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Country Courses FILE COPY

Punamano I

Final

Environmental Impact Statement

COUNTRY COURSES AT KAHUKU

Punamano

Kahuku, Koolauloa, Oahu

VOLUME I

THE ESTATE OF JAMES CAMPBELL

Tax Map Keys:
5-6-05: Portion of 1, Portion 2, 5, 6 and Portion 7
5-7-01: Portion 21

Prepared By:
William E. Wanket, Inc.

May 1990


FINAL
ENVIRONMENTAL IMPACT STATEMENT
VOLUME I
**THE COUNTRY
COURSES AT KAHUKU
(PUNAMANO)**
Kahuku, Oahu

May 1990

Submitted pursuant to Chapter 343, Hawaii
Revised Statutes, Environmental Impact
Statement Regulations.

Prepared For: **THE ESTATE OF JAMES CAMPBELL**
For Submittal To: **DEPARTMENT OF GENERAL PLANNING**

Prepared by: **WILLIAM E. WANKET, INC.**



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[The following Technical Reports are contained in VOLUME II of the FEIS.]

- A. **ENGINEERING STUDIES - THE COUNTRY COURSES AT KAHUKU, PUNAMANO SITE**
(Smith, Young & Associates, Inc.)
- B. **TRAFFIC IMPACT ASSESSMENT, REPORT FOR THE COUNTRY COURSES AT KAHUKU - PUNAMANO SITE**
(Pacific Planning and Engineering, Inc.)
- C. **ARCHAEOLOGICAL INVENTORY SURVEY FOR THE PROPOSED PUNAMANO GOLF COURSE, A PORTION OF THE COUNTRY COURSES AT KAHUKU**
(Archaeological Consultants of Hawaii)
- D. **COUNTRY COURSES AT KAHUKU, SOCIAL IMPACT ASSESSMENT**
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- E. **NOISE IMPACT EVALUATION FOR THE COUNTRY COURSES AT KAHUKU, PUNAMANO, OAHU, HAWAII**
(Darby & Associates)
- F. **VIEW ASSESSMENT, COUNTRY COURSES AT KAHUKU, PUNAMANO GOLF COURSE**
(Michael S. Chu, Land Architect)
- G. **AIR QUALITY IMPACT REPORT, THE COUNTRY COURSES AT KAHUKU: PUNAMANO GOLF COURSE**
(J.W. Morrow, Environmental Consultant)
- H. **THE COUNTRY COURSES AT KAHUKU, IMPACT ON AGRICULTURE**
(Decision Analysts Hawaii, Inc.)
- I. **THE COUNTRY COURSES AT KAHUKU, IMPACT ON STATE AND COUNTY FINANCES**
(Decision Analysts Hawaii, Inc.)
- J. **ENVIRONMENTAL ASSESSMENT OF FERTILIZER AND PESTICIDE USE ON THE PROPOSED COUNTRY COURSES AT KAHUKU (PUNAMANO AREA)**
(Charles L. Murdoch, Ph.D and
Richard E. Green, Ph.D)
- K. **BOTANICAL SURVEY, THE COUNTRY COURSES AT KAHUKU: PUNAMANO, KO'OLAULOA DISTRICT, OAHU**
(Char and Associates)
- L. **AVIFAUNAL AND FERAL MAMMAL SURVEY OF PROPERTY PROPOSED FOR GOLF COURSES TO BE KNOWN AS THE COUNTRY COURSES AT KAHUKU, KAHUKU, OAHU**
(Phillip L. Bruner)
- M. **MARKET ASSESSMENT FOR THE PROPOSED COUNTRY COURSES AT KAHUKU (PUNAMANO)**
(John Zapotocky)

The Country Courses at Kahuku (Punamano)
Environmental Impact Statement
Summary

NEED FOR EIS

An Application for a Development Plan (DP) Amendment and Environmental Assessment was submitted to the City and County of Honolulu, Department of General Planning in September 1989. The proposed action was subject to the provisions of the Environmental Impact Statement Law, Chapter 343, HRS, Section 343-5(a)(6) because the proposed DP Amendment involved a non-county initiated amendment to the City and County of Honolulu Development Plans and would result in designations other than agriculture and conservation.

The Department of General Planning ("accepting authority") determined that the proposed action may have a significant effect on the environment and on September 25, 1989, filed an Environmental Impact Statement Preparation Notice (EISPN) with the Office of Environmental Quality Control (OEQC). Notice of the determination was subsequently published in the October 8, 1989 OEQC Bulletin. Copies of the EISPN were sent to various consulting parties (see *Chapter XII* for listing of comments received).

The *Draft Environmental Impact Statement (DEIS)* was prepared and submitted to OEQC and the City Department of General Planning in February 1990. Notice of the DEIS was initially published in the OEQC's Bulletin of February 8, 1989, with the deadline for comments established as March 25, 1990, but subsequently extended to April 8, 1990 (OEQC Bulletin March 23, 1990). OEQC distributed the copies (60) and a total of 24 comment letters were received. The applicant responded to all comments, including late comments. *Chapter XIV* contains OEQC's distribution list, comment letters received and response letters sent

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This *Final Environmental Impact Statement* is being submitted in 2-Volumes. Volume II contains the Technical Appendices. The FEIS was filed with the Office of Environmental Quality Control in May 1990.

PURPOSE OF EIS

The purpose of this Environmental Impact Statement (EIS) is to:

- (1) Describe the proposed DP Amendment to establish the three 18-hole golf courses at Punamano in Koolauloa ("proposed action");
- (2) Disclose the probable environmental effects of the proposed development;
- (3) Describe measures proposed to minimize adverse effects; and
- (4) Discuss alternatives to the proposed development.

PLANNING PERSPECTIVE

The Estate of James Campbell proposes to develop a 72-hole golf complex in the Koolauloa Development Plan area to be known as the "Country Courses at Kahuku." Of the proposed 72 holes, 54 will be at Punamano. The other 18 holes are proposed at Malaekahana. Because more than a mile separates the sites, two separate DP amendment proposals to the Koolauloa Development Plan have been prepared. DGP reviewed each amendment proposal separately and issued separate letters of determination that an EIS was required. These determinations were then published in OEQC's Bulletin. Because of these actions, two separate EIS's were required for Country Courses at Kahuku.

This FEIS is for the three golf courses at Punamano. A separate FEIS is being prepared for the single course site at Malaekahana. However, several of the Appendices Reports used as source material for the FEIS also contain data on the Malaekahana golf course proposal: (1) Social Impact Assessment; (2) Avifauna and Feral Mammal Survey; (3) The Country Courses at Kahuku, Impact on Agriculture; and the Country Courses at Kahuku, Impact on State and County Finances.

The approximately 605-acre proposed project site at Punamano is located at the north end of the windward side of Oahu, within the Koolauloa Development Plan area (*Figures 3 and 4*). The property lies along the mauka side of Kamehameha Highway, approximately two miles west of the Kahuku community and is immediately east of the Turtle Bay Resort at Kuilima. The project area and all adjacent areas are designated as agriculture by the State Land Use Maps (*Figure 2*) and the Koolauloa DP Land Use Map (*Figure 3*). The site is zoned as AG-1 and AG-2 (*Figure 5*). There are no existing or proposed public facilities in the project boundary, however, a sewer treatment plant (presently under construction) and a

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HECO facility are located adjacent to the site. Improvements within the Kamehameha Highway right-of-way (water) are also proposed along a portion of the site (see *Figure 4*).

Land uses of properties adjoining the Punamano site include military to the southwest, agricultural to the south and east, and aquaculture on the northeast. Across Kamehameha Highway, north of the site is the Tanaka Store, a well-known landmark, which is a small grocery store and gas station. Farther west along Kamehameha Highway lies the Kuilima Resort and complex.

The proposed Country Courses at Kahuku, Punamano site preliminary plans consist of three 18-hole championship, daily-fee golf courses. Two clubhouses are proposed to serve the three courses. A driving range and two putting greens as well as an appropriate amount of parking will be provided.

The project will provide opportunities for employment within the North Shore area as well as further strengthen the area as a dynamic, vital part of Hawaii's visitor attractions.

The site was once part of the Kahuku Sugar Company, and until the early 1970's was cultivated in sugar cane. Since 1973, the project site has been leased to Amorient Aquaculture International ("Amorient"), a local company. The lands currently lie fallow.

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DEVELOPMENT SUMMARY

- Applicant:** The Estate of James Campbell
828 Fort Street Mall
Suite 300
Honolulu, Hawaii 96813
- EIS Consultant:** William E. Wanket, Inc.
Pacific Tower, Suite 660
1001 Bishop Street
Honolulu, Hawaii 96813
- Accepting Authority:** Department of General Planning
City and County of Honolulu
Municipal Office Building 8th Floor
650 South King Street
Honolulu, Hawaii 96813
- Proposed Action:** Applicant requests the Department of General Planning to process proposed changes to the Koolauloa Development Plan Land Use Map to designate certain lands as Park / Golf Course.
- Project Name:** The Country Courses at Kahuku
- Project Location:** In Koolauloa DP area on the south side of Kamehameha Highway approximately two miles west of the Kahuku community and east of the Turtle Bay Resort at Kuilima. (See *Figure 1*)
- TMK:** 5-6-05: Portion 1, Portion 2, 5, 6 and Portion 6, 5-7-01: Portion 21.
- Project Area:** 605 Acres (See *Figure 3*)
- Existing Use:** Vacant
- Proposed Uses:** Three 18-hole golf courses and support facilities. (See *Figure 9*)
- State land Use District:** Agriculture (See *Figure 2*)
- Development Plan Designation:** Agriculture (See *Figure 3*)
- Zoning:** AG-1/AG-2 Agriculture (See *Figure 5*)

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SUMMARY OF BENEFICIAL IMPACTS

Environmental: Physical characteristics of the land are favorable for golf course use. The project's proximity to nearby recreational areas and resort complexes provides a supportive, environmentally compatible neighbor to the nearby facilities.

General Plan/Development Plan: The proposed Country Courses at Kahuku- Punamano site will complement the basic character of the surrounding Kahuku area. It will maintain approximately 605 acres in essentially open space. Scenic views and vistas can be enjoyed that perhaps are not possible at this time due to public inaccessibility.

Socio-Economic: Employment will be created by the project, allowing residents working outside the area an opportunity to be employed closer to their residence. Area teenagers and unemployed persons, especially with agricultural skills, will have additional opportunities for employment.

Fiscal: Real property taxes can be expected to rise for the project as the land will be developed to "higher" use. Increased revenues from personal income taxes and general excise taxes can be expected. Favorable to the public, as projected revenues are expected to exceed public expenditures.

SUMMARY OF ADVERSE IMPACTS

IMPACT

MITIGATING MEASURES

Loss of Agricultural Lands:

The site lies fallow. The property has been leased to Amoriant Aquaculture International ("Amorient"). The firm has concluded, after more than a decade of effort, that in today's economic environment the lands are unsuitable for commercial agricultural crop production. The difficulties being the cost of pumping water to irrigate fields, poor soils, difficult terrain, and excessive wind.

Archaeological Resources:

Land development in the area could result in destruction of archaeological and paleontological resources.

The archaeological survey identified surface features, including possible burial areas. Further testing will be required prior to development to determine sub-surface occupation levels and possible preservation and management plans. A formal preservation plan will be prepared for the site that will include onsite interpretations and/or "as is" preservation and curation of artifacts onsite. Close coordination with the Department of Land and Natural Resources will be maintained.

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Traffic:

Increased vehicular traffic will be generated in areas on and off-site the project area including Kamehameha Highway.

Two roadways are proposed as access into the project area. The existing Military Access Road is recommended for realignment to create an intersection with the existing Marconi Road. Another new access road would be constructed. The Military Access Road/Marconi Road will require improvement to include exclusive left and right-turn lanes for vehicles exiting onto Kamehameha Highway.

No significant impact on traffic flow along Kamehameha is expected in 1998 when the project is expected to be fully completed.

Construction:

Clearing and construction work will result in temporary dust, noise, and some traffic disruption.

The developer and contractors will comply with local grading and subdivision ordinances, and with the regulations of the Department of Health.

Grading will be accomplished in phases with only a limited number of acres barren at any one time, and will be coordinated with drainage improvements. Strict compliance with Chapter 23, Grading, Soil Erosion and Sediment Control of the revised Ordinances of Honolulu, 1978, as amended will be met.

Noise created during construction will comply with appropriate State and City noise regulations, and traffic control measures will be taken to meet State Department of Transportation requirements.

Services:

Increased need for public services such as police and fire facilities.

An impact study prepared on State and County finances indicates that the project will generate revenues exceeding expenditures.

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The project will create approximately 2,000 pounds of refuse per day requiring disposal.

Private refuse collection companies are available in the area. Material will be hauled to the nearest available sanitary landfill, or carried to "H-Power" at Campbell Industrial Park.

Utilities:

Increased need for utility services.

New wells will be required to supply irrigation water for the golf course. Small surface impoundments are proposed to store non-potable water for fire protection use.

The golf course will require its own sewerage collection system, treatment plant and disposal system. The facilities will be in compliance with Chapter 62 of the State Department of Health and with the requirements of Chapter 340B-6 of the Hawaii Revised Statutes.

Water, sewer and drainage plans must be approved by appropriate public agencies.

Fauna:

Land development could result in decline of diversity and abundance of exotic species. Off-site Wildlife Refuge habitat may be impacted.

Temporary displacement of wildlife on-site is anticipated during construction. Landscaping and ponding areas created on-site will act as replacement habitat.

Use of appropriate chemicals and application techniques will be followed to prevent any threat to either water quality or birds, on- and/or off-site. Also, a water quality monitoring program in consultation with appropriate agencies, including the US Fish and Wildlife Service will be established during and after development to safeguard against any possible harmful contamination.

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Noise:

Increased noise levels on and off site are expected.

Vehicular noise levels along Kamehameha Highway will increase, but the increase is negligible. Noise sources involving clubhouse and maintenance activities, including a possible public address sound system and entertainment activities will be designed using standard noise mitigation measures.

Hazards:

Potential ground-water and surface water and air quality contamination through fertilizer and pesticide use.

Only EPA approved chemicals will be used. Application of chemicals will be closely controlled, and monitoring systems, prepared in consultation with the State Department of Health, US Fish and Wildlife Services and other appropriate agencies, will be established.

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ALTERNATIVES CONSIDERED

In *Chapter VII*, three alternatives were considered to the proposed project: (1) No-Action; (2) Agricultural; and (3) Residential. The first (no-action) alternative assumed that for the present time the land would remain vacant. The second alternative considered agricultural activities to include an agricultural lot subdivision and the development of other uses allowed in the AG-1 zoning district. The third alternative reviewed a residential concept for the site.

The findings support the project as the most viable alternative for the property, particularly in view of the compatible use and supportive position the project can provide for other area recreational facilities. The project would essentially maintain the area in open space, with the added benefit of providing employment opportunities and increased government tax revenues.

UNRESOLVED ISSUES

A. STATE LAND USE BOUNDARY

The project area is currently designated for Agricultural use by the State Land Use Commission. An application for a boundary amendment will be filed with the Commission to have the site designated Urban. Until this petition is filed and the land use change to Urban is granted, the project site will remain classified as Agriculture (see *Figure 2*).

B. ZONE CHANGE

Following approval of the development plan amendment, an application will be filed for a change in zoning to P-2 Preservation under the recently enacted Ordinance 90-15. The application for the zone change will include the information requested by the Department of Land Utilization in its comment letter (see *Chapter XIV*).

C. ARCHAEOLOGICAL PRESERVATION PLAN

Based on the archaeologist's findings, further archaeological work (surveying, testing, probing, data recovery, etc.) will be conducted. Based on this additional work, a formal preservation plan will be prepared for the site that will include onsite interpretations and/or "as is" preservation and curation of artifacts onsite. The preservation plan will be submitted to the Historic Section of the State Department of Land and Natural Resources for review and approval. The final plans for the design of the golf course will be based on the approved preservation plan.

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D. MONITORING PROGRAM

In consultation with appropriate agencies, a groundwater/chemical application monitoring program will be established that will meet the 8 conditions of the Department of Health and the concerns of the US Fish and Wildlife Service (see Chapter XIV).

E. COMMUNITY BENEFITS ASSESSMENT

The Department of General Planning has advised the applicant that the department is currently studying the issue of community benefits assessment for private golf courses and may propose new regulations regarding the processing of DP amendments for such uses.

COMPATIBILITY WITH LAND USE PLANS AND POLICIES

A thorough discussion of the relationship of the proposed development to the land use plans and policies is presented in *Chapter VI*. The proposed development is consistent with all the relevant public goals, objectives, policies, plans and control, with the exception of the necessary approvals for a State Land Use Boundary Change, City and County of Honolulu Development Plan Amendment and change in zoning as listed below.

NECESSARY PERMITS AND APPROVALS

A number of permits and approvals must be secured before development of the project area can begin. Major permits and approvals still outstanding include:

<u>PERMIT/APPROVAL</u>	<u>APPROVING AUTHORITY</u>	<u>STATUS</u>
Land Use District Boundary Amendment	Land Use Commission	Petition to be filed
Development Plan Amendment	City Council	In process
Zone Change (See discussion below)	City Council	Will be filed following approval of DP Amendment
EIS	Department of General Planning	In process
Water Master Plan	Board of Water Supply	To be submitted following zone change
Grading / Drainage Wastewater	Department of Public Works	To be submitted following zone change
Building Permit	Building Department	To be submitted following zone change

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ZONE CHANGE APPLICATION

Current plans for the development are preliminary and conceptual at this time. Following development plan approval, and considering the mitigative measures recommended in this EIS, more specific plans and designs for the development, including grading and drainage systems and project details, will be developed and submitted in a zone change application under Ordinance 90-15, pursuant to the requirements of the Department of Land Utilization (see Comment Letter from the Department of Land Utilization, *Chapter XIV*).

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I. PROJECT DESCRIPTION

A. LOCATION AND SIZE

The project area is mauka of Kamehameha Highway between Kahuku Village and the Kuilima Resort Complex. Land uses of properties adjoining the Punamano site include military to the southwest, agricultural to the south and east, and aquaculture to the northeast. Farther west along Kamehameha Highway lies the Kuilima Resort complex.

B. LAND USE PLAN

The Preliminary Site Plan layout for the courses is illustrated on *Figure 9*. This layout does not necessarily reflect the final design and layout of the courses. The final layout design will be prepared by a professional golf course designer. The final design will incorporate the mitigative measures presented in this document including the archaeological preservation plan and program to be submitted for review and approval by the Historic Section of the State Department of Land and Natural Resources.

Land Use	Acres
3 18-Hole Golf Courses	586
Circulation	19
	605

The proposed golf course development consists of three 18-hole championship golf courses, driving range, two putting greens, and two clubhouses served by the appropriate number of parking stalls.

Clubhouse (1) will serve the two 18-hole courses located in the southeastern area of the site. The clubhouse will be approximately 17,000 to 20,000 square feet, with a starting facility, proshop, lockers, restaurant/lounge, restrooms, an administrative office and storage and maintenance facilities. Approximately 10,000 square feet of the clubhouse area will be dedicated to cart storage.

Clubhouse (2) will serve the 18-hole golf course located on the northwest side of the site and would be approximately 10,000 to 12,000 square feet. Incorporated into the clubhouse would be a starting facility, proshop, lockers, restaurant/lounge, restrooms, and cart storage and maintenance facilities. Cart storage is expected to

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account for approximately 5,000 square feet of the clubhouse area. Completion of all courses is estimated to be by 1998.

Assuming the development of visitor accommodations at the Kuilima Resort takes place as projected by the Kuilima Resort Company, the Country Courses at Kahuku, would be totally absorbed by the year 1998. The three courses at Punamano would be absorbed between 1996 and 1998. Demand for the Country Courses at Kahuku is expected to come primarily from increased visitor and resident population golf demand.

Please refer *Chapter II, Feasibility*, for further discussion on absorption, demand, employment and future supply of golf courses on Oahu.

C. PUBLIC FACILITIES

Following is a brief description of the facilities improvements for the project. Please refer to appropriate Sections of this document under *Chapter V* for additional discussion, as well as *Appendices A and B*.

1. Water
(See *Appendix A*)

The development of the project site will require approximately 2.1 to 2.2 mgd (average flow) and 2.6 mgd (maximum) of water. In addition, approximately 30,000-40,000 gpd will be potable quality.

Improvements proposed are:

A dual system will be designed using nonpotable water for irrigation and potable water for domestic purposes. Small surface impondments will be created near buildings and structures to store sufficient quantities of non-potable water for fire protection usage and irrigation of the courses. Future water system improvements will be coordinated with appropriate agencies for review and approval. A Water Master Plan for the clubhouse water requirements will be submitted to the Board of Water Supply for approval.

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2. Wastewater
(See *Appendix A*)

The proposed Punamano Golf Courses could generate a total of 15,000 gpd of wastewater. The proposed recommended method of disposal for Clubhouses 1 and 2 would be a complete mix activated sludge "package" plant (See *Figure 15*). This biological waste treatment process consists of the following major components:

1. Aeration tanks with diffused aeration equipment;
2. Settling tanks;
3. Return and waste sludge pumps and system;
4. Filters;
5. Chlorination contact tank.

The implementation schedule of the project will be coordinated with the Division of Wastewater Management. All improvements will be designed to current State Department of Health standards and requirements as stipulated by Chapter 62 of Hawaii Administrative Rules, Title 11, Department of Health which became effective December 10, 1988, and Chapter 340B-6 of the Hawaii Revised Statutes.

3. Solid Waste and Disposal
(See *Appendix A*)

During construction, solid waste generated would be collected by the contractor of a private collection and disposal company to be hauled to the nearest available City and County sanitary landfill.

Fully developed, the proposed project would generate approximately 2000 pounds of solid waste from the two clubhouses, to include lounge, bar, restaurant, kitchen and maintenance facilities. This 2000 pounds of solid waste from the Punamano courses could be handled by a private refuse collector and disposed of in an appropriate sanitary landfill or carried to "H-Power" at Campbell Industrial Park.

4. Drainage
(See *Appendix A*)

The overall drainage patterns for the site will remain fairly the same as before development. With no consideration to the retention capabilities of the depressions at the driving range or to other facilities which could mitigate runoff, it is seen that the

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runoff from the 605 acres of golf courses could increase 20 percent when fully developed.

The impact of the increased flows can be mitigated by swaling the parking areas, clubhouse sites, putting greens and approximately 70 acres of the Kalaeokahipa drainage basin near and mauka of the clubhouse to the large depression being used as the driving range. Additional mitigating steps such as swaling flows to sand traps, constructing additional retention basins or depressions would make it possible to reduce the storm water runoff rate under the developed conditions to levels below existing conditions.

5. **Grading**
(See *Appendix A*)

Approximately 325 acres of the site will be developed into tees, greens, fairways, driving range and putting greens. The remaining 280 acres will serve as roughs, or be improved into clubhouses, parking areas or maintenance facilities. This will require grading of the golf course site itself, reshaping tees and greens, developing sand traps and swaling areas to guide surface runoff to retention areas or ponds.

Clearing, grubbing and grading of the golf course will be accomplished in phases so that a limited acreage will be barren of ground cover at any given period of time.

Grading will be performed in accordance with Chapter 23, Grading, Soil Erosion and Sediment Control, of the Revised Ordinances of Honolulu, 1978, as amended. Erosion control measures will be implemented as outlined in the City and County Grading Ordinance. Strict compliance to City ordinances should minimize any potential environmental impact.

6. **Electric/Telephone**
(See *Appendix A*)

Electrical

The project is expected to generate a requirement for .5 KVA/acre or 7,250 KWH of electricity. Commercial electrical power service is available from an overhead electric line that runs along Kamehameha Highway. Hawaiian Electric's distribution voltage in this service is 12.47 KV. The service has sufficient capability to service the proposed 18-hole course development and its infrastructure.

Electrical service will be provided by an underground ducting and handhole system from Kamehameha Highway overhead service to the clubhouse, maintenance facility treatment plant

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and any other infrastructure that may be constructed. The installation of underground electrical lines and handholes will require excavation and trenching. All planned improvements will be coordinated with HECO.

Communications

Hawaiian Telephone service runs along Kamehameha Highway in an overhead service. It also has the capacity to serve the proposed golf course development at the Punamano site. Telephone service will be provided by an underground ducting and handhole system from the Kamehameha Highway overhead service to the clubhouse, maintenance facility treatment plant and any other infrastructure facility that may be constructed. Excavation and trenching will be required for installation of the underground telephone system.

D. CIRCULATION
(See *Appendix B*)

Vehicular access for the two proposed Punamano golf courses on the southeastern side of the site would be from the existing Kahuku Military Training Area access road (on land leased from Campbell Estate). The intersection of the Military Access Road and Kamehameha Highway would then be realigned such that the Military Access Road and Marconi Road form a four-way intersection. (The section of roadway intended for modification is owned by the Estate.) A new access road from Kamehameha Highway would provide access to the third course.

To minimize the possibility of long delays for traffic exiting the Military Road and Road "A", it is recommended that exclusive right and left turn lanes be provided along the realigned Military Road and Road "A" for traffic entering onto Kamehameha Highway (see *Figure 4 of Appendix B*). This will permit vehicles attempting right turns to bypass the left/through traffic and decrease delays for vehicles attempting right turns. Any construction plans for roadway improvements will be coordinated with the State DOT and other appropriate agencies.

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E. TIMETABLE / ESTIMATED COSTS

It is estimated that the proposed Punamano golf courses will be fully completed by 1998, with various approval and permit processes preceding construction.

Development Plan Approval:	1991
Zoning Approval (LUC Approvals done concurrently with Zoning):	1992
Golf Course/Clubhouse Design, Grading/Building Permits:	1993
Construction:	1996 to 1998

Project costs are estimated at approximately \$28,500,000. for the three courses to include engineering, surveys and on and off site costs.

F. CHANGES IN LAND USE DESIGNATIONS REQUIRED TO IMPLEMENT THE PROJECT

Amendments to the State Land Use District, Development Plan, and Zoning will be required.

1. State Land Use District

Existing: Agriculture

Proposed: Urban

2. Development Plan

Existing: Agriculture

Proposed: Park (Golf Course) plus necessary Public Facilities Map Amendments

3. Zoning

Existing: AG-1 Restricted Agriculture

AG-2 General Agriculture

Proposed: P-2 General Preservation District

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II. FEASIBILITY
(See Appendix M)

A Market Assessment for the Country Courses at Kahuku was prepared by John Zapotocky. The complete text of the assessment is contained at Appendix M). Following is a summary of the Market Assessment Report.

A. MARKET ANALYSIS

The proposed Country Courses at Kahuku - Punamano have a number of advantages, from a marketing standpoint, over other golf courses proposed in the North Shore and Koolauloa Development Plan area.

- By virtue of its location, less than a mile east of the entrance to the Kuilima Resort, and access from Marconi Road, a secondary entrance to Kuilima, the Punamano Courses have better access to resort guests at the Kuilima development than any other existing or proposed golf course save the two located within the Kuilima Resort proper and the proposed Malaekahana course.
- The size of the Punamano site and its dedication to strictly golf and other recreational activities, will allow the golf course designer to maximize the recreational golf aspects of the site.
- The site possesses natural beauty and at various locations within the site excellent views will add to the enjoyment of the basic recreational golf experience.
- The existing Turtle Bay and Kahuku Courses are already attracting 100,000 (non-Kuilima Complex) golf rounds annually and the North Shore and Koolauloa areas are already known for their recreational amenities, including: major beach parks; major visitor attractions, i.e., Polynesian Cultural Center and Waiamea Falls Park; ocean recreation, including surfing and boating (Haleiwa Harbor); and equestrian activities including polo at Mokuleia and other activities along the entire coast.
- The project courses will build on the strength of the existing Kuilima Resort in attracting golf business while at the same time attracting golfers to the resort.

1. Existing Conditions

Demand for golf nationwide has been increasing for the past 30 years. This growth is expected to continue based on the following: higher incomes; an aging population; early retirement; more leisure time; flex time; and more residential

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mobility. Two studies undertaken in 1986 projected growth in demand for golf participation from zero to five percent annually; so far empirical evidence indicates that actual growth is taking place closer to the upper end of the projections. These growth projections suggest a need to increase the supply of golf facilities significantly on a nationwide basis through the year 2000.

Demand for golf in the State of Hawaii has also exhibited strong growth for the same reasons golf nationwide has grown. In addition golf demand in Hawaii has grown due to the development of a resort golf industry. Thus, growth in golf demand in Hawaii is driven by two distinct factors: growth in visitor demand for golf and growth in resident demand for golf. The largest growth in Hawaiian golf has come from the resort aspect, with the number of resort courses increasing from two in 1965 to twenty in 1985.

2. Future Demand for Courses

Growth in the resort golf business is expected to continue due to the following: projected growth in the volume of visitors over time; higher golf participation rates among visitor populations; an up coming of the resort industry in Hawaii; the trend for an increasing percentage of visitor accommodations to be located in resort destination areas; and an increase in the number of eastbound visitors, particularly the Japanese, who have demonstrated a strong desire to play golf when visiting the Hawaiian Islands.

A survey conducted for this study showed that approximately 1.5 million rounds were played, in 1988, on Oahu's 19 non-military golf courses. Of these, approximately 1.24 million or 79% were played by residents and .27 million or 21% were played by visitors (visitor count could be low due to the limited number of courses available to visitors). Based on this information, the average rounds played in 1988 by Oahu's average resident (non-military) and visitor population was 1.81 and 3.58 rounds respectively. Using the 1988 average round information and the projected growth rates for resident and visitor population as estimated by State planners through the year 2000, alternate demand scenarios were generated by incorporating growth rates of 0%, 2%, 5%, and 10%. Use of these assumptions indicated demand for three (3), eight (8), eighteen (18), and forty-four (44) additional golf courses respectively.

3. Estimated Existing Shortfall of Golf Courses In Hawaii

A number of factors are evident in the Oahu golf industry: courses operating at maximum capacity; escalating green fees; institution of a telephone lottery for municipal course starting

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times; a comparison with the rates of play on the Island of Maui; and the strong interest in the development of new golf facilities by the municipality and by private land owners and developers, suggest that there is currently an existing shortfall in the supply of golf facilities. The consultant estimates that this shortfall could range between two to fourteen golf courses.

There are currently three golf courses under construction on Oahu with an additional forty-one sites planned or being discussed as potential golf course sites. However, based on a number of considerations including the ability to achieve needed governmental approvals, the physical constraints of the sites under consideration, and the ability of potential developers to obtain financing, the consultant estimates that less than half of these courses could be developed by 2000. Excluding the 0% to 10% growth scenarios, a range of demand from ten (10) to thirty-three (33) courses for Oahu by the year 2000 would be needed against a maximum supply of twenty-two (22) new courses.

4. **Target Market and Absorption Rate**

Demand for the Country Courses at Kahuku is expected to come primarily from increased visitor golf demand. The expansion plans of the Kuilima Resort Company are expected to provide the critical mass of visitor units necessary to support the Country Courses at Kahuku. While there is no local (Hawaii State Model) that demonstrates the feasibility of a conglomeration of golf facilities such as those proposed at the Country Courses at Kahuku, there are mainland (U.S.) models including Pinehurst, North Carolina, and Pebble Beach, California which demonstrate successful operations. In addition, this success can be achieved through the use of golf demand factors per visitor unit already experienced at Hawaii destination resorts.

Assuming the development of visitor accommodations at Kuilima Resort takes place as projected by the Kuilima Resort Company, the Country Courses at Kahuku would be totally absorbed by the year 1998. The courses at Punamano would be absorbed in 1996 and 1998. These projections include the development of the golf course planned by the Kuilima Resort Company within the resort proper and at Malaekahana. They also include absorption of additional capacity at the Kahuku Municipal Course.

Of particular benefit to the resident golfing public is that resort oriented golf courses have a significant amount of excess capacity at times other than the traditional peak season (January, February, and March). Given the difference between the theoretical capacity of resort courses of 73,000 rounds and their practical capacity of 50,000 rounds, the three County

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Courses at Kahuku - Punamano are likely to result in the availability of 60,000 rounds which could be used during the off peak times. Golf Course managers are aware of the value of this resource and often promote its use by the resident population. At the Kuilima course, kamaaina play makes up 25 percent of total rounds demonstrating this principle.

Development of the Country Courses at Kahuku is expected to be beneficial to the marketing of the Kuilima Resort. The concentration of golf facilities is expected to enhance golf marketing through availability, variety, accessibility and versatility. There are also expected to be operational benefits to the clustering. Existing and planned uses in the area are expected to be compatible with the proposed golf course developments. Employment generated by the Country Course at Kahuku - Punamano is expected to be 150 full time equivalent jobs. (See discussion under Paragraph 5 below.)

The proposed Country Courses at Kahuku will help to satisfy the growing demand for golf Oahu's visitor and resident populations. The development will help to preserve the long term viability of Hawaii's and Oahu's resort industry. At the same time the Country Courses at Kahuku will foster the development of a niche market (golfing visitors) which will be beneficial for the Hawaiian visitor industry as well as for the approved Kuilima Resort Development.

5. **Employment**

The project will provide four general categories of jobs (about 150 jobs could be created):

- Grounds** - These include the superintendent, assistant superintendents, maintenance superintendents, mechanics, equipment operators, grounds keepers and laborers (+/-63 jobs could be available).
- Golf and Pro Shops** - These include the directing and teaching golf professionals, attendants, and golf pro shop sales assistants (+/-33 jobs could be available).
- Administration and Support** - These include the clubhouse manager, assistant manager, accountant, secretary, receptionist, janitors, locker attendants parking attendants, and security (+/-26 jobs could be available).
- Clubhouse: Food and Beverage** - These include the cooks, cashier, wait help and bus help, and bartender (+/-28 jobs could be available).

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Many of the jobs require little technical training or experience. Those jobs requiring specialized or previous experience are as follows:

Grounds - superintendent, assistant superintendents, maintenance superintendents, and mechanics.

Golf and Pro Shops: - directing and teaching golf professionals.

Administration and Support - clubhouse manager, assistant manager, accountant, secretary.

Clubhouse: Food and Beverage - cooks, cashier, bartender.

Salaries for these specialized positions will be competitive with the job market and will depend on the person's qualifications. Based on 1988 dollars, monthly salaries could range from \$2,000 to \$3,000 for the higher management levels to \$1,300 to \$1,400 for skilled grounds workers. For the remaining positions, hourly wages range from \$5.00 to \$8.50, based on 1988 dollars, plus tips.

Right now, there is likely a pool of qualified management-level people who currently commute to work, but would prefer to work closer to home if jobs were available.

We believe that the Country Courses at Kahuku will benefit area residents by providing job options for the several thousand workers who currently spend more than 45 minutes traveling to their job site. Further, the proposed project will increase job diversity in the area, thus accommodating a wide range of job skills. The various jobs generated by the project will offer both indoor and outdoor work, as well as jobs suitable for full-time breadwinners, part-time workers supplementing family incomes, and first-time workers.

The project will also increase the number of "outdoor" jobs. This may appeal to those who are currently in agricultural jobs. Note that this percentage is high for Kahuku. Finally, the project will provide job opportunities for the currently-unemployed. Even though there is a small percentage of unemployed persons in Kahuku and Laie, these people still need jobs.

6. Resident Play On Existing Resort Courses

In response to a commenting letter from the City Department of Parks and Recreation (See *Chapter XIV*), John Zapotocky conducted a survey of certain resort-type courses on Maui and

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Oahu regarding local green fees and playing times. Following is a discussion on the matter.

MAUI RESORT COURSES

COURSE	KAMAAINA RATE	% LOCAL PLAY
Wailea	\$60.00 ¹	17%
Seibu	\$90.00 ²	6%
Kaanapali	\$40.00 ³	10%
Kapalua	\$90.00 ²	5%

¹ Non Resort Guest - \$105.00, Resort Guest - \$60.00

² Same as Non Resort Guest Rate

³ No Kamaaina Rate per se, however, booklet purchase available used primarily by local residents.

With the exception of the Seibu course, the Maui resort courses are overbooked by resort guests during the months of January, February and March. Most local play takes place during the other months of the year. None of the courses have specific times reserved for local golfers but accommodate them along with other golfers.

It should be noted that the typical Maui resident plays 50% more golf than his Oahu counterpart under superior conditions, i.e., Maui course average only 60% of the rounds of Oahu courses. While resort golf facilities on Maui do not play a major role in providing resident golf, they do play a significant role. However, the most significant contribution of resort courses on Maui, to local play, is that they provide a place for tourists to play golf, thus allowing local golfers the opportunity to play on golf courses outside of tourist destination areas without heavy competition from tourists. In addition, they provide a variety of golf experiences not otherwise available on the Valley Isle.

Local play at Oahu's resort courses, Sheraton Makaha Valley and Turtle Bay Hilton is 8% and 25% respectively. Both Makaha and Turtle Bay are offering Kamaaina rates at the present time. Makaha offers Kamaaina rates of \$55 vs. regular non-guest rates of \$125. Turtle Bay is offering extra low Kamaaina rates of \$36 weekday and \$40.50 weekends currently, due to construction of the second 18-hole course in proximity to the existing course vs. the normal undiscounted rate of \$90 weekdays and \$100 weekends. The Ko Olina Golf

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Course, Oahu's newest resort course (open in January 1990) is offering Kamaaina rates of \$65 vs. regular rates of \$100. (It should be noted that none of the existing resort courses on Oahu or Maui are under any legal obligation to provide Kamaaina rates or provide local availability but do so as a sound business practice.)

A number of Oahu's non-resort daily fee golf courses, including Mililani, Hawaii Kai, Makaha East and Hawaii Country Club accommodate significant numbers of tourists. Additional resort courses on Oahu will enhance both visitor and local recreational opportunities.

Oahu visitor and resident golfers would benefit significantly from an increase in all types of golf facilities including: resort courses, daily fee courses, municipal courses and private membership courses. Increasing supply is the primary means of guaranteeing availability and competitive fees for all golfers.

7. Linkages with Kuilima Resort

As indicated in the market assessment, the Country Courses at Kahuku are expected to stimulate demand for the resort units at Kuilima by providing a golf amenity, in combination with the golf amenity offered within the confines of the Kuilima Destination Resort, which will be unique in the State of Hawaii.

The clustering of these golf facilities, in locations proximate to the Kuilima Resort, will enhance their marketability. Attracting additional golfers to the Kuilima Resort will enhance its success as well as expand the market for golf in the area. This concept is similar to the concept behind such well known projects as Restaurant Row and Automobile Row (where businesses offering a single-type of service or product group consolidate in order to attract buyers by providing variety).

There is a definite linkage between the projected demand for golf, and the development of the Kuilima Resort. If the resort should be delayed, it is likely to extend the timeframe during which the golf demand is expected to develop. The actual timing of the golf course development at the Country Courses at Kahuku will depend on the developer's assessment of market conditions at the time construction is expected to take place. The suggestion that golf supply lags behind demand (DGP Comment Letter, *Chapter XIV*), however, practically guarantees that demand will not meet expectations, due to diminished availability of tee times and variety of golfing experiences. It might be argued that golf facilities at Kuilima and the Country Courses at Kahuku should lead the resort development at Kuilima, thus insuring the availability of a unique amenity, and enhancing the competitiveness of the emerging Kuilima destination resort area.

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The above discussion and the discussion under 8 below were in response to issues raised by the Department of General Planning in its commenting letter on the DEIS (see *Chapter XIV*).

8. **Effect on Long Range Land Use Patterns**

The General Plan of the City and County of Honolulu establishes for the Koolauloa Development Plan area a population distribution policy of between 1.3 to 1.4 percent of the islandwide population. Essentially, this policy directs very low population growth to the area. Continuation of this policy will ensure that growth in the area remain rural in character. Therefore, urbanization at higher than rural densities can only occur with major policy changes in both the General Plan and Development Plan, an event that is largely controlled by the City and County of Honolulu.

Golf courses do not necessarily result in the urbanization of surrounding lands. The Hawaii Country Club golf course along Kunia Road is an example. Another example is the Hawaii Kai Country Club built in 1957. In this case, both the General Plan and Development Plan for the area were changed reversing a long-standing policy of urban growth surrounding the golf course. With respect to the Country Courses, the surrounding vacant lands are DPed and zoned for Agriculture and classified Agriculture by the State Land Use Commission. The development of these lands for uses other than agriculture are under the control of both the State and the City.

Golf courses often are considered a visual and recreational enhancement to the rural environment of an area. As stated in the view assessment (*Chapter III*), although the courses may convert a portion of the natural/agricultural character to a manmade setting, the essence of visual open space will be retained and/or improved. Several mitigative measures have been proposed to include the development of a "pastoral" landscape theme to blend with the existing visual setting. Also, clubhouse structures will be setback on the property and will not be seen. Furthermore, the courses will provide access and viewing point of historic resources on the property as well as views overlooking the Kahuku Plain. Currently enjoyment of these views are not available.

Although there are linkages between the Country Courses at Kahuku and the Kuilima resort area (see discussion under 7 above), these linkages do not represent a "de facto" expansion of the Kawela Bay/Kahuku Point Resort area. The EIS for the Kuilima development contained a socioeconomic analysis which indicated that the resort development would generate direct, indirect and induced jobs. An offsite direct job could be restaurant jobs in Kahuku Town generated due to patronage by

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Kuilima guests, or it could be industrial/commercial jobs generated by the service needs of the resort area. Even Kahuku Municipal Golf Course receives 6 percent of its income from tourists. The mere fact that the Punamano courses are mauka of the highway from the Kuilima resort does not support a conclusion that the size of the Kuilima resort has been increased any more than the Puuloa course or the Seibu course in the Ewa area expands the resort areas of Ko Olina and Waikiki.

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III. PHYSICAL ENVIRONMENT ASSESSMENT

This chapter pertains to the physical characteristics of the existing environment of the project site, identifies the probable impacts on the physical environment associated with the proposed development and, where appropriate, suggests mitigative measures to offset adverse conditions on the environment.

In reviewing this Chapter, the public is encouraged to refer to the reports in the Appendices listed below. These studies have been the major source for much of the information that follows:

APPENDIX REPORT/PREPARER

- A. *Preliminary Engineering Reports for The Country Courses at Kahuku - Punamano Site*
(Smith, Young & Associates, Inc.)
- C. *Archaeological Inventory Survey for the Proposed Punamano Golf Course, A Portion of the Country Courses at Kahuku* (Includes added addendum)
(Archaeological Consultants of Hawaii)
- E. *Noise Impact Evaluation for the Country Courses at Kahuku, Punamano, Oahu, Hawaii*
(Darby and Associates)
- F. *View Assessment, Country Courses at Kahuku, Punamano Golf Course*
(Michael S. Chu, Land Architect)
- G. *Air Quality Impact Report, The Country Courses at Kahuku: Punamano Golf Course*
(J.W. Morrow, Environmental Consultant)
- H. *The Country Courses at Kahuku, Impact on Agriculture*
(Decision Analysts Hawaii, Inc.)
- J. *Environmental Assessment of Fertilizer and Pesticide Use on the Proposed Country Courses at Kahuku (Punamano Area)*
(Charles L. Murdoch, Ph.d and Richard E. Green, Ph.d)
- K. *Botanical Survey, The Country Courses at Kahuku: Punamano, Ko'olaupia District, Oahu*
(Char and Associates)
- L. *Avifaunal and Feral Mammal Survey of Property Proposed for Golf Courses to be Known as the Country Courses at Kahuku, Kahuku, Oahu*
(Phillip L. Bruner)

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A. **TOPOGRAPHY/GEOLOGY**
(See Appendix A)

1. **Topography**
(The topography is illustrated on Figure 9.)

The Punamano site lies within the watersheds of the Hoolapa and Kalaeokahipa Gulches. The two intermittent stream gulches traverse through the golf courses site. The northern boundary, along Kamehameha Highway, is the low lying portion of the site. This boundary varies from a low of 8 feet above sea level to approximately 20 feet above sea level. The highest elevation on site reaches 290 feet in the westerly section of the site in the Hoolapa drainage basin. The overall slope upwards from the Highway to the southern boundary is about 6 percent.

However, different ridges and ravines cause the slopes to vary from a near level plateau at 220 feet near the center of the site to 30 percent slopes in the upper reaches of Hoolapa Gulch. The northwesterly finger of the site, closest to Turtle Bay is nearly flat and is the lowest portion of the site.

2. **Geology**

Based on previous finds (Stearns and Vaksvik, 1938; Stearns and Macdonald, 1940; Stearns, 1966), aerial photo interpretation, and the geologic investigation, the surficial geologic features were mapped into four major categories. They are: (1) unconsolidated noncalcareous to slightly calcareous alluvial deposits (Ra); (2) unconsolidated calcareous talus deposits (Pdt); (3) consolidated thin-bedded and cross-bedded to planar-bedded ancient, calcareous, eolian (dune) deposits (Pd); and (4) the Koolau Volcanic Series (Tkb), which includes vesicular to poorly vesicular porphyritic a'a-type basalt flows along with minor amounts of thinly bedded pahoehoe lava flows and narrow, near-vertical intrusive dike rock composed of similar basaltic material.

No danger from volcanic activity is expected, since the last phases of the Koolau and Waianae volcanoes reportedly occurred well over one million years ago. The probabilities for earthquakes are very low for the project site. The seismic risk classification for the entire island of Oahu is Zone 1 (Uniform Building Code). Zone 1 indicates that the island is subject to minor earthquake damage.

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Impacts

Expected impacts from grading, clearing, grubbing, trenching and excavation include:

- Dust from grading operations.
- Exposed soil subject to wind and rainfall erosion.

Naturally occurring depressions may be useful for possible temporary runoff impoundment and disposal of irrigation water and storm runoff.

Narrow gulches in upland areas can channel storm runoff and cause severe erosion and flooding hazard to low lying areas down-gradient over a very short time frame.

Approximately 15 percent of the site consists of coralline sandstone and basaltic rock outcrop. Excavations into the less weathered portions of the dense, massive lava flows and recrystallized sandstones may be difficult.

Mitigative Measures

All clearing and grubbing work will be done in accordance with Chapter 23, Grading, Soil Erosion and Sediment Control, of the Revised Ordinances of Honolulu, 1978, as amended (Ordinance No. 81-13). All requirements of Title 11, Chapter 26, paragraph 35 (rodents; demolishing of structure and clearing of vacant sites and vacant lots) will be strictly adhered to.

Standard measures to include dust control, watering, temporary grassing, phasing of construction etc. will be employed to minimize both visual and environmental impacts.

The contractor will conform to all State and City and County of Honolulu rules and requirements including:

- All grubbing operations will be performed in conformance with the applicable provision of Chapter 54, Water Quality Standards, and Chapter 55, Water Pollution Control, of Title II, Administrative Rules of the State Department of Health. Grubbed materials will not be placed next to drainage ways, streams, waterways, etc.
- Maximum cut and fill slopes will be 2 horizontal to 1 vertical.
- All equipment used on site will be provided with mufflers and will be operated during normal working hours (7 a.m. and 4 p.m.).

Mitigative measures also include construction of short-term storage reservoirs to retain large volume influx of runoff water. During dry

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seasons, storage reservoirs should be inspected, cleared of debris, and maintained. Surface drainage should be improved in the low lying areas to reduce flooding hazards. (See *Chapter V.E.* for further discussion on drainage.)

B. SOILS
(See *Appendix A* and *Appendix H*)

Accordingly to the U.S. Department of Agriculture Soil Conservation Service (SCS), the Punamano site is divided into eight major categories, which are: Coral outcrop; Kaena Series; Kaloko Series; Kemoo Series; Lahaina Series; Paumalu Series; Rock Land; and Waialua Series. Based on the SCS soils map, many of these major categories are broken up into a number of subseries.

The Kaena Series consist of poorly-drained soils on alluvial fans and talus slopes. They develop in alluvium and colluvium derived from weathered basaltic material. They are dark grayish brown to reddish brown, stony clay with a fine to medium subangular blocky structure. These clays tend to have high plasticity and contain angular pebble-size basalt fragments which increase in both size and content with depth.

The Kemoo Series consist of well-drained, dark reddish brown, silty clay soils which are derived from weathered basaltic material that develops on upland areas. These silty clays are well-drained, have a subangular blocky structure, and moderate to moderately rapid permeability. Both runoff and erosion hazard are moderate. These soils have abundant calcareous fines that are strongly effervescent with hydrogen peroxide.

The Lahaina Series consist of well-drained, dark reddish brown silty clay. These silty clay soils contain cobbles (of cemented calcareous dune deposits and weathered basalts) on the surface in the upland areas, and near the coastal plains. They commonly contain coralline fragments (stones, gravel, or sand). These soils show strong effervescence with hydrogen peroxide, which is probably related to abundant fine-grained calcareous material.

Paumalu Series consist of well-drained, dark reddish brown silty clay soil. These soils developed in old alluvium and colluvium derived from weathered volcanic basalt. They have a subangular to angular blocky structure. The substratum grades to a highly weathered clayey silty gravel which overlies less weathered basalt and which commonly exhibits spheroidal weathering.

Rock Land (rRK) consists of areas where exposed, slightly-to moderately-weathered basalt rock outcrops cover approximately 25 to 90 percent of the surface. The rock land covers only approximately 2 acres (or less than 1 percent) of the study area.

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Waialua Series consist of moderately well-drained dark reddish brown stony silty clay with a medium and coarse-grained subangular blocky structure. These soils are sticky with high plasticity. These soils develop in alluvium or colluvium associated with weathered basaltic rocks.

Agricultural capabilities of the soils are discussed in detail in *Chapter IV., B.*, of this document and in *Appendix H.*

Impacts

The impacts of the project on soils would likely be erosion. Erosion could result from clearing, grubbing and future construction. A slight increase in runoff may occur as the result of construction of structures and roads, thereby increasing imperviousness of the site.

Agricultural soils will be lost as a consequence of the proposed project. See *Section IV. B.* of this document and *Appendix H.* for a detailed discussion of the project's anticipated impact on agricultural lands and the agricultural land policy of the State.

Mitigative Measures

Expansive soils with high shrink-swell capability (particularly those soils associated with saprolitic basalt zone) may need to be excavated prior to construction of building structures and service roads.

Approximately ten percent of the site contains soils that have abundant lithic material, rich in coarse-grained cobbles and boulders. These stoney to very stoney soils may require excavation and removal. This soil type represents poor fill material for mass grading work, but it is considered suitable for golf course fill.

Approximately one percent of the site contains Badland areas where erosion hazard is very severe. These areas represent unstable areas and should be excavated, covered with vegetation to reduce soil erosion (or terraced and benched to lower slope gradients), so as to lower runoff and erosion hazard.

During construction phases, increased soil erosion is expected, due to removal of plant cover and exposing large areas of barren soil. With construction of structures and roads, the percent imperviousness of the site will also increase, resulting in slightly increased runoff. Mitigative measures may include construction of water retention ponds in appropriate areas.

C. CLIMATE

The Kahuku area is subject to tradewinds, which blow from the northeast and east northeast. These winds vary from light sea breezes to velocities of some twelve miles per hour on the average. Gusts up to

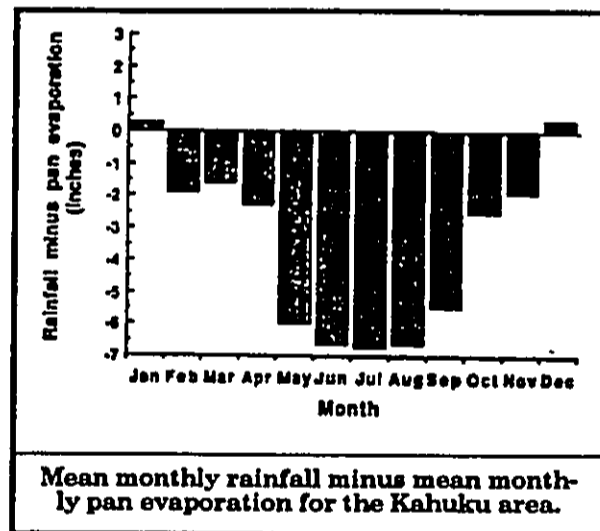
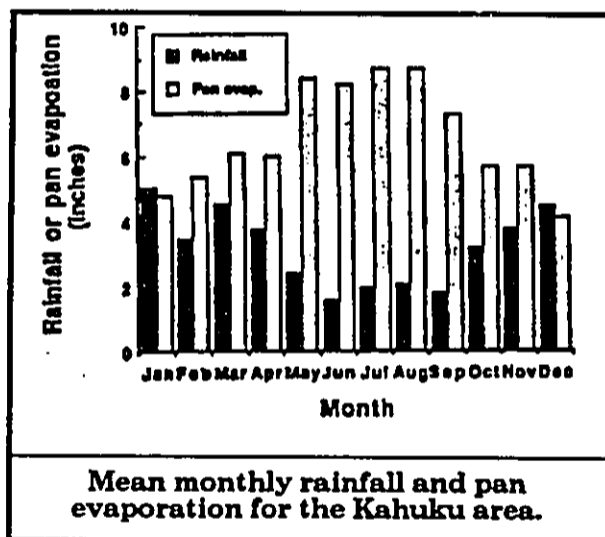
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twenty miles per hour do occur. As moisture laden clouds are shoved against the northernmost extremities of the Koolau Mountains, the uplift created by the winds cool the clouds sufficiently so that rainfall is intensified at the higher elevations. The site is occasionally subject to "Kona winds" from the southerly direction. Normally these winds are mild clear weather winds unless they are associated with a major "Kona storm". At that time, the entire island of Oahu is subjected to heavy rains.

Although extremes in rainfall have been noted at the site, some 30 percent of the days are clear. Possibly one third of the time the sky is considered partly cloudy and another third is overcast. The climate is considered good for golfing activity.

Wind and Evapotranspiration

Irrigation requirements will vary with the variation of month-to-month rainfall and its relationship to temperatures. Tradewinds are stronger in the Kahuku area than in any other area of Oahu and rainfall tends to be less during the drier summer months when the temperatures range slightly higher. Based on the evaporation data in *Appendix J*, and summarized in the chart below, evaporation exceeds rainfall by some 6.5 inches during the month of July, the demand for irrigation water will reach about 2.6 mgd during that month, falling to about 1.4 mgd during January and December, with the yearly average being about 2.1 to 2.2 mgd (See *Chapter V, B.*)



Impact

Climate factors are being considered in the planning, design, and grading of the project. Such factors as the wind direction, path of the

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sun, and amount of rainfall influence the grading and landscape practices.

Mitigative Measures

None necessary since there are no adverse impacts.

D. FLORA
(See *Appendix K*)

A Botanical Survey of the project site was conducted by Char and Associates in November 1989. Field Studies were made to: (1) provide a general description of the major vegetation types; (2) inventory the terrestrial, vascular flora, and (3) search for threatened and endangered plant species protected by Federal and State laws.

Prior botanical studies for portions of the Punamano site (Nagata and Char, 1981; Nagata, 1989) revealed that most of the uplands, with the exception of the steepest slopes and ridge crests, were planted in sugar cane at one time or another. Since these fields were abandoned, most have become overgrown with mixed thickets of koa-haole, Christmas berry, guava or grasslands. Steep ridge crests are characterized by low, windswept scrub. In such areas a few natives as 'ulei and 'akia may be found.

Five major vegetation types are recognized on the site. (See "Plant Species List," *Appendix K*.) These include: mixed shrubland, generally occurring on abandoned sugar cane fields and the most common type encountered; koa-haole shrubland, the second most common, found on gentle to moderate slopes on the east side of the property; grasslands, mixed lowland and upland; exposed scrub on the summits and upper slopes of ridges; and a few small pockets of abandoned sugar cane and clumps of bananas.

Impacts

The proposed golf course development is not expected to have a significant negative impact on the botanical resources on the site, since it will affect areas already disturbed by past agricultural activities. These areas are vegetated largely by weedy introduced or alien species. The steeper slopes and ridge tops, which support a few remnant native plants, will not be developed. None of these native species is officially listed as threatened or endangered by the Federal and State agencies.

Two individuals of the native caper or maiapilo (*Capparis sandwichiana*) are known from the general area and have been discussed in two previous surveys (Nagata and Char 1981; Nagata 1989). One plant is located on limestone outcrops across from Tanaka Store along Kamehameha Highway. The other plant is found on another limestone outcrop at about 175 ft. elevation, northeast of and

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outside the project site. Maiapilo occurs throughout the main Hawaiian Islands in lowlands and coastal areas; it is also found on a few of the leeward Hawaiian Islands (Wagner et al. in press). Although at the time the survey was taken, it was a category 1 candidate endangered species, recent publication by the US Fish and Wildlife Service (US Fish and Wildlife Service, 1990, Endangered and Threatened Species; Notice of Review, Federal Register 55 [35]: 6184-6229) has downgraded the maiapilo to Category 2 (no longer considered vulnerable as threatened or endangered, with not enough data to support listing at this time).

The maiapilo, located across from Tanaka store, is on the boundary of the project site on a rough coralline outcrop. Golf course plans do not include this area for landscaping or development.

Of concern are the effects of removal of upland vegetation and the resulting increase in soil erosion.

Mitigating Measures

The applicant has indicated that all efforts to preserve the maiapilo will be taken.

To mitigate the impact on the botanical resources on the site, areas grubbed and cleared will be landscaped as soon as possible. Other standard precautions for erosion control, such as siltation ponds, will also be initiated.

Use of native materials for landscaping will also be considered, especially natives such as 'ulei, 'akia, and maiapilo. These plants are easy to cultivate and are attractive specimens. These plants are adapted to the local conditions of the site, especially the constant windy nature of the site.

E. FAUNA (See Appendix L)

An Avifaunal and Feral Mammal Survey was conducted (Phillip L. Bruner, Assistant Professor of Biology, BYU Hawaii) on the property in November 1989. The report is summarized below:

The Punamano Unit of the James Campbell National Wildlife Refuge is located makai of the proposed development area. This refuge provides habitat for four endangered species: Common Moorhen (*Gallinula chloropus sandvicensis*), American Coot (*Fulica americana alai*), Black-necked Stilt (*Himantopus mexicanus knudseni*) and Koloa or Hawaiian Duck (*Anas wryvilliana*). No wetlands exist on the Punamano area proposed for the golf course development.

The only resident indigenous species recorded in the area was the Black-crowned Night Heron (*Nycticorax nycticorax*). Two herons were

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observed flying over an offsite area. Two migratory Pacific Golden Plover (*Pluvialis fulva*) were found on the Punamano property. Plover are known to be site-faithful and territorial which make it possible to determine their abundance in a particular area with a reasonable degree of accuracy (Johnson et al. 1981, 1989). The only other shorebird that might be found in the area is the Bristle-thighed Curlew (*Numenius tahitiensis*). This species can be found in upland grasslands and coastal habitats during September as it migrates through Hawaii on its way to the South Pacific (Pratt et al. 1987, Hawaii Audubon Society 1989).

A total of 14 species of introduced (exotic) birds were recorded in the survey of the Punamano project area. Two exotic species not recorded but likely present at times on the property are Barn Owl (*Tyto alba*) and Chestnut Mannikin (*Lonchura malacca*). Bruner (1989a, 1989b) obtained a similar list of exotic species on lands elsewhere in the Kahuku area.

Mongoose (*Herpestes auropunctatus*) and cats were seen on the property. Rats and mice were not recorded but undoubtedly are residents of these sites. The survey found no unusual concentrations of mammals. The endemic and endangered Hawaiian Hoary Bat (*Lasiurus cinereus semotus*) is known from Oahu (Tomich 1986) but was not recorded on this survey.

Impact

The diversity and abundance of exotic species should decline following the construction of golf courses and the subsequent loss of a more diversified habitat.

Native birds at these sites are limited due to inappropriate habitat, i.e., absence of good wetlands and native vegetation. However, numbers of native Pacific Golden Plover should actually increase following the development of the golf courses.

Feral mammal populations will decline following development due to loss of cover and the construction of a more monotypic environment.

Punamano is an important wetland for migratory water fowl as well as for native resident waterbirds. The down slope location of the James Campbell National Wildlife Refuge from the proposed Punamano golf courses raises the concern of potential water supply contamination by pesticides and herbicides.

Mitigative Measures

Potential impact of chemicals on the National Wildlife Refuge and necessary mitigating measures are covered in *Chapter III.K.* and *Appendix J.*

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F. **ARCHAEOLOGICAL/HISTORIC**
(See *Appendix C*)

An archaeological assessment was done for the project site by Archaeological Consultants of Hawaii, Inc. (ACH). The assessment was essentially a resurvey of lands recently surveyed by Dr. Peter M. Jensen of Paul H. Rosendahl, Inc. (PHRI). This assessment included the following tasks:

- Relocate and retag all sites and features previously identified by Jensen.
- Conduct a search for additional sites and tag them.
- Resurvey a percentage of the property where no previous sites were identified by the Jensen report.
- Reevaluate all identified sites and features in terms of function, significance and recommendations for future work.

Based on comments received from the Environmental Center, University of Hawaii (see *Chapter XIV*), and in consultation with the Historic Section of the State Department of Land and Natural Resources, a follow-up survey and re-examination and testing of certain features were conducted. The results of the follow-up survey are included as an Addendum to *Appendix C*.

Impact

The surveys conducted generally concur with most of the PHRI identifications, evaluations, and recommendations. However, three additional sites were recorded on the property, along with 16 new features at previously identified sites. Sites and features found at the site include low stacked walls, overhang/shelters, auwai/modified crevasse, filled crevasse, C-shape structures, and rectangular enclosures. Total number of sites located on the property is 23, with 35 features.

Following are tables taken from the Addendum to *Appendix C* that summarize the survey findings. *Table 1* is a listing of the archaeological resources found at the site with State site numbers followed by ACH (Archaeological Consultants of Hawaii, Inc.) and PHRI (Paul H. Rosendahl, Inc.) temporary numbers, and ACH's significance evaluation (C=excellent site type; D=important for scientific value; E=cultural significance; NLS=no longer significant) for each site and feature, followed by a description.

Table 1A lists all the historic sites on the property and the proposed data recovery work. Most of the existing sites are located on steep cliffs where no grading is planned. A limited data recovery plan is being recommended which will allow for archaeological testing of all significant sites, while preserving ancient strata for future study

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(passive preservation). A more extensive data recovery plan is proposed for site 4076. Information from this relatively undisturbed habitation site will provide a base from which to interpret test results from other areas. Several features associated with site 4076 may also be considered candidates for interpretive preservation based on information content, excellence of type, and the example they represent of a unique cultural and environmental adaptation by pre-contact Hawaiians (active preservation).

Table 1B lists all sites where possible human remains have been identified. All burials located on the property will be treated in accordance with HRS Section 6E. Since these sites are also located on cliff faces where grading will not take place, no destruction or relocation of any burial site is anticipated at this time.

Table 1C list all sites considered no longer significant (NLS). These sites are, for the most part, modern agricultural features or bare rock overhangs with no residual information content. No further work is required at these sites.

Figure 7A presents a revised map showing the locations of the historic areas by State site numbers, as determined by the following survey.

Mitigative Measures

Based on ACH's findings and recommendations, the applicant will, in consultation with the Historic Section of the State Department of Land and Natural Resources, undertake further archaeological work (surveying, testing, probing, data recovery, etc.) relating to appropriate preservation and management plans for the site. Based on this additional work, a formal preservation plan will be prepared for the site that will include, as appropriate, onsite interpretations and/or "as is" preservation and curation of artifacts onsite, which will be submitted for review and approval by the DLNR prior to any development on the site. Furthermore, the final golf course design layout will be based on the approved preservation plan.

Also, during construction activities, should the possibility arise of encountering unknown archaeological features, work will be suspended for an inspection by appropriate experts and an evaluation will be made to determine additional mitigative measures.

