain the school if suitable alternatives are available.

Mr. R. K. Sasaki
Page 2
December 8, 1976

Grades 9-12

The Waiale Project will probably require construction of additional facilities at Maui High School. Enrollment is expected to decline; however, not enough to accommodate the estimated 500-600 students the Waiale Project could generate.

There is also a possibility that some of the Waiale Grade 9-12 students may be assigned to Baldwin High. The assignment will be subject to future evaluation of enrollment trends and available capacity at Baldwin High.

Alternative Actions for Estimated Grades K-8 Enrollment Increases

The Department of Education has no plans at this time to change the K-8, 9-12 organization in the Maui Complex. If the organization is not changed, we would need to build one and possibly two K-8 schools within the Waiale Project. The location will require a detailed site selection study by the Department of Accounting and General Services. The school site shown on the Waiale Land Summary Map may or may not be suitable for one of the schools. Under Board of Education policy (copy attached), we would request dedication of the site or sites.

A second possibility is that the Department of Education would change the grade organization of Kahului, Lihikai, and Puunene from Grades K-8 to K-6. Grades 7-8 would be accommodated at a new intermediate school. The site might be at a number of locations, including the Waiale Project. The acreage requirement would be in the range of 8-10 acres.

The second alternative (reorganization) should require only one K-6 school and possibly an intermediate school in Waiale.

RECOMMENDATION

In view of the uncertainties involved, we recommend that two school sites of approximately 8-10 acres be included in the plan. To the extent possible, the site should be centrally located within the project.

Thank you for the opportunity to comment. We would appreciate your continued cooperation as you proceed with your plans.

Sincerely,


KOICHI H. TOKUSHIGE
Assistant Superintendent
Office of Business Services
Enclosure

cc: Maui District

DEPARTMENT OF EDUCATION
EDUCATIONAL SPECIFICATIONS AND STANDARDS FOR FACILITIES

CHAPTER IX. POLICIES FOR SCHOOL FACILITIES

F. Assistance for School Sites and Facilities Requirements

In the review of land use application, the Department of Education shall request the assistance of landowners and/or developers, whenever deemed necessary, in meeting the anticipated demands for school sites and facilities.

The requested assistance shall include, but not limited to, the following:

1. The dedication of school sites, whenever it is determined by the Department of Education that 75 percent or more of the projected school enrollment will reside within the area being reviewed for land use application.
2. The sale of land for school sites at an agricultural land use or raw land value, whenever it is determined by the Department of Education, that less than 75 percent of the projected school enrollment will reside within the area being reviewed for land use application.
3. The grading of the school site and extension of adequate access and utility lines to the school site.
4. The reimbursement to the State of Hawaii for the cost of providing temporary classrooms and support facilities, as may be needed prior to completion of permanent facilities.

Adopted by the Board of Education
on June 7, 1973

GEORGE R. ARIYOSHI
GOVERNOR OF HAWAII



STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES

DIVISION OF FISH AND GAME
1151 PUNCHBOWL STREET
HONOLULU, HAWAII 96813

DIVISIONS:
CONVEYANCES
FISH AND GAME
FORESTRY
LAND MANAGEMENT
STATE PARKS
WATER AND LAND DEVELOPMENT

November 23
1976

Mr. Sampson S. Mar
Belt Collins and Assoc.
Hawaii Bldg., Suite 514
745 Fort St.
Honolulu, Hawaii 96813

Dear Mr. Mar:

This responds to your letter of November 9, 1976 requesting comments on the discussion and EIS for the Waiale Project in the Kahului-Wailuku area with particular reference to wildlife (endangered species) in the vicinity of the Waiale Reservoir.

Mr. Medeiros's comments are valid, but I would not minimize the value of the site to the endangered Hawaiian stilt. Although it is true that this species uses the reservoir for feeding purposes only, in conjunction with other minor feeding areas on Maui it is important. Even the loss of one small area would be undesirable. Thus I would recommend that any development around the reservoir include a buffer zone between the homesites, etc. and the perimeter of the reservoir. This could be either fencing or natural vegetation. Precautions against contamination of the reservoir with spoil material or fossil fuels should be taken during the course of construction. In other words, leave the site "as is".

The list of animals submitted with your letter is comprehensive with the exception that the roof rat is not included. I've made other minor corrections to the list. I commend you on a very thorough job in making the wildlife inventory.

I trust that the foregoing is satisfactory. Let me know if I can be of further assistance.

Sincerely Yours

Ronald L. Walker
Chief, Wildlife Branch

CC: Joseph S. Medeiros

RLW:rlw

WILDLIFE INVENTORY

Mammals:

Brown rat (*Rattus norvegicus*)
Hawaiian rat (*Rattus exulans hawaiiensis*)
Mongoose (*Herpestes auropunctatus*)
BLACK (ROOF) RAT (*RATTUS RATTUS RATTUS*)

Birds:

Endemic Species:

Hawaiian stilt (Aeo) - *Himantopus himantopus knudseni*
Hawaiian coot (Alae Keokeo) - *Fulica americana alai*

Indigenous Species:

Black-crowned night heron (Aukuu) - *Nycticorax nycticorax hoactli*
Pintail duck (Koloa mapu) - *Anas acuta*
Lesser scaup - *Aythya affinis*
Shoveler (Koloa moha) - *Spatula clypeata*
Pacific golden plover (Kolea) - *Pluvialis dominica fulva*
Ruddy turnstone (Akekeke) - *Arenaria interpres*
Sanderling (Hunakai) - *Crocethia alba*
Wandering tattler (Ulili) - *Heteroscelus brevipes*

Exotic Species:

Cattle egret - *Bubulcus ibis*
Ring-necked pheasant (Kolohala) - *Phasianus colchicus torquatus*
Indian grey francolin - *Francolinus pondicerianus*
Rio Grande turkey (Pelehu) - *Meleagris gallopavo intermedia*
Lace-necked dove - *Streptopelia chinensis*
Barred dove - *Geopelia striata*
Mocking bird - *Mimus polyglottos*
Indian mynah - *Acridotheres tristis*
Japanese white-eye (Mejiro) - *Zosterops japonica*
House finch (Linnet) - *Carpodacus mexicanus frontalis*
Ricebird - *Lonchura punctulata*
English sparrow - *Passer domesticus*
Cardinal - *Richmondia cardinalis*

Belt, Collins and Associates, Ltd.
Honolulu, Hawaii
November 9, 1976

COOPERATIVE EXTENSION SERVICE

University of Hawaii at Manoa - College of Tropical Agriculture
United States Department of Agriculture Cooperating

310 Kaahumanu Ave., Bldg. 206, Kahului, HI 96732
November 16, 1976

Mr. Sampson S. Mar
Belt, Collins & Associates, Ltd.
Hawaii Building, Suite 514
745 Fort Street
Honolulu, HI 96813

Dear Mr. Mar:

I have reviewed the plant inventory for the Waiale
Project as prepared by your office which consists of
the following:

Weeds & Bushes:

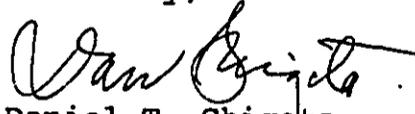
Spanish needle, Beggar tick (kookoolau) - Bidens pilosa L.
Lei ilima - Sida cordifolia L.
Rhomboid ilima - Sida rhombifolia L.
Lantana - Lantana camara L.
Klu - Acacia farnesiana L.
Natal redtop - Rhynchelytrum repens
Koa haole - Leucaena leucocephala
Spiny amaranth (Pakai kuku) - Amaranthus spinosus L.
Hairy abutilon - Abutilon molle sweet

Trees:

Kiawe - prosopis pallida
Java plum - Eugenia cominii L.

To the best of my knowledge your list is accurate and
there are no rare or endangered plant species in the area.

Sincerely,



Daniel T. Shigeta
County Extension Agent Chairman

ARCHAEOLOGICAL SURVEY AT WAIALE, MAUI

Prepared by: Chiniago Enterprises
P.O. Box 22934
Honolulu, Hawaii 96822

Prepared for: Belt Collins & Associates, Ltd.
Suite 514
745 Fort Street
Honolulu, Hawaii 96813

AND

Alexander and Baldwin, Inc.
822 Bishop Street
Honolulu, Hawaii 96801

August 25, 1976

On August 23 and 24, 1976, Chiniago Enterprises conducted an archaeological walk-through survey of approximately 1,020 acres at Waiale, Maui (Exhibit One). Because little was expected in the way of surface indications of archaeological remains, approximately one-half of our time was concentrated on those areas which have been disturbed, in the hope of finding exposed sub-surface materials. The Passion Acres orchard was searched intensively, as were the routes of pipelines and other areas where extensive earthmoving had occurred. In addition, we spent approximately one-half of our time searching through the undisturbed areas of kiawa and lantana.

No prehistoric structural remains were located. Two artifacts, a piece of flaked basalt and a possible hammerstone were found, both in disturbed areas. The flaked specimen was found in the area Northwest of Maui Memorial Hospital, the possible hammerstone was found on the grounds of Passion Acres (Exhibit One).

Our survey results indicate that a regular large-scale surface survey would be unproductive. Due to the physiographic nature of the survey area (sand dunes, lack of water, distance from ocean and arable land), it is highly unlikely that such a survey would produce any valuable information.

The presence of sub-surface remains is still a possibility, however. Reports of human skeletal material unearthed in the sugar fields to the South of the survey area indicate that human interments should be expected at Waiale.

Two methods of dealing with this situation present themselves:

Method 1 - Conduct a test pit survey, wherein archaeologists would excavate one-meter-square pits in a grid pattern designed to give a statistically valid sample of the area being investigated. The primary drawback to this method is the possibility of missing small, isolated concentrations of human remains. If this method is chosen, it would still be necessary to monitor the construction activities, as outlined in Method 2.

Method 2 - Have archaeologists monitor construction activities so as to locate any archaeological remains that might be uncovered. If such materials were found, it would necessitate the postponement of construction until they could be excavated by archaeological techniques. The primary drawback to this method is the possibility of costly construction delays. If this alternative is chosen, allowances should be made for alternate construction areas so as to minimize the expense of equipment down-time.

We strongly recommend that Method 2 be selected, as we feel that it is the most efficient way of dealing with the archaeological remains at Waiale.

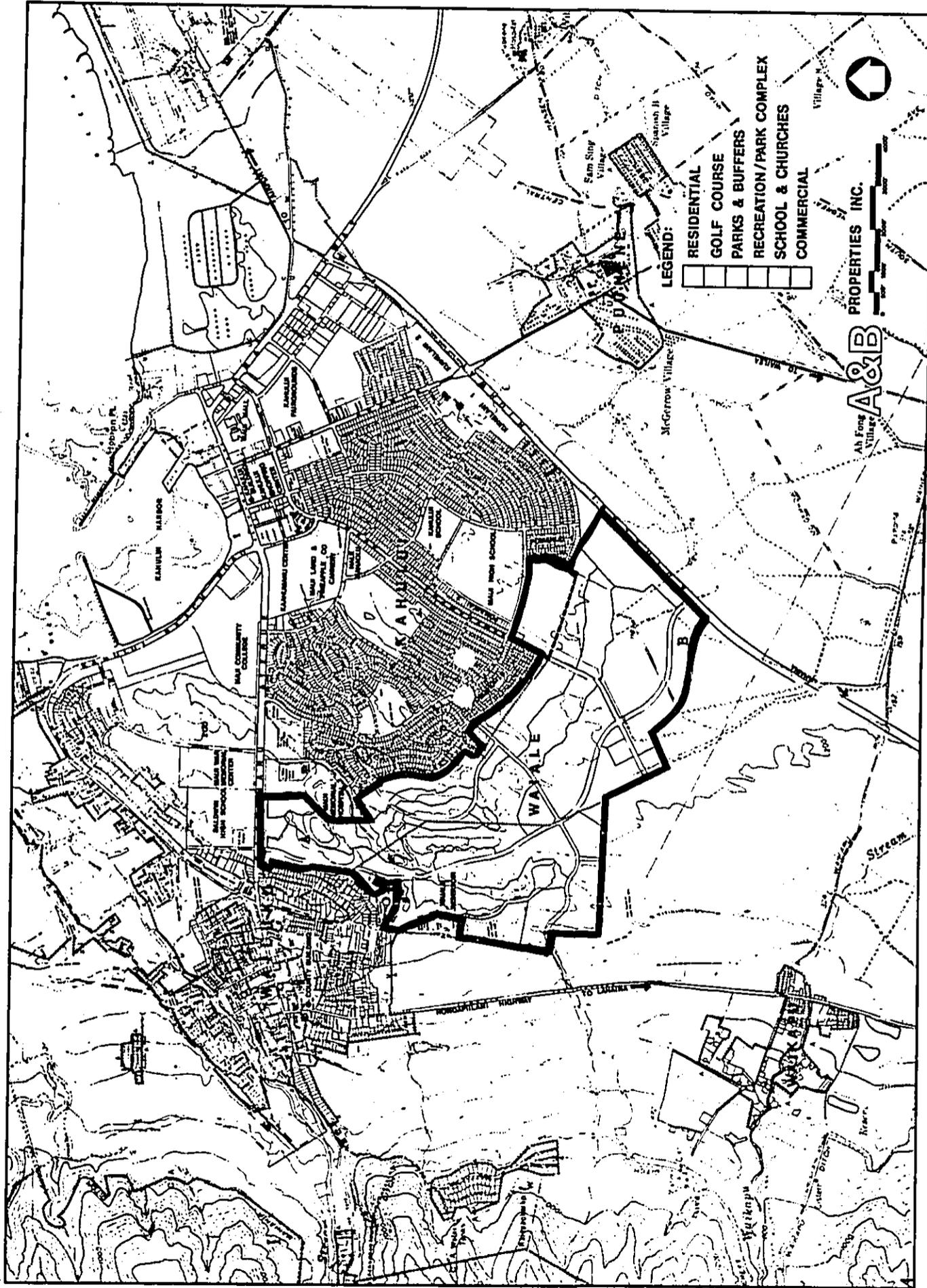

William Barrera, Jr.
Chiniago Enterprises
August 25, 1976

EXHIBIT ONE
CHINIAGO ENTERPRISES

Archaeological Survey at Waiale, Maui
for
Belt Collins and Associates

A = Location of Flaked Basalt Artifact

B = Location of Possible Hammerstone



GEORGE R. ARIYOSHI
GOVERNOR OF HAWAII



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

April 26, 1977

CHRISTOPHER COBB, CHAIRMAN
BOARD OF LAND & NATURAL RESOURCES

EDGAR A. HAMASU
DEPUTY TO THE CHAIRMAN

DIVISIONS:
CONVEYANCES
FISH AND GAME
FORESTRY
LAND MANAGEMENT
STATE PARKS
WATER AND LAND DEVELOPMENT

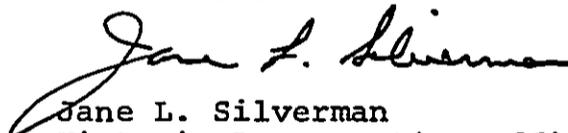
James B. Levine
Manager, Land Planning
Alexander and Baldwin, Inc.
P. O. Box 3440
Honolulu, Hawaii 96801

Dear Mr. Levine:

This office has had the opportunity to review Mr. Barrera's report for a survey of 1020 acres related to the Waiale project. This report adequately identifies cultural resources concerns which should be discussed and appended for inclusion in all EIS documents.

In addition, Mr. Barrera's recommendation of Method 2 as a mitigative action for presently unknown subsurface remains should be implemented in phase with construction activities.

Sincerely yours,


Jane L. Silverman
Historic Preservation Officer
State of Hawaii

PLANNING COMMISSION

Leo Polo, Jr., Chairman
Shiro Hokama, Vice Chairman
George Murashige
Patrick Kawano
Charles Ota
Marvin Romme
Harlow Wright
Wayne Uemas, Ex-Officio
Shigeto Murayama, Ex-Officio



Tosh Ishikawa
Planning Director

Yoshikazu "Zuka" Matsui
Deputy Planning Director

COUNTY OF MAUI
PLANNING DEPARTMENT

200 S. HIGH STREET
WAILUKU, MAUI, HAWAII 96793

26 October 1976

James B. LeVine, ASLA, Assoc. AIP
Manager, Land & Planning
Alexander & Baldwin Ltd, 822 Bishop Street
P.O.Box 3440, Honolulu, HI-96801.

Dear Mr. LeVine:

Just received your letter and material re the Waiale project. Yes, I know the area since about 1915. If remains of any historic sites are there, surely they have been buried by the shifting sands and the run-off onto Kula-o-ka-ma'o-ma'o, or Central Maui Plain. During my many horseback rides in the area I learned of no sites there. The only thing I do know for fact is about the dreadful "Battle of the Sandhills", so called, when Kalani'opu'u, king of Hawaii island, invaded Maui against this isle's final ruler, Kahekili-nui 'Ahumanu the Second in 1776-'77. The Hawaii army invaded from Kiheipukoa and Ma'alaea Bay; was met by Maui's defenders; and Maui won. Always, as the heavy winds shifted sand and dunes, bones, even weapons, would be seen. The 800 warriors of the Alapa regiment were slain in the first encounter, and more died in the next couple of days. Kahekili lived where the Haleakala Motors is now; Na Wai E-ha (The 4 Waters) of the Waikapu, Wailuku, Wai'ehu and Waihe'e valleys were rich in wet-land taro. It was the "bread basket" of that central part of Maui Kingdom. From Kahului Bay upward to Iao and Waikapu there were many temples and other structures. Plows took most of them from the time of King Kamehameha III when, from the 1840s pioneer sugar-growers began helping him to make of all the islands a place of industry and commerce. Under him the Wailuku Sugar Co. began; irrigation ditches were built, and the Spreckles Ditch still runs through Wailuku. The only sites preserved till today are at Pihana between the Iao stream and Wai'ehu. These are Hale Ki'i and Pi'ihanakalani which are listed as national shrines. On the Kihei side the so-called Kealia Pond of the ancient fishponds of Kai'eie is all that remains of that once huge swampland and fishponds which were repaired in the middle 1500s. On Kahului side, some of the fishponds of that time, Kanaha and Mau'oni, remain as a Bird Sanctuary.

There was a huge heiau on Pu'u Nene, mauka the HC&S mill, but it and others in the fields of today are gone. There may have been structures in the area of Waiale, but I doubt it, or we should have heard of them. But, as at Waile'a, Dr. Emory was brought here at my request to Mayor Cravalho, and the ancient Waile'a fishing village was found and the brush and run-off cleared away. I have asked that the village be beautified on A&B land there. Please have your archaeologists preserve that fine village.

I telephoned former senator, John Duarte, who was born here and remains living in Iao. He said there were no structures in the Waiale area.. The Waihe'e Ditch empties into Waiale; and in old times the Waikapu stream went toward Waiale side, but into Kealia Ponds. Maui County Parks dept. and I are working now on a park project including the remaining two fishpond walls in the sea in front of that Menehune Shores condominium and I gave the history of the area to the County and to Walter Ritte. It is difficult, now, to picture what might have been in that central valley area, but so far as I can learn the big structures and important places of ancient times were located mountainward and particularly on the Pihana side. In 1915 my father had much land in lower Waiehu and along the Makawela beach of the north side. There was the huge Meleha'akoa heiau but it was partially destroyed by the 1946 tidal wave, and builders have finished the rest of it. Wailuku Sugar Co has, from the Municipal Golf course at Wai'ehu Point to Waihe'e point, part of an old fishpond plus the heiau in Kapoho, and other sites. From Market & Mill streets downward to their present mill was Pu'u Pua'a and the only structure there was the "corral" with a stone wall which held war prisoners to be sacrificed. Most of the important structures are on the north side of the Iao stream. Mr. Duarte and I agree that the name, properly, should be Wai-ale-ale, meaning Rippling waters or a waterfall. We think the last part of the present name would make it correct because there is no word Wai-ale.. Not according to the dictionary, at least. Many words now are shortened and changed so the real meaning of a place-name is lost. Hammer stones are found in many places, particularly in foremr kule'ana lands where people have dwelt. I judge that weapons could be found because of the battles..

I also phoned Bob Hughes at HC&S.. He said that around 1900 the Spreckles ditch and Waihe'e waters were diverted to the large basin (still in use) below the Waiale reservoir. He knows of no sites there. I tried to reach Wesley Wong Sr., of W.S.Co. and he knows the area well but he was out on his farm. If I learn anything from him I will write to you again. Bulldozers might dig up something interesting which has been buried, but surely the workmen would see it. Seems to me that, like Waile'a, your plans would create beauty on land presently wasted. The big question is water supply!

Hoping this is of help to you, and that the project will prove beneficial, I am,

Respectfully,

Inez Ashdown
Inez Ashdown

(Mrs. C.W. Ashdown
P.O.Box 918, Wailuku,
HI-96793..)
Office phone: 2447735
Res. phone : 2440557.

Page 3.. Ashdown to A&B.. Wai-ale area

Pukui dictionary.. ale= To swallow, engulf, absorb; a hollow or cavern in a sea floor.. A mountain plant, 2 to 6 ft high (Plantago princeps) related to lau-kahi, a medicinal plant.

'Ale= Wave; crest of a wave; billow; ripple; or a gust of wind; or an area or surface..

Aleale= wounded or pierced.

'Ale'ale.. stirring, moving, tossing, rippling.. As: the Sea of

'Ale-nui-haha: means engulfing waves; and figuratively, Overwhelming and/or treacherous.

'Ale-lele: to jump, leap, or fly..

Note: Since central Maui is said to have been under the sea long ago the area could be "a cavern in the sea floor." Also, since much of the area was swampy, or mountain streams might have been there, a waterfall could have made a huge "bowl."

Possible that the name was wae-ale. This would mean a place where (wae) you choose or draft, as soldiers; or reflect and meditate. Maybe Kahekili meditated, planning his defensive strategy against the invaders? Only there is no word, Wae-ale, listed..

Anyway I look at it, the name seems to apply to the battle. You might read S.M.Kamakau's "Ruling Chiefs of Hawai'i" along on page 85 etc.. Also, "Napoleon of the Pacific" by McGarrow, which gives a picturesque account of this Slaughter of the Pi'i-pi'i at Ka-kani-lua, or "Ahu-lau ka Pi'ipi'i i Kakanilua."

Such material often is useful for a brochure regarding a new residential area or a park..

Aloha,

Jay Ashdown

**SURVEY &
MARKETING
SERVICES, INC.**

SUITE 517 • 184 SOUTH HOTEL ST. • HONOLULU, HI. 96813 PHO

PHONE 537-3356 • 537-3357

October 11, 1976

RECEIVED

OCT 14 1976

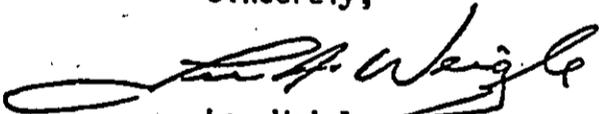
Mr. Tosh Ishikawa
Planning Director
Department of Planning
County of Maui
200 South High Street
Wailuku, Maui 96793

DEPT. OF PLANNING
COUNTY OF MAUI

Dear Mr. Ishikawa:

My apologies for not responding sooner to your request for a statement on the population estimate for Maui County. I have attached a statement presenting our position on the official population estimate for Maui County.

Sincerely,



Lee Weigle
Executive Director

LW:dm

Attachment

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50

OEO 1975 CENSUS UPDATE SURVEY:

MAUI COUNTY POPULATION ESTIMATE

The population estimate for Maui County that should be used for government planning and programming purposes is the official estimate generated by the State Department of Planning and Economic Development.

In the production of the OEO 1975 Census Update Survey: Maui County, a weighting system was employed that did not utilize, or take into consideration, the official DPED estimate for Maui County. However, in our later Census Update Survey reports for Oahu and Hawaii County, we altered our methodology so that our population projections would be consistent with official estimates.

One of the reasons we changed our methodology to make our population figures equivalent to official estimates is that there is the possibility that our sampling method produced population estimates that are too high. This may have occurred because larger households may have had a greater chance of being interviewed than smaller households (because of a greater likelihood of someone being at home).

We hope to see further analyses of the OEO survey data conducted in order to investigate this possibility.

The purpose of the OEO 1975 Census Update Survey of Maui County was to describe the characteristics of the population in terms of socioeconomic and demographic statistics. This objective has been accomplished by the survey. The percentages used in all the tables of the report can be applied to the official State population figure for Maui County with no loss in validity if the objective of the user is to have numbers that correspond to the official DPED estimates.

45 North Kukui Street, Honolulu, Haw

AMERICAN  LUNG ASSOCIATION *of Hawaii*

November 22, 1976

Mr. R. K. Sasaki, President
A&B Properties, Inc.
P. O. Box 3440
Honolulu, Hawaii 96801

Dear Mr. Sasaki:

Subject: Preparation of an Environmental Impact Statement
for the Proposed Waiale Development, Island of Maui

Thank you for your swift response to our request for an EIS Preparation Notice and additional information pertaining to the proposed project. We have reviewed the materials you provided and have the following suggestions regarding air quality impact analysis.

Normally, the principal long-term impact on air quality of a project such as this is due to the increased vehicular traffic both within and outside the project boundaries. We therefore recommend that you quantify this impact along the major access roads and internal streets to determine whether state or federal air quality standards will be approached or exceeded. A useful EPA publication describing a screening methodology which would enable you to make a first order approximation of the impact is:

Guidelines for Air Quality Maintenance Planning
Analysis, Volume 9: Evaluating Indirect Sources.
EPA-450/4-75-001 (January, 1975)

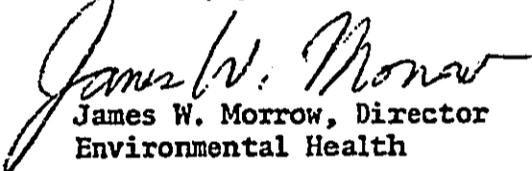
If the rough screening method indicates possible violations of standards, then more refined analysis would be appropriate to determine the probable frequency of occurrence of such violations. The above publication provides some additional methodologies and recommendations on how this might be accomplished. Considering the magnitude of the proposed development, we strongly recommend that a thorough analysis of traffic and air quality impact be conducted.

Mr. R. K. Sasaki
November 22, 1976
Page 2

Another aspect of the project that probably deserves some attention is the impact of the existing environment on the proposed project. In this particular case, we are thinking of Maui Electric Company's generating station which, in terms of prevailing winds, is directly upwind of the project site most of the time. An assessment to determine whether power plant emissions will have a significant impact on air quality at the Waiale site seems justified.

If we may be of any further assistance in this matter, please do not hesitate to call on us.

Sincerely yours,


James W. Morrow, Director
Environmental Health

JWM:lp



DEPARTMENT OF PLANNING
AND ECONOMIC DEVELOPMENT

Kamamalu Building, 250 South King St., Honolulu, Hawaii • Mailing Address: P.O. Box 2359, Honolulu, Hawaii 96804

GEORGE R. ARIYOSHI
Governor

HIDETO KONO
Director

FRANK SKRIVANEK
Deputy Director

MEMORANDUM

May 5, 1976

TO: All Federal, State, County and Private Agencies
Using Hawaii Population Projections

FROM: Hideto Kono, Director, DPED

SUBJECT: Uniformity and Consistency in Population Projections

A recurring difficulty in Federal, State, County and Private planning work in Hawaii has been the need for uniformity and consistency, as well as validity, in the preparation and use of Hawaii population projections. Such projections are critical to sound planning.

Chapter 225-2 (b)(14), Hawaii Revised Statutes, relating to powers and duties of the Director of the DPED, states that the Director "shall cooperate with all public agencies to ensure an ongoing, uniform and valid base of data and projections" to fulfill the responsibility for the development and coordination of a State Plan.

As one response to that legislative mandate, our Department has prepared a major report, The Population of Hawaii, 1958-2025: Recent Trends and Projections. It follows earlier, similar reports. It summarizes more than 20 separate studies--public and private--of the future population of the State or the City and County of Honolulu, (or both), and offers nine new series of projections to the year 2025.

The nine series are based on three fertility assumptions, three migration assumptions, and one mortality assumption. The resulting series were compared with findings of the DPED Economic Model. This comparison indicates that the projections titled Series E-2 have been the most consistent with our economic analysis, and are probably the most satisfactory for planning purposes.

Everyone engaged in this field of work recognizes that there can be no perfection in projections. It is also recognized that a lack of uniformity in the use of projections for planning by various agencies causes considerable difficulty and confusion.

Given our legislative mandate to encourage uniformity and validity in data and projections, I request that all agencies involved in population projections use the Series E-2 to promote that uniformity.

Table A-24.--TOTAL RESIDENT POPULATION (SERIES E-2), BY COUNTIES:
1970 TO 2000

Year	State total	City and County of Honolulu	Other counties			
			Total	Hawaii	Kauai	Maui
1970 (census)	769,913	630,528	139,385	63,468	29,761	46,156
1975 (estimate)	864,900	704,500	160,400	74,700	31,800	53,900
1980	930,000	749,500	180,600	83,800	36,700	60,100
1985	1,027,600	818,700	208,900	97,700	41,300	69,900
1990	1,131,700	891,000	240,700	113,400	46,100	81,200
1995	1,238,700	965,000	273,700	130,000	50,700	93,000
2000	1,349,200	1,039,400	309,900	146,900	55,400	107,600
2005	1,469,200	1,125,500	343,600	164,400	59,500	119,700
2010	1,606,100	1,221,200	384,800	185,700	64,400	134,700
2015	1,760,200	1,326,000	434,200	211,200	70,100	152,900
2020	1,927,400	1,436,000	491,400	240,700	76,500	174,200

Source: Federal-State Cooperative Program for Local Population Estimates; present study.

HOWARD K. NAKAMURA
PLANNING CONSULTANT
SUITE 609 - 2180 MAIN STREET
WAILUKU, MAUI, HAWAII 96793
PHONE (808) 244-4686

January 13, 1977

Memorandum

To: Jim LeVine

From: Howard K. Nakamura *Howard K. Nakamura*

Subject: Waiale E.I.S.

I met this morning with Mrs. Jan Dapitan, Acting Director of the County's Department of Parks and Recreation, to discuss the above project. In the course of the discussion the following points were raised:

(1) General recreational needs in the Wailuku-Kahului area include the following:

- (a) Golf driving range
- (b) Additional parks, primarily landscaped areas oriented toward passive activities
- (c) A quality theater for the performing arts
- (d) Bike paths and bikeways
- (e) A "movement" center (gymnasium oriented toward gymnastics, martial arts, tumbling, modern dancing, etc.)
- (f) Archery, both indoors and outdoors
- (g) Motorcycle track
- (h) Additional gymnasium facilities for organized sports
- (i) Additional seating at the football and baseball stadiums and improvements to the track at the football stadium
- (j) A community center primarily oriented toward Wailuku

(2) As indicated above, a major need primarily in Wailuku is a community center. Perhaps a site could be incorporated in the Waiale project particularly within that area oriented toward Wailuku.

It is possible that the community center could be included within a school complex. While this may be practical from a financial standpoint, it would require a major change in policy on behalf of the State Department of Education.

Mr. Jim LeVine
January 13, 1977
Page 2

(3) Major recreational facilities already exist in the Wailuku-Kahului area. These include the War Memorial Sports Complex, the Maui Central Park, the Maui Zoo and the Kahului Community Park. Furthermore, another major complex is proposed within the Waiale project.

There does, however, appear to be a need within the proposed development for neighborhood park facilities oriented toward pre-school and school children. These would include tot-lots and facilities for picnicking, basketball, volleyball, etc.

(4) The proposed golf course is of major interest to the County of Maui. At the present time there is only one publicly-owned course on the island. Play has become extremely heavy at the Waiehu course. We are attaching information regarding the number of rounds played per month since 1972.

The need for another course readily accessible to the public is apparent. Demands for public golf play will probably become more pronounced as the Wailea complex develops further and priority is given to resort residents and guests.

Should you have any questions, please contact me.

rt

Encl.

HOWARD K. NAKAMURA
PLANNING CONSULTANT
SUITE 609 - 2180 MAIN STREET
WAILUKU, MAUI, HAWAII 96793
PHONE (808) 244-4686

January 3, 1977

To: Jim LeVine
From: Howard K. Nakamura *Howard K. Nakamura*
Subject: Discussion with Police Chief John San Diego
Regarding Waiale E.I.S.

I met last week with Chief San Diego to discuss the Waiale Project E.I.S. The following points were raised during the course of the discussion:

(1) Chief San Diego's major concern was to be kept advised regarding the project's phasing and timetable so that manpower needs could be anticipated ahead of the actual demands.

(2) The Police Department would also like to have some indication, if possible, as to whether we would be accommodating new residents to Maui or residents who are relocating from other areas of the island. In other words, is there a demand for additional police officers or will the need be primarily a matter of reassigning existing personnel.

(3) The Police Department does not contemplate the need for a satellite station in the area. They believe that a satellite station would not be necessary primarily because of cost duplication.

(4) Major police problems are not anticipated due to the primarily residential character of the project. Police problems encountered in residential areas are primarily traffic, burglary and theft and domestic situations.

(5) Chief San Diego also noted other potential problems which are not related specifically to the Waiale Project but which have some impact on providing adequate police protection. These include:

(a) Adequate street lighting

Mr. Jim Levine
January 3, 1977
Page 2

- (b) The need to have sufficient pavement widths so that traffic will not be impeded even if parking occurs on both sides of the street
- (c) Consideration should be given to prohibiting use of jalousie windows less than 8 feet above the ground in order to discourage break-ins.

Pertinent points arising out of our discussion with Chief San Diego will be incorporated into the E.I.S.

rt

HAWAIIAN COMMERCIAL & SUGAR COMPANY

A DIVISION OF ALEXANDER & BALDWIN, INC.

PUUNENE, MAUI, HAWAII 96784

November 23, 1976

Mr. Howard K. Nakamura
Planning Consultant
Suite 609 - 2180 Main Street
Wailuku, Maui, HI 96793

Dear Howard:

The following is submitted in response to the questions contained in your letter of November 15 regarding the proposed Waiale development project.

- #1) The area is probably suitable for cultivation of sugar cane through drip irrigation on an economically viable basis although the soil is relatively poor and the area is not considered prime agricultural land.
- #2) The primary limitation to cultivation of the area by HC&S is the capital cost involved. First, there is the capital cost of developing irrigation water for the area, either through sinking wells or by increasing water utilization by converting nearby cane lands from furrow to drip irrigation, thereby making existing water available for expansion. Also, the cost of the drip irrigation system itself for this type of area is relatively high because of the flat terrain and lack of necessary static head for normal gravity feed. Primarily for these reasons, expansion into this area is not a part of current HC&S long range plans.
- #3) Yes, HC&S is increasing its acreage into land available adjacent to the higher sloped fields on the Haleakala side of the plantation. The new area is being added as fast as irrigation water can be made available through conversion of nearby existing cane land from furrow to drip irrigation.

I trust that this gives you the information you need.

Sincerely,



W. S. Haines
Manager

WSH:ec
cc: HTavares
PScott

AGRICULTURAL ASSESSMENT OF WAIALE

According to the US Soil Conservation Service and University of Hawaii Agricultural Experiment Station Soil Survey and the University of Hawaii Land Study Bureau Detailed Land Classification, Island of Maui, the soil in the Waiale area is classified as Puuone sand, 7 to 30% slopes. Current usage of the land is pasture and vacant. The overall land productivity rating is E on a scale of A (highest) to E (lowest). The pasture rating is 30 acres per animal unit year (AUU) or estimated live beef gains of 9 pounds per acre per year (class A = 2.5 AUU or 110 lbs per acre per year).

Other characteristics of the soil are as follows:

1. Low available water capacity (0.7 inches per foot).
2. pH ranges from 7.8 to 8.3 in the adjacent RJP passion fruit farm.
3. Soil mineral content:
 - a. 25-30 lbs P per acre. Very low to low.
 - b. 320 lbs K per acre. Moderate.
 - c. 6000 lbs Ca per acre. High.
 - d. 500 lbs Mg per acre. Low.
4. Low organic matter content.
5. Erosion hazard from wind and rain is great.

Approximately 200 acres of passion fruit is currently being grown by RJ Reynolds, Inc, adjacent to Waiale. According to RJP, their yields are approximately 8 tons per acre and they consider this very low. Normal yields in good soil are approximately 15 tons per acre.

There are many problems in growing diversified crops on Puuone sand.

The major factors are:

1. Low available water capacity (Kula soils have a capacity of 1.3 inches per foot). Shallow rooted crops must be irrigated daily. Drainage is excessive.
2. Very high pH. Most horticultural crops grow best in pH of 6.5.
3. Minor element deficiencies, especially iron, zinc and magnesium. This causes poor growth and greatly reduced yields.
4. Warm temperature and strong winds. These factors increase loss of water to evaporation and plant transpiration. More water must be applied to overcome this loss.
5. Lack of organic matter in the soil. This is related to soil moisture, texture and fertility.

Horticultural crops can be grown in Puuone sand. Under irrigation, the productivity rating for vegetables is rated D. For sugar cane, orchards and forage, the land is rated C. However, costs of production will be increased considerably to grow quality horticultural crops. Among the practices recommended are:

1. Addition of 5 to 10 tons of manure or compost. This will improve moisture and mineral retention in the soil.
2. Regular applications of minor element fertilizers to the plants or to the soil.
3. Drip irrigation for maximum utilization of water.
4. Grow or construct windbreaks to protect plants.

5. Grading of large areas to allow for efficiency in machinery use and irrigation.

With these added costs, growers on Puuone sand will be at a distinct economic disadvantage in selling their produce in the highly competitive market in the State of Hawaii.


Daniel T. Shigeta
Agricultural Extension Agent

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XIV
SUMMARY OF UNRESOLVED ISSUES

THE UNIVERSITY OF CHICAGO

XIV SUMMARY OF UNRESOLVED ISSUES

No major unresolved issues exist at the present time. However, any comments on this draft statement which cannot be resolved will be discussed fully and included in the final environmental impact statement.

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XV LIST OF NECESSARY APPROVALS

In order to fully implement the proposed project, consultation, review and approval by the following will be required.

GENERAL PLAN AMENDMENT

A public hearing on the request for general plan amendment will be conducted by the Maui County Planning Commission. Subsequently, a recommendation on the request will be made by the Commission to the Maui County Council. The general plan amendment must be approved in ordinance form by the County Council and Mayor, in accordance with the provisions of the County Charter.

STATE LAND USE DISTRICTS

That portion of the property (approximately 611 acres) presently within the Agricultural District, as classified by the Land Use Commission of the State of Hawaii, will have to be re-classified within the Urban District. Public hearing and decision on the re-classification will be the responsibility of the Land Use Commission.

COUNTY ZONING

Amendment to the Comprehensive Zoning Ordinance of the County of Maui will be required to designate the proposed development as a "Project District." In this respect, the overall project density must also be established. Final action by the Maui County Council and Mayor is required, with recommendation by the Maui County Planning Commission.

PROJECT DISTRICT

Subsequent to designation of the development area as a Project District, all specific development plans will require the approval of the County of Maui,

in accordance with the provisions of Ordinance No. 787 and the Charter of the County of Maui.

SUBDIVISION

Subdivision of lands within the Project District shall be implemented in accordance with the approved development plans. The Director of Public Works, through the Land Use and Codes Administration Division, shall be responsible for carrying out the actual review process. The subdivision of land also requires the approval of the Department of Water Supply (County of Maui), the Department of Health (State of Hawaii) and, if appropriate, the Highways Division of the Department of Transportation (State of Hawaii).

GOLF COURSE

Actual construction of the proposed golf course will require the issuance of a grading permit by the Land Use and Codes Administration Division of the County's Department of Public Works. Review and approval will be in accordance with the provisions of Ordinance 816 (Grading Ordinance) of the County of Maui. An integral part of the review process will include input from the Soil Conservation Service, U. S. Department of Agriculture.

Issuance of plumbing, electrical and building permits by the Land Use and Codes Division of the County's Department of Public Works will also be required.

OTHER APPROVALS

The major steps in the implementation process have been outlined above. It is probable that other additional approvals may be required by some of the agencies mentioned, as the project proceeds.