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**TABLE 1
SIGNIFICANCE CHART**

REC #	State Site #	ACH #	PHRI #	Significance	Description
1	4068-A	S-23	T-1	D	Overhang/Shelter
2	4068-B	S-23	T-1	D	Overhang/Shelter
3	4068-C	S-23	T-1	D	Overhang/Shelter
4	4069	S-24	T-2	D	Overhang/Wall
5	4070-A	S-22	T-3	D,E	Overhang/Poss. Burial
6	4070-B	S-22	T-3	D	Overhang/Shelter
7	4071-A	S-21	T-4	D	Overhang/Shelter
8	4071-B	S-21	T-4	D	Low Stacked Wall
9	4071-C	S-21	T-4	D	Overhang/Shelter
10	4072-A	S-25	T-5	D	Overhang/Shelter
11	4072-B	S-25	T-5	D,E	Filled Crevasse/ Poss. Burial
12	4072-C	S-25	T-5	D	Crevasse/Shelter
13	4073	S-26	T-7	D	Overhang/Shelter
14	4074	S-27	T-9	NLS	Overhang/Shelter
15	4075		T-11	NLS	Gun Emplacement
16	4076-A	S-5	T-15	C,D,E	Overhang/Shelter
17	4076-B	S-5	T-15	D	Low Stacked Wall
18	4076-C	S-5	T-15	C,D,E	Overhang/Shelter
19	4076-D	S-5	T-15	D	C-Shape
20	4076-E	S-5	T-15	D	Low Stacked Wall
21	4076-F	S-5	T-15	D	Low Stacked Wall

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REC #	State Site #	ACH #	PHRI #	Significance	Description
22	4076-G	S-5	T-15	C,D,E	Overhang/Shelter
23	4076-H	S-5	T-15	C,D,E	Overhang/Shelter
24	4076-I	S-5	T-15	D	Rectangular Enclosure
25	4077-A	S-17	T-16	D	Terrace Facing
26	4077-B	S-17	T-16	D	Wall/Terrace
27	4077-C	S-17	T-16	D	Auwai/Modified Crevasse
28	4078-A	S-16	T-17	D	Overhang
29	4078-B	S-16	T-17	D	Low Stacked Wall
30	4078-C	S-16	T-17	D	Low Stacked Wall
31	4079	S-9	T-19	D	2 Low Stacked Walls
32	4080	S-10	T-20	NLS	Historic Dump
33	4081	S-7	T-21	D	Overhang/Shelter
34	4082-A	S-19	T-22	D	Overhang/Shelter
35	4082-B	S-19	T-22	D,E	Overhang/Burial
36	4082-C	S-19	T-22	D,E	Overhang/Burial
37	4082-D	S-19	T-22	D,E	Overhang/Burial
38	4082-E	S-19	T-22	D	Overhang/Shelter
39	4082-F	S-19	T-22	D	Midden Pocket
40	4082-G	S-19	T-22	D,E	Overhang/Burial
41	4082-H	S-19	T-22	D	Overhang/Shelter
42	4082-I	S-19	T-22	NLS	Overhang/Shelter
43	4082-J	S-13	T-22	NLS	Overhang/Shelter
44	4082-K	S-19	T-22	NLS	Overhang/Shelter

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REC #	State Site #	ACH #	PHRI #	Significance	Description
45	4083	S-2	T-24	NLS	Rock Alignment/ Modified Ag.
46	4084	S-1	T-25	NLS	Terrace/Modified Ag. Mound
47	4085-A	S-14	T-26	NLS	Circular Enclosure
48	4085-B	S-14	T-26	NLS	Low Stacked Wall
49	4086	S-18	T-27	NLS	Wall/Modified Ag. Pile
50	4087	S-20	T-28	D	Overhang/Shelter
51	4230-A	S-8		D	Overhang/Shelter
52	4230-B	S-8		C,D,E	Crevasse/Burial
53	4230-C	S-8		D	C-Shape
54	4230-D	S-8		D	Low Stacked Wall
55	4230-E	S-8		D,E	Burial
56	4230-F	S-8		D	Low Stacked Mounds
57	4231	S-6		D	Low Stacked Walls/Enclosure
58	4232	S-15		D	Irrigation Ditch <= 1937

Total Sites: 23
 Total Features: 35

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**TABLE 1A
 RECOMMENDATION CHART**

REC #	State Site #	ACH #	PHRI #	Description	RECOMMEND
1	4068-A	S-23	T-1	Overhang/Shelter	1-2 Trenches
2	4068-B	S-23	T-1	Overhang/Shelter	1 Trench
3	4068-C	S-23	T-1	Overhang/Shelter	1 Trench
4	4069	S-24	T-2	Overhang/Wall	1 Trench
5	4070-A	S-22	T-3	Overhang/Poss. Burial	Possible Burial Test
6	4070-B	S-22	T-3	Overhang/Shelter	1 Trench
7	4071-A	S-21	T-4	Overhang/Shelter	1-2 Trenches
8	4071-B	S-21	T-4	Low Stacked Wall	1 Trench
9	4071-C	S-21	T-4	Overhang/Shelter	1 Trench
10	4072-A	S-25	T-5	Overhang/Shelter	1 Trench
11	4072-B	S-25	T-5	Filled Crevasse/ Poss. Burial	HRS Section 6E
12	4072-C	S-25	T-5	Crevasse/Shelter	1-2 Trenches
13	4073	S-26	T-7	Overhang/Shelter	2-3 Trenches
14	4074	S-27	T-9	Overhang/Shelter	None
15	4075		T-11	Gun Emplacement	None
16	4076-A	S-5	T-15	Overhang/Shelter	4-6 Trenches
17	4076-B	S-5	T-15	Low Stacked Wall	Map, 1 Trench
18	4076-C	S-5	T-15	Overhang/Shelter	2-3 Trenches
19	4076-D	S-5	T-15	C-Shape	1 Trench
20	4076-E	S-5	T-15	Low Stacked Wall	Map
21	4076-F	S-5	T-15	Low Stacked Wall	Map

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REC #	State Site #	ACH #	PHRI #	Description	RECOMMEND
22	4076-G	S-5	T-15	Overhang/Shelter	2-3 Trenches
23	4076-H	S-5	T-15	Overhang/Shelter	2-3 Trenches
24	4076-I	S-5	T-15	Rectangular Enclosure	1-2 Trenches
25	4077-A	S-17	T-16	Terrace Facing	1 Small Trench
26	4077-B	S-17	T-16	Wall/Terrace	1 Small Trench
27	4077-C	S-17	T-16	Auwai/Modified Crevasse	Map and Grade
28	4078-A	S-16	T-17	Overhang	1-2 Trenches
29	4078-B	S-16	T-17	Low Stacked Wall	1 Trench Small Sample
30	4078-C	S-16	T-17	Low Stacked Wall	1 Trench Small Sample
31	4079	S-9	T-19	2 Low Stacked Walls	1-2 Trenches
32	4080	S-10	T-20	Historic Dump	None
33	4081	S-7	T-21	Overhang/Shelter	2-3 Trenches
34	4082-A	S-19	T-22	Overhang/Shelter	2-3 Trenches
35	4082-B	S-19	T-22	Overhang/Burial	HRS Section 6E
36	4082-C	S-19	T-22	Overhang/Burial	HRS Section 6E
37	4082-D	S-19	T-22	Overhang/Burial	HRS Section 6E
38	4082-E	S-19	T-22	Overhang/Shelter	3-4 Trenches
39	4082-F	S-19	T-22	Midden Pocket	1 Trench
40	4082-G	S-19	T-22	Overhang/Burial	HRS Section 6E
41	4082-H	S-19	T-22	Overhang/Shelter	1-2 Trenches
42	4082-I	S-19	T-22	Overhang/Shelter	None
43	4082-J	S-13	T-22	Overhang/Shelter	None

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REC #	State Site #	ACH #	PHRI #	Description	RECOMMEND
44	4082-K	S-19	T-22	Overhang/Shelter	None
45	4083	S-2	T-24	Rock Alignment /Modified Ag.	None
46	4084	S-1	T-25	Terrace/Modified Ag. Mound	None
47	4085-A	S-14	T-26	Circular Enclosure	None
48	4085-B	S-14	T-26	Low Stacked Wall	None
49	4086	S-18	T-27	Wall/Modified Ag. Pile	None
50	4087	S-20	T-28	Overhang/Shelter	3-4 Trenches
51	4230-A	S-8		Overhang/Shelter	1-2 Trenches
52	4230-B	S-8		Crevasse/Burial	HRS Section 6E
53	4230-C	S-8		C-Shape	1 Trench
54	4230-D	S-8		Low Stacked Wall	1 Trench
55	4230-E	S-8		Burial	HRS Section 6E
56	4230-F	S-8		Low Stacked Mounds	1-2 Trenches, Map
57	4231	S-6		Low Stacked Walls /Enclosure	2-3 Trenches
58	4232	S-15		Irrigation Ditch <= 1937	1-2 Trenches

Total Sites: 23
 Total Features: 35

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**TABLE 1B
 TABLE OF POSSIBLE BURIALS**

State Site #	ACH #	PHRI #	Description	RECOMMEND
4070-A	S-22	T-3	Overhang/Poss. Burial	Possible Burial Test
4072-B	S-25	T-5	Filled Crevasse /Poss. Burial	HRS Section 6E
4082-B	S-19	T-22	Overhang/Burial	HRS Section 6E
4082-C	S-19	T-22	Overhang/Burial	HRS Section 6E
4082-D	S-19	T-22	Overhang/Burial	HRS Section 6E
4082-G	S-19	T-22	Overhang/Burial	HRS Section 6E
4230-B	S-8		Crevasse/Burial	HRS Section 6E
4230-E	S-8		Burial	HRS Section 6E

**TABLE 1C
 TABLE OF "NLS" SITES
 WITH RECOMMENDATION "NONE"**

State Site #	ACH #	PHRI #	Description	RECOMMEND
4074	S-27	T-9	Overhang/Shelter	None
4075		T-11	Gun Emplacement	None
4080	S-10	T-20	Historic Dump	None
4082-I	S-19	T-22	Overhang/Shelter	None
4082-J	S-13	T-22	Overhang/Shelter	None
4082-K	S-19	T-22	Overhang/Shelter	None
4083	S-2	T-24	Rock Alignment /Modified Ag.	None
4084	S-1	T-25	Terrace/Modified Ag. Mound	None

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State Site #	ACH #	PHRI #	Description	RECOMMEND
4085-A	S-14	T-26	Circular Enclosure	None
4085-B	S-14	T-26	Low Stacked Wall	None
4086	S-18	T-27	Wall/Modified Ag. Pile	None

G. NOISE
 (See Appendix E)

A noise impact evaluation for the project site was performed by Darby and Associates, Acoustical Consultants.

Impact

Existing and future noise sources which may affect the proposed project site and its surroundings are:

- Traffic noise generated on Kamehameha Highway by additional traffic From the project.
- Noise generated by clubhouse and ground maintenance activities.
- Noise from construction activities during development of the project site.

Additional traffic on Kamehameha Highway generated by the project will not increase the future traffic noise level significantly. *Table 2 of Appendix E* indicates that future noise levels due to the project will be negligible.

Noise sources from clubhouses, such as public address system, kitchen activities; refrigeration; air-conditioning equipment; fans; golf cart chargers; pumps; and other stationary equipment should not cause the ambient noise levels to exceed the allowable noise levels specific in local noise regulations of the Department of Health and City and County of Honolulu, since such long sound propagation distances are involved. There are no known noise-sensitive areas within the proposed site.

Development of the project site will require grubbing, grading, and the construction of infrastructure and buildings. The various construction phases of development may generate significant amounts of noise, dependent upon the methods employed during each stage. Typical construction equipment noise ranges in dBA are shown on

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Figure 2 of Appendix E. Earthmoving equipment will probably be the loudest equipment used during construction.

Mitigative Measures

The design of the facilities will include noise mitigation measures in the planning of the location and orientation of the air-conditioning equipment, exhaust fans, etc., so that local noise regulations will be satisfied.

If noise generated during construction exceeds the allowable limits, a permit will be obtained from the Department of Health. In addition, construction equipment and on-site vehicles, or devices requiring an exhaust of gas or air, will be equipped with mufflers.

H. VIEW ASSESSMENT
(See *Appendix F*)

A visual assessment of the Punamano site was conducted by Michael S. Chu, Land Architect, to evaluate the potential visual impacts of the proposed project. The assessment identifies potential impacts relative to open space, scenic and other visual resources within the project area, and proposes mitigation measures to reduce or eliminate possible adverse impacts. The assessment was conducted within the context of (a) existing visual conditions and (b) current State and City/County development plans and policies relating to visual quality. Not all the project's site development and building design details are finalized at this stage of the development process, but sufficient data exists (three golf courses and appurtenances) for the preparation of a meaningful visual impact analysis and mitigative guidelines.

The project site is approximately two miles west of Kahuku, immediately east of the Kuilima Resort and is one mile inland from the shoreline. It contains approximately 1.75 miles of frontage along the mauka side of Kamehameha Highway. Makai portions of the site abutting the Highway lie within the Kahuku Plain. This coastal plain is a broad, low-lying area extending from the shoreline across the Highway to the foothills of the Koolau Mountains. It is currently planted with diversified agricultural crops as well as uncultivated fields which are overgrown with naturalized vegetation.

Upper portions of the site lie within the descending foothills and ridge top plateaus. The foothills provide a highly visible backdrop to the agricultural and open space in the foreground. A portion of the foothills (Kalaeokahipa Ridge) descends and abuts the Highway at the southeastern point of the project site and is a prominent and unique natural feature. The maintained landscape and low-rise structures across the Highway at the Kuilima resort area contrast with the agricultural / natural character of the area and represent a distinct and unique urban node within the Koolauloa district.

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Figure 9 is a preliminary site plan and illustrates the general golf course layouts, major structures and entry roads, identifying the location of primary design features. Photos of the area are shown on Figures 11, 12 and 13.

The Kahuku Plain portion lies in naturalized vegetation, i.e. various tall grasses and koa-haole, the latter ranging in coverage from individual shrubby trees (*Photo C*) to vast and dense stands. This vegetation forms partial and complete visual screening at certain segments along Kamehameha Highway (*Photos D and G*). Visibility into the site at its Highway frontage is generally unobstructed except for these occasional stands of roadside vegetation. Visibility into the site from eastern and western approaches of the Highway is generally not available due to a row of Ironwood trees (to the east) and agricultural crops (to the west). Manmade intrusions into the existing views include four large, abandoned wind-turbine towers, located near but just off the site's narrow northwestern end (*Photo E*) and a sewage treatment plant (under construction, *Photos B and C*). Overhead utility poles and lines are located along the mauka side of the Highway (*Photos G, K and L*).

The descending foothills are fairly gentle landforms extending downward to meet the Kahuku Plain. Their angle of repose allows good visibility of them. They are well vegetated and free of any visible manmade intrusions. In contrast is the Kalaeokahipa Ridge, which rises steeply to form a vertical cliff condition. This ridge line is a prominent and important landform, standing nearly perpendicular to the on-coming vehicular traffic circulation and extending a mauka/makai direction to abut Kamehameha Highway (*Photos K and L*) at one location.

Impact

Overall Short-Term Visual Impacts

Construction of the project would have a significant short-term impact on the existing visual quality of the area due to necessary vegetation removal, contour grading, construction equipment, stockpiling of materials and occasional dust. Visual impact will be most apparent at entry roads proposed as primary access into the golf courses and along the faces of descending foothills. Such impacts will be visible from most portions of the Highway directly fronting the project.

Long-Term Visual Impacts

The overall permanent visual impacts of the Punamano Golf Courses are the conversion of the scenic quality of the site from a naturalized environment to a highly manmade setting. While it is likely that the golf course proposal will continue to provide the open space, public views and visual relief called for in the Koolauloa Development Plan, the visual character will be substantially altered. The natural

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vegetation will be substantially replaced with manicured grasses, tree masses and other golf course amenities. This transformation will be most visible within the low lying Kahuku Plain area abutting the Highway, along the faces of the descending foothills and atop the Kalaeokahipa ridge line. Entry roads will be located at the Highway and will alter the visual character of the roadway.

Mitigative Measures

While short-term construction impacts are unavoidable, there are a number of mitigative measures which will minimize them. The City and County Department of Public Works will specify various construction impact controls (temporary and permanent erosion controls, limits on time and phasing of construction, temporary and permanent re-vegetation, watering of graded areas for dust control, etc.) which will keep the impacts within acceptable limits.

Landscaping will eventually re-vegetate all graded areas and the retention of the Ironwood trees along the highway and the continuation of agricultural activities at the east and west portion of Kamehameha Highway will minimize certain view impacts from the Highway.

The attributes of open space, extended views and relative absence of structures that comprise the essential visual quality of the Kahuku Viewshed can be preserved through the following additional measures:

- Panoramic views into the site should continue to be retained as a component of the golf course concept.
- Alteration of the rural or country character of the region can be minimized through design. A "pastoral" character employing a design palette of open space and landscape based on elements found in the Koolauloa District should be utilized by the planners and golf course architect(s).
- Panoramic views overlooking the Kahuku Viewshed in a makai and lateral direction will become available from the upper plateaus and descending foothills when the golf courses are completed. These are views which are now unavailable to the general public.

The landscape palette may consist of the following types of plants:

Wind Breaks and/or Vertical Buffers

Ironwood*	Norfolk Island Pine*
Paperbark*	Brassaia*
African Tulip*	Eucalyptus

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Large Canopy Trees

Banyan*
Kukui
True Kamani

Monkeypod
False Kamani

Medium & Small Canopy Trees

Autograph Tree
Wili-Wili
Hala*

Be-Still
Strawberry Guava*

Palms

Coconut Palm
Royal Palm

Areca Palm
Date Palm

* Indicates existing specimens on site

- The visual integrity of the Kalaeokahipa Ridge may be preserved by locating all structural elements along the eastern ridge line, thereby preserving the more prominent western view of the land form.
- Ungraded areas of the site should remain in natural vegetation. Formalized plantings along the edge of the Highway which screen views into the site should be avoided.
- The Highway should retain a rural character. Public facility improvements along the Highway should be scrutinized. Grass shoulders should be used in place of concrete curbs and gutters. Undergrounding of overhead utilities should be considered.
- All structures on the upper plateau should be setback from the ridgeline. Placement of all structures within the lower Kahuku Plain should be set back substantially from the Highway and screened with landscape plantings.

I. AIR QUALITY
(See Appendix G)

An air quality assessment for the proposed development was conducted by J. W. Morrow, Environmental Management Consultant. The study includes impacts associated with mobile source impacts, pesticide use, and construction activities. *Tables 1 through 9 of Appendix G* provide information on air sampling and monitoring data and estimates of downwind pesticide concentrations. *Figures 1*

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through 8 of *Appendix G* include site photos and graphs depicting existing site conditions and air quality samplings conducted at Kamehameha Highway and Marconi Road. Air quality impact was evaluated for existing (1989) and future (1998) conditions.

Results of the microscale analysis reveal that while the project will impact local air quality, the 1-hour and 8-hour "worst case" carbon monoxide concentration estimates for existing as well as future "with project" and "without project" scenarios all indicated compliance with state and federal standards. The results are summarized in *Figures 7 and 8, Appendix G*.

Impact

The principal access road to the project area is Kamehameha Highway, a typical 2-lane rural roadway (See *Figure 6, Appendix G*). Peak traffic volumes tend to occur during weekend afternoons, because of the generally recreational nature of the area. The peak period was between 1:30 and 3:30 p.m. and the traffic and air quality analyses focused on this period. The microscale screening analysis was performed for the Marconi Road intersection with Kamehameha Highway, because this is where the proposed golf course access road will also intersect Kamehameha Highway. Traffic generated by the project will impact local air quality, but carbon monoxide concentration estimates indicated compliance with both state and federal standards.

The use of pesticides is routinely required at golf courses to maintain fairways and greens (refer to *Table 8, Appendix G, "Typical Pesticide Use at an 18-Hole Golf Course"*), but the potential for significant airborne concentrations is relatively slight when considering the dilution factor in application solutions plus the coarse spray that is normally used to assure adequate coverage and avoidance of drift. If a user improperly applied chemicals under wind conditions which would contribute to drift, then there would be an increased possibility of downwind exposure of property and people. (See following *Section J* for additional discussion.)

The principal source of short-term air quality impact will be construction activity. Construction vehicle activity will increase automotive pollutant concentrations along the principal access roads and in the vicinity of the project site itself. Site preparation and earth moving will create particulate emission, as will building and on-site road construction. Construction vehicles movement on unpaved on-site roads will also generate particulate emissions. It may be assumed that there is a potential for fugitive dust problems. In addition to on-site activities, there will also be offsite impacts from the operation of concrete batching plants. The worst case concentration of total suspended particulates (TSP) was estimated to be 105 micrograms/cubic meter (ug/m³) due to plant operation.

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Mitigative Measures

No mitigative measures are proposed for mobile source impacts, since state and federal standards will be met.

Modeling results indicated airborne pesticide concentrations several orders of magnitude below the effects and standards levels. Proper use of pesticides in accordance with legally required label instructions should prevent any significant air quality impact. Use of other non-chemical means of pest control wherever possible would also help reduce or eliminate the potential for air quality impact.

As discussed above, there is a potential for fugitive dust generation, a short-term impact, during construction. Adequate dust control measures should be employed during the construction period and dust control should be accomplished through frequent watering of unpaved roads and areas of exposed soil. The soonest possible landscaping of completed areas will also help, as will the use of dust screens when excavation and other activities occur close to existing dwellings.

Proper maintenance of vehicle engines will help reduce construction vehicle emissions and effects, and scheduling of truck traffic during offpeak hours will reduce the impact on Kamehameha Highway.

Offsite construction activity, such as concrete batching will affect air quality in the vicinity of the plant, but such plants must demonstrate compliance with state and federal standards before they receive operating permits.

J. IMPACT OF CHEMICALS
(See *Appendix J*)

A study of the environmental impact of fertilizer and pesticide use on the proposed golf courses was performed by Charles L. Murdoch, Ph.D. and Richard E. Green, Ph.D. in December 1989. The report is attached as *Appendix J* and is summarized below.

The report includes an analysis of site factors such as geology, soils, topography, climate, sensitivity of off-site areas, and the nature of the groundwater aquifer. Management factors include fertilizer use, pesticide use, and irrigation. The principal focus of the report is the possible impact on the quality of ground and surface waters.

The following are tables on the fertilizer use rates for the different parts of a golf course, a typical pesticide program for three 18-hole golf courses in Hawaii, and properties of pesticides used on Hawaii turf.

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TABLE 2

**Approximate Fertilizer Use For Different Areas of
 Three 18-Hole Golf Course in Hawaii**

TYPE OF TURF	AREA (Acres)	FERTILIZER AMOUNT (lb.N/1000sq.ft.)	APPLICATION FREQUENCY	TOTAL ANNUAL APPLICATION (Tons N)
Greens	9	0.5	2 weeks	2.55
Tees	9	1.0	4 weeks	2.55
Fairways	150	1.5	8 weeks	31.85
Rough	80	1.0	3 months	6.97
Total	248			43.92

TABLE 3

**A Typical Pesticide Program For
 An 18-hole Golf Course In Hawaii**

TURF GRASS AREA	AREA (Acres)	CHEMICAL	FREQUENCY	RATE/ APPLICATION	ANNUAL TOTAL
I. HERBICIDES					
A. Greens	9	MSMA	6 times/year	2 lb.ai/acre	108 lb. ai
		bensulide	2 times/year	12 lb.ai/acre	216 lb. ai
B. Tees	9	MSMA	6 times/year	2 lb.ai/acre	108 lb. ai
		33 Plus	3 times/year	1 pint/acre	3.4 gallons
		bensulide	2 times/year	12 lb.ai/acre	216 lb. ai
C. Fairways	150	MSMA	6 times/year	2 lb.ai/acre	1,800 lb. ai
		33 Plus	3 times/year	1 pint/acre	58 gallons
		metribuzin	2 times/year	0.75 lb.ai/acre	225 lb. ai
D. Perimeter Areas	60	glyphosate	3 times/year	1.5 lb.ai/acre	270 lb. ai.
II. INSECTICIDES					
A. Greens	9	chlorpyrifos	As needed	1 lb.ai/acre	54 lb. ai
B. Tees	9	chlorpyrifos	As needed	1 lb.ai/acre	54 lb. ai
C. Fairways	Spot Treatments	chlorpyrifos	As needed	1 lb.ai/acre	150 lb. ai
III. FUNGICIDES					
A. Greens	9	metalaxyl	As needed	1.3 lb.ai/acre	75 lb.ai
B. Tees	9	metalaxyl	As needed	1.3 lb.ai/acre	75 lb.ai
C. Fairways	Spot treatments	chlorothalonil	As needed	8 lb.ai/acre	750 lb.ai

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Table 4
 Properties of Pesticides Used on Turf in Hawaii

Pesticide common name	Trade name (s)	Oral LD-50 (mg/kg body wt)	Toxicity to fish and wildlife*	Soil sorption Index (Koc)**	Water solubility (mg/l)**	Half-life in soil (days)**	Leaching potential**
I. Herbicides							
MMA	Wendite etc.	1800	Low	10000	1000000	100	Small
glyphosate	Roundup, Kleenup	150	Mod to high, none to fish	10000	1000000	30	Small
metribath	Senior	2700	Moderate	41	1220	30	Large
2,4-D	part of mixtures	370-700	High to fish	109	300000	10	Medium
metoprop	Ortho	700-1500	Low	3	800000	21	Large
dicamba	Ortho	1000-2000	Non toxic to fish	2	800000	14	Large
oryzalin	Surflan	10000	Mod to high, toxic to fish	2700	2.5	80	Small
oxydemeton	Renstar	8000	Toxic to fish		0.7		
propylsulfon	Karb	5620-8150	Low	890	15	30	Small
amatsrha	Princap	>5000	Low	138	3.5	75	Large
chloral-ethyl	Drachal	>3000	Low	5000	0.5	30	Small
bromoxynil	Bromox, Bromoxec	770	Mod. to fish	10000	25	80	Small
paraquat dichloride	Ortho Paraquat CL	150	Mod to high, none to fish	100000	1000000	3000	Small
benfluralin	Balen	10000	Low to high, high to fish	11000	0.1	30	Small
II. Insecticides							
carbaryl	Sevin	400-850	Moderate	278	40	7	Small
cyfluthrin	Dylox	450-830	Moderate	2	154000	27	Large
III. Fungicides							
azoxystrobin	Dystan	<5000	Low	3000	10	1	Small
benlate	Benlate	9900	Low	2100	2	100	Small
chlorothalonil	Daconil 2787	>10000	Low to high, mod. to fish	1380	0.6	20	Small
prochloraz	Chlorox 26019 RP	3500	Low	500	13	20	Small
mancozeb	Dithane M-45	>8000	Low	1000	0.5	35	Small
quintozene	PCMB, Terrachlor	12000	Non-toxic	1000	0.44	21	Small
thiuram	Tenson	7500	Low	383	30	20	Medium
imidanil	Bayleton	588	Low	273	260	21	Medium
metazolin	Subdue	688	Non-toxic	16	7100	7	Medium
trifluralin	Clary 3338	7500	Low	1000	3.5	0	Small

*From: Hartley, Douglas and Hamish Kidd (Eds.) 1983. The Agrochemicals Handbook. Unwin Bros., Ltd. Old Working., Surrey, England.

**From: Wauchope, R. D. 1988. U. S. D. A.-ARS Interim Pesticide Properties Database, Version 1.0. Unpublished

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Impacts

Groundwater Quality

The importance of the Koolauloa groundwater aquifer as a drinking water source is a major consideration. It is unlikely that any of the chemicals used on the golf courses would reach the aquifer in sufficient concentration to adversely affect human health. Nitrate and metribuzin are the two chemicals which are applied in sufficient quantities but are sufficiently mobile and persistent. It is unlikely that the small amount of metribuzin used on golf courses would contribute a measurable amount to the groundwater.

Recharge of groundwater from infiltration of rainfall in the development area will be minimal, due to relatively low rainfall much of the year, high evapotranspiration most of the year, and high potential for runoff on steeply sloping areas which comprise about 20 percent of the land area at this site. The soils which dominate the area contain sufficient organic carbon (2 percent or more) in the surface horizon to retard movement of pesticides through the soil profile. The major portion of the developed area will be at elevations exceeding 100 feet above sea level. This great leaching distance will reduce the likelihood of pesticides reaching groundwater, as both degradation and dispersion reduce the concentration. The lowland area is dominated by the Kaena soil series and distance to groundwater is no more than 10 to 20 feet, but the soils have low permeability which will restrict leaching loss.

Surface Water Quality

The area which might be impacted most by chemical application is the marsh land north of Kamehameha Highway. South Hoolapa and Kalaeokahipa Gulches pass through the area to be developed and drain into the marshes. The soil in the marsh area is principally Pearl Harbor Clay (Typic Tropaquepts), a very low permeability clay soil underlain by muck or peat. The relatively poor drainage of this area, plus water inputs from both surface runoff and groundwater seepage, contribute to the maintenance of the wet condition of the marsh.

Groundwater and shoreline waters are not likely to be affected adversely by chemicals applied to the proposed courses. However, portions of the marshes north of Kamehameha Highway, in and around James Campbell National Wildlife Refuge, might receive runoff from the golf courses, thus the water in these marshes appears more vulnerable to impact of transported chemicals than are coastal waters.

The approximate area to be treated with chemicals is about 250 acres, which is less than 20 percent of the entire watershed in which the golf courses are located. While movement of applied chemicals in runoff from turfed areas is not considered a major problem under these conditions, caution should be exercised in applying the chemicals

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during the rainy season (November through February) when high rainfall intensity and duration might move recently applied chemicals, especially nitrogen fertilizer, to lowland areas in runoff. Diversion of runoff through improved drainage ways which would bypass the National Wildlife Refuge would circumvent the problem of the chemicals in runoff reaching the protected portions of the marsh.

Punamano Air Force Station

Concerns were raised by the Department of the Army on possible contamination of the water well providing potable water to Punamano Air Force Station. The exact location of this Well was unknown, but is believed to be the Well located makai of the Highway about midway between Turtle Bay Resort and the western portion of the National Wildlife Refuge.

According to the maps of Mink and Lau (WRRC Tech. Rept. No. 179, Nov. 1987), there are two additional aquifers associated with the area makai of the Highway where the Air Force Well is located. Both of these aquifers are in the Koolauloa aquifer systems; a shallow, unconfined sedimentary aquifer overlies a confined basal, flank aquifer. It is likely that the Air Force Well is located in the deep confined aquifer, which is characterized by Mink and Lau as having a low vulnerability to contamination. Thus, there should be no contamination of the Well by chemicals used in the management of the golf courses at the project site.

Some increase in nitrate in the overlying unconfined, sedimentary aquifer is possible; however this aquifer is brackish and is not used as a potable water source. Small increases in nitrate in the shallow aquifer should not adversely impact these waters relative to ecological considerations.

Air Quality

There will be no significant impact on air quality from application of herbicides or pesticides in golf course management, provided that appropriate application techniques are used. The spray equipment used in golf course maintenance is ground-operated. Nozzle heights are typically less than two feet. Low spray pressures and coarse nozzle openings result in relatively large droplet sizes which are not highly subject to drift. High wind speed would increase the likelihood of drift of fine spray droplets; however, because high wind speed distorts spray patterns and results in poor coverage spraying in periods of high wind is not common practice.

Wildlife

The fertilizers, herbicides, and fungicides used in golf course maintenance pose little or no hazard to birds frequenting the grassed areas or ponds associated with golf courses. Fertilizers are relatively non-toxic unless ingested in large amounts. All herbicides and

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fungicides used in golf course maintenance in Hawaii are of low to moderate toxicity. The only chemicals used in Hawaii which are highly toxic to birds are the organic phosphate insecticides.

Because of the absorption of organic phosphate insecticides on organic layers in turf and their rapid breakdown, there is little chance of their movement from grassed areas into the ponds associated with the proposed golf course.

Golf courses are frequently visited by birds, and there are no known reported incidents of bird kill in Hawaii from chemicals applied in golf course management. Waterfowl and fish appear to thrive in ponds and water hazards on golf courses in Hawaii. Many golf courses cultivate white amur fish in the ponds to control algae. Mosquito fish are generally stocked to prevent mosquito problems. There are no known incidents of fish or waterfowl injury from chemicals applied to golf courses in Hawaii.

Mitigative Measures

Irrigation management is critical to the conclusions reached above. U.S. Weather Bureau class A evaporation pan will be used to measure evaporation and schedule irrigation application in the management of the proposed golf courses.

Where grading is necessary, topsoil will be stockpiled and replaced over the areas to which chemicals will be applied; the high-organic matter content of surface soils will retard pesticide movement. Eroded soil areas that are leveled will be covered with surface soil containing at least 1.5 percent organic carbon.

Judicious use of fertilizers and pesticides, especially in the early establishment of turf, will be carefully controlled, since pesticides and nitrogen will be more likely to move before an extensive root system and thatch layer are developed. Special care in pesticide application will also be applied during the winter months when runoff-producing storms are likely. Pesticides spraying will be done with a shield sprayer to avoid any drift of sprays.

Slow-release nitrogen fertilizers will be used during the rainy season (November through February) to reduce the likelihood of nitrate-enriched runoff waters.

Although significant movement of applied chemicals in either leachate or runoff is not anticipated, a monitoring program of marshland waters seems appropriate. Since fertilizer nitrogen is applied in the largest amounts and nitrate nitrogen derived from this source is the most mobile and persistent chemical used in golf course management, it would be the most logical chemical for which to test initially. Pre-development samples will be taken three times (at one- to two-month intervals during the period November through March) to provide an adequate reference nitrate level. After development,

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water samples will be taken quarterly in the lowest areas in the marsh for three to four years. Any enrichment of marsh waters would signal the need for more restrictive use of nitrogen fertilizer.

The likelihood of bird injury by pesticides used in maintenance of the proposed golf courses can be reduced by proper application of pesticides with reduced toxicity to birds. Carbaryl and trichlorfon are less toxic to birds than chlorpyrifos. In most cases these insecticides may be substituted for chlorpyrifos with little loss of effectiveness.

To ensure that the above mitigative measures are effective, the applicant will, prior to development of the site, develop in coordination with appropriate agencies, including the State Departments of Agriculture and Health and the U.S. Fish and Wildlife Services, all necessary monitoring systems designed to ensure that appropriate chemicals are used and applied correctly, and that the wetland areas and ground, surface and coastal waters are not adversely impacted by the development and/or operation and maintenance of the golf course.

K. FLOOD HAZARDS

Flood History

The Kahuku gulches, which are intermittent, have no stream flow records. An analysis of the available records from the three nearby stream gaging stations indicates that floods for the Kahuku area are characterized by flows with sharp peaks of relatively short duration. The largest flood recorded during the 11-year period from 1958-69 for the Kahuku area occurred on April 15, 1963. During that occurrence, waterborne debris blocked the highway bridge openings and caused the flood waters to flow through the then canefields and into the depressed areas. No estimate of damage from the 1963 flooding is available.

Flood Problem

The area gulches are confined to narrow valleys until they reach the flood plain at about elevation 20. The basin topography and existing drainageway capacities are such that flooding in the Kahuku area is restricted almost entirely to the low-lying area below Kamehameha Highway. During floods with moderate to high peak discharges, flood waters overflow the drainageway banks. An investigation of the existing topography of the Kii, Punahoolapa and Punamano Swamps indicated adequate storage to contain floods of greater than a 100-year magnitude. However, in analyzing the potential flood hazards and considering the slow rate of discharge into the ocean, the low-lying areas can be inundated when runoff occurs at frequent intervals. Minor to moderate damages can be expected from ponding of these flood waters. The area flood problem is compounded by the

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sand dune formations at the beach which prevent floodwater from discharging overload into the ocean.

Flood Outlines

Flood storage volumes for the 100 year storm was computed as 1430 acre-feet. Flood waters overflow the drainageway banks, ponding in areas of lower elevations. The extreme limits of the ponding area for the 100 year storm is represented by the highest waterline that would be reached by extraordinary flood runoff.

Figure 8 illustrates the flood zones as delineated by FEMA. The floodway is shown as extending along the makai section of Hoolapa Stream (Zone A and AE). Along the highway frontage of the site, the area is mapped as Zone X. Zone X are areas of 500-year flood, or areas of 100-year flood with average depths of less than one foot.

Based on information taken from the Department of Land and Natural Resources, Division of Water and Land Development (*Figure 16*), a small tip of the 100-year of the 100-year flood also enters the project site at the point when Kalaeokahipa Stream crosses Kamehameha Highway. Although the FIRM map and the information from DLNR seem to differ, it is because the FIRM designation evidently refers to the actual flow way of the flooding stream, while the information from DLNR refers to the impoundment limits of a 100-year storm.

Flooding By Tsunami

Tsunamis, commonly known as tidal waves, have also caused extensive flooding and damage along the Hawaiian coastal regions. Tsunamis are also referred to as "seismic sea waves" because of their association with earthquakes. The tsunami events of April 1, 1946 and March 7, 1957 had the severest effects in the Kahuku coastal areas. The waves of these two occurrences, generated by strong earthquakes near the Aleutian Islands, had runups to about the 9 foot elevation, flooding inland a distance of about 500 feet. The limits of this wave action is shown on *Figure 16*. No mitigating measures are necessary.

Mitigative Measures

The drainage system will be designed to minimize flooding, and measures will be taken to mitigate against any increased storm runoff when the courses are developed. Actual peak storm water runoff will be less after the courses are developed than under the current underdeveloped condition - see *Chapter V.E.* for drainage improvements.

IV. SOCIO-ECONOMIC ASSESSMENT

This Chapter addresses the impact of the project on the community environment, its impact on agriculture, and the effects on State and County finances. Where appropriate, mitigative measures are proposed. In reviewing this Chapter, the public is encouraged to refer to the following reports in the Appendices listed below, which have been the major source for much of the information that follows:

APPENDIX REPORT/PREPARER

- D. *Country Courses at Kahuku Social Impact Assessment*
(Earthplan)
- H. *The Country Courses at Kahuku, Impact on*
Agriculture
(Decision Analysts Hawaii, Inc.)
- I. *The Country Courses At Kahuku, Impact On State And*
County Finances
(Decision Analysts Hawaii, Inc.)

A. SOCIAL IMPACT ASSESSMENT (See Appendix D)

1. Summary

This social impact assessment of the Country Courses at Kahuku was prepared for proposed amendments to the Koolauloa Development Plan. Earthplan prepared this report with research assistance from independent contractor Michael P. Mays.

This social impact assessment provides a profile of the existing community to establish the social context in which project impacts may occur. This baseline data is extended by identifying the community's possible future scenario independent of the proposed project. Community issues and concerns are identified, based on historical trends to date. This social impact assessment presents discussions on (1) how the project will increase the de facto population and the effects of this increase; (2) the employment and labor supply; (3) the addition of recreational resources; (4) the effects on the character of the surrounding community; (5) displacement; and (6) the impacts on public services and facilities.

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2. Profile of the Existing Community

a. Study Area Description

The Study Area for this project includes the Koolauloa Development Plan area, in which the project site is located, and the nearby North Shore Development Plan area.

The Koolauloa Development Plan Area is comprised of a series of residential communities extending from Kahuku in the northernmost portion to Kaaawa in the southernmost area. The economic base of Koolauloa has evolved from being dominated by sugar to one which includes tourism, aquaculture and specialized agriculture. Major employers are visitor-oriented and these include the Kuilima Resort and the Polynesian Cultural Center.

The North Shore Development Plan Area extends from the Sunset Beach area, which is over two miles west of the Punamano site, to Kaena Point. Whereas Koolauloa tends to have pockets of residential communities, North Shore's population is more dispersed and homes in the North Shore region are found all along Kamehameha Highway. Except for the retail centers in Haleiwa and Waialua, commercial establishments are few and scattered.

b. Description of the Existing Community

1. Population and Housing

The Study Area grew by 4.91 percent between 1980 and 1985, which is a proportion slightly lower than the islandwide growth of five percent. As Table 5 shows, an estimated 25,203 people lived in the combined Koolauloa and North Shore regions in 1985.

Koolauloa had 48 percent of the total Study Area population and grew at a faster pace than North Shore. Koolauloa experienced a population increase of 6.29 percent between 1980 and 1985, whereas the North Shore population grew by 3.68 percent.

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Table 5

**Population and Housing Trends, 1980 and 1985:
 Total Study Area, Koolauloa and North Shore**

	Total Study Area			Primary Study Area Koolauloa			Secondary Study Area North Shore		
	1980	1985	Percent Change	1980	1985	Percent Change	1980	1985	Percent Change
Population	24,023	25,203	4.91%	11,347	12,061	6.29%	12,676	13,142	3.58%
% of total study area	N/A	N/A	N/A	47%	48%	N/A	53%	52%	N/A
Total Housing Units	8,454	9,003	6.49%	3,647	3,963	8.66%	4,807	5,040	4.85%
Single Family Units	7,132	7,555	5.93%	2,816	3,138	11.43%	4,316	4,417	2.34%
Multi-Family Units	1,292	1,416	9.60%	833	825	-.96%	459	591	28.76%
Military Units	32	32	.00%	0	0	.00%	32	32	.00%
Visitor Units	97	221	127.84%	97	191	96.91%	0	30	100.00%
Household size	2.87	2.87	-.15%	3.20	3.20	.06%	2.64	2.62	-.52%

Koolauloa includes Traffic Assessment Zones 166 through 168. North Shore includes Traffic Assessment Zones 162 through 165.

Source: City and County of Honolulu Department of General Planning Information Branch. *Traffic Assessment Zones*. October 1987. Calculations performed by Earthplan.

The total Study Area had an estimated 9,003 housing units in 1985, which represents a 6.49 percent increase from 1980. Related to the larger proportion of population increase, the housing stock in Koolauloa also increased at a faster pace than that of the North Shore region.

A significant 84 percent of Study Area housing units were single-family homes, as compared to the 55 percent of the islandwide housing stock. Though lesser in numbers, multi-family housing units are increasing at a faster pace than single family units. The reported housing units used as short-term visitor accommodations totaled 221 units in 1985 for the entire Study area and almost all of these units were reported in Koolauloa.

Household sizes were smaller in the North Shore region, when compared to islandwide averages, while Koolauloa household sizes were similar to that of Oahu.

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2. Employment Trends

Tables 6 and 7 presents estimated 1985 Employment figures based on information generated by the City Department of General Planning. The Study Area contained approximately 9,202 jobs in 1985.

Over half, or 5,145 jobs, were found in the Koolauloa region. The Koolauloa region contained all the area's hotel jobs, and most of these were in the Kuilima Resort. Koolauloa also had almost three-fourths of the Study Area's service jobs. The North Shore region contained all of the Study Area's military jobs, and 88 percent of the industrial jobs. Seventy three percent of the Study Area's agricultural jobs were in this region, as were 61 percent of the construction jobs.

The largest category of jobs for both regions is service, although the relative proportions differ greatly. In the Koolauloa region, service jobs account for 53 percent of the total area jobs; in the North Shore, 26 percent.

Based on 1980 census, the Study Area had similar civilian unemployment rates as Oahu, as indicated in Table 8. Corresponding to the relatively high proportion of area service jobs in 1985, and compared to the islandwide occupational profile, the Koolauloa population had a significantly higher proportion of residents working in service-related occupations. Relatively fewer residents in both Koolauloa and the North Shore held the higher-paying occupations related to managerial / professional and technical / sale / administration. Significantly higher proportions of both Koolauloa and North Shore had residents who had to travel 45 minutes or more to get to work outside of region.

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Table 6
Study Area Employment
Number and Breakdown by Study Area
1985

	Total Study Area	Primary Study Area: Koolauloa			Secondary Study Area
		Total	Kahuku	Laie	North Shore
Military % of Total	336 100%	0 0%	0 0%	0 0%	336 100%
Government % of Total	662 100%	326 49%	127 19%	97 15%	336 51%
Hotel % of Total	328 100%	328 100%	299 91%	29 9%	0 0%
Transportation, Communi- cations & Utilities % of Total	374 100%	227 61%	146 39%	26 7%	147 39%
Industry % of Total	558 100%	66 61%	27 5%	12 2%	492 88%
Finance, Insurance & Real Estate % of Total	371 100%	209 56%	54 15%	74 20%	162 44%
Service % of Total	3,784 100%	2,750 73%	260 7%	2,166 57%	1,034 27%
Retail % of Total	1,673 100%	899 54%	330 20%	219 13%	774 46%
Construction % of Total	415 100%	162 39%	37 9%	97 23%	253 61%
Agriculture % of Total	701 100%	187 27%	90 13%	81 12%	514 73%
TOTAL	9,202 100%	5,154 56%	1,370 15%	2,801 30%	4,048 44%

Koolauloa includes Traffic Assessment Zones 166 through 168. North Shore includes Traffic Assessment Zones 162 through 165.

Source: City and County of Honolulu Department of General Planning, Planning Information Branch. *Traffic Assessment Zones*. October 1987. Calculations performed by Earthplan.

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Table 7
Study Area Employment Breakdown by Type of Job
1985

	Total Study Area	Primary Study Area: Koolauloa			Secondary Study Area
		Total	Kahuku	Lale	North Shore
Military	4%	0%	0%	0%	8%
Government	7%	6%	9%	3%	8%
Hotel	4%	6%	22%	1%	0%
Transportation, Communications & Utilities	4%	4%	11%	1%	4%
Industry	6%	1%	2%	0%	12%
Finance, Insurance & Real Estate	4%	4%	4%	3%	4%
Service	41%	53%	19%	77%	26%
Retail	18%	17%	24%	8%	19%
Construction	5%	3%	3%	3%	6%
Agriculture	8%	4%	7%	3%	13%
TOTAL	100%	100%	100%	100%	100%

Koolauloa includes Traffic Assessment Zones 166 through 168. North Shore includes Traffic Assessment Zones 162 through 165.

Source: City and County of Honolulu Department of General Planning, Planning Information Branch. *Traffic Assessment Zones*. October 1987. Calculations performed by Earthplan.

Table 8
Labor Force Characteristics, 1980:
City and County of Honolulu and Study Area

	City and County Of Honolulu	Total Study Area	Primary Study Area: Koolauloa	Secondary Study Area: North Shore
Total Potential				
Labor Force	574,903	17,207	9,833	7,374
Civilian Labor Force	59.1%	53.0%	62.2%	52.0%
Unemployed Civilian Labor Force	4.6%	4.7%	4.9%	4.6%
Occupation of Employed Civilian Labor Force				
Service	17.6%	23.3%	28.6%	15.1%
Managerial & professional	24.7%	20.6%	22.2%	18.1%
Technical, Sales & Administration	33.7%	22.6%	23.5%	21.3%
Farming, Fishing & Forestry	1.8%	7.5%	5.8%	10.4%
Precision, Craft & Repair	11.3%	12.4%	10.7%	.15%
Operators, Fabricators & Laborers	10.9%	13.4%	9.2%	27.2%
Commute to Work				
45 minutes or more	11.9%	23.1%	21.1%	27.2%
Mean Travel Time (In minutes)	22.9	25.5	25.1	25.9

NOTE: Statistics generated by the U.S. Bureau of the Census includes Sunset Beach in the Koolauloa Census District. Otherwise, Sunset Beach is considered part of the North Shore Development Plan and Neighborhood Board areas.

Sources: U.S. Bureau of the Census, 1981a and 1981b.

3. Other Population Characteristics

Table 9 presents social and economic characteristics of Oahu, the entire Study Area and the Koolauloa and North Shore Development Plan areas. When compared to the islandwide profile, the Study Area had similar proportions of Caucasian residents. Koolauloa tended to have more Caucasian residents than the North Shore. As a whole, the study area had less Japanese and Chinese residents and more residents who were of Filipino, Hawaiian or other ethnic extractions.

Collectively, the Koolauloa and North Shore regions tended to be younger than the islandwide population. Of note is that both Koolauloa and North Shore

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had high proportions of people born in another country, with 17.7 and 17.8 percent respectively, when compared to the islandwide 14.8 percent.

A significantly higher proportion of North Shore residents did not graduate from high school. A high proportion of Study Area families met poverty standards and the median family incomes for Koolauloa and the North Shore were respectively between \$4,000 and \$6,700, lower than the 1980 Oahu median family income of \$23,554.

c. Profile of the Nearby Communities

The communities nearest to the Punamano project site are Kahuku and Laie. Both communities have characteristics of a typical small town. They both evolved around a central focus. Kahuku grew around the sugar mill and Laie expanded around the church and its other facilities. In these towns, there are businesses or service centers, and neighborhoods are easily discernible. Hence, residential densities are relatively high. When compared to some other areas of the Study Area which are more rural in character, such as Kaaawa, Punaluu, Sunset and Pupukea.

As *Table 10* indicates, Kahuku's population grew by 34.7 percent between 1980 and 1985, resulting in a 1985 population of 2,240. Much of this growth is attributable to the addition of new single-family housing units during this five-year period. During that time, Laie's population experienced only nominal growth and its 1985 count of 5,820 persons represented only a 1.54 percent increase over the 1980 population.

Unlike other communities in the Study Area, Kahuku has a large proportion of multi-family units, which accounted for 39 percent of the total housing stock. Many of the multi-family units are townhouse units at Kuilima Resort and elderly housing project. Household size was relatively small at 2.21 persons in 1985.

Laie's housing stock is virtually all single-family units and experienced only a nominal increase of 29 units between 1980 and 1985. Further, Laie's large and stable household size indicates a pressing need for increased housing supply in this area.

Kahuku accounted for 15 percent of the Study Area's total jobs, and the bulk of the hotel jobs. Laie contained almost a third of the Study Area's jobs, and 57 percent of the area's service jobs.

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Table 9
Population Characteristics, 1980:
City and County of Honolulu and Study Area

	City and County Of Honolulu	Total Study Area	Primary Study Area: Koolauloa	Secondary Study Area: North Shore
Ethnicity				
Caucasian	33.1%	35.3%	38.2%	31.2%
Japanese	24.9%	11.6%	7.4%	17.7%
Chinese	6.9%	2.3%	3.2%	1.0%
Filipino	12.8%	17.5%	7.1%	34.2%
Hawaiian	10.5%	18.3%	22.9%	11.6%
Other	11.8%	15.0%	21.2%	6.0%
Age				
Less than 5 years	7.9%	10.5%	11.6%	9.0%
5 to 17 years	20.2%	21.7%	22.8%	20.0%
18 to 64 years	64.6%	60.4%	59.3%	61.9%
65 years and older	7.3%	7.4%	6.3%	9.1%
Median Age	28.1	25.1	23.8	26.3
Place of Birth				
Hawaii	55.1%	52.7%	50.9%	55.2%
Other U.S.	30.1%	29.6%	31.4%	27.0%
Another Country	14.8%	17.7%	17.7%	17.8%
Residence Five Years Previous				
Same House	48.2%	47.8%	46.0%	50.4%
Same County	25.5%	26.6%	28.3%	24.2%
Other County	1.3%	5.9%	.8%	2.8%
Other State	18.4%	16.5%	14.8%	18.9%
Other Country	6.6%	8.8%	10.0%	3.7%
Education (25 years and older)				
Up to 11 years completed	24.4%	30.2%	24.7%	37.4%
Graduated from High School	35.5%	31.9%	31.9%	32.0%
Some Post High School	18.3%	20.0%	23.3%	15.6%
College (4+ years)	21.7%	17.9%	20.1%	15.0%
Population in Families	85.6%	83.8%	82.3%	86.0%
Families Below Poverty Level	7.5%	11.5%	13.5%	9.0%
Median Family Income	\$23,554	Not Available	\$19,556	\$16,895

NOTE: Statistics generated by the U.S. Bureau of the Census includes Sunset Beach in the Koolauloa Census District. Otherwise, Sunset Beach is considered part of the North Shore Development Plan and Neighborhood Board areas.

Sources: U.S. Bureau of Census, 1981a and 1981b.

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Table 10
Population and Housing Trends, 1980 and 1985:
Total Study Area: Kahuku and Laie

	Total Study Area			Primary Study Area Koolauloa			Secondary Study Area North Shore		
	1980	1985	Percent Change	1980	1985	Percent Change	1980	1985	Percent Change
Population	24,023	25,203	4.91%	1,663	2,240	34.70%	5,732	5,820	1.54%
% of Total Study Area	N/A	N/A	N/A	7%	9%	N/A	24%	23%	N/A
Total Housing Units	8,454	9,003	6.49%	909	1,187	30.58%	1,084	1,111	2.49%
Single Family Units	7,132	7,555	5.93%	450	728	61.78%	1,076	1,105	2.70%
Multi-Family Units	918	1,416	54.25%	459	459	.00%	8	6	-25.00%
Military Units	32	32	.00%	0	0	.00%	0	0	.00%
Visitor Units	97	221	127.84%	55	172	212.73%	0	1	100.00%
Household Size	2.87	2.87	-.15	1.95	2.21	13.33%	5.29	5.24	-.84%

NOTE: The Total Study Area includes the Koolauloa and North Shore Development Areas.

Census information indicates that in 1980, the Kahuku Census Designated Place (CDP) had a very low unemployment rate of 1.3 percent, as compared to Oahu's 4.6 percent. As shown on *Table 11*, a significant portion of Kahuku CDP residents (25.9 percent) held agricultural-related jobs, when compared to Oahu's 1.8 percent, the Study Area's 7.5 percent and Laie CDP's 2.2 percent. At the same time, there were smaller proportions of residents in service, managerial, administrative and precision / craft / repair occupations.

Laie CDP residents also had a low unemployment rate at 3.7 percent. Except for a high proportion of residents in service (32.5 percent as compared to the island's 17.6%), Laie's labor profile was similar to that of the island and the Study area.

Table 12 indicates that Kahuku CDP had significantly more Filipinos (51.8 percent) than Oahu as a whole (12.8 percent), the Study Area (17.5 percent) and Laie CDP (1.6 percent). Laie, on the other hand, had a significantly high proportion of people of other extractions (46.5 percent), and this is attributable to the larger number of Pacific Islanders affiliated with the Church of Jesus Christ of the Latter Day Saints and the Polynesian Cultural Center.

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In terms of age, Kahuku CDP tended to be older, while Laie CDP had a much younger population. Both the Kahuku and Laie CDPs had large proportions of residents born in another country when compared to the Oahu proportion of 14.8 percent. With over 60 percent of its residents not graduating from high school, Kahuku CDP residents had generally less education than Oahu, the Study Area and Laie CDP. Both communities had higher proportions of families below poverty level, with Laie CDP's proportion being over twice that Oahu and Kahuku CDP.

Table 11
Labor Force Characteristics, 1980:
City and County of Honolulu, Total Study Area
and Kahuku and Laie Census Designated Places

	City and County of Honolulu	Total Study Area	Kahuku Census Designated Place	Laie Census Designated Place
Total Potential Labor Force	574,903	3,171	659	2,512
Civilian Labor Force	59.1%	287.9%	56.4%	80.4%
Unemployed Civilian Labor Force	4.6%	4.7%	1.3%	3.7%
Occupation of Employed Civilian Labor Force				
Service	17.6%	23.3%	14.4%	32.5%
Managerial & Professional	24.7%	20.6%	17.7%	24.9%
Technical, Sales & Administration	33.7%	22.6%	21.8%	27.0%
Farming, Fishing & Forestry	1.8%	7.5%	25.9%	2.2%
Precision, Craft & Repair	11.3%	12.4%	2.7%	6.4%
Operators, Fabricators & Laborers	10.9%	13.4%	17.4%	6.9%
Commute to Work				
45 minutes or more	11.9%	23.1%	6.0%	9.0%
Mean Travel Time (In minutes)	22.9	25.5	15.0	12.6

NOTE: The Total Study Area includes the Koolauloa and North Shore Development areas.

Sources: U.S. Bureau of the Census, 1981a and 1981b.

**3. Policies And Proposals Which Will Affect The
Community's Future**

a. Public Policies

The City and County of Honolulu General Plan recognizes the entire Study Area as rural. The residential population targeted for the Study Area is designed to be consistent with the character of development and environmental qualities desired for this area. As shown in *Table 13*, Koolauloa and the North Shore are targeted to collectively

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accommodate up to 3.2 percent of the island's population in 2010. The Koolauloa Development Plan area is currently targeted to accommodate between 1.3 and 1.4 percent of Oahu's 2010 population, implying that, in 2010, between 12,994 and 13,993 people could be residing in this area. The North Shore Development Plan area is currently targeted to accommodate between 1.6 and 1.8 percent of Oahu's 2010 population, which means that by that time, between 15,992 and 17,991 people could be living in the area.

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Table 12
Population Characteristics, 1980:
City and County of Honolulu, Total Study Area
and Kahuku and Laie Census Designated Places

	City and County of Honolulu	Total Study Area	Kahuku Census Designated Place	Laie Census Designated Place
Ethnicity				
Caucasian	33.1%	35.3%	16.4%	30.0%
Japanese	24.9%	11.6%	15.6%	4.1%
Chinese	6.9%	2.3%	.4%	6.3%
Filipino	12.8%	17.5%	51.8%	1.6%
Hawaiian	10.5%	18.3%	9.7%	11.5%
Other	11.8%	15.0%	6.1%	46.5%
Age				
Less than 5 years	7.9%	10.5%	6.7%	14.7%
5 to 17 years	20.2%	21.7%	23.1%	22.6%
18 to 64 years	64.6%	60.4%	46.5%	59.9%
65 years and older	7.3%	7.4%	23.6%	2.8%
Median Age	28.1	25.1	37.3	20.6
Place of Birth				
Hawaii	55.1%	52.7%	57.8%	35.1%
Other U.S.	30.1%	29.6%	13.3%	33.0%
Another Country	14.8%	17.7%	28.9%	31.9%
Residence Five Years Previous				
Same House	48.2%	47.8%	41.2%	32.7%
Same County	25.5%	26.6%	44.2%	22.4%
Other County	1.3%	5.9%	.0%	.6%
Other State	18.4%	16.5%	2.4%	19.6%
Other Country	6.6%	8.8%	12.2%	24.7%
Education (25 years and older)				
Up to 11 years completed	24.4%	30.2%	61.6%	15.0%
Graduated from High School	35.5%	31.9%	18.2%	26.2%
Some Post High School	18.3%	20.0%	11.7%	33.7%
College (4+ years)	21.7%	17.9%	8.5%	25.1%
Population in Families	85.6%	83.8%	87.7%	77.9%
Families Below Poverty Level	7.5%	11.5%	9.9%	20.3%
Median Family Income	\$23,554	Not Available	\$13,611	\$15,183

NOTE: The Total Study Area includes the Koolauloa and North Shore Development areas.

Sources: U.S. Bureau of Census, 1981a and 1981b.

Table 13

**Population Projections by
 Development Plan Area, 2010**

	General Plan Distribution of Residential Population ¹	2010 Population Range Based on Series M-K Projections ²
Primary Urban Center	45.1 - 49.8%	450,775 - 497,751
Ewa	12.0 - 13.3%	119,940 - 132,934
Central Oahu	14.9 - 16.5%	148,926 - 164,918
East Honolulu	5.3 - 5.8%	52,974 - 57,971
Koolaupoko	11.0 - 12.2%	109,945 - 121,939
Koolauloa	1.3 - 1.4%	12,994 - 13,993
North Shore	1.6 - 1.8%	15,992 - 17,991
Waianae	3.8 - 4.2%	37,981 - 41,979
TOTAL OAHU	95.0 - 105.0%	949,525 - 1,049,475

1. City Council, *Resolution Relating to Amending the General Plan of the City and County of Honolulu*, No. 88-404, CD-1, FD-1.
2. Table 18 of *The State of Hawaii Data Book: 1988* (State Department of Business and Economic Development, 1988) provides a population projection of 999,500 persons for the City and County of Honolulu, 2010.

b. Major Development Proposals

Neither the Koolauloa nor the North Shore Development Plan areas have specific land use amendments proposed in the current annual Development Plan review. The only major approved proposal for these areas is the Kuilima Resort expansion which is located makai of the project site. The Kuilima Resort Expansion is expected to be the major employment-generating force for the Study Area in the near future, and is expected to create 3,555 new direct, indirect and induced jobs in the region (Community Resources, Inc. and A. Lono Lyman, Inc., November 1984.)

Other job-generating potential uses would be generated by the development of land held by major landowners, such as The Estate of James Campbell, which owns about 14,000 acres in Kahuku; Zion Security Corporation, which is preparing the Laie master plan; the Kamehameha Schools/Bishop Estate (KS/BE), which is currently preparing a master plan for 800 acres in the North Shore

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region; and Castle and Cooke, Inc., which owns lands in Haleiwa and Waialua.

In terms of residential development, no housing developments are planned in the immediate future for the North Shore Development Plan area. A potential for increasing the Study Area's residential supply is the development of lands held by major landowners. It is stressed, however, that these plans are very long-range in nature and implementation would require major approvals. Further, some of these plans are in very preliminary stages and have not been formally adopted by the respective landowners.

The Study Area is targeted for two major roadway improvements, both of which are located in the North Shore region. The most extensive proposed change is the Haleiwa Bypass, which will divert through-traffic away from the more congested areas of Haleiwa. With planning and engineering funds already budgeted, the Haleiwa Bypass Road is scheduled for construction this year. Completion of this roadway should be in the latter part of 1991. The State Department of Transportation is also planning to realign Kamehameha Highway at Waiamea Bay.

The improvement of the wastewater Management system in Koolauloa and North Shore regions is also a priority on the respective Development Plans, as is the improvement of the water system to support agricultural and necessary urban uses.

In terms of golf course developments, the Study Area's two existing golf courses are both in Koolauloa. These include a nine-hole municipal golf course in Kahuku, and an 18-hole Turtle Bay course at the Kuilima Resort. A second 18-hole golf course at the Kuilima Resort has been approved. To date, six golf courses have been proposed for the Study Area, not including the proposed project. These six Courses are located in Waialua, Mokuleia, Kawailoa, Pupukea (two) and Malaekahana (one proposed by the Estate and the other proposed by Kuilima Resort Company). The three Punamano golf courses raise this count to ten. Further, the City is considering expanding the Kahuku Golf Course into an 18-hole course, although the implementation of this proposal is still being studied (personal communication with Steve Salis, Advanced Planning, City and County of Honolulu Department of Parks and Recreation, December 1, 1989).

Recreational facilities and resources are major ingredients of most private development proposals, as well as targets

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of the government entities. Currently the City is acquiring land for beach access and park expansion in both Koolauloa and North Shore Development Plan areas.

c. Likely Future Without The Proposed Project

Changes in the Study area are expected to be gradual, due to the public policies calling for the retention of the area's rural character.

1. Change in Economic Base

The hotel and commercial development of the Kuilima Resort expansion will essentially change the economic base for the area. The projected 3,555 new direct, indirect and induced jobs resulting from the proposed actions will help the region in improving the overall economy.

2. Increased Presence of Visitors

Study Area residents will experience increased interactions with visitors as the Kuilima Resort expansion brings more visitors into the area. Currently, resident-visitor interaction is enabled by the facilities at the Polynesian Cultural Center in Laie, the Waiamea Falls Park and accommodations and facilities at the Turtle Bay Hilton.

3. Expansion and Enhancement of the Recreational Resources

The area's beaches are major recreational resources for Study Area and islandwide residents, as well as visitors. Efforts to expand and enhance these resources are expected to continue because of public efforts to acquire more land and private proposals to develop recreation-oriented facilities.

4. Roadway Changes and Other Infrastructure Improvements

The physical landscape is expected to gradually take on a more urban character as roadways are widened and added, the water system is expanded and sewers are upgraded and expanded.

5. Increased Community Awareness of Change

Though preliminary and requiring major land use approvals, the master plans of major landowners can influence the type and pace of change in the

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Study Area. These master plans were prepared with community input, and presumably incorporates the desires of at least some of the area's residents. Hence, change in the area's character is being discussed as a possibility, and, in some cases, as inevitable directions for the community's future.

6. Development of More Golf Courses

It is likely that some of the proposed golf courses will be developed, if they meet land use and planning criteria.

4. Community Issues On Country Courses at Kahuku

a. Community Issues Independent of the Proposed Project

1. Neighborhood Board Issues

The Neighborhood Board system is a formal mechanism for citizen input to public entities regarding islandwide City policies, , specific community problems and other matters, and proposed changes. Often, the type of issues addressed by a Neighborhood Board and subsequent actions reflect values and concerns of the constituent population. To understand the values, concerns and issues of Study Area residents, the meeting minutes of the Koolauloa Neighborhood Board No. 28 and the North Shore Neighborhood Board No. 27 from 1987 through October 1989 were reviewed.

In general, these Boards tended to support changes which would directly benefit the current population, but were apprehensive about changes which would cause or lead to major growth. For example, although roadway improvements were supported if they relieved localized congestion, Board members tended to oppose proposed improvements which would "open up" an area, such as the road around Kaena Point, or improve through-traffic, such as road widening north of Kaneohe.

2. Community Issues Related to Golf Courses

The islandwide community has had a wide range of reactions to proposed golf course developments throughout Oahu. Although many of golf course issues were raised in reaction to specific proposals, some common concerns have emerged, as follows:

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(a) Golf Course Versus Agriculture

Because of the land availability in rural areas, numerous golf courses have been proposed for the non-developed portions of Oahu. Over the past few years, golf course proposals have been met with vociferous opposition if the subject land is being farmed at the time of the proposal. Nearby farmers are typically concerned that the golf course will compete with agricultural operations for water. These issues are further exacerbated when displacement of existing farmers is necessary for project implementation.

(b) Ecological Effects

Golf course impacts on the water supply are frequent concerns, in terms of competition for use and chemical impacts from herbicides and pesticides normally applied to golf courses.

(c) Change in Rural Lifestyle

Golf courses are commonly appreciated as open space. Rural communities often acknowledge that the development of a golf course will prevent large-scale residential development on that site.

b. Possible Community Issues on the Proposed Project

This section discusses *preliminary* social issues on The Country Courses at Kahuku. Whereas social impacts are those changes which are likely to occur, social issues are community concerns which arise *in response* to a proposed action. Social issues often shift over time, as people's priorities, environment and lifestyles change. Possible issues on this project are as follows:

a. Need for More Golf Courses

The need for three more golf courses in the Study Area would probably be a major question among Study Area residents.

b. The Value of Golf Courses as a Recreational Resource

A golf course is traditionally considered a recreational resource because it accommodates a relaxing physical leisure-time activity. As more private profit-oriented golf courses are proposed,

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however, the emphasis of golf course development shifts from its recreational value to economic. Instead of focusing on the potential to increase a recreational resource, the community is directing its attention to the Japanese developer, the high cost of development and the potential for economic exclusion of the local golfer.

c. Competition for Land Resources With "More Desirable" Uses

Some people may view the proposed use of this land as "extravagant" considering the critical need for more jobs and housing.

d. Change in Rural Character of the Area

Even though some people may prefer other job-generating uses or residential units on these sites, most would probably choose uses dominated by open space to retain the rural quality of the Study Area. In fact, rural communities often acknowledge that the development of a golf course will prevent large-scale residential development on that site.

Some people will likely be concerned, however, about the long-term effects of "urbanizing" this open space. They may fear that putting the project sites into more intense and exclusive use will eventually pressure the surrounding areas into becoming more urban.

e. Potential for Foreign Investor

Given the number of Japanese-owned and proposed golf courses, Study Area residents will likely be concerned about whether any of the Country Courses at Kahuku will be so owned and/or operated.

f. Origin of Employees at Country Courses at Kahuku

Area residents will likely want some assurances that golf course operator's will hire nearby residents as much as possible.

g. Community Benefits

The Study Area has numerous experiences of community involvement in private development efforts, including the proposals for the Kuilima Resort expansion and the Lihi-Lani community, as

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well as the master planning efforts of major landowners. A common thread in all of these efforts is the assurance that the proposed uses will somehow benefit the nearby communities, either through employment, recreational resources, off-site facilities or in-kind contributions.

h. Traffic

Because traffic is a major problem now, the community will likely express concern about the project's potential for increasing the number of cars and busses in the area.

5. Potential Social Impacts of the Country Courses at Kahuku

a. De Facto Population Impacts

Having no residential component, the Country Courses at Kahuku will not increase residential population. The project will, however, increase the area's de facto population through its (1) on-site employment and (2) golf course and clubhouse users. DBED defines defacto as "all persons physically present in area, regardless of military status or usual place of residence. Includes visitors present but excludes residents temporarily absent. The golf course is expected to generate between 30 and 50 jobs, which implies a total job count ranging from 90 to 150. When fully operational, the proposed project could accommodate a total of 98 golf course users, including one foursome at each of the 18 holes; three foursomes waiting to play at any given time; and two foursomes using other on-site facilities after their play.

All four courses would be operational in 1998. At that time, the project site could result in a total de facto population of 366 to 426 persons, including employees and facility users.

b. Effects of Increasing The De Facto Population

The Country Courses at Kahuku is intended to serve primarily the visitor market, including the guests at the Kuilima Resort and participants in tour groups. The proposed project will therefore bring more people into the area and increase the potential for resident-visitor interaction.

Such interactions will greatly increase with the total development of Kuilima Resort expansion, which is expected to result in an estimated de facto resort

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population of 5,523 persons (Community Resources and A. Lono Lyman, 1984). The Malaekahana Golf Course proposed by the Kuilima Resort Company (adjacent to the Country Courses at Kahuku Malaekahana site) would have a total de facto population of 130 to 150 people on a peak day (Community Resources, Inc., 1989).

Although the project-related increase is relatively small, it is still necessary to consider the effects of increased resident-visitor interaction since the proposed project would contribute to the overall changes. Such effects are discussed by Earthplan in the social impact assessment which is appended to this Draft Environmental Impact Statement.

c. Employment and Labor Supply

It is estimated that the proposed golf courses will generate between 30 and 50 jobs per course, or a total of about 120 to 200 jobs. The actual number of jobs will depend on a number of factors, including terrain and difficulty in greens maintenance, the level of service provided in the clubhouses and pro shops, and the extent of resource-sharing at the Punamano courses.

Four general categories of jobs are anticipated for Country Courses at Kahuku: (1) Grounds (include the superintendent, assistant superintendents, maintenance superintendents, mechanics, equipment operators, groundskeepers and laborers); (2) Golf and Pro Shops (include the directing and teaching golf professionals, attendants, and golf pro shop sales assistants); (3) Administration and Support (include the club-house manager, assistant manager, accountant, secretary, receptionist, janitors, locker attendants parking attendants, and security); and (4) Clubhouse: Food and Beverage (include the cooks, cashier, waithelp and bushelp, and bartender).