It will also be necessary to coordinate development plans with HC&S Company, which may have irrigation systems, private roads and water storage reservoirs

affected by the proposed project; and with R. J. Reynolds Foods, which currently leases a portion of the subject area for the cultivation of passion fruit.

In summary, those involved in the process of review and approval include the following:

Federal

Soil conservation Service, U. S. Department of Agriculture

State of Hawaii

Department of Education

Department of Health

Department of Transportation

Department of General Services

County of Maui

Mayor

County Council

Planning Commission

Department of Planning

Department of Public Works

Department of Parks and Recreation

Police Department

Private

Hawaiian Commercial and Sugar Company

R. J. Reynolds Foods

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APPENDICES

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100

APPENDIX III-A

ETHNICITY -- 1975

	<u>%</u>	<u>MEO SURVEY</u>	<u>ADJUSTED</u>
Black	---	---	---
Caucasian (Not including Portuguese)	9.30	2045	1848
Portuguese	4.24	933	843
Chinese	0.85	186	168
Filipino	17.18	3779	3414
Hawaiian	1.04	229	207
Part-Hawaiian	15.88	3493	3156
Japanese	39.78	8751	7906
Korean	0.46	100	90
Puerto Rican	0.55	121	109
Samoan	0.10	22	20
Mixed (Not including Part-Hawaiian)	9.72	2139	1932
Other	0.85	187	169
Refused/Don't Know	0.05	11	10
Total	100.00	21,996	19,872

Source: 1975 Census Update Survey
Maui Economic Opportunity, Inc.

APPENDIX III-B

PLACE OF BIRTH

	<u>%</u>	<u>MEO SURVEY</u>	<u>ADJUSTED</u>
Hawaii Island	3.10	682	616
Maui Island	66.29	14,580	13,172
Molokai	1.00	220	199
Lanai	0.75	166	150
Oahu	7.89	1,735	1,568
Kauai-Niihau	0.50	110	99
Other U.S. States	7.05	1,551	1,401
U.S. Possession/Territory	0.71	156	141
Other Country	12.46	2,740	2,475
Refused/Don't Know	0.25	56	51
Total	100.00	21,996	19,872

Source: 1975 Census Update Survey
Maui Economic Opportunity, Inc.

APPENDIX III-C

PLACE OF RESIDENCE
FIVE YEARS AGO

	<u>%</u>	<u>MEO SURVEY</u>	<u>ADJUSTED</u>
Same House (Maui Island)	66.74	14,679	13,262
Other (Oahu)	6.02	1,324	1,196
Other (Hawaii Island)	0.61	134	121
Other (Maui Island)	18.10	3,981	3,597
Other (Molokai)	1.51	332	300
Other (Lanai)	---	---	---
Other (Kauai-Niihau)	0.10	23	21
Other (U.S. State)	4.05	891	805
Other (U.S. Possession/Territory)	0.25	56	50
Other Country	2.62	576	520
Total	100.00	21,996	19,872

Source: 1975 Census Update Survey
Maui Economic Opportunity, Inc.

APPENDIX III-D

OWNERSHIP STATUS

	<u>%</u>	<u>MEO SURVEY</u>
Owned or being purchased (Home)	75.54	4,868
Owned or being purchased (Condominium or Coop)	0.25	16
Rented for cash	22.39	1,443
Occupied w/o cash rent	1.82	117
Total	100.00	6,444

TYPE OF HOUSING UNIT

	<u>%</u>	<u>MEO SURVEY</u>
Single-family detached	86.92	5,601
Duplex	0.82	53
Townhouse	0.36	23
Apartment or Condominium	11.90	767
Total	100.00	6,444

APPENDIX III-E

TOTAL MONTHLY HOUSING COSTS
(EXCLUDING MAINTENANCE AND UTILITIES)
FOR OWNER-OCCUPIED UNITS

	<u>%</u>	<u>MEO SURVEY</u>
Under \$100	32.85	1,601
\$100-\$199	18.49	901
\$200-\$299	16.56	807
\$300-\$349	6.91	337
\$350-\$399	2.09	102
\$400-\$449	2.01	98
\$450-\$499	0.39	19
\$500-\$549	0.84	41
\$550 or more	1.35	66
Refused/Don't know	18.51	902
Total	100.00	4,874

TOTAL MONTHLY RENT

	<u>%</u>	<u>MEO SURVEY</u>
Under \$100	18.42	266
\$100-\$149	8.17	118
\$150-\$199	30.54	441
\$200-\$249	15.10	218
\$250-\$299	16.76	242
\$300-\$349	5.13	74
\$350-\$399	1.66	24
\$400-\$499	---	---
\$500-\$599	---	---
Refused/Don't know	4.22	61
Total	100.00	1,444

Source: 1975 Census Update Survey
Maui Economic Opportunity, Inc.

APPENDIX III-F

HOUSEHOLD INCOME

	<u>%</u>	<u>MEO SURVEY</u>
Under \$2,000	2.78	179
\$2,000-2,999	3.75	242
\$3,000-3,999	4.07	262
\$4,000-4,999	1.37	88
\$5,000-5,999	2.61	168
\$6,000-6,999	1.99	128
\$7,000-7,999	2.79	180
\$8,000-8,999	3.96	255
\$9,000-9,999	3.43	221
\$10,000-11,999	6.07	391
\$12,000-14,999	13.90	896
\$15,000-19,999	15.91	1,025
\$20,000-24,999	8.33	537
\$25,000 or more	14.21	916
Not available	14.83	956
Total	100.00	6,444
Mean		\$15,615
Median		\$14,110

Source: 1975 Census Update Survey
Maui Economic Opportunity, Inc.

HOUSEHOLD INCOME BY HOUSEHOLD SIZE

	one	two	three	four	five	six	seven	eight	nine or more
Total # HHs	# HHS	# HHS	# HHS	# HHS	# HHS	# HHS	# HHS	# HHS	# HHS
under \$2,000	62	40	11	16	21	27	0	0	0
\$2,000-\$2,999	138	75	11	8	0	9	0	0	0
\$3,000-\$3,999	85	86	49	17	17	0	0	8	0
\$4,000-\$4,999	16	19	16	8	16	11	0	0	0
\$5,000-\$5,999	28	79	19	11	17	11	0	0	0
\$6,000-\$6,999	11	83	18	8	8	0	0	0	0
\$7,000-\$7,999	18	111	19	16	0	0	0	0	0
\$8,000-\$8,999	40	99	40	60	9	8	9	0	8
\$9,000-\$9,999	23	89	69	16	9	9	0	0	0
\$10,000-\$11,999	31	92	107	73	9	11	8	0	0
\$12,000-\$14,999	16	304	195	200	45	11	24	0	8
\$15,000-\$19,999	46	250	166	269	78	80	8	0	16
\$20,000-\$24,999	19	156	79	97	147	79	33	9	24
\$25,000 or more	0	129	99	269	98	46	32	0	9
insuff. infor..	62	318	191	139	133	147	26	17	9
Base (est. HHs)	597	1,929	1,091	1,208	818	511	166	34	16
	6,444								90

Note: All numbers in the above table are estimates projected from sample results. Numbers may not add to totals exactly because weights used in the projections are rounded to the nearest 1/100.

Source: 1975 Census Update Survey
Maui Economic Opportunity, Inc.

APPENDIX III-G

INDUSTRY OF EMPLOYED POPULATION
16 AND OLDER

	<u>%</u>	<u>MEO SURVEY</u>	<u>ADJUSTED</u>
Agriculture	9.43	961	868
Fishing & hunting	0.15	15	14
Construction	11.21	1,142	1,032
Manufacturing	14.11	1,438	1,299
Transportation & commodities	7.04	717	648
Wholesale	1.80	183	165
Retail	13.03	1,328	1,200
Finance & insurance	5.00	509	460
Service	20.40	2,079	1,878
Government	15.62	1,591	1,437
Miscellaneous	2.21	225	203
Base (estimated population 16 and over)	100.00	10,188	9,204

Source: 1975 Census Update Survey
Maui Economic Opportunity, Inc.

APPENDIX III-H

INDUSTRY OF UNEMPLOYED POPULATION
16 AND OLDER

	<u>%</u>	<u>MEO SURVEY</u>	<u>ADJUSTED</u>
Agriculture	1.66	12	11
Fishing & hunting	---	---	---
Construction	10.94	79	71
Manufacturing	10.80	78	70
Transportation & commodities	2.77	20	18
Wholesale	1.25	9	8
Retail	19.95	144	130
Finance & insurance	3.60	26	24
Service	18.56	134	121
Government	11.91	86	78
Miscellaneous	18.56	134	121
Base (estimated population 16 and older unemployed less than two years)	100.00	722	652

Source: 1975 Census Update Survey
Maui Economic Opportunity, Inc.

APPENDIX V-A

PROJECTED PEAK HOUR TRAFFIC SPLIT BY PERCENTAGE ON CORRIDOR*						
Site No.	Honoapiilani Highway	Kaahumanu Avenue	Kamehameha Avenue	Kuihe'lani Highway	Papa Avenue	Internal Flow
Luana Gardens Low Income Apts. Low Income Res.	0%	25%	25%	15%	10%	25%
1	5	35	25	10	25	25
2	5	45	15	10	40	20
3	5	30	20	10	30	30
4	5	70	0	10	0	15
5	10	60	10	10	20	30
6	15	25	15	5	15	30
7	5	15	30	15	20	20

*Based on a percentage estimation of peak hour trips as follows:

Work	50%
Work/School	25%
School	15%
Misc., Recreation, Home Visits	10%

APPENDIX V-A (Cont.)

AVERAGE DAILY TRAFFIC AND PEAK HOUR CALCULATIONS							
Residential Development Areas	Area (Ac.)	Density (Un/Ac)	Total Units	Household Size (Per/Un)	Population	Average* Daily Traffic (A.D.T.)	Peak Hour (x.11)
Low Income Apts.	29	7.8	225	2.5	560	933	103
Low Income Res.	27	4.8	130	3.3	430	717	79
1a, b, c	99	5.0	495	3.3	1,630	2,717	299
2a, b, c, d, e	60	4.5	270	3.3	890	1,483	163
3a, b, c	82	5.6	460	3.3	1,520	2,533	279
4a, b	51	5.0	255	3.3	840	1,400	154
5a, b	66	4.8	315	3.3	1,040	1,733	191
6a, b, c	68	5.0	340	3.3	1,120	1,867	205
7a, b, c	101	5.7	575	3.3	1,900	3,167	348
TOTAL	583	5.3	3,065	3.2	9,930	16,550	1,821

*Multiply population x 3 trips/person/day ÷ 1.8 persons/vehicle.

APPENDIX V-A (Cont.)

WAIALE PROJECT - PEAK HOUR CONTRIBUTIONS TO TRAFFIC CORRIDORS BY TIME INCREMENT							
Minimum Build-Out Schedule							
Site No.	Completion Year	To Honoapiilani Highway	To Kaahumanu Highway	To Kamehameha Avenue	To Kuihe'lani Highway	To Papa Avenue	Internal Flow
Luana Gardens Low Income Apts.		-	26	26	15	10	26
Low Income Res.	1979	-	20	20	12	8	20
SUBTOTAL		-	46	46	27	18	46
1	1981	15	105	75	30	75	75
2	1982	8	73	24	16	65	33
3	1984	14	84	56	28	84	84
4	1985	8	108	-	15	-	23
SUBTOTAL		45	370	155	89	224	215
CUMULATIVE SUBTOTAL		45	416	201	116	242	261
5	1986	19	115	19	19	38	57
6	1987	31	51	31	10	31	62
7	1990	17	52	104	52	70	70
SUBTOTAL		67	218	154	81	139	189
TOTAL		112	634	355	197	381	450
Maximum Build-Out Schedule							
Luana Gardens Low Income Apts.		-	26	26	15	10	26
Low Income Res.	1979	-	20	20	12	8	20
SUBTOTAL		-	46	46	27	18	46
1	1981	15	105	75	30	75	75
2	1983	8	73	24	16	65	33
SUBTOTAL		23	178	99	46	140	108
CUMULATIVE SUBTOTAL		23	224	145	73	158	154
3	1987	14	84	56	28	84	84
4	1989	8	108	-	15	-	23
SUBTOTAL		22	192	56	43	84	107
CUMULATIVE SUBTOTAL		45	416	201	116	242	261
5	1992	19	115	19	19	38	57
6	1995	31	51	31	10	31	62
SUBTOTAL		50	166	50	29	69	119
CUMULATIVE SUBTOTAL		94	582	251	145	311	380
7	2001	17	52	104	52	70	70
TOTAL		112	634	355	197	381	450

APPENDIX V-B

PROJECTED 1990 VEHICLE EMISSIONS (lbs./day)									
Vehicle Year Type	Fraction	No. of Vehicles	Trips/Vehicle Type/Day	Mile/Vehicle Type/Day	Carbon Monoxide	Hydro-Carbons	Nitrogen Oxides		
1977	0.14	927	2,318	11,590	460	72	66		
1978	.031	205	513	2,565	32	5	10		
1979	.042	278	695	3,475	43	6	13		
1980	.056	371	928	4,640	57	8	17		
1981	.061	404	1,010	5,050	59	8	17		
1982	.061	404	1,010	5,050	56	8	14		
1983	.066	437	1,093	5,465	58	8	13		
1984	.084	556	1,390	6,950	69	9	14		
1985	.078	516	1,290	6,450	60	8	10		
1986	.073	483	1,208	6,040	52	7	7		
1987	.078	516	1,290	6,450	51	6	6		
1988	.094	622	1,555	7,775	58	7	6		
1989	.090	596	1,490	7,450	51	5	5		
1990	.046	305	763	3,815	24	2	2		
TOTAL	1.00	6,620			1,130	164	200		

1/ (No. of Vehicles) x (2.5 trips/vehicle/day).

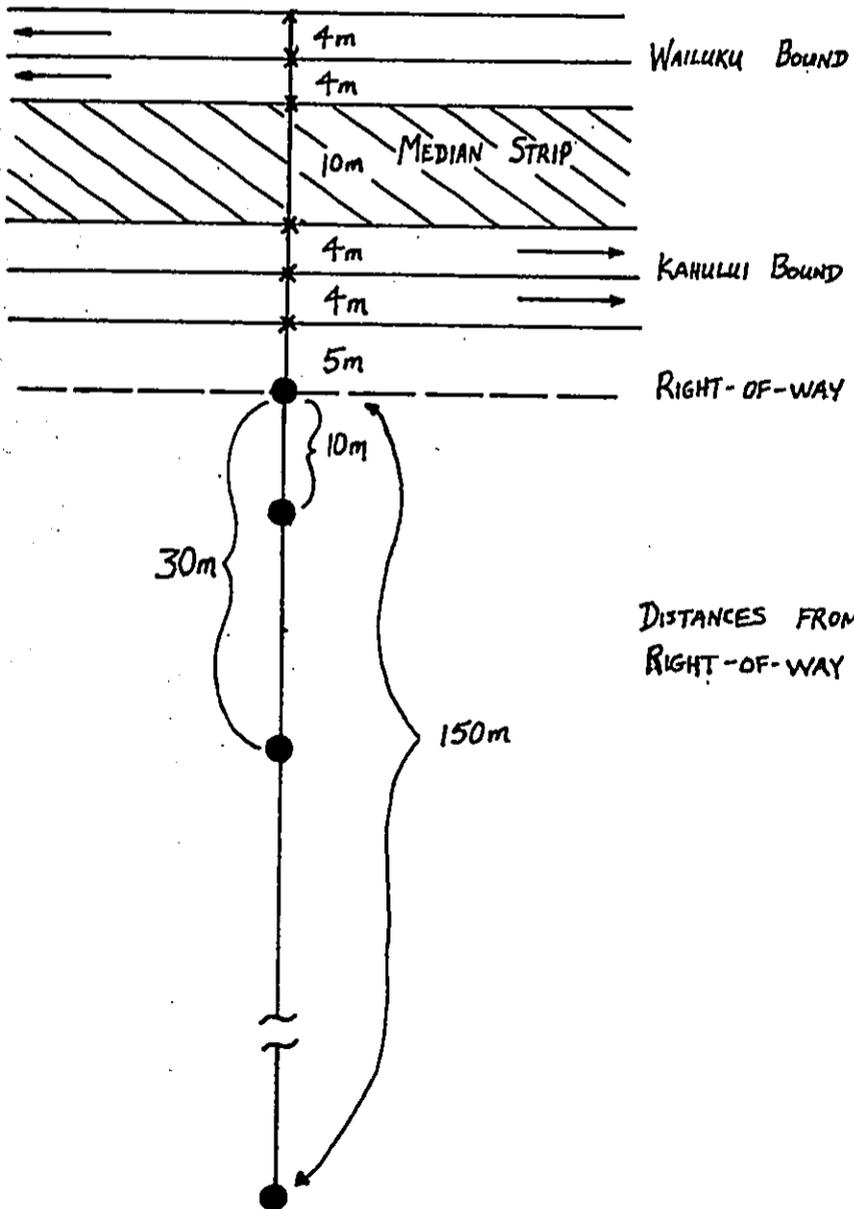
2/ (Trips/Vehicle Type/Day) x (5 miles/vehicle trip).

APPENDIX V-C

Dispersion Analysis - Estimated Carbon Monoxide Concentrations Due to Automotive Emissions - Sample Calculation

NOTES:

1. Sample projection for Kaahumanu Avenue
2. Projected for 1990 using a correctional factor of 0.2 (calculated from Supplements, AP-42)
3. Dispersion methodology as detailed in Guidelines for Air Quality Maintenance Planning and Analysis Volume 9: Evaluating Indirect Sources by the U.S. Environmental Protection Agency.



- o 4-lane highway
- o projected peak hour traffic = 3,197 or about 800 vehicles/lane = V
- o capacity = 900 vehicles/lane = C
- o $V/C = \frac{800}{900} = 0.89$
- o 10m., 1-hr. CO Concentration = 8.4 ppm
- o 1990 correction factor = 0.2

DISTANCES FROM
RIGHT-OF-WAY

APPENDIX V-C (Cont.)

1. At R.O.W.

5m	(8.4)	(1.2)	=	10.08
9m	(8.4)	(1.0)	=	8.40
23m	(8.4)	(0.6)	=	5.04
27m	(8.4)	(0.55)	=	<u>4.62</u>

$$28.14 \times (0.2) = 5.63 \text{ ppm}$$

2. At 10m

15m	(8.4)	(0.8)	=	6.72
19m	(8.4)	(0.7)	=	5.88
33m	(8.4)	(0.52)	=	4.37
37m	(8.4)	(0.45)	=	<u>3.78</u>

$$20.75 \times (0.2) = 4.15 \text{ ppm}$$

3. At 30m

35m	(8.4)	(0.47)	=	3.95
39m	(8.4)	(0.43)	=	3.61
53m	(8.4)	(0.35)	=	2.94
57m	(8.4)	(0.33)	=	<u>2.77</u>

$$13.27 \times (0.2) = 2.65 \text{ ppm}$$

4. At 150m

155m	(8.4)	(0.12)	=	1.01
159m	(8.4)	(0.11)	=	0.92
173m	(8.4)	(0.10)	=	0.84
177m	(8.4)	(0.09)	=	<u>0.76</u>

$$3.53 \times (0.2) = 0.71 \text{ ppm}$$

FIGURE 4.9

TRAFFIC NOISE COMPUTATION TALLY
NOISE LEVEL, dBA

Project WAIALE Engineer S. Mar
 Segment Kaa Iuamau Avenue Date for project completion.
 Autos/hr. 3101 Trucks/hr. 96 Miles/hr. 45
 Highway Width 48 feet. Observer 50, 100, 500, 1000 ft.
 Comments NCHRP 117

Assumptions :
 • no barrier
 • average road surface
 • foliage not crucial
 • rows of houses not crucial
 • 0% gradient.

Item	50ft.		100ft.		500ft		1000 ft.	
	A	T	A	T	A	T	A	T
L ₅₀ reference at 100 feet	66	62	66	62	66	62	66	62
Distance, width adjustment	2.5	2.5	-1	-1	-10	-10	-15	-15
L ₁₀ -L ₅₀ adjustment	3.2	12.4	2.6	11.3	1.6	6.2	1.3	4.6
L ₁₀ reference at observer	71.7	76.9	67.6	72.3	57.6	58.2	52.3	51.6
Segment adjustment								
Barrier adjustment								
Miscellaneous Adjustments	Gradient							
	Road surface							
	Foliage							
	Rows of houses							
L ₁₀ at observer, by veh. type	71.7	76.9	67.6	72.3	57.6	58.2	52.3	51.6
L ₁₀ at observer, summed	78		73		61		55	

FIGURE 4.9

TRAFFIC NOISE COMPUTATION TALLY
NOISE LEVEL, dBA

Project WAIALE Engineer S. Mar.
 Segment Kuihelani Highway Date for 1220
 Autos/hr. 880 Trucks/hr. 77 Miles/hr. 55
 Highway Width 24 feet. Observer 50, 100, 500, 1500ft.
 Comments NCHRP 117

Item	50 ft		100ft		500ft		1000ft.	
	A	T	A	T	A	T	A	T
L ₅₀ reference at 100 feet	63	59	63	59	63	59	63	59
Distance, width adjustment	4	4	0	0	-10	-10	-15	-15
L ₁₀ -L ₅₀ adjustment	7	13	5.5	12.5	2.7	7.6	2	5.7
L ₁₀ reference at observer	74	76	68.5	71.5	55.7	56.6	50	49.7
Segment adjustment								
Barrier adjustment								
Miscellaneous Adjustments	Gradient							
	Road surface							
	Foliage							
	Rows of houses							
L ₁₀ at observer, by veh. type	74	76	68.5	71.5	55.7	56.6	50	49.7
L ₁₀ at observer, summed	78		74		60		53	

FIGURE 4.9

Sheet 3 of 5

TRAFFIC NOISE COMPUTATION TALLY
NOISE LEVEL, dBA

Project WAIALE Engineer S. Neer
 Segment HONOAPILANI HIGHWAY Date for project completion.
 Autos/hr. 910 Trucks/hr. 69 Miles/hr. 45
 Highway Width 24 feet. Observer 50, 100, 500, 1000ft
 Comments NCHRP 117

Item	50 ft		100 ft		500 ft		1000 ft.	
	A	T	A	T	A	T	A	T
L ₅₀ reference at 100 feet	61	60	61	60	61	60	61	60
Distance, width adjustment	4	4	0	0	-10	-10	-15	-15
L ₁₀ -L ₅₀ adjustment	6.2	13	4.8	12.5	2.4	7.3	1.8	5.6
L ₁₀ reference at observer	71.2	77	65.8	72.5	53.4	57.3	47.8	50.6
Segment adjustment								
Barrier adjustment								
Miscellaneous Adjustments	Gradient							
	Road surface							
	Foliage							
	Rows of houses							
L ₁₀ at observer, by veh. type	71.2	77	65.8	72.5	53.4	57.3	47.8	50.6
L ₁₀ at observer, summed	78		74		58		53	

FIGURE 4.9

Sheet 4 of 5

TRAFFIC NOISE COMPUTATION TALLY
NOISE LEVEL, dBA

Project WAI'ALE Engineer S. Mar
 Segment Kamohameha Avenue Date for project completion
 Autos/hr. 541 Trucks/hr. — Miles/hr. 25
 Highway Width 24 feet. Observer 50, 100, 500, 1000 ft.
 Comments NCHRP 117

Item	50		100		500		1000'	
	A	T	A	T	A	T	A	T
L ₅₀ reference at 100 feet	54		54		54		54	
Distance, width adjustment	4		0		-10		-15	
L ₁₀ -L ₅₀ adjustment	6.1		4.3		2.2		1.8	
L ₁₀ reference at observer	64.1		58.3		46.2			
Segment adjustment								
Barrier adjustment								
Miscellaneous Adjustments	Gradient							
	Road surface							
	Foliage							
	Rows of houses							
L ₁₀ at observer, by veh. type	64.1		58.3		46.2		40.8	
L ₁₀ at observer, summed	64		58		46		41	

FIGURE 4.9

Sheet 5 of 5

TRAFFIC NOISE COMPUTATION TALLY
NOISE LEVEL, dBA

Project WAI'ALE Engineer S. Mar
 Segment Papa Avenue Date for project completion.
 Autos/hr. 621 Trucks/hr. - Miles/hr. 25
 Highway Width 24 feet. Observer 50, 100, 500, 1000 ft.
 Comments NCHRP 117.

Item	50		100		500		1000'	
	A	T	A	T	A	T	A	T
L ₅₀ reference at 100 feet	55		55		55		55	
Distance, width adjustment	4		0		-10		-15	
L ₁₀ -L ₅₀ adjustment	5.9		4.4		2.3		1.8	
L ₁₀ reference at observer	64.9		59.4		47.3			
Segment adjustment								
Barrier adjustment								
Miscellaneous Adjustments	Gradient							
	Road surface							
	Foliage							
	Rows of houses							
L ₁₀ at observer, by veh. type	64.9		59.4		47.3		41.8	
L ₁₀ at observer, summed	65		59		47		42	

APPENDIX VII-A

WAIEHU MUNICIPAL GOLF COURSE
ROUNDS PLAYED PER MONTH
1972-1976

	<u>1976</u>	<u>1975</u>	<u>1974</u>	<u>1973</u>	<u>1972</u>
January	6,705	6,778	4,719	5,072	5,215
February	7,351	6,971	6,964	6,471	6,037
March	6,625	7,477	7,275	6,481	6,486
April	6,293	5,921	6,314	6,239	5,680
May	6,469	6,342	6,147	5,941	5,957
June	5,658	5,793	6,181	6,321	5,657
July	6,485	6,512	6,372	7,087	6,954
August	6,292	6,764	7,011	7,461	6,623
September	5,203	5,475	5,207	5,004	5,249
October	5,524	5,455	4,997	4,985	4,124
November	7,574	6,169	5,190	5,269	4,797
December	5,693	6,274	5,592	5,227	4,707
Annual	75,872	75,931	71,969	71,558	67,486

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100

COMMENTS MADE DURING THE
REVIEW PERIOD

GEORGE R. ARIYOSHI
GOVERNOR



VALENTINE A. SIEFERMANN
MAJOR GENERAL
ADJUTANT GENERAL

STATE OF HAWAII
DEPARTMENT OF DEFENSE
OFFICE OF THE ADJUTANT GENERAL
FORT RUGER, HONOLULU, HAWAII 96816

HIENG

25 MAY 1977

Dr. Albert Tom, Chairman
Environmental Quality Commission
550 Halekauwila Street, Room 301
Honolulu, Hawaii 96813

Dear Dr. Tom:

Waiale Development Plan

Thank you for sending us a copy of the "Waiale Development Plan"
Environmental Impact Statement. We have received the publication and
have no comments to offer.

Yours truly,

A handwritten signature in cursive script, appearing to read "Wayne R. Tomoyasu".

WAYNE R. TOMOYASU
Captain, CE, HARRG
Contr & Engr Officer

Enclosure



United States Department of the Interior

FISH AND WILDLIFE SERVICE
Division of Ecological Services
300 Ala Moana Blvd., Rm. 5302
P. O. Box 50167
Honolulu, Hawaii 96850

June 1, 1977

Dr. Richard Marland, Director
Environmental Quality Commission
550 Halekauwila Street, Rm. 301
Honolulu, Hawaii 96813

Re: Draft EIS
Waiale Development Plan
Maui County, Hawaii

Dear Sir:

We have reviewed the subject Draft Environmental Impact Statement for the Waiale Development Plan and have no additional comments to offer.

We are returning the copy of the DEIS as requested.

Sincerely yours,

Maurice H. Taylor

Maurice H. Taylor
Field Supervisor

EC: HA



Save Energy and You Serve America!

AFZV-FB-EE

02 JUN 1977

Hawai County Planning Commission
200 South High Street
Wailuku, Hawaii 96793

Gentlemen:

Reference is made to Draft Environmental Impact Statement for Waiale
Development Plan which was forwarded for our comments on May 20, 1977.

The document has been reviewed and we have no comments. The Army Reserve
Center, located across Kaahumanu Avenue from the proposed 1,015 acres,
3,065 units of residential development, does not appear to be adversely
affected by the plan.

Thank you for the opportunity to review the environmental and planning
aspects of the project at this early stage of development.

Sincerely yours,

I Incl
As stated

CARL P. RODOLPH
Colonel, CE
Director of Facilities Engineering

CF:
A & B Properties Inc.
822 Bishop Street
P.O. Box 3440
Honolulu, Hawaii 96801

CORRECTION

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

GEORGE R. ARIYOSHI
GOVERNOR



VALENTINE A. SIEFERMANN
MAJOR GENERAL
ADJUTANT GENERAL

STATE OF HAWAII
DEPARTMENT OF DEFENSE
OFFICE OF THE ADJUTANT GENERAL
FORT RUGER, HONOLULU, HAWAII 96816

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WAYNE R. TOMOYASU
Captain, CE, HARG
Contr & Engr Officer

Enclosure



United States Department of the Interior

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Maurice H. Taylor
Maurice H. Taylor
Field Supervisor

EC: HA



Save Energy and You Serve America!

AFZV-FB-EE

02 JUN 1977

Hawai County Planning Commission
200 South High Street
Waikuku, Hawaii 96793

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Thank you for the opportunity to review the environmental and planning
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Sincerely yours,

1 Incl
As stated

CARL P. RODOLPH
Colonel, CE
Director of Facilities Engineering

CF:
A & B Properties Inc.
822 Bishop Street
P.O. Box 3440
Honolulu, Hawaii 96801



DEPARTMENT OF THE ARMY
PACIFIC OCEAN DIVISION, CORPS OF ENGINEERS
BLDG. 230, FT. SHAFTER
APO SAN FRANCISCO 96338

PODED-P

8 June 1977

Maul Planning Commission
County of Maui
200 S. High Street
Wailuku, Hawaii 96793

Dear Sirs:

We have reviewed the Waiiale Development Plan Draft Environmental Impact Statement in accordance with your request of 20 May 1977.

On page II-17 you state that all runoff generated from the project site will be directed to major depressed areas in the golf course. Are there provisions to prevent overflows from causing flooding of residences? Structures subject to flooding from a 100-year flood should conform to flood plain management ordinances and provisions of the flood insurance program. We suggest that this be addressed in the Environmental Impact Statement.

Thank you for the opportunity to review this document.

Sincerely yours,

WM. J. MATTHEWS
Acting Chief, Engineering Division

Cy Furn:
A & B Properties, Inc.
822 Bishop St., P.O. Box 3440
Honolulu, HI 96801

245 North Kukui Street, Honolulu, Hawaii 96817, Telephone (808) 537-5966

AMERICAN  LUNG ASSOCIATION *of Hawaii*

June 9, 1977

Maui County Planning Commission
200 South High Street
Mailuku, Hawaii 96793

Gentlemen:

Subject: Draft EIS for the Waiale Development Plan

We have reviewed the subject draft EIS, and our comments are attached. Review was restricted to those portions of the EIS pertaining to air quality impact, and we generally concur with the findings of the statement.

Sincerely,

James W. Morrow, Director
Environmental Health

JWM:ct
Att.

cc: Mr. R.K. Sasaki
Dr. Richard E. Marland



**AMERICAN LUNG ASSOCIATION
OF HAWAII**

ENVIRONMENTAL IMPACT STATEMENT REVIEW

... an air quality assurance program

Project: Waiale Development Plan (Maui)

Date: June 9, 1977

The draft EIS for the subject project has been reviewed with the following findings:

1. Overall, the report provides a fine discussion of the potential short and long term impacts on air quality and the results of the analysis represent a reasonable estimate of the magnitude of that impact.
2. The title of Table V-7 should indicate grams/mile (g/mi) instead of milligrams/mile (mg/mi).
3. The sentence under Table V-7 should indicate over what period of time the emission quantities specified will be generated (daily).

STATE OFFICE
245 N. Kukui St.
Hono., Hawaii 96817
Telephone 537-5968

HAWAII COUNTY
Post Office Box 925
Hilo, Hawaii 96720
Telephone 935-1208

KAUAI COUNTY
Post Office Box 991
Lihue, Hawaii 96788
Telephone 245-4142

MAUI COUNTY
Cameron Center
Wailuku, Hawaii 96783
Telephone 244-5110

GEORGE R. ARIYOSHI
GOVERNOR



JOHN FARIAS, JR.
CHAIRMAN, BOARD OF AGRICULTURE

YUKIO KITAGAWA
DEPUTY TO THE CHAIRMAN

STATE OF HAWAII
DEPARTMENT OF AGRICULTURE
1428 SO. KING STREET
HONOLULU, HAWAII 96814

June 13, 1977

MEMORANDUM

To: Maui Planning Commission, County of Maui

Subject: EIS for Waiale Development Plan

The Department of Agriculture has reviewed the subject environmental impact statement, and can add nothing further to the analysis of potential impact of the project.

Thank you for the opportunity to comment.

A handwritten signature in cursive script, appearing to read "John Farias, Jr.", written in dark ink.

JOHN FARIAS, JR.
Chairman, Board of Agriculture

cc: A & B Properties, Inc. ✓

GEORGE R. ARIYOSHI
GOVERNOR OF HAWAII



CHRISTOPHER COBB, CHAIRMAN
BOARD OF LAND & NATURAL RESOURCES

EDGAR A. HAMASU
DEPUTY TO THE CHAIRMAN

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

DIVISIONS:
CONVEYANCES
FISH AND GAME
FORESTRY
LAND MANAGEMENT
STATE PARKS
WATER AND LAND DEVELOPMENT

June 16, 1977

MEMORANDUM

TO: Environmental Quality Commission
State of Hawaii

FROM: Gordon Soh, Program Planning Coordinator
Planning Office

SUBJECT: EIS for Waiale Development

We have reviewed the Waiale EIS. Because of concern for protection of basal ground water quality, we recommend further investigation of any proposal for drainage utilizing infiltration well fields. The Department of Health should be given opportunity to review the matter of ground water quality.

It also occurs to us that on-site wells for irrigating the golf course may be an alternative to using the County water system.


GORDON SOH



DEPARTMENT OF PLANNING
AND ECONOMIC DEVELOPMENT

Kamamalu Building, 250 South King St., Honolulu, Hawaii • Mailing Address: P.O. Box 2359, Honolulu, Hawaii 96804

GEORGE R. ARIYOSHI
Governor

HIDETO KONO
Director

FRANK SKRIVANEK
Deputy Director

Ref. No. 3844

June 17, 1977

Mr. R. K. Sasaki, President
A&B Properties, Inc.
822 Bishop Street
P.O. Box 3440
Honolulu, Hawaii 96801

Dear Mr. Sasaki:

Subject: Draft Environmental Impact Statement for
Waiale Development Plan

We have reviewed the subject Draft EIS and find that, in general, it has adequately identified and assessed the major environmental impacts which can be anticipated to result from the proposed project.

We have no other comments to offer at this time, however, we appreciate this opportunity to review the Draft EIS.

Sincerely,



HIDETO KONO

University of Hawaii at Manoa

Water Resources Research Center

June 17, 1977

MEMORANDUM

TO: Maui Planning Commission
County of Maui
A & B Properties, Inc.

FROM: Reginald H.F. Young^{RHY}
Assistant Director

SUBJECT: Waiale Development Plan EIS

The following comments are offered for your consideration concerning the Waiale Development Plan EIS:

1. The description of hydrology (III-4) should include information on groundwater quality and use (if any) in immediate vicinity of development site.
2. It would be useful to have more information on the storm water injection system (V-5,6). For example, since these wells will presumably operate by gravity flow, what is the depth to the water table? Also, what is the holding capacity of the drainage ponds relative to the design storm for the subdivision? It would be advisable to cite the operating history of a similar storm runoff injection well system at the nearby A & B subdivision adjacent to the Maui Pine plant.
3. The full impact of the sewage, generated by the project (V-27,28), has not been considered. Capacities of the Wailuku and Kahului pump stations and the collection system leading to an existing 30-inch sewer have been enumerated. However, the estimated 1.1 mgd of sewage generated will have an impact on the newly-completed Kahului wastewater treatment plant and the ultimate disposal of the treated effluent by injection wells. This flow will add at least a 10% hydraulic load to the plant (6 mgd initial and 9 mgd ultimate design capacity).

Has any consideration been given to wastewater reuse for golf course irrigation?

cc: EW Center
H. Gee
Y. Fok
E. Murabayashi
F. Peterson

GEORGE R. ARIYOSHI
GOVERNOR



ANDREW I. T. CHANG
DIRECTOR OF SOCIAL SERVICES & HOUSING

STATE OF HAWAII
DEPARTMENT OF SOCIAL SERVICES AND HOUSING
P. O. Box 339
Honolulu, Hawaii 96809

June 22, 1977

TO: Environmental Quality Commission
550 Halekauwila St., Rm. 301
Honolulu, Hawaii 96813

FROM: Andrew I. T. Chang, Director
Department of Social Services and Housing

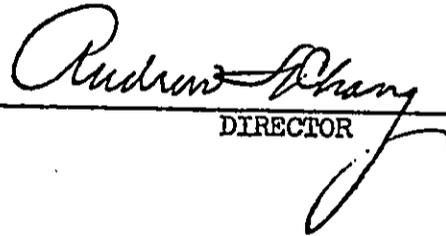
SUBJECT: Environmental Impact Statement - Waiale Development Plan.

Subject EIS has been reviewed by our Hawaii Housing Authority for effect on our departmental programs.

There is no apparent conflict with our objectives.

We are returning the EIS for your further usage.

Thank you for the opportunity to review and comment.



DIRECTOR

Attachment
cc: Maui Planning Commission
✓ A & B Properties, Inc.



University of Hawaii at Manoa

Environmental Center
Crawford 317 • 2550 Campus Road
Honolulu, Hawaii 96822
Telephone (808) 948-7361

Office of the Director

June 22, 1977

Mr. R.K. Sasaki, President
A&B Properties, Inc.
822 Bishop Street
Honolulu, Hawaii 96813

Dear Mr. Sasaki:

The Environmental Center review of the Environmental Impact Statement for the Waiale Development Plan was prepared largely by the staff of the Center. We were unable to provide our usual broad based University review due to limitations in time and availability of personnel during the summer schedule.

The following comments are offered for your consideration.

Geology

Figure III-1. An explanation of the 3rd sedimentary rock pattern is missing. It is probably older alluvium.

Geomorphology

The EIS recognizes the "hill and valley terrain of ancient sand dunes near the reservoir" (p. II-20), but the discussion of topography (p. III-1) involves only slopes and elevations and not the geomorphologic character of the terrain. The dunes in the Waiale area are not as large or as regular in shape as, say, that crossed by the Main Kahului-Wailuku highway. The terrain in Waiale is, however, of some geomorphological interest because it is unusual in Hawaii. This interest seems not explicitly recognized in the EIS.

It is not clear how much the development plan will modify the sand-dune terrain. The EIS states (p. IV-11): "The proposed project is designed to harmonize with existing topographical features, rather than drastically alter them." Waiale Reservoir will be within a park, but because there are no contours on fig. II-3 it is not clear whether the park will include dune crests or will be confined to inter-dune depressions. The golf course will include at least five existing inter-dune depressions (p. V-3), but these are to be enlarged to serve as drainage ponds and additional drainage ponds are to be excavated by mass grading. Overall, the project is described as requiring "extensive earth-work for the roads, buildings pads, and golf course" (p. V-3), and the estimate of earth to be moved in cutting and filling, 4×10^6 yds³ implies an average change of elevation of 1 yard over the project area.

AN EQUAL OPPORTUNITY EMPLOYER

June 22, 1977

We suggest that the EIS should address the extent to which the sand-dune geomorphology will be destroyed (or the extent to which this geomorphology will be preserved as it was to advantage in the first increment of the "Dream City" development of Kahalai, southeast of the old town).

Hydrology

The EIS states (p. III-4) that the "primary source of fresh water is basal water in the West Maui Mountains." This is true only with regard to domestic water. The irrigation water flowing through and stored within the project area is West Maui surface water and dike water, and in the general region still more important sources of irrigation water are East Maui surface and ground water.