The various jobs generated by the project will offer both indoor and outdoor work, as well as jobs suitable for full-time breadwinners, part-time workers supplementing family incomes, and first-time workers.

The employment generated by the proposed project will benefit residents of nearby communities, as follows:

- Country Courses at Kahuku will provide job options for the several thousand workers who currently spend more than 45 minutes traveling to their job site.

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- The proposed project will further increase job diversity in the area, thus accommodating a wide range of job skills.
- The project will increase the number of "outdoor" jobs. This may appeal to those who are currently in agricultural jobs. Note that this percentage is high for Kahuku.
- Because many of the jobs require little or no experience, students, graduates and currently non-working spouses may qualify for part- and full-time employment.
- Finally the project will provide job opportunities for the currently-unemployed. even though there is a small percentage of unemployed persons in Kahuku, these people nevertheless need jobs.

When considered in the context of the Kuilima Resort expansion, the proposed project will therefore add to the demand for labor supply and could increase the need for in-migrant workers.

The Estate and future golf course operators could minimize the hiring of out-of-area residents by providing job training to assist area residents in successfully competing with out-of-area residents for golf course jobs. A possible vehicle for job training is the "Turtle Bay Resort Employment Center" and the "North Shore Career Training Corporation." The applicant currently contributes \$20,000 per year to the latter organization.

d. Addition of Recreational Resources

The proposed project will add three golf course to the Study Area and therefore play a major role in enhancing the area's non-shoreline recreational resources. The value of golf courses as recreational resources is increasingly being weighted against other values, such as the role of golf courses as visitor attractions, the competition with agricultural uses and foreign investment interests. The following factors are apt to influence the value of the proposed project as a recreational resource:

1. The Type of Golf Course

The project is proposed as a privately-owned course open to the public. A daily fee golf course will benefit the resident golfer by increasing the number of courses which would be open to any golfer.

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2. Affordability and Desirability

In evaluating the proposed project, resident golfers will undoubtedly want to know if rates will be affordable to local players. Kamaaina rates and special rates for certain groups will likely elicit favorable responses.

The lowest rates do not necessarily imply the most desirable golf courses. As of the end of 1988, weekday green and cart fees for 18-hole golf courses on Oahu ranged from a low of \$19 to a high of \$95. Weekend fees ranged from \$23 to \$95 (City and County of Honolulu, 1989).

The lowest fees for both weekday and weekend play were offered by the municipal courses. If one were to base desirability solely on affordability, then municipal courses would apparently be the most desired. Further, it would be expected that municipal golf courses would be a priority among City recreational facilities because of financial accessibility.

A recent survey commissioned by the City did not verify this expectation, however. Municipal golf courses ranked the lowest among other recreational facilities, in terms of both importance and use. (City and County of Honolulu, 1989). This relative non-popularity of municipal golf courses on Oahu may be attributed to a number of factors, such as the proportion of golfers to the islandwide community, the quality of existing municipal courses, and the preference for privately-owned golf courses.

3. Residents vs. Visitor Use

The more a golf course is intended to attract the local resident golfer, the less likely the golf course will be used by visitors. Only two percent of the total rounds at municipal golf courses were played by visitors, as compared to 17 to 19 percent at private or semi-private courses. This proportion of visitor play increases greatly for resort courses (City and County of Honolulu, 1989).

A golf course is more likely to be valued as a recreational resource if the rates and amenities are primarily aimed at the local resident golfer. A resort golf course is considered more a visitor attraction, one which is intended to serve the recreational needs of the visitor.

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Project Effects

The primary market for the proposed project is the visitor, especially guests at the Kuilima Resort and participants of arranged tours. To promote the project's recreational value for the local golfer, operators of the Country Courses at Kahuku should consider establishing incentives for local play, such as kamaaina rates. Also, management initiatives, such as community input in the planning of the project and ongoing communication, will help establish a community sense of belonging.

The proposed project is not anticipated to directly impact the numerous recreational resources in the area, nor is the project likely to impact the planned expansion and addition of shoreline parks and accesses.

e. Project Effects on the Character of the Area

Regional Character

If all of the proposed golf courses are developed, the Study Area could become a major golf destination for Hawaii. The most apparent effect of these golf courses would be the visual impression. The present rural landscape is characterized by a few small towns - containing clusters of houses, neighborhood stores, and public facilities - separated by strips of housing along the highway, underdeveloped and agricultural lands, and relatively large country lots. Golf courses would punctuate this pattern with frequently-maintained and well-manicured green open space, although some of the proposed golf courses, including three of the Country Courses at Kahuku, are not expected to be visible from the highway.

The long-range effect of numerous golf courses on the regional character can be approached or viewed in two ways. On one hand, the large open space of a golf course will provide an attractive background for the Study Area. The golf courses would also be permanent open spaces which would not be used for housing sprawl or other development. Town dwellers and those who wish to retain or "beautify" open space would likely appreciate the visual effects of golf courses.

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On the other hand, the open space quality of a golf course differs from the existing openness. The placement of trees, waterways and support facilities would be deliberate and essentially urbanize what is now natural or agricultural. For further discussion on views, refer to *Chapter III, Section H.*)

Nearby Communities

The visual effects on neighboring Kahuku and Laie would essentially be the same as those discussed relative to regional character. Another potential impact the proposed project may have on the nearby communities is its effect on land value and urban encroachment. The Country Courses at Kahuku may contribute to urbanization of adjacent lands in following ways:

1. Potential Increase In Land Values

Discussion on the impact of the Country Courses at Kahuku on the land values of adjacent properties can be found in *Chapter IV, Section B. (Impact of Agricultural Land Values and Lease Rents).*

2. A "Backyard" for Expensive Housing

Proposed planned communities on Oahu will often contain a golf course which would be fronted by higher-priced executive homes. The impetus for this is the market assumption that the golf course is a visual and recreational amenity which justifies higher prices. Although the project does not include a residential component, it may attract developers who want to build golf course frontage homes.

Note that current public policy for the nearby communities, as well as the overall Study Area, prohibits major urbanization. Thus, if the proposed project or any of the other proposed courses stimulate more development, particularly residential development, then policy changes will be needed.

If the Country Courses at Kahuku does encourage more urban uses in the nearby communities, then the character of the nearby Kahuku community may change. Currently, the most intense activities are resort uses, and these are confined to the Polynesian Cultural Center and the Kuilima Resort. The

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proposed project could be viewed as a "gateway" on the western side of Kahuku. If there is more development around the Punamano sites, then there will be less of an undeveloped, open space "buffer" between the Kuilima Resort and Kahuku town.

Kuilima Resort

The Country Courses at Kahuku will complement the Kuilima Resort by increasing visitor attractions for resort guests and promoting the area as a world-class resort destination.

Developing the Punamano site into three golf courses would result in an attractive backdrop for the Kuilima Resort. Hence, the resort is a physically-cohesive development which is isolated from a city-like environment.

f. **Displacement**

The project site is currently vacant; hence, no displacement will occur.

B. AGRICULTURAL IMPACT
(See *Appendix H*)

An Agricultural Impact Study, prepared by Decision Analysts Hawaii, Inc. is included at *Appendix H* and is summarized below.

Since 1973, the Punamano property has been leased to Amorient Aquaculture International ("Amorient"), a local firm. However, after over a decade of analyzing the economic feasibility of various crops, including field testing of the more promising ones, the company has not identified a profitable agricultural use for the property, and the lands now lie fallow.

Amorient has concluded that the Punamano lands are unsuited for crop production, and has expressed a desire to be released from its lease obligation to Campbell Estate. Principal difficulties cited were the cost of pumping water to irrigate mauka fields; soils that are poor and thin, and subject to erosion on the steeper slopes and very rocky at the lower elevations; difficult terrain, with the area chopped up by gullies and ravines; and excessive winds which damage plants.

The affected acreage consists of 19 soil types:

CR Coral outcrop

KaB Kaena clay, 2 to 6 percent slope

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- KaC Kaena clay, 6 to 12 percent slope
- KaeC Kaena stony clay, 6 to 12 percent slope
- KanE Kaena very strong clay, 10 to 35 percent slope
- Kfa Koloko clay
- KpB Kemoo silty clay, 2 to 6 percent slope
- KpC Kemoo silty clay, 6 to 12 percent slope
- KpD Kemoo silty clay, 12 to 20 percent slope
- KPZ Kemoo-Badland complex
- LaB Lahaina silty clay, 3 to 7 percent slope
- LaC Lahaina silty clay, 7 to 15 percent slope
- PeB Paumalu silty clay, 3 to 8 percent slope
- PeC Paumalu silty clay, 8 to 15 percent slope
- PeD Paumalu silty clay, 15 to 25 percent slope
- PeF Paumalu silty clay, 40 to 70 percent slope
- rRK Rock land; 0 to 70 percent slope
- WkA Waialua silty clay, 0 to 3 percent slope
- WkB Waialua silty clay, 3 to 8 Percent slope

For each soil type, *Table 14* shows the approximate land area in acres and by percentage of total land area, possible agricultural uses, and two soil ratings. (Additional discussion on soils is contained in *Chapter III, Section B* and *Appendix A*.)

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Table 14

**Proposed Golf Course At Punamano:
 Soil Types, Acreage, Agricultural Uses, And
 SCS And LESA Ratings**

Soil Type	Acreage	Percent Of Total	Agriculture Uses	SCS Rating ¹	LESA Rating
CR	87	14	None	Vlls	
KaB	37	6	Sugar, Truck Crops, Pasture	Illw	79
KaC	37	6	Sugar, Pasture	Illw	70
KaeC	20	3	Sugar, Pasture	Illw	62
KanE	33	6	Pasture	Vis	41
Kfa	3	1	Sugar, Pasture	Illw	81
KpB	18	3	Sugar, Pasture	Ile	87
KpC	7	1	Sugar, Pasture	Ille	85
KpD	5	1	Pasture, Sugar	IVe	69
KPZ	6	1	Pasture	Vile	23
LaB	97	16	Sugar, Pineapple, Truck Crops, Pasture	Ile	90
LaC	70	12	Sugar, Pineapple	Ille	82
PeB	26	4	Sugar, Pasture	Ile	85
PeC	60	10	Sugar, Pasture	Ille	76
PeD	15	2	Pasture, Sugar	IVe	57
PeF	26	4	Pasture	Vile	20
rRK	2	1	Pasture	Vlls	
WkA	11	2	Sugar, Truck Crops, Pasture	I	93
WkB	45	7	Sugar, Truck Crops, Pasture	Ile	91

1. Assuming that the soils are irrigated.

SOURCE: Dames & Moore, Honolulu, Hawaii; and United States Department of Agriculture, Soil Conservation Service in cooperation with the University of Hawaii Agricultural Experiment Station, , *Soil Survey of Islands of Kauai, Oahu, Maui, Molokai, and Lanai, State of Hawaii*, Washington, D.C., August 1972.

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Soils within the project area have been rated in terms of four classification systems commonly used in Hawaii. These classification systems and their relationship to the project soils are discussed below:

(1) Land Capability Grouping by the United States Department of Agriculture Soil Conservation Service (SCS)

The system rates soils into eight levels, ranging from the highest level, "I" to the lowest level, "VIII." At Punamano, approximately 2 percent of the proposed project site has a land capability of I, 30 percent is rated IIe, 39 percent is rated IIIe or IIIw, and 3 percent is rated IVe or IVw. The remaining lands - about 26 percent of the total area - have a land capability rating of VI or higher, which indicates that severe limitations make them generally unsuitable for cultivation, either because of erosion or stoniness.

Subclassification "e" indicates risk of erosion as described above, while subclassification "w" indicates that the limitation results from excess water because the soils are poorly drained and subject to seepage.

(2) Agricultural Lands of Importance in the State of Hawaii (ALISH), by the SCS, University of Hawaii (UH) College of Tropical Agriculture and Human Resources, and the State of Hawaii, Department of Agriculture.

This system classifies lands into three categories: (a) "Prime" agricultural land, which is land that is best-suited for the production of crops because of its ability to sustain high yields with relatively little input and with the least damage to the environment; (b) "Unique" agricultural land which is non-prime agricultural land that is currently used for production of specific high-value crops; and (c) "Other" agricultural land which is non-prime and non-unique agricultural land that is of importance to the production of crops.

At Punamano, 57 percent of the lands are rated as "Prime" agricultural lands, 17 percent as "Other," and the remaining 26 percent is not rated.

(3) Overall Productivity Rating, by the UH Land Study Bureau (LSB)

This classification rates soils according to five levels, where "A" represents the class of highest productivity and "E" the lowest.

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At Punamano, 7 percent of the lands are rated A; 52 percent are rated B; 11 percent are C; 3 percent are D and 27 percent are E. A quarry and a reservoir take up less than 1 percent of the area, and are not rated.

- (4) Proposed Land Evaluation and Site Assessment (LESA) System, by the State of Hawaii Land Evaluation and Site Assessment Commission (Still under review by the State Legislature)

Based on soil quality, locational attributes, improvements, nearby activities, and land-use plans, this proposed classification system attempts to designate a sufficient amount of the better agricultural lands to meet projected agricultural goals.

At Punamano, about 69 percent of the lands would be termed IAL ("important agricultural lands").

Based on the various soil surveys, a little over two thirds of the Punamano site is comprised of good soils. These good soils, however, are scattered throughout the property, with gulches and steep slopes intersecting the more gently sloping terrain.

1. **Past and Current Agricultural Uses of the Property**

Until 1971, most of the Punamano property was cultivated in sugar cane as part of Kahuku Plantation Company. Since 1973, the property has been leased to Amorient Aquaculture International ("Amorient"), a local firm.

Amorient has investigated the economic feasibility of numerous candidate crops on this land, including test cultivation of Christmas trees, pineapple, hale koa seed for export, and other crops. They also analyzed the economics of feed corn, sorghum, sudex, hay and other fodder crops.

After more than a decade of effort, Amorient concluded that in today's economic environment the lands are unsuitable for commercial agricultural crop production. The principal difficulties being the cost of pumping water to irrigate mauka fields, poor soils, difficult terrain, and excessive wind.

Amorient ultimately concluded that the Punamano lands are completely unsuitable for crop production, and have expressed a desire to be released from their lease obligation to Campbell Estate because of their inability to find a profitable crop to cultivate on the site.

Please refer to *Appendix H* for further discussion on Current Agricultural Uses.

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2. Availability of Additional Agricultural Land in Kahuku

Additional agricultural lands will become available soon in the Kahuku area with the completion of the State's Kahuku Agricultural Park, which is now under development. This Park, which will be under a 30-year lease from Campbell Estate, will have 220 usable acres of land divided into 24 lots. Land will be available for nursery products, truck crops, and orchards. Other lands in the Kahuku area could possibly be made available for diversified agriculture operations if justified by the economics; this justification would include lease rents that are sufficient to cover the cost of any improvements that might be required.

3. Demand For and Supply of Land For Diversified Agriculture-Statewide

The development of The Country Courses at Kahuku would eliminate the possibility of using the project lands for diversified agriculture. However, ample prime agricultural lands will be available to easily accommodate the Statewide requirements of diversified agriculture. This conclusion is derived from the following:

- (1) A vast amount of agricultural land and water in the State has been freed from sugar and pineapple production due to past plantation closings and reductions in operations - over 100,00 acres since 1968, including announced reduction plans - and most of this land has favorable soil ratings and remains available for diversified-agriculture activities;
- (2) It is very possible that additional sugar cane acreage and water will be freed, given the existence of unprofitable sugar operations;
- (3) Some, if not most, of the sugar companies would make their lands available for profitable replacement crops to the extent that such crops exist, and in contrast;
- (4) Land requirements to accommodate the growth of diversified agriculture are surprisingly modest. In other words, the limiting factor is not the land supply, but rather the market demand for those crops that can be grown profitably in Hawaii. The proposed Country Courses at Kahuku involve too little land to affect this conclusion, and would therefore not adversely affect the Statewide growth of diversified agriculture.

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Small-scale farmers, however, do have difficulty obtaining land because of expensive subdivision requirements. To help overcome this problem in the Kahuku area, the State is developing the Kahuku Agricultural Park.

4. Retrievable Commitment of Resources

Even though the development of The Country Courses at Kahuku constitutes a commitment of prime agricultural land to recreational use, this would not constitute an irretrievable loss of these agricultural lands. If, at some time in the future, farming this land would contribute more economically than the Kahuku golf operations, then the land could be planted in crops relatively easily. Although such a conversion is possible, it is extremely improbable in that Hawaii's economy would have to undergo a dramatic change through one or both of two highly improbable events: (1) the collapse of Hawaii's very healthy and robust visitor industry, followed by the collapse in the demand for golfing by visitors and residents; and/or (2) the discovery of some high-value land-intensive export crop that is unique to Hawaii, and for which the demand would be so large as to virtually absorb all of Hawaii's agronomically suitable land for that crop. Such a crop has been sought for over a century without success.

5. Impact of Agricultural Land Values and Lease Rents

To the extent that The Country Courses at Kahuku are perceived to increase the long-term development potential of nearby agricultural lands, the proposed golf courses will also increase the current market value of the nearby lands. The resulting higher land values represent a market signal that, at some time in the future, greater benefits can be derived from the nearby lands than were previously anticipated. Until such development occurs - assuming that it in fact does occur - the land may be put to some temporary use, and this can include an agricultural activity which can last for decades. In the meantime, lease rents should be unaffected.

6. Contribution of the Country Courses to the Growth of Diversified Agriculture

To an undetermined extent, The Country Courses at Kahuku would contribute to the growth of diversified agriculture in that nursery sales would increase, since a large number of plants and trees would be required to landscape the four courses.

The Country Courses at Kahuku would allow a significant number of people who possess agricultural skills to work in an activity that is closely related to farming, since about 80 of the jobs involve cultivating grasses and plants, applying fertilizers and chemicals, maintaining irrigation systems, etc. This

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represents a significant number of agricultural-type jobs inasmuch as Statewide agricultural field employment has exhibited a declining trend for the sugar and pineapple industries, and even for diversified agriculture. After increasing their agricultural skills even further, some of these people may eventually move on to start their own commercial farm operations, thereby contributing to the growth of diversified agriculture. According to the State Department of Agriculture (see Comment Letter, *Chapter XIV*), golf courses could provide an employment opportunity for former plantation workers

7. **Consistency with State and County Plans**

The Country Courses at Kahuku (1) would not adversely affect plantation agriculture, since none exists on the properties; (2) would adversely affect existing diversified-agriculture crop production, since none exists on the properties; (3) involves lands found to be poorly suited for crop production; (4) would not limit the Statewide growth of diversified agriculture since the supply of land available to diversified agriculture far exceeds projected demand, with additional agricultural lands to be made available in the area at the State's Kahuku Agricultural Park; (5) would not represent an irretrievable commitment of resources, although a dramatic economic change sufficient to justify converting the golf courses to crop production is regarded as extremely improbable; (6) would not increase agricultural lease rents in the area, although some land values may increase; and (7) would enhance the growth of diversified agriculture to an undetermined extent by increasing nursery sales, and by maintaining and increasing the pool of workers having skills applicable to farming.

In view of these findings, The Country Courses at Kahuku is consistent with the major thrust of the *Hawaii State Plan*, the *State Agriculture Functional Plan*, and the *General Plan of the City and County of Honolulu*. The thrust in all three plans calls for preserving the economic viability of plantation agriculture, and maintaining and promoting the growth of diversified agriculture. To accomplish this, an adequate supply of agriculturally suitable lands and water must be assured. Nevertheless, about two-thirds of the Punamano site is inconsistent with the lower-level State agricultural guidelines which call for Agricultural Lands of Importance to be protected from development. However, this guideline does not apply if an overriding public interest exists to provide such lands for other objectives of the Hawaii State Plan.

Finally, The Country Courses at Kahuku would conform with those State and County objectives and policies which favor increased recreation and employment. The entire complex (including one at Malaekahana would accommodate about 560

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resident and visitor golfers per day; would contribute to the economic health of the visitor industry; and would provide an estimated 200 jobs, of which about 80 would be outdoor jobs similar to certain jobs in the agriculture industry.

C. **IMPACT ON STATE AND COUNTY FINANCES**
(See *Appendix I*)

The impact of the proposed Country Courses at Kahuku on State of Hawaii and City and County of Honolulu finances was prepared by Decision Analysts Hawaii, Inc. The values expressed are in 1989 dollars. The study has been attached as *Appendix I* and is summarized below:

Impact

Currently, the property taxes on the Punamano site is \$24,079 per year. In this case, a portion of the land is taxed at its agricultural value, while the remainder is taxed at its estimated market value.

When land assessed and taxed at its agricultural value is developed, the action triggers "rollback" taxes which recover 10 years of back taxes based on the difference between taxes computed on the market assessment and the agricultural assessment, plus a penalty of 10 percent. Development of the golf courses would trigger the rollback tax. For the project site, 1989 property taxes would have been \$36,245 if based on its market value, rather than a mix of market and agricultural values. When development occurs, the rollback tax is estimated to be \$200,000.

Upon full development the property assessment for the three courses at Punamano would be about \$37 million. This is based on the property assessments for the golf course at \$625,000 per hole (the current County guideline), and \$1.5 million each for two of the clubhouses and associated improvements (maintenance area, parking, roads, water systems, sewers, drainage etc.).

Property taxes on the three golf courses would be about \$336,375 per year, based on a tax rate of \$9 per \$1,000.

Additional revenues to the County would be derived from miscellaneous taxes and user fees.

After the courses are approved, the County could expect to net approximately \$200,000 in rollback taxes, and the State could net about \$1.3 million from taxes on construction expenditures and approximately \$306,600 from taxes on operations. Upon full development, the State and County would net about \$642,975 per year from taxes on operations.

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Mitigative Measures

None necessary. No significant State or County expenditures are anticipated for infrastructure development, facilities, or services in support of the golf courses, since these items would be paid by the developer, operator, and/or users.

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V. PUBLIC SERVICES AND FACILITIES ASSESSMENT

This Chapter describes the public services and facilities in the area; its adequacies with respect to serving the needs of the proposed development; the need for improvements; and the necessary mitigative measures to ameliorate or reduce any adverse impacts.

In reviewing this Chapter, the public is invited to refer to the following Appendices, which have been the major source of much of the information that follows:

APPENDIX	REPORT	PREPARER
A.	<i>Engineering Studies - The Country Courses At Kahuku, Punamano Site</i>	Smith, Young and Associates
B.	<i>Traffic Impact Assessment, Report For The Country Courses At Kahuku - Punamano Site</i>	Pacific Planning and Engineering, Inc.
D.	<i>Country Courses At Kahuku, Social Impact Assessment</i>	Earthplan

A. TRANSPORTATION / TRAFFIC
(See Appendix B)

A study to identify and assess future traffic impacts on Kamehameha Highway resulting from the proposed Country Courses at Kahuku was conducted by Pacific Planning & Engineering, Inc. The report presents the findings and recommendations of the -traffic study for the Punamano site golf courses. The focus of the study was to determine the impact of the project generated traffic at the intersection of Kamehameha Highway and the proposed golf course access roads when the project is fully completed and in operation by 1998. The study intersection was analyzed for the present case, 1998 without the project, and 1998 with the project.

Vehicular access for the proposed two courses on the southeastern side of the site will be from the existing Kahuku Military Training Area access road. The intersection of the Military Access Road and Kamehameha Highway will be modified so that the Military Access Road and Marconi Road form a four-way intersection. A new access road from Kamehameha Highway will be constructed west of the Military Road to provide access to the third golf course.

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Kamehameha Highway is a rural arterial highway connecting major population centers along the North Shore such as Haleiwa, Kahuku, and Laie. It is a State maintained highway with a 20-foot wide pavement in the vicinity of the project. There is a 10-foot wide lane in each direction. The shoulders are grassed or dirt and vehicles park along both sides of the road. The posted speed of Kamehameha Highway in the project vicinity is 45 miles per hour.

The Military Road is narrow paved road to the Kahuku Army Training Area that intersects Kamehameha Highway approximately 800 feet east of Marconi Road. Marconi Road is located on the makai side of Kamehameha Highway opposite the Punamano site. Marconi Road provides access to the Estate's aquaculture operations.

Three nearby developments which would likely contribute to traffic at the project site are the Kahuku Village Makai Subdivision, Campbell Estate's proposed Malaekahana golf course, and the Kuilima Resort expansion. The Kahuku Village Makai project is a housing subdivision to be constructed in Kahuku Town near the municipal golf course. Completion of this project is estimated to be 1992, with fully occupancy expected by 1993.

The Campbell Estate's Malaekahana golf course is an 18-hole course projected for completion in 1994.

Kuilima Bay Resort has a long range plan for expanding the resort. By 1998, the resort plans to construct additional units, another golf course, and add commercial space for a shopping center.

Presently there are no major roadway improvements planned by the Department of Transportation for Kamehameha Highway in the vicinity of the project.

Impacts

Impacts from the proposed project were estimated for the year 1998 with and without the project. Traffic from future major developments were used to forecast traffic without the project. The additional traffic volumes from ambient growth and the proposed project were added to the present traffic counts to arrive at the 1998 forecast volumes with project.

By 1998, without the project, the left turn movements from Kamehameha Highway into Marconi Road and the Military Road will continue to operate at LOS A. Kamehameha Highway through traffic will experience little or no delays. However, the LOS for vehicles attempting to exit Marconi Road and Military Road onto Kamehameha Highway will worsen. Marconi Road and the Military Road will operate at LOS D with long delays during the weekend afternoon peak hour. This increased delay is due, in part, to an increase in traffic along Kamehameha Highway as well as traffic generated from the nearby developments.

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With the project completed in 1998, the left turn movements from Kamehameha Highway into Marconi Road will remain at LOS A while left turn movements into Military Road and Road "A" will operate at LOS B. Traffic on Kamehameha Highway at these intersections will experience a little delay during the Saturday afternoon peak hour.

The LOS for vehicles attempting to exit the minor roads onto Kamehameha Highway will worsen. The LOS for vehicles exiting Marconi Road will drop from LOS D to LOS E. The LOS for vehicles exiting the Military Road will drop from LOS D to LOS F. The LOS for vehicles exiting Road "A" will be LOS F. (*Appendix A of Appendix B provides definitions for LOS A to LOS F.*)

Mitigative Measures

To minimize the very long delays for traffic exiting Military Road and Road "A", it is recommended that exclusive right and left turn lanes be provided along the realigned Military Road and Road "A" for traffic entering onto Kamehameha Highway. This will permit vehicles attempting right turns to bypass the left through traffic and decrease delays for vehicles attempting right turns.

B. WATER (See *Appendix A*)

The water resource study indicates that there is a sufficient resource to provide both domestic and irrigation water to the development. It is not anticipated that more than 2.6 MGD (maximum) will be needed, even on the drier days of the year. History has indicated that over pumpage degraded the quality of the supply during the sugar cane years of Kahuku Plantation. It is now believed the lens has re-established itself as a good water source.

An existing well near Kamehameha Highway, Well 341 (*see Figure 19*), provides domestic water today. This well, with some improvements, could provide domestic water service to the development. Also, BWS Sunset Beach-Kawela subsystem, with approval from BWS, could serve as an alternate source of potable water for the project. Another alternative would be to develop another potable water source on the property.

The State Department of Land and Natural Resources has agreed that the Kahuku Region has a sustainable yield of 15 million gallons per day (MGD). According to a 1988 study by Mink & Yuen Inc., the current draft in the Kahuku area is 8.7 MGD leaving 6.3 MGD unused. The Honolulu Board of Water Supply plans to eventually take another 0.5 MGD leaving 5.8 MGD unused. Campbell Estate, therefore, has 6.3 MGD available for use. Assuming the BWS will take 0.5 MGD and lessees of Campbell Estate increase their usage by 1.8 MGD, the unused portion remains as 4.0 MGD. It is estimated

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that maximum water usage for the Punamano area will be about 2.6 MGD. There appears to be an adequate supply source to meet this requirement. Furthermore, this increase in groundwater withdrawal will not lower the ground water table below 13 feet msl which should have no effect on the wetlands.

Impact

New water wells will be required to supply irrigation water for golf courses. In general, the new water wells should be placed close to Kamehameha Highway where the basal water lens has sufficient artesian head and the water quality may be below the drinking water standards but still suitable for golf course irrigation needs.

Mitigative Measures

An important mitigating feature must be incorporated into the proposed water supply and distribution systems. A slow steady withdrawal of water from the wells that penetrate the basal lens is essential. This slow withdrawal is necessary to reduce well drawdown and thereby reduce possible salt water intrusion from the bottom of the lens. Well withdrawal should be over a 20 to 24 hour period per day, at a reasonable drawdown rate. If the drawdown is unreasonable (over 2 or 3 feet) a second, third, or even a fourth well will be required. The water withdrawn from the wells shall then be stored in irrigation ponds (water hazards) for use over a 6 to 10 hour irrigation period during the night hours.

Depending on the distribution pipe system, the number of holding ponds and pump stations may vary. At least one large storage reservoir and one pump station will provide a continuous pressurized system around each clubhouse. The system will be pressurized by a small jockey pump for hand watering of putting greens etc. At a demand great enough to cause a sizeable pressure drop, large pumps will become activated for irrigation of the course or provide fire flows to the several fire hydrants to be located at the clubhouse or maintenance facility.

The system for irrigation would be identical in its operation to that at the Waialae Country Club in Honolulu as far as supply and distribution operations are concerned.

A water master plan for the clubhouse water requirements will be submitted to the Board of Water Supply (BWS) for review and approval. All other BWS's requirements as specified and recommended in their Comment Letter (see *Chapter XIV*) will be met.

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C. WASTEWATER
(See Appendix A)

The project area is within the Board of Water Supply's "No Pass-Zone," mauka of the "no-pass" line. The Hawaii State Department of Health's Underground Injection Control (UIC) line is situated along Kamehameha Highway. Thus, the project site is located mauka of and within this injection control zone. Injection is not recommended.

Impact

The proposed project includes three 18-hole golf courses and two clubhouses. The clubhouse for Course No. 1 will lie approximately 4000 feet southeast of the Kuilima Wastewater Treatment Plant being constructed by the Kuilima Resort Development Company. That plant will be operated by the City and County Wastewater Management Division when it has been completed and dedicated. The plant is designed to treat 1.3 million gallons of domestic wastewater per day. This plant could handle the flow from the clubhouse of No. 1 course.

The clubhouse is expected to generate a maximum of approximately 4,000 to 5,000 gallons of wastewater per day. The contributing sources of the wastewater would be from the following:

250 golfers @ 10 gallons per day	2,500 gpd
200 snack meals @ 4 gallons per meal	800 gpd
<u>20 office & maintenance personnel @ 50 gpd</u>	<u>1,000 qpd</u>
	4,300 gpd

Clubhouse No. 2 will lie approximately 7,500 feet southeast of the Kuilima Wastewater Treatment Plant and on the top of a ridge of coralline limestone. If this clubhouse wastewater were to be diverted to the City and County treatment facility, the Kuilima plant presently under construction could handle the flow.

Clubhouse No. 2 is expected to generate a maximum of approximately 8,000 to 10,000 gallons of wastewater per day. The contributing sources of the wastewater would be from the following:

500 golfers @ 10 gallons per day	5,000 gpd
300 meals @ 5 gallons per meal	1,500 gpd
<u>40 office & maintenance personnel @ 50 gpd</u>	<u>2,000 qpd</u>
	8,500 gpd

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Mitigative Measures

With the total wastewater quantity only reaching a possible 15,000 gallons per day, it becomes a questionable solution to dispose of the wastewater at the Kuilima Treatment Plant. Three ejector stations and some 9,500 feet of force mains and gravity sewers complete with manholes does not appear to be an economical method of disposal. It is, however, offered as a solution should the alternate proposal presented below not be approved by government agencies.

The proposed, and recommenced, treatment process to handle the small quantities of wastewater generated at both Clubhouse No. 1 and Clubhouse No. 2 would be a complete mix activated sludge "package" plant. This biological waste treatment process consists of the following major components:

- (1) Aeration tanks with diffused aeration equipment;
- (2) Settling tanks;
- (3) Return and waste sludge pumps and system;
- (4) Filters;
- (5) Chlorination contact tank.

A flow diagram of the treatment process is schematically shown in *Figure 15*. The treatment process would be constructed, maintained and operated in compliance with State Department of Health standards and requirements as stipulated in Chapter 62 of Hawaii Administrative Rules, Title 11, Department of Health which became effective December 10, 1988. Chapter 62 of the State Department of Health Regulations. Any design and plans will be coordinated with the appropriate agencies for review and approval. All requirements such as those for irrigation laterals will be met. Please refer to *Appendix A* for charts, diagrams, and further discussion, including bacteriological surveys.

D. SOLID WASTE AND DISPOSAL
(See *Appendix A*)

Currently, residential developments in the project site area are serviced by the City and County of Honolulu Refuse Service. Private refuse collection companies provide service for non-residential and multi-family disposal requirements.

Short-Term Impact

Solid waste during the construction phase will most likely consist of vegetation from grubbing activities, unusable concrete ditch material, old barbed wire fences, and excess construction material.

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Mitigative Measures

Construction-related materials should be collected by the contractor or a private collection and disposal company to be hauled to the nearest available City and County sanitary landfill. It is not possible to estimate the volume of solid waste that could be generated during the construction phase.

Long-Term Impact

After completion of the construction, when the proposed Punamano courses have come under full operation, the lounge, bar, restaurant and kitchen may generate some 1,200 pounds of solid waste. Much of this will be in the form of cans, bottles, paper plates, and napkins. Additional solid waste from the proshop and maintenance facility such as broken or worn out machinery may add another 800 pounds of solid waste per day.

Mitigative Measures

A private refuse collector would most likely handle the anticipated 2,000 pounds of solid waste from the proposed golf course. Disposal would probably be at an appropriate sanitary landfill or carried to "H-Power" at Campbell Industrial Park.

E. DRAINAGE/STORM WATER RUNOFF
(See *Appendix A*)

The site slopes up from the low grasslands lying along the mauka side of Kamehameha Highway and opposite from the Punamano Marsh which is a Natural Wildlife Refuge. The irregularly shaped parcel consists mainly of vacant grass and shrub lands, rolling hillsides, intermittent stream gulches and several steep cliffs of coral limestone. An area of rough terrain exists approximately 100 feet mauka of Kamehameha Highway and extends in a westerly direction through the center of the site. Elevations range from 10 feet above sea level near Kamehameha Highway to approximately 270 feet elevation along the western boundary. The elevation within the site is 250 feet above sea level near the proposed parking lot for Clubhouse No. 2.

Slopes of 5 to 10 percent are found throughout the site with additional slopes in the Hoolapa and Kalaeokahipa gulches. Here steeper slopes of 30 to 40 percent occur in isolated areas. One large depression lies within the site which can hold normal runoff at times of moderate to heavy rainfall/runoff.

Calculations for runoff have been based on rainfall intensities of 2.5 inches per hour for 10 year storms and 3.5 inches per hour for 100 year storms. *Table 15* shows the runoff quantities for the project site under existing conditions and also after development of the golf courses. *Table 16* shows the total drainage basin runoff under

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existing and developed conditions. Not taken into account is the retention effect provided by depressions existing or to be made on the site as mitigating steps.

Impact

Development of the golf courses will change the drainage characteristics of the 605-acre project site. Landscaping, parking lots, and buildings combined with the close-cut grass associated with golf courses will account for a higher runoff and a shorter time of concentration. These features will all tend to increase runoff. The calculated unmitigated runoff for the 10 and 50 year storm intervals and the effect the development may have on the Hoolapa-Kalaeokahipa Drainage Basins are presented in *Tables 15 and 16*. *Figure 17* shows the relationship of the golf courses and the Hoolapa-Kalaeokahipa Drainage Basin.

The overall drainage patterns for the site will remain fairly much the same as before development. There will be additional ponding areas and swales will conduct minor surface flows to specific areas and to certain retention ponds or depressions. Areas not incorporated into the golf courses will remain as they presently are in both vegetation and slope configuration.

Mitigative Measures

Giving no consideration to the retention capabilities of the depression at the driving range or to other facilities which could mitigate runoff, it is seen that the runoff from the 605 acres of golf courses will increase 20 percent when the courses are fully developed.

By relating the 605 acres of developed golf courses to the 390 acres of Hoolapa Gulch and the 667 acres of Kalaeokahipa Gulch, the percentage increase is reduced to 13.4 for the 10 and 100 year storms for both gulches as a whole. This lower percentage increase is directly related to the 1,057 acres of drainage area of the combined Hoolapa and Kalaeokahipa and the 605 acres of the golf course area.

The impact of the increased flow can be mitigated by swaling the parking area, clubhouse site, putting green approximately 70 acres of the Kalaeokahipa drainage basin near and mauka of the clubhouse to the large depression being used as the driving range (*see Figure 18*). By swaling flows to sand traps, and constructing additional retention basins or depressions, it is possible to reduce the storm water runoff rate under the developed conditions to levels below those of the existing conditions. This action, combined with partial activation of the Drainage Master Plan, would then negate any impact on the wetlands lying makai of Kamehameha Highway as far as major storm flow quantities are concerned.

A Drainage Master Plan will be prepared based on the final design of the courses and submitted to the Department of Public Works for

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approval. All drainage improvements will be designed to City and County Department of Public Works standards.

Table 15

**Storm Water Runoff
Punamano Golf Course Sites**

Storm Interval	Existing Conditions (cfs)	Developed Conditions (cfs)	Percent Increase
10 Years	1,286	1,543	20.0
100 Years	1,800	2,160	20.0

Table 16

**Storm Water Runoff
Hoolapa & Kalaeokahipa Watershed**

Storm Interval	Existing Conditions (cfs)	Developed Conditions (cfs)	Percent Increase
10 Years	1,913	2,170	13.4
100 Years	2,678	3,038	13.4

F. GRADING/CONSTRUCTION
(See *Appendix A*)

The 605 acre project site consists primarily of vacant grass and shrub lands. Four abandoned windmill structures are located on the site near Kamehameha Highway. Abandoned irrigation ditchwork remains from previous years when the Kahuku Plantation cultivated the site in sugar cane.

Three 18-holes golf courses are planned for the Punamano site. Approximately 325 acres of the site are proposed to be reshaped into

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tees, greens, fairways, driving range, and putting greens. The remaining 280 acres will serve as roughs, or be improved into clubhouses, parking areas or maintenance facilities.

The existing large swale which lies within the proposed driving range will remain as a major storm flow retention pond. Additional ponds or depressions will be constructed within the course development to serve as retention during storm periods when runoff is heavy.

Two clubhouses are planned for the three courses. Clubhouse (1) will serve the two 18-hole courses located in the southeastern portion of the site. This clubhouse is proposed to be 17,000 to 20,000 square feet. Incorporated into the clubhouse would be a starting facility, pro shop, lockers, restaurant/lounge, restrooms, an administrative office and storage and maintenance facilities for 180 golf carts. Approximately 10,000 square feet of the clubhouse is intended to be dedicated to cart storage. A driving range and putting green will serve Clubhouse (1).

Clubhouse (2) will serve the 18-hole course located on the northwest side of the site. This clubhouse would be approximately 10,000 to 12,000 square feet. Incorporated into the clubhouse would be a starting facility, pro shop, lockers, restaurant/lounge, restrooms, and cart storage and maintenance facilities for 90 golf carts. Cart storage is expected to account for approximately 5,000 square feet or approximately one-half of the clubhouse area. Clubhouse (2) will have a putting green with no driving range.

An appropriate number of parking stalls will be provided for both clubhouses.

As the golf course complex develops, the access road will be constructed and the military road realigned, the parking lot graded and leveled and the clubhouses erected. Associated with these activities would be necessary trenching for waterlines, sewerlines, electrical and telephone ducts etc. At least two new wells will be drilled or refurbished for irrigation sources and one well for domestic water will be drilled or refurbished. Clearing, grubbing and grading will be accomplished in phases.

Mitigative Measures

Watering is considered the major mitigating step for dust suppression during the development of the course. Planting the graded areas as soon as possible after the grading and shaping would also assist in suppression of fugitive dust.

All clearing and grubbing work should be performed in accordance with Chapter 23, Grading, Soil Erosion and Sediment Control, of the Revised Ordinance of Honolulu, 1978, as amended (Ordinance No. 81-13).

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The contractor should remove all silt and debris, without deposit in drainage facilities, roadways, and other areas.

Work should be done in conformance with the air pollution control standards and regulation of the State Department of Health. All slopes and exposed areas shall be sodded or planted as soon as final grades have been established.

Any fills on slopes steeper than 5 horizontal to 1 vertical shall be keyed. Temporary erosion controls shall not be removed before permanent erosion controls are in place and established.

All grubbing operations shall be performed in conformance with the applicable provision of Chapter 54, Water Quality Standards, and Chapter 55, Water Pollution Control of Title II, Administrative Rules of the State Department of Health.

Maximum cut and fill slopes should be 2 horizontal and 1 vertical.

Limits of the area to be grubbed should be flagged before the commencement of the grubbing work. Grubbed material should not be placed next to drainage ways, streams, waterways etc. All grubbed, graded and other exposed areas should be watered. At the end of each day, the site should be sufficiently dampened so that the site remains moist during the night.

Any roadway access improvements will be coordinated with State Department of Transportation and other appropriate agencies.

Grading will be performed in accordance with Chapter 23, *Grading, Soil Erosion and Sediment Control*, of the revised Ordinances of Honolulu, 1978 as amended. Erosion control measures will be implemented as outlined in the City and County Grading Ordinance. Strict compliance to City ordinances will minimize any potential environmental impacts. A grading Plan showing the volume, location and grading extent, and an Erosion Control Plan will be prepared and submitted to the City based on the final design of the courses.

G. ELECTRICAL AND COMMUNICATIONS
(See *Appendix A*)

Existing 46kv overhead distribution lines traverse the length of the project area. At this time, there are no plans to request HECO to relocate these lines. The applicant will coordinate with HECO as plans for the development become more specific.

The project is expected to generate a requirement for .5 KVA/acre or 7,250 KWH of electricity. At the present time commercial electrical power service is available from an overhead electric line that runs along Kamehameha Highway. Hawaiian Electric's distribution voltage in this service is 12.47 KV. The service has sufficient

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capability to service the proposed 18-hole course development and its infrastructure.

Hawaiian Telephone service also runs along Kamehameha Highway in an overhead service. It also has the capacity to serve the proposed golf course development at the Malaekahana site.

The electrical and telephone service will be provided by an underground ducting and handhole system from the Kamehameha Highway overhead service to the clubhouse, maintenance facility treatment plant and any other infrastructure facility that may be constructed.

Impact

The installation of the underground electrical and telephone lines and handholes will require excavation and trenching. The anticipated short-term impact of this construction activity is addresses in *Chapter V., Section F., Grading/Construction*. Mitigation measures related to construction are also covered in that section. No long term impacts relating to electrical and telephone services are anticipated.

H. POLICE PROTECTION

The Country Courses at Kahuku is located in District 4 of Area 2 of the Honolulu Police Department. The region extends from Kailua to Kahuku. Police protection services is provided by officers at the Kahuku Police Substation, which patrols from Kaaawa to the Haleiwa Bridge. Six police officers are on duty during each shift and response time is five to ten minutes to locations near the project site.

The de facto population generated by the proposed project will cause occasional demand for police protection. Further, additional police officers will be required to control traffic and pedestrians related to major events at the project site.

To help minimize the need for police protection, golf course operators should take measures to provide on-site security during construction and operation.

I. FIRE PROTECTION

The Kahuku Fire Station is located approximately 1.5 miles away from the project site. Fire trucks are expected to be able to access the project sites in approximately five minutes.

Backup services would be provided by other fire stations with a response time of about ten minutes. The other fire station closest to the project site is the Sunset Beach Fire Station, which is approximately six miles south.

CORRECTION

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

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The contractor should remove all silt and debris, without deposit in drainage facilities, roadways, and other areas.

Work should be done in conformance with the air pollution control standards and regulation of the State Department of Health. All slopes and exposed areas shall be sodded or planted as soon as final grades have been established.

Any fills on slopes steeper than 5 horizontal to 1 vertical shall be keyed. Temporary erosion controls shall not be removed before permanent erosion controls are in place and established.

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Maximum cut and fill slopes should be 2 horizontal and 1 vertical.

Limits of the area to be grubbed should be flagged before the commencement of the grubbing work. Grubbed material should not be placed next to drainage ways, streams, waterways etc. All grubbed, graded and other exposed areas should be watered. At the end of each day, the site should be sufficiently dampened so that the site remains moist during the night.

Any roadway access improvements will be coordinated with State Department of Transportation and other appropriate agencies.

Grading will be performed in accordance with Chapter 23, *Grading, Soil Erosion and Sediment Control*, of the revised Ordinances of Honolulu, 1978 as amended. Erosion control measures will be implemented as outlined in the City and County Grading Ordinance. Strict compliance to City ordinances will minimize any potential environmental impacts. A grading Plan showing the volume, location and grading extent, and an Erosion Control Plan will be prepared and submitted to the City based on the final design of the courses.

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(See Appendix A)

Existing 46kv overhead distribution lines traverse the length of the project area. At this time, there are no plans to request HECO to relocate these lines. The applicant will coordinate with HECO as plans for the development become more specific.

The project is expected to generate a requirement for .5 KVA/acre or 7,250 KWH of electricity. At the present time commercial electrical power service is available from an overhead electric line that runs along Kamehameha Highway. Hawaiian Electric's distribution voltage in this service is 12.47 KV. The service has sufficient

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Hawaiian Telephone service also runs along Kamehameha Highway in an overhead service. It also has the capacity to serve the proposed golf course development at the Malaekahana site.

The electrical and telephone service will be provided by an underground ducting and handhole system from the Kamehameha Highway overhead service to the clubhouse, maintenance facility treatment plant and any other infrastructure facility that may be constructed.

Impact

The installation of the underground electrical and telephone lines and handholes will require excavation and trenching. The anticipated short-term impact of this construction activity is addresses in *Chapter V, Section F, Grading/Construction*. Mitigation measures related to construction are also covered in that section. No long term impacts relating to electrical and telephone services are anticipated.

H. POLICE PROTECTION

The Country Courses at Kahuku is located in District 4 of Area 2 of the Honolulu Police Department. The region extends from Kailua to Kahuku. Police protection services is provided by officers at the Kahuku Police Substation, which patrols from Kaaawa to the Haleiwa Bridge. Six police officers are on duty during each shift and response time is five to ten minutes to locations near the project site.

The de facto population generated by the proposed project will cause occasional demand for police protection. Further, additional police officers will be required to control traffic and pedestrians related to major events at the project site.

To help minimize the need for police protection, golf course operators should take measures to provide on-site security during construction and operation.

I. FIRE PROTECTION

The Kahuku Fire Station is located approximately 1.5 miles away from the project site. Fire trucks are expected to be able to access the project sites in approximately five minutes.

Backup services would be provided by other fire stations with a response time of about ten minutes. The other fire station closest to the project site is the Sunset Beach Fire Station, which is approximately six miles south.

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The structures supporting the Country Courses at Kahuku, which include the clubhouses and maintenance buildings, will require fire protection. On-site water lines and storage, as well as fire hydrants, will be designed to meet the required capacity. Further, the designing of these buildings will follow City fire protection standards and safety precaution measures.

J. SCHOOLS

The Kahuku Elementary and High School is located near the project site. With no residential component, the Country Courses at Kahuku will not increase the residential population and is therefore not expected to impact these facilities.

K. HEALTH CARE AND HOSPITALS

The Kahuku Hospital is a 26-bed facility which provides ambulance service and a helipad for medical evacuation by helicopter. Located in Kahuku Village, this hospital offers 24-hour comprehensive medical services. Other facilities at the hospital include a private dental office and a medical office/clinic with five physicians in private practice.

Because the project will not increase the resident population, the Country Courses at Kahuku is not expected to generate significant demand for services provided by these facilities.

The hospital staff and directors have indicated full support of the project, based on their review of the Preparation Notice for the Environmental Impact Statement. This support is based on (1) the project indirectly encouragement of more service industries in the Kahuku Sugar Mill Business Center and adjoining business communities and (2) the employment-generating potentials (based on letter from Rikio Tanji, Chief Executive Officer, Kahuku Hospital, dated November 24, 1989).

VI. RELATIONSHIP TO EXISTING POLICIES AND PLANS

The following is a discussion of how the project relates to the State of Hawaii and City and County of Honolulu's plans, goals, objectives and policies.

A. STATE PLAN

1. The Hawaii State Plan

The Hawaii State Plan specifies the goals, objectives, policies, and priorities for the State (reference *Chapter 226, Hawaii Revised Statutes*). Section 226-4 establishes certain broad, generalized goals which can be summarized as: "a strong viable economy, a desired physical environment, and physical, social and economic well-being for the community." Within the framework of these goals, certain objectives and policies are established for areas of state-wide concern. This section weighs the consistency of the project against the broad goals and describes how it meets the more specific objectives and policies for the State's economy, the physical environment, and socio-cultural advancement.

a. The Economy

Section 226-6, HRS, calls for increased and diversified employment opportunities to achieve full employment, increased income and job choice, and improved living standards for Hawaii's people. To meet this objective, it supports a policy to stimulate the development and expansion of economic activities which will benefit areas with substantial or expected employment problems.

Construction of the golf courses will support Hawaii's construction industry and, when completed, they will provide approximately 150 full-time jobs. The Koolauloa District has experienced higher than average unemployment.

Another general policy to ensure a healthy economy is to promote and protect intangible resources in Hawaii, such as scenic beauty and the aloha spirit. The project would ensure continued open space, enhance the scenic beauty and rural character of the area and would contribute to the economic health of the district, while protecting and promoting its natural character.

Section 226-8, HRS, directs planning for the State's economy toward the achievement of a visitor industry that constitutes a major component of steady growth for

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Hawaii's economy. In furtherance of that objective, there are three policies to:

- i. Support and assist in the promotion of Hawaii's visitor attractions and facilities.
- ii. Ensure that visitor industry activities are in keeping with the social, economic, and physical needs and aspirations of Hawaii's people.
- iii. Encourage cooperation and coordination between the government and private sectors in developing and maintaining well-designed, adequately serviced visitor industry and related developments which are sensitive to neighboring communities and activities.

The project, because of its proximity to other popular visitor designations, will support the economic growth of those facilities and will provide activities to meet the diverse needs of both visitors and residents. It will be designed in such a way that it not only supports economic goals but is environmentally compatible with the neighboring physical and social characteristics of the Koolauloa District.

b. The Physical Environment

Sections 226-11, 226-12, and 225-13, HRS, presents the State's major objectives and policies for the physical environment.

Prudent use of the State's land-based, shoreline, and marine resources and the effective protection of the State's unique and fragile environmental resources are the objectives (Sec. 266-11). The project conforms to and is consistent with policies to achieve these objectives, as follows:

- i. Exercise an overall conservation ethic in the use of Hawaii's natural resources.
- ii. Take into account the physical attributes of areas when planning and designing activities and facilities.
- iii. Pursue compatible relationships among activities, facilities, and natural resources.
- iv. Promote increased accessibility and prudent use of inland and shoreline areas for public

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recreational, educational, and scientific purposes.

The project will help to permanently preserve the site's open spaces and mountain and ocean views. The site is unique in natural features, e.g. topography and views, and will be designed in a manner to preserve and enhance these features. The preservation of 605 acres in a visually-pleasing, yet economically and socially beneficial way to the resident and visitor populace will increase the enjoyment of the site without endangering plant or animal species. A well-designed outdoor recreational facility is not incompatible with existing uses in the district and will provide both economic and environmental benefits, being a more benign and less intensive use than most alternative uses. The development of golf courses on this site will open the area to both local public recreational needs and visitor enjoyment of views and open space.

Section 226-12, HRS, addresses the State's physical environment in terms of enhancing scenic assets, natural beauty, and multi-cultural/historical resources. The project will be designed to complement the natural beauty of the site, preserving open space and existing views and vistas of both ocean and mountains. All significant historic or cultural resources will be protected. The project is expected to enhance the rural, open-space character of the Koolauloa District and will also be compatible with adjacent agricultural uses.

Finally, two physical environmental objectives having to do with land, air and water quality (*Section 226-13, HRS*) are: maintenance and pursuit of improved quality in Hawaii's land, air, and water resources, and greater public awareness and appreciation of Hawaii's environmental resources. The policies to carry out these objectives include promoting proper management of the State's land and water resources and effective measures to achieve desired surface, ground, and coastal water quality.

The golf course complex will be designed in such a way as to take advantage of existing topography and preserve natural drainage ways, thus providing opportunities to manage runoff. Since most of the site will be committed to recreation open space, soil erosion and run-off will be less than with other more intensive uses.

c. Socio-Cultural Advancement - Leisure

In *Section 226-23, HRS*, planning for the State's socio-cultural advancement in this area is to be directed toward providing adequate resources to accommodate various

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needs, including recreational, for present and future generations. To achieve the leisure objective, certain policies are established. The project is consistent with the following:

- i. Provide a wide range of activities and facilities to fulfill the cultural, artistic, and recreational needs of all diverse and special groups effectively and efficiently.
- ii. Promote the recreational and educational potential of natural resources having scenic, open space, cultural, historical, geological, or biological values while ensuring that their inherent values are preserved.
- iii. Ensure opportunities for everyone to use and enjoy Hawaii's recreational resources.

The project will add significantly to the recreational needs of both local residents and visitors, creating a unique golf course complex to complement the range of other visitor-oriented recreational facilities in the area. It will serve to preserve existing scenic and open-space resources and will enhance their value with landscaping and water features. It will meet a strong marketing need for this recreational activity and will provide new opportunities on a variety of courses.

Section 226-25 establishes the objective of enhancing cultural identities, traditions, values, customs and arts of Hawaii's people. As a policy in support of this objective, (b)(2) calls for supporting "activities and conditions that promote cultural values, customs, and arts that enrich the lifestyle of Hawaii's people and which are sensitive and responsive to family and community needs."

The proposed project would be located in a district in which the predominant uses are resort and agricultural. The district can also be characterized as "rural" in nature. The outdoor recreation use proposed is compatible with and supportive of the established resort uses in the district and would not conflict with, but rather compliment, adjacent agricultural uses. It would contribute to the basic open-space character of the district and would result in accessibility to mountain and ocean views from the project site for both residents and visitors to an extent not possible under its current use.

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2. The Hawaii State Functional Plans.

Functional plans contain objectives, policies, and implementing actions within a specific field of activity. This section discusses the relationship of the project with pertinent Functional Plans.

a. Agricultural Functional Plan

Agricultural plan policies include encouraging productive agricultural use of the most suitable agricultural lands; and providing greater protection to agricultural lands in accordance with the Hawaii State Constitution.

The project site has land only marginally suitable for agricultural uses and has not been fully farmed since the 1970's. Although it is designated for agriculture on the State Land Use Map and City Development Plan and is zoned for agricultural uses, past studies have shown that agricultural use is infeasible. Topography, climate, and inadequacies in infrastructure make it less suitable than other lands in the district better suited to agriculture; removal of the site from agricultural use should have no major negative impact on the district.

b. Tourism Functional Plan

Tourism policies are aimed at improving the quality of existing destination areas; encouraging greater cooperation between the public and private sectors in developing and maintaining well-designed and adequately serviced visitor industry and related developments; and ensuring that visitor facilities and destination areas are carefully planned and sensitive to existing neighboring communities and activities.

Addition of the golf course complex will be a major contribution to the existing visitor designations in the district, especially to the Kuilima Resort. It will strengthen the Kahuku visitor industry and provide a unique, statewide attraction for visitors as well. The professionally-designed landscaping, water features and general improvements will complement not only visitor designations but adjacent agricultural uses. In addition, it will provide recreational opportunities to both local residents and visitors.

c. Recreational Functional Plan

Policies include emphasizing the scenic and open space qualities of physical resources and recreational areas; and maintaining an adequate supply of recreational facilities

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and programs which will fulfill the needs of all recreational groups.

The proposed site has unique scenic features, which will be preserved and enhanced in project design. It is an open space use compatible with all surrounding uses and will be designed to take advantage of existing natural resources. It will also contribute significantly to meeting the growing demand for this type of recreational facility for all golfers.

B. CITY AND COUNTY OF HONOLULU

1. General Plan (GP)

The following is an assessment of how the project relates to the City and County of Honolulu General Plan.

a. Economic Activity

Objective A: To promote employment opportunities that will enable all the people of Oahu to attain a decent standard of living.

Policies 1 and 3: Encourage the growth and diversification of Oahu's economic base; and encourage the development in appropriate locations on Oahu of trade, communications, and other industries of a nonpolluting nature.

Comment: Additional employment opportunities will be created by the project, both in short-term construction and in long-term, permanent opportunities. From 30 to 50 new jobs per course will provide a greater choice of employment for the Koolauloa District. The overall economy will benefit from taxes and indirect economic benefits. The golf course use is one of the less intensive and environmentally beneficial uses possible for the site and will be nonpolluting.

Objective B: To maintain the viability of Oahu's visitor industry.

Policies 6, 7, 8 and 9: Permit the development of secondary resort areas in West Beach, Kahuku, Makaha, and Laie; manage the development of secondary resort areas in a manner which respects existing

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lifestyles and the natural environment and avoid substantial increases in the cost of providing public services in the area; preserve the well-known and widely publicized beauty of Oahu for visitors as well as residents; and encourage the visitor industry to provide a high level of service to visitors.

Comment: The project will attract visitors and provide a unique recreational opportunity. A well-managed open space will complement the surrounding uses in Kahuku. Preservation of views and vistas, landscaping, preservation of most of the site's natural features and added amenities will benefit the visitor industry in general and the Kahuku resort community specifically. The site's amenities will be made available to both resident and visitor population.

b. Natural Environment

Objective A: To protect and preserve the natural environment of Oahu.

Policy 6: Design surface drainage and flood control systems in a manner which will help preserve their natural settings.

Comment: All existing natural drainage ways will remain unaltered to the extent feasible. Runoff from on-site and off-site sources will be managed in a manner which will recharge the aquifer and provide water for irrigation.

Objective B: To preserve and enhance the natural monuments and scenic views of Oahu for the benefit of both residents and visitors.

Policy 4: Provide opportunities for recreational and educational use and physical contact with Oahu's natural environment.

Comment: Residents and visitors will be able to experience the scenic views and openness of the site to an extent not possible at the present time.

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c. Physical Development and Urban Design

Objective D: To create and maintain attractive, meaningful, and stimulating environments throughout Oahu.

Policies 5 and 7: Require new developments in stable, established communities and rural areas to be compatible with the existing communities in areas; and promote public and private programs to beautify the urban and rural environments.

Comment: The project will complement the basic "rural" character of the surrounding Kahuku area. Essentially, it will be approximately 605 acres of open space in a relatively undisturbed state. Support facilities will also be designed to be compatible with the rural character of the community.

d. Culture and Recreation

Objective D: To provide a wide range of recreational facilities and services that are readily available to all residents of Oahu.

Policy 10: Encourage the private provision of recreation and leisure-time facilities and services.

Comment: The project is in keeping with the objective and policy above, since it will meet a strong need for recreational facilities, will increase recreational opportunities for resident and visitor, and will serve and strengthen an existing resort/recreational area.

2. **Development Plan (DP) Common Provisions and Special Provisions for Koolauloa**

The project will require a Development Plan change from its current Agricultural designation to Preservation/Park.

Public Views and Open Space are two of the more significant DP common provisions pertinent to this project. (Reference DP Section 32-1.4, *General Urban Design Principles and Controls*, [1] and [2]).

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With regard to public views, no views of significant landmarks will be blocked by the project. The project site, which is now vacant has existing scenic ocean and Koolau mountain views, which will be enhanced and made more accessible to the public when development of the courses is completed.

The project consists of preserving and improving a site of approximately 605 acres for open space recreational use. It includes Oio, Hoolapa, and Kalaeokahipa gulches, hilltops, and drainage ways which will be left in a natural state to the extent feasible.

A third common provision relates to vehicular and pedestrian routes (paragraph 3), as follows: "Landscaping shall be provided along major vehicular arterials and collector streets as a means to increase the general attractiveness of the community and the enjoyment of vehicular travel for visitors and residents.

The project site abuts Kamehameha Highway; dry grass and scrub Halekoa will be replaced with a tree-lined corridor. Access roads and entrances will also be designed and appropriately landscaped in a manner compatible with surrounding uses.

Section 32-1.10 of the DP common provisions discusses "The Social Impact of Development." The following factors are to be examined as they pertain to General Plan policies and objectives in this area:

a. Demographic

There will be no increase in resident population within the district as a direct result of the project; if Kuilima Resort becomes a major golf course destination, the project could result in an increase in visitor population, since Kuilima, fully developed, would accommodate 4,000 visitor units.

The character and culture of the Kahuku area is a function of existing agricultural and resort uses and is basically characterized as "rural." While the project would impact economically on the community by providing more jobs, it is not expected to negatively affect its character or culture.

The basic use proposed is an open-space, recreational use which will be compatible with the nature of the area.

b. Economic

New construction jobs will be created for the short-term and the project is expected to provide from 30 to 50 new permanent jobs per course when completed. It should also

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contribute and enhance the overall growth of the area as a visitor designation by attracting and increasing the visitor population. There will be government revenues from taxes and other indirect economic benefits derived from the creation of new jobs.

c. Housing

Resident housing is not expected to be affected by the project, either in terms of housing supply or the affordability or quality of units.

d. Public Services

The project will have minimal effects on public services in most cases. There are no effects on medical or education facilities. The project would have a positive effect on recreational facilities in the area by providing an attractive alternative to parks and other amenities in the Koolauloa District.

With regard to transportation facilities, access to the golf courses from Kamehameha Highway will be improved as required by public agencies in conformance with traffic impact studies. It is anticipated that there will be some realignment of access roads and the addition of turning lanes and traffic signage.

Police and fire services will be provided by the Kahuku Police Substation and Kahuku Fire Station, respectively.

It is estimated that the project will require between 2.4 to 2.7 mgd. for irrigation. This will require the development of wells. The project will also generate an estimated 15,000 gpd of effluent, to be treated in a new sewage treatment plant, owned and operated by the City and County of Honolulu.

Solid waste disposal will be by private agencies, and each course will be graded to manage runoff and potential flooding.

e. Physical: Environmental

As noted elsewhere in this section, the project would have positive effects in terms of preserving the natural environment, including improving accessibility to open space and scenic views.

Special provisions call for future development to be sensitive to the "delicate coexistence between the natural scenic, recreational, and agricultural resources of the

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area." It also emphasizes "minimizing adverse impacts on and preserving important agricultural lands and public view, maintaining public access to recreational areas, and providing building designs which reflect the rural character of the area."

Of special significance and relevance to this project are the specific urban design considerations of open space and public views.

High priority will be given to the panoramic mountain and ocean views now available from the project site. The design, which will incorporate landscaping to enhance the view from Kamehameha Highway, will improve and beautify views. Trees, water features and improvements made to the natural gulches and drainage ways will maintain the attractive features of the site, enhance the "openness" of the site and make it both more attractive and accessible to the public.

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VII. ALTERNATIVES TO THE PROPOSED ACTION

Alternative uses for the project site are discussed below. They are no-action, agricultural use and residential use.

A. NO-ACTION ALTERNATIVE

The project site is vacant now and would likely remain so under this alternative. The land has not been fully farmed since the 1970's, because of a variety of conditions making active agricultural use economically infeasible.

Accessibility to scenic views would continue to be severely limited and the site would continue to have limited attractiveness without the landscaping and other amenities proposed as part of the golf course development.

Strengthening of the Kahuku visitor industry would not occur and the increasing need for this type of recreational facility by both residents and visitors would not be met.

Short-term employment opportunities and approximately 150 permanent jobs would not be available; tax revenues and other indirect economic benefits would also be lost.

B. AGRICULTURAL ALTERNATIVE

While agricultural use of the site is possible, it has proved uneconomical in the past. Topography, soils, irrigation needs and other conditions make this alternative less feasible than outdoor recreation use for the site.

Further, other more suitable lands are to be made available in the district. A new state agricultural park will be developed on 210 acres in Kahuku, providing 16 ten-acre lots and 8 five-acre lots for lease to farmers.

Agricultural use would have physical environmental impacts similar to the impacts of the proposed project. Cultivation would affect drainage and run-off and with intense use of the site for crops, fertilizers and pesticides would also have possible adverse impacts.

An agricultural subdivision, under AG-1 Restricted Agricultural District zoning, could be achieved. This could theoretically result in approximately 73 five-acre lots, each of which could contain one "farm dwelling." Active agricultural use on the lots would be a zoning requirement.

In addition to the more traditional principal uses within the AG-1 district, it is also possible to establish certain other uses under the

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Conditional Use Permit (CUP) process. Some of these uses would likely have a much greater range of potentially negative environmental effects. For example: under a CUP, Type 1 (no public hearing), minor agricultural products processing, centralized bulk collection, helistops, resource extraction, sale and service of agricultural machinery, saw mills, and storage and sale of agricultural production products are permitted.

A CUP, Type 2 (public hearing required) would also permit major agricultural products processing, broadcast antennas, and group living facilities.

Few of these uses would be considered economically viable and they would not produce the economic benefits either regionally or to the State as a whole in comparison with the proposed golf-course use.

C. RESIDENTIAL ALTERNATIVE

A residential development alternative is theoretically possible under either Country or Residential zoning districts. A zoning district change would be required for either. Active agricultural use of the site would not be required under either zoning district.

While the need for housing, and especially affordable housing, is a recognized community need, topography of the site and the need for an extensive infrastructure to support residential use make this alternative highly questionable in terms of both marketability and affordability.

Topography would dictate that only certain portions of the site could be developed for housing either at the one-acre minimum required for the Country district or the varying lot sizes of other Residential zoning districts (20,000 square feet to 3,500 square feet).

A residential alternative would require considerably more infrastructure, e.g. roadways to subdivision standards, and potable water needs and wastewater generation would be greater. In addition, more grading, grubbing, clearing and runoff (from developed surfaces) would likely result. This alternative would ultimately result in a demand for more public services, such as schools.

Visually, the site would be affected more than it would be by the proposed project. A residential use would result in a more "urbanized" character than either the agricultural alternative, the no-action alternative, or the outdoor recreation use proposed.

Since the predominant uses in the Koolauloa District are now resort and agriculture, this could have a significant effect on the character of the district.

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The residential alternative would also make it much more difficult to preserve other natural features of the site and presents the possibility of disturbing archaeological and historic resources to a greater extent.

The residential uses would increase resident population, without the economic benefits to Kahuku or the State accruing from strengthening an established visitor designation, employment, and taxes from the proposed project. It would also result in the loss of much of the 605 acres of attractive and managed open space.

**VIII. UNAVOIDABLE ADVERSE ENVIRONMENTAL
IMPACTS**

Based on the previous impact assessments, there are some adverse environmental impacts associated with the construction and operation of the courses that are unavoidable. Mitigative measures, however, have been proposed that will minimize these impacts.

During construction, soils will be disturbed resulting in temporary loss of vegetation, increases in soil erosion, and a decline in feral mammal populations. Construction vehicle activity will increase automotive pollutant concentrations along the principal access roads, as well as on and in the vicinity of the project site. Site preparation and earth moving will create particulate emissions as will building and on-site road construction. In addition, off-site construction related activity may affect air quality in the area of such activity. Noise levels will increase and the visual character of the area may change by construction activity and by the presence and operation of construction equipment.