The EIS states that: "The basal water begins at an elevation of 1 foot above mean sea level (MSL) near the coast and rises at an average of 1.5 to 2.5 feet per mile for the first 2 to 3 miles inland. The basal water table ends 4 to 5 miles inland at an elevation of about 30 feet above MSL." This implies an inland gradient of at least 8 ft./mi. The cited gradient near the coast seems to refer to that of the basal ground water in the East Maui lavas of the Maui Isthmus, or to the basal water in the sediments of the Maui Isthmus, although it is higher than is actually the case in those aquifers. The 30-foot head refers clearly, however, to that in the West Maui lavas west of the project area.

The EIS states that "Recharge of the basal water occurs primarily by underflow of high level water (i.e. dike or perched water)," and that "recharge occurs to a minor degree by rainfall and irrigation water percolation." These statements are certainly invalid for the groundwater in the sediments and in the East Maui lavas, and are not in accord with the findings of M.C. Casky (The recharge of the Waikapu aquifer. Univ. Hawaii Geol. and Geophysics MS thesis, Aug. 1968) with respect to the groundwater in the West Maui lavas

Much of the hydrology discussion is not closely related to the project, but to such an extent as it is needed or provided for general interest it should be revised for accuracy.

Domestic Water Supply

The EIS states (p. II-14, see also p. V-27) that "Development of additional domestic water source capacity at either Mokuahau or Waihee...will be required to serve the project," and cite the Central Maui Water Study (CMWS). The Mokuahau wells are the major present county source but the additional source discussed in the CMWS is actually at Waiehu rather than Waihee. The estimated eventual mean demand for the project is estimated 2.8 mgd (p. V-25).

Mr. R.K. Sasaki

- 3 -

June 22, 1977

It is not clear how this estimate relates to the estimates of demand in the CMWS because the Waiale area is split between two service areas discussed in the CMWS, Wailuku Low and Kahului. The CMWS estimates increases in maximum day demands of 1.28 mg between 1180 and 2000 for the Wailuku Low area and 6.70 mg for the Kahului area, equivalent respectively to increases of mean demands of 0.85 mgd and 4.46 mgd. Hence, the 2.8 mgd mean demand for Waiale may be included within the demand estimates of the CMWS. The EIS should state this if it is true.

As we have pointed out in our review of the Central Water Transmission System EIS, the aquifer at Mokuhaui and that at Waiehu must surely be interconnected, although pump tests suggest that the connection is restricted. It is very unlikely that the combination of aquifers from Wailuku to Waihee can supply the entire demand projected in the CMWS. Hence, the Waiale EIS should address the problem of supplementary sources to be developed when the safe yield of these aquifers has been fully developed, and also the impacts of development of these supplementary sources.

We appreciate the opportunity to have reviewed this DEIS.

Yours truly,

Doak C. Cox

Doak C. Cox
Director

DCC:ck

cc: Maui Planning Commission
Richard Marland, OEQC

GEORGE R. ARIYOSHI
GOVERNOR



RICHARD E. MARLAND, PH.D.
DIRECTOR

TELEPHONE NO.
548-6915

STATE OF HAWAII
OFFICE OF ENVIRONMENTAL QUALITY CONTROL
OFFICE OF THE GOVERNOR
550 HALEKAUWILA ST.
ROOM 301
HONOLULU, HAWAII 96813

June 22, 1977

Maui Planning Commission
County of Maui
200 S. High Street
Wailuku, Maui, 96793

SUBJECT: Environmental Impact Statement for Waiale
Development Plan, Maui

Gentlemen:

As of this date, this Office has received four comments on the above subject. An attached sheet lists the responding agencies/organizations.

In our review of the environmental impact statement, this Office has found several areas in which the document should expand discussion. We offer the following comments:

WATER SUPPLY (pp. II-14-16, V-25)

The EIS states on page II-14, "Development of additional source capacity at either Mokuhanu or Waihee as reported in 'Central Maui Water Study for the Development of Sources Transmission Lines and Storage Reservoirs' by Norman Saito and Associates, Engineering Consultants, Inc., CH₂M Hill, Inc. and Dr. Harold Stearns, will be required to serve the project." The discussion should be expanded to clarify if the additional water needed will be from the proposed central Maui water transmission system or from another source. Has the Waiale development been considered in terms of the proposed central Maui water transmission to Kihei? If so, would the water supply limit the Kihei end if water was diverted to the Waiale development?

In view of the "water problem" that Maui has long had, will the water supply be adequate for this proposed development? If other sources are to be developed, how much water would be needed to adequately supply this project?

We note that the project will include a golf course. One feasible suggestion to conserve water is to water the golf course with recycled water from the sewage effluent as done for Wailua golf course in Kauai.

DRAINAGE (p. II-17)

Although the EIS indicates the percentage of land covered by structures and open space, we recommend that the expected run-off be discussed. In addition, it should also be noted that studies have shown receiving bodies of water run-off become degraded because of it. Will order be controlled from the ponding areas?

SEWAGE (pp. V-27-30)

Although sewage is pumped to the sewage pump stations, the EIS does not indicate the final disposition. Will the present facility (presumably a sewage treatment plant) be able to accommodate the increased sewage generated by the proposed development? This should be discussed.

HOUSING DEMAND

The EIS often justifies the proposed project as meeting the housing demand. The need is based on the general plan of Maui. However, we would like to point out the general plan is only a policy not a fixed document that cannot be amended. It should be used as a guideline. Citing the general plan does not reflect the actual housing need. Thus, what is the current housing availability? Is there presently a shortage? Will there be a need for housing in the future? Will the need for housing be for low, moderate, or high income units? An analysis of these issues is needed.

CONSULTATION PROCESS

Although the EIS includes a section of comments and responses made during the consultation process, we find that only the comments are included. According to the EIS Regulations, section 1:41 c. states,

Any written comments received by the proposing agency or applicant pursuant to this section shall be responded to in writing by the proposing agency or applicant prior to the filing of the EIS with the approving agency. (emphasis added)

The regulations further require that the comments and responses be reproduced in the EIS. Thus, we recommend that the responses made to the comments during the consultation process be included in the EIS prior to acceptance of the EIS.

Page 3

RECOMMENDATION

For brevity and fairness, our Office did not attempt to summarize other comments. Instead, we strongly feel that careful consideration be given to each commentor.

We trust that these comments will be helpful to you in determining whether or not the EIS is acceptable. We thank you for the opportunity to comment on this document.

Sincerely,

/S/ Richard E. Marland

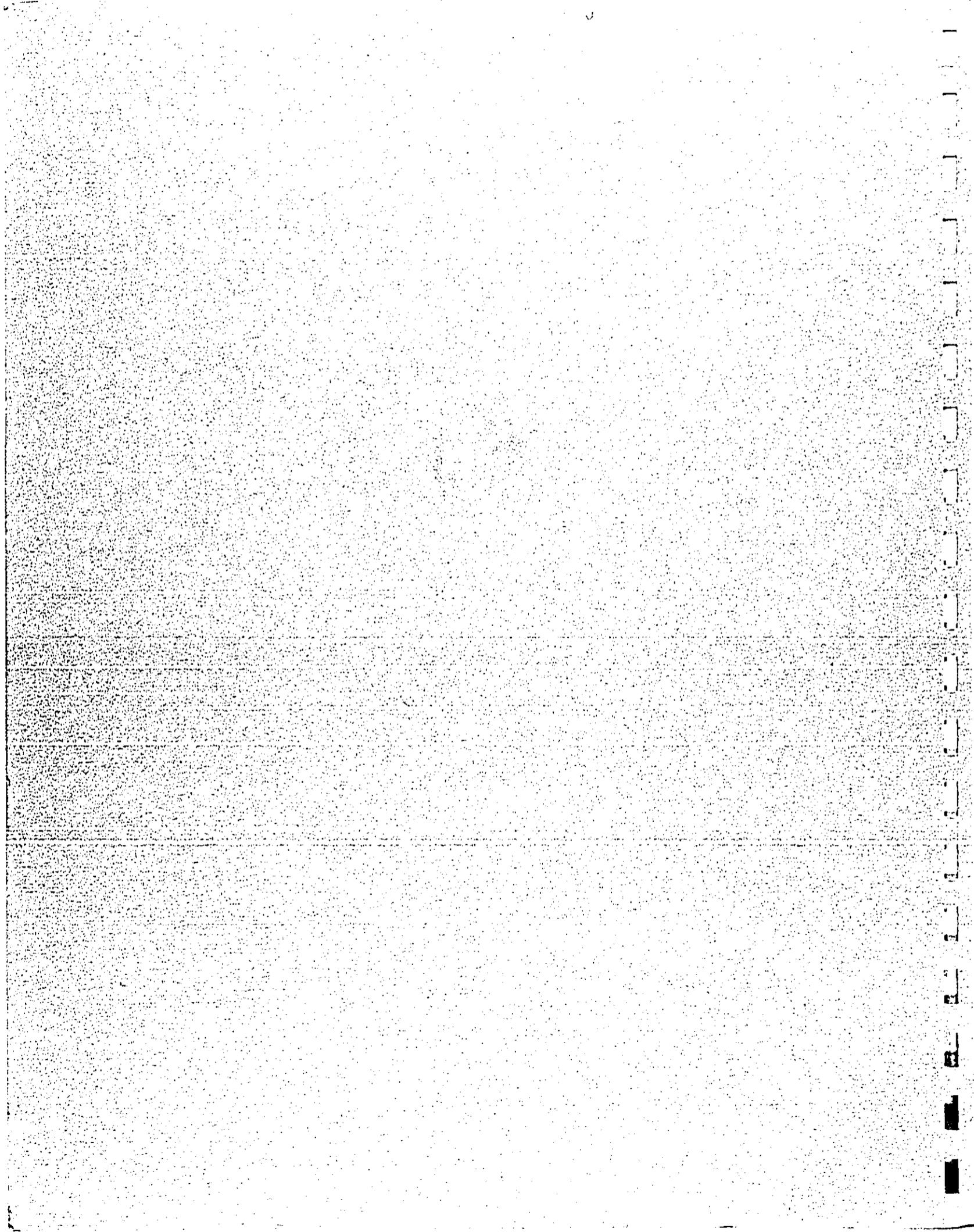
Richard E. Marland
Director

Attachments

cc: R. K. Sasaki, President, A&B Properties Inc./without attachment, P.O. Box 3440, Hon. HI 96801

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RESPONSES MADE DURING THE
RESPONSE PERIOD





A&B PROPERTIES, INC. 822 BISHOP STREET • P. O. BOX 3440 • HONOLULU, HAWAII 96801 • TELEPHONE (808) 525 6611

July 6, 1977

Captain Wayne R. Tomoyasu, CE, HARNG
Controller and Engineering Officer
Department of Defense
State of Hawaii
Office of the Adjutant General
Fort Ruger
Honolulu, Hawaii 96816

Dear Captain Tomoyasu:

This is to acknowledge the receipt of your letter dated May 25, 1977, regarding your review of the Draft Environmental Impact Statement for the Waiale Development Plan. We appreciate the time spend by your department reviewing the documents and are pleased that you have no comment to offer.

Should you have any questions or comments in the future regarding this project, please don't hesitate to contact us.

Sincerely,

A&B PROPERTIES, INC.


R. K. Sasaki, President



A&B PROPERTIES, INC. 822 BISHOP STREET • P. O. BOX 3440 • HONOLULU, HAWAII 96801 • TELEPHONE (808) 525-6611

July 6, 1977

Mr. Maurice H. Taylor
Field Supervisor
Division of Ecological Services
Fish and Wildlife Service
United States Department of the Interior
P. O. Box 50167
Honolulu, Hawaii 96850

Dear Mr. Taylor:

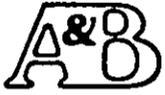
This is to acknowledge the receipt of your letter dated June 1, 1977, regarding your review of the Draft Environmental Impact Statement for the Waiale Development Plan. We appreciate the time spent by your division reviewing the document and are pleased that you have no additional comments to offer.

Should you have any questions or comments in the future regarding this project, please don't hesitate to contact us.

Sincerely,

A&B PROPERTIES, INC.

R. K. Sasaki, President



A&B PROPERTIES, INC. 822 BISHOP STREET • P. O. BOX 3440 • HONOLULU, HAWAII 96801 • TELEPHONE (808) 525-6611

July 6, 1977

Col. Carl P. Rodolph, CE
Director of Facilities Engineering
Department of the Army
Headquarters, USA
Support Command, Hawaii
APO San Francisco 96558

Dear Col. Rodolph:

This is to acknowledge the receipt of your letter dated June 2, 1977, regarding your review of the Draft Environmental Impact Statement for the Waiale Development Plan. We appreciate the time spent by your department reviewing the document and are pleased that the plan will not adversely affect the nearby Army Reserve Center.

Should you have any questions or comments in the future regarding this project, please don't hesitate to contact us.

Sincerely,

A&B PROPERTIES, INC.

A handwritten signature in black ink, appearing to read 'R. K. Sasaki', written over a horizontal line.

R. K. Sasaki, President



A&B PROPERTIES, INC. 822 BISHOP STREET • P. O. BOX 3440 • HONOLULU, HAWAII 96801 • TELEPHONE (808) 525-6611

July 6, 1977

Mr. William J. Matthews
Acting Chief, Engineering Division
Department of the Army
Pacific Ocean Division, Corps of Engineers
Building 230, Fort Shafter
APO San Francisco 96558

Dear Mr. Matthews:

This is to acknowledge the receipt of your letter dated June 8, 1977, regarding your review of the Draft Environmental Impact Statement for the Waiale Development Plan. We appreciate the time spent by your division reviewing the document and offer the following response to your concerns.

Although the statements on drainage in the EIS (page II-17 and pages V-23 to 25) are somewhat general, much study, field work and discussion with key County administrators and engineers has transpired since the EIS was written. A great quantity of planning and research now underlies the drainage plan. As presently designed, the golf course, ponding areas and infiltration wells will dispose of the 100-year, 24-hour storm runoff from all onsite and offsite tributary areas. Flooding from a 10-year storm will essentially be limited to the ponding areas, and flooding from a 100-year storm will be contained within the golf course fairways. Therefore, there will be no flooding of residential lots or structures during the 100-year storm condition. Although Maui County has not completed or adopted the flood plain management ordinances and provisions of the national flood insurance program, the design of the Waiale drainage system does conform to the national guidelines.

Should you have any questions or comments in the future regarding this project, please don't hesitate to contact us.

Sincerely,

A&B PROPERTIES, INC.


R. K. Sasaki, President



A&B PROPERTIES, INC. 822 BISHOP STREET • P. O. BOX 3440 • HONOLULU, HAWAII 96801 • TELEPHONE (808) 525-6611

July 6, 1977

Mr. James W. Morrow, Director
Environmental Health
American Lung Association of Hawaii
245 North Kukui Street
Honolulu, Hawaii 96817

Dear Mr. Morrow:

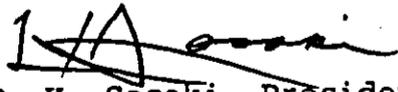
This is to acknowledge the receipt of your letter dated June 9, 1977, regarding your review of the Draft Environmental Impact Statement for the Waiale Development Plan. We appreciate the time you spent reviewing the document and are pleased that you generally concur with its findings pertaining to air quality impact.

Attached you will find a copy of page V-11 from the EIS which has been corrected as per comments 2 and 3 on your review sheet. This will be appended to the EIS and submitted as part of the final document.

Should you have any questions or comments in the future regarding this project, please don't hesitate to contact us.

Sincerely,

A&B PROPERTIES, INC.


R. K. Sasaki, President

Attachment

During the construction phase of the project, heavy-duty vehicles will be used to transport fill material, construction equipment and building supplies, as well as for site preparation purposes. The number of trucks trips which will be required daily throughout the development of the Waiale Project has been estimated at 20 per day, that is 10 truck trips for earthwork and 10 truck trips for supplies. Table V-7 is an incremental emissions tabulation for heavy-duty, diesel-powered vehicles for the years 1980, 1985, and 1990. Each truck trip is estimated to be 5 miles.

Table V-7
Emission Factors for
Heavy-Duty Diesel-Powered Vehicles
By Calendar Year (gm/mi)^{1/}

	<u>Carbon Monoxide</u>	<u>Hydrocarbon</u>	<u>Nitrogen Oxides</u>
1980	28.7	4.6	19.9
1985	28.7	4.6	20.3
1990	28.7	4.6	20.3

The daily emissions from heavy-duty vehicles will be minimal, compared to future automobile emissions, at 6.3 pounds of CO, 1 pound of HC, and 4.8 pounds of NO_x. It is assumed that these emission levels will hold fairly constant for the construction period.

1/ AP-42 - Supplement No. 5 for Compilation of Air Pollutant Emission Factors, Edition; U.S. Environmental Protection Agency, Office of Air and Waste Management, Office of Air Quality Planning and Standards; Research Triangle Park, North Carolina; December 1975, P. D. 5-2.



A&B PROPERTIES, INC. 822 BISHOP STREET • P. O. BOX 3440 • HONOLULU, HAWAII 96801 • TELEPHONE (808) 525-6611

July 6, 1977

Mr. John Farias, Jr.
Chairman, Board of Agriculture
Department of Agriculture
State of Hawaii
1428 South King Street
Honolulu, Hawaii 96814

Dear Mr. Farias:

This is to acknowledge the receipt of your memorandum dated June 13, 1977, regarding your review of the Draft Environmental Impact Statement for the Waiale Development Plan. We appreciate the time spent by your department reviewing the document and are pleased that you have nothing further to add to the analysis of the potential impact.

Should you have any questions or comments in the future regarding this project, please don't hesitate to contact us.

Sincerely,

A&B PROPERTIES, INC.

A handwritten signature in dark ink, appearing to read 'R. K. Sasaki', is written over a horizontal line.

R. K. Sasaki, President



A&B PROPERTIES, INC. 822 BISHOP STREET • P. O. BOX 3440 • HONOLULU, HAWAII 96801 • TELEPHONE (808) 525-6611

July 6, 1977

Mr. Gordon Soh
Program Planning Coordinator
Planning Office
Department of Land and
Natural Resources
State of Hawaii
P. O. Box 621
Honolulu, Hawaii 96809

Dear Mr. Soh:

This is to acknowledge the receipt of your memorandum dated June 16, 1977, regarding your review of the Draft Environmental Impact Statement for the Waiale Development Plan. We appreciate the time spent by your office reviewing the document and offer the following response to your concerns.

Coincidentally, as recommended in your memorandum, further studies, field work and discussions with the County have transpired since the section on drainage in the EIS was written. A great quantity of planning and research now underlies the drainage plan. Presently, the storm water injection system will consist of the following major elements: a conventional pipe conduit system to collect runoff from the residential areas and deliver it to one of the retention ponds; five separate retention ponds located in the 205-acre golf course (two ponds will be in existing, natural depressions; the other three will be excavated in conjunction with golf course construction); and a battery of from two to six infiltration

Mr. Gordon Soh
Page 2
July 6, 1977

wells in each retention pond (depending on the permeability of the formations encountered), to be located at the low points in each of the ponds.

Handling of storm runoff will depend on the simultaneous functions of retention pond storage and well discharge. Capacities will be constructed so that runoff of a "10-year" storm will be entirely contained within the ponds until completely disposed of by the wells. Runoff of more severe storms will be allowed to flood out portions of the golf course. In effect, the retention capacity of portions of the golf course will be combined with that of the ponds. The most extreme storm to be considered in the design will be the "100-year" 24-hour event. Capacities will be chosen so that all floodwater retention will be confined to the golf course, with a suitable "freeboard" difference between the water level in the golf course and ground elevation of adjacent roadway and residential development. Since the system is not conventional, concerns of its satisfactory performance and effect on the basal lens are to be expected. The following points speak directly to such concerns:

- o The infiltration wells will inject storm water to the deep and more saline groundwater which underlies the "fresh" water occupying the upper 120+ feet of the basal lens. A solid casing sealed with grout will

Mr. Gordon Soh
Page 3
July 6, 1977

insure that storm water is injected where it is intended; the permeability of the deep, receiving lavas will insure that the storm water rapidly mixes in the aquifer at this low level; and the many times greater horizontal than vertical permeability will tend to prevent upward movement of injected runoff into the "fresh" upper layer of the lens.

- o Vaults with grated inlets, 180° elbows for the wells, and retention time provided by the ponds all will tend to prevent floatables from being drawn into the wells and minimize the entrance of bed load, coarser sediments. Finer suspended sediments which don't settle out during the retention period may end up in the well and do raise some concern for potential clogging. However, performance of the wells can be periodically tested with pumping equipment and the wells can be "redeveloped" as necessary. The process is the reverse of the injection well flow: water is pumped from the aquifer into the well at a high rate to dislodge and remove sediments which may have collected around the well.
- o The 5-year performance of the Kahului Development Co.'s nearby complex of four infiltration wells at the sump of a large retention pond bodes well for the system proposed for the Waiale Project. These wells

Mr. Gordon Soh
Page 4
July 6, 1977

and related appurtenances are similar to the facilities proposed for Waiale, discharging runoff below -120 feet (MSL) to avoid polluting the "fresh" upper portion of the groundwater. Their satisfactory performance since 1972 is an indication that the general concept can work and that well clogging does not occur rapidly, if it occurs at all.

- o The performance of the cooling water and heated effluent disposal wells at the Maui Land & Pineapple cannery site is an indication that water can be injected deep in the groundwater body without polluting the "fresh" upper layer. Cooling water is drawn up from -280 feet (MSL) and heated effluent disposed of at -140 feet (MSL). The heated, brine water has not been detected in the nearby ML&P shaft which draws water from near the surface of the water table.

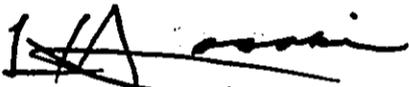
In your memorandum you also suggested the alternative of using onsite wells for irrigation of the golf course rather than the County water system. The EIS (page V-27) does point out that irrigating the golf course may be accomplished either by constructing and operating onsite wells or by extension of the County water system. At the present time, the onsite wells appear to be the most feasible, although either source is possible.

Mr. Gordon Soh
Page 5
July 6, 1977

We hope that this discussion answers your concerns. Should you have any questions or comments in the future regarding this project, please don't hesitate to contact us.

Sincerely,

A&B PROPERTIES, INC.


R. K. Sasaki, President



A&B PROPERTIES, INC. 822 BISHOP STREET • P. O. BOX 3440 • HONOLULU, HAWAII 96801 • TELEPHONE (808) 525-6611

July 6, 1977

Mr. Hideto Kono, Director
Department of Planning and
Economic Development
State of Hawaii P. O. Box 2359
Honolulu, Hawaii 96804

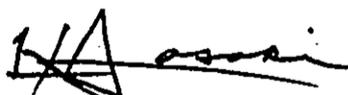
Dear Mr. Kono:

This is to acknowledge the receipt of your letter dated June 17, 1977, regarding your review of the Draft Environmental Impact Statement for the Waiale Development Plan. We appreciate the time spent by your department reviewing the document and are pleased that you feel it has adequately identified and assessed the major environmental impacts of the proposed project.

Should you have any questions or comments in the future regarding this project, please don't hesitate to contact us.

Sincerely,

A&B PROPERTIES, INC.


R. K. Sasaki, President



A&B PROPERTIES, INC. 822 BISHOP STREET • P. O. BOX 3440 • HONOLULU, HAWAII 96801 • TELEPHONE (808) 525-6611

July 6, 1977

Mr. Reginald H. F. Young
Assistant Director
Water Resources Research Center
University of Hawaii at Manoa
Honolulu, Hawaii 96822

Dear Mr. Young:

This is to acknowledge the receipt of your memorandum dated June 17, 1977, regarding your review of the Draft Environmental Impact Statement for the Waiale Development Plan. We appreciate the time spent by your department reviewing the document and offer the following response to your concerns.

Your first point suggested the inclusion of information on groundwater quality and uses in the immediate vicinity. The best indicator of water quality of a basal lens near the shoreline is the salinity or chloride content. The attached drawing from Peterson and Hargis (1971, page 23) shows the chloride content as a function of depth for Test Hole KD-1 just east of the Waiale Project Area. The sigmoidal salinity curve shows a sharp break below -100 feet (MSL) from "fresh" water of 100+ ppm Cl^- to essentially pure seawater of 19,000+ ppm Cl^- at about -150 feet (MSL). The depth of the "fresh" layer closely agrees with what would be predicted for static conditions due to the density difference between fresh and salt

Mr. Reginald H. F. Young
Page 2
July 6, 1977

water, but tests run by the consulting hydrologist, Stephen Bowles, indicate that conditions are not static. The sharp break in the salinity curve occurs at the same level that a dense basalt layer, assumed to be an a'a core, was found. The less permeable lavas at the fresh-salt water interface decrease vertical flow and mixing, giving rise to a relatively rapid seaward flow of fresh water over the slow moving salt water below.

There are numerous wells in the vicinity of the project site, though none are within it. Most of these are small diameter irrigation wells which draw water from the top of the lens. The only large capacity facility is the Maui Land & Pineapple shaft east of the site. The shaft's invert is about seven feet below the water table and its water quality is 130 to 150 ppm Cl^- . About 4 million gallons per day are withdrawn for industrial use.

Of particular interest to the Waiale project are the infiltration wells in the vicinity. Maui Land & Pineapple has a battery of three wells, two to draw up cooling water and the third to dispose of the heated effluent. The cooling wells draw salt water from -220 to -240 feet (MSL); the infiltration well injects this heated, salt water effluent back into the ground at -140 feet (MSL) where the groundwater quality is about 7000 ppm Cl^- . There has been no indication of vertical movement of the heated effluent. For example, there has been no change in the quality of water from the nearby shaft.

Mr. Reginald H. F. Young
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July 6, 1977

The other infiltration wells of note are the four, adjacent 16-inch diameter wells drilled by Kahului Development Co. in 1970-1971. The wells are located about 0.8 miles east of the Waiale Project area. In conjunction with a 2.5 million gallon retention pond, these wells dispose of storm water runoff from the surrounding residential area in the same manner as proposed for the Waiale Project. They have solid casings to below -120 feet (MSL) and open holes from the bottoms of the castings to -280 feet (MSL). This insures that runoff is injected below the overlying, fresher layer of the lens described above. Tests conducted by the consulting hydrologist, Stephen Bowles, indicate that extremely permeable functions exist below the solid casings -- each of the four wells was found to be capable of discharging 4500 GPM with a maximum of 1.5 feet of head build-up. Bowles estimates that capacities might be two or three times greater during storm design conditions when the water level in the retention pond will provide a 30 feet head above the well inlets.

Your second point requested more information on the storm water injection system including the depth to the water table, holding capacity of the drainage ponds and history of the existing Kahului injection wells. The storm water injection system will consist of the following major elements: a conventional pipe conduit system to collect runoff from the

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residential areas and deliver it to one of the retention ponds; five separate retention ponds located in the 205-acre golf course (two ponds will be in existing, natural depressions; the other three will be excavated in conjunction with golf course construction); and a battery of from two to six infiltration wells in each retention pond (depending on the permeability of the formations encountered), to be located at the low points in each of the ponds.

Handling of storm runoff will depend on the simultaneous functions of retention pond storage and well discharge. Capacities will be constructed so that runoff of a "10-year" storm will be entirely contained within the ponds until completely disposed of by the wells. Runoff of more severe storms will be allowed to flood out portions of the golf course. In effect, the retention capacity of portions of the golf course will be combined with that of the ponds. The most extreme storm to be considered in the design will be the "100-year" 24-hour event. Capacities will be chosen so that all floodwater retention will be confined to the golf course, with a suitable "freeboard" difference between the water level in the golf course and ground elevation of adjacent roadway and residential development. Since the system is not conventional, concerns of its satisfactory performance and effect on the basal lens are to be expected. The following points speak directly to such concerns:

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- o The infiltration wells will inject storm water to the deep and more saline groundwater which underlies the "fresh" water occupying the upper 120+ feet of the basal lens. A solid casing sealed with grout will insure that storm water is injected where it is intended; the permeability of the deep, receiving lavas will insure that the storm water rapidly mixes in the aquifer at this low level; and the many times greater horizontal than vertical permeability will tend to prevent upward movement of injected runoff into the "fresh" upper layer of the lens.
- o Vaults with grated inlets, 180° elbows for the wells, and retention time provided by the ponds all will tend to prevent floatables from being drawn into the wells and minimize the entrance of bed load, coarser sediments. Finer suspended sediments which don't settle out during the retention period may end up in the well and do raise some concern for potential clogging. However, performance of the wells can be periodically tested with pumping equipment and the wells can be "redeveloped" as necessary. The process is the reverse of the injection well flow: water is pumped from the aquifer into the well at a high rate to dislodge and remove sediments which may have collected around the well.

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- o The 5-year performance of the Kahului Development Co.'s nearby complex of four infiltration wells at the sump of a large retention pond bodes well for the system proposed for the Waiale Project. These wells and related appurtenances are similar to the facilities proposed for Waiale, discharging runoff below -120 feet (MSL) to avoid polluting the "fresh" upper portion of the groundwater. Their satisfactory performance since 1972 is an indication that the general concept can work and that well clogging does not occur rapidly, if it occurs at all.
- o The performance of the cooling water and heated effluent disposal wells at the Maui Land & Pineapple cannery site is an indication that water can be injected deep in the groundwater body without polluting the "fresh" upper layer. Cooling water is drawn up from -280 feet (MSL) and heated effluent disposed of at -140 feet (MSL). The heated, brine water has not been detected in the nearby ML&P shaft which draws water from near the surface of the water table.

Your final point concerned the impact of the sewage generated by the project on the new Kahului wastewater treatment plant. The sewage from the Waiale Project will be

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conveyed to the Wailuku-Kahului wastewater treatment facility. The flow from the Waiale Project will not increase the design hydraulic load of the treatment plant or the injection wells due to the fact that this area (Waiale Project area) was included in computing the flows for the wastewater treatment facility. As noted in the County of Maui "Study of Wastewater Treatment and Disposal for Wailuku-Kahului" by Chung Dho Ahn and Associates in April, 1971, the master plan for development of portions of Kahului for Alexander & Baldwin, Inc. was used as a basis for predicting the wastewater flow and population of the area. The master plan of the Kahului area did include development of the Waiale Project area. A population of 36,000 was projected for the Wailuku-Kahului area in the report prepared for Alexander & Baldwin, Inc. while the design population used in the County of Maui study for the wastewater treatment facility was 36,500.

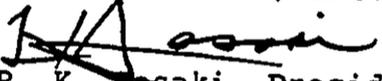
The use of wastewater effluent was considered for the golf course irrigation. However, the cost to transmit the effluent three miles or more from the Kanaha Pond treatment plant was the most expensive of three primary alternatives, the others being use of onsite wells or County water. We understand, however that Hawaiian Commercial & Sugar Company and the County are exploring the possibility of using the effluent to irrigate nearby cane fields.

Mr. Reginald H. F. Young
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July 6, 1977

We hope that this discussion answers your concerns. Should you have any questions or comments in the future regarding this project, please don't hesitate to contact us.

Sincerely,

A&B PROPERTIES, INC.


R. K. Sasaki, President

Attachment

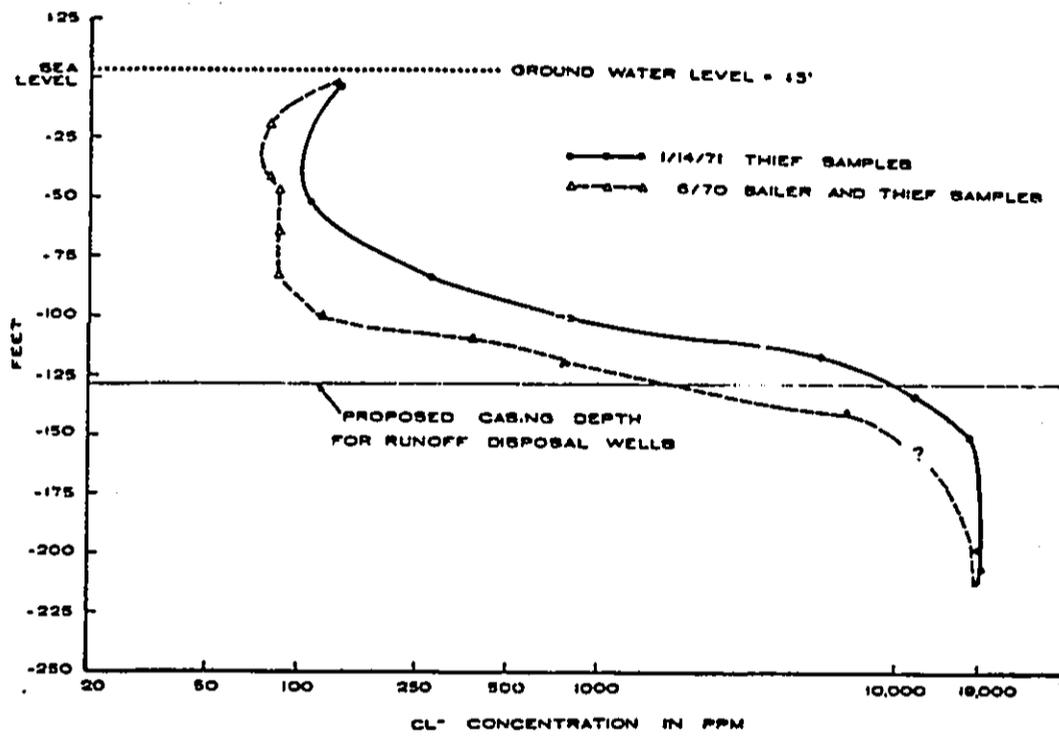


FIGURE 6. CHLORIDE CONCENTRATION VERSUS DEPTH IN TEST HOLE KD-1 (DATA FOR 6/70 FROM S. BOWLES).

(Drawing reproduced from Peterson and Hargis (1971), p. 23)



A&B PROPERTIES, INC. 822 BISHOP STREET • P. O. BOX 3440 • HONOLULU, HAWAII 96801 • TELEPHONE (808) 525-6611

July 6, 1977

Mr. Andrew I. T. Chang, Director
Department of Social Services and Housing
State of Hawaii
P. O. Box 339
Honolulu, Hawaii 96809

Dear Mr. Chang:

This is to acknowledge the receipt of your memorandum dated June 22, 1977, regarding your review of the Draft Environmental Impact Statement for the Waiale Development Plan. We appreciate the time spent by your department reviewing the document and are pleased that there is no apparent conflict with your objectives.

Should you have any questions or comments in the future regarding this project, please don't hesitate to contact us.

Sincerely,

A&B PROPERTIES, INC.

A handwritten signature in dark ink, appearing to read 'R. K. Sasaki'. The signature is written in a cursive style with a large initial 'R' and 'S'.

R. K. Sasaki, President



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July 6, 1977

Mr. Doak C. Cox, Director
Environmental Center
University of Hawaii at Manoa
Crawford 317, 2550 Campus Road
Honolulu, Hawaii 96822

Dear Mr. Cox:

This is to acknowledge the receipt of your letter dated June 22, 1977, regarding your review of the Draft Environmental Impact Statement for the Waiale Development Plan. We appreciate the time spent by your department reviewing the document and offer the following response to your concerns.

Geology

Figure III-1, "Generalized Geologic Map of the Wailuku-Kahului Area", was incorrectly keyed as noted in your comment. Attached you will find a copy of the corrected figure which will be appended to the EIS and submitted as part of the final document.

Geomorphology

As described in the EIS, the western portion of the Waiale Project covers the "hill and valley terrain of ancient sand dunes near the reservoir." The steepest portions of these dunes will be left in their natural or near natural state. In particular these are areas adjacent to the golf course, drainage ponds and reservoir. Other sloping areas which are proposed for development in this portion will require some grading for the golf course, roads and residential sites, but cutting and filling will be kept to a minimum to preserve the general land forms and take advantage of the views and breezes which are available from these sloping lands.

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The eastern portion of the site is much flatter and does not offer the same topographic amenities as exist on the western portion. It also does not offer the natural ponding areas which exist on the western side, and therefore, these must be created. The majority of the earthwork cited in your letter is confined to this eastern portion of the project where it is necessary to grade the area so that runoff will flow into these man-made drainage basins. Essentially, we are hoping to actually create more interesting land forms in these flat areas while preserving the natural land forms in the steeper areas where the dunes are more pronounced.

Hydrology

All of the comments in the hydrology section of your letter correct errors contained in the Draft EIS. One point deserves further explanation. The water table elevation in the East Maui lavas and sediments of the Maui Isthmus is generally 3 to 5 feet above sea level, and lower, of course, near the Kahului and Maalaea Bay shorelines. Concurrent water level measurements in selected wells and shafts in the isthmus allowed construction of the water table contours shown on the attached drawing. The general configuration of the water table, believed to be reasonably representative of conditions throughout the year according to Peterson and Hargis (1971, p. 21), indicates and/or supports the following conclusions:

- o Due to the elevation contrast of the +20 to +30 ft (MSL) water table in the West Maui lavas west of the project compared to the lower level in the isthmus, it appears that a hydraulic discontinuity exists. Leakage from one formation to the other is definitely from the West Maui volcanics toward the isthmus.
- o The gradient of the isthmus water table suggests that most recharge comes from the west. Principle recharge sources are: (1) the above mentioned groundwater flow; (2) irrigation return flow of water imported from West Maui; (3) direct leakage of this imported irrigation water from reservoirs and ditches; and (4) storm water runoff onto the isthmus from the West Maui slopes. Recharge via the small amount of rainfall directly on the isthmus certainly contributes in some storms, but

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this is believed to be of lesser importance than other sources.

- o The Waiale Project area, with reference to the enclosed drawing, is south of Kaahumanu Avenue and includes the Waiale Reservoir on its west boundary. The groundwater table gradient in this vicinity indicates that the direction of flow is a curvilinear path toward Kahului and probably outletting to sea at Kahului Harbor or near to it.

Domestic Water Supply

Approximately 270 acres of the Waiale Development lie beyond or outside of the water service area boundaries shown in the Central Maui Water Study (CMWS). Thus, we can say that water for these 270 acres has not been directly planned for.

However, the real question should be, "Can the projected demands accommodate the Waiale development?" To answer this, we must look at the basis of the water demands for both the CMWS and the Waiale project.

The CMWS maximum daily water demands for 1990 "have been derived directly from data contained in the Maui Master Water Plan" prepared in 1971 by R. M. Towill Corporation for Maui County. For a projection of demand to the year 2000, which the Master Plan did not do, the CMWS increased the Master Plan demands by 33 percent.

For that portion of the Waiale project within the Master Plan and CMWS service area (1015-270 = 745 acres), the average water demand projected by the Towill Water Master Plan is calculated below.

<u>Acres</u>	<u>Towill Parcel #</u>	<u>Land Use</u>	<u>Unit Demand (GPDPA)</u>	<u>1990 Total Avge. Demand (MGD)</u>
257	52	Public	1,770	.43
488	33 & 38	Residential	2,500	1.22
745				1.65

Multiplying the Towill 1990 demand of 1.65 by 1.33 gives the average demand for the year 2000 projected by the CMWS. Thus, the CMWS has projected 2.20 MGD average daily demand for the

Mr. Doak C. Cox
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Waiale project compared to a total of 2.8 MGD shown in the EIS for ultimate development expected by the year 2000.

Assuming all projections to be valid, the Waiale Development would be deficient by 0.6 MGD if all water is to be provided by the County system. However, as stated in the DEIS, page V-27, irrigation of 0.9 MGD average daily flow may be provided from onsite wells. Golf course irrigation by onsite wells is at present considered the most desirable alternate due to initial and operating costs, and the favorable geo-hydrologic characteristics of the area. Thus, if an irrigation well supply is constructed as expected, the projected average daily demand of 2.20 MGD by the CMWS exceeds the Waiale Development demand of 1.9 MGD by .3 MGD.

In the unlikely event that an irrigation well supply system cannot be developed for the Waiale Golf Course, one important factor should be considered to determine the adequacy of projected demand to serve this project. That factor is the magnitude of the projected water demands by the CMWS. For example, in Wailuku-Kahului using population projections stated in the DEIS, page V-33, extending them to the year 2000 and multiplying by the unit water demand, we see that the CMWS is about 10 percent higher than the highest projection by DPED and almost 100 percent higher than the minimum General Plan population.