Following construction, the operation of the courses will prevent the potential use of the land for agriculture. Traffic volumes will increase, as well as noise and automotive emissions associated with the traffic. Certain archaeological resources, in consultation with the Historic Section of DLNR, may be altered. Water resources will be used and chemicals if applied improperly poses a risk to water quality. Demand on public services and facilities will increase.

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

The short-term uses are generally associated with the physical actions required to establish and develop a golf course project. These actions include clearing, grubbing, reshaping greens, installing infrastructure, constructing various buildings and developing the necessary support facilities.

The long-term enhancement is related to the project's contribution to society and the general well-being of its residents.

SHORT-TERM

Construction related activities will create increased air pollution, noise, and possibly disrupt traffic circulation. Dust will be generated from construction activities, and during grading operations. The existing vegetation cover will be lost and surface soils would be subject to erosion. Construction activities will result in 3 short-term negative impact on the environment; however, compliance with local standards would provide sufficient mitigative measures to reduce and virtually eliminate those temporary conditions.

Jobs will be created during the construction period. This would result in a short-term, "positive cash flow" impact on the area's economy.

LONG-TERM

Although development of the Country Course at Kahuku would not irreversibly and irretrievably foreclose the land to future agricultural options (see *Appendix H* and *Chapter IV.B.*), the development would constitute a commitment of these lands to recreational use. The project does, however, support the General Plan of the City and County of Honolulu and the Koolauloa Development Plan by complementing the basis "rural" character of the surrounding Kahuku area. Approximately 200 acres will be essentially maintained in open space. In long-term productivity, the Country Courses at Kahuku will also assist in sustaining the area's economic vitality.

X. IRREVERSIBLE AND IRRETRIEVABLE COMMITMENTS OF RESOURCES

Although the development of the project site does not constitute an irretrievable loss of agricultural land (see *Appendix H* and *Chapter IV. B.*), the development does provide a commitment of the area to recreational use.

Building materials necessary to construct the project will be irretrievably committed. There would be only limited salvage value.

Human resources to construct, maintain, and service the project would be irretrievable. Infrastructure and service consumption factors are also essentially irretrievable.

Environmental resources will be committed and, perhaps, changed. Water resources will be tapped, used and returned in polluted form to the environment. Ecological balance will be modified somewhat between such natural events as precipitation, ground runoff, evaporation and ground water storage as surface permeability is reduced due to construction. Air masses will change and become polluted with dust and vehicular exhaust emissions. The developer must control erosion and establish new drainage patterns with man-made structures and landscaping. Much of dense growth and shrubs currently growing by the roadsides and on portions of the site will be lost by clearing, and grubbing operations. Any structures placed on the site will cause minor loss of views and vistas.

Development of the land in accordance with the amendment will foreclose alternative land use options, although sufficient flexibility will be maintained to respond to changing public needs and market conditions.

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**XI. INTERESTS AND GOVERNMENTAL POLICY
CONSIDERATION THOUGHT TO OFFSET THE
ADVERSE ENVIRONMENTAL EFFECTS OF THE
PROPOSED PROJECT**

The proposed project was determined to be the best alternative for the site. The negative impacts generated by the proposed project are small when compared to the positive impacts derived from the project.

Views and vistas, heretofore unavailable for enjoyment by the general public, will be created by development of the project.

The proposed Country Courses at Kahuku will create new employment opportunities for area residents. The project will maintain the open space quality of the area. The project will complement other proposed and existing recreational areas in the region and assist in sustaining the economic vitality of the area. During the short-term jobs will be created in the construction industry during the development phases. Long-term employment opportunities for area youths and other residents desiring work in the region will result from the project.

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XII. LIST OF CONSULTANTS INVOLVED IN PREPARATION OF EIS

This report was prepared for The Estate of James Campbell by William E. Wanket, Inc. The following identifies the consultants involved in the preparation of their respective contributions. A resume follows each consultant's report.

FIRM	TASK	INDIVIDUAL
William E. Wanket, Inc.	Primary Author/ Consultants Coordinator	William E. Wanket
John Zapotocky	Market Study	John Zapotocky
Smith, Young & Associates	Engineering Studies	Russell L. Smith, Jr.
Pacific Planning & Engineering, Inc.	Traffic Impact	Conrad Higashionna
Archaeological Consultants of Hawaii, Inc.	Archaeological Survey	Joseph Kennedy
Earthplan	Social Impact	Berna Cabacungan
Darby & Associates	Noise Impacts	Ron Darby
Michael S. Chu	View Assessment/ Graphics	Michael S. Chu
J.W. Morrow	Air Quality Impact	James Morrow
Decision Analysts Hawaii, Inc.	Agricultural Impact/ Fiscal Impact	Bruce Plasch
Phillip L. Bruner	Survey of Avifauna and Feral Mammals	Phillip L. Bruner
Charles L. Murdoch Richard E. Green	Assessment of Fertilizer and Pesticide use	Charles L. Murdoch Richard E. Green
Lani Nedbalek	Consultant	Lani Nedbalek
Barbara Moon	Land Use Consultant	Barbara Moon
McCarter Computer Services	Typing	Ann McCarter
Best	Printing	Ralph Hee

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**XIII. CONSULTED PARTIES AND COMMENTS RECEIVED
DURING THE PREPARATION OF THE DRAFT EIS**

The notice of availability of the EIS Preparation Notice (EISPN) was officially published in the Office of Environmental Quality Control (OEQC) Bulletin on October 8, 1989. Below is a list of those receiving a copy of the EISPN. Comment letters received are indicated with a + sign.

FEDERAL AGENCIES

- + U.S. Department of the Army, U.S. Army
Engineer District, Honolulu
 - + U.S. Department of the Army, Pacific Ocean
Division, Corps of Engineers
 - + U.S. Department of the Navy, Naval Base, Pearl
Harbor
 - + U.S. Department of Agriculture, Soil
Conservation Services
 - + U.S. Department of Interior, Fish and Wildlife
Services
- Department of Transportation, Federal Aviation
Administration, Airports District Office

STATE AGENCIES

- + Department of Accounting & General Services,
Division of Public Works
 - + Department of Agriculture
 - + Department of Business and Economic
Development
 - + Department of Education
 - Department of Health
 - + Department of Land and Natural Resources
 - + Department of Land and Natural Resources,
Historic Preservation Office
 - + Department of Land and Natural Resources,
Division of Land Management
- Kahana Valley State Park Advisory Council

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- + State Land Use Commission
 - Office of Environmental Quality Control
 - Office of Hawaiian Affairs
- + Office of State Planning
 - Oahu Metropolitan Planning Organization
- + Department of Transportation
- + Department of Budget and Finance, Housing,
Finance and Development Corporation
 - University of Hawaii, Water Resource Research
Center
 - University of Hawaii, Environmental Center

CITY AND COUNTY OF HONOLULU

- + Board of Water Supply
 - Department of General Planning
 - Department of Housing and Community
Development
- + Department of Parks and Recreation
 - Department of Transportation Services
- + Honolulu Fire Department
- + Honolulu Police Department
- + Department of Land Utilization
- + Department of Public Works

PUBLIC UTILITIES/COMMUNITY ORGANIZATIONS/OTHERS

- + Hawaiian Telephone Company
- + Hawaiian Electric Company
 - Hawaiian Electric Renewable Systems

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- North Shore Neighborhood Board #27
- Koolauloa Neighborhood Board #28
- Kawela Bay Community Association
- West Kawela Bay Community Association
- Kahuku Community Association
- + Koolauloa Community Council
- Hauula Satellite City Hall
- Kuilima Estates East Owners' Association
- Kuilima Estates Owner' Association
- Pat's at Punaluu Owners' Association
- Hanohano Hale Owners Association
- Kaaawa Community Association
- Kahuku Housing Corporation
- ✦ Laie Community Association
- Kunani O Hauula
- Kahuku Village Association
- Kahuku Farmers Association
- + Zion's Security Corporation
- + Kahuku Hospital

Reproduced on the following pages (Blue Section) is the EISPN, followed by the comment letters received and the letters prepared in response. (NOTE: the same comment letters and responses will be included in the DEIS for Malaekahana, since many of the consulting parties treated the Country Courses at Kahuku as a single entity.

**XIV. COMMENTS RECEIVED DURING THE PREPARATION
OF THE FINAL EIS**

Sixty (60) copies of the Draft Environmental Impact Statement (DEIS) were delivered to the Office of Environmental Quality Control (OEQC) on February 2, 1990. Notice of the DEIS was published in the February 8, 1990 issue of the OEQC Bulletin. OEQC distributed copies of the DEIS to interested public agencies, organizations and individuals (see OEQC Distribution List in the following GREEN Section) per Section 11-200-21 of the Environmental Impact Statement Rules. In addition, two-copies of the DEIS were delivered to the Honolulu Department of General Planning, the "accepting agency".

Following is a list of persons, organizations and public agencies that have commented on the DEIS (24 total). Four (4) late comment letters were received after the public review deadline extension of April 8, 1990. Response letters were sent to all commenting parties, including late comment letters.

**LIST OF PERSONS, ORGANIZATIONS AND PUBLIC AGENCIES
COMMENTING ON THE DEIS**

Federal

Department of the Army
Department of the Navy
U.S. Fish and Wildlife Service
U.S. Soil Conservation District

State of Hawaii

Department of Agriculture
Department of Budget and Finance, Housing
Finance and Development Corporation
Department of Business and Economic
Development, Energy Division
Department of Defense
Department of Health
Office of Environmental Quality Control
State Public Works Engineer

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University of Hawaii, Environmental Center

City and County of Honolulu

Department of General Planning

Department of Housing and Community
Development

Department of Land Utilization

Department of Parks and Recreation

Department of Transportation Services

Building Department

Fire Department

Police Department

Board of Water Supply

Others

Hawaiian Electric Company

Koolauloa Neighborhood Board No. 28

Kahuku Farmers Association

Reproduced on the following pages (Green Section) is OEQC's Distribution List of those receiving copies of the DEIS, followed by the comment letters received and the letters prepared in response.

Environmental Impact Statement
THE COUNTRY COURSES AT KAHUKU

EISPN

Application for Development Plan Amendment and
Environmental Assessment on Proposal to
Designate Certain Land In Koolauloa for Preservation
On the Koolauloa Development Plan
September 1, 1989

PUNAMANO

I. Background

A. Essential Information:

1. Applicant: The Estate of James Campbell
828 Fort Street Mall, Suite 500
Honolulu, HI 96813
Telephone: 536-1961
- Agent: Owner
2. Land Owner: The Estate of James Campbell
3. Request: To designate certain land in
Koolauloa as Parks & Recreation (golf
course use) on the Development Plan
Land Use Map
4. Area: About 605 acres
5. Location: Site 1: In Koolauloa opposite the
(See Exhibit A) easterly end of the Kuilima Resort
and on the southern side of
Kamehameha Highway
6. TMK: 5-6-05:5, 6, Por. 1, Por 2, and Por. 7
5-7-01:Por. 21
7. Existing Use: Vacant
8. State Land Use: Agriculture
9. Development Plan
Designation:
Land Use: Agriculture
Public Facilities: None
10. County Zoning: AG-1 and AG-2 Agriculture

B. Description of Property:

1. Property Boundary:

The property includes about 605 acres, is irregularly shaped, and fronts on Kamehameha Highway. It is bounded on the east by the State Agricultural Park, the U. S. Army training area to the south and various agricultural users to the west.

2. Topography:

The site occupies three gulches, Oio, Hoolapa, and Kalaeokahipa Gulches. The bottom sides and hilltops of these gulches create variable topography.

<u>Slope</u>	<u>% of Area</u>
0-10%	45%
10%-20%	30%
20%+	<u>25%</u>
	<u>100%</u>

3. Elaborate on Existing Uses:

The site is vacant and unused.

4. Slope:

See information under no. 2., topography, above.

5. Soils:

There are two soils associations covering this request. The first is the Kaena-Waialua association which are deep mainly nearly level and gently sloping, poorly drained to excessively drained soils that have a fine texture to coarse texture subsoil or underlying material on coastal plains and lower slopes and in drainageways.

The second is the Lolekaa-Waikanae association which are deep nearly level to very steep but well-drained soils that have a dominantly fine texture subsoil on fans, terraces and upgrounds. This information comes from the U. S. Dept. of Agriculture, Soils Conversation Service.

6. Location Map: See Exhibit "A."

7. Topo Map:

A topo study has been completed based on existing U.S.G.S. information. These maps are used as a basis for compiling Exhibit "A."

8. Project Layout:

The project area is conceptual. More detailed site planning of golf course fairways, clubhouse and accessory facilities will be presented in later project stages.

II. Development Proposal

A. Applicant's Proposed Use of Property (Master Plan):

The property will be developed along with a fourth course at Malaekahana, as shown on the location map, Exhibit "A," as an integrated golf course complex of four 18-hole courses. They will make a significant contribution to the Kahuku region as a unique golf course destination.

B. Development Timetable:

The following is a tentative development timetable:

Development Plan Approval	- December, 1990
County Conditional Use Permit	- July, 1990
State Land Use Boundary Amendment	- December, 1991
Subdivision Approval	- December, 1991
Zoning	- July, 1992
Completion of Golf Course Improvements	- 1996

C. Approximate Costs:

As indicated, the plans for development are still conceptual. No final cost estimates have been developed.

III. Need for Proposed Development

A. Public Problem or Need:

The Hawaii golf market is virtually untapped. Oahu courses can, at the most, only take care of about 3% of the average daily visitor population. All of these are now at or near capacity. There is a strong market to expand the number of golf facilities in Hawaii. The experience on the U. S. mainland, Japan, and visitor counts in Hawaii justify this conclusion.

Market studies show that resorts offering golf can generate 0.25 rounds of golf per day per unit. Depending on the extent to which a resort is effectively marketed as a golf course destination, the rounds per resort unit can be even higher.

B. Intended Market:

The intended market for the Kahuku golf course complex will be visitors to Kuilima as well as local island-wide residents.

C. Designated Use Versus Proposed Uses:

The following shows how the request for the Development Plan Parks and Recreation designation for golf course use is more appropriate than the current Agricultural designation.

1. Abundance of Agricultural Lands in the Area:

The region's primary land use is resort and agriculture. The revised EIS for the Kahuku Agricultural Park, dated May 30, 1984, indicates that a new state agricultural park will be developed on 210 acres of land in the Kahuku area providing 16 ten-acre lots and 8 five-acre lots for lease to farmers. This land is expected to be available to qualified farmers in the near future.

The land which is subject to this request has proven to be infeasible to farm over the years since the closing of the Kahuku plantation in the early 1970s. Some of the reasons are the variable topography, climatic conditions, lack of adequate access, and lack of water.

2. Need for Preservation Land for Golf Course Use:

The integrated golf course complex will further strengthen the Kahuku region as a dynamic and unique part of Hawaii's visitor attractions and strengthen the attractiveness of the Kuilima Resort.

3. Increase of Employment Opportunities:

The three Punamano golf courses will provide opportunities for employment within the North Shore region. Each course could generate 30 to 50 jobs depending upon the degree to which accessory uses such as restaurants are developed. This means the four courses could result in upwards of 120 new jobs.

4. Enhanced Visual Impact:

The golf courses will preserve open space for future generations by creating an attractive green landscape of trees, water features, and fairways.

5. Flood Control and Water Recharge:

The development of golf courses create the opportunity to provide limited control of runoff during heavy rains and the opportunity to recharge underlying aquifers.

IV. Federal, State and City Plans, and Programs Involved

A. Federal:

These courses are mauka of Kamehameha Highway across from Punamano Pond and straddle the range road which serves the U. S. Army training area and the Punamano Air Force telecommunications site. Campbell Estate will work with applicable agencies to insure their access.

B. State:

1. Hawaii State Plan:

The integrated golf course complex will be consistent with the following objectives and policies of the Hawaii State Plan, as stated in Chapter 26 of the Hawaii Revised Statutes:

Objectives and Policies for Population (Section 5)

(b)(3) Promote increased opportunities for Hawaii's people to pursue their socio-economic aspirations throughout the islands.

Comment: The proposed project will provide a wide range of employment and secondary business opportunities.

Objectives and Policies for the Economy in General (Section 6)

(a)(1). Increased and diversified employment opportunities to achieve full employment, increased income and job choice, and improved living standards for Hawaii's people.

(b)(4) Expand existing markets and penetrate new markets for Hawaii's products and services.

(b)(8) Encourage labor-intensive activities that are economically satisfying and which offer opportunities for upward mobility.

(b)(11) Maintain acceptable working conditions and standards for Hawaii's workers.

(b)(14) Promote and project intangible resources in Hawaii such as scenic beauty and the Aloha spirit which are vital to a healthy economy.

Comments: The proposed project will allow a wider range of job opportunities in close proximity to the Kuilima Resort. These jobs, as many as 120 jobs, will increase the range of employment choices within a reasonable traveling distance for regional residents.

The area's scenic beauty will be enhanced through the open space management of up to about 605 acres.

Objective and Policies for the Economy - Visitor Industry (Section 8)

(b)(1) Support and assist in the promotion of Hawaii's visitor attraction and facilities.

(b)(3) Improve the quality of existing visitor destination areas.

(b)(5) Develop the industry in a manner that will continue to provide new job opportunities and steady employment for Hawaii's people.

Comments: The integrated golf course complex will create a unique niche for the Kahuku region as part of Hawaii's overall visitor industry.

The project will provide new job opportunities and steady employment for area residents. The golf courses could provide up to 120 jobs, depending upon the types of accessory services offered by each course.

Objectives and Policies for the Physical Environment - Land Base, Shoreline, and Marine Bases (Section 11)

(b)(3) Take into account the physical attributes of areas when planning and designing activities and facilities.

(b)(4) Managing natural resources and environs to encourage their beneficial and multiple use without generating costly or irreparable damage.

(b)(8) Pursue compatible relationships among activities, facilities, and natural resources.

Comments: The integrated golf course complex will be designed and laid out to take advantage of existing topography. Natural drainage ways will be preserved to the greatest extent possible as these are opportunities to manage runoff from both on and off-site areas.

Objectives and Policies for the Physical Environment - Scenic, Natural Beauty, and Historic Resources (Section 12)

(b)(3) Promote the preservation of views and vistas to enhance the visual and aesthetic enjoyment of mountains, oceans, scenic landscapes, and other natural resources.

(b)(5) Encourage the design of developments and activities that complement the natural beauty of the islands.

Comments: The project will promote the enhancement of the scenic beauty of the area through the open space management of up to about 605 acres. This open space will be compatible with adjacent agricultural uses.

Objectives and Policies for the Physical Environment - Land, Air, and Water Quality (Section 13)

(b)(2) Promote the proper management of Hawaii's land and water resources.

Comment: The management of drainage due to on- and off-site runoff will be a significant contributor to the proper management of downstream flows.

2. State Functional Plans:

This section identifies the relationship of the proposal to relevant State Functional Plan objectives.

State Agricultural Functional Plan

Objective B, Policy 4: Encourage productive agricultural use of the most suitable agricultural lands.

Comment: The project area is designated Agriculture on the State Land Use Map and on the Development Plan. It is also zoned for agriculture. There should be no impact on agricultural uses due to the withdrawal of up to about 605 acres from the agricultural district.

The project area has proven to be infeasible for productive agricultural use since the early 1970s. Contributing factors have been climate, poor soils, topography, and the lack of water and access.

State Tourism Functional Plan

Objective B, Policy 2: Improve the quality of existing destination areas.

Objective B, Policy 3: Encourage greater cooperation between the public and private sectors in developing and maintaining well-designed and adequately serviced visitor industry and related developments.

Objective B, Policy 4: Ensure that visitor facilities and destination areas are carefully planned and sensitive to existing neighboring communities and activities.

Comment: The proposal for an integrated golf course complex will strengthen the Kuilima Resort. Kuilima will be attractive to golf vacationers by providing an opportunity unique to Hawaii to play and experience a variety of course conditions within easy reach. Its placement on poor agricultural land recognizes the need to preserve agriculture on better adjoining lands. Local North Shore and Koolauloa communities have been and will continue to be appraised of this development.

State Recreation Functional Plan

Object A, Policy 3: Emphasize the scenic and open space qualities of physical resources and recreation areas.

Object C, Policy 1: Maintain an adequate supply of recreation facilities and programs which will fulfill the needs of all recreation groups.

Comment: This proposal will enhance the visual qualities of the area through the open space management of about 605 acres, including landscaping, water features, and drainage controls. The facility will provide recreational opportunities for not only visitors, but the community at large.

C. City:

1. General Plan:

This section discusses how this project conforms to and implements the City and County General Plan.

Objective and Policies for Economic Activity

Objective A: To promote employment opportunities that will enable all the people of Oahu to attain a decent standard of living.

Objective A, Policy 1: Encourage the growth and diversification of Oahu's economic base.

Objective A, Policy 3: Encourage the development in appropriate locations on Oahu of trade, communications, and other industries of a nonpolluting nature.

Comment: This project will provide Koolauloa with additional employment opportunities. When the integrated golf course complex is finished, it might provide up to 120 new jobs. These jobs will increase the range of employment choices within a reasonable distance for North Shore and Koolauloa residents. Hawaii's visitor industry is a non-polluting one and the proposed golf courses will further this objective.

Objective B: To maintain the viability of Oahu's visitor industry.

Objective B, Policy 6: Permit the development of secondary resort areas in West Beach, Kahuku, Makaha, and Laie.

Objective B, Policy 7: Manage the development of secondary resort areas in a manner which respects existing lifestyles and the natural environment and avoid substantial increases in the cost of providing public services in the area.

Objective B, Policy 9: Encourage the visitor industry to provide a high level of service to visitors.

Comment: The golf complex will attract and give Hawaii visitors a unique opportunity to pursue golf in a way that cannot be achieved anywhere else within the State. In addition to enhancing the experience for golf visitors to Kuilima, about 605 acres of managed open space will enhance the region's open space character.

Objective E: To prevent the occurrence of large scale unemployment.

Comment: These three new golf courses will provide upwards of 120 new jobs contingent upon the level of services provided by each golf course.

Objective and Policies for the Natural Environment

Objective A: To protect and preserve the natural environment of Oahu.

Objective A, Policy 6: Design surface drainage and flood control systems in a manner which will help preserve their natural settings.

Comment: The golf course complex will respect natural drainage ways. These will be designed so that runoff from both on-site and off-site sources will be controlled to recharge the aquifer and to provide irrigation water.

Objective and Policies for Cultural and Recreation

To provide a wide range of recreational facilities and services that are readily available to all residents of Oahu.

Objective A, Policy 7: Provide for recreational programs which serve a broad spectrum of the population.

Objective D, Policy 10: Encourage the private provision of recreation and leisure time facilities and services.

Comment: These proposed golf courses will provide Koolauloa and the North Shore communities with increased recreational opportunities.

Objective and Policies for Physical Development and Urban Design

Objective A, Policy 7: Locate new industries and new commercial areas so that they will be well related to their markets and suppliers and to residential areas and transportation facilities.

Comment: The Punamano courses have been created to provide the Kailima visitor with a wide range of golfing opportunities. The golf courses will strengthen and serve the Kailima Resort and Kahuku region.

Objective D: To create and maintain attractive, meaningful and stimulating environments throughout Oahu.

Objective D, Policy 2: Integrate the City and County's urban design plan to all levels of physical planning and development controls.

Objective D, Policy 4: Require the consideration of urban design principles in all development project.

Objective D, Policy 5: Require new developments, stable, established communities and rural areas to be compatible with the existing communities in areas.

Objective D, Policy 7: Promote public and private programs to beautify the urban and rural environments.

Comment: The golf courses will receive input from both private and public interests throughout the planning process. This will achieve the general plan goal of integrating design elements into the final project and insure compatibility with adjoining land uses.

2. Development Plan for Koolauloa

This section discusses how the proposed golf course project conforms to and implements the Koolauloa development plan.

Development Plan Common Provisions

General Urban Design Principles and Controls

Public Views: Public views include views along streets and highways, mauka - makai view corridors, panoramic, and significant landmark views from public places, views of natural features, heritage resources, and other landmarks, and view corridors between significant landmarks. Such public views shall be protected by appropriate building heights, setbacks, design and siting controls established in the LUO.

Open Space: Open space areas consist of but are not limited to ocean, beaches, parks, plazas, institutional properties with park like grounds, streams, inland bodies of water, significant land forms, golf courses, cemeteries, and agricultural and preservation lands The City's mountains, hills, shoreline and streams shall be considered as major scenic space open and recreational resources.

Adequate public access to these resources shall be incorporated as part developments adjacent to them Existing natural stream beds and drainageways shall be retained wherever possible. Where further channelization must occur materials that are harmonious with the setting as stone shall be used wherever feasible.

Comment: Punamano enjoys panoramic views of the ocean, the Koolauloa mountain range and surrounding agricultural properties. It also enjoys near views of the many gulches, ravines, and Pu'us within the courses. Public views through the site will be enhanced by the open space management of about 605 acres of well-maintained landscaping, drainageways, and water features.

Identification of Areas, Sites and Structures of Historical Significance

General . . . The continued use, enhancement or preservation of areas, sites and structures (of historical, archaeological or architectural significance) shall be incorporated or promoted in any applicable action by the City.

Comment: An archaeological investigation will be conducted as part of the Environmental Impact Statement process.

Social Impact of Development

Social Impact Factors: In evaluating any proposed development, the objectives relating to the distribution of social benefits shall be considered. The following factors shall be examined as they pertain to such objectives:

- a. Demographic
- b. Economic
- c. Housing
- d. Physical; Environmental

Comment: The social impact of the proposed development will be addressed in the approval process.

Development Plan Special Provisions for Koolauloa

The Special Provisions describe the unique features and goals for Koolauloa. The specific urban design considerations provide guidelines for open space, public views, height controls and density controls.

Section 15: Specific Urban Design Considerations

Item a, Public Views, indicates the importance of Kamehameha Highway views along the Kahuku plain and state "Development adjacent to the highway shall reflect the need to preserve the current panoramic roadway views of the sea, the coastline, the Koolau mountains and lateral ridges, inner valleys, and landmarks."

Comment: The golf courses will enhance public views of the Koolauloa mountains from Kamehameha Highway. Extensive landscaping will beautify the Kamehameha Highway corridor through the placement of trees, fairways, water features, and improved and attractive drainageways.

V. Impacts

A. Demographic Impacts:

1. Residential Population:

Not applicable.

2. Visitor Population:

The full development of the Kuilima Resort will include 4,000 visitor units. If these visitors are attracted to Kuilima through an aggressive marketing campaign promoting the Kahuku region as a golf course destination, they will have an added incentive to stay within the area and take advantage of all golfing opportunities.

3. Character or Culture of Neighborhood:

The character and culture of the Kahuku area is changing by the implementation of the Kuilima Resort development. A large increase in employment, population and economic activity is expected when Kuilima is fully implemented.

The integrated golf course complex will generate additional jobs in the Kahuku North Shore region. Upwards of 120 new jobs could be provided.

The open space management of about 605 acres will enhance views and the environment through well-maintained landscaping, fairways, natural drainage ways, and water features.

4. Displacement:

The development of about 605 acres will not displace either farming activities or residential units.

5. Other Social Impacts:

The golf course complex will provide an alternative recreational resource for visitors and island residents.

B. Economic Impacts:

1. Economic Growth:

Development of the project will provide for economic activity in the construction sector of the economy during development. Upon completion, both primary and secondary jobs will be created.

2. Employment:

Development of the project will result in short-term jobs in the construction industry. In addition, permanent jobs will be created once the courses open for "play." As much as 120 jobs may be created depending upon the level of accessory services.

3. Government Revenues (Taxes):

Government revenues from the general excise tax, income taxes and taxes on employee incomes will increase.

4. Location Vis-A-Vis Intended Market:

The proposed site is located as close as practicable to the intended market which is the Kuilima Resort.

C. Housing Impacts:

1. Increase in Supply:

The project will have no impact on the housing supply.

2. Affordable Units:

The project will have no impact on affordable units.

D. Public Services:

1. Access and Transportation:

Access to the Punamano golf courses will be from Kamehameha Highway over a realigned range road. A more detailed traffic impact study will be done as part of the EIS process.

2. Water:

The total irrigation needs for the three golf courses will be between 2.4 to 2.7 mgd. Wells will be developed to meet these needs.

3. Waste Water:

Punamano is expected to generate up to 15,000 gpd of effluent. This will be treated in the new sewage treatment plant that will be developed to serve Kuilima and which is to be owned and operated by the City and County of Honolulu.

4. Drainage:

Golf courses provide the opportunity for positive drainage control and the ability to assist in the recharge of underlying aquifers. Each of the three courses will be graded to control runoff with the effect of reducing the flooding of Kamehameha Highway and Punamano Pond.

5. Solid Waste:

Solid waste will be disposed of by private collection agencies.

6. Schools:

The proposed development will have no impact on schools.

7. Parks:

The golf courses will provide an alternative recreation source for area residents and, therefore, may relieve pressure on parks and other recreational amenities in the North Shore and Koolauloa areas.

8. Police:

Construction may cause a temporary need for increased police services due to the construction related traffic. Over the long-term, routine patrols as well as normal police services, will be provided by the Kahuku Police Substation.

9. Fire:

Fire protection is available from the Kahuku Fire Station with backup from Sunset Beach.

10. Utilities:

a. Electrical:

Electrical service is available on Kamehameha Highway.

b. Gas:

Bottled gas is available from two local suppliers requiring individual service arrangements.

c. Telephone:

Telephone service is available on Kamehameha Highway.

11. Other: N/A.

12. List of Agencies Contacted:

Department of General Planning.

E. Environmental Impacts:

1. Noise:

A temporary increase in noise will result from construction activities which will be subject to rules and regulations of the State Health Department.

2. Air Quality:

Short-term impacts can be expected from construction activities including dust and emissions from heavy equipment. County ordinances contain mitigating measures for these activities. Additional air quality impacts may be caused by increased local traffic.

3. Compatibility with Surrounding Environment (Size, Design, Materials and Citing of Structures):

The golf courses will maintain high standards of building design, landscaping, and fairway layout in order to ensure minimum visual impact and compatibility with surrounding areas. The Koolauloa Development Plans contain provisions to enhance the compatibility of new development and the golf courses will fully comply with both the letter and spirit of these provisions.

4. Historic and Archaeological Resources:

The lands under consideration were part of the Kahuku Sugar Company until the early 1970s when the company ceased operations. Since that time, the land has laid vacant with the exception of a brief attempt at a feed corn operation which proved to be uneconomic. Having been under cultivation for many years, it is doubtful that any significant archaeological sites remain. We will, however, commission an archaeological study to discover any potential historic sites and will work with the State Historic Preservation officer.

5. Natural Features:

a. Water Resources:

At present, the Board of Water Supply has no long-range plans for the development of new facilities. Natural drainageways will be improved to control runoff. This will assist with the recharge of underlying aquifers as well as being a possible irrigation source.

b. Flood Plain Management:

According to the FIRM maps for Oahu, Puanamano is covered by the flood zone designation of "D." This classification does not preclude the ability for grading and/or building subject to compliance with Ordinance 80-62.

c. Wetland Protection:

Puanamano is mauka of Kamehameha Highway, but drains into a wetland area under the control of the Fish & Wildlife Services.

d. Coastal Zone Management:

The project area is outside of the SMA.

e. Unique Natural Features (Slopes, Erosions, Soils Suitability, Sand Dunes and Others):

There are no unique natural features other than gulches which run through the area.

f. Vegetation and Animal Life (flora and fauna):

A study will be commissioned to study the flora and fauna of the area during the EIS process. Because of the site's previous cultivation and proximity to the highway, it is unlikely that any unique or endangered plants or animals will be found.

g. Agricultural Lands:

Punamano has been dormant since the Kahuku sugar plantation closed in the early 1970s. Exception has been an attempt to cultivate feed corn. This operation ceased when it was found to be uneconomic.

The State Department of Agriculture is in the final stages of developing the Kahuku Agricultural Park. 210 acres of improved agricultural land will be leased to farmers.

h. Open Space:

The golf courses will enhance the open space qualities of the region through the open space management of about 605 acres which will be maintained in landscaping, fairways, and water features. Punamano, which abuts Kamehameha Highway for about 6,000 to 7,000 feet, will replace dry grasses and scrub Halekoa with a tree lined corridor.

6. Hazards:

- a. Nuisance and Site Safety: N/A.
- b. Thermal Explosive: N/A.
- c. Airport Clear Zone: N/A.

F. Alternatives Considered:

Campbell Estate has considered a number of alternatives for the property. Land uses for individual parcels have been considered due to land attributes and not simply because the applicant owns a particular piece of land.

1. No Action:

Under this alternative, the proposed integrated golf course complex would not be developed. The land would continue to lie fallow and continue to be a management and eye-sore problem due to illegal dumping of trash and the appearance of brown grasses and scrub Halekoa.

There is a large unmet demand for golf courses on the island of Oahu. The failure to locate and allow this demand to be accommodated on unused, unproductive agricultural land may mean pressures elsewhere for productive agricultural land. The proposed courses are seen as a unique opportunity to enhance the viability and success of the Kuilima Resort by making the area a golf course destination in its own right competitive with other world class golf course resorts. If the golf courses are dispersed elsewhere, then this critical mass will be lost. The sites would remain in their present state awaiting some other development opportunity and none of the benefits of the golf course complex would occur.

2. Agriculture:

While it is possible that additional land in the Kahuku area could be developed for agricultural purposes, additional agricultural development within the proposed sites is not economically attractive. The reasons for this conclusion are as follows: (1) The Estate of James Campbell has made available a mixture of large and small parcels to farmers in the area, and these operations have achieved success and failure; (2) the State Department of Agriculture is developing an agricultural subdivision and anticipates making parcels available in the next year, thus providing ample farmland for some time to come--it is unlikely that small parcels could be developed and leased in a market competitive with the State Agricultural Park; and (3) the agricultural enterprises in the Kahuku area have proved fragile with the Estate having to renegotiate leases and actively pursue alternate tenants.

As noted previously, these sites have proven to be infeasible for productive agricultural use since the Kahuku sugar mill closed in the early 1970s. The reasons relate to weather conditions, topography, poor soils, and lack of infrastructure.

3. Alternative Location:

The only alternative locations that could be considered on Campbell Estate's Kahuku properties are areas that are more suitable for agricultural production. These include the low lands along Malaekahana Stream and the lands that are now actively farmed across Kamehameha Highway from Kuilima Resort. Other lands further mauka might also be considered, but these are presently under lease to the U. S. Army as part of their training facilities. All lands makai of Kamehameha Highway are also in use.

G. Proposed Mitigation Measures, If Any:

Mitigation measures will be defined during the EIS process.

VI. Summary Sheet (See Exhibit "B")

VII. Notification Requirements

A. Attached (see Exhibit "C") is a list of individuals and groups which have been notified concerning this proposal. They include property owners, lessees, sublessees, and residents (none) of the property being proposed for redesignation and of each abutting parcel, neighborhood boards and community associations.

B. Include the Following Certification:

"Ordinance 84-111 states: No application for development plan land use map amendment shall be accepted for processing unless the applicant notifies by mail all owners, lessees, sublessees, and residents of the affected property and of each abutting parcel.

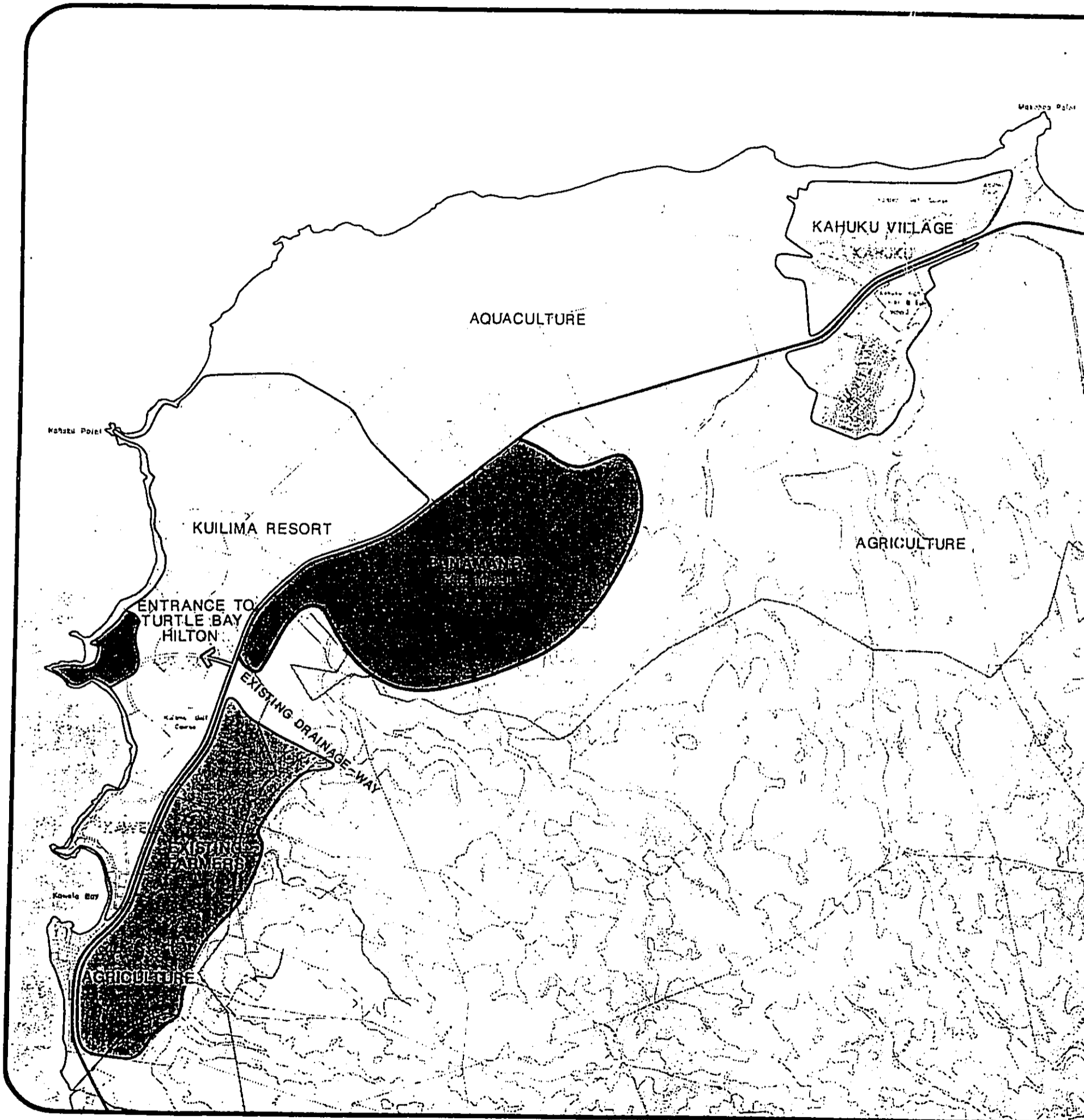
I hereby certify that I have complied with the notification requirements of Ordinance 84-111."

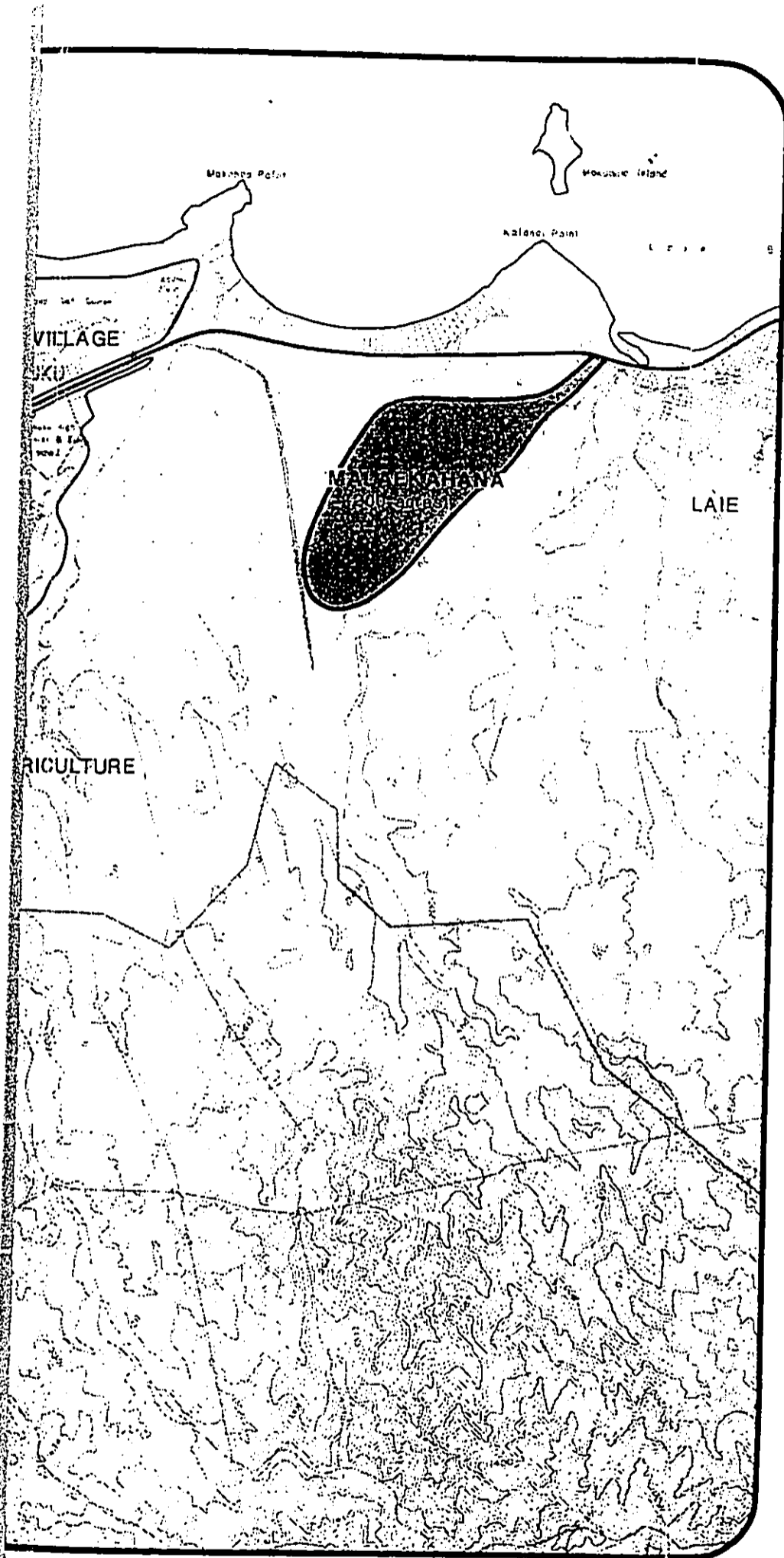


Clinton R. Churchill
Chief Executive Officer

bic:0888r
9/11/89

Attachments





**Exhibit A
Parcel Locations**

**The Estate of
James Campbell**

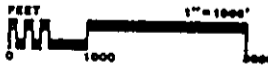


EXHIBIT "B"

DGP SUMMARY SHEET

DGP Ref. No.:
NB Area: Koolauloa
Acreage: About 605 acres
TMK: 5-7-01:Por. 21
5-6-05:5, 6 & Por 1, Por 2 & 7
Date: 09/11/89

Koolauloa
Development Plan Land Use Amendments Being Considered

Amendment Request: Designate certain land in Koolauloa as Park and Recreation

Location: Punamano, Koolauloa, across from the eastern end of the Kuilima Resort on the mauka side of Kamehameha Highway.

Owner: The Estate of James Campbell
828 Fort Street Mall, Suite 500
Honolulu, HI 96813

Basis for Request: To provide land for an integrated golf course complex, "The Country Courses," of ultimately four courses to support Kahuku as a golf course destination.

Type of Project: An integrated golf course complex to strengthen the region as a unique golfing destination.

Impact on Provision of Housing: None

Requested by: Owner

Agent is: Owner

<u>Existing Conditions</u>	<u>Present Plan/Zoning Designations</u>
Land Use: Vacant	State Land Use: Agriculture
Structures: None	DP Public Facilities Map: None
ALISH: Prime/Other Important	DP Special Provisions: None
Soil Features: Coral outcrop, and soil associations Kaena-Waialua and Lolekaa-Waikane	County Zoning: AG-1 & AG-2Agriculture
Possible Constraints: Access to Kamehameha Highway	

EXHIBIT "C"

LIST OF INDIVIDUALS AND GROUPS WHICH HAVE BEEN CONTACTED

Federal Agencies

Department of Agriculture, Soil and Conservation Service
Department of the Army, U.S. Army Engineer District, Honolulu
Department of the Navy, Pearl Harbor Naval Base
Department of the Interior, Fish and Wildlife Service
Department of Transportation, Federal Aviation Administration,
Airports District Office

State and County Agencies

Department of Accounting and General Services
Department of Agriculture
Department of Business and Economic Development
Department of Education
Department of Health
Department of Land & Natural Resources, Historic Preservation
Office
Department of Land & Natural Resources, Division of Land
Management
Kahana Valley State Park Advisory Council
Department of Public Works
Department of Transportation
Land Use Commission
Office of Environmental Quality Control
Office of Hawaiian Affairs
Office of State Planning
University of Hawaii, Water Resources Research Center
University of Hawaii, Environmental Center
Oahu Metropolitan Planning Organization
Department of General Planning
Department of Housing and Community Development
Department of Parks and Recreation
Department of Public Works
Department of Transportation Services
Board of Water Supply
Fire Department
Police Department

Public Utilities

Hawaiian Telephone Company
Hawaiian Electric Company
Hawaiian Electric Renewable Systems

Neighborhood Boards, Community Associations

North Shore Neighborhood Board #27
Koolauloa Neighborhood Board #28
Kawela Bay Community Association
West Kawela Bay Community Association

Exhibit "C"
List of Individuals & Groups
Which Have Been Contacted
Page 2

Kahuku Community Association
Koolauloa Community Council
Hauula Satellite City Hall
Kuilima Estates East Owners' Association
Kuilima Estates Owners Association
Pat's at Punaluu Owners' Association
Hanohano Hale Owners Association
Kaaawa Community Association
Kahuku Housing Corporation
Laie Community Association
Kunani O Hauula
Kahuku Village Association
Kahuku Farmers Association

Islandwide Organizations

Hawaii's Thousand Friends
Land Use Research Foundation
League of Women Voters
The Outdoor Circle
American Lung Association of Hawaii

Other

Amorient Aquafarm, Inc.
Asahi Jyuken
Kahuku Prawn Co.
Cackle Fresh Egg Farms, Inc.
Mr. John Miyasato
Pomai, Inc.
Zion Securities
Ms. A. Kekaulike Kawanakoa
Mr. Jack Waters, Sr.
Mr. Max Smith
Senator Gerald T. Hagino, District 7
Senator Mike McCartney, District 8
Representative Joseph P. Leong, District 14
Representative Reb Bellinger, District 15
Kahuku General Hospital, Administrator

jg:2111h
11/15/89

Environmental Impact Statement
THE COUNTRY COURSES AT KAHUKU

EISPN

**Comment Letters /
Responses**



DEPARTMENT OF THE ARMY
U. S. ARMY ENGINEER DISTRICT, HONOLULU
BUILDING 230
FT. SHAFTER, HAWAII 96858-5440

REPLY TO
ATTENTION OF:

December 8, 1989

Planning Branch

Mr. William E. Wanket
President
William E. Wanket, Inc.
Pacific Tower 660
1001 Bishop Street
Honolulu, Hawaii 96813

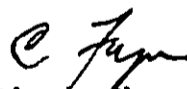
Dear Mr. Wanket:

Thank you for the opportunity to review the Environmental Impact Statement Preparation Notice for the proposed County Courses at Kahuku, Oahu (3 golf course sites at Punamano and 1 golf course site at Malaekahana). The following comments are offered:

a. If fill is placed in any gulches or streams, a Department of the Army permit may be required. The developer should contact Operations Branch (telephone 438-9258) for further information.

b. According to the Flood Insurance Study for the City and County of Honolulu, all of the Punamano site and much of the Malaekahana site are located in Zone D (areas in which flood hazards are undetermined). Portions of the Malaekahana site are located in Zone A (special flood hazard areas inundated by the 100-year flood, with no base flood elevations determined) and in Zone X ("Other Areas" determined to be outside of the 500-year flood plain), as designated by the Federal Emergency Management Agency in September 1987.

Sincerely,


Kisuk Cheung
Chief, Engineering Division

WILLIAM
E.
WANKET
INC.

Land Use Consultant

January 18, 1990

Mr. Kisuk Cheung
Chief, Engineering Division
Department of the Army
U.S. Army Engineer District, Honolulu
Building 230
Ft Shafter, Hawaii 96858-5440

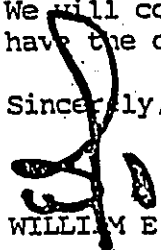
RE: Environmental Impact Statement Preparation Notice (EISPN)
for the Proposed Country Courses at Kahuku - Response to
Comments Received

Dear Mr. Cheung:

Thank you for taking the time to review the above-referenced EISPN. Telephone conversations with Peter Galloway of the Planning Branch, U.S. Army Engineer District, Honolulu, on January 11, 1990, confirmed annotated designations of the Flood Zone Map sent to your office on the same date. This map will be included in the DEIS. Future permit requirements will be coordinated with your office.

We appreciate your additional effort in reviewing the DEIS map. We will continue to coordinate our project with you to ensure that you have the opportunity to provide any additional comments.

Sincerely,


WILLIAM E. WANKET

Pacific Tower
Suite 660
1001 Bishop Street
Honolulu, HI 96813
Phone
(808) 533-4937
FAX 521-5410



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

January 12, 1990

REPLY TO
ATTENTION OF

Real Estate Division

Mr. William E. Wanket
1001 Bishop Street, Suite 600
Honolulu, Hawaii 96813

Dear Mr. Wanket:

As discussed with you on January 12, 1990, the U.S. Air Force had the following comments on the Environmental Impact Statement Preparation Notice (EISPN) for the proposed Country Courses at Kahuku.

a. The EISPN does not address the impact or potential impact of golf course activities on an Air Force water well in the area that provides potable water to Punamano Air Force Station.

b. Golf course maintenance activities could contaminate the water supply in the area. The environmental impact statement should address this issue.

For further information, please contact Mrs. Willette at 449-2105, Hickam Air Force Base.

Sincerely,

A handwritten signature in cursive script, reading "Michael D. Taylor", is written over the typed name.

Michael D. Taylor
Acting Chief, Real Estate
Division

WILLIAM
E.
WANKET
INC.

Land Use Consultant

January 24, 1990

Mr. Michael D. Taylor
Acting Chief, Real Estate Division
Department of the Army
Pacific Ocean Division, Corps of Engineers
Fort Shafter, Hawaii 96858-5440

RE: Environmental Impact Statement Preparation Notice (EISPN)
for the Proposed Country Courses at Kahuku - Response to
Comments Received

Dear Mr. Taylor:

Thank you for your letter of January 12, 1990 forwarding the U.S. Air Force comments on the above-referenced EISPN. Information on comments received is provided:

Air Force Water Well

The exact location of the well which supplies potable water to the Punamano Air Force Station has not yet been established. However, following discussions with Ms Willette, Hickam Air Force Base and our consulting engineer of Smith, Young, and Associates, we believe that the well is located makai of the highway about midway between Turtle Bay Resort and the western portion of the National Wildlife Refuge.

Charles L. Murdoch, Ph.D. and Richard E. Green, Ph.D. have prepared an assessment of fertilizer and pesticide use that will be included in the DEIS. The DEIS addresses the groundwater aquifer which would be recharged by the major portion of the development in the upland area. However, according to the maps of Mink and Lau (WRRC Tech. Rept. No. 179, Nov 1987), there are two additional aquifers associated with the area makai of the highway where the Air Force well is located. Both of these aquifers are in the Koolauloa aquifer system; a shallow, unconfined sedimentary aquifer overlies a confined basal, flank aquifer. It is likely that the Air Force well is located in the deep confined aquifer, which is characterized by

Pacific Tower
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1001 Bishop Street
Honolulu, HI 96813
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FAX 521-5410

-Page 2-

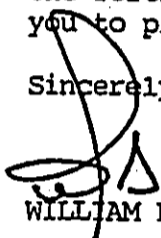
Mr. Michael D. Taylor
Department of the Army
January 24, 1990

Mink and Lau as having a low vulnerability to contamination. Thus, there should be no contamination of the well by chemicals used in management of a golf course at the proposed Punamano site.

Some increase in nitrate in the overlying unconfined, sedimentary aquifer is possible; however this aquifer is brackish and is not used as a potable water source. Small increases in nitrate in the shallow aquifer should not adversely impact these waters relative to ecological considerations.

We appreciate your comments and will incorporate the information into the forthcoming DEIS. We will continue to coordinate our project with you to provide the opportunity for additional review and comments.

Sincerely,



WILLIAM E. WANKET



DEPARTMENT OF THE NAVY

COMMANDER
NAVAL BASE PEARL HARBOR
BOX 110
PEARL HARBOR, HAWAII 96860-5020

IN REPLY REFER TO:

11000
Ser 03(2021C)/3209
15 DEC 1989

Mr. William E. Wanket
William E. Wanket, Inc.
Pacific Tower, Suite 1010
1001 Bishop Street
Honolulu, HI 96813

Dear Mr. Wanket:

ENVIRONMENTAL IMPACT STATEMENT PREPARATION NOTICE (EISPN)
FOR THE PROPOSED COUNTRY COURSES AT KAHUKU

In response to your letter of November 15, 1989, we have reviewed the Environmental Impact Statement Preparation Notice (EISPN) for Country Courses at Kahuku and have no comments to offer at this time. This project proposes to develop one golf course on 200 acres of land at Malaekahana and three golf courses on 605 acres of land at Punamano. The Punamano and Malaekahana sites are located approximately 1.5 and 3.5 miles, respectively, east of the Navy's telecommunications facility at Opana.

The Navy's point of contact is Mr. Bill Liu at 471-3324. Thank you for the opportunity to review the EISPN.

Sincerely,

Bill Liu
Commander
Naval Base Pearl Harbor
Pearl Harbor, HI 96860-5020

WILLIAM
E.
WANKET
INC.

Environmental Consultant

December 19, 1989

Mr. W. K. Liu
Assistant Base Civil Engineer
Department of the Navy
Commander Naval Base Pearl Harbor
Box 110
Pearl Harbor, Hawaii 96860-5020

RE: Environmental Impact Statement Preparation Notice (EISPN)
for the Proposed Country Courses at Kahuku - Response to
Comments Received

Dear Mr. Liu:

Thank you very much for taking the time to review the above-referenced EISPN. We will continue to coordinate our project with you to ensure that you have the opportunity for further review and comments.

Sincerely,



WILLIAM E. WANKET

Pacific Tower
Suite 660
1001 Bishop Street
Honolulu, HI 96813
Phone
(809) 533-4937
FAX 521 5410

UNITED STATES
DEPARTMENT OF
AGRICULTURE

SOIL
CONSERVATION
SERVICE

P.O. BOX 50006
HONOLULU, HAWAII
96850

William E. Wanket
Pacific Tower 660
1001 Bishop Street
Honolulu, Hawaii 96813

December 13, 1989

Subject: Comments on Environmental Impact Statement Preparation Notice
(EISP/N) for THE COUNTRY COURSES AT KAHUKU

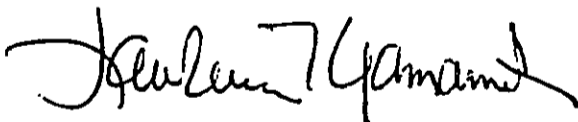
Dear Mr. Wanket:

Both the Funamano and Malaekahana sites contain areas that are classified as Prime Agricultural lands. Because of their suitability for diversified agriculture and their close proximity to other agricultural operations, it is important that these lands remain available for agricultural use. Encroachment by development and non-agricultural uses have historically lead to the loss of agricultural uses for neighboring property.

The Kahuku area is one of the last concentrations of diversified agriculture on Oahu. Conversion of these lands to non-agricultural uses could adversely affect the long term viability of diversified agriculture in the area. Although both sites are currently under-utilized, these lands could be productive if adequate roads, water, electricity, and reasonable long-term leases were available. While it is true that the State of Hawaii is developing an agricultural subdivision in the Kahuku area, it should be noted that there were not enough parcels to supply the number of interested applicants and there continues to be a need for agricultural land.

Thank you for the opportunity to comment on this issue.

Sincerely,



Lawrence T. Yamamoto
District Conservationist

WILLIAM
E.
WANKET
INC.

December 19, 1989

Mr. Lawrence T. Yamamoto
District Conservationist
U.S. Department of Agriculture
Soil Conservation Service
P.O. Box 50006
Honolulu, Hawaii 96830

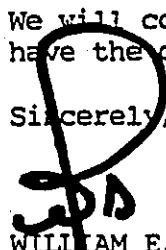
RE: Environmental Impact Statement Preparation Notice (EISPN)
for the Proposed Country Courses at Kahuku - Response to
Comments Received

Dear Mr. Yamamoto:

Thank you very much for taking the time to review the above-referenced EISPN. The Draft EIS presently being prepared will include an agricultural impact analysis by Decision Analysts Hawaii, Inc. The analysis will address the issues of supply and demand for prime agricultural land and the availability of land to small-scale farmers and diversified agriculture.

We will continue to coordinate our project with you to ensure that you have the opportunity for further review and comments.

Sincerely,


WILLIAM E. WANKET

Pacific Tower
Suite 660
1001 Bishop Street
Honolulu, HI 96813
Phone
(808) 533-4937
FAX 521 5410



United States Department of the Interior

FISH AND WILDLIFE SERVICE
PACIFIC ISLANDS OFFICE

P.O. BOX 50167
HONOLULU, HAWAII 96850

DEC 13 1989

William E. Wanket, Inc.
William E. Wanket, President
Pacific Tower Suite 660
1001 Bishop Street
Honolulu, Hawaii 96813

Re: Environmental Impact Statement Preparation Notice, Country Courses
at Kahuku, Oahu

Dear Mr. Wanket:

The U.S. Fish and Wildlife Service (Service) has reviewed the referenced documents and offers the following comments for your consideration.

The James Campbell National Wildlife Refuge in Kahuku was established for the protection of the four species of endangered Hawaiian waterbirds. This refuge consists of the 104.5-acre Kii unit and the 37.5-acre Punamano unit. Both units are leased by the Service from the Estate of James Campbell (Campbell Estate). The Service is currently negotiating with the Campbell Estate to acquire additional acreage for the refuge. Adjacent to the Punamano unit is Punahoolapa Marsh, a wetland identified as essential for the recovery of the endangered Hawaiian waterbirds (Hawaiian Waterbirds Recovery Plan, 1985).

The proposed development of three golf courses at Punamano are of particular concern to the Service because of potential adverse impacts to the wildlife resources of the Punamano unit, Punahoolapa Marsh, and other wetlands in the project area. Potential adverse impacts to these wetlands include the following:

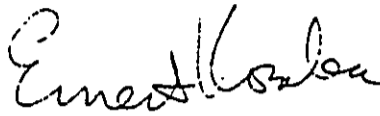
a. Stormwater run-off from these golf courses may carry pesticide residues and suspended sediments into these wetlands. Chronic and acute levels of contaminants may adversely affect the productivity of these wetlands for endangered waterbirds. Increased sediment loading in these wetlands may accelerate their succession to fastlands. The Draft Environmental Impact Statement (EIS) should discuss the potential transport of pesticides, herbicides, and other biocides into the affected wetlands, and their potential impacts on wildlife resources. In addition, the Draft EIS should discuss the existing drainage patterns and the proposed drainage plans for these golf courses in relation to the affected wetlands. As a condition to a Conditional Use Permit, the Service may request to review and approve a list of pesticides, herbicides, and other biocides that may be applied on the proposed golf courses.

b. The Draft EIS should discuss potential impacts to the hydrology of these wetlands by the withdrawal of groundwater for irrigation purposes, and from changes in surface run-off.

There are several small wetlands in the project area for the proposed golf course at Malaekahana. Potential impacts to these wetlands and to coastal water quality from run-off from the proposed golf course should be discussed in the Draft EIS.

We appreciate the opportunity to comment.

Sincerely,



Ernest Kosaka
Field Supervisor
Pacific Islands Office

cc: R/W

WILLIAM
E.
WANKET
INC.

Land Use Consultant

December 20, 1989

Mr. Ernest Kosaka
Field Supervisor
Fish and Wildlife Service
Pacific Islands Office
P.O. Box 50167
Honolulu, Hawaii 96850

RE: Environmental Impact Statements Preparation Notice (EISPN)
for the Proposed Country Courses at Kahuku - Response to
Comments Received

Dear Mr. Kosaka:

Thank you for taking the time to review the above-referenced EISPN.
The following information is provided in response to your comments:

Malaekahana

It is being proposed that the two depressions within the site will remain. A third is being recommended at the lower edge of the site so that the total runoff from the developed course will be less than currently occurs for any given storm condition. The well (or wells) proposed for irrigation of Malaekahana will operate over a long period of the day with very little drawdown. It is not believed that the wells at the golf course site will affect the wetlands at the lower reach of the stream.

Punamano

1. Hoolapa Gulch presently empties into Punahoolapa Marsh. We do not propose to redirect that flow because it could tend to dry the marshlands if it were redirected to the south.

Pacific Tower
Suite 660
1001 Bishop Street
Honolulu, HI 96813
Phone
(808) 533-4937
FAX 521-5410

Page 2

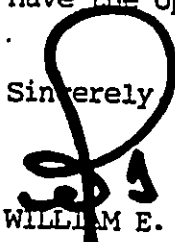
Mr. Ernest Kosaka, Field Supervisor
Fish and Wildlife Service
December 20, 1989

2. Peak flows from Kalaeokahipa will be greatly reduced by diverting flows to a retention basin mauka of Kamehameha Highway. This retention pond can reduce the storm flow by 770 cfs for a one-hour peak flow period. The remaining flow will be directed past Punamano wetlands and then ponded makai and south of Punahoolapa Marsh before being released through the old Kahuku airfield Drain System. The drainage proposal being considered by the Estate of James Campbell will keep all Kalaeokahipa Gulch runoff out of the Wildlife Refuge. Although the draft EIS does not cover the drainage pattern makai of Kamehameha Highway, the Kahuku Drainage Master Plan being prepared by Smith, Young and Associates for the area from approximately Hoolapa Gulch to Kahuku Town (including the Kii Ditch Wildlife Preserve area) will address impacts and mitigative measures for that area.

The Draft EIS will further discuss the preliminary engineering for the drainage of the sites, the resulting impacts, and the mitigative measures to be undertaken. In addition, a comprehensive study on the pesticides and fertilizers as they relate to the proposed project will be presented in the DEIS.

We will continue to coordinate our project with you to ensure that you have the opportunity for further review and comments.

Sincerely,



WILLIAM E. WANKET

JOHN WAIHEE
GOVERNOR



STATE OF HAWAII
DEPARTMENT OF ACCOUNTING AND GENERAL SERVICES
DIVISION OF PUBLIC WORKS

P. O. BOX 119, HONOLULU, HAWAII 96810

DEC 1 1988

RUSSEL S. NAGATA
COMPTROLLER

JAMES H. YASUDA
DEPUTY COMPTROLLER

LETTER NO. (P)2181.9

Mr. William E. Wanket
William E. Wanket, Inc.
1001 Bishop Street, #660
Honolulu, Hawaii 96813

Dear Mr. Wanket:

Subject: Kahuku Country Courses
EIS Preparation Notice

Thank you for the opportunity to review the subject document. Our Department does not intend to be a consulted party for the subject project.

Should there be any questions, please have your staff contact Mr. Cedric Takamoto of the Planning Branch at 548-7192.

Very truly yours,

A handwritten signature in cursive script, appearing to read "Teuane Tominaga".

TEUANE TOMINAGA
State Public Works Engineer

CT:em

WILLIAM
E.
WANKET
INC.

Land Use Consultant

December 6, 1989

Mr. Teuane Tominaga
State Public Works Engineer
Department of Accounting and General Services
Division of Public Works
P.O. Box 119
Honolulu, Hawaii 96810

RE: Environment Impact Statement Preparation Notice (EISPN)
for Proposed Country Courses at Kahuku - Response to Comments
Received

Dear Mr. Tominaga:

Thank you very much for taking the time to review the above-referenced EISPN. We will continue to coordinate our project with you, for information purposes, to provide you an opportunity for further review and comment.

Sincerely,


WILLIAM E. WANKET

Pacific Tower
Suite 660
1001 Bishop Street
Honolulu, HI 96813
Phone
(808) 533-4937
FAX 521-5410

JOHN WAIHEE
GOVERNOR



YUKIO KITAGAWA
CHAIRPERSON, BOARD OF AGRICULTURE

SUZANNE D. PETERSON
DEPUTY TO THE CHAIRPERSON

FAX: 548-6100

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

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

December 22, 1989

William E. Wanket, Inc.
William E. Wanket, President
Pacific Tower 660
1001 Bishop Street
Honolulu, Hawaii 96813

Dear Mr. Wanket:

Subject: Environmental Impact Statement Preparation Notice
(EISPN) for Country Courses at Kahuku, Oahu
Four Golf Courses - Punamano and Malaekahana
Estate of James Campbell
TMK: 5-6-05: 5, 6, por. 1, por. 2, por. 7
5-7-01: por. 21
5-6-06: 2, por. 6
Area: 805 acres

The Department of Agriculture has reviewed the document for each site and offers the following comments.

The applicant is seeking to develop three golf courses at the Punamano site (605 acres) and one course at the Malaekahana site (200 acres). Both sites were formerly cultivated in sugarcane by Kahuku Sugar Company.

For both sites, the respective documents state that "(t)he land which is subject to this request has proven infeasible to farm over the years since the closing of the Kahuku plantation in the early 1970s. Some of the reasons are the variable topography, climatic conditions, lack of adequate access, and lack of water" (page 4, both documents). This statement is paraphrased elsewhere (page 8 of Punamano and page 7 of Malaekahana).

We agree that feasibility for agricultural use of the subject sites is partly a function of the subject land areas' physical limitations. However, our cursory review of the soils of the area indicates that about one-half of the Punamano site



and two-thirds of the Malaekahana site are comprised of soils well-suited to the cultivation of most agricultural crops. Outside of the coral outcrops and rocky land, the Malaekahana site is fairly level. The mauka portion of the Punamano site is variably sloped. The agronomic suitability of the relevant soils does not appear to be a limiting factor to substantial agricultural use of the subject lands. The Draft EIS should be more specific and further define the limitations which adversely affect the agronomic and economic viability of agricultural use of the subject properties.

The documents go on to say that "...additional agricultural development within the proposed site(s) (are) not economically attractive" due to:

- (1) farming activities in the area achieving "...success and failure" (page 19 of Punamano and page 18 of Malaekahana);

COMMENT: What is meant by "success and failure"? We understand that agricultural leases in the area are generally short (e.g., month-to-month). Short leases make it difficult for many farmers to acquire loans to start, maintain and expand most agricultural pursuits.