<u>Basis of Comparison</u>	<u>Year 2000 Population</u>	<u>Year 2000 Max. Day Water Demand (MGD)</u>
Wailuku-Kahului, Gen. Plan (Min.)	51,200	11.5
Wailuku-Kahului, Gen. Plan (Max.)	62,100	14.0
Wailuku-Kahului, DPED (Max.)	80,700	18.2
CMWS		20.6

Therefore, for Wailuku-Kahului and in addition by inference for the Maalaea, Kihei, Makena areas, the CMWS projections might be said to be very conservative and projections for the year 2000 may not be reached until well into the 21st century.

What this also leads to is whether the Mokuahau and Waiehu sources are adequate to serve not only Waiale but all projected demands of the CMWS and if the sources are not adequate what supplementary sources are available. We must state that the

Mr. Doak C. Cox
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July 6, 1977

question should not be answered by this EIS which addresses an area comprising only about 8 percent of the total CMWS demand but should be answered in broader overall context of water development for central Maui.

We hope that this discussion answers your concerns. Should you have any questions or comments in the future regarding this project, please do not hesitate to contact us.

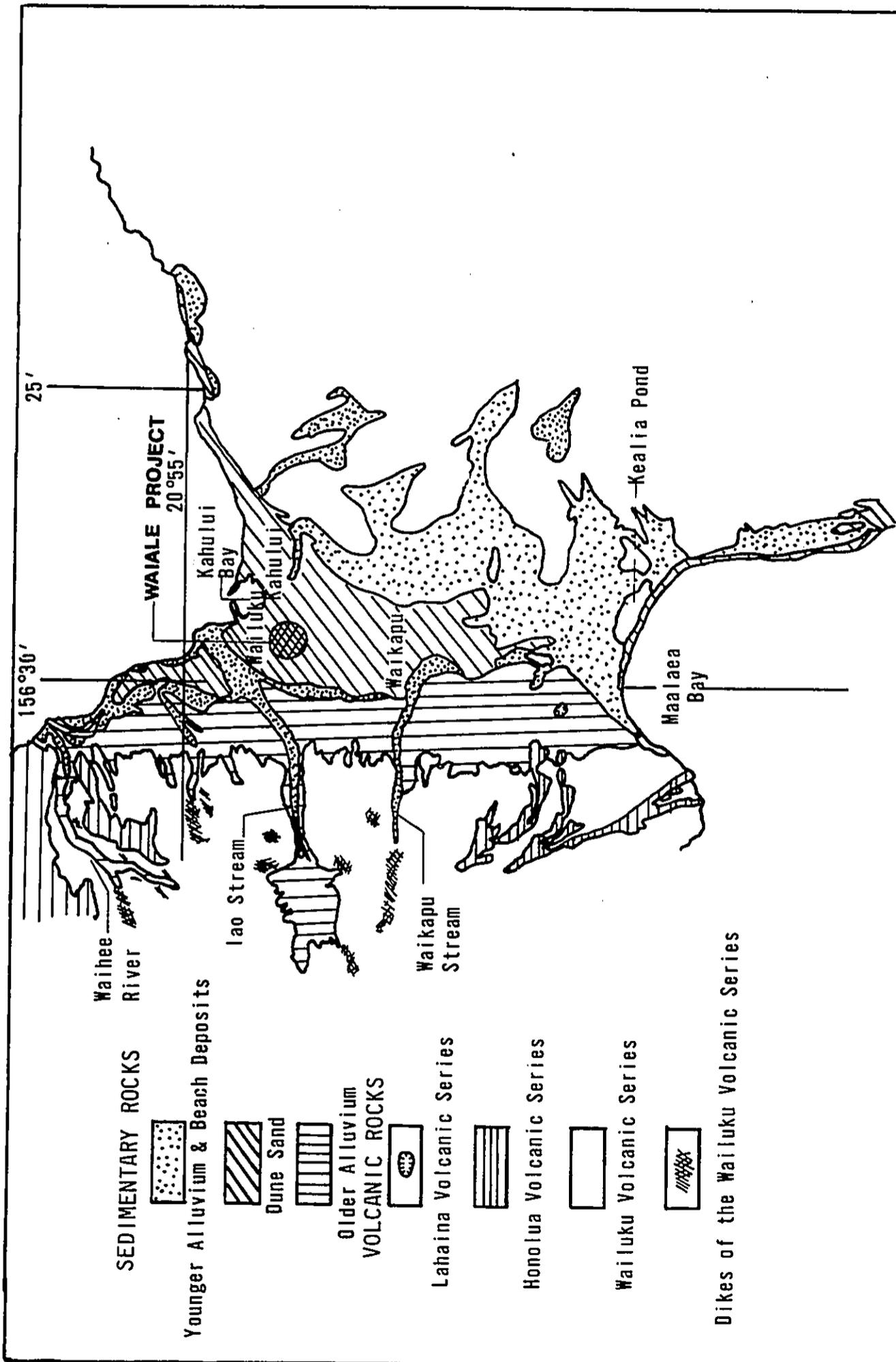
Sincerely,

A & B PROPERTIES, INC.



Robert K. Sasaki, President

RKS:ekp
Attachments



Generalized Geologic Map of the Wailuku - Kahului Area

FIGURE III-1

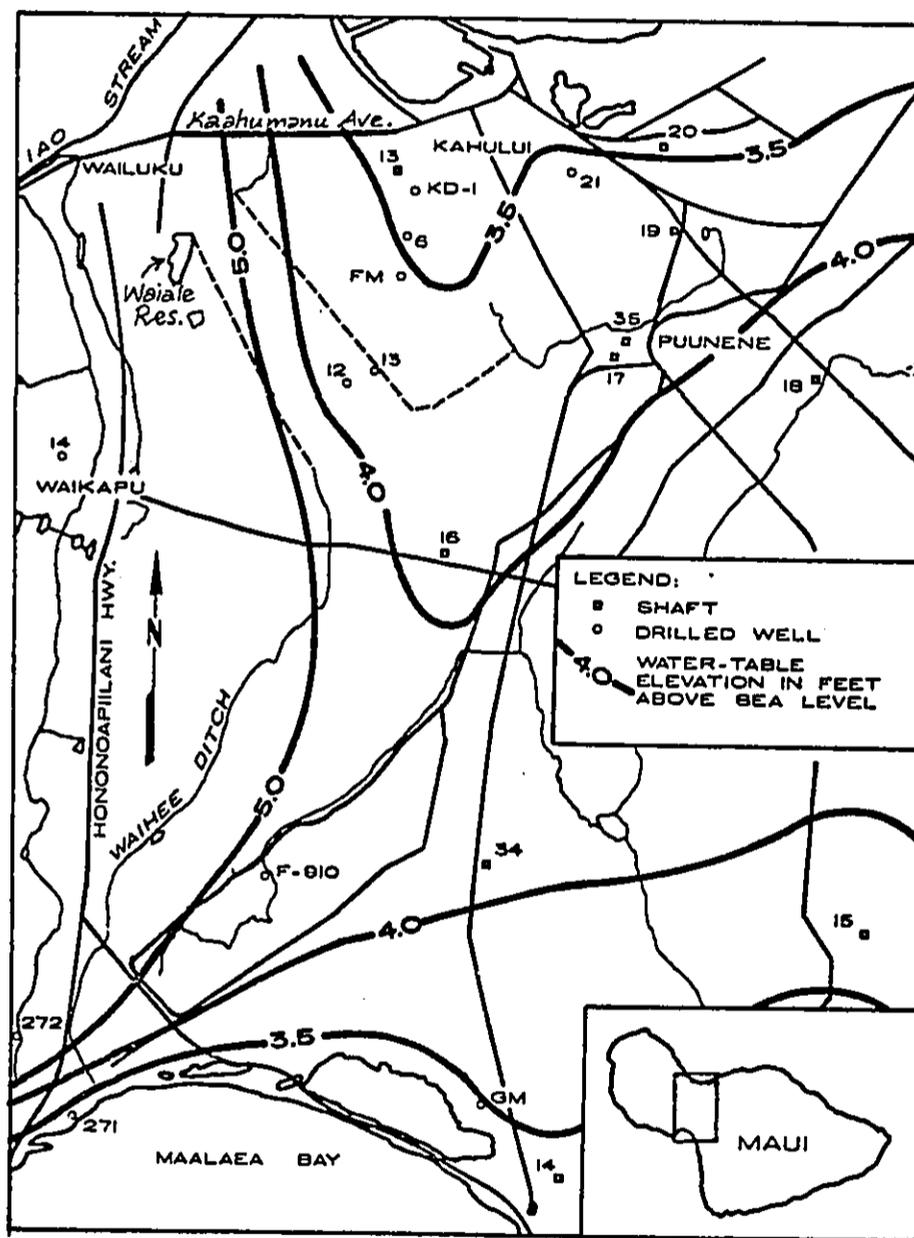


FIGURE 5. GROUND WATER LEVEL CONTOUR MAP OF THE MAUI ISTHMUS.

(Drawing reproduced from p. 22 of Peterson, F.L., and D.R. Hargis, "Effect of Storm Runoff Disposal and Other Artificial Recharge to Hawaiian Ghyben Sterzberg Aquifers", Tech. Rept. No. 54, U.H. Water Resources Research Center, 1971)



A&B PROPERTIES, INC. 822 BISHOP STREET • P. O. BOX 3440 • HONOLULU, HAWAII 96801 • TELEPHONE (808) 525-6611

July 6, 1977

Dr. Richard E. Marland, Director
Office of Environmental Quality Control
Office of the Governor
State of Hawaii
550 Halekauwila Street, Room 301
Honolulu, Hawaii 96813

Dear Dr. Marland:

This is to acknowledge the receipt of your letter dated June 22, 1977, regarding your review of the Draft Environmental Impact Statement for the Waiale Development Plan. We appreciate the time spent by your office reviewing the document and offer the following response to your concerns.

WATER SUPPLY

Approximately 270 acres of the Waiale Development lie beyond or outside of the water service area boundaries shown in the Central Maui Water Study (CMWS). Thus, we can say that water for these 270 acres has not been directly planned for.

However, the real question should be "Can the projected demands accommodate the Waiale development?" To answer this, we must look at the basis of the water demands for both the CMWS and the Waiale project.

The CMWS maximum daily water demands for 1990 "have been derived directly from data contained in the Maui Master Water Plan" prepared in 1971 by R. M. Towill Corporation for Maui County. For a projection of demand to the year 2000, which the Master Plan did not do, the CMWS increased the Master Plan demands by 33%.

For that portion of the Waiale project within the Master Plan and CMWS service area (1015 - 270 = 745 acres) the average water demand projected by the Towill Water Master Plan is calculated below.

<u>Acres</u>	<u>Towill Parcel #</u>	<u>Land Use</u>	<u>Unit Demand (GPDPA)</u>	<u>1990 Total Avge. Demand (MGD)</u>
257	52	Public	1,770	.43
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<u>745</u>				<u>1.65</u>

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Multiplying the Towill 1990 demand of 1.65 by 1.33 gives the average demand for the year 2000 projected by the CMWS. Thus, the CMWS has projected 2.20 MGD average daily demand for the Waiale project compared to a total of 2.8 MGD shown in the EIS for ultimate development expected by the year 2000.

Assuming all projections to be valid, the Waiale Development would be deficient by 0.6 MGD if all water is to be provided by the County system. However, as stated in the DEIS, page V-27, irrigation of 0.9 MGD average daily flow may be provided from onsite wells. Golf course irrigation by onsite wells is at present considered the most desirable alternate due to initial and operating costs, and the favorable geo-hydrologic characteristics of the area. Thus, if an irrigation well supply is constructed as expected, the projected average daily demand of 2.20 MGD by the CMWS exceeds the Waiale Development demand of 1.9 MGD by .3 MGD.

In the unlikely event that an irrigation well supply system cannot be developed for the Waiale Golf Course, one important factor should be considered to determine the adequacy of projected demand to serve this project. That factor is the magnitude of the projected water demands by the CMWS. For example, in Wailuku-Kahului using population projections stated in the DEIS, page V-33, extending them to the year 2000 and multiplying by the unit water demand, we see that the CMWS is about 10% higher than the highest projection by DPED and almost 100% higher than the minimum General Plan population.

<u>Basis of Comparison</u>	<u>Yr. 2000 Population</u>	<u>Yr. 2000 Max. Day Water Demand (MGD)</u>
Wailuku-Kahului, Gen. Plan (Min.)	51,200	11.5
Wailuku-Kahului, Gen. Plan (Max.)	62,100	14.0
Wailuku-Kahului, DPED (Max.)	80,700	18.2
CMWS		20.6

Therefore, for Wailuku-Kahului and in addition by inference for the Maalaea, Kihei, Makena areas, the CMWS projections might be said to be very conservative and projections for the year 2000 may not be reached until well into the 21st century.

What this also leads to is whether the Mokuau and Waiehu sources are adequate to serve not only Waiale but all projected demands of the CMWS and if the sources are not adequate what supplementary sources are available. We must state that the question should not be answered by this EIS which addresses an area comprising only about 8% of the total CMWS demand but

Dr. Richard E. Marland

Page 3

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should be answered in broader overall context of water development for central Maui.

The use of wastewater effluent was considered for the golf course irrigation. However, the cost to transmit the effluent three miles or more from the County treatment plant was the most expensive of three primary alternatives, the others being use of onsite wells or County water. We understand, however, that HC&S and the County are exploring the possibility of using the County treatment plant effluent to irrigate nearby cane fields, in which case wastewater from this project would be put to beneficial uses.

DRAINAGE

Runoff from the proposed development will be discharged by a drainage system consisting of the following major elements: a conventional pipe conduit system to collect runoff from the residential areas and deliver it to one of the retention ponds; five separate retention ponds located in the 205-acre golf course (two ponds will be in existing, natural depressions; the other three will be excavated in conjunction with golf course construction); and a battery of from two to six infiltration wells in each retention pond (depending on the permeability of the formations encountered), to be located at the low points in each of the ponds.

Handling of storm runoff will depend on the simultaneous functions of retention pond storage and well discharge. Capacities will be constructed so that runoff of a "10-year" storm will be entirely contained within the ponds until completely disposed of by the wells. Runoff of more severe storms will be allowed to flood out portions of the golf course. In effect, the retention capacity of portions of the golf course will be combined with that of the ponds. The most extreme storm to be considered in the design will be the "100-year" 24-hour event. Capacities will be chosen so that all floodwater retention will be confined to the golf course, with a suitable "freeboard" difference between the water level in the golf course and ground elevation of adjacent roadway and residential development.

Degradation of the ponding areas can be minimized with adequate maintenance programs which are currently being studied and discussed with the County. Because the ponding areas are surrounded by the golf course, it would be in the best interests of the golf course management to keep the areas in an attractive manner. In addition, it is not anticipated that water will be standing in these ponding areas for much time,

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and, therefore, degradation of plant life will be minimal. Under these conditions, odor is not expected to be a problem. (There is no evidence that offensive odors have developed at the existing ponding area in Kahului).

SEWAGE

The sewage from the Waiale Project will be conveyed to the Wailuku-Kahului wastewater treatment facility. The flow from the Waiale Project will not increase the design hydraulic load of the treatment plant or the injection wells due to the fact that this area (Waiale Project area) was included in computing the flows for the wastewater treatment facility. As noted in the County of Maui "Study of Wastewater Treatment and Disposal for Wailuku-Kahului" by Chung Dho Ahn and Associates in April, 1971, the master plan for development of portions of Kahului for Alexander & Baldwin, Inc. was used as a basis for predicting the wastewater flow and population of the area. The master plan of the Kahului area did include development of the Waiale Project area. A population of 36,000 was projected for the Wailuku-Kahului area in the report prepared for Alexander & Baldwin, Inc. while the design population used in the County of Maui study for the wastewater treatment facility was 36,500.

HOUSING DEMAND

Although the EIS makes reference to the County General Plan regarding future housing needs (page V-37), the actual demand factors used for the proposed Waiale project were derived initially from an in-house study conducted by our own staff and more recently from a study by Daly & Associates completed in December 1976. The Daly study indicates a potential absorption rate of 150 to 200 lots per year. This compares favorably with the projected development shown in the EIS (Figure II-5, Phasing Absorption Graph) which indicates a range of 110 to 250 units per year.

Regarding the question of current housing availability and the future need for low, moderate or high income units, we are attaching portions of the Daly study which addresses these items in detail. Short range needs (to 1980) are based on an analysis of existing housing in the area and long range needs (to 1990) on DPED projections for Maui County. Also attached is an excerpt from the A&B Wailuku-Kahului General Plan amendment application describing A&B's past housing experience in Kahului and its housing surveys in Paia and Puunene.

Dr. Richard E. Marland
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July 6, 1977

CONSULTATION PROCESS

Your letter of June 22, 1977, refers to the lack of written responses in Section XIII of the EIS entitled "Comments and Responses Made During the Consultation Process." As provided in Sections 1:31d and 1:41 of the EIS Regulations, only three agencies, groups or individuals requested to be consulted parties. On November 16, 1976, these three, consisting of the Department of Accounting and General Services, the Shoreline Protection Alliance and the American Lung Association of Hawaii, were all sent letters acknowledging their requests and enclosing the determination letter from the Maui County Planning Commission, the Planning Department staff report and general information pertaining to the proposed project. Of these three parties, only the American Lung Association of Hawaii submitted written comments as part of the official consultation process. These comments, contained in a letter dated November 22, 1976, are included in Section XIII of the EIS and a copy of our official written response is attached herewith.

In an effort to respond more thoroughly to Mr. Morrow's concerns, our planners discussed his methodologies and recommendations with him on several occasions and incorporated them into the draft EIS. Evidence of his satisfaction is contained in his letter to the Maui County Planning Commission dated June 9, 1977, following his review of the draft. (Copy attached.)

The remaining correspondence in Section XIII of the EIS was reference material which was incorporated into the document. Since it was not gathered as part of the official EIS process as described in Section 1:41 of the EIS Regulations, it should not have been included in the section on "Comments and Responses Made During the Consultation Process," but rather as an appendix to the document. The "Comments and Responses" section was incorrectly used as a "catch-all" for any written information which was relevant to the text. We apologize for this error in our format and will make sure that it is corrected in future EIS reports.

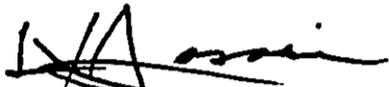
Although there was a lack of interest by agencies, groups and individuals to be consulted parties, we do want to emphasize the efforts which were expended to gather information and discuss the plan with people who are knowledgeable or would be affected by the project. These individuals are listed in Section XII of the EIS, and the plan and EIS reflect, wherever possible, their inputs and concerns.

Dr. Richard E. Marland
Page 6
July 6, 1977

We hope that this discussion answers your office's concerns.
Should you have any questions or comments in the future
regarding this project, please don't hesitate to contact us.

Sincerely,

A&B PROPERTIES, INC.



R. K. Sasaki, President

Attachments

C. FORECAST OF HOUSING DEMAND

1. Demand, 1976-1990

The population of Maui County in 1990 is projected to be 81,200 (DPED). Assuming the number of persons per household remains at approximately 3.3 persons per household, an additional 8,612 households will be added. This is a gross measure of the demand for new housing. To this figure must be added an anticipated demolition rate of 100 units per year (based on the trend for the past five years) or 1,500 additional units. Assuming a continued minimum vacancy rate of 2.7%, an additional 273 units would be required.

Housing Demand, Maui County, 1975-1990

Projected Number of New Households* (Assumes 3.3 persons/household)	8,612
Projected Number of Demolitions (Assumes 100 units demolished/year)	1,500
Needed to Maintain 2.7% Vacancy Rate**	<u>273</u>
Total (692 new units/year to 1990)	<u>10,385</u>

*Smaller households result from: 1) decline in birth rate; 2) changes in life style; 3) decline of the extended family; 4) increased divorce rate; 5) increased housing supply; 6) increased personal incomes; and 7) elderly moving into smaller units. If the decline in household size experienced since 1960 continues, household size in 1990 would be 3.0 persons/household. This would result in housing demand increasing to 12,912. This would mean an average of 861 houses per year would have to be produced.