- (2) the Department of Agriculture is developing the Kahuku Agricultural Park which would provide "...ample farm land for some time to come" and would make unlikely that "...small farm parcels could be developed and leased in a market competitive with the State Agricultural Park" (page 19 of Punamano and page 18 of Malaekahana);

COMMENT: Upon completion, the 550-acre (220 arable acres) Kahuku Agricultural Park will consist of 24 lots (5 to 10 acres each) for truck crops, orchards and nurseries. No dwellings will be allowed on the lots. A recent count indicated about 80 applicants have submitted interest forms for Kahuku Agricultural Park. Lease rents (in other Parks, up to \$250 per acre/year) for a lease term to the year 2007 will reflect valuation of the land in its agriculture use. While it is unlikely that a private agricultural park development could match the State's lease rent, especially if a property's speculative rather than agricultural value is used to establish rents,

Mr. William E. Wanket
December 22, 1989
Page -3-

there remains a need for additional agricultural lots in the Kahuku area.

- (3) "...the agricultural enterprises in the Kahuku area have proved fragile with the Estate having to renegotiate leases and actively pursue alternate tenants" (page 19 of Punamano and page 18 of Malaekahana)

COMMENT: see comment to (1).

The documents for both golf course sites state that their "...placement on poor (sic) agricultural land recognizes the need to preserve agriculture on better adjoining lands" (Punamano and Malaekahana, page 8). We believe that the economic value of these "better adjoining lands" is closely related to that of the proposed golf courses. Such a relationship would be an adverse one from the perspective of these agricultural lands' subsequent availability and affordability for bona-fide agricultural uses, if the golf courses are developed.

Regarding the golf courses themselves, we have the following comments:

- (1) Plants already present in Hawaii should be used for landscaping, with emphasis on native species.
- (2) Imported sod or plant materials from certified mainland growers will have to go through a one-year quarantine as stated in the import rules to prevent the establishment of new insects and diseases.
- (3) For turfgrass, native turfgrass and certified seed should be used for initial planting at the golf courses. The use of certified seeds will minimize the potential for the introduction of alien pathogens and insect species. Turfgrasses already grown in Hawaii should be considered first, as new species or varieties may become naturalized over time and perhaps exhibit noxious tendencies.

Mr. William E. Wanket
December 22, 1989
Page -4-

We hope our comments are helpful in the development of the Draft EIS. We look forward to reviewing the Draft EIS upon its availability.

Thank you for the opportunity to comment.

Sincerely,

Yukio Kitagawa
YUKIO KITAGAWA
Chairperson, Board of Agriculture

cc: OEQC
OSP (attn: Land Use Division)
Plant Industry (attn: Mr. Robert A. Boesch)

WILLIAM
E.
WANKET
INC.

Land Use Consultants

December 27, 1989

Mr. Yukio Kitagawa
Chairperson, Board of Agriculture
Department of Agriculture
1428 South King Street
Honolulu, Hawaii 96814-2512

**RE: Environmental Impact Statement Preparation Notice (EISPN)
for the Proposed Country Courses at Kahuku - Response to
Comments Received**

Dear Mr Kitagawa:

Thank you very much for taking the time to review and comment on the above-referenced EISPN. Information, in response to your statements and questions, is provided:

Agriculture

Much of the information contained in the EISPN was preliminary in nature, awaiting the report by Decision Analysts Hawaii, Inc., on "The Country Courses at Kahuku, Impact on Agriculture." The report presents a comprehensive analysis of the project site agronomical conditions, the four soil classifications commonly used in Hawaii, and agricultural uses and soil types as they pertain to the project area. In addition, the report also addresses the issue of demand and supply for prime agricultural lands and the availability of land to small-scale farmers for diversified agriculture. Decision Analysts Hawaii, Inc. has included a section on the impact on agricultural land values and lease rents as well as the impact that the proposed courses will have on the growth of diversified agriculture. Where appropriate, mitigative measures are recommended.

Pacific Tower
Suite 660
1001 Bishop Street
Honolulu, HI 96813
Phone
(808) 533-4937
FAX 521-5410

-Page 2-
Mr. Yukio Kitagawa
Board of Agriculture
December 27, 1989

Landscaping and Plantings

We agree that all effort should be made to use locally available grasses and plants. All requirements for plant materials seeds, and plants will be met.

We appreciate your comments and will continue to coordinate our project with you to ensure that you have further opportunity for review and comments.

Sincerely,



WILLIAM E. WANKET



DEPARTMENT OF BUSINESS
AND ECONOMIC DEVELOPMENT

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

KAMAMAU BUILDING, 250 SOUTH KING ST., HONOLULU, HAWAII
MAILING ADDRESS: P.O. BOX 2359, HONOLULU, HAWAII 96804 TELEX: 7430250 HIDPED FAX: (808) 523-8637

November 28, 1989

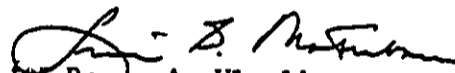
Mr. William E. Wanket
Land Use Consultant
Pacific Tower 660
1001 Bishop Street
Honolulu, Hawaii 96813

Re: Environmental Impact Statement Preparation Notice
Country Courses at Kahuku
(3-golf course sites at Punamano and
1 golf course site at Malaekahana)

Dear Mr. Wanket:

The Department of Business and Economic Development
has no comments.

Sincerely,


for Roger A. Ulveling

RAU:dq

WILLIAM
E.
WANKET
INC.

Land Use Consultant

November 30, 1989

Mr. Roger A. Ulveling
Director
State Department of Business
and Economic Development
P.O. Box 2359
Honolulu, Hawaii 96804

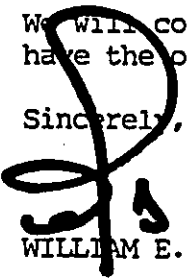
RE: Environmental Impact Statement Preparation Notice (EISPN) for
the Proposed Country Courses at Kahuku - Response to Comments
Received

Dear Mr. Ulveling:

Thank you very much for taking the time to review the above-referenced
EISPN and for your letter of November 28, 1989.

We will continue to coordinate our project with you to ensure that you
have the opportunity for further review and additional comments.

Sincerely,


WILLIAM E. WANKET

Pacific Tower
Suite 660
1001 Bishop Street
Honolulu, HI 96813
Phone
(808) 533-4937
FAX 521-5410

JOHN WAIHEE
GOVERNOR



CHARLES T. TOGUCHI
SUPERINTENDENT

STATE OF HAWAII
DEPARTMENT OF EDUCATION
P. O. BOX 2360
HONOLULU, HAWAII 96804

OFFICE OF THE SUPERINTENDENT

November 27, 1989

Mr. William E. Wanket, President
William E. Wanket, Inc.
Pacific Tower 660
1001 Bishop Street
Honolulu, Hawaii 96813

Dear Mr. Wanket:

SUBJECT: Applications for Development Plan Amendments and
Environmental Assessment on Proposals to Designate
Land for Preservation at:

1. Punamano
TMK: 5-6-05: 5,6, Por 1, Por 2, and Por 7
5-7-01: Por 21

2. Malaekahana
TMK: 5-6-06:2 and Por. 6

Our review of both proposals to develop the subject lands
into golf courses indicates that there will be negligible
impact on our area schools in Kahuku.

Thank you for the opportunity to comment.

Sincerely,

A handwritten signature in cursive script that reads "Charles T. Toguchi".

Charles T. Toguchi
Superintendent

CTT:jl

cc: Mr. E. Imai
Mrs. S. Loo

WILLIAM
E.
WANKET
INC.

Land Use Consultant

December 10, 1989

Mr. Charles T. Toguchi
Superintendent
Department of Education
P.O. Box 2360
Honolulu, Hawaii 96804

RE: Environmental Impact Statement Preparation Notice (EISPN)
for Proposed Country Courses at Kahuku - Response to Comments
Received

Dear Mr. Toguchi

Thank you very much for taking the time to review the above-referenced EISPN. Although you have indicated that the project will have a negligible impact on Kahuku area schools, we will continue to coordinate our project with you to ensure that you have the opportunity for further review and comments.

Sincerely,


WILLIAM E. WANKET.

Pacific Tower
Suite 660
1001 Bishop Street
Honolulu, HI 96813
Phone
(808) 533-4937
FAX 521-5410

JOHN WAIHEE
GOVERNOR OF HAWAII



STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES

P. O. BOX 621
HONOLULU, HAWAII 96809

REF:OCEA-VIN

JAN 4 1990

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

DEPUTIES

LIBERT K. LANDGRAF
MANABU TAGOMORI
RUSSELL N. FUKUMOTO

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

File: 90-290
Doc.: 7091E

William E. Wanket, Inc.
Mr. William E. Wanket, President
Pacific Tower 660
1001 Bishop Street
Honolulu, Hawaii 96813

Dear Mr. Wanket,

SUBJECT: Environmental Impact Statement Preparation Notice
(EISPN) for proposed Country Courses at Kahuku (three
golf course sites at Punamano and one golf course
site at Malaekahana)

Thank you for giving our Department the opportunity to comment on
this matter. We have reviewed the materials you submitted and have
the following comments.

The EIS should address the water source and quantity of water
required for this development. If new wells are proposed to be
drilled, Well construction permits will be required. Any work in
streams will require a Stream Channel Alteration permit.

Also, the EIS should describe measures to mitigate impacts on
aquatic resources from the proposed grading activities. We are
concerned that excessive erosion would occur during periods of
heavy rainfall resulting in siltation of aquatic habitats makai of
the proposed project site. In addition, storm water runoff, may
transport herbicides, pesticides and other contaminants into nearby
aquatic environments.

The potential effect of drainage from the Punamano parcel into
lower U.S. Fish and Wildlife Wetlands should be addressed. Heavy
use of fertilizer, as well as pesticides and herbicides, is
characteristic of golf course grounds management. Introduction of
these contaminants, either through runoff or subsurface drainage,
to the wetlands could fundamentally alter the nature of the area.
Mitigation measures to prevent such contamination might be required.

Mr. William E. Wanket


- 2 -

Doc. 7091E

Finally, the EISPN document states that the developer will commission an archaeological study which will constitute a portion of the EIS. We believe that the study should meet our inventory survey requirements.

If you have any questions, please feel free to call me or Cathy Tilton at our Office of Conservation and Environmental Affairs at 548-7837.

Very truly yours,



W. W. Paty

WILLIAM W. PATY

cc: DAR, Historic Preservation Program, DOFAW, DOWALD

WILLIAM
E.
WANKET
INC.

Land Use Consultant

January 19, 1990

Mr. William W. Paty
Chairperson
Board of Land and Natural Resources
P.O. Box 621
Honolulu, Hawaii 96809

RE: Environmental Impact Statement Preparation Notice (EISPN)
for Proposed Country Courses at Kahuku - Response to
Comments Received

Dear Mr. Paty:

Thank you for taking the time to review the above-referenced EISPN.
Information to comments received is provided:

Water Source and Quantity of Water:

Preliminary engineering studies for the project have been prepared by Smith, Young and Associates. The Draft EIS will present information on project water sources and estimated requirements for potable and nonpotable water. We appreciate receiving the information on permits. Should such work be necessary, all requirements will be met.

Drainage:

The Draft EIS will include a section on drainage and, where appropriate, mitigative measures regarding erosion and storm water runoff will be presented.

Fertilizers and Pesticides:

An environmental assessment of fertilizer and pesticide use has been conducted by Charles L. Murdoch, Ph.D. and Richard E. Green, Ph.D. The study addresses the potential of chemical runoff into the lower U.S. Fish and Wildlife Wetlands. Recommended mitigative measures to prevent contamination will be included in the Draft EIS.

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1001 Bishop Street
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Phone
(808) 533-4937
FAX 521-5410

-Page 2-
Mr. William W. Paty
Chairperson
Board of Land and Natural Resources
January 19, 1990

Archaeological Survey

The Draft EIS will include an archaeological study of the project prepared, in coordination with your office, by Archaeological Consultants of Hawaii, Inc. The study was prepared using the required survey methods.

We appreciate your comments and will continue to coordinate our project with your office to ensure further opportunity for review and comments.

Sincerely,



WILLIAM E. WANKET

JOHN WAIHEE
GOVERNOR OF HAWAII



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

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

DEPUTIES

LIBERT K. LANDGRAF
MANABU TAGOMORI
RUSSELL N. FUKUMOTO

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

December 21, 1989

William E. Wanket, President
William E. Wanket, Inc.
Pacific Tower 660
1001 Bishop Street
Honolulu, Hawaii 96813

Dear Mr. Wanket:

SUBJECT: Review of EISPN for the Country Courses at Kahuku
Kahuku and Malaekahana, Koolauloa, O'ahu

Thank you for the opportunity to comment on this EISPN.

Although, as you note on page 16 under environmental impacts, the properties have been used for both sugar and cattle, we believe there are still a number of extant archaeological sites and that the project needs to undergo historic preservation review.

As the applicant has undertaken to commission an archaeological survey, we will look forward to receiving the survey report.

Sincerely,

A handwritten signature in cursive script, appearing to read "Don Hibbard".

DON HIBBARD, Director
Historic Preservation Program

WILLIAM
E.
WANKET
INC.

Land Use Consultant

January 2, 1990

Mr. Don Hibbard
Director
Historic Preservation Program
Department of Land and Natural Resources
P.O. Box 621
Honolulu, Hawaii 96809


RE: Environmental Impact Statement Preparation Notice (EISPN)
for the Proposed Country Courses at Kahuku - Response to
Comments Received

Dear Mr. Hibbard:

Thank you for taking the time to review the above-referenced EISPN. The Draft EISs for the proposed Country Courses at Kahuku, Malaekahana and Punamano sites, will contain comprehensive archaeological information prepared by Archaeological Consultants of Hawaii, Inc. The reports provide an archaeological assessment for each site and, where appropriate, mitigative measures are recommended.

We will continue to coordinate our project with your office to provide the opportunity for further review and comments.

Sincerely,


WILLIAM E. WANKET

Pacific Tower
Suite 660
1001 Bishop Street
Honolulu, HI 96813
Phone
(808) 533-4937
FAX 521-5410

to file 728

JOHN WAIHEE
GOVERNOR OF HAWAII



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

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

September 20, 1989

SEP 22

Mr. Charles A. Ehrhorn
Asset Manager
The Estate of James Campbell
Suite 500
828 Fort Street Mall
Honolulu, HI 96813-4380

Dear Sir:

Subject: Application to Amend the Koolauloa Development Plan
Land Use Map

Your application dated September 11, 1989 regarding the subject matter is acknowledged.

We will communicate with you again as soon as we have had the opportunity to review your request. If you have any questions, please feel free to contact us at 548-3262.

Very truly yours,

DEAN UCHIDA
Oahu District Land Agent

cc: Mr. J. D. Ing
Mr. M. Kealoha
Mr. M. Shimabukuro

D-94

WILLIAM
E.
WANKET
INC.

Land Use Consultant

November 30, 1989

Mr. Dean Uchida
Oahu District Land Agent
Department of Land and Natural Resources
Division of Land Management
P.O. Box 621
Honolulu, Hawaii 96809

RE: Environmental Impact Statement Preparation Notice (EISPN) for
the Proposed Country Courses at Kahuku - Response to Comments
Received

Dear Mr. Uchida:

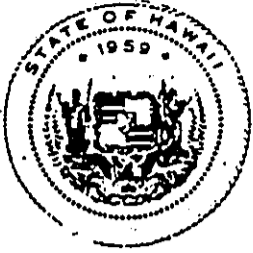
Thank you very much for taking the time to review the above-referenced
EISPN and for your letter of September 20, 1989 acknowledging the
Application to Amend the Koolauloa Development Plan Land Use Map.

We will continue to coordinate our project with your office to ensure
that you have the opportunity for further review and additional comments.

Sincerely,


WILLIAM E. WANKET

Pacific Tower
Suite 660
1001 Bishop Street
Honolulu, HI 96813
Phone
(808) 533-4937
FAX 521-5410



STATE OF HAWAII
DEPARTMENT OF BUSINESS
AND ECONOMIC DEVELOPMENT

LAND USE COMMISSION

Room 104, Old Federal Building, 335 Merchant Street
Honolulu, Hawaii 96813 Telephone: 548-4611

JOHN WAIHEE
Governor
RENTON L.K. NIP
Chairman
LAWRENCE F. CHUN
Vice Chairman

COMMISSION MEMBERS:
Sharon R. Himeno
Allen K. Hoe
Allen Y. Kalfoka
Eusebio Lapena, Jr.
James M. Shinno
Elton Wada
Frederick P. Whittemore
ESTHER UEDA
Executive Officer

December 11, 1989

William E. Wanket, Inc.
William E. Wanket, President
Pacific Tower 660
1001 Bishop Street
Honolulu, Hawaii 96813

Dear Mr. Wanket:

Subject: EISPN For the Proposed Country Courses at
Punamano and Malaekahana, Koolauloa, City and
County of Honolulu

We have no comments to offer except that the proposed sites are designated within the State Land Use Agricultural District and involve lands rated Overall Master Productivity "A" and "B" by the Land Study Bureau. Based on the information contained in the subject report, we understand the applicant will be submitting a district boundary amendment petition for the proposed golf course uses.

Thank you for the opportunity to comment.

Sincerely,

ESTHER UEDA
Executive Officer

EU:to

WILLIAM
E.
WANKET
INC.

Land Use Consultant

December 20, 1989


Ms Esther Ueda
Executive Officer
Land Use Commission
Department of Business and Economic
Development
335 Merchant Street
Room 104
Honolulu, Hawaii 96813

RE: Environmental Impact Statement Preparation Notice (EISPN)
for the Proposed Country Courses at Kahuku - Response to
Comments Received

Dear Ms Ueda:

Thank you for taking the time to review the above-referenced EISPN and for providing the Land Study Bureau ratings for the proposed sites. We will continue to coordinate our project with your office to ensure that you have the opportunity for further review and comments.

Sincerely,


WILLIAM E. WANKET

Pacific Tower
Suite 660
1001 Bishop Street
Honolulu, HI 96813
Phone
(808) 533-4937
FAX 521-5410



OFFICE OF STATE PLANNING

Office of the Governor

STATE CAPITOL, HONOLULU, HAWAII 96813 TELEPHONE (808) 548-5893

JOHN WAIKILE, Governor

January 4, 1990

Mr. William E. Wanket, President
William E. Wanket, Inc.
Pacific Tower 660
1001 Bishop Street
Honolulu, Hawaii 96813

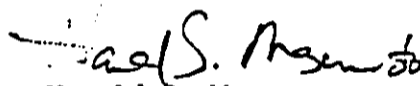
Dear Mr. Wanket:

SUBJECT: Environmental Impact Statement Preparation Notice (EISPN)
for the Proposed Country Courses at Kahuku

Enclosed for your information and use is a letter dated April 6, 1989
pertaining to the Draft Environmental Impact Statement for the subject
projects.

Thank you for the opportunity to comment.

Sincerely,


Harold S. Masumoto
Director

Enclosure

Ref. No. P-9327

April 6, 1989

The Honorable Donald A. Clegg
Chief Planning Officer
Department of General Planning
City and County of Honolulu
650 South King Street
Honolulu, Hawaii 96813

Dear Mr. Clegg:

Subject: Draft Environmental Impact Statement (DEIS) for The Country
Courses at Kahuku, Punamano and Malaekahana, Koolauloa
District, Oahu, Hawaii

We have reviewed the DEIS and have the following comments.

It is our understanding that the Kuilima Resort Company is proposing to
develop two golf course complexes consisting of the following:

Punamano Site (605 acres)
Three 18-hole golf courses
Three golf clubhouses
Two golf driving ranges

Malaekahana Site (228 acres)
One 18-hole golf course
One golf clubhouse
One golf driving range

According to the DEIS, there are 387 acres of Class A and Class B soils
on the Punamano site and approximately 42 acres of Class B soils on the
Malaekahana site. The DEIS further states that a Land Use District Boundary
Amendment (LUDBA) from Agriculture to Urban will be required because golf
courses are not permitted uses on these lands as designated by the former Land
Study Bureau.

Information provided in the DEIS indicates that there are 28 golf courses
presently operating on Oahu and further that there are 29 proposed golf
courses currently planned at 23 developments on Oahu. The DEIS even mentions
the North Shore/Koolauloa area as a possible golf center for both residents
and visitors.

The Honorable Donald A. Clegg
Page 2
April 6, 1989

Due to the proliferation of golf courses on Oahu, the Office of State Planning will carefully analyze the environmental impacts and the need for additional golf courses on the North Shore and the costs/benefits to the residents of the area. We will focus on these issues during the Land Use Commission hearings on the proposed projects.

The Kahuku Land Use Plan (March 1988) by the Estate of James Campbell should also be discussed in the DEIS.

With respect to the Hawaii Coastal Zone Management (CZM) Program, we are concerned with the potential impacts upon coastal ecosystems. It is the CZM coastal ecosystem objective to protect valuable coastal ecosystems from disruption and minimize adverse impacts on all coastal ecosystems. In this regard the EIS should discuss the impacts of pesticides and fertilizers in surface water runoff on the James Campbell National Wildlife Refuge at Punamano Pond and the endangered Hawaiian waterbirds. Even small quantities of pesticides can adversely affect the endangered waterbirds due to chronic long-term exposure, and increased nutrient levels can adversely affect their habitat.

Thank you for the opportunity to provide our comments. If you have any questions, please feel free to contact our CZM office at 548-5973.

Sincerely,

Harold S. Masumoto
Director

cc: Alan Nii, Esq.
Kuilima Resort Company
Group 70 Ltd.

January 9, 1990

WILLIAM
E.
WANKET
INC.

Mr. Harold S. Masumoto
Director
Office of State Planning
State Capitol
Honolulu, Hawaii 96813

**RE: Environmental Impact Statement Preparation Notice (EISPN)
for the Proposed Country Courses at Kahuku - Response to
Comments Received**

Dear Mr. Masumoto:

Thank you very much for taking the time to review the above-referenced EISPN. Information on comments offered is provided below:

Punamano/Malaekahana Sites (Description)

For information purposes, I am enclosing a copy of the proposed Malaekahana project site, showing the relationship of this project to the site previously referred to as "The Country Courses at Kahuku (Malaekahana). The Punamano course, however, is the same site identified by your referenced DEIS, but with some revisions.

Punamano Site (605 acres)

Three 18-hole golf courses
Two clubhouses
One golf driving range

Malaekahana Site (200 acres)

One 18-hole golf course
One Clubhouse
One golf driving range

Soil Classifications

The DEIS will include a discussion and evaluation of soil classifications on the site. The evaluation was performed by Decision Analysts, Hawaii, Inc.

Pacific Tower
Suite 660
1001 Bishop Street
Honolulu, HI 96813
Phone
(808) 533-4937
FAX 521-5410

-2-

Mr. Harold Masumoto
Office of State Planning
January 9, 1990

The DEIS will provide a list of the approvals and permits required as well as an estimated timetable for completion. Included in the various processes required preceding construction is a Land Use District Boundary Amendment from Agriculture to Urban.

Existing and Proposed Golf Courses on Oahu

Information provided in the market assessment prepared by John Zapotocky, Consultant, indicates that there are 28 golf courses presently operating on Oahu with 44 (18 hole equivalent courses) planned at 38 locations. The Draft Environmental Impact Statement for the Country Courses at Kahuku (Punamano and Malaekahana) will include discussions on the demand for the proposed golf complex, the project's support of the proposed Kuilima Resort complex, and the added recreational opportunities created for Oahu's resident population. The market assessment will be included in entirety as an appendix to the Draft EIS.

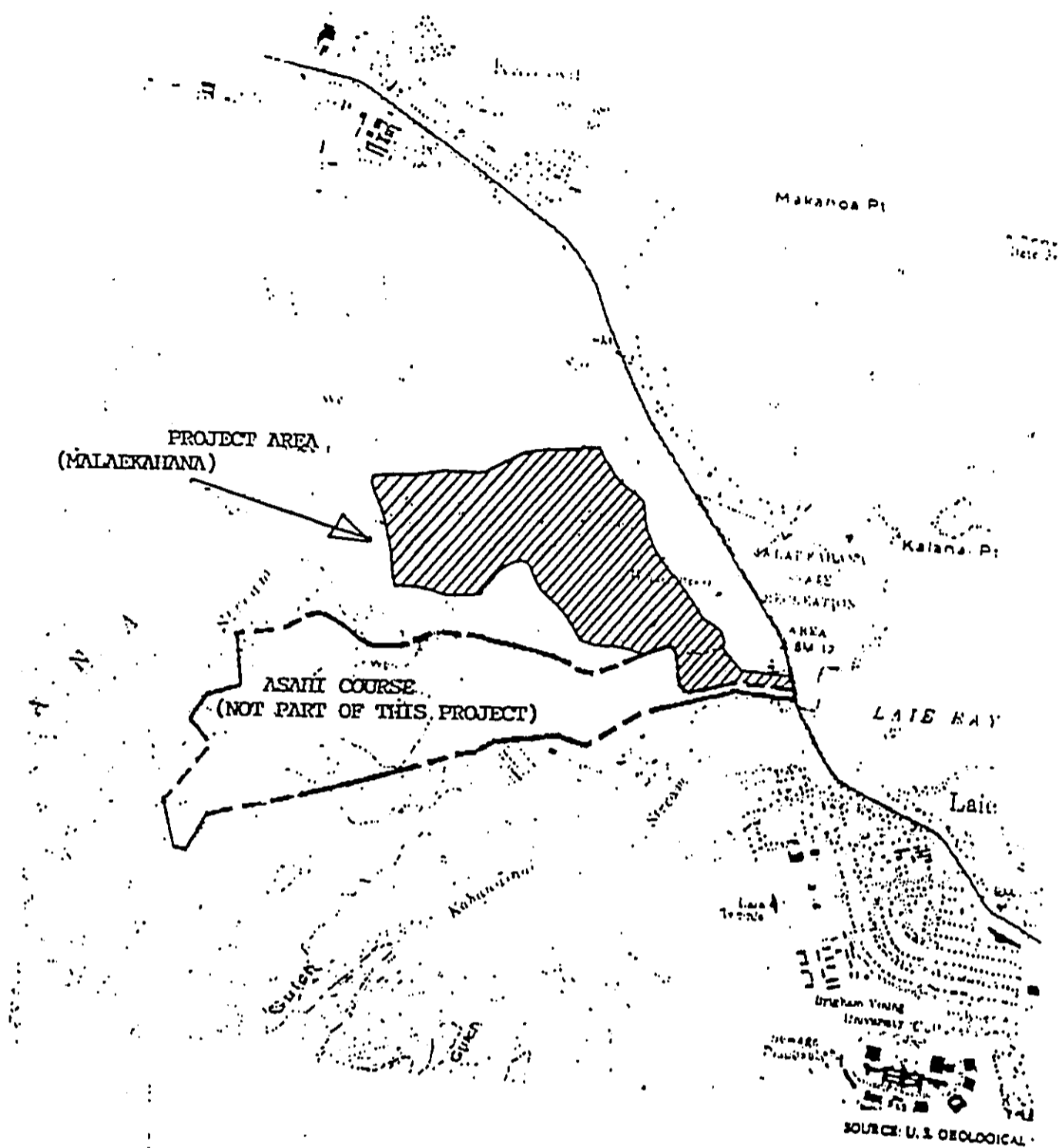
The Draft EIS will be related to the adopted DP Land Use Map.

A study on the impacts of pesticides, fertilizers, and herbicides has been prepared by Charles L. Murdoch, Ph.D and Richard E. Green, Ph.D. This report describes the potential impact of chemicals to the areas surrounding the project sites and, where appropriate, will suggest mitigative measures.

We appreciate your comments and will continue to coordinate our project with your office to ensure further opportunity for review and comment.

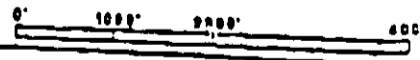
Sincerely,


WILLIAM E. WANKET



THE COUNTRY COURSES AT KAHUKU (MALAEKAHANA)

PROPERTY BOUNDARY



JOHN WAIHEE
GOVERNOR



STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
869 PUNCH-BOWL STREET
HONOLULU HAWAII 96813-5097

DEC 11 1989

EDWARD Y. HIRATA
DIRECTOR

DEPUTY DIRECTORS
JOHN K. UCHIMA
RONALD N. HIRANO
DAN T. KOCHI
JEANNE K. SCHULTZ

IN REPLY REFER TO:
HWY-PS
2.9488

Mr. William E. Wanket
President
William E. Wanket Inc.
Pacific Tower 660
1001 Bishop Street
Honolulu, Hawaii 96813

Dear Mr. Wanket:

Environmental Impact Statement Preparation Notice
(EISPN) for the Proposed Country Courses at Kahuku

Thank you for your letter of November 15, 1989, requesting our review of the subject EISPN.

We are attaching our letter (HWY-PS 2.6230 dated May 2, 1989) to OEQC which states our concerns regarding the DEIS. These comments are still applicable and should be considered in the preparation of the traffic impact study.

Very truly yours,

A handwritten signature in black ink, appearing to read "Edward Y. Hirata".

Edward Y. Hirata
Director of Transportation

Attachment

MAY - 2 1989

5111
HWY-PS
2.6230

MEMORANDUM

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

FROM: Director of Transportation

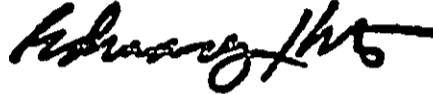
SUBJECT: DEIS FOR THE COUNTRY COURSES AT KAHUKU, OAHU,
TMK: 5-5; 5-6; 5-7

Thank you for transmitting the above document. We have reviewed the DEIS and our comments are as follows:

1. A protective fence should be installed along the Kamehameha Highway rights-of-way at the Punamano Golf Course to protect motorists/bystanders from being hit by stray golf balls. The developer should also consider realigning the course layout for optimum safety.
2. The developer should dedicate to the State a minimum 20 feet wide strip of land along the existing highway rights-of-way to allow for future widening of Kamehameha Highway.
3. Direct diversion of surface water runoff onto Kamehameha Highway is not allowed.
4. Plans for roadway related improvements especially at the access connections to these golf courses shall be submitted to us for our review and approval. All costs incurred for these improvements shall be borne by the developer.

MAY - 2 1989

5. At the top of page 13 of the TIAR Appendix "O", the referenced traffic station should be 26-F instead of C-29-B.
6. Using only the counts at Pearl Country Golf Club in Honolulu may not be reliable enough to use in estimating the project generated trips. We recommend that the ITE trip generation rates be used. The "numbers" in the tables and figures in the TIAR should be revised accordingly.
7. We also recommend that the developer conduct periodic traffic studies to reassess the adequacy of the highway intersections and to implement, at his cost, mitigative measures to correct any deficiencies.



Edward Y. Hirata

FC/RFT:gf

bcc: HWY-DD, -T, -CM, -PS

WILLIAM
E.
WANKET
INC.

Land Use Consultant

December 19, 1989

Mr. Edward Y. Hirata, Director
Department of Transportation
State of Hawaii
880 Punchbowl Street
Honolulu, Hawaii 96813

RE: Environmental Impact Statement Preparation Notice (EISPN)
for Proposed Country Courses at Kahuku - Response to
Comments Received

Dear Mr. Hirata:

Thank you for taking the time to review the above-referenced EISPN and for enclosing the letter to Dr. Miura on the same subject. The following is provided in response to your comments:

Protective Fence

A protective fence is considered appropriate and we will coordinate with the State Department of Transportation on the necessary height and length of the fence.

Right of Way

The project will comply with State DOT requirements for right-of-way standards.

Drainage and Stormwater Runoff

The Draft EIS will address the diversion of water from the Punamano Courses to a storm water sump mauka of Kamehameha Highway. The sump will have the ability to hold 64 acre feet and, therefore, some 770 cfs of peak runoff will be removed from the main flow at the highway. No diversion onto Kamehameha Highway is proposed.

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Honolulu, HI 96813
Phone
(808) 533-4937
FAX 521-5410

Page 2

Mr. Edward Y. Hirata, Director
Department of Transportation
December 19, 1989

Roadway Improvements

Construction plans for roadway improvements at the access connections to the proposed golf courses will be provided for coordination and review. All costs incurred will be borne by the developer.

Traffic Station

The referenced traffic station C-29-B in the TIAR will be changed to station 26-F.

ITE Trip Generation Rates

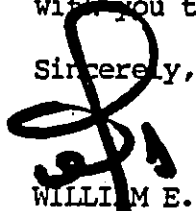
The revised TIAR dated December 1989 will reflect the standard ITE trip generation rates rather than the counts obtained at the Pearl Country Club in establishing the project generated trips.

Traffic Assessment

The project will require several major permit approvals such as Land Use Boundary Map change, DP Land Use Map change, and a change in zoning. During these major permit review processes, updated traffic impact information, as necessary, will be made available.

We appreciate your comments and will continue to coordinate our project with you to provide additional opportunity for review.

Sincerely,



WILLIAM E. WANKET

JOHN WAIHEE
GOVERNOR



JOSEPH K. CONANT
EXECUTIVE DIRECTOR

STATE OF HAWAII
DEPARTMENT OF BUDGET AND FINANCE
HOUSING FINANCE AND DEVELOPMENT CORPORATION
SEVEN WATERFRONT PLAZA, SUITE 300
500 ALA MOANA BOULEVARD
HONOLULU, HAWAII 96813
FAX (808) 543-6841

IN REPLY REFER TO:

89:PLNG/5047 jt

December 14, 1989

Mr. William E. Wanket, President
William E. Wanket, Inc.
Pacific Tower 660
1001 Bishop Street
Honolulu, Hawaii 96813

Dear Mr. Wanket:

Re: Environmental Impact Statement Preparation Notice (EISPN)
for the Proposed Country Courses at Kahuku

We have reviewed the subject EISPN and have the following
comments:

1. An underlying value of the Hawaii State Plan is community or social well-being. Thus, one of the policies of the Plan [Section 226-25(b)(3)] is to "encourage increased awareness of the effects of proposed public or private actions on the integrity and quality of cultural and community lifestyles in Hawaii." As lifestyles in the project area are relatively rural in nature, the impact of the operation of the proposed four golf courses should be addressed.
2. It is estimated that operation of the proposed golf courses could provide between 150 and 180 new jobs. Is it anticipated that residents will fill all of the jobs or will in-migrants be needed? Also, will area residents be given work preference and job training?
3. What are the impacts of the Punamano golf courses on the wetland area?

Thank you for the opportunity to comment.

Sincerely,

A handwritten signature in black ink, appearing to read "Joseph K. Conant", written over a circular stamp or seal.

JOSEPH K. CONANT
Executive Director

WILLIAM
E.
WANKET
INC.

Land Use Consultant

December 21, 1989

Mr. Joseph K. Conant
Executive Director
Department of Budget and Finance
Housing Finance and Development Corporation
Seven Waterfront Plaza, Suite 300
500 Ala Moana Boulevard
Honolulu, Hawaii 96813

RE: Environmental Impact Statement Preparation Notice (EISPN)
for the Proposed Country Courses at Kahuku - Response to
Comments Received

Dear Mr. Conant:

Thank you very much for taking the time to review and comment on the above-referenced EISPN. Information on comments offered is provided below:

Social Impact and Employment

The Draft EIS presently being prepared will include a Social Impact Assessment prepared by Earthplan. The assessment will address the potential social impacts of the projects on the surrounding and nearby communities. Employment and the issues of jobs and training will also be discussed in the Draft EIS.

Wetland Area

The Draft EIS will discuss the impacts of drainage and the effects of golf course pesticides, etc. on the wetland areas.

We will continue to coordinate our project with you to ensure that you have further opportunity for review and comments.

Sincerely,


WILLIAM E. WANKET

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Suite 660
1001 Bishop Street
Honolulu, HI 96813
Phone
(808) 533-4937
FAX 521-5410

BOARD OF WATER SUPPLY

CITY AND COUNTY OF HONOLULU

630 SOUTH BÉRETANIA STREET

HONOLULU, HAWAII 96843



FRANK F. FASI, Mayor

DONNA B. GOTH, Chairman
JOHN K. TSUI, Vice Chairman
SISTER M. DAVILYN AH CHICK, O.S.F.
SAM CALLEJO
EDWARD Y. HIRATA
WALTER O. WATSON, JR.
MAURICE H. YAMASATO

KAZU HAYASHIDA
Manager and Chief Engineer

December 20, 1989

William E. Wanket, Inc.
William E. Wanket, President
Pacific Tower 660
1001 Bishop Street
Honolulu, Hawaii 96813

Dear Mr. Wanket:

Subject: Your Letter of November 15, 1989 on the
Environmental Impact Statement Preparation
Notice (EISPN) for the Proposed Country Courses
at Kahuku Golf Course Project

Thank you for the opportunity to review and comment on the
EISPN for the proposed golf course project.

We have the following comments to offer:

1. The Board of Water Supply (BWS) does not have a domestic water system serving the Malaekahana site, and therefore, the developer will have to install a source and the necessary distribution facilities for both the domestic and irrigation requirements of the golf course. Regarding the Punamano site, we may be able to provide domestic water for the clubhouse. However, to confirm this, the developer should submit a water master plan for the clubhouse's water requirements for our review and approval.

The discussion on irrigation requirements should fully address the potential impacts of the wells. Of primary concern to us is the effect they may have on our existing well stations, as well as our ability to develop wells planned for the area. The question of whether the aquifer has an adequate sustainable capacity to meet the proposed project's demands and all other existing and proposed withdrawals without being degraded as a result of over pumpage needs to be addressed.



Mr. William E. Wanket
Page 2
December 20, 1989

It should also be noted that the BWS will only provide domestic water for irrigation purposes if there is no source of lesser quality irrigation water available, and on the condition that the golf course will convert to the use of irrigation quality water in the future if such a supply was available. DOH approval is required for the use of low (non-potable) quality irrigation water over high (potable) quality aquifers.

2. Wastewater injection wells are regulated by the State Department of Health (DOH), which administers the "UIC" program. A variance will be required for injection wells situated mauka of the "UIC" line regardless of their location in regards to the "No-Pass" line.
3. BWS-approved reduced pressure principle backflow prevention devices will be required immediately after all BWS water meters.

If you have any questions, please contact Lawrence Whang at 527-6138.

Very truly yours,

KAZU HAYASHIDA
Manager and Chief Engineer

cc: Dr. Marvin Miura, Director
(Office of Environmental Quality Control)

WILLIAM
E.
WANKET
INC.

Land Use Consultant

December 22, 1989

Mr. Kazu Hayashida
Manager and Chief Engineer
Board of Water Supply
City and County of Honolulu
630 South Beretania Street
Honolulu, Hawaii 96843

RE: Environmental Impact Statement Preparation Notice (EISPN) for
the Proposed Country Courses at Kahuku - Response to Comments
Received

Dear Mr. Hayashida:

Thank you for taking the time to review the above-referenced EISPN.
Information on comments provided is offered below:

Domestic Water Supply

The Draft EIS (DEIS) will address both domestic and irrigation water requirements for the Malaekahana site. Both withdrawal rates and drawdown information will be included. The engineering study conducted by Smith, Young & Associates will also discuss the Punamano site requirements.

Coordination with the Board of Water Supply and the Department of Health will be conducted in order to perform both theoretical and actual field analyses from which to further quantify the sustainable capacity of the aquifer to meet the proposed projects' demands and all other existing and proposed withdrawals without degrading the water quality.

The concept of using low (non-potable) quality water for golf course irrigation will be fully explored.

Pacific Tower
Suite 660
1001 Bishop Street
Honolulu, HI 96813
Phone
(808) 533-4937
FAX 521-5410


Wastewater Injection Wells

There are no injection wells planned, at this time, for any of the sites.

Designs and plans will be coordinated with the appropriate agencies for review and approval. All requirements such as those for irrigation laterals will be met.

We will continue to coordinate our project with you to ensure that you have the opportunity for further review and comments.

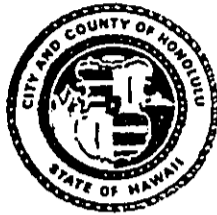
Sincerely,



WILLIAM E. WANKET

DEPARTMENT OF PARKS AND RECREATION
CITY AND COUNTY OF HONOLULU

650 SOUTH KING STREET
HONOLULU, HAWAII 96813



FRANK F. FASI
MAYOR

WALTER M. OZAWA
DIRECTOR

HIROAKI MORITA
DEPUTY DIRECTOR

December 21, 1989

Mr. William E. Wanket, President
William E. Wanket, Inc.
Pacific Tower, Suite 660
1001 Bishop Street
Honolulu, Hawaii 96813

Dear Mr. Wanket:

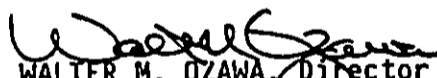
Subject: Environmental Impact Statement
Preparation Notice (EISPN)
Country Courses at Kahuku

Thank you for allowing the Department of Parks and Recreation to review the above-referenced EISPN.

The EIS should contain information regarding the availability of the proposed golf courses for use by local residents. Any such discussion should include proposed playing times and green fees for residents.

We look forward to receiving the draft EIS when it is distributed for review.

Sincerely,


WALTER M. OZAWA, Director

WMO:js

WILLIAM
E.
WANKET
INC.

Land Use Consultant

January 8, 1990

Mr. Walter M. Ozawa
Director
Department of Parks and Recreation
City and County of Honolulu
650 South King Street
Honolulu, Hawaii 96813

RE: Environmental Impact Statement Preparation Notice (EISPN) for
the Proposed Country Courses at Kahuku - Response to Comments
Received

Dear Mr. Ozawa:

Thank you for taking the time to review the above-referenced EISPN.
Information, in response to your comments, is provided:

Playing Times and Green Fees for Local Residents

The Country Courses at Kahuku are planned as daily fee type courses,
available to all players on a reservation basis. During "slow" periods
reservations may not be necessary. The Market Assessment prepared by
John Zapotocky points out that an aspect of particular benefit to the
resident golfing public is that resort oriented golf courses have a
significant amount of excess capacity at times other than the traditional
peak season (January, February, and March).

Information on green fees is not available at this time as much of the
engineering and construction details are still preliminary, but will be
provided when costs are finalized and no longer subject to change.

We appreciate your comments and will continue to coordinate our project
with you to provide the opportunity for further review.

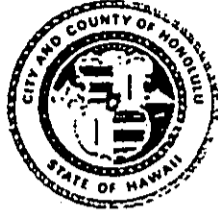
Sincerely,


WILLIAM E. WANKET

Pacific Tower
Suite 660
1001 Bishop Street
Honolulu, HI 96813
Phone
(808) 533-4937
FAX 521-5410

FIRE DEPARTMENT
CITY AND COUNTY OF HONOLULU

1455 S. BERETANIA STREET, ROOM 305
HONOLULU, HAWAII 96814



FRANK F. FASI
MAYOR

FRANK K. KAHOOHANOHANO
FIRE CHIEF

LIONEL E. CAMARA
DEPUTY FIRE CHIEF

December 6, 1989

William E. Wanket, Inc.
William E. Wanket, President
Pacific Tower 660
1001 Bishop Street
Honolulu, Hawaii 96813

Dear Mr. Wanket:

We have reviewed the subject material provided and
have no comments.

Sincerely,


FRANK K. KAHOOHANOHANO
Fire Chief

MZ:ny

WILLIAM
E.
WANKET
INC.

Land Use Consultant

December 10, 1989

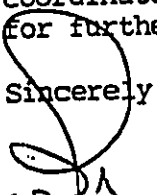
Chief Frank K. Kahoochanohano
Fire Chief
Fire Department
1455 S. Beretania Street
Room 305
Honolulu, Hawaii 96814

RE: Environmental Impact Statement Preparation Notice (EISPN)
for Proposed Country Courses at Kahuku - Response to Comments
Received

Dear Chief Kahoochanohano:

Thank you very much for taking the time to review the above-referenced EISPN. Although you have no comments at this time, we will continue to coordinate our project with you to ensure that you have the opportunity for further review and comments.

Sincerely,

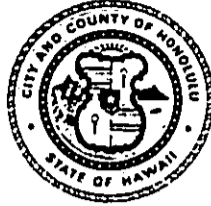

WILLIAM E. WANKET

Pacific Tower
Suite 660
1001 Bishop Street
Honolulu, HI 96813
Phone
(808) 533-4937
FAX 521-5410

POLICE DEPARTMENT
CITY AND COUNTY OF HONOLULU

1455 SOUTH BERETANIA STREET
HONOLULU, HAWAII 96814 - AREA CODE (808) 943-3111

FRANK F. FASI
MAYOR



DOUGLAS G. GIBB
CHIEF

WARREN FERREIRA
DEPUTY CHIEF

OUR REFERENCE SS-LK

December 8, 1989

Mr. William E. Wanket, President
William E. Wanket, Inc.
Pacific Tower 660
1001 Bishop Street
Honolulu, Hawaii 96813

Dear Mr. Wanket:

Subject: Environmental Impact Statement Preparation Notice
(EISPN) - Country Courses at Kahuku

We have reviewed the EISPN for the development of the Country Courses at Kahuku and offer the following comments.

During the construction phases of the project, we recommended that adequate safety measures (e.g., use of warning signs, cones, and traffic officers) be taken to minimize any construction-related traffic problems.

Because Kamehameha Highway is a two-lane roadway, we recommend that storage lanes be created to facilitate turns into the golf courses and to alleviate overall traffic congestion.

Please send us a copy of the EIS that includes the detailed traffic impact study when it becomes available.

Thank you for the opportunity to comment on this matter.

Sincerely,

DOUGLAS G. GIBB
Chief of Police

By 
JOSEPH AVEIRO
Assistant Chief of Police
Support Services Bureau

WILLIAM
E.
WANKET
INC.

Land Use Consultant

December 20, 1989

Chief Douglas G. Gibb
Chief of Police
City and County of Honolulu
1455 South Beretania Street
Honolulu, Hawaii 96814

RE: Environmental Impact Statement Preparation Notice (EISPN)
for the Proposed Country Courses at Kahuku - Response to
Comments Received

Dear Chief Gibb:

Thank you very much for taking the time to review the above-referenced EISPN. Information on the comments offered is provided below:

Traffic Impact

During construction, adequate safety measures will be taken to minimize any construction related traffic problem. Construction plans will include an approved DOT traffic control plan for providing warning signs, placing of traffic cones and traffic control officers whenever necessary.

The Draft EIS will include a detailed traffic study prepared by Pacific Planning and Engineering, Inc., with impacts and the recommended mitigative measures to be undertaken.

Plans for roadway related improvements especially at the access connections to these golf courses will be submitted to the State Department of Transportation (SDOT) for their review and approval. All requirements of SDOT will be met.

We will continue to coordinate our project with you to ensure that you have further opportunity for review and comments.

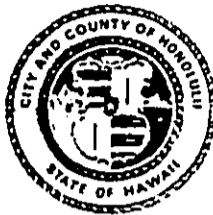
Sincerely,


WILLIAM E. WANKET

Pacific Tower
Suite 660
1001 Bishop Street
Honolulu, HI 96813
Phone
(808) 533-4937
FAX 521-5410

DEPARTMENT OF LAND UTILIZATION
CITY AND COUNTY OF HONOLULU

650 SOUTH KING STREET
HONOLULU, HAWAII 96813 • (808) 523-4432



FRANK F. FASI
MAYOR

JOHN P. WHALEN
DIRECTOR

BENJAMIN B. LEE
DEPUTY DIRECTOR

LU11/89-7419(DEB)

December 15, 1989

Mr. William E. Wanket, President
William E. Wanket, Inc.
Pacific Tower 660
1001 Bishop Street
Honolulu, Hawaii 96813

Dear Mr. Wanket:

Country Courses at Kahuku
Environmental Impact Statement Preparation Notice (EISPN)
Application for Development Plan Amendment
Tax Map Keys: 5-6-06: 2 & Por 6
5-6-05: 5, 6, Por 1, Por 2, Por 7
5-7-01: Por 21

We have reviewed the EISPN and Application for Development Plan Amendment for the above-described project and offer the following comments.

Last year we reviewed your Draft Environmental Impact Statement (DEIS) for the Punamano complex and a Malaekahana golf course very close to this second Malaekahana course. In general, the level of information in the new DEIS should be as detailed as in the previous DEIS.

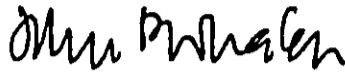
There are areas of conflict between the information in the previous DEIS and statements made in this EISPN. For instance, the Punamano EISPN states on Page 17, Section E.4, that the land has remained primarily vacant, and it is doubtful that any significant archaeological sites remain. The previous DEIS, however, states on Page 95, Section 4.10(A.4), that 29 components at 14 sites were recorded. The same type of conflict occurs for the statements concerning endangered plant species.

Since there were extensive comments for the previous project which directly apply to these projects, we will not offer comments on specific issues at this time. It is expected that the DEIS for this current project will address previously stated comments and concerns and will adequately respond to those issues.

Mr. William E. Wanket, President
Page 2

Thank you for the opportunity to review this EISPN. If you have any questions, please contact Diane E. Borchardt of our staff at 527-5349.

Very truly yours,



JOHN P. WHALEN
Director of Land Utilization

JPW:s1
0251N/14-15

WILLIAM
E.
WANKET
INC.

December 22, 1989

Land Use Consultant

Mr. John P. Whalen
Director
Department of Land Utilization
City and County of Honolulu
650 South King Street
Honolulu, Hawaii 96813

RE: Environmental Impact Statement Preparation Notice (EISPN)
for the Proposed Country Courses at Kahuku - Response to
Comments Received

Dear Mr. Whalen:

Thank you very much for taking the time to review and comment on the above-reference EISPN. Information on comments received is provided below:

Archaeology-Punamano

The information contained in the EISPN was preliminary in nature, awaiting the Archaeological Assessment prepared by Archaeological Consultants of Hawaii, Inc. The Draft EIS will include a comprehensive list of archaeological sites located on the Punamano site, including information on new sites and site features discovered during the recent site reconnaissance that go beyond the previous EIS. The DEIS will address impacts and recommend mitigative measures. Archaeological Consultants of Hawaii, Inc. has maintained close coordination with DLNR (Joyce Bath).

Flora Study

Information contained in the EISPN regarding flora was preliminary in nature. Char and Associates has conducted a botanical study of the project area. The DEIS will contain a list of flora discovered on the field survey, and will include impacts and mitigative measures for any endangered plant species discovered.

We will continue to coordinate our project with you to ensure that you have the opportunity for further review and comments.

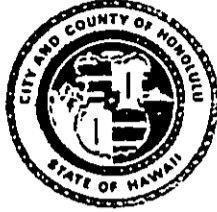
Sincerely,


WILLIAM E. WANKET

Pacific Tower
Suite 660
1001 Bishop Street
Honolulu, HI 96813
Phone
(808) 533-4937
FAX 521-5410

DEPARTMENT OF PUBLIC WORKS
CITY AND COUNTY OF HONOLULU

650 SOUTH KING STREET
HONOLULU, HAWAII 96813



FRANK F. FASI
MAYOR

SAM CALLEJO
DIRECTOR AND CHIEF ENGINEER
In reply refer to:
ENV 89-226(449)

November 30, 1989

Mr. William E. Wanket, President
William E. Wanket, Inc.
Pacific Tower Suite 660
1001 Bishop Street
Honolulu, Hawaii 96813

Dear Mr. *Bill* Wanket:

Subject: Environmental Impact Statement Preparation
Notice (EISPN) - Country Courses At Kahuku
TMK: 5-6-05: 5, 6, Por. 1, Por. 2, and Por. 7
5-7-01: Por. 21

We have reviewed the subject EISPN and have the following comments:

1. We have no objection to the proposed method of treatment of wastewater generated from the golf courses.
2. Plans from the Punamano Course should be included in the design flow for the proposed Kuilima Wastewater Treatment Plant.
3. A drainage report should be submitted to the Drainage Section, Division of Engineering, for review and approval.

Very truly yours,

Sam
SAM CALLEJO
Director and Chief Engineer

WILLIAM
E.
WANKET
INC.

Land Use Consultants

December 19, 1989

Mr. Sam Callejo
Director and Chief Engineer
Department of Public Works
City and County of Honolulu
650 South King Street
Honolulu, Hawaii 96813

RE: Environmental Impact Statement (EISPN) Preparation Notice
for the Proposed Country Courses at Kahuku - Response to
Comments Received

Dear Mr. Callejo:

Thank you for taking the time to review the above referenced EISPN.
The following is provided in response to your comments:

Wastewater Treatment and Disposal:

Two alternatives for the disposal of wastewater will be presented in the Draft EIS currently being prepared on the courses proposed for the Punamano site. The preferred alternative would be to have a 5000 gpd and a 10,000 gpd activated effluent blended into the irrigation water for the courses. This system would be by gravity. According to the engineering study prepared by Russell Smith of Smith, Young & Associates, Inc., the second alternative would be to have three ejector stations, some 1500 feet of force main and 8000 feet of gravity sewer carry 15,000 gallons of wastewater per day to the City and County plant. This does not appear to be an economical solution. It is pointed out that the Punamano site lies within the no-pass zone of the BWS and back of the State injection well line. We have also put forth the facts that less nitrate will come from the effluent than from chemical fertilizers. We also point out that viruses and bacteria do not appear in effluent percolate according to the University of Hawaii studies at Honouliuli.

Pacific Tower
Suite 660
1001 Bishop Street
Honolulu, HI 96813
Phone
(808) 533-4277
FAX 521-5410

Page 2
Mr. Sam Callejo
Director and Chief Engineer
Department of Public Works
December 19, 1989

Drainage

The Draft EIS will discuss the preliminary engineering for the drainage of the sites, the resulting impacts, and the mitigative measures to be undertaken.

We will continue to coordinate our project with you to ensure that you have the opportunity for further review and comments.

Sincerely,



WILLIAM E. WANKET

Beyond the call

DEC 29 1989

William E. Wanket, Inc.
Pacific Tower, Suite 660
1001 Bishop Street
Honolulu, Hawaii 96813

Attention: Mr. William E. Wanket

Gentlemen:

Environmental Impact Statement (EIS) Preparation Notice
Country Courses at Kahuku

Thank you for giving us the opportunity to review the EIS Preparation Notice for the subject project.

Existing communication facilities, both poleline and underground, must be continued along existing routes. We would appreciate reviewing more detailed plans as they become available.

Please continue to include us on the list of parties to be consulted for the preparation and review of the EIS.

Should you have any questions, please call Lella Sanders at 7880.

Sincerely,



Mary Matsuda
Section Manager
Land & Buildings

WILLIAM
E.
WANKET
INC.

Land Use Consultant

January 4, 1990

Ms Mary Matsuda
Section Manager
Land and Buildings
GTE Hawaiian Telephone Company, Inc.
P.O. Box 2200
Honolulu, Hawaii 96841

RE: Environmental Impact Statement Preparation Notice (EISPN)
for the Proposed Country Courses at Kahuku - Response to
Comment Received

Dear Ms Matsuda:

Thank you for taking the time to review the above-referenced EISPN and for your letter of December 29, 1989. The Draft EIS will include a section, prepared by Smith, Young and Associates, on the communication facilities existing in the area, possible impacts, and mitigative measures, where appropriate.

We will continue to coordinate our project with you to provide opportunity for further review and comments.

Sincerely,


WILLIAM E. WANKET

Pacific Tower
Suite 660
1001 Bishop Street
Honolulu, HI 96813
Phone
(808) 533-4937
FAX 521-5410

ENV 2-1
JA/G



William A. Bonnet
Manager
Environmental Department

January 15, 1990

Mr. William E. Wanket, President
William E. Wanket, Inc.
Pacific Tower 660
1001 Bishop Street
Honolulu, Hawaii 96813

Dear Mr. Wanket:

Subject: Environmental Impact Statement Preparation Notice (EISPN)
for the Proposed Country Courses at Kahuku

We have reviewed the above subject document and have no comments.

Sincerely,

WILLIAM
E.
WANKET
INC.

Land Use Consultant

January 18, 1990


Mr. William A. Bonnet
Manager
Environmental Department
Hawaiian Electric Company, Inc.
P.O. Box 2750
Honolulu, Hawaii 96840-0001

Re: Environmental Impact Statement Preparation Notice (EISPN)
for the Proposed Country Courses at Kahuku - Response to
Comments Received

Dear Mr. Bonnet:

Thank you very much for taking the time to review the above-referenced EISPN and for your letter of January 15, 1990. We will continue to coordinate our project with you to ensure that you have the opportunity for additional review and comments.

Sincerely,


WILLIAM E. WANKET

Pacific Tower
Suite 660
1001 Bishop Street
Honolulu, HI 96813
Phone
(808) 533-4937
FAX 521-5410

KOOLAULOA COMMUNITY COUNCIL
P.O. BOX 12
HAUULA, HAWAII 96717
PHONE: (808)293-8521

December 12, 1989

Mr. William E. Wanket, President
William E. Wanket, Incorporated
Pacific Tower 660
1001 Bishop Street
Honolulu, Hawaii 96813

Dear Mr. Wanket:

Thank you for the EISPN regarding the proposed golf courses at Kahuku. It generated considerable discussion at our regular meeting held on Friday, December 1, and because the proposal will have considerable impact on our community, the opinions and comments were both pro and con.

As we still have concerns, our council would like to invite you or a representative to attend our next meeting. We are also extending a similar invitation to Mr. Chuck Ehrhorn of Campbell Estate from whom we received an earlier communication.

Our next meeting will be held on:

Friday, January 5, 1990
from 9:00 - 11:00 a.m.
at Hauula Satellite City Hall
54-010 Kukuna Road

We thank you for allowing us to review and comment on this project and hope you can join us at the January meeting.

Sincerely,

Martha K. Turner
Martha Kealohapuni Turner
KCC Chairman (239-5754)

WILLIAM
E.
WANKET
INC.

December 20, 1989

Ms Martha Kealohapuni Turner
Chairperson
Koolauloa Community Council
P.O. Box 12
Hauula, Hawaii 96717

RE: Environmental Impact Statement Preparation Notice (EISPN)
for the Proposed Country Courses at Kahuku - Response to
Comments Received

Dear Ms Turner

Thank you for taking the time to review the above-referenced EISPN and for the invitation to attend the council's meeting on January 5, 1990. I will be able to attend the meeting. I look forward to discussing the proposed Country Courses at Kahuku with you and the members of the council.

We will continue to coordinate our project with you to ensure that you have the opportunity for further review and comments.

Sincerely,


WILLIAM E. WANKET

Pacific Tower
Suite 660
1001 Bishop Street
Honolulu, HI 96813
Phone
(808) 533-4937
FAX 521-5410

L A I E
*Community
Association*

P.O. Box O, Laie, HI 96762

December 21, 1989

William E. Wanket, Inc.
William E. Wanket, President
Pacific Tower 660
1001 Bishop Street
Honolulu, Hawaii 96813

RE: EISPN FOR PROPOSED COUNTRY COURSES
AT KAHUKU

Dear Mr. Wanket:

I'm sorry for my late response to your letter dated November 15, 1989. The packet of information was sent to the former President of the Laie Community Association and was not forwarded to me until today, December 21, 1989.

Because I have not discussed this matter with my entire Board of Directors, this letter is to merely raise issues which we may have and to preserve our right to enlarge these issues should we desire to do so in the future. Our comments are relevant to the Malaekahana Course only because of it's close proximity to Laie.

A. INCREASE OF EMPLOYMENT OPPORTUNITIES:

1. Out of the 30 to 50 jobs generated from the Malaekahana Course, what is the breakdown or description of each position?, How many jobs will actually be filled by the local people?, and What kind of wages will be offered?
2. Promises of increased Employment have always been part of development plans, however, many projects have fallen short by bringing top employees from areas outside of the Local Community leaving only service oriented positions for the local population.
3. There must be greater care given in actively recruiting local people for all employment positions generated by the Malaekahana Course.
4. No mention of where Contracting Groups will come from. Preference should be given to Local Contractors to be a major part of this development so that more local employment may be generated prior to completion of the Malaekahana Course.

B. ENHANCED VISUAL IMPACT:

HUI LAU LIMA O'LAIE

Mr. Wanket, President
Page 2
December 21, 1989

1. Presently, there is nothing wrong with the visual impact surrounding the Malaekahana Area.
2. The present natural beauty of the area, it's fenced in pasture lands, it's slopes covered with natural brush, trees, trails, a few houses, cattle, horses, and the Koolau Range will be difficult to replace in this area.
3. Whether or not the golf course will preserve open space for future generations by creating an attractive green landscape of trees, water features, and fairways versus what is presently there is an open question.


E. PUBLIC SERVICES:

1. Transportation, Traffic Congestion, inadequate highways to handle projected traffic increase.
2. More information must be shared with the community on research which you or other private or governmental agencies have done to show there is no risk of a traffic problem.
3. There is presently inadequate waste water facilities in the area, inadequate drainage, and inadequate sewage treatment facilities.

Again, the above issues are not all inclusive. Our community may have more concerns after our Board Meeting or they may be satisfied with the plan or may have other issues for you to consider.

Thank you very much for the opportunity to respond.

Very truly yours,



WILLIAM K. WALLACE III
President & Chairman of the Board
Laie Community Association

cc: All LCA Board Members
Rene Mansho, City Council

January 19, 1990

WILLIAM
E.
WANKET
INC.

Land Use Consultant

Mr. William K. Wallace III
President & Chairman of the Board
Laie Community Association
P.O. Box 0
Laie, Hawaii 96762

RE: Environmental Impact Statement Preparation Notice (EISPN)
for the Proposed Country Courses at Kahuku - Response to
Comments Received

Dear Mr. Wallace:

Thank you very much for taking the time to review the above-referenced EISPN. Information is provided in response to your comments:

Increase of Employment Opportunities

The project is expected to provide at least four general categories of jobs:

Grounds: These would include the superintendent, assistant superintendents, maintenance superintendents, mechanics, equipment operators, groundskeepers and laborers.

Golf and Pro Shops: These would include the directing and teaching golf professionals, attendants, and golf pro shop sales assistants.

Administration and Support: These include the clubhouse manager, assistant manager, accountant, secretary, receptionist, janitors, locker attendants, parking attendants, and security.

The Country Courses at Kahuku will benefit area residents by providing job options for workers who currently spend more than 45 minutes traveling to their job sites. The proposed project will increase job diversity in the area, thus accommodating a wide range of job skills. The various jobs will offer both indoor and outdoor work, as well as jobs suitable for full-time breadwinners, part-time workers supplementing family incomes, and first-time workers.

Pacific Tower
Suite 660
1001 Bishop Street
Honolulu, HI 96813
Phone
(808) 533-4937
FAX 521-5410

-Page 2-

Mr. William K. Wallace III
President & Chairman of the Board
Laie Community Association
January 19, 1990

We are very aware of the community's desires to maximize the hiring of nearby residents and contracting of local businesses. We share that view; however because of "equal opportunity in hiring" laws, a "guarantee" is not legally possible. However, through training programs, such as the North Shore Career Training Corporation (NSTC), residents of the area can be trained to compete effectively on a competitive basis. We will continue to be active supporters of the NSTC.

Visual Impact

The Draft EIS will include a chapter on the project's visual impact on the area, and, where appropriate, mitigative measures will be provided.

Public Services:

The Draft EIS will address public services. Maps, diagrams and charts will be included in the report, and technical reports will be appended.

We appreciate your comments and look forward to your review of the forthcoming Draft EIS. We will continue to coordinate our project with you to ensure the opportunity for further review and comments.

Sincerely,


WILLIAM E. WANKET

NO: H16 728

ZIONS SECURITIES CORPORATION
55-510 KAMEHAMEHA HWY. • LAIE, OAHU, HAWAII 96762
(808) 293-9201 FAX # 293-5722

September 21, 1989

Estate of James Campbell
828 Fort St Mall
Suite 500
Honolulu, Hi 96813

SEP 22

ATTN: Charles A. Ehrhorn

Dear Mr Ehrhorn:

Thank you for your letter of September 11, 1989 and your application to amend the Koolauloa Development plan land use map. We appreciate receiving copies of this application and applaud your efforts in the development of your plan adjacent to ours. We agree that your development plan will be an important resource for the local residents and enhance the use of your properties.

Zions Securities main concern is that we be allowed the joint use of your property to enter and exit our adjoining property. We wish to develop the adjoining property to the 200-acre Malaekahana golf course area into residential and agricultural subdivisions. The access road that crosses your property which we and the residents of Laie have been using for many years is very important to our continued use of our property.

Thank you for your cooperation and review.

Very truly yours,

ZIONS SECURITIES CORPOPATION

Marvin W. Stone, MANAGER

MHS:vjt

D-34

WILLIAM
E.
WANKET
INC.

Land Use Consultant

30 November 1989

Zions Securities Corporation
55-510 Kamehameha Highway
Laie, Hawaii 96762
Attn: Mr. Marvin Stone, Manager

RE: Environmental Impact Statement Preparation Notice (EISPN) for
the Proposed Country Courses at Kahuku - Response to Comments
Received

Gentlemen:

Thank you very much for taking the time to review the above-referenced EISPN and for your letter of September 21, 1989. Our responses to the comments offered are provided:

At this time, we have not developed specific roadway designs and our golf course plans are very schematic, and will probably change significantly as we proceed through the various governmental approval processes. We will, however, continue to coordinate our project with you to ensure that you have the opportunity for further review and additional comments.

Sincerely,


WILLIAM E. WANKET

Pacific Tower
Suite 660
1001 Bishop Street
Honolulu, HI 96813
Phone
(808) 533-4937
FAX 521-5410

KAHUKU HOSPITAL

P.O. BOX 218
KAHUKU, HAWAII 96731
PHONE 283-2221

November 24, 1989

Mr. William E. Wanket, President
William E. Wanket, Inc.
1001 Bishop Street - Pacific 600
Honolulu, Hawaii 96813

Dear Mr. Wanket:

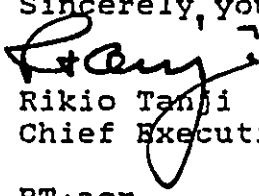
Re: **EISPN Proposed Country Courses at Kahuku**

Thank you for the opportunity to review subject Environmental Impact Statement Preparation Notice (EISPN). Your integrated golf course complex development plans are consistent with the general provisions outlined and required under Chapter 26, Hawaii Revised Statutes.

Kahuku Hospital management and hospital directors are in full support of the initial EISPN. The integrated golf course complex development plans are particularly desirable because of their immediate and easy access from the Kamehameha Highway and proximity to the hotel or the visitor industry. The Koolauloa District is economically depressed area and the proposed complex development will not only provide new job opportunities, but will also encourage more support and service industries to permanently locate in the Kahuku Sugar Mill Business Center and adjoining business communities. Increase in jobs and permanent residents in the Kahuku and surrounding communities of Malaekahana and Kuilima have been our five-year planning considerations since 1985, and we are extremely supportive of this integrated golf course development plan. This is the beginning of a larger development to come. One other comment I wish to share is "what will happen to the existing Kahuku Golf Course?" Some of the oldtimers are asking this question.

If I can be of any assistance, please call me at 293-5594.

Sincerely, yours,


Rikio Tanji
Chief Executive Officer

RT:acr

cc: Charles Ehrhorn
Clinton R. Churchill

WILLIAM
E.
WANKET
INC.

Land Use Consultant

November 30, 1989

Mr. Rikio Tanji
Chief Executive Officer
Kahuku Hospital
P.O. Box 218
Kahuku, Hawaii 96731

RE: Environmental Impact Statement Preparation Notice (EISPN) for
the Proposed Country Courses at Kahuku - Response to Comments
Received

Dear Mr. Tanji:

Thank you very much for taking the time and effort to review the
above-referenced EISPN and for your letter of November 24, 1989
expressing support for the proposed golf course developments.

Future plans for the golf course have not been determined at this time;
however, any changes to the course will be coordinated with the community
prior to submitting a proposal to the City and County. We will continue
to coordinate our project with you to ensure that you have the opportunity
for further review and additional comments.

Sincerely,


WILLIAM E. WANKET

Pacific Tower
Suite 660
1001 Bishop Street
Honolulu, HI 96813
Phone
(808) 533-4937
FAX 521-5410

Environmental Impact Statement
THE COUNTRY COURSES AT KAHUKU

OEQC

Distribution List

E.A.
 APPLICANT ACTION
 AGENCY ACTION

EIS
 APPLICANT ACTION
 AGENCY ACTION

Title: COUNTRY COURSES AT KAHUKU (PUNAMANO) VOLUMES I & II

Location: Koolauloa, Oahu

Proposing Agency/Applicant: The Estate of James Campbell

Accepting Authority/Approving Agency: Dept. of General Planning-C&C Honolulu

Deadline for Comments: March 25, 1990

Date Sent/By: February 8 1990

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William E. Wanket; Pacific
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 AGENCY ACTION

EIS
 APPLICANT ACTION
 AGENCY ACTION

Title: COUNTRY COURSES AT KAHUKU (PUNAMANO) VOLUMES I & II

Location: Koolauloa, Oahu

Proposing Agency/Applicant: The Estate of James Campbell

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Environmental Impact Statement
THE COUNTRY COURSES AT KAHUKU

DEIS

**Federal Comment
Letters and
Applicant Responses**



DEPARTMENT OF THE ARMY
U. S. ARMY ENGINEER DISTRICT, HONOLULU
BUILDING 230
FT. SHAFTER, HAWAII 96858-5440

March 19, 1990

REPLY TO
ATTENTION OF:

Planning Division

Mr. Benjamin B. Lee
Chief Planning Officer
Municipal Office Building, 8th Floor
650 South King Street
Honolulu, Hawaii 96813

Dear Mr. Lee:

We have reviewed the Draft Environmental Impact Statement for the proposed Country Courses at Kahuku, Punamano, Kahuku, Koolauloa, Oahu. We wish to modify our previous comment concerning fill (letter dated December 8, 1989), to read as follows: "If fill is placed in any gulches, streams, or wetlands, a Department of the Army permit may be required. The developer should contact Operations Branch (438-9258) for further information." We have no additional comments.

Sincerely,


Kisuk Cheung
Director of Engineering

Copy Furnished:

The Estate of James Campbell
Suite 300
828 Fort Street Mall
Honolulu, Hawaii 96813

William E. Wanket
Pacific Tower 660
1001 Bishop Street
Honolulu, Hawaii 96813

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

WILLIAM
E.
WANKET
INC.

Land Use Consultant

March 23, 1990

Mr. Kisuk Cheung
Director, Engineering
U.S. Army Engineer District, Honolulu
Building 230
Ft Shafter, Hawaii 96858-5440

**RE: Draft Environmental Impact Statement (DEIS) for Proposed
Country Courses at Kahuku (Punamano) - Response to Comments
Received**

Dear Mr. Cheung:

Thank you very much for the copy of your letter of March 19, 1990 to the Department of General Planning regarding the above-referenced project. Modification of your December 8, 1989 comment on the project's EISPN concerning fill is noted. Future permit requirements will be coordinated with your office.

Again, thank you for your comments. For your information, your letter, together with this response, will be published in the Final EIS.

Sincerely,


WILLIAM E. WANKET

cc: Benjamin B. Lee, Chief Planning Officer

Pacific Tower
Suite 660
1001 Bishop Street
Honolulu, HI 96813
Phone
(808) 533-4937
FAX 521-5410



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

IN REPLY REFER TO:

5090
Ser 00F2/395
9 Feb 1990

Mr. Bill Medieros
Department of General Planning
City & County of Honolulu
650 South King Street
Honolulu, Hawaii 96813

Dear Mr. Medieros:

COUNTRY COURSES AT KAHUKU (PUNAMANO)

Volumes I and II of the Draft Environmental Impact Statement for Country Courses at Kahuku (Punamano) have been reviewed, and we have no comments to offer. Since we have no further use for the documents, they are being returned to the Office of Environmental Quality Control.

Thank you for the opportunity to review the draft.

Sincerely,

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

Copy to:
Estate of James Campbell
William E. Wanket
OEQC (w/DEIS)

REPRODUCED AT GOVERNMENT EXPENSE

WILLIAM
E.
WANKET
INC.

Land Use Consultant

February 13, 1990

Mr. W. K. Liu
Assistant Base Civil Engineer
Department of the Navy
Commander Naval Base
Box 110
Pearl Harbor, Hawaii 96869-5020

**RE: Draft Environmental Impact Statement (DEIS) for Proposed
Country Courses at Kahuku - Response to Comments
Received**

Dear Mr. Liu:

Thank you very much for the copy of your letter of February 9, 1990 to the Department of General Planning regarding the Punamano site of the above-referenced DEIS. We appreciate your efforts in reviewing the documents.

For your information, your letter, together with this response, will be published in the Final EIS.

Sincerely,


WILLIAM E. WANKET

cc: Benjamin B. Lee, Chief Planning Officer

Pacific Tower
Suite 660
1001 Bishop Street
Honolulu, HI 96813
Phone
(808) 533-4937
FAX 521-5410



United States Department of the Interior

FISH AND WILDLIFE SERVICE
PACIFIC ISLANDS OFFICE

P.O. BOX 50167
HONOLULU, HAWAII 96850

APR 11 1990

Mr. Benjamin Lee, Director
Department of General Planning
City and County of Honolulu
Honolulu, Hawaii 96813

Re: Draft Environmental Impact Statement, Country Courses at Kahuku and
Malaekahana, Oahu

Dear Mr. Lee:

The U.S. Fish and Wildlife Service (Service) has reviewed the Draft Environmental Impact Statement (EIS) for the proposed golf courses. We offer the following comments for your consideration.

General Comments

The wetlands located within the Kahuku and Malaekahana drainage basins provide habitat for the four species of endangered Hawaiian waterbirds, and for migratory shorebirds and waterfowl (Figures 1 and 2). The Punahoolapa Marsh and the James Campbell National Wildlife Refuge (NWR) at Punamano and Kii are particularly important wetlands in the Kahuku basin for endangered Hawaiian waterbirds and migratory shorebirds and waterfowl. While the wetlands at the Kahuku and Malaekahana sites would not be directly impacted by the construction of the golf courses, secondary impacts to wetland habitats and endangered waterbirds may occur from the operation of the proposed golf courses. These secondary impacts include the potential run-off and drift of pesticides from the golf courses into the refuge and other wetlands, increased nutrient and pesticide levels in the groundwater that support these wetlands, modification of wetland hydrology from the withdrawal of groundwater and from the alteration of surface drainage patterns, and potential poisoning of endangered waterbirds and migratory birds foraging in the water hazards and golf greens.

Specific Comments

Groundwater Withdrawal

a. Many of the wetlands in the Malaekahana and Kahuku basins are sustained by groundwater leaking through the limestone caprock (J.F. Mink, 1982, Koolauloa Water Resources Assessment, prepared for Honolulu Board of Water Supply). For example, the Punamano unit of the James Campbell NWR and Punahoolapa Marsh are spring-fed wetlands. The lowering of the water table from increased groundwater withdrawals may reduce the areal extent of wetlands in these basins. The Draft EIS does not adequately describe the potential impacts to wetlands within the Kahuku and Malaekahana basins from the proposed increased withdrawal of groundwater. We recommend that a groundwater hydrologist evaluate the potential hydrologic impacts to these wetlands from increased groundwater withdrawals.

b. The Service is proposing to expand the James Campbell NWR in Kahuku. This expansion may require an increase in our pumping rates of the existing wells or the development of additional wells at Kii. We are concerned that the groundwater supplies within the Koolauloa basal aquifer may become fully allocated, and that adequate groundwater resources to meet the future water needs of the refuge may not be available. We recommend that existing and proposed groundwater withdrawals in the Koolauloa basal aquifer be comprehensively evaluated by a groundwater hydrologist to determine the potential for future conflicts over competing water needs.

Wetland Delineation

a. Keaau clay covers approximately 18 acres of the Malaekahana project site. This soil type may contain areas that meet the criteria for hydric soils where the water table is high or where ponding occurs for periods longer than seven days (Soil Conservation Service, April 1989, Hydric Soil Map Unit List for Oahu). Since hydric soils are an indicator of wetlands, the presence of wetlands within the Malaekahana project site should be evaluated by the U.S. Army Corps of Engineers and other federal, state, and county agencies.

Drainage and Flooding

a. The Draft EIS states that under project conditions, run-off from the golf course sites within the Kahuku basin for the ten-year storm interval would increase by approximately 21%, while run-off from the Hoolapa and Kalaeokahipa watersheds would increase by approximately 11%. The Service maintains and operates an evacuation pump at the James Campbell NWR at Kii to prevent flooding in the Kahuku plain. Increased run-off into the Kahuku plain from the proposed golf courses may affect the Service's ability to control flooding under our lease agreement with the Campbell Estate. The drainage studies for the Final EIS should evaluate the increased run-off generated from the golf course sites and its potential impact on flooding in the Kahuku plain. In addition, the proposed golf course drainage plan should be integrated within the proposed Kahuku Drainage Master Plan.

Pesticide and Nutrient Loading

a. The Draft EIS and Appendix J list the pesticides typically applied to golf courses in Hawaii. However, we understand that other pesticides not listed in Table 3 of Appendix J may be used on occasion to treat particular insect or disease problems. We recommend that Table 3 of Appendix J be expanded to include all pesticides that may be used on the proposed golf courses at Kahuku and Malaekahana. In addition, the solvents, surfactants, and diluents used with the proposed pesticides should also be described. This information should be included in the Final EIS.

b. Appendix Table B-1 does not adequately summarize available scientific information regarding potential threats to endangered waterbirds and their aquatic food sources. We recommend that Table B-1 be expanded to include separate acute and chronic toxicity evaluations for birds, fishes, and

aquatic invertebrates. The impacts to emergent wetland vegetation from the run-off of herbicides into the refuge and other wetlands should also be analyzed. We recommend that the following relative rating scale be used to identify toxicity categories for wildlife (G.J. Smith, 1987, Pesticide Use and Toxicology in Relation to Wildlife: Organophosphorus and Carbamate Compounds, U.S. Fish and Wildlife Service Resource Publication 170):

- Extremely toxic (LD50 \leq 40 mg/kg)
- Highly toxic (LD50 41 - 200 mg/kg)
- Moderately toxic (LD50 201-1,000 mg/kg)
- Slightly toxic (LD50 1,001 - 5,000 mg/kg)
- Relatively nontoxic (LD50 > 5,000 mg/kg)

For example, paraquat dichloride has a median lethal dose (LD50) of 199 mg/kg for mallard ducks (R.H. Hudson, R.K. Tucker, and M.A. Haegele, 1984. Handbook of Toxicity of Pesticides to Wildlife, U.S. Fish and Wildlife Service Resource Publication 153). In addition, paraquat is toxic and teratogenic to mallard embryos (D.J. Hoffman and P.H. Albers, 1984, Evaluation of Potential Embryotoxicity and Teratogenicity of 42 Herbicides, Insecticides, and Petroleum Contaminants to Mallard Eggs, Arch. Environ. Contam. Toxicol. 13:15-27). Thus, paraquat should be more correctly described as highly toxic to birds, rather than moderately toxic as is described in Appendix Table B-1.

c. The discussion in Appendix J of the Draft EIS regarding the potential transport of pesticides by groundwater into the James Campbell NWR at Punamano and surrounding wetlands is not adequately documented. For example, Appendix J states that the organic carbon content in the soils is sufficient to retard the movement of pesticides through the soil profile. However, actual measurements of the organic carbon content of the soils at the project sites and for imported soils are not reported in Appendix J. Specific measurements of soil properties at the project sites and of imported soils should be conducted to support the conclusion that pesticides would not reach the groundwater and be transported into the James Campbell NWR.

d. Pesticides may also be transported into the James Campbell NWR and other wetlands by stormwater run-off. The Draft EIS states that the stormwater run-off under project conditions could be reduced to levels below existing conditions. However, a drainage system that would offer this level of protection to the refuge is only briefly described in the appendix. Such a drainage system would reduce the run-off and contaminant load conveyed into the refuge during storm events. The Final EIS should include a detailed engineering study that describes the drainage system that would contain the stormwater run-off up to the 50-year storm within the Kahuku golf course sites.

e. Under certain wind conditions, pesticides may drift northward towards the Punamano refuge. The Final EIS should include an evaluation of the potential drift of pesticides into the refuge under variable wind conditions.

f. Acute poisoning of endangered Hawaiian waterbirds from foraging on golf courses has not been documented for Hawaii. However, waterfowl poisoning on golf courses has been reported for the mainland (W.B. Stone, 1979, Poisoning of Wild Birds by Organophosphate and Carbamate Pesticides, New York Fish and Game Journal 26(1):37-47). Endangered waterbirds,

particularly the Hawaiian coot (Fulica americana alai), may frequent the water hazards on the proposed golf courses. The water hazards may collect run-off from the golf courses, and may function as a sink for contaminants. The potential exposure to pesticides by endangered waterbirds attracted to and foraging in water hazards should be discussed in the Final EIS.

g. The monitoring program described in Appendix J of the Draft EIS is inadequate to conclusively detect the introduction of pesticides and nutrients into the refuge and other wetlands from the proposed golf courses. The proposed monitoring plan should be developed in coordination with the Service.

h. Our preliminary analysis of the pesticides that may be applied onto the proposed golf courses indicate that chlorpyrifos, bendiocarb, and trichlorfon may be highly toxic to birds, including mallard ducks. Thus, to manage the input and source of contaminants into the refuge, we request that all pesticides proposed to be used on the golf courses be reviewed and approved by the Service.

Summary Comments

The Draft EIS does not fully discuss the impacts associated with the construction and operation of the proposed golf courses to the James Campbell NWR and to wetlands in the Kahuku and Malaekahana basins. These impacts include the following:

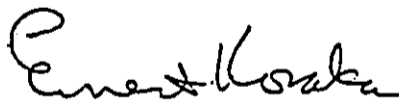
a. the potential transport and impact of pesticides and nutrients upon the James Campbell NWR, other wetlands, endangered waterbirds, and aquatic invertebrates;

b. the potential increase in run-off onto the Kahuku plain, and the Service's ability to meet flood control obligations;

c. the proposed increase in groundwater withdrawal from the Koolauloa basal aquifer, and its effect on wetlands and the proposed expansion of the James Campbell NWR.

We recommend that the Final EIS fully address these concerns. We appreciate the opportunity to comment.

Sincerely,



Ernest Kosaka
Field Supervisor
Pacific Islands Office

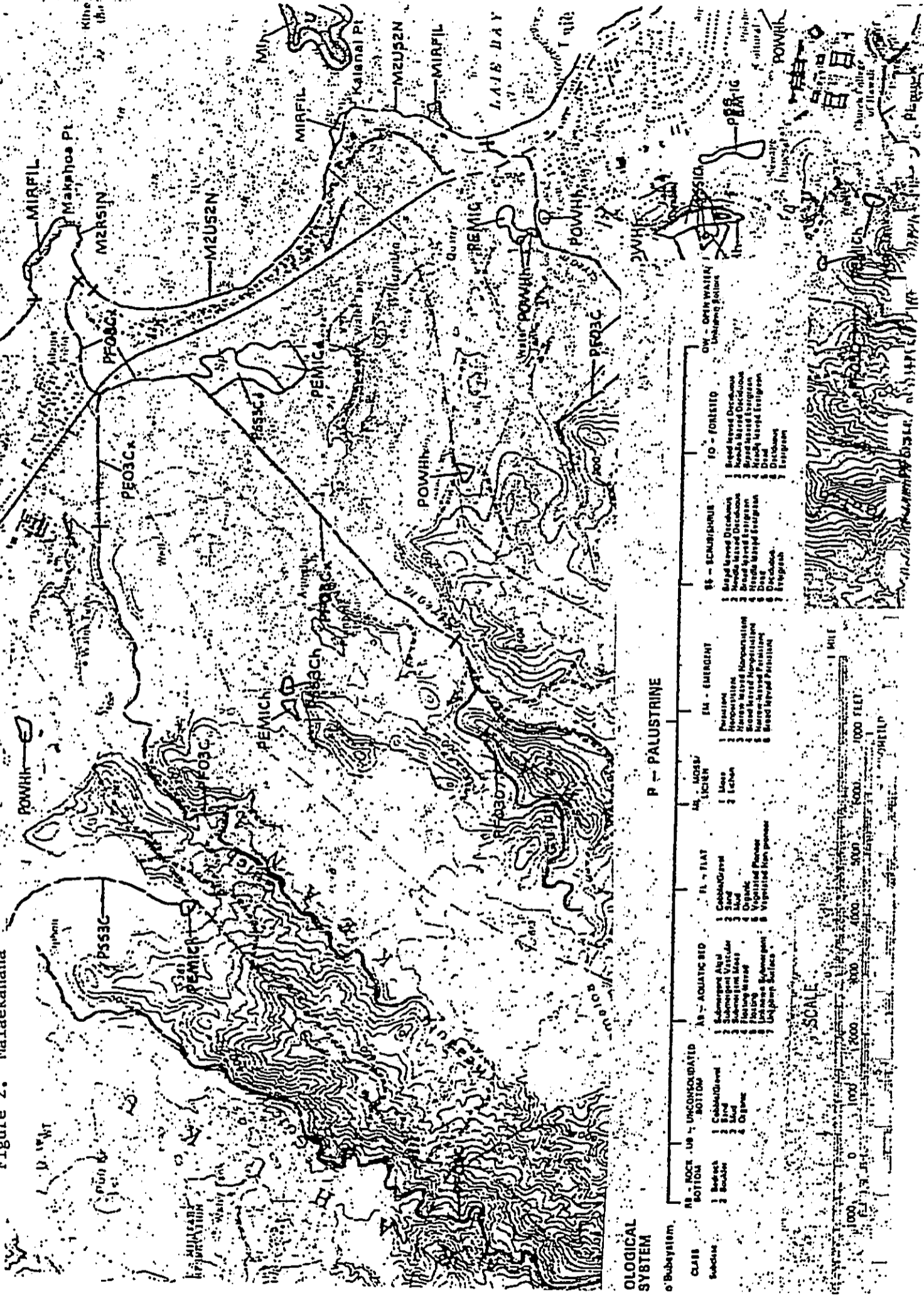
Enclosures

cc: RO, Portland, OR (TS-EC)
William E. Wanket, Inc.
Campbell Estate
DLNR
OEQC
RW

NATIONAL WETLANDS INVENTORY

UNITED STATES DEPARTMENT OF THE INTERIOR

Figure 2. Malaekahana



WILLIAM
E.
WANKET
INC.

Land Use Consultant

April 30, 1990

Mr. Ernest Kosaka
Field Supervisor
Fish and Wildlife Service
Pacific Islands Office
P.O. Box 50167
Honolulu, Hawaii 96850

**RE: Draft Environmental Impact Statement (DEIS) for Proposed
Country Courses at Kahuku - Response to Comments
Received**

Dear Mr. Kosaka:

Thank you very much for the copy of your letter dated April 11, 1990 to the Department of General Planning regarding the above-mentioned project, and for providing the National Wetlands Inventory maps. We appreciate your review of the DEIS and provide the following information in response to your comments:

General Comments:

We agree that some of the pesticides which are used on golf courses in Hawaii are toxic to birds and other wildlife. Drs. Murdoch and Green have presented evidence to support their conclusions that, if used properly there is little likelihood of adverse environmental impact to fish and wildlife from application of fertilizers and pesticides in the maintenance of the Country Courses at Kahuku. Proper pesticide use, in some cases may mean choice of pesticides with lower toxicity. The list of pesticides used on golf courses in the consultant's reports (Appendix J, Table 2 and Table B-1) is a list of those used for golf course maintenance in Hawaii. It is not implied that all of these chemicals will be used on a given golf course. In some cases, especially for insecticides, there is a choice of several chemicals to control the same pests. Most of the turf insect pests in Hawaii can be controlled with either organic phosphate (e.g. Chlorpyrifos, trichlorfon) or carbamate insecticides (e.g., carbaryl, bendiocarb). Since carbaryl is much less toxic to birds than the organic phosphate insecticides, and much less likely to leach to groundwater than bendiocarb, carbaryl should clearly be the choice of insecticides for the golf courses.

Pacific Tower
Suite 660
1001 Bishop Street
Honolulu, HI 96813
Phone
(808) 533-4937
FAX 521-5410

The provisions of the rules and regulations of the EPA governing pesticide usage are such that, if it is determined by EPA that a pesticide has the potential for negative impact at a given location, its use can be banned for that location. Since the Hawaii Department of Agriculture is the agency responsible for enforcing the pesticide laws in the Hawaii, the Fish and Wildlife Service can present a list of pesticides which they feel should not be used on the golf courses because of potential for negative impacts to fish and wildlife. The Hawaii Department of Agriculture can then enforce the ban of these pesticides on those golf courses. This can be done for existing golf courses in the area.

Specific Comments:

Groundwater Withdrawal:

a. The Punamano Refuge and the Punahoolepa Marsh have ground elevations that vary from 2 to 6 feet above sea level. The same holds true for the Kii Refuge lying to the southeast of Punamano. The Punamano Spring, lying makai of Kamehameha Highway is located on ground that drops from 10 feet to 5 feet above sea level. Water levels within the said wetlands and surrounding areas stands at 2.65 feet above sea level during normal dry weather periods.

A study made by Mr. John F. Mink, a recognized groundwater hydrologist, in December 1988, for the Estate of James Campbell, stated that the sustainable yield of the Koolauloa Aquifer is 35 mgd at a head of 13 feet at Kahuku and 19 feet in Hauula. The assigned allowable draft from the Kahuku Region has been established at 15 mgd. This assignment was agreed to by the State Department of Water and Land Development several years ago. With groundwater levels remaining at 13 feet msl, free flow to ground elevations at 6 feet or below will remain.

The current groundwater draft in the Kahuku area is 8.7 mgd, which leaves 6.3 mgd unused. Lessees of the Campbell Estate lands have expressed interest in taking an additional 1.8 mgd which then leaves 4.0 mgd of the 15 mgd sustainable draft unused. It would be from this 4.0 mgd unused portion that the 2.2 mgd (average) use for golf course irrigation and domestic supply would come.

Mr. John Mink's report indicates that the increased groundwater withdrawal will not adversely affect the spring fed wetlands as ground water levels would not drop.

b. The response to a. above indicates that the groundwater table will remain at 13 feet above sea level even with the proposed increase in withdrawal contemplated by the golf course development. There will still remain a 1.8 mgd portion of the sustainable yield that is unused. The Fish and Wildlife Service are users of groundwater and their reserve should be in the current 8.7 mgd draft of the Kahuku region.

Wetland Delineation:

Referring to the Keaau Clay shown on Plate M-2 of Appendix A, Sub Appendix A, Vol II, the clay has a Jaucas Sand strip coursing through it. It is this site on the golf course (Fig 5 of Sub Appendix E, Vol II, Page 7) that a storm water retention pond is contemplated. We believe our proposed use of the area is compatible with the existing conditions at the site. Your expressed concern will be coordinated with the Corps of Engineers and other agencies mentioned and the results will be followed in the site development.

Drainage and Flooding

Revised storm water runoff tables will be provided in the Final EIS. Table I provides for a 20.0% increase in the runoff for the 605 acre site. This is because of the different ground cover that will be on the golf courses. Table II indicates that the 20.0% increased runoff from the golf course sites, would actually increase the entire watershed runoff 13.5%. The second paragraph of Page 9 under *Impacts and Mitigation* indicates how approximately 70 acres of the Kalaekahipa Gulch drainage basin will be directed through an existing sump that will reduce the runoff of Kalaekahipa Gulch (Figure 6, Sub Appendix E, Vol II). This diversion will reduce the peak runoff from the gulch and combined with other swales and retention ponds, to be built within the golf course, will actually reduce the storm-water runoff from the drainage basins mauka of Kamehameha Highway. There will be no increased runoff from the mauka drainage basins and the proposed golf course drainage plan is to be incorporated within the Kahuku Drainage Master Plan. The Kahuku Drainage Master Plan is being developed with input from the US Fish and Wildlife Services. When the Drainage Master Plan is implemented, no normal storm flows will be directed through Kii or Punamano Refuge sites.

Pesticide and Nutrient Loading:

a. The list of pesticides provided in the DEIS provide the chemicals most commonly applied. Appendix J, Table 1 lists all the chemicals that the Drs. Murdoch and Green, consultants, are aware of which are used on Hawaii golf courses. There are possibly others which are labeled for use but are not used in Hawaii for various reasons. As to chemicals available in the future, the consultants cannot speculate. However, any chemical used will, by law, have to be approved by EPA and the Hawaii Department of Agriculture. Potential impact on fish and wildlife is one consideration in the labeling of pesticides for use on golf courses.

The solvents, surfactants, and diluents contained in pesticide formulations are considered privileged information and not usually divulged by the companies. This information is unavailable and, thus cannot be included.

b. The acute and chronic toxicity evaluations for birds, fishes, and aquatic invertebrates for all the pesticides given in Appendix J, Table B-1 are not available. The consultants have given acute mammalian LD 50's for

those pesticides as published in: Hartley, Douglas and Hamish Kidd (Eds.), 1983, The Agrochemicals Handbook, Unwin Brothers, Ltd. Old Working, Surrey England. The relative toxicity to fish and wildlife has been provided in the same publication. Only limited information was given for the pesticides listed in Appendix J, Table B-1 in the publications of the Fish and Wildlife Service which was reviewed (Hudson, R.H., R. K. Tucker, and M. A. Haegele, 1984, Handbook of Toxicity of Pesticides to Wildlife, 2nd Edition, U.S. Fish and Wildlife Service, Resource Publication 153, Smith, G.J., 1987, Pesticide Use and Toxicology in Relation to Wildlife: Organophosphorus and Carbamate Compounds, U.S. Fish and Wildlife Service Resource Publication 170). There are great differences in toxicology of each pesticide to different species of fish, birds, and aquatic invertebrates given in those publications. Also the formulations of pesticides used and the age or size of the test organisms resulted in large differences in results. The species which are given in the Fish and Wildlife publications are not always the same as those in Hawaii. Because the data were limited and were not easily summarized, relative toxicity estimations, where available, were more appropriate in this assessment.

The relative toxicity scale used is the EPA scale which is widely accepted (shown below as given in Appendix Table 2). If the scale suggested by Smith is more realistic for wildlife, the LD 50's in terms of mg/kg are given in Appendix J, Table B-1. These can be applied to the scale suggested by Smith. Paraquat is seldom used on golf courses in Hawaii, although it is labeled for use.

APPENDIX TABLE B-2 (Toxicity classes of pesticides)

Class	Description	Warning Statement	Oral LD50
1	Highly Toxic Skull & Crossbones	Poison	1-50
2	Moderately Toxic	Danger	51-500
3	Low Toxicity	Warning	501-5,000
4	Very Low Toxicity	Caution	Less than 5,000

c. It is true that actual measurements of organic carbon contents of soils in the development area have not been measured. Published data in USDA soil survey reports were the basis of conclusions reached in the report (Appendix J, Vol II). Actual measured data could be obtained as part of development activities following approval of the project. Recommendation No. 2 in the report states: "Eroded soil areas that are leveled should be covered with surface soil containing at least 1.5% organic carbon." The depth of imported top soil required would depend on the organic carbon content of the underlying native soil. Specific guidelines for the depth of topsoil and content of organic carbon do not exist, but reasonable estimates can be made

based on numerical models. It would be premature to conduct a thorough assessment of soil organic carbon content throughout the development area prior to approval of the project, but it is appropriate to set criteria for acceptable levels of soil organic matter in the surface soil. Tentatively, an amount of organic carbon to a depth of two feet equivalent to that in one foot of soil with an organic carbon content at or above 1.5% is reasonable.

d. Certain portions of the proposed Kahuku Drainage Master Plan are being designed to control runoff from the golf course sites so that there will be no more storm runoff than exists presently. The proposed design will be to reduce peak flows to levels well below those experienced at the present time. The plan also calls for a diversion ditch to be constructed along Nudist Camp Road so that Hoolapa Gulch flows will not spill into Punamano Spring. It is also proposed that storm flows from Ohia Ai Gulch and Mill Ditch by Kahuku as well as flows in the East-West Ditch will eventually bypass Kii Refuge so that control of water levels within both Kii and Punamano will be under the Fish and Wildlife Service. The Master Plan will keep storm runoff flow up to the 100 year storm out of Kii and Punamano.

There will be no increase in storm runoff onto the Kahuku Plain. The increase in groundwater withdrawal will not lower the groundwater table below 13 feet msl and the effect on wetlands will be nil.

e. The potential for drift of pesticides is discussed in Appendix D of Appendix J. As indicated there is little potential for drift of pesticides. Pesticides applied as sprays on golf courses are applied by ground-operated equipment. The spray booms are close to the soil surface (usually 1.5 to 2.0 feet) and coarse spray droplets are used to decrease the likelihood of spray drift. Because wind distorts spray patterns and results in reduced effectiveness of pesticide sprays, spraying of pesticides on golf courses is done when wind speed is minimal. Data cited in Sub Appendix D indicates that, even at a wind speed of 10 mph, less than 1% of the spray solution drifts more than 17 feet. There are shielded sprayers on the market which contain essentially 100% of the spray. The consultants additionally recommend that pesticide spraying be done with a shielded sprayer to avoid any drift of sprays.

f. There were eight cases of poisoning of birds cited by Stone (Stone, W.B. 1979, Poisoning of wild birds by organophosphate and carbamate insecticides, New York Fish and Game Journ. 26(1):37-47). Of the eight cases, three were attributed by Stone to have been purposeful poisoning by farmers or bird haters. One case was the result of water birds using an industrial lagoon of a pesticide manufacturer which contained high levels of thiocarbamate insecticide (carbofuran, which is not used on golf courses). One was attributed to the use of Dazinit, an organic phosphate used primarily for nematode control and not used in Hawaii (although it is labeled). Two cases were attributed to diazinon, an insecticide which has been banned from use on golf courses. One case was attributed to an incident when both chlorpyrifos and diazinon were applied to golf green and Canada Geese feed-in the grass were killed. The pesticides applied to the Country Courses

Kahuku will be applied in accordance with labeled instructions, including precautions about watering in insecticides, avoiding application to streams, ponds, etc. In most cases, the insecticide carbaryl, which is less toxic to birds than the organic phosphate insecticides can be used for insect control. As was previously stated, there has been no reported incidence of water birds being poisoned from frequenting water hazards of any golf course in Hawaii.

g. Regarding impacts of golf course chemical applications on the James Campbell National Wildlife Refuge and the Punahoolapa Marsh, a water quality monitoring protocol in cooperation with the U.S. Fish and Wildlife Service would be an appropriate approach. The plan would specify a minimum frequency of sampling and analysis (as in Recommendation 5 of Appendix J, DEIS), but allow for increased frequency and spatial intensity of sampling if early results warrant. We concur with additional mitigative measures as presented. Similar recommendations have been provided in Appendix J, Page iii. Also, we will meet the 8 conditions outline in the State Department of Health's letter (attached) that includes groundwater monitoring. Further we will develop, in consultation with the City and State, a rigorous monitoring program designed to minimize the potential adverse effects of leaching and runoff and to assure proper turf management. This program will include making available to appropriate agencies those records related to fertilizer and biocide applications and the results of the monitoring program. The EPA is the agency which approves pesticides for particular use. Only approved pesticides will be used.

h. As indicated above, the mechanism for prohibiting the use of potentially harmful pesticides is already in place. The Fish and Wildlife Service can eliminate the use of proven potentially damaging pesticides through the Hawaii Department of Agriculture. In some cases, effective pesticides can be chosen with reduced toxicity.

Summary Comments:

Portions of the above responses will be included in the Final EIS in the appropriate sections.

Thank you for your comments. For your information, your letter together with this response will be included in the Final EIS.

Sincerely,


WILLIAM E. WANKET

cc: Benjamin B. Lee, Chief Planning Officer

April 7, 1989

EIGHT (8) CONDITIONS APPLICABLE TO THIS NEW GOLF COURSE DEVELOPMENT

Conditions:

1. The owner/developer and all subsequent owners shall establish a groundwater monitoring plan and system which shall be presented to the State Department of Health for its approval. The groundwater monitoring plan and system shall minimally describe the following components:
 - a. A system of monitoring wells constructed throughout the site. These monitoring wells shall extend approximately ten (10) feet below the water table.
 - b. A routine groundwater monitoring schedule of at least once every six (6) months and more frequently, as required by the State Department of Health, in the event that the monitoring data indicates a need for more frequent monitoring.
 - c. A list of compounds which shall be tested for as agreed to by the State Department of Health. This list may include, but not be limited to the following: total dissolved solids; chlorides; PH; nitrogen; phosphorus; or any other compounds associated with fertilizers, biocides or effluent irrigation.
2. A baseline groundwater data shall be established as described in this paragraph. Once the test well sites and list of compounds to be monitored for have been determined and approved by the State Department of Health, the owner/developer shall contract with an independent third-party professional (approved by the State Department of Health) to have the groundwater sampled and its data reported to the State Department of Health. Testing of the groundwater shall be done by a certified laboratory.
3. If the data from the monitoring wells indicate the presence of the measured compound and/or the increased level of such compound, the State Department of Health can require the owner/developer or subsequent owner to take immediate mitigating action to stop the cause of the contamination. Subsequently, the developer/owner or subsequent owner shall mitigate any adverse effects caused by the contamination.
4. Owner/developer shall provide sewage disposal by means of connection to the public sewer system; or by means of a wastewater treatment works providing treatment to a secondary level with chlorination. Effluent from this wastewater treatment works may be used for golf course irrigation, subject to Condition #3. The entire system shall be approved by the State Department of Health in conformance with Administrative Rules Title 11, Chapter 62, Wastewater Treatment Systems, effective December 10, 1988.

5. If a wastewater treatment works with effluent reuse becomes the choice of wastewater disposal, then the owner/developer and all subsequent owners shall develop and adhere to a Wastewater Reuse Plan which shall address as a minimum, the following items:
- a. Management Responsibility. The managers of the irrigation system using reclaiming wastewater shall be aware of the possible hazards and shall evaluate their system for public health, safety, and efficiency. They must recognize that contact with the reclaimed wastewater from treated domestic sewage poses potential exposure to pathogenic organisms which commonly cause infectious diseases (bacteria, viruses, protozoa, and helminths or worms).
 - b. General Recommendations
 - 1) Irrigated areas should be no closer than 500 feet from potable water wells and reservoirs.
 - 2) Irrigated areas should be no closer than 100 feet from any private residence.
 - 3) Application rates should be controlled to minimize ponding. Excess irrigation tailwater in the reclaimed wastewater irrigation area shall be contained and properly disposed. An assessment should be made of the acceptable time and rate of application based on factors such as type of vegetation, soil, topography, climate and seasonal variations.
 - 4) Effluent holding/mixing ponds shall be designed to prevent the infiltration of the wastewater into the subsurface. The holding/mixing ponds shall be made impervious.
 - 5) Irrigation shall be scheduled such that the public is not in the vicinity and the soil is sufficiently dry to accept the irrigation water.
 - 6) Permanent fencing or barriers shall be erected around polishing or holding ponds to prevent public entry or stray feral and tame animals from gaining access to the ponds.
 - 7) Adequate irrigation records shall be maintained. Records should include dates when the fields are irrigated, rate of application, total application and climatic conditions. Records should also include any operational problems, diversions to emergency storage or safe disposal and corrective or preventive action taken.
 - 8) The holding/mixing ponds shall be periodically monitored for the purpose of detecting leakage into the subsurface. If leakage is detected, corrective action shall be immediately taken.
 - c. Adequate Notice. Appropriate means of notification shall be provided to inform the employees and public that reclaimed wastewater is being used for irrigation on the site.

- 1) Posting of conspicuous signs with sufficient letter size for clear visibility with proper wording should be distributed around the use areas.
 - 2) Signs shall be securely fastened. Periodic surveillance shall be conducted to assure permanent posting at all times. Immediate replacements shall be made when necessitated by deterioration, vandalism or misuse.
- d. Adequate Employee Education. Employees or users should be cautioned and warned of the potential health hazards associated with the ingestion of reclaimed wastewater being used at the site.
- 1) Employees should be warned that the ingestion of reclaimed wastewater is unsafe.
 - 2) Employees should be protected from direct contact of the reclaimed wastewater. If necessary, protective clothing should be provided.
 - 3) Employees should be informed of the following:
 - o The irrigation water is unsafe for drinking or washing.
 - o Avoid contact of the water or soil with any open cuts or wounds.
 - o Avoid touching the mouth, nose, ear or eyes with soiled hands, clothes or any other contaminated objects.
 - o Be aware that inanimate objects such as clothes or tools can transport pathogenic organisms.
 - o Always wear shoes or boots to protect feet from the pathogenic organisms in the soil or irrigation water.
6. Use of electrical golf carts is recommended. It is recognized that underground storage tank(s) to store gasoline for gas driven golf carts will impose potential risks to the groundwater. If gasoline-driven golf carts are to be utilized, the developer/owner must meet all federal requirements in the installation of any underground storage tank.
7. Buildings designated to house the fertilizer and biocides shall be bermed to a height sufficient to contain a catastrophic leak of all fluid containers. It is also recommended that the floor of this room be made waterproof so that all leaks can be contained within the structure for cleanup.
8. A golf course maintenance plan and program will be established based on "Best Management Practices (BMP)" in regards to utilization of fertilizers and biocides as well as the irrigation schedule. BMP's will be revised as an ongoing measure. The golf course maintenance plan will be reviewed by the State Department of Health prior to implementation.

If there are any questions regarding the eight (8) conditions mentioned here, please contact Mr. James K. Ikeda at 548-6455. We ask your cooperation in the protection of Hawaii's valuable groundwater resource.

UNITED STATES
DEPARTMENT OF
AGRICULTURE

SOIL
CONSERVATION
SERVICE

P. O. BOX 50004
HONOLULU, HAWAII
96850

March 28, 1990

Mr. Donald Clegg
Chief General Planner
Department of General Planning
City and County of Honolulu
Municipal Office Building, 8th Flr.
650 S. King Street
Honolulu, Hawaii 96813

Dear Mr. Clegg:

Subject: Draft Environmental Impact Statement (DEIS) -
Country Courses at Kahuku (Malaekahana & Punamano)
Vols. I and II; Koolauloa, Oahu, Hawaii

We have no comments to offer at this time; however, we would appreciate the opportunity to review the final EIS for both projects.

Sincerely,



WARREN M. LEE
State Conservationist

cc:

The Estate of James Campbell, Suite 300, 828 Fort Street Mall,
Honolulu, HI 96813

William E. Wanket, Pacific Tower 660, 1001 Bishop Street,
Honolulu, HI 96813

Mr. Marvin Miura, Director, Office of Environmental Quality Control,
465 S. King Street, Rm. 104, Honolulu, HI 96813

WILLIAM
E.
WANKET
INC.

Land Use Consultant

March 30, 1990

Mr. Warren M. Lee
State Conservationist
United States Department of Agriculture
Soil Conservation Service
P.O. Box 50004
Honolulu, Hawaii 96850

RE: Draft Environmental Impact Statement (DEIS) for Proposed
Country Courses at Kahuku (Malaekahana & Punamano) - Response to
Comments Received

Dear Mr. Lee:

Thank you very much for the copy of your letter of March 28, 1990 to the Department of General Planning regarding the referenced project. We appreciate your efforts in reviewing the DEIS.

For your information, your letter, together with this response, will be published in the Final EIS.

Sincerely,


WILLIAM E. WANKET

cc: Benjamin B. Lee, Chief Planning Officer

Pacific Tower
Suite 660
1001 Bishop Street
Honolulu, HI 96813
Phone
(808) 533-4937
FAX 521-5410

DEIS

**State Comment
Letters and
Applicant Responses**

JOHN WAIHEE
GOVERNOR



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

W. E. Wanket
YUKIO KITAGAWA
CHAIRPERSON, BOARD OF AGRICULTURE
SUZANNE D. PETERSON
DEPUTY TO THE CHAIRPERSON

FAX: 548-6100

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

March 16, 1990

Mr. Benjamin B. Lee
Chief Planning Officer
Department of General Planning
City and County of Honolulu
650 South King Street
Honolulu, Hawaii 96813

Dear Mr. Lee:

Subject: Draft Environmental Impact Statements (DEIS's)
for Country Courses at Kahuku
Malaekahana and Punamano
The Estate of James Campbell
TMK: 5-6-06: 2 and por. 6 (Malaekahana)
Area: 200 acres (one course)
TMK: 5-6-05: pars. 1, 2, 7, and 5 and 6
5-7-01: por. 21 (Punamano)
Area: 605 acres (three courses)

The Department of Agriculture has reviewed the subject documents and offers the following comments.

The applicant is proposing an amendment to the Koolauloa Development Plan Land Use Map for the two sites from Agriculture to Park/Golf Course.

The DEIS's do address most of the concerns found in our letter to William E. Wanket, Inc. (dated December 22, 1989) regarding the Environmental Impact Statement Preparation Notice (EISPN) for the subject projects. We do, however, have the following additional comments to offer.

We understand that the Gunstock Ranch leases about 125 acres of the Malaekahana site for grazing purposes (100 head cattle, 40 horses). Approval and development of the Malaekahana course will force the closure of the ranch or its relocation (Appendix D, Social Impact Assessment, pages 53-54). Insofar as the lands surrounding the proposed golf course sites are available for some temporary use and potential lease rents would be unaffected by the existence of these courses (Appendix H, Impact on Agriculture, pages VA-via), the Ranch should logically be allowed relocation privileges.



Mr. Benjamin B. Lee
March 16, 1990
Page -2-

Appendix H states that Orient Aquaculture International's attempts to find an economic use of the Punamano lands included grain and forage crops such as corn, sorghum, sudex and hay (Ibid, page 7). These crops have high moisture requirements (somewhat similar to sugarcane), and to our recollection, Amorient used an extensive mobile sprinkler and spray gun system as the principal means of irrigation. These factors, combined with a high rate of evaporation due to the constant tradewinds, probably explain the high cost of pumping water which is listed as a reason for Punamano's unsuitability for commercial agricultural crop production (Ibid, page 8).

The DEIS's state that the proposed courses would employ about 80 people in "... jobs involved with cultivating grasses and plants, applying fertilizers and chemicals, maintaining irrigation systems, etc." (Appendix H, page 18.) It is possible that these specific jobs would require specialization and thus be similar to employment in plantation agriculture. Therefore, it is not unrealistic to expect that the golf courses could provide an employment opportunity for former plantation workers.

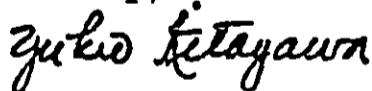
Regarding overall agricultural employment since the closure of the Puna Sugar Company in 1984, there has been a net loss of 300 between 1985 to 1988 or about 70 jobs per year. While both sugar and pineapple employment decreased during this period, diversified agriculture increased by 325 jobs (1988 Statistics of Hawaiian Agriculture, page 96).

We note that our concerns about landscaping plants, importation of sod and plant materials, and use of native turfgrass and certified seed on the golf courses will be met (letter of William E. Wanket to Yukio Kitagawa, dated December 27, 1989).

When available, please send us a copy of the Final EIS.

Thank you for the opportunity to comment.

Sincerely,



YUKIO KITAGAWA
Chairperson, Board of Agriculture

cc: The Estate of James Campbell
William E. Wanket, Inc.
Office of Environmental Quality Control
Office of State Planning (attention: Land Use Division)

WILLIAM
E.
WANKET
INC.

Land Use Consultant

April 17, 1990

The Honorable Yukio Kitagawa
Chairperson
Board of Agriculture
1428 South King Street
Honolulu, Hawaii 96814-2512

RE: Draft Environmental Impact Statement (DEIS) for Proposed
Country Courses at Kahuku (Malaekahana and Punamano) - Response
to Comments Received

Dear Mr. Kitagawa:

Thank you very much for the copy of your letter dated March 16, 1990 to the Department of General Planning regarding the above-mentioned project and for information that the DEIS and our letter of December 27, 1990 have addressed most of your previous concerns. The following information is provided in response to your comments to the DEIS.

Gunstock Ranch

If Gunstock wishes to relocate, Campbell Estate has indicated that it will put forth its best effort to relocate the Ranch on other lands which the Estate owns in the Kahuku area with terms similar to those of the existing lease between the two parties.

Orient Aquaculture International

Although Amorient used a sprinkler system to water its lower-elevation lands, it used a more water-efficient drip irrigation system to water the mauka lands which are proposed for the golf courses at Punamano. Because of the uneven terrain of the mauka lands, a sprinkler system is not practical.

In addition to high pumping costs and uneven terrain on the Punamano lands, other difficulties for crop production include poor soils and excessive winds.

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Employment

We concur that golf courses could provide an employment opportunity for former plantation workers.

Overall Agricultural Employment


Using the data from the Statistics of Hawaiian Agriculture: 1988, Page 96, the annual loss of agricultural employment over the 3-year period from 1985 to 1988 is 100 jobs.

However, the agricultural employment data used in Appendix H of the Draft EIS indicates an average annual decline of 260 jobs over the 10-year period from 1978 to 1988. Furthermore, diversified agriculture shares in the decline.

For the Draft EIS, agricultural employment data comes from the State of Hawaii Data Book, 1988, pp. 332 and 333, updated by the Department of Labor and Industrial Relations (DLIR) to 1988. This is a more reliable source than that of the Statistics of Hawaiian Agriculture since the former source is based on monthly sampling, while the latter source is based on quarterly sampling. Also, the Draft EIS includes agricultural self-employed, while the Statistics of Hawaiian Agriculture does not. Finally, the 10-year period ending in 1988 appears to provide a more reliable trend than that provided by the 3-year period ending in 1988 (see the attached graph).

Again, thank you for providing comments to the DEIS. For your information, this response together with your letter will be included in the Final EIS.

Sincerely,

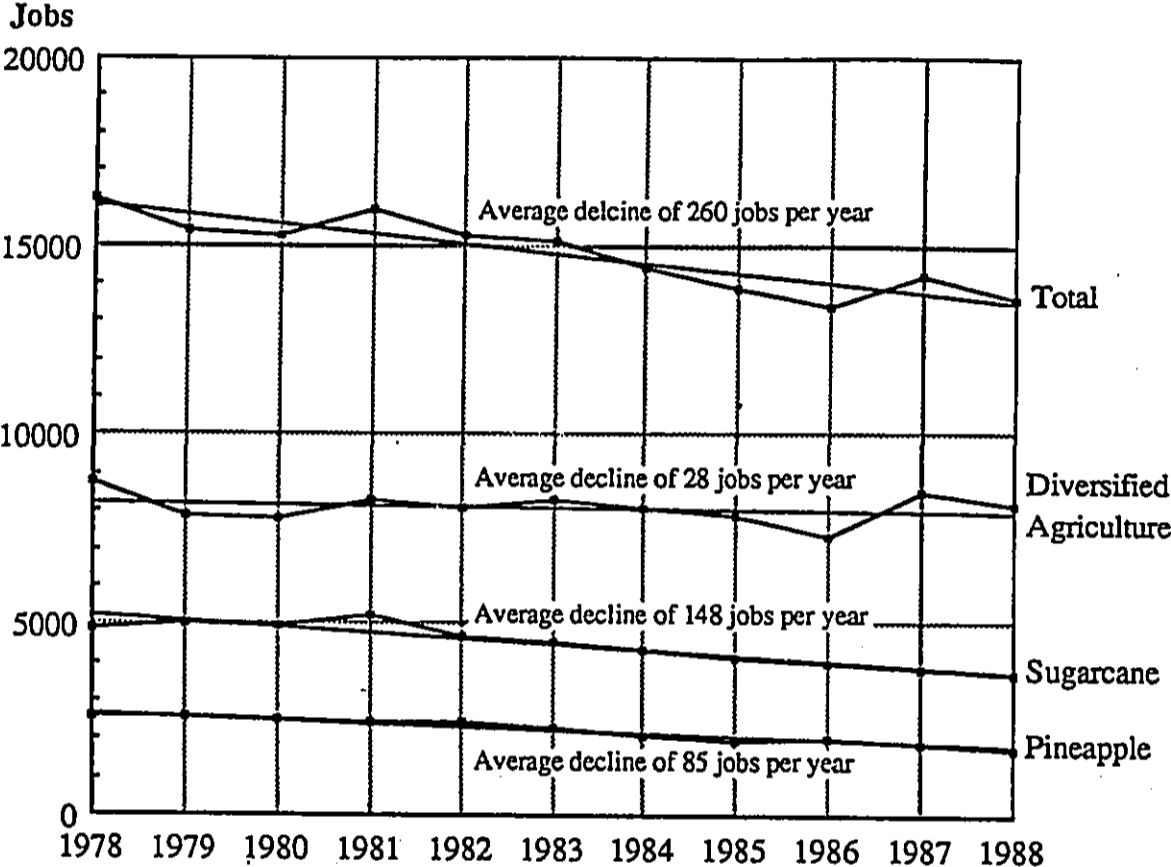


WILLIAM E. WANKET

cc: Benjamin B. Lee, Chief Planning Officer

Encl: (1)

Agriculture Field Employment: 1978 to 1988



JOHN WAIHEE
GOVERNOR



JOSEPH K. CONANT
EXECUTIVE DIRECTOR

STATE OF HAWAII
DEPARTMENT OF BUDGET AND FINANCE
HOUSING FINANCE AND DEVELOPMENT CORPORATION
SEVEN WATERFRONT PLAZA, SUITE 303
500 ALA MOANA BOULEVARD
HONOLULU, HAWAII 96813
FAX (808) 543-8841

IN REPLY REFER TO:

90:PLNG/1286 jt

March 20, 1990

MEMORANDUM

TO: Department of General Planning
City & County of Honolulu

FROM: Joseph K. Conant

SUBJECT: Draft Environmental Impact Statement for the Proposed
Country Courses at Kahuku (Malaekahana and Punamano)

Thank you for addressing our previous concerns regarding the potential social, employment and environmental (wetland area) impacts of the proposed project.

The Social Impact Assessment notes that when considered with the Kuilima Resort expansion, the proposed project will add to the demand for labor supply and could increase the need for in-migrant workers. However, it is further noted that job training to assist area residents successfully compete with out-of-area residents for golf course jobs could minimize the need for in-migrant workers. We believe that this is an important mitigative measure in light of the critical need for affordable housing in Koolauloa. Should employment stemming from the proposed project exacerbate this critical housing need, we believe that the developer should provide affordable employee housing opportunities.

Thank you for the opportunity to comment.

A handwritten signature in black ink, appearing to read "Joseph K. Conant", written over a horizontal line.

JOSEPH K. CONANT
Executive Director

cc: The Estate of James Campbell
✓ William E. Wanket
Dr. Marvin T. Miura, OEQC

WILLIAM
E.
WANKET
INC.

Land Use Consultant

April 9, 1990

Mr. Joseph K. Conant
Executive Director
Department of Budget and Finance
Housing, Finance and Development Corporation
Seven Waterfront Plaza, Suite 300
500 Ala Moana Boulevard
Honolulu, Hawaii 96813

**RE: Draft Environmental Impact Statement (DEIS) for Proposed
Country Courses at Kahuku (Malaekahana and Punamano) - Response
to Comments Received**

Dear Mr. Conant:

Thank you very much for the copy of your letter dated March 20, 1990 to the Department of General Planning regarding the above-referenced project and for the information that your previous concerns relating to the potential social, employment and environmental (wetland area) impacts have been addressed by the DEIS. Regarding your statements on the project's effect on demand for labor resulting in immigrant workers and the impact of the already critical need for affordable housing in Koolauloa, the following is offered:

Housing availability in rural areas is a socio-political issue addressed by the City Council in the General Plan for the City and County of Honolulu and Development Plans for the Koolauloa and North Shore areas. In addition to offering job training to allow area residents the chance to compete for project employment, The Estate of James Campbell and a number of other land owners and developers have proposed additional housing in the North Shore and Koolauloa areas. For example, The Estate of James Campbell is currently processing a DP Amendment Application (90/KL-4) for a proposed subdivision in Kahuku of approximately 87 single-family homes that will be targeted for sale to residents and employees of the region. The Estate is also assisting in the expansion of the Kahuku Wastewater Treatment Plant, which will serve not only the proposed Kahuku Residential project, but also the adjacent Kahuku Village Makai Development. The \$3 million dollar expansion cost is being funded by the City and County of Honolulu, State of Hawaii, Kahuku Village Association and the Estate of James Campbell.

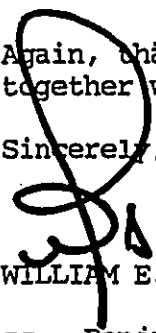
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FAX 521-5410

-Page 2-

Housing, Finance and Development Corporation

Again, thank you for providing comments. For your information, your letter together with this response will be included in the Final EIS.

Sincerely,



WILLIAM E. WANKET

cc: Benjamin B. Lee, Chief Planning Officer



DEPARTMENT OF BUSINESS
AND ECONOMIC DEVELOPMENT

ENERGY DIVISION, 335 MERCHANT ST., RM. 110, HONOLULU, HAWAII 96813 FAX: (808) 531-5243

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

February 20, 1990

Department of General Planning
City & County of Honolulu
Municipal Office Building, 8th Floor
650 South King Street
Honolulu, Hawaii 96813

Attention: Mr. Bill Medeiros

Dear Sir:

Subject: Country Courses at Kahuku (Punamano), Volumes I and II,
Kahuku, Koolauloa, Oahu

We wish to inform you that we have no comments to offer on the subject
environmental impact statement.

Thank you for the opportunity to review the document.

Sincerely,

Maurice H. Kaya
Energy Program Administrator

MHK:if

cc: The Estate of James Campbell
✓ Mr. William E. Wanket
Dr. Marvin T. Miura

WILLIAM
E.
WANKET
INC.

Environmental Consultant

February 23, 1990

Mr. Maurice H. Kaya
Energy Program Administrator
Department of Business and Economic
Development
Energy Division
335 Merchant Street, Room 110
Honolulu, Hawaii 96813

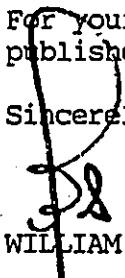
RE: Draft Environmental Impact Statement (DEIS) for Proposed
Country Courses at Kahuku (Punamano) - Response to Comments
Received

Dear Mr. Kaya:

Thank you very much for the copy of your letter of February 20, 1990
to the Department of General Planning regarding the referenced project.
We appreciate your efforts in reviewing the DEIS.

For your information, your letter, together with this response, will be
published in the Final EIS.

Sincerely,


WILLIAM E. WANKET

cc: Benjamin B. Lee, Chief Planning Officer

Pacific Tower
Suite 600
1001 Bishop Street
Honolulu, HI 96813
Phone
(808) 533 4937
FAX 521 5410

JOHN WAIHEE
GOVERNOR



STATE OF HAWAII
DEPARTMENT OF DEFENSE
OFFICE OF THE ADJUTANT GENERAL
3949 DIAMOND HEAD ROAD, HONOLULU, HAWAII 96816-4495

ALEXIS T. LUM
MAJOR GENERAL
ADJUTANT GENERAL

MYLES M. NAKATSU
COLONEL
DEPUTY ADJUTANT GENERAL

February 15, 1990

Engineering Office

Department of General Planning
Municipal Office Bldg, 8th Floor
650 South King Street
Honolulu, Hawaii 96813
Attn: Mr. Bill Medeiros

Dear Dr. Miura:

Country Courses at Kahuku (Punamano) Volumes I & II
Kahuku, Koolauloa, Oahu

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

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

Sincerely,

A handwritten signature in black ink that reads "Jerry M. Matsuda".

Jerry M. Matsuda
Lieutenant Colonel
Hawaii Air National Guard
Contracting & Engineering Officer

cc: Marvin T. Miura, Ph.D., Director, OEQC
The Estate of James Campbell
✓ Mr. William E. Wanket, Inc.



WILLIAM
E.
WANKET
INC.

Land Use Consultant

February 19, 1990

Jerry M. Matsuda
Lieutenant Colonel
Hawaii Air National Guard
Contracting & Engineering Officer
Department of Defense
Office of the Adjutant General
3949 Diamond Head Road
Honolulu, Hawaii 96816-4495


**RE: Draft Environmental Impact Statement (DEIS) for the Proposed
Country Courses at Kahuku (Punahono Site) - Response to
Comments Received**

Dear Lieutenant Colonel Matsuda:

Thank you very much for the copy of your letter of February 15, 1990 to the Department of General Planning regarding the referenced project. We appreciate your efforts in reviewing the DEIS.

For your information, your letter, together with this response, will be published in the Final EIS.

Sincerely,


WILLIAM E. WANKET

cc: Benjamin B. Lee, Chief Planning Officer

Pacific Tower
Suite 660
1001 Bishop Street
Honolulu, HI 96813
Phone
(808) 533-4937
FAX 521-5410

JOHN WAIHEE
GOVERNOR OF HAWAII



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

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

March 6, 1990

In reply, please refer to:
EPHSD

Mr. William E. Wanket, President
William E. Wanket, Inc.
Pacific Tower 660
1001 Bishop Street
Honolulu, Hawaii 96813

Dear Mr. Wanket:

SUBJECT: Application for Development Plan Amendment and Environmental Impact Statement (EIS) Preparation Notice on Proposal to Designate Certain Land in Koolauloa for Preservation Malaekahana, about 200 acres (TMK: 5-6-06: 2 & Por. 6); Punamano, about 605 acres (TMK: 5-6-05: 5, 6, Por. 1, Por. 2, and Por. 7, 57-01: Por. 21) Kahuku, Oahu

Thank you for the opportunity to review the subject document. We have the following comments:

Drinking Water

1. The application concerns the development of one golf course in Malaekahana and three in Punamano, to be known as the Country Courses at Kahuku.
2. The applicant needs to address the sources of potable water for the projects.
3. The irrigation needs for the Malaekahana Golf Course is estimated to be .6 to .9 mgd, while 2.4 to 2.7 mgd will be required for other three courses. The applicant states that new wells will be drilled to supply this irrigation water.
4. If the proposed wells will be supplying potable water to the golf courses, the Department's Administrative Rules, Title 11, Chapter 20, "Potable Water Systems", will be applicable. Section 11-20-29 requires that any new source of potable water serving a public water system be approved by the Director of Health prior to its use. Such an approval is based primarily upon the submission of a satisfactory engineering report which addresses the requirements set in Section 11-20-29.

5. The proposed golf courses lie in proximity to the Board of Water Supply (BWS) Kawela well, Kahuku Air Base well, BWS Kahuku wells, and Malaekahana well. Because golf course irrigation typically requires heavy aquifer pumpage, operation of future wells shall not be allowed to degrade the water quality of the existing drinking water wells, especially with regards to salinity.
6. The proposed projects lie above the UIC line. Land areas above the UIC line are considered to contain underground sources of drinking water. These areas should therefore be protected against all sources of groundwater contamination. It is essential that the irrigation wells be designed and constructed so that they do not themselves contribute to groundwater contamination. For example, each well should have a concrete well pad to prevent seepage or floodwaters from migrating down the well shaft.
7. There are many golf course activities which might contribute to groundwater contamination. Among the activities which should not be allowed to contaminate groundwater are the following:
 - a. Application of biocides, and fertilizers
 - b. Storage of fuel for vehicles (especially underground storage)
 - c. Maintenance of vehicles and equipment (cleaning, refueling, lubrication, etc.)If any of these activities is planned, mitigative measures to assure that groundwater contamination will not occur must be included.
8. The attached "Eight (8) Conditions Applicable to this New Golf Course Development" apply to this project. The condition on monitoring wells is modified to include the use of lysimeters, or vadose zone monitoring instruments, or a combination of the different types. The monitoring system should be tailored to fit the site conditions and circumstances, and approved by the DOH.
9. Wastewater disposal activities must comply with all pertinent rules and regulations in the event that the project does not connect to an existing, approved wastewater treatment works.

Hazardous Waste

The proposed development of the Punamano and Malaekahana golf courses with its associated equipment maintenance facilities may lead to the generation of regulated quantities of hazardous waste. Facilities which generate hazardous waste must properly manage it in accordance with the directives contained in 40 Code of Federal Regulations, Part 262, Standards Applicable to Generators of Hazardous Waste. Any hazardous waste pesticides or chemicals generated from the maintenance of the grass, shrubs

and trees on the golf courses must also be properly handled according to federal hazardous waste regulations.

Underground Storage Tanks (USTs)

1. The applicant should recognize that any USTs installed in the proposed development areas may be subject both to Federal UST rules and regulations, as found in 40 CFR Part 280, and State of Hawaii UST rules adopted in accordance with Chapter 342-L, Hawaii Revised Statutes.

If the applicant elects to install regulated USTs (for instance, to supply fuel for maintenance vehicles), the applicant must comply with the federal technical standards and financial responsibility requirements under 40 CFR Part 280. These regulations include requirements for:
 - a. design, construction, installation, and notification;
 - b. general operating requirements;
 - c. release detection;
 - d. release reporting, investigation, and confirmation;
 - e. release response and corrective action;
 - f. changes-in-service and closure; and
 - g. financial responsibility requirements.
2. The proposed development areas are currently zoned as agricultural and thus are unlikely to have contained USTs in the past. Nevertheless, a records search should be made to check for the presence of any USTs that may currently be or may previously have been located in the proposed development areas. If such USTs are discovered, they should be closed in accordance with the requirements of 40 CFR Part 280 Subpart G before construction in the proposed development areas begins. If, during the closure of such USTs, contamination due to releases from those USTs is also discovered, the applicant should initiate corrective action in accordance with the requirements of 40 CFR Part 280 Subpart F.
3. The installation of UST systems containing flammable and combustible liquids is also subject to regulation by the City and County of Honolulu. The Honolulu City and County Fire Department should be contacted regarding any county requirements that may exist governing UST systems.
4. The proposed site is above the UIC (Underground Injection Control) line. Any ground water contamination resulting from leaking UST at the site may potentially threaten drinking water resources. Therefore, due to

the sensitive location of the proposed site and the permeability of the volcanic soils and bedrock in the area, we strongly recommend that all USTs installed in the proposed development areas incorporate secondary containment measures and appropriate release detection methods into their design as a precaution against releases of product to the soil and ground water, in addition to other Federal UST requirements.

Wastewater Disposal

We have reviewed the subject EIS preparation notice and found that public sewer service is not available in the proposed area. Therefore a private wastewater system is required for the proposed golf course. As no details of the wastewater system are given in the notice, we are unable to further comment on the system. All technical details of the facilities must be in compliance with Administrative Rules, Title 11, Chapter 62, Wastewater Systems effective December 10, 1989 and submitted to this office for review and approval prior to construction.

Vector Control

1. During the construction phase, the developer must conform to Administrative Rule 11-26 Section 11-26-35, Rodents; Demolition of Structures and clearing of sites and vacant lots.
2. Construction design must prevent standing water that might breed mosquitoes, gnats, and other aquatic pest, unless such body of water is cleared of vegetation and stocked with mosquito eating fishes.

Noise and Radiation

1. Concerns are directed to potential adverse noise impacts on surrounding residential communities from golf course related activities, particularly ground maintenance type, including use of lawn mowers and leaf blowers. Mitigative measures must be included to minimize such noise impacts.
2. Noise from activities associated with clubhouse facilities, specifically toward amplified music for entertainment and use of loudspeakers, may impact residents in terms of annoyances. Mitigative measures to minimize potential disturbances must be addressed.
3. Noise from stationary equipment, such as air conditioning units, exhaust fans, pumps, and generators, must be attenuated to meet the allowable noise levels as specified in Title II, Administrative Rules Chapter 43, Community Noise Control for Oahu.

4. Construction activities must comply with the provisions of Title II, Administrative Rules Chapter 43, Community Noise Control for Oahu.
 - a. The contractor must obtain a noise permit if the noise levels from the construction activities are expected to exceed the allowable levels of the regulations.
 - b. Construction equipment and on-site vehicles requiring an exhaust of gas and air must be equipped with mufflers.
 - c. The contractor must comply with the requirements specified in the regulations and conditions issued with the permit.
5. Traffic noise from heavy vehicles travelling to and from the construction sites must be minimized near existing residential areas and must comply with the provisions of Title II, Administrative Rules Chapter 42, Vehicular Noise Control for Oahu.


BRUCE S. ANDERSON, PH.D.

Attachment

April 7, 1989

EIGHT (8) CONDITIONS APPLICABLE TO THIS NEW GOLF COURSE DEVELOPMENT

Conditions:

1. The owner/developer and all subsequent owners shall establish a groundwater monitoring plan and system which shall be presented to the State Department of Health for its approval. The groundwater monitoring plan and system shall minimally describe the following components:
 - a. A system of monitoring wells constructed throughout the site. These monitoring wells shall extend approximately ten (10) feet below the water table.
 - b. A routine groundwater monitoring schedule of at least once every six (6) months and more frequently, as required by the State Department of Health, in the event that the monitoring data indicates a need for more frequent monitoring.
 - c. A list of compounds which shall be tested for as agreed to by the State Department of Health. This list may include, but not be limited to the following: total dissolved solids; chlorides; PH; nitrogen; phosphorus; or any other compounds associated with fertilizers, biocides or effluent irrigation.
2. A baseline groundwater data shall be established as described in this paragraph. Once the test well sites and list of compounds to be monitored for have been determined and approved by the State Department of Health, the owner/developer shall contract with an independent third-party professional (approved by the State Department of Health) to have the groundwater sampled and its data reported to the State Department of Health. Testing of the groundwater shall be done by a certified laboratory.
3. If the data from the monitoring wells indicate the presence of the measured compound and/or the increased level of such compound, the State Department of Health can require the owner/developer or subsequent owner to take immediate mitigating action to stop the cause of the contamination. Subsequently, the developer/owner or subsequent owner shall mitigate any adverse effects caused by the contamination.
4. Owner/developer shall provide sewage disposal by means of connection to the public sewer system; or by means of a wastewater treatment works providing treatment to a secondary level with chlorination. Effluent from this wastewater treatment works may be used for golf course irrigation, subject to Condition #3. The entire system shall be approved by the State Department of Health in conformance with Administrative Rules Title 11, Chapter 62, Wastewater Treatment Systems, effective December 10, 1988.