**Should the vacancy rate increase, additional units would be required. For example, a 5% vacancy rate would increase demand to 10,986 (assuming 3.3 persons/household).

2. Ability to Pay

The table below indicates the maximum affordable sales price for various income ranges. Given current price trends, it is expected that the family must be earning at least \$18,000 in order to afford most house/lot packages currently being offered in Central Maui. In terms of 1975 household incomes, this represents approximately 25% of all households in the market area.

<u>Ability to Pay*</u>		
<u>Annual Household Income</u>	<u>Maximum Monthly Housing Expenditure</u>	<u>Maximum Affordable Sales Price</u>
\$ 9,000-11,999	\$188-249	\$23,750-27,499
12,000-13,999	250-291	27,500-32,499
14,000-19,999	292-416	32,500-46,245
20,000-24,999	417-521	46,250-66,249
25,000 and above	522+	66,250+

*Assumes conventional financing with 20% down payment, 30-year mortgage, 8-3/4% interest, 20% of monthly housing expenditure is allocated for real property taxes and assessments.

Housing price indicators (construction cost index, value of single family building permits, MLS-listed units) and income indicators (per capita income, median income) have been increasing at comparable rates. It should not be expected that the percentage of those able to afford units using conventional financing will increase in the near future. The percentage may, in fact, decrease since employment growth is expected to be greatest in the lower paying jobs.

3. Projected Housing Demand, 1975-1980

Table 25: Total Demand for Housing, 1975 to 1980 for the Island of Maui and Market Area

	<u>Number of Units</u>
Total Additional Demand for Maui Island, 1975-1980	3,671
Total Additional Demand for Market Area, 1975-1980	2,349
Additional Demand for Market Area by Tenure, 1975-1980	
Owner-Occupied Units	1,762
Renter-Occupied Units	587
Potential Demand for Additional Owner-Occupied Units from Renter Households in Market Area, 1975-1980	513 to 760
Total Demand for Owner-Occupied Units in Market Area	2,275 to 2,522
Total Demand for Market Area by Unit Type, 1975-1980	
Single Family Detached	2,114
Duplex	23
Apartment or Condominium	211

Demand for housing in the market area and on Maui Island for the next five years was computed using the following assumptions and methodology.

Assumptions

- o The projected population for Maui County in 1980 is 60,100 (DPED Series E-2 Population Projections).
- o The number of persons per household will be 3.3.
- o Housing tenure, relative income distribution, vacancy rate, demolition rate, and geographic distribution of the population will remain the same as in 1975.

Methodology and Computations

- o Projected population for Maui Island in 1980:
 $60,000 \times .90^1 = 54,000$ residents
- o Projected household population for Maui Island, 1980:
 $54,000 \text{ persons} \div 3.3 \text{ persons/household} = 16,364$ households
- o Increase in the number of households, 1975 to 1980:
 $16,364 - 13,228^2 = 3,136$ households
- o Additional units needed to maintain the current 2.7% vacancy rate, 1975 to 1980:
 $3,136 \text{ units} \times .027 \text{ vacancies} = 85$ units
- o Additional units needed to replace demolished units, 1975 to 1980:
 $90 \text{ units demolished per year} \times 5 \text{ years} = 450 \text{ units}^3$
- o Total demand for Maui Island, 1975 to 1980 (all types of residential units):
 $3,136 + 85 + 450 = 3,671$ units
- o Total demand for the market area, 1975 to 1980:
 $3,671 \text{ units} \times .64^4 = 2,349$
- o Demand for market area by tenure, 1975 to 1980:
 $2,349 \text{ units} \times .75^5 \text{ owners per units} = 1,762$ owner-occupied units
 $2,349 \text{ units} \times .25^5 \text{ renters per units} = 587$ renter-occupied units
- o Potential additional demand for owner-occupant units in the market area from renter households, 1975 to 1980:
 $(2,150^6 + 587) \times .25^7 \times .75^8 = 513$ units
 $(2,150^6 + 587) \times .37^9 \times .75^8 = 760$ units

¹Based on ratio of 1975 Maui Island population to 1975 Maui County population.

²Based on DPED estimates of 1975 Maui Island population and number of households.

³Based on historical annual average demolition rate of 100 units per year for Maui County.

⁴Estimated percentage of total Maui Island population residing in the market area in 1975. Based on OEO Census Update Maui County-1975.

⁵1975 estimates of tenure split in market area. Based on OEO Census Update Maui County-1975.

⁶Number of renters in market area during 1975. Based on OEO Census Update Maui County-1975.

⁷Estimated number of renters whose household income is above \$20,000.

⁸Estimated number of renters who would prefer to buy.

- o Total demand for owner-occupied units in market area, 1975 to 1980:
 $513 \text{ units} + 1,762 \text{ units} = 2,275^1$
 $760 \text{ units} + 1,762 \text{ units} = 2,522^2$
- o Total demand for market area by unit type:
 $2,349 \text{ units} \times .90^3 \text{ single family units per total units} = 2,314 \text{ single family units}$
 $2,349 \text{ units} \times .01^3 \text{ duplex units per total units} = 23 \text{ duplex units}$
 $2,349 \text{ units} \times .09^3 \text{ apartment/condominium units per total units} = 211 \text{ apartment/condominium units}$

Increases would occur in projected demand in the market area if the population per household decreases, if there were more growth in the total population than expected, or if demolitions increase.

The large percentage of the population in the 10-19 year age group may also result in additional demand beyond the projection. This age group currently comprises one-fifth of the population in the market area. Within the next five years, many of these people will become potential homeowners and will be starting families. This would increase total housing demand beyond projected levels due to the disproportionate percentage of the population within this 10-19 year age group.

Much of the demand for renter units will be filled by current owners who buy new units and rent their old units. This will result in an increase in demand for owner-occupied new units. It should be expected that the demand for rental units will be filled mostly by vacated existing units.

The potential demand for additional owner-occupied units from renter households depends on the ability of renters to pay and the number of these renters who are both able to afford and prefer to buy. Should the income distribution of renter households change, or if the proportion of renters who desire to buy changes, the potential demand from renters could change. A shift in tenure from renter to owner would result in a decrease in demand for rental units and increase the demand for owner-occupied units. The net effect on total additional demand for all types of tenure would be zero.

¹Estimated number of renters whose household income is above \$20,000.

²Estimated number of renters whose household income is above \$15,000.

³1975 estimates of housing stock by unit type. Based on OEO Census Update Maui County-1975.

The following table is a forecast of electrical connections for new single family units for Maui County from 1976 to 1980. This is comparable to the projected demand outlined above.

Electrical Connections for New
Single Family Units, Maui County
1976-1980

<u>Year</u>	<u>Number</u>
1976	720
1977	800
1978	980
1979	960
1980	<u>1,000</u>
Total	<u>4,460</u>

Source: Maui Electric Company,
New Construction Sales
Division, November 10, 1976.

4. Elderly Housing Demand

The proportion of the population over age 65 has been slowly increasing over the last few years. This trend is expected to continue. Because this group is characterized by fixed income levels, they do not represent a large part of the demand for new market units. Most of this age group, if they are not already homeowners at age 65, will not be homeowners due to their limited ability to pay. The wealthier retirees who move to Maui can be expected to purchase homes outside the market area in places like Kihei, Wailea, Kaanapali, and Napili. Other elderly who are not homeowners have to depend on government programs to meet their housing needs.

Plans for Waiale include construction of a low cost elderly project which would include 165 elderly and 60 family units, probably with Farmers Home Administration (FmHA) financing.

5. Demand by Low and Moderate Income Groups

The demand by groups with below \$15,000 annual household incomes for new market units is limited. Unless these groups have adequate savings to reduce the mortgage amount to levels within their ability to pay, they will not be able to afford new market units. The needs of this group are usually met by government-assisted housing programs. If we assume that the proportion of homeowners who fall into this category will not change between 1975 and 1980, there will be a net increase of 781 low and moderate income homeowners within the market area. In addition to government-assisted units, the demand for this group will be met by

older units filtering down as homeowners trade up to newer, better units. The net effect on the total demand for new units will be zero.

6. Unit Type Demand

Demand by unit type is dependent on a number of factors. The projections in number 3 of this section, page IV-11, are based on the assumption that the proportion of unit types reflected in the present housing stock will remain the same in 1980. However, while the unit type in the market area has been predominantly single family detached, certain factors may cause a greater proportion of new duplex or town house units to be built.

As costs continue to rise, the savings that can result from construction of duplex and town house developments will exert a strong influence toward a move away from detached single family units. All parties involved, from governmental agencies responsible for the infrastructure costs to the consumer who must bear the higher costs in increased selling prices, may change their current preference to favor less expensive forms of housing.

Family size has been declining for the past 15 years. The average family's space requirements have declined as a result of the decrease in average household size. Families may find that their design and space requirements can be adequately met by a unit type other than the detached single family house.

The increase in the number of new young families expected as a result of the disproportionate number of 10-19 year olds, coupled with a decline in the birth rate and family size, will result in a greater number of families whose housing requirements can be met by town house developments. This group is in an early income-earning cycle and may not be able to afford to buy detached single family units. They may see a town house or duplex as a cheaper form of initial housing and as a way to begin to build equity to purchase a larger home when their requirements change.

The increased proportion of elderly will also exert pressure toward smaller units. As children grow and move out to begin families of their own, the space requirements of the parents will be reduced. Those elderly who own a home may decide to move to smaller duplex/town house units, using their existing home as equity.

Whether or not there is a move away from the detached single family unit depends largely on the attitude of governmental agencies. As costs to build and maintain the required infrastructure increase, the town house type development may be viewed in a more favorable light due to the lower costs involved.

Future trends in unit type will depend on the interaction of the factors mentioned above, but in all probability there will be a shift away from the detached single family unit toward town house

development.*

7. Projected Housing Supply in Market Area

Within the next five years, there are 2,024 residential lots or house/lot packages currently planned for the market area. Seventy-four of these are one-half acre to two acre lots in the Kula area, and 442 are County or State-County sponsored units. The net number of privately developed residential lots and house/lot packages planned in the market area is 1,508.

Planned Projects

<u>Development</u>	<u>Number of Lots/Units</u>	<u>Tax Map Key/ Location</u>	<u>Developers' Estimated Date of Completion</u>
Waiehu Heights			
Phase I	169 res. lots	3-3-01:95	4th Quarter 1976
Phase II	170 res. lots		N.A.
Phase III	171 res. lots		N.A.
Wailuku Sugar- ILWU Maui County	65 res. lots	3-3-01:16	2nd Quarter 1977
Kanaloa Sub- division/Maui County	68 res. lots	3-8-07:94	1st Quarter 1978
Kuihelani Sub- division/Alex- ander & Baldwin			
Phase I	100 res. lots	3-8-07:91	2nd Quarter 1977
Phase II	100 res. lots	3-8-06:5	N.A.
Hale Mahaolu/ Hawaii State- Maui County			
Phase II	180 res. units	3-8-07:46	3rd Quarter 1978
Paia Halelani Subdivision/Maui County, 2nd Increment	91 res. lots	2-5-05:21	2nd Quarter 1978
Pili Aloha Subdivision/ Maui County	38 res. lots	2-7-08:48,49	4th Quarter 1977

*"Town house" is used here in a generic sense to include cluster development, PUD, zero lot line and other concepts. In all cases, it is assumed to be limited to one or two stories in height.

Planned Projects (Continued)

<u>Development</u>	<u>Number of Lots/Units</u>	<u>Tax Map Key/ Location</u>	<u>Developers' Estimated Date of Completion</u>
Ainaola Subdivision/Hicks Construction	48 res. lots	2-4-05:15,18	1st Quarter 1977
Pukalani Terrace & Country Club Estates/LANDCO Phase II	750 lots + PUD units	Pukalani	N.A.
Kula Glen Subdivision/Fong Construction	58 res. lots	2-3-02:17	4th Quarter 1977
Kulaloha Subdivision/Hirota-Wilson Associates Unit II	16 res. lots	2-3-50:28,29	N.A.

In addition, there is a 39-unit condominium planned in the Wailuku area called Iao Gardens Condominium, tentatively slated for completion late in 1977. Approximately 300 additional units need to be produced by 1980 if the projected demand is to be met, assuming all of the above projects proceed as planned.*

*Wailuku Heights, another possible development by C. Brewer on Wailuku Sugar Company lands, consists of 300 lots on 110 acres. It has not been included here because the plans are still considered tentative. For the same reason, Brewer's planned developments in the Waihee area have not been included.

2. A&B Experience

The experiences of A&B Properties, Inc. (formerly Kahului Development Co., Ltd.) in Kahului provides another indication of the general demand for housing in the Wailuku-Kahului area. For the Twelfth Increment of Kahului Town Subdivision, in 1970, A&B Properties, Inc. received 1,281 applications. Less than 400 applicants were processed before all 314 lots were sold. For the subsequent Pomaikai Subdivision (13th Increment - 251 lots in Units I, II, and III in 1975 to 1976) A&B Properties, Inc. received 859 applications. It is estimated that more than 500 of the remaining 608 unsuccessful applicants would have purchased had they had the chance to purchase an average-sized lot. In view of the restrictions on resale and owner-occupancy, this demand is considered significant.

3. Alexander & Baldwin, Inc. Market Study

In a market survey conducted by Alexander & Baldwin, Inc. and the I.L.W.U. during May of 1975 in the communities of Paia (within five miles of Kahului) and Puunene (within one mile of Kahului) to find a possible market for new low income housing in Kahului, 353 families responded favorably to the possibility of new facilities for rental housing. Based on the formulas used by the Farmers Home Administration and HUD for determining adjusted income limits, a family's ability to pay for housing was established and, subsequently, their eligibility for a specific housing program.

The eligibility of these families for either home ownership or rental housing is shown in Table 3, below:

Table 3

PROGRAM ELIGIBILITY OF SURVEYED FAMILIES (PUUNENE)

	1 BR	2 BR	3 BR	4 BR	Sub Totals	Totals
<u>Home Ownership</u>						
Private Financing	2	1	6	6	15	
FmHA 502/Market Int. Rate	10	13	21	15	59	
FmHA 502/Interest Credit	22	21	8	6	57	
TOTAL HOME OWNERSHIP	34	35	35	27		131
<u>Rental - Elderly</u>						
FmHA 515/Interest Credit	23	10	-	-	33	
FmHA 515/Sec. 8/Rent Supp.	94	21	-	-	115	
TOTAL RENTAL-ELDERLY	117	31	-	-		148
<u>Rental - Non-Elderly</u>						
FmHA 515/Interest Credit	25	15	6	1	47	
FmHA 515/Sec. 8/Rent Supp.	6	3	9	9	27	
TOTAL RENTAL NON-ELDERLY	31	18	15	10		74
TOTAL NUMBER OF UNITS						<u>353</u>

There are 131 families that appear to qualify for home ownership either with private financing or a FmHA 502 loan at market or interest credit rates. Of the 222 families that would qualify only for rental housing, 80 would be eligible under FmHA's 515 program with interest credit (33 elderly and 47 non-elderly families). The remaining 142 families (115 elderly and 27

non-elderly) would require larger subsidies than those provided through an interest credit reduction program.

Families eligible for rental housing are classified as elderly (age 62 and over) and non-elderly because FmHA's 515 program provides for a 50-year mortgage for the elderly and a 40-year mortgage for non-elderly rental units. The chart further indicates the number of bedrooms required for each category.



A&B PROPERTIES, INC.

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November 23, 1976

Mr. James W. Morrow, Director
Environmental Health
American Lung Association of Hawaii
245 North Kukul Street
Honolulu, Hawaii 96817

Dear Mr. Morrow:

Thank you very much for your letter of November 22, 1976. We certainly appreciate your recommendations pertaining to the long term impact on air quality of our Waiale Project.

We have submitted your recommendations to our planner and will certainly review the EPA publication.

We would certainly appreciate any comments or recommendations. Thank you again for your interest in our project.

Sincerely,

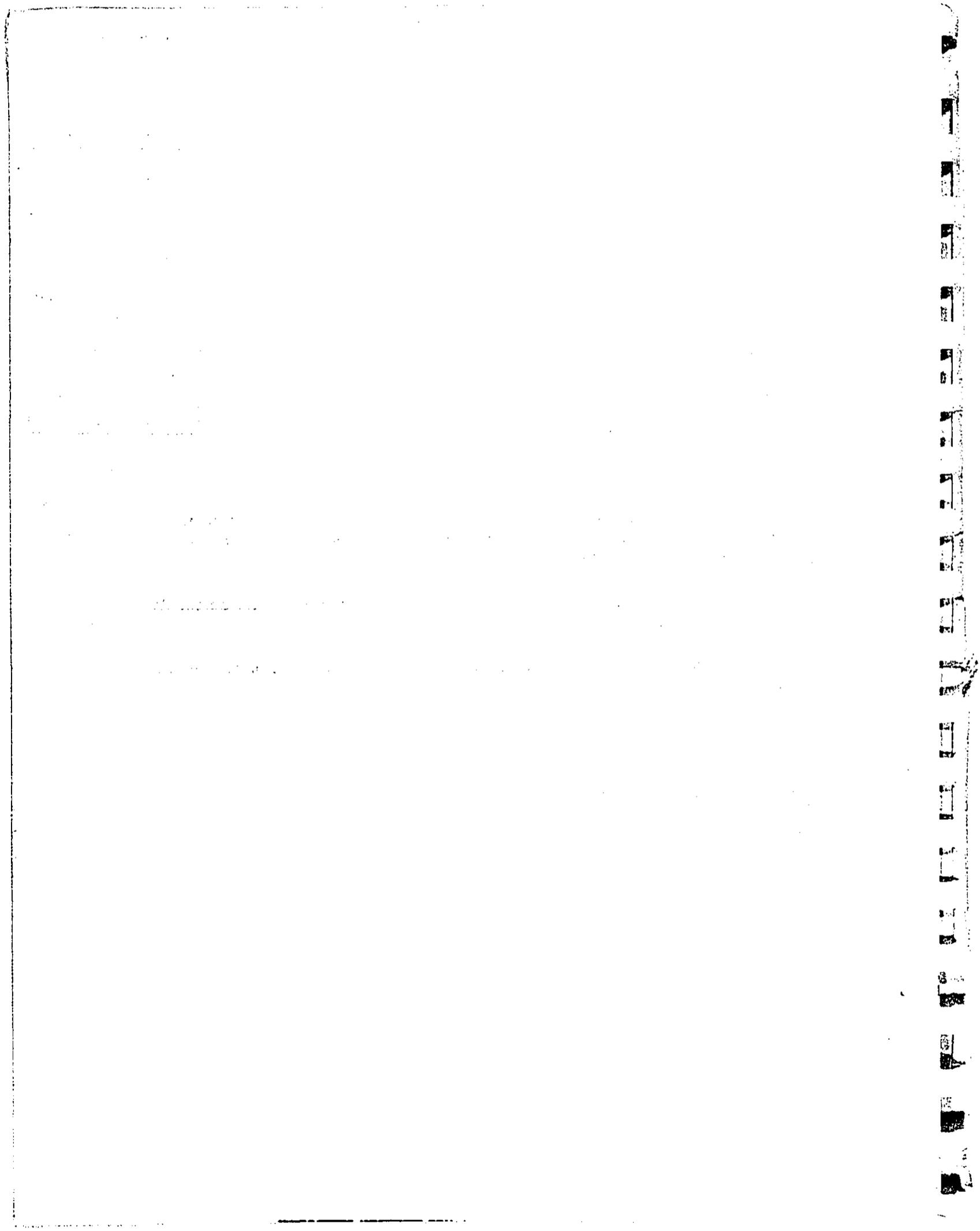
R. K. Sasaki
President

RKS:stt

cc: M. Hastert

Route to:	
___ Belt, R. M.	
<u>X</u> Bell, J.	
<u>2</u> Hirota, P.	
___ Lyon, F. E.	
___ Ng, W.	
___ Viana, J.	
<u>4</u> Washburn, J.	
___ Cain, P.	
<u>1</u> Hastert, M.	AM
___ Helber, L.	
<u>12</u> Mac	
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