5. If a wastewater treatment works with effluent reuse becomes the choice of wastewater disposal, then the owner/developer and all subsequent owners shall develop and adhere to a Wastewater Reuse Plan which shall address as a minimum, the following items:
- a. Management Responsibility. The managers of the irrigation system using reclaiming wastewater shall be aware of the possible hazards and shall evaluate their system for public health, safety, and efficiency. They must recognize that contact with the reclaimed wastewater from treated domestic sewage poses potential exposure to pathogenic organisms which commonly cause infectious diseases (bacteria, viruses, protozoa, and helminths or worms).
 - b. General Recommendations
 - 1) Irrigated areas should be no closer than 500 feet from potable water wells and reservoirs.
 - 2) Irrigated areas should be no closer than 100 feet from any private residence.
 - 3) Application rates should be controlled to minimize ponding. Excess irrigation tailwater in the reclaimed wastewater irrigation area shall be contained and properly disposed. An assessment should be made of the acceptable time and rate of application based on factors such as type of vegetation, soil, topography, climate and seasonal variations.
 - 4) Effluent holding/mixing ponds shall be designed to prevent the infiltration of the wastewater into the subsurface. The holding/mixing ponds shall be made impervious.
 - 5) Irrigation shall be scheduled such that the public is not in the vicinity and the soil is sufficiently dry to accept the irrigation water.
 - 6) Permanent fencing or barriers shall be erected around polishing or holding ponds to prevent public entry or stray feral and tame animals from gaining access to the ponds.
 - 7) Adequate irrigation records shall be maintained. Records should include dates when the fields are irrigated, rate of application, total application and climatic conditions. Records should also include any operational problems, diversions to emergency storage or safe disposal and corrective or preventive action taken.
 - 8) The holding/mixing ponds shall be periodically monitored for the purpose of detecting leakage into the subsurface. If leakage is detected, corrective action shall be immediately taken.
 - c. Adequate Notice. Appropriate means of notification shall be provided to inform the employees and public that reclaimed wastewater is being used for irrigation on the site.

- 1) Posting of conspicuous signs with sufficient letter size for clear visibility with proper wording should be distributed around the use areas.
 - 2) Signs shall be securely fastened. Periodic surveillance shall be conducted to assure permanent posting at all times. Immediate replacements shall be made when necessitated by deterioration, vandalism or misuse.
- d. Adequate Employee Education. Employees or users should be cautioned and warned of the potential health hazards associated with the ingestion of reclaimed wastewater being used at the site.
- 1) Employees should be warned that the ingestion of reclaimed wastewater is unsafe.
 - 2) Employees should be protected from direct contact of the reclaimed wastewater. If necessary, protective clothing should be provided.
 - 3) Employees should be informed of the following:
 - o The irrigation water is unsafe for drinking or washing.
 - o Avoid contact of the water or soil with any open cuts or wounds.
 - o Avoid touching the mouth, nose, ear or eyes with soiled hands, clothes or any other contaminated objects.
 - o Be aware that inanimate objects such as clothes or tools can transport pathogenic organisms.
 - o Always wear shoes or boots to protect feet from the pathogenic organisms in the soil or irrigation water.
6. Use of electrical golf carts is recommended. It is recognized that underground storage tank(s) to store gasoline for gas driven golf carts will impose potential risks to the groundwater. If gasoline-driven golf carts are to be utilized, the developer/owner must meet all federal requirements in the installation of any underground storage tank.
7. Buildings designated to house the fertilizer and biocides shall be bermed to a height sufficient to contain a catastrophic leak of all fluid containers. It is also recommended that the floor of this room be made waterproof so that all leaks can be contained within the structure for cleanup.
8. A golf course maintenance plan and program will be established based on "Best Management Practices (BMP)" in regards to utilization of fertilizers and biocides as well as the irrigation schedule. BMP's will be revised as an ongoing measure. The golf course maintenance plan will be reviewed by the State Department of Health prior to implementation.

If there are any questions regarding the eight (8) conditions mentioned here, please contact Mr. James K. Ikeda at 548-6455. We ask your cooperation in the protection of Hawaii's valuable groundwater resource.

April 26, 1990

WILLIAM
E.
WANKET
INC.

Land Use Consultant

Mr Bruce S. Anderson, Ph.D.
Deputy Director
Department of Health
P.O. Box 3378
Honolulu, Hawaii 96801

**RE: Draft Environmental Impact Statement (DEIS) for Proposed
Country Courses at Kahuku (Malaekahana and Punamano) - Response
to Comments Received**

Dear Dr. Anderson:

Thank you very much for your letter of March 6, 1990 regarding the EISPN for the above-mentioned project. We appreciate your comments and the information provided. The Draft EIS has been published (February 1990) and distributed and includes, in addition to required project information, detailed engineering studies on irrigation requirements, water sources and quality, wastewater management, impact of pesticides and herbicides, and a noise impact study. Regarding your comments to the EISPN, reference will be given to the expanded DEIS text (pertinent Appendices will be cited).

Drinking Water

ITEM 1: No Comment Required.

ITEM 2: The proposed sources of potable water for the Punamano courses are existing Wells 341 and 353 which over the years have flowed at a combined rate of 2-3 mgd. Domestic water has been pumped at 100,000 to 200,000 gpd (Reference DEIS Appendix A, Sub Appendix F, Page 1, Volume II, for Punamano). Domestic water demands for Punamano will be 30,000 to 40,000 gpd. Irrigation water will fluctuate from 1.4 to 2.6 mgd with an average if about 2.1 to 2.2 mgd.

The proposed source of potable water for the Malaekahana Course is existing Well 363 which has supplied domestic water at about 0.5 mgd. (Reference Appendix A, Sub Appendix F, Page 1, Volume II for Malaekahana). Water for Malaekahana will be 10,000 to 15,000 gpd and irrigations will fluctuate from .4 to .75 mgd.

ITEM 3 (Irrigation Needs): Preliminary irrigation requirements for the Country Courses at Kahuku have been calculated by Smith, Young and Associates. The entire acreage is not expected to require irrigation but only those acres that will be landscaped or maintained as greens, tees etc. Thus, the following estimates are provided:

Pacific Tower
Suite 660
1001 Bishop Street
Honolulu, HI 96813
Phone
(808) 533-4937
FAX 521-5410

Punamano: Evaporation exceeds rainfall by approximately 6.5 inches during the month of July, for that month the demand for irrigation will reach about 2.6 mgd, falling to about 1.4 mgd during January and December. The average requirement for the three courses at the project site would range from 2.1 mgd to 2.2 mgd. The rate of fluctuation being an inverse factor of the daily rainfall (Appendix A, Sub-Appendix L, Page 6, Punamano). Irrigation water demands will probably require two or three new wells on the site some distance from the domestic well site (existing Well 341).

Malaekahana: Evaporation exceeds rainfall by approximately 6 inches during the month of June, the demand for irrigation water will reach about .75 mgd during that month, falling to about .38 mgd during January and December. The average requirement will be approximately .5 mgd. The rate of fluctuation being inversely proportional to the daily rainfall. New wells will be required to supply irrigation water for the golf course. However, regional groundwater resources can sustain the additional withdrawal of 0.5 mgd for golf course irrigation.

ITEM 4: Prior to the drilling of wells an engineering report addressing the requirements set forth by the Department of Health will be submitted for review and approval.

ITEM 5: To avoid adverse impacts to the groundwater resources in the area, several mitigative measures have been presented in the DEIS, Volume II, Appendix A, Sub-Appendix F; Page 2, Malaekahana and Punamano). These measures include the use of the lowest pumping rate possible for water retrieval to mitigate brackish water intrusion.

ITEM 6: Comments regarding the UIC line are correct. The necessary design to case and seal surface waters from the completed well are essential.

ITEM 7:

Application of biocides, and fertilizers. An Environmental Assessment of Fertilizer and Pesticide Use on the Proposed Country Courses at Kahuku (DEIS, Appendix J, Punamano and Malaekahana) has been prepared by Charles L. Murdoch and Richard E. Green. The study provides recommendations to mitigate the possibility of adverse impacts to the environment resulting from the use of fertilizers and pesticides at the project sites. Recommendations include the hiring of a qualified Golf Course Superintendent trained in the proper application and irrigation of fertilizers and pesticides.

Storage of fuel for vehicles (especially underground)/Maintenance of vehicles and equipment (cleaning, refueling, lubrication, etc.)

Underground storage of fuel is not being contemplated at this time. Electric

golf carts are being recommended for use at the project courses. However if gasoline fueled carts are used, all pertinent regulations regarding fuel storage, maintenance, and other potential waste-generating activities will be complied with. In general, however, maintenance facilities will be carefully monitored regarding potential generation of hazardous waste. The golf course maintenance supervisor will be trained in the types of chemicals used, various types of possible wastes generated, and proper chemical and waste storage. Training will include familiarization with regulations and procedures contained in 40 CFR 260-270, and particularly 262, Standards Applicable to Generators of Hazardous Waste.

ITEM 8 (Conditions Applicable to New Golf Course Development):

It is noted that the condition on monitoring wells has been modified to include the use of lysimeters, or vadose zone monitoring instruments, or a combination of the different types. All of the measures described in the eight conditions applicable to the new golf course developments, as imposed by the State of Hawaii Department of Health will be implemented by the developer and/or future golf course operators.

ITEM 9 (Wastewater Disposal): The facilities will be in compliance with Title II, Chapter 62, which became effective on December 10, 1988. Additional information on wastewater disposal is provided below.

Hazardous Waste: The response to this comment has been included in Item 7 above.

Underground Storage Tanks (USTs)

1. In the event that Underground Storage Tanks (USTs) are required, it is noted that Federal UST rules and regulations as found in 40 CFR Part 280, and State of Hawaii UST rules adopted in accordance with Chapter 342-L, Hawaii Revised Statutes may apply.

2. As you state it is unlikely that USTs would be discovered at the sites because of the current agricultural designation and activities. However, in the event USTs are detected, all regulations pertaining to closure and contamination prevention will be complied with.

3. The Honolulu City and County Fire Department will be contacted in the event of UST systems installations containing flammable or combustible liquids.

4. All precautions and Federal UST requirements to avoid contamination of ground water will be complied with.

Wastewater Disposal

The following information contained in the DEIS is provided in response to your comment (Page 4, your letter) on wastewater systems for the proposed courses:

Malaekahana: The proposed Malaekahana Golf Course will require its own sewage collection system, treatment plant and disposal system. An activated sludge "package plant" complete with redundant tankage and effluent filter is being considered for the site. The concept meets Chapter 62 of the State of Hawaii Department of Health Regulations (DEIS, Appendix A, Sub-Appendix G).

Punamano: Two alternatives are available for the Punamano Courses. The Kuilima Wastewater Treatment Plant is being constructed by the Kuilima Resort Development Company. That plant will be operated by the City and County Wastewater Management Division when it has been completed and dedicated. The plant is designed to treat 1.3 million gallons of domestic wastewater per day. The total wastewater generated by the Country Courses at Kahuku, Punamano site, is expected to be approximately 15,000 gallons per day. A combination force main, ejector station, gravity system could carry the estimated 15,000 gpd quantity to the City and County Kuilima Treatment Plant Facility some 8000 feet away.

In addition to this alternative, a complete mix activated sludge "package" plant is being considered that could service each of the two proposed clubhouses and the maintenance facilities under gravity flow conditions. Both alternatives meet Department of Health Chapter 62 requirements.

Vector Control:

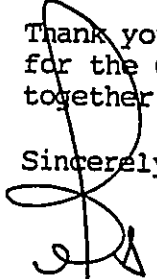
We concur that the vector control regulation of 11-26, Section 11-26-35 should be adhered to. These regulations will be stipulated on the construction plans for clearing and grubbing and site grading.

Noise and Radiation:

The Draft EIS includes a noise impact study by Darby and Associates (Appendix E). The construction of the proposed project will comply with the State Department of Health's Title 11, Administrative Rules Chapter 43, Community Noise Control for Oahu, and Chapter 42, Vehicular Noise Control for Oahu. Mitigative measures to include siting of buildings and equipment have been included in the DEIS. If noise generated during construction exceeds the allowable limits, a permit will be obtained from the Department of Health.

Thank you again for taking the time to review and comment on the EISPN for the Country Courses at Kahuku. For your information, your letter together with this response will be included in the Final EIS.

Sincerely,


WILLIAM E. WANKET

cc: Benjamin B. Lee, Chief Planning

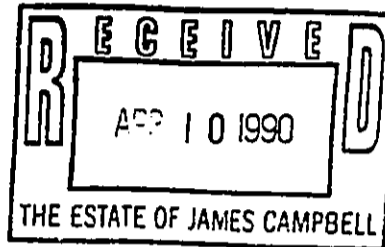
JOHN WAIHEE
GOVERNOR



STATE OF HAWAII
OFFICE OF ENVIRONMENTAL QUALITY CONTROL
465 SOUTH KING STREET, ROOM 104
HONOLULU, HAWAII 96813

MARVIN T. MIURA, Ph.D.
DIRECTOR
TELEPHONE NO.
548-6915

April 9, 1990



TO: The Honorable Benjamin Lee
Chief Planning Officer
City and County of Honolulu
Department of General Planning

FROM: Marvin T. Miura, Ph.D., Director
Office of Environmental Quality Control

SUBJECT: Draft Environmental Impact Statement Country Courses
at Kahuku: Funamano

We have reviewed the draft environmental impact statement and offer the following comments:

LOSS OF AGRICULTURAL LANDS - LONG TERM EFFECTS:

The subject Punamano site contains an area that has been classified as prime agricultural lands by the Land Study Bureau. In Chapter 205 of Hawaii Revised Statutes, golf courses and golf driving ranges are not permitted within agricultural district lands with soil classified as overall (Master) productivity rating class A or B (prime agricultural lands). The conversion of these sites to non-agricultural uses as proposed, could adversely affect the long term viability of diversified agricultural uses in the North Shore area as well as on the island of Oahu. Chapter 226, Section 7(a), HRS, "Objectives and Policies for the economy - agriculture" states that "Planning for the State's economy with regard to agriculture shall be directed towards achievement of the following objectives: (subsection 2) Continued growth and development of diversified agriculture throughout the State."

The Final EIS should provide further clarification on the long term effects of the development on the potential for viable agricultural activities on adjacent lands.

The DEIS estimates the present demand for golf courses and the growth potential of the golf industry on Oahu. However, the issue that confronts this proposal, and has not been properly addressed, is the appropriateness (per the Hawaii State Plan and the

The Honorable Benjamin Lee
April 9, 1990
Page 2

Agriculture Functional Plan) of putting a recreational use on property that has been classified as prime agricultural land.

The DEIS did not adequately address the importance of the agricultural land supply. Current agricultural statistics should be used instead of outdated material.

On page 17, of Appendix H, Volume II of the DEIS, the statement that "If, some time in the future, farming this land would contribute, then the lands could be planted in crops relatively easily." is a misleading statement. After the proposed soil grading and removal, in conjunction with the substantial costs associated with golf course development, the reconversion would be difficult.

"Country Courses at Kahuku: Impact on Agriculture", prepared by Decision Analysts Hawaii, Inc., presents information that primarily focuses on the maximum profit situation for the subject property. Agricultural land is not only a valuable commodity but it is also a limited resource. The allocation of prime agricultural lands by market forces alone not only risks the present and future supply of agricultural lands on Oahu, but it disrupts the goals of long-range land use planning for the community.

ARCHAEOLOGICAL RESOURCES AT PUNAMANO:

The long term impacts on archaeological sites at Punamano should be thoroughly investigated and discussed.

Final mitigative measures will need to be approved by the Department of Land and Natural Resources. Mitigative measures for future discovery of sites need to be proposed and the appropriate State agencies identified.

TRAFFIC:

The Final EIS should expand on the additional information provided on present conditions of Kamehameha Highway and the impacts that the completed golf courses will have on this presently congested road. The traffic study provided in Volume II of the DEIS focused primarily on the turning movements of the given project site. Presently, Kamehameha Highway is considered an overburdened highway. Without proposed State Highway improvements, this proposal may adversely affect present road conditions by supplying additional traffic to this heavily congested road.

Has the proposed realignment of the Military Road been approved by the appropriate authority? We suggest that roadway improvements

The Honorable Benjamin Lee
April 9, 1990
Page 3

should be scheduled to be completed prior to construction. Additionally, information should be included with respect to project operations such as circulation patterns and truck routing.

Mitigative measures which might be considered in regard to truck traffic during the construction period include the following:

1. Truck use of highways during off-peak hours.
2. Staggered work start and finish times.
3. Dust control-measures need to include frequent watering of roadways.

GRADING (PUNAMANO):

The following information should be provided in the Final EIS:

1. a grading plan that shows the areas that are to be reserved for open space and archaeological sites;
2. estimates of the approximate amount of soil to be excavated (cu/yds);
3. destination of excavated soils;
4. a slope analysis that clearly illustrates a break down in slope percentages;
5. a discussion on how the proposed project will affect existing topography (natural slopes).

The applicant would also need to file an approved conservation plan as part of their approved grading permit.

USE OF PESTICIDES AND FERTILIZERS ON THE GOLF COURSE:

The proposed project could cause potential impacts on surface water quality. The "Environmental Assessment of Fertilizer and Pesticide Use on the Courses at Kahuku (Punamano)", prepared by Murdoch and Green, states that "the area which might be impacted the most by chemical application on the proposed golf courses is the marsh land north of Kamehameha Highway." This site is referred to as the Punahoolapa Marsh, a wetland that has been identified as essential for the recovery of the endangered Hawaiian waterbirds (Hawaiian Waterbirds Recovery Plan, 1985). The James Campbell National Wildlife Refuge is also located in this area. It was established for the protection of the four species of endangered Hawaiian waterbirds.

The Honorable Benjamin Lee
April 9, 1990
Page 4

As a mitigative measure, the DEIS proposes to monitor levels of pollutants that reach the marshes. The final EIS should also address the actions which will be taken if waters exceed acceptable levels of contamination.

To reduce off-site transport of pesticides and nitrate, improved drainage ways have been proposed. The Final EIS will need to provide a proposed drainage system that would divert runoff away from the National Wildlife Refuge, and the other wetlands located in that area.

Additional mitigative measures should be undertaken such as:

1. Careful management of water to avoid over-watering.
2. Minimizing application of pesticides to only pest-outbreak areas and/or seasons.
3. Use of a slow-release nitrogen fertilizer will help to minimize the potential for nitrate enrichment of runoff waters.

The list of chemicals provided has not yet been approved by the Fish and Wildlife Service. An approved list of chemicals (by FWS) should be utilized.

DRAINAGE AND STORMWATER RUNOFF

The DEIS does not supply adequate measures to prevent adverse impacts to surface waters. Storm runoff from the golf courses will contain pesticides, herbicides and fertilizer (nitrogen). Without adequate measures to prevent runoff, significant impacts on wildlife in specifically the wetlands area are anticipated. Fertilizers in the runoff can cause an algal bloom. Herbicides and pesticides may adversely affect the fish and wildlife populations.

The Final EIS should provide detailed information on existing drainage patterns and proposed drainage plans. These plans will need to relate to the affected wetlands.

Drainage calculations shown in Tables I and II on page 7 of Appendix E, Volume II, appear to be low for proposed golf courses at Punamano. The Final EIS should explain how these figures are computed.

According to the U.S. Fish and Wildlife Service, the Kahuku Drainage Master Plan has not been approved and there is no anticipated completion date. This proposal should include an alternate solution for off-site drainage.

The Honorable Benjamin Lee
April 9, 1990
Page 5

The final EIS should provide mitigative measures for temporary runoff during construction and grading. Grading should occur during dry seasons to avoid additional runoff of soil.

WATER-SUPPLY:

The DEIS does not indicate the availability of potable water in the surrounding communities. Detailed estimates of current and projected water requirements and supplies should be given.

WASTEWATER:

The proposed wastewater treatment plan will need approval by the Department of Health.

SOLID WASTE:

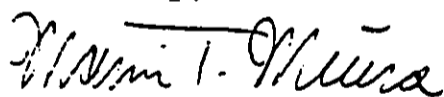
Prior to project approval, a decision should be reached regarding the location chosen for disposal of solid wastes.

ADDITIONAL COMMENTS:

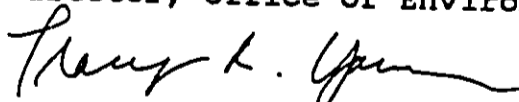
Additional information should be submitted on building proposals and landscaping. We suggest that the proposed landscaping include native species that are weather tolerant of conditions in that area.

Thank you for the opportunity to review this draft EIS.

Sincerely,



Marvin T. Miura, PH.D.
Director, Office of Environmental Quality Control



Tracy Elliot-Yawn
Planner

cc: The Estate of James Campbell
Ofc of State Planning
Dept. of Land & Natural Resources
Dept. of Transportation

WILLIAM
E.
WANKET
INC.

Land Use Consultant

April 27, 1990

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

**RE: Draft Environmental Impact Statement (DEIS) for Proposed
Country Courses at Kahuku (Punahoa) - Response to Comments
Received**

Dear Mr. Miura:

Thank you very much for the copy of your letter dated April 9, 1990 to the Department of General Planning regarding the above-mentioned project. We appreciate your review of the DEIS and provide the following information in response to your comments:

Loss of Agricultural Lands:
Long Term Effects:

We appreciate the information on the Hawaii Revised Statutes as it pertains to golf courses and golf driving ranges. The petition requests redistricting of land to the Urban District, within which golf courses are a permitted use. Development of such land for a golf course is very unlikely to adversely affect the long term viability of diversified agriculture in the North Shore area of Oahu.

In the long term, adjacent properties would not be directly affected by the proposed golf courses. However, adjacent properties would be indirectly impacted in that land values will probably rise somewhat, but agricultural lease rents will probably remain about the same. This impact is discussed in the DEIS (Appendix H, Pages 17 and 18).

Regarding the appropriateness (per the Hawaii State Plan and the Agricultural Functional Plan) of putting a recreational use on property that has

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Office of Environmental Quality Control
The Country Courses at Kahuku (Punamano)

been classified as prime agricultural land, the subject properties have not been successfully farmed for about two decades. In addition, the properties have poor agronomical conditions in terms of high pumping costs, eroded soils, difficult terrain, and excessive wind.

Because of these poor agronomical conditions as well as considerable erosion which have occurred since the soil ratings were conducted, it is questionable whether the property should be considered "prime" agricultural land.

Also, the benefits of using the land for a golf course extend beyond recreational use to include economic benefits. In particular, the golf courses will provide an estimated 200 jobs, of which about 80 positions would be grounds-maintenance jobs involved with cultivating plants, applying chemicals, maintaining irrigation systems, etc. In terms of function, required skills, and training, these jobs are very similar to many jobs within the agriculture industry. This is a significant number of agriculture-type jobs in view of declining employment in traditional agriculture.

The reports incorporated the most recently available data. Appendix H discussed the agricultural land supply in considerable detail and included all relevant official data and information available.

Statement on Page 17, Appendix H, Vol II: Regardless of soil grading and removal, and any sunk cost for developing a golf course, landowners normally pursue the most profitable permitted use of their land. If the most profitable permitted use is farming, then it would not be difficult to replant the golf course into crops. Furthermore, it would probably be less expensive to convert the golf course to crop production than it would be to clear and prepare raw land. Unlike most urban uses, most of the land for the golf course will not be paved over.

However, as discussed in the DEIS, such a conversion from a golf course to crop production is "extremely improbable in that Hawaii's economy would have to undergo a dramatic change" before agriculture would provide greater economic benefits than would a golf course.

The focus of the discussion on agriculture in this report is not on the "maximum profit situation for the subject property." Rather, the focus is on (1) whether crops can be grown profitably on the site given the agronomical conditions of the property and the economic environment, and (2) the impact of the project on the agricultural land supply and on the growth of diversified agriculture.

It is agreed that agricultural land is a limited resource. However, for land-use planning, it is important to realize that the availability of this

limited resource for diversified agriculture is increasing because of the release of land from plantation agriculture.

Regarding the "allocation of prime agricultural lands by market forces alone," it is not discussed nor advocated in the DEIS.

Archaeological

The archaeologist, Joe Kennedy, conducted an archaeological inventory of the site with an additional follow-up field investigation that identified 23 surface sites with 58 separate features. Each site/feature was given a significance evaluation, description and recommendation. Based on the archaeologist's findings and recommendations, the applicant will, in consultation with the Historic Section of the State of Hawaii, undertake further archaeological work (surveying, testing, probing, data recovery, etc.) relating to appropriate preservation and management plans for the site. Based on this additional work, a formal preservation plan will be prepared for the site that will include onsite interpretations and/or "as is" preservation and curation of artifacts onsite, which will be submitted for review and approval by DLNR prior to any development on the site. The final golf course design layout will be based on the approved preservation plan.

Traffic

Traffic Along Kamehameha Highway: A capacity analysis of Kamehameha Highway near each project site indicated that presently Kamehameha Highway is below capacity (LOS) D at the Punamano site. With or without the project, in 1998, the capacity of Kamehameha Highway will be at capacity (LOS E) during the afternoon peak hour.

Military Road: The military road is located on land leased from the Estate of James Campbell. The Estate has indicated that there are no anticipated problems to realign the roadway.

Construction Related Traffic Impacts: It is anticipated that the construction related traffic (truck and employee trips for this project will minimally impact traffic along Kamehameha Highway due to the relatively short term construction period and the presence of existing slow moving vehicles (buses and military vehicles) on the highway. Truck trips will be limited to off-peak hours when practicable.

Dust control measures will be followed as required by the appropriate regulatory agencies.

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Office of Environmental Quality Control
The Country Courses at Kahuku (Punamano)

Grading (Punamano)

Within the 605 acre parcel that constitutes the project site, some 350 acres will be reshaped to some extent. This will require grading of the golf course site itself, reshaping tees and greens, developing sand traps and swaling areas to guide surface runoff to retention areas or ponds.

The total cubic yardage of excavation is not expected to be extensive. The volume and location of deposition of excavated soil will be indicated on the grading plan when the detailed grading requirements are known. It is expected that all excavated soil will be spread and leveled to shape the several fairways, tees and greens of the course. Shaping of drainage swales, retention basins, sand traps and the like will be a combination of excavated areas and embankments. The grading permit review will require both the volume of grading and the site location for deposition. When the permit is sought, an erosion control plan will be provided. (This paragraph has been coordinated by telephone conversation with Louise Peterson/OEQC.)

Use of Pesticides and Fertilizers on the Golf Course

Regarding impacts of golf course chemical applications on the James Campbell National Wildlife Refuge and the Punahoolapa Marsh, a water quality monitoring protocol in cooperation with the U.S. Fish and Wildlife Service would be an appropriate approach. The plan would specify a minimum frequency of sampling and analysis (as in Recommendation 5 of Appendix J, DEIS), but allow for increased frequency and spatial intensity of sampling if early results warrant. We concur with additional mitigative measures as presented. Similar recommendations have been provided in Appendix J, Page iii. Also, we will meet the 8 conditions outlined in the State Department of Health's letter (attached) that includes groundwater monitoring. Further we will develop, in consultation with the City and State, a rigorous monitoring program designed to minimize the potential adverse effects of leaching and runoff and to assure proper turf management. This program will include making available to appropriate enforcing agencies those records related to fertilizer and biocide applications and the results of the monitoring program.

The EPA is the agency which approves pesticides for particular use. Only approved pesticides will be used.

Drainage and Stormwater Runoff

Tables I and II of Appendix A, Sub Appendix E, Vol II will be revised in the Final EIS. Revised calculations for Table I will include that golf course sites at Punamano would provide 20.0% increased runoff for the 605 area site. This is due to different ground cover that will be on the golf courses. Table II indicates that the 20.0% increase in runoff from the sites, would actually increase the entire watershed runoff by 13.4%. The second paragraph

-Page 5-

Office of Environmental Quality Control
The Country Courses at Kahuku (Punamano)

of Page 9, Appendix E, under Impacts and Mitigation indicates that the approximately 70 acres of the Kalaeokahipa Gulch drainage basin will be directed through an existing sump that will reduce the runoff of Kalaeokahipa Gulch (Figure 6, Appendix A, SubAppendix E). This diversion will reduce the peak runoff from the gulch and, combined with other swales and retention ponds to be built within the courses, will actually reduce the stormwater runoff from the drainage basins mauka of Kamehameha Highway. There will be no increased runoff from the mauka drainage basins. The proposed golf course drainage plan is intended to be incorporated into the Kahuku Drainage Master Plan. When the Drainage Master Plan is implemented, no normal storm flows will be directed through Kii or Punamano Refuge sites.

Erosion control methods would be required by the grading contractor at the time the grading permit is obtained from Public Works. The grading would probably be limited to a maximum clear area of 15 acres at a time. During grading, sprinkling would be required to control dust. Immediate mulching after each approved grading site is completed would be necessary to protect the graded area and maintain the soil. Swales and ponding areas are also contemplated within the golf course sites.

It will be up to the golf course developer to keep as much of his top soil in place through erosion control. Should a sudden storm create a "red water" runoff, the siltation will occur within the ditch system makai of Kamehameha Highway and mauka of the old Kahuku Airfield. Regardless of seasonal conditions, grading will be controlled so as not to affect the Wildlife Refuges at Punamano and Kii. By protecting those two refuges, the bay will be spared.

Water Supply

The Punamano site overlies the most northerly portion of the basal water lens that is found along the northeastern coastal plain of Oahu. It is expected that the top of this water lens is some 7 to 9 feet above sea level with the associated fresh water extending downward some 275+ feet. The water resource appears more than sufficient for the proposed development.

The sustainable yield at Kahuku is estimated to be approximately 15 mgd. As current and planned use is some eleven million gallons per day for the area, the result is a 4.0 mgd surplus available for the golf course development at Punamano. This amount is more than adequate for the proposed 2.1 to 2.2 mgd demand. An existing well near Kamehameha Highway (Well 341) provides domestic water currently. Site development will determine whether this well should be refurbished or a new well drilled to provide domestic water service. Irrigation water will probably require an additional two or three new wells on the site some distance from the domestic well site.

Wastewater

The wastewater plant will be operated and maintained according to State Department of Health Regulation, Chapter 62. Plans regarding this facility will be provided to the Department of Health for review and approval. (DEIS, Appendix A, Sub Appendix G, Vol II, Page 14)

Solid Waste

The solid waste from the Malaekahana golf course will be handled by a private refuse collector. The project will not be developed for several years, however, it is anticipated that at that time disposal will be at an appropriate sanitary landfill or at the "H-Power" plant at Campbell Industrial Park.

Additional Comments

The DEIS contains a preliminary site plan illustrating the general location of structures and the general golf course layout. These preliminary site plans are presented for planning purposes only, and do not reflect the design intent of the project. Preliminary design, to include architectural character, landscape design and the golf course design will be developed upon completion of the DP amendment from Agriculture to Park/Golf Course and pursuant to the appropriate zoning designations (P-2). These preliminary design studies will take into account further engineering and site analysis, LUO standards and environmental considerations. Preliminary designs will be included in subsequent zoning amendment applications.

Landscape Character: The climatic conditions and rural character of the Kahuku region will strongly influence the landscape design character of both the Punamano and Malaekahana golf course project. Landscape plant material will be selected based on their tolerance for climatic conditions at lower elevations, as well as other desired design characteristics. The landscape palette may consist of the following types of plants:

Wind Breaks and/or Vertical Buffers

Ironwood*	Norfolk Island Pine*
Paperbark*	Brassaia*
African Tulip*	Eucalyptus

Large Canopy Trees

Banyan*	Monkeypod
Kukui	False Kamani
True Kamani	

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Office of Environmental Quality Control
The Country Courses at Kahuku (Punamano)

Medium & Small Canopy Trees

Autograph Tree	Be-Still
Wili-Wili	Strawberry Guava*
Hala*	

Palms

Coconut Palm	Areca Palm
Royal Palm	Date Palm

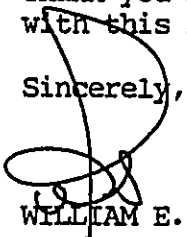
* (Indicates existing specimens on site)

In addition to the landscape plant material, stands of existing vegetation may be retained and used as part of the overall golf course design. The extent of retaining existing vegetation will be dependent upon the site grading plan and the golf course design.

Architectural Character: The primary architectural feature of the Punamano and Malaekahana project will be the golf clubhouse. Based on the P-2 zoning standards, these structures may be up to 25 ft in height provided appropriate setbacks are used. Parking shall be based on the total floor area of the structure(s) plus additional parking for the golf course determined by DLU. Additional information regarding specific architectural character shall be provided during the zoning application.

Thank you for your comments. For your information, your letter together with this response will be included in the FEIS.

Sincerely,


WILLIAM E. WANKET

cc: Benjamin B. Lee, Chief Planning Officer

April 7, 1989

EIGHT (8) CONDITIONS APPLICABLE TO THIS NEW GOLF COURSE DEVELOPMENT

Conditions:

1. The owner/developer and all subsequent owners shall establish a groundwater monitoring plan and system which shall be presented to the State Department of Health for its approval. The groundwater monitoring plan and system shall minimally describe the following components:
 - a. A system of monitoring wells constructed throughout the site. These monitoring wells shall extend approximately ten (10) feet below the water table.
 - b. A routine groundwater monitoring schedule of at least once every six (6) months and more frequently, as required by the State Department of Health, in the event that the monitoring data indicates a need for more frequent monitoring.
 - c. A list of compounds which shall be tested for as agreed to by the State Department of Health. This list may include, but not be limited to the following: total dissolved solids; chlorides; PH; nitrogen; phosphorus; or any other compounds associated with fertilizers, biocides or effluent irrigation.
2. A baseline groundwater data shall be established as described in this paragraph. Once the test well sites and list of compounds to be monitored for have been determined and approved by the State Department of Health, the owner/developer shall contract with an independent third-party professional (approved by the State Department of Health) to have the groundwater sampled and its data reported to the State Department of Health. Testing of the groundwater shall be done by a certified laboratory.
3. If the data from the monitoring wells indicate the presence of the measured compound and/or the increased level of such compound, the State Department of Health can require the owner/developer or subsequent owner to take immediate mitigating action to stop the cause of the contamination. Subsequently, the developer/owner or subsequent owner shall mitigate any adverse effects caused by the contamination.
4. Owner/developer shall provide sewage disposal by means of connection to the public sewer system; or by means of a wastewater treatment works providing treatment to a secondary level with chlorination. Effluent from this wastewater treatment works may be used for golf course irrigation, subject to Condition #3. The entire system shall be approved by the State Department of Health in conformance with Administrative Rules Title 11, Chapter 62, Wastewater Treatment Systems, effective December 10, 1988.

5. If a wastewater treatment works with effluent reuse becomes the choice of wastewater disposal, then the owner/developer and all subsequent owners shall develop and adhere to a Wastewater Reuse Plan which shall address as a minimum, the following items:
- a. Management Responsibility. The managers of the irrigation system using reclaiming wastewater shall be aware of the possible hazards and shall evaluate their system for public health, safety, and efficiency. They must recognize that contact with the reclaimed wastewater from treated domestic sewage poses potential exposure to pathogenic organisms which commonly cause infectious diseases (bacteria, viruses, protozoa, and helminths or worms).
 - b. General Recommendations
 - 1) Irrigated areas should be no closer than 500 feet from potable water wells and reservoirs.
 - 2) Irrigated areas should be no closer than 100 feet from any private residence.
 - 3) Application rates should be controlled to minimize ponding. Excess irrigation tailwater in the reclaimed wastewater irrigation area shall be contained and properly disposed. An assessment should be made of the acceptable time and rate of application based on factors such as type of vegetation, soil, topography, climate and seasonal variations.
 - 4) Effluent holding/mixing ponds shall be designed to prevent the infiltration of the wastewater into the subsurface. The holding/mixing ponds shall be made impervious.
 - 5) Irrigation shall be scheduled such that the public is not in the vicinity and the soil is sufficiently dry to accept the irrigation water.
 - 6) Permanent fencing or barriers shall be erected around polishing or holding ponds to prevent public entry or stray feral and tame animals from gaining access to the ponds.
 - 7) Adequate irrigation records shall be maintained. Records should include dates when the fields are irrigated, rate of application, total application and climatic conditions. Records should also include any operational problems, diversions to emergency storage or safe disposal and corrective or preventive action taken.
 - 8) The holding/mixing ponds shall be periodically monitored for the purpose of detecting leakage into the subsurface. If leakage is detected, corrective action shall be immediately taken.
 - c. Adequate Notice. Appropriate means of notification shall be provided to inform the employees and public that reclaimed wastewater is being used for irrigation on the site.

- 1) Posting of conspicuous signs with sufficient letter size for clear visibility with proper wording should be distributed around the use areas.
 - 2) Signs shall be securely fastened. Periodic surveillance shall be conducted to assure permanent posting at all times. Immediate replacements shall be made when necessitated by deterioration, vandalism or misuse.
- d. Adequate Employee Education. Employees or users should be cautioned and warned of the potential health hazards associated with the ingestion of reclaimed wastewater being used at the site.
- 1) Employees should be warned that the ingestion of reclaimed wastewater is unsafe.
 - 2) Employees should be protected from direct contact of the reclaimed wastewater. If necessary, protective clothing should be provided.
 - 3) Employees should be informed of the following:
 - o The irrigation water is unsafe for drinking or washing.
 - o Avoid contact of the water or soil with any open cuts or wounds.
 - o Avoid touching the mouth, nose, ear or eyes with soiled hands, clothes or any other contaminated objects.
 - o Be aware that inanimate objects such as clothes or tools can transport pathogenic organisms.
 - o Always wear shoes or boots to protect feet from the pathogenic organisms in the soil or irrigation water.
6. Use of electrical golf carts is recommended. It is recognized that underground storage tank(s) to store gasoline for gas driven golf carts will impose potential risks to the groundwater. If gasoline-driven golf carts are to be utilized, the developer/owner must meet all federal requirements in the installation of any underground storage tank.
7. Buildings designated to house the fertilizer and biocides shall be bermed to a height sufficient to contain a catastrophic leak of all fluid containers. It is also recommended that the floor of this room be made waterproof so that all leaks can be contained within the structure for cleanup.
8. A golf course maintenance plan and program will be established based on "Best Management Practices (BMP)" in regards to utilization of fertilizers and biocides as well as the irrigation schedule. BMP's will be revised as an ongoing measure. The golf course maintenance plan will be reviewed by the State Department of Health prior to implementation.

If there are any questions regarding the eight (8) conditions mentioned here, please contact Mr. James K. Ikeda at 548-6455. We ask your cooperation in the protection of Hawaii's valuable groundwater resource.

FEB 8

(P)1079.0

Mr. Benjamin Lee
Department of General Planning
City and County of Honolulu
650 S. King Street, 8th Floor
Honolulu, Hawaii

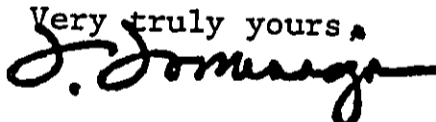
Dear Mr. Lee:

Subject: Country Courses at Kahuku
Draft EIS

Thank you for the opportunity to review the subject document. We have no comments to offer.

Should there be any questions, please contact Mr. Cedric Takamoto of the Planning Branch at 548-7192.

Very truly yours,



TEUANE TOMINAGA
State Public Works Engineer

CT:em

cc: The Estate of James Campbell
✓ Mr. William E. Wanket
Dr. Marvin T. Miura

WILLIAM
E.
WANKET
INC.

Land Use Consultant

February 9, 1990

Mr. Teuane Tominaga
State Public Works Engineer
State Department of Accounting and
General Planning, Division of
Public Works
P.O. Box 119
Honolulu, Hawaii 96810


RE: Draft Environmental Impact Statement (DEIS) for Proposed
Country Courses at Kahuku - Response to Comments
Received

Dear Mr. Tominaga:

Thank you very much for the copy of your letter of February 8, 1990
to the Department of General Planning regarding the referenced project.
We appreciate your efforts in reviewing the DEIS.

For your information, your letter, together with this response, will be
published in the Final EIS.

Sincerely,


WILLIAM E. WANKET

cc: Benjamin B. Lee, Chief Planning Officer

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University of Hawaii at Manoa

Environmental Center
Crawford 317 • 2550 Campus Road
Honolulu, Hawaii 96822
Telephone (808) 948-7361

March 23, 1990
RE:0552

Department of General Planning
City and County of Honolulu
Municipal Office Building, 8th Floor
650 South King Street
Honolulu, Hawaii 96813

Dear Sir:

Draft Environmental Impact Statement
Kahuku Country Courses
Malaekahana and Punamano
Kahuku, Koolauloa, Oahu

The proposed project includes three golf courses at Punamano (605 acres) and one at Malaekahana (200 acres). The Punamano site will contain three 18-hole championship golf courses and two clubhouses. A driving range, two putting greens, and parking lots will be provided. One 18-hole course and supporting facilities are planned for Malaekahana. In both cases the land presently is zoned for agriculture.

This review was prepared with the assistance of Bion Griffin, Anthropology; Paul Ekern, Yu Si Fok, and Henry Gee, Water Resource Research Center; Frank Scott, Agriculture and Resource Economics; Nicholas Ordway, Real Estate Research and Education; and Carolyn D. Cook, Environmental Center. We offer the following items for further consideration.

Water Related Problems

1. Groundwater Quality

The statement on page 64 of volume I (Punamano) under Impacts on Groundwater Quality that nitrates are sufficiently mobile and non-persistent contradicts the statement made by the consultants in Volume II, Appendix J, page iii, paragraph 5, that nitrate nitrogen is the most mobile and persistent chemical used in golf course management. Also contained in the same paragraph in Volume I (Punamano) is the statement that the contribution of nitrate is relatively small compared to the background nitrate present in the aquifer. This is merely conjecture, since no data have been presented as to the existing nitrate concentration in the aquifer.

Director of Water Resources Research Center

AN EQUAL OPPORTUNITY EMPLOYER

The question of whether the aquifer in the Kahuku area has an adequate sustainable capacity to meet the demands of the proposed projects without having a negative impact on the community as a whole needs to be addressed. Together with other existing and proposed withdrawals, the water demands may result in a degradation of the water supply due to overdraft.

3. Rainfall

The discussion of climate for Malaekahana on page 3, vol. II, should relate to the supporting data on pages 4 and 5. Table 1 correctly presents the average annual rainfall as 41.9 inches. It also shows extreme variation from year to year and the consequent need for supplemental irrigation which could be determined precisely from appropriate data. The indication of 118 inches of rainfall 2 miles southwest of the site is irrelevant and misleading. Sources and cost of the irrigation water might also be addressed in this section.

4. Water Budget

Volume I in each set of DEISSs should include a water budget summary.

5. Peak Summer Demands

The average water use data in Appendix J should be expanded to include maximum summer use rates, which are nearly double those for the annual average. Calculations in appendix J were based on Turtle Bay averages, and resulting figures are not as high as the actual needs might be, especially considering that sprinkler applications are only 60 percent efficient. Our reviewers have calculated that the three courses at Punamano may require up to 6.0mgd to satisfy peak needs.

6. Wind and Evapotranspiration

Climate sections in appendices for both Punamano and Malaekahana DEISSs could provide more data on sunlight, evaporation, and wind.

The average wind velocity in the Kahuku area is generally greater than anywhere else on Oahu (Daniels & Oshiro, 1980) resulting in higher transpiration rates. This should be included in calculations for water needs.

The potential wind hazard for the Kahuku site may be found in the Wind Energy Resource Atlas, vol.11, ONL-3195 WERA-11. Maps for Oahu (pp. 48-49) indicate very high wind energy. Also, Noguchi (1979) maps surface wind flow patterns on Oahu. Prevailing conditions in Kahuku will not be conducive to golf courses or driving ranges unless shelterbelt protection is provided.

Evaporation data and water use needs from Appendix J ought to be brought forward or at least cited for inclusion in Appendix A section C.

7. Wastewater

The wastewater section (G) of Appendix A does not provide an estimate of the salinity expected in the effluent. This may be significant if the collection mains lie in brackish waters and seepage into the lines occurs. This is particularly important if the effluent is expected to reduce the salinity of the brackish wells during peak use periods of summer.

Archaeology

1. Discrepancy between ACH and PHRI reports

The archaeological reports are unclear and cannot be reconciled with the February '89 reports of Paul H. Rosendahl, Ph.D., Inc. (PHRI). The major task is to clarify the tables, reconciling the sites of PHRI and Archaeological Consultants of Hawaii (ACH) for Punamano. A related task is to better correlate maps and tables. Sites are found on the maps that are not in the tables and vice versa. The PHRI maps and the ACH maps are markedly different, hence one set or both may be in error. The organization of tables and site numbers of ACH material make it difficult to evaluate the project's impacts on archaeological material. Both Malaekahana and Punamano archaeology reports need to be carefully reevaluated and significant sites explicitly defined. For example, rather than the liberal use of assignments of major significance, such as ranch era walls, significance should be restricted to sites of major research potential and those representative of other sites, or at least more justification should be provided for choice as significant sites.

2. Burials

A preservation plan will be necessary for the burial caves/shelters. Both preservation and data recovery plans should be included in the EIS. Monitoring of landscape excavations should be required with special care and sensitivity given to possible burial sites.

Socio-economic Aspects

1. Employment

A stronger case needs to be made about the benefits that the golf course will create for the local community. While it is true that employment will be created and property taxes will exceed services consumed, this may not be enough to justify the course. One intriguing concept is the area that will be maintained in open space. There is an implication that this area may be open to the public.

2. Housing

The creation of 50 jobs will also require more housing. How does the course impact affordable housing in the area? The social impact assessment indicates that "pressures for affordable units will increase as people move into the area." It does not appear that a constructive solution is proposed in the report.

3. Fees

Will local residents be given discounted green fees to play the course? There is an implication that this will be the case (p. 35 Malaekahana vol. I and p. 35 Punamano). Perhaps a clearer statement on this topic would be appropriate.

4. Demand

Reviewers have all expressed general concern over the assessment for golf course demand. The development of eight or more courses within a small and relatively isolated area of Kahuku seems excessive, especially in view of the fact that other courses are under consideration for communities south and west of the project.

Loss of Agricultural Land

Project lands probably are not needed for commercial agriculture, based on existing technology and the current market supply situation, but the proposed use of Punamano and Malaekahana sites will separate the best remaining contiguous area of good agricultural land on the North Shore. It is a different situation than in the second city (Waipaho-Ewa) area where urban development has already encroached on sugar lands and the area is critically needed for additional housing. This critical need for conversion of agricultural lands to other uses does not exist at the project sites.

Agricultural Parks as Alternatives

The demand for lots in agricultural parks far exceeds the supply in the area, and the project sites have ecological characteristics that would satisfy conversion to agricultural parks. The consultants address the fact that a former lessee found the area infeasible for commercial agriculture, but the situation might be different for small farms subsidized by low government lease rents and water development costs.

It is misleading to imply that the Kahuku Agricultural Park can accommodate potential farmers in the area who need land (Appendix H, p. 8) when, as stated elsewhere, there are currently 80 applicants for the 24 lots.

Land Values

Reviewers agree that the current market value of nearby lands will increase as a result of project development. The report (Appendix H, p. 17)

Department of General Planning
March 23, 1990
Page 5

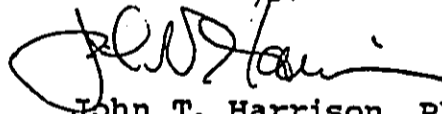
indicates that this will have no effect on lease rents. There is no basis for such a statement. Lease rents for private lands are related to land values if the owners are to profit from the leases. This excepts the fact that lease rents on some sugar lands have not been increased because the alternative of higher lease rents would force sugar out of production and the alternative in some instances would be fallow land with no ability to pay lease rent. We suggest that this section be constructed so as to describe a more realistic perspective.

Hawaii State Plan for Land Use

The Draft EIS, in Vol. I and section VI of Punamano and Malaekahana documents, states that the project is consistent with the major thrust of the Hawaii State Plan, the State Agriculture Functional Plan and the General Plan of the City and County of Honolulu. It further states that the thrust of the three plans is to preserve the economic viability of plantation agriculture and maintain and promote growth of diversified agriculture. The statement that the proposed project is consistent with the above mentioned plans is misleading. The proposed development is not consistent with the indicated thrust of the agencies and contributes nothing to the attainment of the goals of the agencies. A more meaningful statement would be that the project would not interfere with the thrust of the agencies because the subject land is not needed for agriculture.

Thank you for the opportunity to offer comments on this document. We hope that our comments will be helpful in your preparation of the final document.

Yours truly,



John T. Harrison, Ph.D.
Environmental Coordinator

cc: The Estate of James Campbell
William E. Wanket, Inc. ✓
OEQC
L. Stephen Lau
Paul Ekern
Bion Griffin
Nicholas Ordway
Frank Scott
Henry Gee
Y.S. Fok
Carolyn D. Cook

WILLIAM
E.
WANKET
INC.

Land Use Consultant

April 26, 1990

Mr. John T. Harrison, Ph.D.
Environmental Coordinator
University of Hawaii at Manoa
Environmental Center
Crawford 317
2550 Campus Road
Honolulu, Hawaii 96822

**RE: Draft Environmental Impact Statement (DEIS) for Proposed
Country Courses at Kahuku (Malaekahana and Punamano) - Response
to Comments Received**

Dear Mr. Harrison:

Thank you very much for the copy of your letter dated March 23, 1990 to the Department of General Planning on the referenced project. We appreciate your review of the DEIS and provide the following information in response to your comments.

Water Related Problems

Item 1: The word non-persistent on Page 64 of Volume I (Punamano) is a typographical error and will be changed to read "persistent" in the Final EIS. Regarding the existing nitrate concentration in the aquifer, the phrase referring to present nitrate levels in the aquifer will be deleted in the Final EIS.

Item 2: The adequacy of the aquifer in the Kahuku area is discussed in Volume II, Appendix A, Sub-Appendix L, Page 5, Paragraph 3, Water Quality and Supply. The studies by the Department of Land and Natural Resources (referenced in the engineering report) indicate there is a surplus of water available to provide both domestic and irrigation water for the development. The slow pumping of the water from wells to mitigate brackish water intrusion is also discussed on Page 6 of the Sub-Appendix L. For Malaekahana, similar statements are provided (Appendix A, Sub-Appendix L, Page 5) that indicate sufficient water resources to provide both domestic and irrigation water to the development. Volume II, Appendix A, Sub-Appendix F, Page 1 (Malaekahana) provides information on water supply.

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Rainfall

The discussion of climate on Page 3 of Volume II, Sub-Appendix C is not intended to prove Table I or the isohyetal map of the report, but provides general area climate information. The 118 inches of rainfall some two miles southwest of the site is relevant. The high rainfall occurs within the Malaekahana watershed and contributes the recharge water necessary for irrigation. The moisture laden clouds that pile up against the Koolau Mountains may well create a cloudy sky at Malaekahana, but the rain will fall inland from the golf course site. Table 1 provides that irrigation requirements may vary with the variation of month-to-month rainfall and its relationship to temperatures.

Sources of water are provided in Appendix A, Sub-Appendices F and L. The proposed sources of potable water for the Punamano courses are existing Wells 341 and/or 353 which over the years have flowed at a combined rate of 2-3 mgd. Domestic water has been pumped at 100,000 to 200,000 gpd. For Malaekahana, the proposed source of potable water is existing Well 363 which has supplied domestic water at about 0.5 mgd.

The cost of the irrigation water is calculated at approximately 9 cents per 1000 gallons for pumping costs. The capital expenditures and amortization of an undesigned system would be speculative at this time.

Water Budget Summary

Volume I of the Final EIS will include the following:

"The Punamano site overlies the most northerly portion of the basal water lens that is found along the northeastern coastal plain of Oahu. It is expected that the top of this water lens is some 7 to 9 feet above sea level with the associated fresh water extending downward some 275+ feet. The water resource appears more than sufficient for the proposed development.

The sustainable yield at Kahuku is estimated to be approximately 15 mgd. As current and planned use is some eleven million gallons per day for the area, the result is a 4.0 mgd surplus available for the golf course development at Punamano. This amount is more than adequate for the proposed 2.1 to 2.2 mgd demand."

"The Malaekahana site overlies the basal water lens that can be found along the coastal plain of northeastern Oahu. It is expected that the top of the water lens is some 8 to 10 feet above sea level with the fresh water lens extending downward for some 300 ± feet. The water resource appears more than sufficient for the proposed development. "

In addition to the above, statements regarding aquifer recharge (peak summer demands, rainfall, and wind and evapotranspiration) will be included in the appropriate sections of the Final EIS.

Peak Summer Demands

The Malaekahana site has a maximum deficiency of 6 inches of rainfall when pan evaporation is at its maximum in June. At that time, irrigation demands would be approximately .75 mgd. However during January and February the irrigation rate could be as low as 250,000 gpd. The average irrigation needs appear to be about .6 mgd.

At Punamano, the highest evaporation month is July when the deficiency is 6.75 inches. At that time, daily irrigation rates should be about 2.6 mgd. In the winter months the irrigation rate could drop to about 1.5 mgd. The 2.2 mgd average rate indicated in Appendix A, Sub-Appendix L remains satisfactory.

Wind and Evapotranspiration

Regarding your comments on wind and evapotranspiration, the following information will be included in the Final EIS:

Punamano

Taking into account the fact that the tradewinds are stronger in the Kahuku area than in any other area of Oahu; that the rainfall tends to be less during the drier summer months when the temperature range is slightly higher, and combining this information with the evaporation data presented in Appendix J; the need for irrigation of the proposed golf courses is realized. Based on the fact that evaporation exceeds rainfall by some 6.5 inches during the month of July, the demand for irrigation water will reach about 2.6 mgd during that month and falling to about 1.4 mgd during January and December. The average still being the 2.1 to 2.2 mgd discussed in Appendix A of the DEIS. The rate of fluctuation being an inverse factor of the daily rainfall.

Malaekahana

Taking into account that the tradewinds are stronger in the Kahuku area than in any other area of Oahu; that the rainfall tends to be less during the drier summer months when the temperature range is slightly higher, and combining this information with the evaporation data presented in Appendix J, Environmental Assessment of Fertilizer and Pesticide Use on the Proposed Country Courses at Kahuku); the need for irrigation of the proposed golf course is realized. Based on the fact that evaporation exceeds rainfall by some six inches during the month of June, the demand for irrigation water will reach about .75 mgd during that month falling to about .38 mgd during January and December. The average still will be the .5 mgd discussed in Appendix A of the

DEIS. The rate of fluctuation being inversely proportional to the daily rainfall.

As noted in the FEIS (Punamano, Page 46 and Malaekahana, Page 42) climate factors will be taken into consideration in the planning and design of the courses.

Wastewater

No collection sewer lines will be in brackish water as all lines are proposed well above the groundwater table. Normal domestic sewage has about 20 milligrams per liter (mg/l) more chlorides than the potable water used in the potable system. As the potable water from the proposed sources is about 150 mg/l the salinity of the wastewater will run about 170 mg/l. This level is well below the tolerance level of the turf grass.

ARCHAEOLOGY

Item 1:

The archaeological report will be revised for the FEIS, taking into consideration your comments. Archaeological Consultants of Hawaii (ACH) attended a meeting with Dr. Joyce Bath of DLNR. At this meeting, it was discussed that the following report reconciliation procedures would be provided:

1. Archaeological Consultants (ACH) would make additions to site tables in order to reflect state site numbers in numerical order.
2. A testing and mapping program will be conducted to further assess the significance of Site S-5.
3. The project location map as it appears in Appendix E of the Draft EIS and the project boundary as it appears on Page 18, Vol I, DEIS will be amended. A topography map will be used to provide accurate site locations.

Item 2:

The Final EIS will include a section on archaeological sites. The section and the Archaeological Study will present recommendations and mitigative measures by the archaeological consultants on burial caves/shelter and other archaeological resources existing at the project sites. Revisions to charts and significance evaluations will be done in accordance with discussions with DLNR.

Socio-Economic Aspects

Item 1 - Employment:

While the market assessment does not specifically address the issue of community benefits as relates to employment, the assessment does detail the supportive nature that the proposed golf complex would play with regards to the overall resort development proposed in the Koolauloa area and, more specifically, at the Kuilima Resort. Golf availability is an important factor in the upgrading of the Hawaii and Oahu visitor plan. Development of the golf course complex at Kahuku is supportive of the thousands of resort related jobs projected as the main long term economic generator for the North Shore and Koolauloa areas. Thus, the long term economic implications of the golf course development go far beyond the fifty direct jobs created at each golf course within the proposed complex.

The market assessment envisions that the golf complex would be operated as a daily fee facility. Thus, the local golfing public would have the use of the facility. The general public would enjoy the open space benefits provided by golf course development currently envisioned primarily as a view amenity.

Item 2 - Housing:

Housing availability in rural areas is a socio-political issue addressed by the City Council in the General Plan for the City and County of Honolulu and Development Plans for the Koolauloa and North Shore areas. The Estate of James Campbell is one of a number of land owners and developers which has proposed additional housing in the North Shore and Koolauloa areas. For example, the Estate of James Campbell is currently processing a DP Amendment Application (90/KL-4) for a proposed subdivision in Kahuku of approximately 87 single-family homes that will be targeted for sale to residents and employees of the region. The Estate is also proposing to assist in the expansion of the Kahuku Wastewater Treatment Plant, which will serve not only the proposed Kahuku Residential project, but also the adjacent Kahuku Village Makai Development. The \$3+ million dollar expansion cost is being funded by the City and County of Honolulu, State of Hawaii, Kahuku Village Association and the Estate of James Campbell.

Item 3 - Fees:

The Honolulu City Council has, in the the case of other golf course permit applications, sought and obtained agreements from developers regarding availability and fees for resident golfers. It would seem appropriate that these agreements be tailored to the individual application, depending on the type of course, location of the course and the availability of resident golf in the area of the proposed course.

Given the number of golf courses in the Kahuku/Kuilima area: two existing, Turtle Bay and Kahuku Municipal, one under construction (Turtle Bay Second

Course), and five proposed four by Estate of James Campbell and one by Asahi Jyuken, it would appear that the need for mandatory availability and fee controls for resident golfers is minimal. John Zapotocky, Consultant has also prepared the following information relative to fees charged and percent of play by local golfers on resort courses, using Maui courses as an example:

<u>Course</u>	<u>Kamaaina Rate</u>	<u>% Local Play</u>
Wailea	\$60.00 (1)	17%
Seibu	\$90.00 (2)	6%
Kaanapali	\$40.00 (3)	10%
Kapalua	\$90.00 (2)	5%

- (1) Non Resort Guest - \$105.00, Resort Guest - \$60.00
- (2) Same as Non Resort Guest Rate
- (3) No Kamaaina Rate per se, however, booklet purchase available - used primarily by local residents.

With the exception of the Seibu course, the Maui resort courses are over-booked by resort guests during the months of January, February, and March. Most local play takes place during the other months of the year. None of the courses have specific times reserved for local golfers but accommodate them along with other golfers.

It should be noted that the typical Maui resident plays 50% more golf than his Oahu counterpart under superior conditions, i.e., Maui course average only 60% of the rounds of Oahu courses. While resort golf facilities on Maui do not play a major role in providing resident golf, they do play a significant role. However, the most significant contribution of resort courses on Maui, to local play, is that they provide a place for tourists to play golf, thus allowing local golfers the opportunity to play on golf courses outside of tourist destination areas without heavy competition from tourists. In addition, they provide a variety of golf experiences not otherwise available on the Valley Isle.

Local play at Oahu's resort courses, Sheraton Makaha Valley and Turtle Bay Hilton is 8% and 25% respectively. Both Makaha and Turtle Bay are offering Kaamaina rates at the present time. Makaha offers Kaamaina rates of \$55 vs. regular non-guest rates of \$125. Turtle Bay is offering extra low Kamaaina rates of \$36 weekday and \$40.50 weekends currently, due to construction of the second 18-hole course in proximity to the existing course vs. the normal undiscounted rate of \$90 weekdays and \$100 weekends. The KoOlina Golf Course, Oahu's newest resort course (open in January 1990) is offering Kaamaina rates of \$65 vs. regular rates of \$100. (It should be noted that none of the existing resort courses on Oahu or Maui are under any legal obligation to provide Kaamaina rates or provide local availability but do so as a sound business practice.)

A number of Oahu's non-resort, daily fee golf courses, including Mililani, Hawaii Kai, Makaha East and Hawaii Country Club accommodate significant numbers of tourists. Additional resort courses on Oahu will enhance both visitor and local recreational opportunities.

Oahu visitor and resident golfers would benefit significantly from an increase in all types of golf facilities including: resort courses, daily fee courses, municipal courses and private membership courses. Increasing supply is the primary means of guaranteeing availability and competitive fees for all golfers.

Item 4: Demand

Regarding your statement that "development of eight or more courses within a small and relatively isolated area of Kahuku seems excessive", the market study envisions the evolution of a golf-oriented resort community at Kuilima. The study identified a number of golf-oriented resorts nationwide and suggests that the Kuilima resort could develop into a golf destination in Hawaii. Additional golf course development on Oahu and particularly in the North Shore and Koolauloa areas might pose a short run imbalance of supply and demand, however, in the long term, the concentration of courses in the area will serve as a magnet to golfers, both resident and visitor, seeking availability, challenge and variety.

Initially, the size, scope, and perceived risk involved in successful ventures such as the James Campbell Industrial Park, Hawaii Kai, the Hilton Hawaiian Village and Ala Moana Center evoked some degree of skepticism, but the demand for these facilities is now without question.

Loss of Agricultural Land

Regarding the comment that the proposed projects will separate the best remaining contiguous area of good agricultural land on the North Shore, the good agricultural lands in that area are already separated by lands which have poor agronomical conditions.

In the comparison to the loss of sugarcane lands in Ewa, the two situations are not comparable. In terms of soil quality and climatic conditions, the agricultural lands at Ewa are far better for crop production than are the lands proposed for the Country Courses at Kahuku. Also, lands at Ewa are being cultivated, while those proposed for the Country Courses at Kahuku have been fallow for 19 years.

Regarding the critical need to justify conversion of agricultural lands, the subject property would be placed in a use which contributes more to the community in terms of recreation and economic benefits than is currently the case, or is likely to be the case in the future.

Agricultural Parks as Alternatives

While the number of applicants for lots at the Kahuku Agricultural Park does exceed the supply, this is not a meaningful measure of the demand for agricultural land for three reasons. First, the applicants have not been screened for their farming abilities. Second, more people would like to be farmers than the market can support. Third, an undetermined number of the applicants for subsidized farm land may in fact be diverting from unsubsidized farm land. It should also be noted that many of the parcels in other State agricultural parks, such as in Waimanalo, have been leased but remain vacant.

Regarding the prospects for profitable farming on the subject property, it is true that the land could become productive given sufficient State subsidies. But this is also true for 1.5 million acres of agricultural land in Hawaii that remain vacant, fallow, or in low-value pasture operations. It should also be noted that 90,000 acres of high-quality agricultural land has been released from plantation agriculture since 1968, and much of this land remains available for profitable agricultural activities.

According to Decision Analysts, Hawaii, the statement on Page 8 of Appendix H does not state nor was it meant to imply that the 24 lots at the Kahuku Agricultural Park will accommodate the demand for farm lots on the North Shore, although this may be possible since the number of qualified farmers in the list of applicants is unknown. The statement in Appendix H is that "Additional agricultural lands will become available in the Kahuku area with the completion of the State's Kahuku Agricultural Park, which is now under development. This Park...will have 220 usable acres of land divided into 24 lots."

Land Values

Regarding the increase in value of properties near a golf course, an additional clarification is that the impact declines rapidly with distance from the golf course: properties adjacent to or commanding a prominent view of a golf course are expected to increase in value, while more distant properties are expected to experience little if any change in value.

Regarding the relationship between land values and agricultural lease rents, the report is correct as written: agricultural lease rents are limited by the rent the farmers are able to pay, and bear little relationship to the market value of the land. Typically, the market value of land exceeds its agricultural value by ten times or more. This relationship is based on the consultant's knowledge of Hawaii's agricultural land values and agricultural lease rents, land appraisals, agricultural land dedication practices designed to reduce property taxes, and land economics. The explanation for this relationship is that the market value of agricultural land on Oahu is dominated by its eventual development potential (e.g., the discounted present value of the land when sold for homes), rather than being based on its agricultural value (i.e., the discounted present value

of agricultural rents). If farmers had to pay lease rents that reflected the market value of land or, if they owned the land and had to generate sufficient profits from farming to reflect the market value of the land, then nearly all agriculture on Oahu would become unprofitable, and would cease to exist. Any farmer or investor who has attempted to buy land on Oahu is well aware of the impossibility of buying farm land financed by the profits or rents from farming.

Hawaii State Plan for Land Use

Perhaps an even more accurate statement is that the project does not conflict with the major thrust of the Hawaii State Plan, the State Agricultural Functional Plan and the General Plan of the City and County of Honolulu.

However, it is worth repeating that "The Country Courses at Kahuku would contribute to the growth of diversified agriculture in that nursery sales would increase, since a large number of plants and trees would be required to landscape four golf courses." Also, 80 of the jobs to be provided would, by function but not product, be agricultural-type jobs. These are outdoor jobs involved with cultivating grasses and plants, applying fertilizers and chemicals, maintaining irrigation systems, etc.--jobs that require skills and training that are similar to many jobs within the agricultural industry.

Again, thank you for taking the time provide to comments. For your information, your letter together with this response will be included in the Final EIS.

Sincerely,



WILLIAM E. WANKET

cc: Benjamin B. Lee, Chief Planning Officer

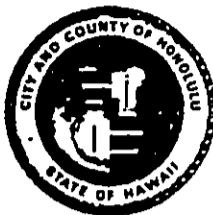
Environmental Impact Statement
THE COUNTRY COURSES AT KAHUKU

DEIS

**City Comment Letters
and
Applicant Responses**

DEPARTMENT OF GENERAL PLANNING
CITY AND COUNTY OF HONOLULU

650 SOUTH KING STREET
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FRANK F. FASI
MAYOR

BENJAMIN B. LEE
DEPT. PLANNING OFFICER

ROLAND D. LIBBY JR.
DEPT. PLANNING OFFICER

WM/DGP 2/90-352

April 19, 1990

Mr. Clinton Churchill
James Campbell Estate
828 Fort Street Mall, Suite 500
Honolulu, Hawaii 96813-4380

Dear Mr. Churchill:

Draft Environmental Impact Statement (DEIS)
for the Proposed Punamano Golf Course
in Kahuku, Koolauloa, Oahu

The Department of General Planning has reviewed the above referenced DEIS and offers the following comments.

Conformity to General Plan

Implementation of the proposed golf course project will irrevocably commit a large portion of agricultural land to non-agricultural uses, and appears to be inconsistent with General Plan policies related to the protection and efficient use of agricultural lands. However, to the extent that the proposed project may be shown to involve a significant contribution to the general welfare of, and enhance the recreational opportunities for, the residents of the Koolauloa and North Shore Development Plan areas and the public at large, then the loss of these agricultural lands may be justified.

Conformity to the Development Plan

The lands associated with the development of the proposed golf course complex are designated for Agriculture use on the Development Plan (DP) Land Use Map for Koolauloa. The developer has submitted an application for an amendment to the DP Land Use Map in order to change the designation for these lands from Agriculture to Park/Golf Course.

Mr. Clinton Churchill
April 19, 1990
Page 2

The Department of General Planning is concerned about the cumulative impacts of the numerous private golf courses being proposed on Oahu. These golf courses will have a significant impact on the island's water resources, environment, and agricultural land supply. In order to strike a balance between the competing needs of private golf course developers and the public at large, the City administration has suggested a community benefits assessment for private golf course development on the Island of Oahu. The Department of General Planning is currently studying this issue and may propose new regulations regarding the processing of DP amendments for private golf courses. The applicant should be aware of such pending changes that may affect the subject golf course proposal.

Linkages with Kuilima Resort

The DEIS does not expressly identify the possible developer and operator of the golf course complex. It is unclear whether the Kuilima Resort Company (Asahi Jyuken) is expected to be a participant at some level in the project or a competitor (Kuilima Resort already has two DP-approved golf courses and one additional proposed golf course in the Kahuku area). It is clear, however, that the success of any major golf course development in the Kahuku area will depend largely on the completed expansion of the Kuilima Resort.

If, for any reason, the entire Kuilima Resort development does not proceed according to schedule, the result could be a substantial overcommitment of resources (both natural and financial) to golf course development. It may be more prudent to allow golf course development to lag behind the market expansion created by the development of the resort.

Monitoring Program

The applicant should commit to a program to monitor the level of usage and possible harmful effects of the application of fertilizers (including the use of effluent) and biocides. Such a monitoring program should not only include a groundwater monitoring system as suggested by the State Department of Health, but also a rigorous monitoring of the application of these compounds to assure proper turf management and to minimize the potential adverse effects of leaching and runoff. All future operators of the golf course facility should be required to continue the monitoring program and to make

Mr. Clinton Churchill
April 19, 1990
Page 3

available to the appropriate enforcing agency those records related to fertilizer and biocide application and the results of the monitoring program.

Rare and Endangered Plantlife

The DEIS indicates that there are two specimens of maiapilo (*Capparis sandwichiana*) adjacent to the boundaries of the proposed development. While it is understood that the two specimens lie outside of the project boundaries, there is always the possibility of accidental damage to plant life adjacent to areas of groundwork. Therefore, the department supports any effort on behalf of the landowner (and any subsequent developers of the project) to protect these specimens and to use native species in the landscaping of the golf course.

Changes in Long Range Land Use Patterns

The approval of the golf course proposals of Campbell Estate and Kuilima Resort in the Kahuku area may have far reaching effects on the land use patterns in the Kahuku-Laie area. These effects are expected to be twofold. First, there are the possible pressures of urbanization (and subsequent increases in infrastructural demands) created by the development of golf course projects in general. Secondly, the linkages between the development of the Kuilima Resort and the development of the golf course project could result in a de facto increase in the resort and resort-related development beyond currently established boundaries.

With respect to the issue of possible development pressures on surrounding lands arising out of the ultimate completion of the proposed golf course development, there may be substantial secondary and cumulative impacts on the character and lifestyle in the Kahuku and Laie communities. In addition, these pressures for urbanization carry with them ever-increasing demands on the infrastructural system. In order to maintain adequate service to subsequent development at urban densities, infrastructural capacities would have to be increased at public cost. Therefore, while the proposed project may not involve an urban development in a technical sense, there remains the possibility that resultant pressures for urbanization may lead to the need for complementary development at higher than rural densities, thus changing the rural environment of the area over the long term.

Mr. Clinton Churchill
April 19, 1990
Page 4

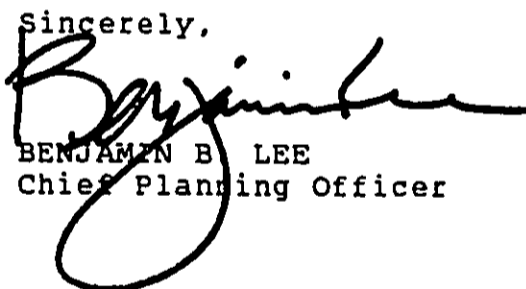
Similarly, while these lands are proposed for Park/Golf Course designation on the DP Land Use Map, the project, by virtue of its marketing dependency on the Kuilima Resort, may well constitute a de facto increase in the size of the Kuilima Resort and the extension of the resort beyond the Kawela Bay/Kahuku Point area. This extension of the de facto "resort" area mauka of the highway, and especially south of Kahuku in the Malaekahana area, may set the stage for the development of other appurtenant or accessory land uses which may change long range development patterns for the Kahuku area.

Conclusion

The department concludes that the Final Environmental Impact Statement (FEIS) should address those issues related to the commitment of agricultural lands for private golf course development and the possible phasing of land use approvals to prevent overcommitment of agricultural resources. The FEIS should also address the cumulative environmental and social effects of this development in terms of increased pressures for urbanization in the Kahuku area and the de facto expansion of the Kuilima Resort. Further, the applicant should be aware that the City is moving forward with plans for a community benefit assessment for private golf courses.

Should you have any questions please contact Bill Medeiros at 527-6089.

Sincerely,



BENJAMIN B. LEE
Chief Planning Officer

BBL:ft

cc: ✓William Wanket
OEQC

WILLIAM
E.
WANKET
INC.

Land Use Consultant

May 3, 1990

Mr. Benjamin B. Lee
Chief Planning Officer
Department of General Planning
650 South King Street
Honolulu, Hawaii 96813

**RE: Draft Environmental Impact Statement (DEIS) for Proposed
Country Courses at Kahuku (Punamano) - Response to Comments
Received**

Dear Mr. Lee:

Thank you very much for the copy of your letter dated April 19, 1990 to the Estate of James Campbell regarding the above-referenced DEIS. The following information is provided in response to your comments:

Conformity to General Plan

From a physical perspective, "implementation of the proposed golf course project" would not "irrevocably commit a large portion of agricultural land to non-agricultural uses." If the most profitable permitted use is farming, then it would not be difficult to replant the golf course into crops. Unlike most urban uses, most of the land for the golf course will not be paved over. Nevertheless, as discussed in the Draft EIS, such a conversion from a golf course to crop production is "extremely improbable in that Hawaii's economy would have to undergo a dramatic change before agriculture would provide greater economic benefits than would a golf course. However, as the DEIS further points out, to a certain extent, golf course development would contribute to the growth of diversified agriculture in that nursery sales would increase, since a large number of plants and trees would be required to landscape the course. Also golf courses generate agricultural-type jobs that will offer people with agricultural skills employment opportunities.

It should also be noted that the subject property has not been farmed successfully for about two decades. Furthermore, the properties have poor agronomical conditions in terms of high irrigation costs, eroded soils, difficult terrain, and excessive wind. Attached is a copy of a letter from

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-Page 2-

Department of General Planning
The Country Courses at Kahuku (Punamano)

the Kahuku Farmers Association confirming the difficulties associated with the farming of this land.

Also, the benefits of using the land for a golf course extend beyond recreational use to include economic benefits. In particular, the golf courses will provide an estimated 200 jobs (Punamano and Malaekahana), of which 80 positions will be grounds-maintenance jobs involved with cultivating plants, applying chemicals, maintaining irrigation systems, etc. In terms of function, required skills, and training, these jobs are very similar to many jobs within the agriculture industry. This is a significant number of agriculture-type jobs in view of declining employment in traditional agriculture. According to the Department of Agriculture, it is not unrealistic to expect that golf courses could provide an employment opportunity for former plantation workers.

Conformity to the Development Plan

We appreciate the information regarding the community benefits assessment program for private golf course development on Oahu. We appreciate being apprised of your ongoing study, and suggest that the community benefit assessment study clearly draw a relationship between the impact of golf courses and a specific community.

Linkages with Kuilima Resort

The Estate of James Campbell is the landowner offering the proposed amendment for the Country Courses at Kahuku. The Estate will be negotiating with potential developer/operators for the proposed Country Courses at Kahuku. At the present time, it would be premature for the Estate to disclose the identity of potential developer/operators.

Describing the developer/operator of the Country Courses at Kahuku as a potential competitor of the Kuilima Resort developer/operator, may not be appropriate. The relationship could better be described as symbiotic or complementary. As indicated in the text of the market assessment, the Country Courses at Kahuku are expected to stimulate demand for the resort units at Kuilima by providing a golf amenity, in combination with the golf amenity offered within the confines of the Kuilima Destination Resort, which will be unique in the State of Hawaii.

The term competition implies that golf courses developed by Asahi Jyukun within the Kuilima Resort and at Malaekahana, and the Country Courses at Kahuku, will be competing for a fixed (finite) number of golfers, which might be staying at the Kuilima Resort. Rather, the golf amenities available in the Koolauloa area, supporting the Kuilima development, will be competing for statewide and countywide demand for recreational facilities. The clustering of these facilities, in locations proximate to the Kuilima Resort, will enhance their marketability. Attracting additional

golfers to the Kuilima Resort will enhance its success as well as expand the market for golf in the area. This is the concept behind such well known projects as Restaurant Row and Automobile Row (where businesses offering a single-type of service or product group consolidate in order to attract buyers by providing variety. Another example is Sun Valley, Idaho where a number of ski slopes are concentrated in a given area offering the skier a variety of challenges.

There is a definite linkage between the projected demand for golf, and the development of the Kuilima Resort. If the resort should be delayed, it is likely to extend the timeframe during which the golf demand is expected to develop. The actual timing of the golf course development at the Country Courses at Kahuku will depend on the developer's assessment of market conditions at the time construction is expected to take place. The suggestion that golf supply lags behind demand, however, practically guarantees that demand will not meet expectations, due to diminished availability of tee times and variety of golfing experiences. It might be argued that golf facilities at Kuilima and the Country Courses at Kahuku should lead the resort development at Kuilima, thus insuring the availability of a unique amenity, and enhancing the competitiveness of the emerging Kuilima destination resort area.

Monitoring Program

We agree that a monitoring program should be implemented to gauge the level of usage and effects of applied fertilizers and biocides. We believe that controls do exist, including the implementation of sound management practices as recommended by Green and Murdoch, to safeguard the aquifer. In addition to the mitigative measures recommended by Green and Murdoch, we will meet the 8 conditions outlined in the State Department of Health's letter (attached) that includes groundwater monitoring. Further, as you recommended, we will develop, in consultation with the City and State, a rigorous monitoring program designed to minimize the potential adverse effects of leaching and runoff and to assure proper turf management. This program will include making available to appropriate enforcing agencies those records related to fertilizer and biocide applications and the results of the monitoring program.

Rare and Endangered Plantlife

According to the Botanical Survey conducted by Char and Associates, the maiapilo can be found throughout the Hawaiian Islands in lowlands and coastal areas. A recent publication by the U.S. Fish and Wildlife Service (U.S. Fish and Wildlife Service., 1990, Endangered and Threatened Species; Notice of Review. Federal Register 55 (35): 6184-6229) has downgraded the maiapilo to Category 2 (no longer considered vulnerable as threatened or endangered, with not enough data to support listing at this time).

A landscape plan will be developed for the golf course development. It is expected that certain native (indigenous) plants will comprise a significant portion of the landscape plant selection.

Changes in Long Range Land Use Patterns

The General Plan of the City and County of Honolulu establishes for the Koolauloa Development Plan area a population distribution policy of between 1.3 to 1.4 percent of the islandwide population. Essentially, this policy directs very low population growth to the area. Continuation of this policy will ensure that growth in the area remain rural in character. Therefore, urbanization at higher than rural densities can only occur with major policy changes in both the General Plan and Development Plan, an event that is largely controlled by the City and County of Honolulu.

Golf courses do not necessarily result in the urbanization of surrounding lands. The Hawaii Country Club golf course along Kunia Road is an example. Another example is the Hawaii Kai Country Club built in 1957. In this case, both the General Plan and Development Plan for the area were changed reversing a long-standing policy of urban growth surrounding the golf course. With respect to the Country Courses, the surrounding vacant lands are DPed and zoned for Agriculture and classified Agriculture by the State Land Use Commission. The development of these lands for uses other than agriculture are under the control of both the State and the City.

On the other hand, golf courses often are considered a visual and recreational enhancement to the rural environment of an area. As stated in the view assessments for the Country Courses, although the courses may convert a portion of the natural/agricultural character to a manmade setting, the essence of visual open space will be retained and/or may be improved. Several mitigative measures have been proposed to include the development of a "pastoral" landscape theme to blend with the existing visual setting. Also clubhouse structures are setback on the site and will not be seen. The course will provide access and viewing points of historic resources on the property as well as views overlooking the Kahuku Plain. Currently enjoyment of these views are not available.

We do not agree that the development of the golf course constitutes an expansion of the Kawela Bay/Kahuku Point Resort area. The EIS for the Kuilima development contained a socio-economic analysis which indicated that the resort development would generate direct, indirect and induced jobs. Direct jobs include both onsite and offsite jobs. An offsite direct job could be restaurant jobs in Kahuku Town generated due to patronage by Kuilima guests, or it could be industrial/commercial jobs generated by the service needs of the resort area. For your information, the Kahuku Municipal Golf Course receives 6 percent of its income from tourists. The fact that these golf courses are across (mauka of the highway) from the Kuilima resort does not, in our opinion, constitute a "de facto" increase in the size of the Kuilima

-Page 5-
Department of General Planning
The Country Courses at Kahuku (Punamano)

resort, any more than Puuloa Golf Course in Ewa Beach expands the Koolina resort. Furthermore, the Country Courses at Kahuku will be available for public play and not limited or intended solely for tourists.

Thank you for your comments. For your information, your letter together with this response will be included in the Final EIS.

Sincerely,



WILLIAM E. WANKET

cc: Benjamin B. Lee, Chief Planning Officer

Encl: (2)

April 7, 1989

EIGHT (8) CONDITIONS APPLICABLE TO THIS NEW GOLF COURSE DEVELOPMENT

Conditions:

1. The owner/developer and all subsequent owners shall establish a groundwater monitoring plan and system which shall be presented to the State Department of Health for its approval. The groundwater monitoring plan and system shall minimally describe the following components:
 - a. A system of monitoring wells constructed throughout the site. These monitoring wells shall extend approximately ten (10) feet below the water table.
 - b. A routine groundwater monitoring schedule of at least once every six (6) months and more frequently, as required by the State Department of Health, in the event that the monitoring data indicates a need for more frequent monitoring.
 - c. A list of compounds which shall be tested for as agreed to by the State Department of Health. This list may include, but not be limited to the following: total dissolved solids; chlorides; PH; nitrogen; phosphorus; or any other compounds associated with fertilizers, biocides or effluent irrigation.
2. A baseline groundwater data shall be established as described in this paragraph. Once the test well sites and list of compounds to be monitored for have been determined and approved by the State Department of Health, the owner/developer shall contract with an independent third-party professional (approved by the State Department of Health) to have the groundwater sampled and its data reported to the State Department of Health. Testing of the groundwater shall be done by a certified laboratory.
3. If the data from the monitoring wells indicate the presence of the measured compound and/or the increased level of such compound, the State Department of Health can require the owner/developer or subsequent owner to take immediate mitigating action to stop the cause of the contamination. Subsequently, the developer/owner or subsequent owner shall mitigate any adverse effects caused by the contamination.
4. Owner/developer shall provide sewage disposal by means of connection to the public sewer system; or by means of a wastewater treatment works providing treatment to a secondary level with chlorination. Effluent from this wastewater treatment works may be used for golf course irrigation, subject to Condition #3. The entire system shall be approved by the State Department of Health in conformance with Administrative Rules Title 11, Chapter 62, Wastewater Treatment Systems, effective December 10, 1988.

5. If a wastewater treatment works with effluent reuse becomes the choice of wastewater disposal, then the owner/developer and all subsequent owners shall develop and adhere to a Wastewater Reuse Plan which shall address as a minimum, the following items:
- a. Management Responsibility. The managers of the irrigation system using reclaiming wastewater shall be aware of the possible hazards and shall evaluate their system for public health, safety, and efficiency. They must recognize that contact with the reclaimed wastewater from treated domestic sewage poses potential exposure to pathogenic organisms which commonly cause infectious diseases (bacteria, viruses, protozoa, and helminths or worms).
 - b. General Recommendations
 - 1) Irrigated areas should be no closer than 500 feet from potable water wells and reservoirs.
 - 2) Irrigated areas should be no closer than 100 feet from any private residence:
 - 3) Application rates should be controlled to minimize ponding. Excess irrigation tailwater in the reclaimed wastewater irrigation area shall be contained and properly disposed. An assessment should be made of the acceptable time and rate of application based on factors such as type of vegetation, soil, topography, climate and seasonal variations.
 - 4) Effluent holding/mixing ponds shall be designed to prevent the infiltration of the wastewater into the subsurface. The holding/mixing ponds shall be made impervious.
 - 5) Irrigation shall be scheduled such that the public is not in the vicinity and the soil is sufficiently dry to accept the irrigation water.
 - 6) Permanent fencing or barriers shall be erected around polishing or holding ponds to prevent public entry or stray feral and tame animals from gaining access to the ponds.
 - 7) Adequate irrigation records shall be maintained. Records should include dates when the fields are irrigated; rate of application, total application and climatic conditions. Records should also include any operational problems, diversions to emergency storage or safe disposal and corrective or preventive action taken.
 - 8) The holding/mixing ponds shall be periodically monitored for the purpose of detecting leakage into the subsurface. If leakage is detected, corrective action shall be immediately taken.
 - c. Adequate Notice. Appropriate means of notification shall be provided to inform the employees and public that reclaimed wastewater is being used for irrigation on the site.

- 1) Posting of conspicuous signs with sufficient letter size for clear visibility with proper wording should be distributed around the use areas.
 - 2) Signs shall be securely fastened. Periodic surveillance shall be conducted to assure permanent posting at all times. Immediate replacements shall be made when necessitated by deterioration, vandalism or misuse.
- d. Adequate Employee Education. Employees or users should be cautioned and warned of the potential health hazards associated with the ingestion of reclaimed wastewater being used at the site.
- 1) Employees should be warned that the ingestion of reclaimed wastewater is unsafe.
 - 2) Employees should be protected from direct contact of the reclaimed wastewater. If necessary, protective clothing should be provided.
 - 3) Employees should be informed of the following:
 - o The irrigation water is unsafe for drinking or washing.
 - o Avoid contact of the water or soil with any open cuts or wounds.
 - o Avoid touching the mouth, nose, ear or eyes with soiled hands, clothes or any other contaminated objects.
 - o Be aware that inanimate objects such as clothes or tools can transport pathogenic organisms.
 - o Always wear shoes or boots to protect feet from the pathogenic organisms in the soil or irrigation water.
6. Use of electrical golf carts is recommended. It is recognized that underground storage tank(s) to store gasoline for gas driven golf carts will impose potential risks to the groundwater. If gasoline-driven golf carts are to be utilized, the developer/owner must meet all federal requirements in the installation of any underground storage tank.
7. Buildings designated to house the fertilizer and biocides shall be bermed to a height sufficient to contain a catastrophic leak of all fluid containers. It is also recommended that the floor of this room be made waterproof so that all leaks can be contained within the structure for cleanup.
8. A golf course maintenance plan and program will be established based on "Best Management Practices (BMP)" in regards to utilization of fertilizers and biocides as well as the irrigation schedule. BMP's will be revised as an ongoing measure. The golf course maintenance plan will be reviewed by the State Department of Health prior to implementation.

If there are any questions regarding the eight (8) conditions mentioned here, please contact Mr. James K. Ikeda at 548-6455. We ask your cooperation in the protection of Hawaii's valuable groundwater resource.

Kahuku Farmers Association
P.O. Box 206
Kahuku, Hawaii 96731

January 30, 1990

William E. Wanket, Inc.
Pacific Tower 660
1001 Bishop Street
Honolulu, Hawaii 96813

Dear Mr. Wanket:

Re: EISPN Country Courses at Kahuku

Members of the Kahuku Farmers Association currently farms on 250 acres of land in Kahuku and has done so for the past 20 years. We are very familiar with the many obstacles a farmer need to overcome in order to farm successfully.


We, as a group, occupy the best possible agricultural land in Kahuku with level terrain and an abundant water source nearby. Even with these advantages the farmers are hard pressed and constantly struggling to make their ends meet.

The Punamano area was once planted in sugarcane but was not considered productive lands. Following the close of the plantation an effort was made to grow cattle feed but this too failed after several years. This particular land has laid fallow for the past 12-15 years.

The Malaekahana land poses severe problems for farmers requiring excessive pumping to bring irrigation water to the mauka section. As farmers neither of the proposed golf course sites would be our choice for farming.

Presently, both parcels are overgrown with weeds and is an eye-sore. We would not object to golf courses as it would preserve the open space nature of the rural areas and present an esthetically pleasing landscape. The Kahuku Farmers, however, does not support the construction of homes on the proposed sites.

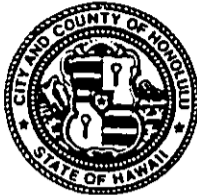
Thank for the opportunity to comment.

Very truly yours,

Norwood Conner, President
Kahuku Farmers Association

DEPARTMENT OF HOUSING AND COMMUNITY DEVELOPMENT
CITY AND COUNTY OF HONOLULU

650 SOUTH KING STREET, 5TH FLOOR
HONOLULU, HAWAII 96813
PHONE: 523-4427 • FAX 527-5498

FRANK F. FASI
MAYOR



MICHAEL N. SCARFONE
DIRECTOR

RONALD B. MUN
DEPUTY DIRECTOR

March 22, 1990

MEMORANDUM

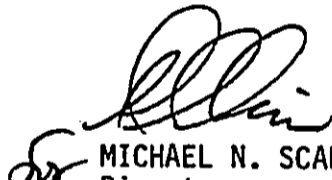
TO: Benjamin Lee, Chief Planning Officer
Department of General Planning

ATTENTION: Bill Medeiros

FROM: Michael N. Scarfone

SUBJECT: Draft Environmental Impact Statement
Country Courses at Kahuku (Punamano) Volume I & II

Thank you for the opportunity to review and comment on the Draft Environmental Impact Statement for the Country Courses at Kahuku. We have no comments at this time.


MICHAEL N. SCARFONE
Director

cc: The Estate of James Campbell
William E. Wanket, Inc.
Office of Environmental Quality
Control

WILLIAM
E.
WANKET
INC.

Land Use Consultant

March 27, 1990

Mr. Michael N. Scarfone
Director
Department of Housing and Community
Development
650 South King Street, 5th Floor
Honolulu, Hawaii 96813

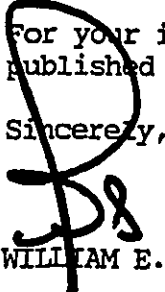
RE: Environment Impact Statement Preparation Notice (EISPN) for
Proposed Country Courses at Kāhuku (Punamano) - Response to
Comments Received

Dear Mr. Scarfone:

Thank you very much for the copy of your letter of March 22, 1990 to the Department of General Planning regarding the referenced project. We appreciate your efforts in reviewing the DEIS.

For your information, your letter, together with this response, will be published in the Final EIS.

Sincerely,


WILLIAM E. WANKET

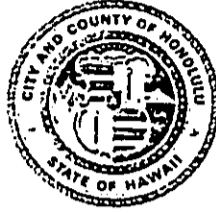
cc: Benjamin B. Lee, Chief Planning Officer

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Honolulu, HI 96813
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DEPARTMENT OF LAND UTILIZATION
CITY AND COUNTY OF HONOLULU

650 SOUTH KING STREET
HONOLULU, HAWAII 96813 • (808) 523-4432

FRANK F. FASI
MAYOR



DONALD A. CLEGG
DIRECTOR

LORETTA K.C. CHEE
DEPUTY DIRECTOR

LU2/90-0825(DEB)

March 30, 1990

MEMORANDUM

TO: BENJAMIN LEE, CHIEF PLANNING OFFICER
DEPARTMENT OF GENERAL PLANNING

FROM: DONALD A. CLEGG, DIRECTOR

SUBJECT: COUNTRY COURSES AT KAHUKU (PUNAMANO)
DRAFT ENVIRONMENTAL IMPACT STATEMENT (EIS)
APPLICATION FOR DEVELOPMENT PLAN AMENDMENT
TAX MAP KEYS: 5-6-05: PORTION OF 1, PORTION 2, 5, 6
AND PORTION 7; 5-7-01: PORTION 21

We have reviewed the above described project and offer the following comments.

1. Potential impacts of water withdrawal for project operations on agricultural/aquacultural uses in the area should be described.
2. The volume (cubic yards) of excavation and fill for the proposed golf course should be included in Volume I and Volume II (Appendix A) of the Final EIS. In addition, an exhibit clearly showing where the excavation and fill will occur should be included.
3. A clearer description of the proposed drainage system should be included in the Final EIS. This description should include exhibits indicating the location of any swales, drainage ditches, retention basins or sedimentation ponds.
4. Due to the recently adopted Ordinance No. 90-15 which relates to permitting regulations for golf courses, zone changes would be the last certain step in the permit process for most proposed golf course developments. As such, information required for the zone change application will need to be more definitive regarding:
 - a. design, floor area, heights, setbacks and functions of all structures;
 - b. parking calculations;
 - c. hours of operation;
 - d. landscaping;

- e. signage; and
 - f. traffic improvements (ingress/egress, interior circulation).
5. The project's zone change application should include preliminary comments from the appropriate governmental agencies regarding the adequacy of the various technical studies included in the Draft EIS, as well as other studies or plans which are required. The following is a partial listing of issues and agencies for which comments will be required.
- a. Water supply, groundwater resources for both potable and irrigation water, water quality (Department of Land and Natural Resources, State Commission on Water Resources, Department of Health, Board of Water Supply).
 - b. Drainage and runoff (Department of Public Works).
 - c. Wastewater management (Department of Health, Department of Public Works).
 - d. Traffic impact assessment (Department of Transportation, Department of Transportation Services).
 - e. Archaeological or historical sites (the need for preservation and data recovery plans should be discussed with the Department of Land and Natural Resources staff).

Thank you for the opportunity to review the Draft EIS. If you have any questions, please contact Diane E. Borchardt of our staff at 527-5349.



DONALD A. CLEGG
Director of Land Utilization

DAC:s1
0278N/3-4

cc: ✓ William E. Wanket

WILLIAM
E.
WANKET
INC.

Land Use Consultant

April 16, 1990

Mr. Donald A. Clegg
Director
Department of Land Utilization
650 South King Street
Honolulu, Hawaii 96813

RE: Draft Environmental Impact Statement (DEIS) for Proposed
Country Courses at Kahuku (Punamano) - Response to Comments
Received

Dear Mr. Clegg:

Thank you very much for the copy of your letter dated March 30, 1990 to the Department of General Planning regarding the above-referenced project. The following information is offered in response to your comments.

Comment #1: Impacts of Water Withdrawal.

Response: The State Department of Land and Natural Resources has agreed that the Kahuku Region has a sustainable yield of 15 million gallons per day (MGD). According to a 1988 study by Mink & Yuen Inc., the current draft in the Kahuku area is 8.7 MGD leaving 6.3 MGD unused. The Honolulu Board of Water Supply plans to eventually take another 0.5 MGD leaving 5.8 MGD unused. Campbell Estate, therefore, has 6.3 MGD available for use. Assuming the BWS will take 0.5 MGD and lessees of Campbell Estate increase their usage by 1.5 MGD, the unused portion remains as 4.3 MGD. It is estimated that water usage for the Punamano area will be about 2.1 to 2.2 MGD. There appears to be an adequate supply source to meet this requirement.

It is important to note that recommendations are to remove the water from the aquifer at a slow discharge rate over a long period of time each day so that large drawdowns within the wells will not permit salt water intrusion.

Comment #2: Volume (Cubic yards) of excavation and fill for the Proposed Course.

Response: The volume and location of the excavations within the golf course will be provided with the grading plan when the detailed grading requirements are known. No major land excavation is contemplated at this

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time. The details of grading cannot be indicated at this point of development. The grading involved will be in relation to the technical detailing of the tees, fairways, and greens themselves. (Personal communication with Don Clegg, Director, Department of Land Utilization) The grading permit review will require both the volume, location and grading extent. When the permit is sought, an erosion control plan will also be provided.

Comment #3: Proposed drainage system.

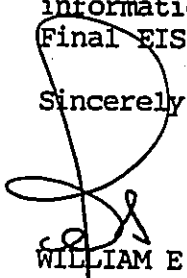
Response: These requirements, as those stated in Comment #2 above, would fall under the control of the golf course designer who lays out the course in its final form. The general layout points out that swales, ditches, ponds, and retention basins will be required. The final design, after general approval has been received, will match these requirements with the design of the course by the golf course professional selected. Control of these features will be by Public Works review at the time of grading permit requests.

Comment #4 and Comment #5 - Zone Change Application Processing.

Response: We appreciate the information regarding the recently adopted Ordinance No. 90-15 as it pertains to the requirements of the zone change application process. During the zone change phase, more definitive information will be provided as specified in Paragraph 4., subparagraphs a. through f. of your letter. In addition appropriate governmental agencies will be contacted, including those suggested in your letter, for their comments.

Again, thank you for taking the time to comment on the DEIS. For your information, your letter together with this response will be included in the Final EIS.

Sincerely,



WILLIAM E. WANKET

cc: Benjamin B. Lee, Chief Planning Officer

RCU BY: R. P. SCHOLZ, CONSULTANT ; 3-19-90 2:38PM ;
MAR-19-90 MON 14:38 GENERAL PLANNING

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Draft 3/90
DCPD/CPD/CPD 827

DEPARTMENT OF PARKS AND RECREATION
CITY AND COUNTY OF HONOLULU

650 SOUTH KING STREET
HONOLULU, HAWAII 96813



FRANK F. PASI
MAYOR

WALTER M. OZAWA
DIRECTOR

HIROAKI MORITA
DEPUTY DIRECTOR

March 13, 1990

TO: BENJAMIN B. LEE, DIRECTOR
DEPARTMENT OF GENERAL PLANNING

FROM: WALTER M. OZAWA, DIRECTOR

SUBJECT: DRAFT ENVIRONMENTAL IMPACT STATEMENT
COUNTRY COURSES AT KAHUKU (PUNAMANO)
VOLUMES I & II

DEPT. OF
GENERAL PLANNING
C & C HONOLULU

90 MAR 14 PM 6:14

RECEIVED

The Department of Parks and Recreation has reviewed the above referenced, Draft Environmental Impact Statement (DEIS) and finds that it has not fully addressed the concerns we expressed in the Environmental Impact Statement Preparation Notice (EISPN). In the EISPN, the Department stated that the EIS should contain information regarding the availability of the proposed golf courses for use by residents including proposed playing times and green fees.

We suggest that inasmuch as this information may not be presently available, that the EIS include current resident playing times and fees at such courses as Wailea, Seibu, Kaanapali and Kapalua as examples of fees and times which may be expected at the Country Courses.

WALTER M. OZAWA, Director
#

WMO:11

WILLIAM
E.
WANKET
INC.

Land Use Consultant

April 16, 1990

Mr. Walter M. Ozawa
Director
Department of Parks and Recreation
650 South King Street
Honolulu, Hawaii 96813

RE: Draft Environmental Impact Statement for Proposed Country
Courses at Kahuku (Punamano) - Response to Comments
Received

Dear Mr. Ozawa:

Thank you for the copy of your letter dated March 13, 1990 to the Department of General Planning regarding the above-referenced project. In response to your comments, John Zapotocky, Consultant, has prepared the following additional information requested.

Maui Resort Courses - Fees Charged, Percent Play by Local Golfers:

<u>COURSE</u>	<u>KAMAAINA RATE</u>	<u>% LOCAL PLAY</u>
Wailea	\$60.00 (1)	17%
Seibu	\$90.00 (2)	6%
Kaanapali	\$40.00 (3)	10%
Kapalua	\$90.00 (2)	5%

- (1) Non Resort Guest - \$105.00, Resort Guest - \$60.00
(2) Same as Non Resort Guest Rate
(3) No Kamaaina Rate per se, however, booklet purchase available - used primarily by local residents.

With the exception of the Seibu course, the Maui resort courses are over-booked by resort guests during the months of January, February and March. Most local play takes place during the other months of the year. None of the courses have specific times reserved for local golfers but accommodate them along with other golfers.

It should be noted that the typical Maui resident plays 50% more golf than

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his Oahu counterpart under superior conditions, i.e., Maui course average only 60% of the rounds of Oahu courses. While resort golf facilities on Maui do not play a major role in providing resident golf, they do play a significant role. However, the most significant contribution of resort courses on Maui, to local play, is that they provide a place for tourists to play golf, thus allowing local golfers the opportunity to play on golf courses outside of tourist destination areas without heavy competition from tourists. In addition, they provide a variety of golf experiences not otherwise available on the Valley Isle.

Local play at Oahu's resort courses, Sheraton Makaha Valley and Turtle Bay Hilton is 8% and 25% respectively. Both Makaha and Turtle Bay are offering Kaamaina rates at the present time. Makaha offers Kaamaina rates of \$55 vs. regular non-guest rates of \$125. Turtle Bay is offering extra low Kaamaina rates of \$36 weekday and \$40.50 weekends currently, due to construction of the second 18-hole course in proximity to the existing course vs. the normal undiscounted rate of \$90 weekdays and \$100 weekends. The KoOlina Golf Course, Oahu's newest resort course (open in January 1990) is offering Kaamaina rates of \$65 vs. regular rates of \$100. (It should be noted that none of the existing resort courses on Oahu or Maui are under any legal obligation to provide Kaamaina rates or provide local availability but do so as a sound business practice.)

A number of Oahu's non-resort daily fee golf courses, including Mililani, Hawaii Kai, Makaha East and Hawaii Country Club accommodate significant numbers of tourists. Additional resort courses on Oahu will enhance both visitor and local recreational opportunities.

Oahu visitor and resident golfers would benefit significantly from an increase in all types of golf facilities including: resort courses, daily fee courses, municipal courses and private membership courses. Increasing supply is the primary means of guaranteeing availability and competitive fees for all golfers.

City Policy Regarding Resident Golf Fees and Availability

The Honolulu City Council has, in the case of other golf course permit applications, sought and obtained agreements from developers regarding availability and fees for resident golfers. It would seem appropriate that these agreements be tailored to the individual application, depending on the type of course, location of the course and the availability of resident golf in the area of the proposed course.

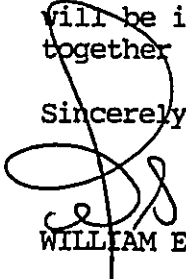
Given the number of golf courses in the Kahuku/Kuilima area: two existing, Turtle Bay and Kahuku Municipal, one under construction Turtle Bay Second

-Page 3-
Department of Parks and Recreation

Course, and five proposed, four by the Estate of James Campbell and one by Asahi Jyuken, it would appear that the need for mandatory availability and fee controls for resident golfers is minimal.

Again, thank you for your comments. The above responses, as appropriate, will be incorporated into the Final EIS. For your information, your letter together with this response will be included in the Final EIS.

Sincerely,

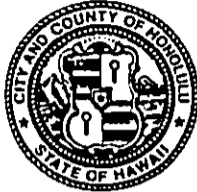


WILLIAM E. WANKET

cc: Benjamin B. Lee

DEPARTMENT OF TRANSPORTATION SERVICES
CITY AND COUNTY OF HONOLULU

HONOLULU MUNICIPAL BUILDING
650 SOUTH KING STREET
HONOLULU, HAWAII 96813



FRANK F. FAGI
MAYOR

ALFRED J. THIEDE
DIRECTOR

JOSEPH M. MAGALDI, JR.
DEPUTY DIRECTOR
TE-702
PL90.1.049

March 20, 1990

MEMORANDUM

TO: BENJAMIN B. LEE, CHIEF PLANNING OFFICER
DEPARTMENT OF GENERAL PLANNING

FROM: ALFRED J. THIEDE, DIRECTOR

SUBJECT: COUNTRY COURSES AT KAHUKU-PUNAMANO
DRAFT EIS
TMK: 5-6-05: POR. OF 1 & 2, 5 & 6


This is in response to a letter from the Office of Environmental Quality Control requesting our comments on the subject project.

Kamehameha Highway fronting the proposed site is under the jurisdiction of the State Department of Transportation. They should, therefore, be the primary agency to comment on this project with regard to traffic impacts on the affected street system.

The ultimate ownership of the internal roadways servicing the project should be specified in the report. Based on the proposed roadway alignment and its intended use, we understand that the internal roadway system will be owned and maintained either privately or by the military.

We, therefore, have no comments to offer at this time.

(for)



ALFRED J. THIEDE

cc: The Estate of James Campbell
William E. Wanket
Office of Environmental Quality Control

March 28, 1990

WILLIAM
E.
WANKET
INC.

Land Use Consultant

Mr. Alfred J. Thiede
Department of Transportation Services
Municipal Building
650 South King Street
Honolulu, Hawaii 96813

**RE: Draft Environmental Impact Statement (DEIS) for Proposed
Country Courses at Kahuku (Punamano) - Response to Comments
Received**

Dear Mr. Thiede:

Thank you very much for the copy of your March 20, 1990 letter to the Department of General Planning regarding the above-referenced DEIS. Information in response to comments offered is provided:

Jurisdiction of Kamehameha Highway

We appreciate the information that the jurisdiction of Kamehameha Highway fronting the proposed site is under the State Department of Transportation. The DEIS has been distributed by OEQC to a number of agencies for review and comment, including the State Department of Transportation.

Internal Roadways - Ownership and Maintenance

The internal private roadway that will be servicing the project is currently leased to the U.S. Government. It is planned that maintenance will be a joint private/Government responsibility, shared on a prorata basis.

Again, thank you for your comments. For your information, your letter, together with this response, will be published in the Final EIS.

Sincerely,


WILLIAM E. WANKET

cc: Benjamin B. Lee, Chief Planning Officer

Pacific Tower
Suite 660
1001 Bishop Street
Honolulu, HI 96813
Phone
(808) 533-4937
FAX 521-5410

February 13, 1990

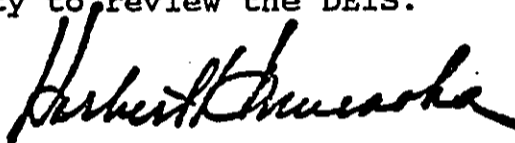
MEMO TO: BENJAMIN LEE, CHIEF PLANNING OFFICER
DEPARTMENT OF GENERAL PLANNING

FROM: HERBERT K. MURAOKA
DIRECTOR AND BUILDING SUPERINTENDENT

SUBJECT: DRAFT ENVIRONMENTAL IMPACT STATEMENT (DEIS)
COUNTRY COURSES AT KAHUKU (PUNAMANO)
VOLUMES I AND II

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

Thank you for the opportunity to review the DEIS.



HERBERT K. MURAOKA
Director and Building Superintendent

DC:jo
cc: J. Harada
Campbell Estate
Office of Environ. Quality Control

WILLIAM
E.
WANKET
INC.

Land Use Consultant

February 22, 1990

Mr. Herbert K. Muraoka
Director and Building Superintendent
Building Department
650 South King Street
Honolulu, Hawaii 96813

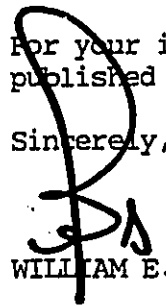
RE: Draft Environmental Impact Statement (DEIS) for Proposed
Country Courses at Kahuku (Punamano) - Response to Comments
Received

Dear Mr. Muraoka:

Thank you very much for the copy of your memo of February 13, 1990,
to the Department of General Planning regarding the referenced project.
We appreciate your efforts in reviewing the DEIS.

For your information, your letter, together with this response, will be
published in the Final EIS.

Sincerely,


WILLIAM E. WANKET

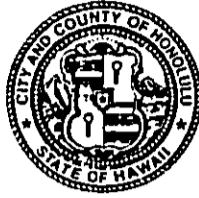
cc: Benjamin B. Lee, Chief Planning Officer

Pacific Tower
Suite 660
1001 Bishop Street
Honolulu, HI 96813
Phone
(808) 533-4937
FAX 521-5410

FIRE DEPARTMENT
CITY AND COUNTY OF HONOLULU

1455 SOUTH BERETANIA STREET, ROOM 305
HONOLULU, HAWAII 96814

FRANK F. FASI
MAYOR



LIONEL E. CAMARA
FIRE CHIEF

DONALD S.M. CHANG
DEPUTY FIRE CHIEF

February 15, 1990

TO: BENJAMIN B. LEE, CHIEF PLANNING OFFICER
DEPARTMENT OF GENERAL PLANNING

FROM: LIONEL E. CAMARA, FIRE CHIEF

SUBJECT: COUNTRY COURSES AT KAHUKU (PUNAMANO) VOLUME I & II

We have reviewed the subject material provided and have no additional comments.


LIONEL E. CAMARA
Fire Chief

MZ

Copy to: Estate of James Campbell
William Wanket, Consultant
Marvin Miura. OEQC

WILLIAM
E.
WANKET
INC.

Land Use Consultant

February 22, 1990

Chief Lionel E. Camara
Fire Chief
Fire Department
1455 South Beretania Street
Room 305
Honolulu, Hawaii 96814

RE: Draft Environmental Impact Statement (DEIS) for Proposed
Country Courses at Kahuku (Punamano) - Response to Comments
Received

Dear Chief Camara:

Thank you very much for the copy of your letter of February 15, 1990,
to the Department of General Planning regarding the referenced project.
We appreciate your efforts in reviewing the DEIS.

For your information, your letter, together with this response, will be
published in the Final EIS.

Sincerely,

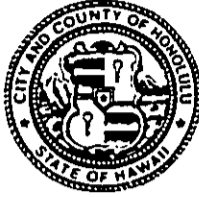

WILLIAM E. WANKET

cc: Benjamin B. Lee, Chief Planning Officer

Pacific Tower
Suite 660
1001 Bishop Street
Honolulu, HI 96813
Phone
(808) 533-4937
FAX 521-5410

POLICE DEPARTMENT
CITY AND COUNTY OF HONOLULU

1455 SOUTH BERETANIA STREET
HONOLULU, HAWAII 96814 - AREA CODE (808) 943-3111



FRANK F. FASI
MAYOR

HAROLD KAWASAKI
CHIEF

KN-JNB

OUR REFERENCE

March 1, 1990

TO: BENJAMIN B. LEE, CHIEF PLANNING OFFICER
DEPARTMENT OF GENERAL PLANNING

FROM: HAROLD KAWASAKI, CHIEF OF POLICE
HONOLULU POLICE DEPARTMENT

SUBJECT: DRAFT ENVIRONMENTAL IMPACT STATEMENT FOR COUNTRY
COURSES AT KAHUKU, PUNAMANO

We have reviewed the draft environmental impact statement for the golf courses at Kahuku and find that the three courses proposed for the Punamano site will not significantly impact police services provided in that area.

We would, however, appreciate having our Kaneohe District Station commander informed of periods when that construction-related vehicular movement are expected to disrupt traffic. He may be reached at 247-2166.

Thank you for the opportunity to comment.

HAROLD KAWASAKI
Chief of Police

By 
JOSEPH AVEIRO
Assistant Chief of Police
Support Services Bureau

WILLIAM
E.
WANKET
INC.

Land Use Consultant

April 12, 1990

Chief Harold Kawasaki
Chief of Police
Police Department
1455 South Beretania Street
Honolulu, Hawaii 96814

**RE: Draft Environmental Impact Statement (DEIS) for Proposed
Country Courses at Kahuku (Punamano) - Response to Comments
Received**

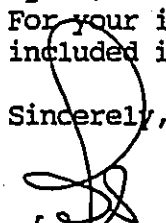
Dear Chief Kawasaki:

Thank you for the copy of your letter dated March 1, 1990 to the Department of General Planning regarding the above-mentioned project. We appreciate your review of the DEIS and the information that the proposed Punamano courses will not significantly impact police services in that area.

The Kaneohe District Station commander will be informed of any periods when traffic disruption may occur due to project construction-related vehicular movement.

Again, thank you for taking the time to review and comment on the DEIS. For your information, your letter together with this response will be included in the Final EIS.

Sincerely,


WILLIAM E. WANKET

cc: Benjamin B. Lee, Chief Planning Officer

Pacific Tower
Suite 660
1001 Bishop Street
Honolulu, HI 96813
Phone
(808) 533-4937
FAX 521-5410



COPY

April 25, 1990

TO: BENJAMIN B. LEE, CHIEF PLANNING OFFICER
DEPARTMENT OF GENERAL PLANNING

FROM: KAZU HAYASHIDA, MANAGER AND CHIEF ENGINEER
BOARD OF WATER SUPPLY

SUBJECT: DRAFT ENVIRONMENTAL IMPACT STATEMENT (DEIS)
FOR THE COUNTRY COURSES AT KAHUKU, PUNAMANO,
TAX MAP KEY: 5-6-05: POR. OF 1, 2, 5, 6, AND 7;
5-7-01: POR. OF 21

Thank you for the opportunity to comment on the DEIS.

The availability of domestic water will be confirmed when the building permit is submitted for our review and approval. If domestic water is made available, the applicant will be required to pay our Water System Facilities Charges for source-transmission and daily storage. The on-site fire protection should be coordinated with the Fire Department.

Board of Water Supply (BWS) approved reduced pressure principle backflow prevention devices will be required immediately after all BWS water meters.

A water master plan for the clubhouse water requirements should be submitted to the Board of Water Supply for review and approval.

State Department of Health review and approval are required before low (non-potable) quality water may be used for irrigation.

If you have any questions, please contact Lawrence Whang at 527-6138.

cc: The Estate of James Campbell
✓ William E. Wanket, Inc.
Marvin T. Miura, Ph.D.

WILLIAM
E.
WANKET
INC.

Land Use Consultant

April 30, 1990

Mr. Kazu Hayashida
Manager and Chief Engineer
Board of Water Supply
630 South Beretania Street
Honolulu, Hawaii 96843

**RE: Draft Environmental Impact Statement (DEIS) for Proposed
Country Courses at Kahuku (Punamano) - Response to Comments
Received**

Dear Mr. Hayashida:

Thank you very much for the copy of your memorandum of April 25, 1990 to the Department of General Planning regarding the referenced project. The information provided was very helpful. All items specified in your memorandum will be met.

For your information, your letter together with this response will be included in the Final EIS.

Sincerely,


WILLIAM E. WANKET

cc: Benjamin B. Lee, Chief Planning Officer

Pacific Tower
Suite 660
1001 Bishop Street
Honolulu, HI 96813
Phone
(808) 533-4937
FAX 521-5410

Environmental Impact Statement
THE COUNTRY COURSES AT KAHUKU

DEIS

**Other Comment
Letters and
Applicant Responses**



William A. Bonnet
Manager
Environmental Department

ENV 2-1
JA/G

March 1, 1990

City and County of Honolulu
Department of General Planning
Municipal Office Building, 8th Floor
650 South King Street
Honolulu, Hawaii 96813

Dear Sir:

Subject: Draft Environmental Impact Statement (EIS) for Country
Courses at Kahuku (Punamano) Volume I & II

We have reviewed the subject EIS and have the following comment:

We have attached a copy of the State Land Use map of the subject development marked in red to show our existing 46kv overhead distribution lines in an easement traversing the length of the development area.

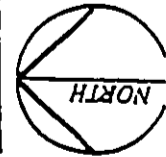
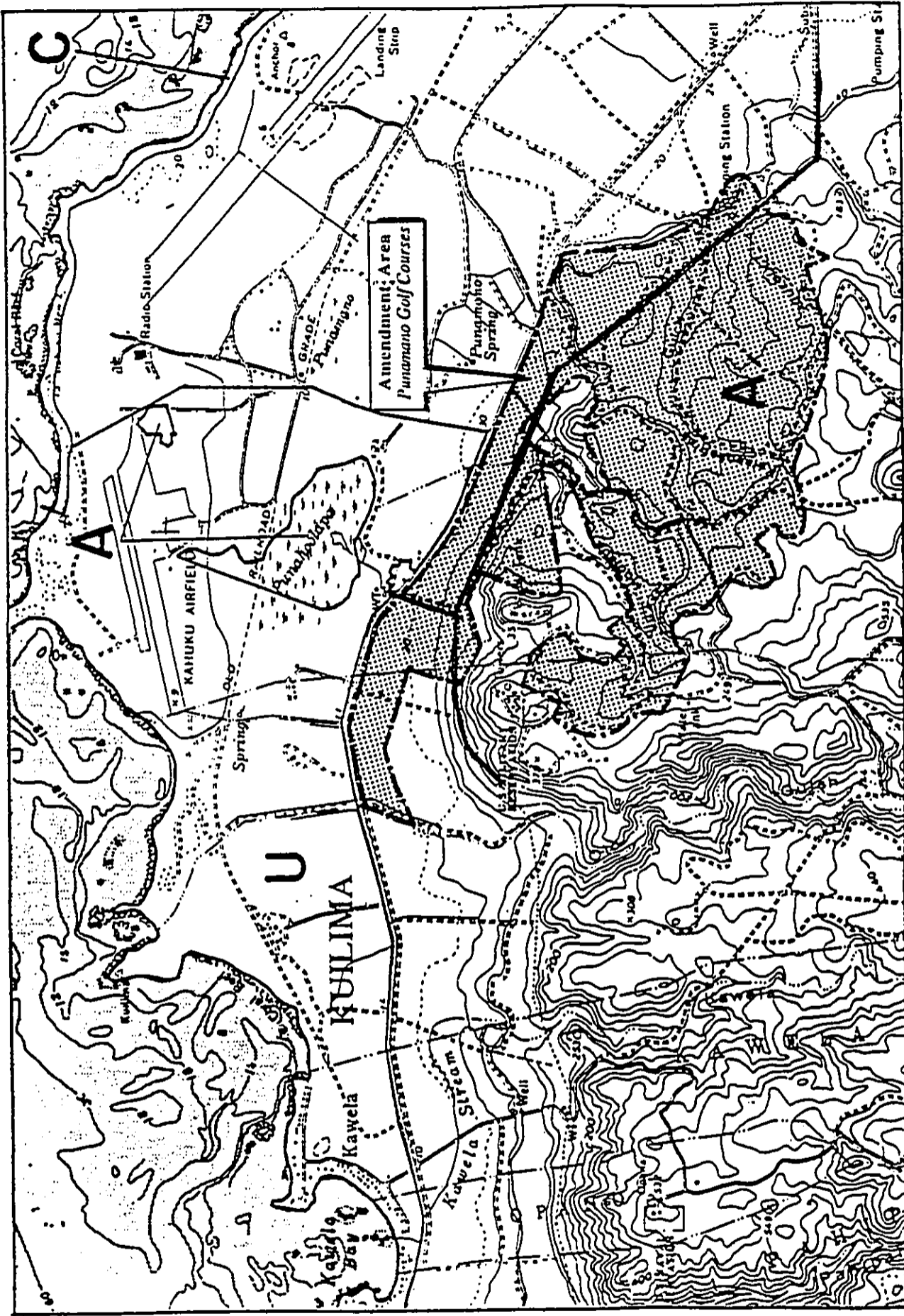
Unless HECO is requested to relocate these lines, they will remain energized at the location shown. The HECO notes submitted in our earlier response of January 15, 1990 still apply.

Sincerely,

William A. Bonnet

Attachment

cc: The Estate of James Campbell
William A. Wanket, Inc.
Marvin T. Miura, Ph.D.



The Country Courses at Kahuku
STATE LAND USE

prepared for: *The Estate of James Campbell*
prepared by: *Michael S. Chu, Land Architect*

FIGURE 2



WILLIAM
E.
WANKET
INC.

Land Use Consultant

March 28, 1990

Mr. William A. Bonnet
Manager
Environmental Department
Hawaiian Electric Company, Inc.
P.O. Box 2750
Honolulu, Hawaii 96840-0001

RE: Draft Environmental Impact Statement (DEIS) for Proposed
Country Courses at Kahuku (Punamano) - Response to Comments
Received

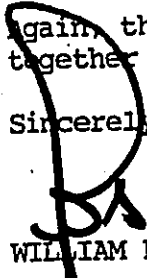
Dear Mr. Bonnet:

Thank you very much for the copy of your letter of March 1, 1990 to the Department of General Planning regarding the above-referenced project and for the map providing information on your existing 46kv overhead distribution lines.

At this time there are no plans for lines to be relocated or for restrictions to be placed on access to the easement. Final development plans will be coordinated with your office. We note reference to your previous January 15, 1990 letter stating you have no comments.

Again, thank you for your comments. For your information, your letter, together with this response will be included in the Final EIS.

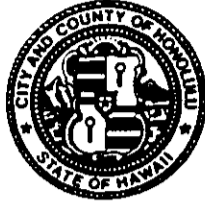
Sincerely,


WILLIAM E. WANKET

cc: Benjamin B. Lee, Chief Planning Officer

Pacific Tower
Suite 660
1001 Bishop Street
Honolulu, HI 96813
Phone
(808) 533-4937
FAX 521-5410

KOOLAULOA NEIGHBORHOOD BOARD NO. .
(Kahuku, Lale, Hauula, Punaluu, Kaaawa-Kahana)
c/o HAUULA SATELLITE CITY HALL
54-010 KUKUNA ROAD
HAUULA, HAWAII 96717



March 25, 1990

MEMORANDUM

TO: Department of General Planning
650 S. King St. 8th Floor
Honolulu, Hawaii 96813

FR: Creighton Mattoon, Chair
Koolauloa Neighborhood Board

RE: The Draft EIS
Country Courses at Kahuku
Punamano
TMK 5-6-05: Portion of 1,2,5,6&7 and 5-7-01: Portion 21
February 1990

Grading

Should the golf courses be approved the Neighborhood Board would request that all grading be limited to the dry months of the year to minimize impact of runoff and possible siltation of the bay.

Golf Course Irrigation

The applicant maintains that brackish water will be used for irrigation. Most of the golf courses the Board is familiar with mix brackish with potable water to dilute the impact of the salt on the grass. Will these courses do that and if so what is the % mix and how much potable water would be used?

25% Local Play

The Neighborhood Board questions this figure. Based on our experiences with Kuilima we feel local play is more in the area of 10-15%.

Employment

The employment numbers seem high based on the employment numbers at the Kuilima course. The course at Kuilima has trouble currently getting qualified workers thus the assumption that people will give up their current jobs outside the area to work at the golf courses within the area seems far to optimistic.

Land Values

The applicant maintains that this is a positive impact as more money will be generated to the City and County in the form of taxes. The Neighborhood Boards maintains that this is a negative impact to the community as it adversely impacts the residents ability to pay the taxes and thus impacts their ability to remain in their homes.

Consistency with Development Plan

The Koolauloa Development Plan designates the Kuilima Hotel Site as the resort site within the area. The applicant admits that this course is primarily for the tourist market. Although the argument could be made that the courses are contiguous to the resort area their placement also constitutes expansion of this designated use questioning their consistency with the Development Plan.

Economic Viability-Play Demand Numbers

The applicant maintains that the demand is present to warrant the golf courses. This assumption is made on statistics for island wide demand for golf. This area because of its remoteness has historically not been able to attract its proportionate market share. (The struggle of the commercial sugar mill to make it should be a good example of this.) Thus any economic forecast should be predicated on the ability of this area to attract its fair market share which historically has not been the case.

Catalytic Impact for Housing Development

The applicant admits that golf courses are a catalyst for high end market housing. This DP area is designated to remain rural with very low population growth. These golf courses should not go forward unless steps are taken to assure that this does not happen. Perhaps an green belt or preservation/park dedication of the surrounding lands.

Archaeological

The applicant has admitted that the area may have significant archaeological resources and the Board is concerned that should these courses be developed that utmost care is taken to not damage any sites. The Board would also maintain that

these sites be interpreted on site and that artifacts not be removed from the community.

Sewerage Treatment

The treated effluent from the site how is it disposed of? Considering the admitted sensitivity of the aquifer any disposal that entails use on the property should be questioned.

Water and Aquifer Impact

The proposed courses lie over an aquifer which by the applicant's admission is important and significant. The applicant maintains that sound management practices in the use of fertilizers, pesticides and herbicides will be sufficient to ensure non-degradation of the aquifer. The Neighborhood Board strongly recommends the denial of this EIS and the courses based on the fact that past history on the Island of Oahu has proved that sound management when lined up with economic gains always loses. The Board would like to call the accepting agency's attention to the recent problems at Hawaii Kai Sewerage Treatment Plan where sound management was suppose to have been occurring, to the water well contamination by EDB and DBCP that was never suppose to happen due to sound management practices etc., ect.. The City and County has been depending on and developing the Koolauloa area and its aquifers as a water source for all of Oahu. If the City is depending on these aquifers to support future urban needs on the Island then they should be protected. The Neighborhood Board feels strongly that golf course development above these aquifers depending on "sound management" of pesticide, herbicide and fertilizer application is not only inadequate protection but will most likely based on past history lead to the contamination of these aquifers. A little long range planning recognizing the needs of future generations rather than planning based on immediate economics would go along way here.

WILLIAM
E.
WANKET
INC.

Land Use Consultant

April 26, 1990

Mr. Creighton Mattoon
Chair
Koolauloa Neighborhood Board
c/o Hauula Satellite City Hall
54-010 Kukuna Road
Hauula, Hawaii 96717

RE: Draft Environmental Impact Statement (DEIS) for Proposed
Country Courses at Kahuku (Punamano) - Response to Comments
Received

Dear Mr. Mattoon:

Thank you very much for the copy of your letter dated March 25, 1990 to the Department of General Planning regarding the above-mentioned project. We appreciate your review of the DEIS and provide the following information in response to your comments:

Grading

We note your concern of runoff and possible siltation into the bay. Preliminary engineering reports are currently being prepared to mitigate this occurrence. As the project proceeds through the various phases of development and a developer is selected, methods of prevention will be further defined. However, for your information, erosion control methods would be required by the grading contractor at the time the grading permit is obtained from City and County of Honolulu, Public Works. The grading will be limited to a maximum clear area of 15 acres at a time. During grading, sprinkling would be required to control dust. Immediate mulching after each approved grading site is completed would be necessary to protect the graded area and maintain the soil. Swales and ponding areas are also contemplated within the golf course sites.

Should a sudden storm create a "red water" runoff, the siltation will occur within the ditch system makai of Kamehameha Highway and mauka of the old Kahuku Airfield. Grading will be controlled so as not to affect the Wildlife Refuges at Punamano and Kii, regardless of the season. By protecting those two refuges, the bay will be spared from any runoff.

Pacific Tower
Suite 660
1001 Bishop Street
Honolulu, HI 96813
Phone
(808) 533-4937
FAX 521-5410

-Page 2-

Koolauloa Neighborhood Board
The Country Courses at Kahuku (Punamano)

Golf Course Irrigation

Studies have shown that overpumpage of wells during the sugar cane period at Kahuku caused an increase in salinity in the well waters. Partially due to overpumpage that drew ocean water upwards into the wells, and because of irrigation of the brackish water on the cane fields, saline water infiltrated downwards, the ground water in the Punamano area varied from 350 mg/l to 1000 mg/l. Since 1964, pumpage has been greatly reduced and due to normal groundwater flow to the ocean, salinity has dropped to domestic quality of approximately 200-250 mg/l.

It is proposed that several existing wells will be refurbished to provide irrigation water by slowly pumping water over long periods of time to fill irrigation ponds within the golf course site. There also may be the need to develop several new wells to accomplish proper withdrawal of water so that salt water intrusion will not recur as during the "sugar cane days."

Studies completed in 1969 by the State Department of Land and Natural Resources and by Mink and Yuen, Inc. in 1988 both indicate there is a sustainable yield of 15 MGD in the Kahuku/Punamano area. As only 8.7 MGD of this amount is presently pumped, there remains some 6.3 MGD available for irrigation. It is contemplated that average irrigation usage at Punamano will be 2.1 to 2.2 MGD. There should be no need to blend irrigation (brackish) and domestic waters.

25% Local Play

The information was provided by the operations personnel at the Turtle Bay Course. This information is consistent with information provided by golf operations personnel to Peat Marwick Main & Co. for their study in February 1989 for the Asahi Jyuken sponsored market assessment.

Employment

Employment figures were estimated based on four courses providing a range of service levels and including food service employees. These employment levels are consistent with other golf courses operating throughout the state.

Land Values

Regarding the increase in value of properties near golf courses, an additional clarification is that the impact declines rapidly with distance from the golf course: properties adjacent to or commanding a prominent view of a golf course are expected to increase in value, while more distant properties are expected to experience little if any change in value.

Nevertheless, owners whose properties increase in value would be subject to higher property taxes than would otherwise be the case. However, the

increase in property taxes would be modest compared to the increase in the owner's wealth. For example, if an owner's property increases in value by \$10,000 because of an enhanced view, then the increase in property taxes would amount to \$60.90 per year under current tax rates.

Most, but not all, people would consider an increase in wealth to be a benefit--even with a modest increase in property taxes. In contrast, most people would object to a neighboring activity which decreases the value of their land and, correspondingly, their wealth.

Consistency with Development Plan

We do not agree that the development of golf courses constitutes an expansion of the Kawela Bay/Kahuku Point Resort area. The EIS for Kuilima development contained a socio-economic analysis which indicated that the resort development would generate direct, indirect, and induced jobs. Direct jobs include both onsite and offsite jobs. An offsite direct job could be restaurant jobs in Kahuku Town generated due to patronage by Kuilima guests, or it could be industrial/commercial jobs generated by the service needs of the resort area. The fact that these golf courses are across (mauka of the Highway) from the Kuilima resort does not, in our opinion, constitute a "de facto" increase in the size of the Kuilima resort. For your information, the Kahuku Municipal Golf Course receives 6% of its income from tourists. Furthermore, the Country courses will be available for public play and not limited or intended solely for tourists.

Economic Viability-Play Demand Numbers

While the comment is partially accurate in describing the methodology used in the market assessment, the following is the actual demand scenario used. The report segmented the market into three areas of demand: hotel rooms; resort condominiums and residential demand.

The hotel demand assumed that the Kuilima Resort would become noted for its golf orientation and attract golf playing guests at a rate comparable to other Hawaiian resorts noted for their golf facilities. The resort condominium demand assumed an average level golf demand as compared with other Hawaiian resorts. The residential demand assumed that existing residential play in the area would grow consistent with islandwide demand.

The following analysis shows that the comment which states that the Koolauloa area has not been able to attract its share of golfers does not apply to current conditions, in fact, the analysis shows that the Kahuku area courses, including Kuilima, attract local golfers at a much higher rate than would be suggested if only population levels of the North Shore and Koolauloa DP areas were considered.

Koolauloa Neighborhood Board
The Country Courses at Kahuku (Punamano)

1988 Rounds

	<u>Total</u>	<u>Resident</u>	<u>Total</u>
Turtle Bay	65,000	25%(1)	16,250
Kahuku	<u>48,000</u>	94%	<u>45,240</u>
	<u>113,000</u>	54%	<u>61,490</u>
Percent of Oahu Golf	7.5%		
Percent of Resident Golf			5.0%
Koolauloa/Oahu Population (2)			1.5%
North Shore/Oahu Population (2)			<u>1.7%</u>
Koolauloa and North Shore/Oahu Population (2)			<u>3.2%</u>

(1) **Note:** Figures shown in Exhibit 16 of the market report shows 35% based on consultant's allocation of 50% of condo rounds to resident category. Use of 25% is a more conservative number and ties to rounds which are unquestionably residential.

(2) Department of General Planning "Development Plan Status Review"
September 1, 1989, p. 98.

As shown in the table above, the golf courses in Koolauloa attract three times the number of local golfers as the population of Koolauloa would indicate. If the North Shore is included, the Koolauloa golf courses attract 50% more golfers than the two areas combined population would indicate. Further, the Kahuku Municipal Course experienced a 20% increase in play in 1989. There does not appear to be validity to the assertion that the Kahuku golf courses do not get their share of play. It is possible that golf demand in the Koolauloa area could grow much faster than island-wide demand given the potential for greater golf availability in the area. The demand scenario presented in the market study was on the demand push rather than one of supply pull which could also be effective in drawing golfers to Koolauloa.

While it might be argued that play at both the Turtle Bay Course and the Kahuku Municipal course is lower than the average Oahu course, the Turtle Bay Course play is consistent with that of other resort courses on Oahu and the neighbor islands. The level of play at the Municipal course is relatively low when compared with other municipal courses, however, is relatively high for a 9-hole facility. Further, the existing support facilities at the Kahuku Course, i.e., clubhouse, maintenance facility, cart barn are next to non-existent, the parking lot is inadequate and not even paved. Thus the level of play being experienced at Kahuku seems reasonably high when all factors are considered.

-Page 5-

Koolauloa Neighborhood Board
The Country Courses at Kahuku (Punamano)

Catalytic Impact for Housing Development

Regarding population, the General Plan of the City and County of Honolulu, establishes for the Koolauloa Development Plan area a population distribution policy of between 1.3 to 1.4 percent of the islandwide population. Essentially, this policy directs very low population growth to the area. To substantially deviate from this policy would require an amendment to the General Plan. Furthermore, the golf course plans (Malaekahana and Punamano) do not include a residential component.

Archaeological

The archaeologist, Joe Kennedy, conducted an archaeological inventory of the site, with an additional follow-up field investigation (April 1990) that identified 23 surface sites with 58 separate features. Each site/feature was given a significance evaluation, description and recommendation. Based on the archaeologist's findings and recommendations, the applicant will, in consultation with the Historic Section of the State of Hawaii, undertake further archaeological work (surveying, testing, probing, data recovery, etc.) relating to appropriate preservation and management plans for the site. Based on this additional work, a formal preservation plan will be prepared for the site that will include onsite interpretations and/or "as is" preservation and curation of artifacts onsite, which will be submitted for review and approval by the DLNR prior to any development on the site. The final golf course design layout will be based on the approved preservation plan.

Sewage Treatment

Both the Punamano and Malaekahana sites will have secondary treatment of the wastewater generated at each site, with possibly 20,000 gallons per day at Malaekahana and 45,000 gallons at Punamano. The biological treatment will be followed by chlorination and sand infiltration. The effluent will be blended with irrigation water and used on the fairway turf grass. The nitrates contained in the effluent will be used as fertilizer. The treatment process will be in compliance with Chapter 62 of the State Department of Health. The use of chlorinated and filtered effluent as a golf course irrigation source is an approved use by both the EPA and the State Department of Health. To be used, the effluent must always be below a maximum level of 30 mg/1 of biochemical oxygen demand (BOD) and 30 mg/1 of suspended solids (SS). A properly operated plant will produce an effluent of less than 20 mg/1 of BOD and 20 mg/1 of SS.

-Page 6-
Koolauloa Neighborhood Board
The Country Courses at Kahuku (Punamano)

Water and Aquifer Impact

We agree that the aquifer is important and significant, and must be protected. We also believe that controls do exist, including the implementation of sound management practices as recommended by Green and Murdoch, to safeguard the aquifer. In addition to the mitigative measures recommended by Murdoch and Green, we will meet the 8 conditions outlined in the State Department of Health's letter (attached) that includes ground-water monitoring. Further, we will develop, in consultation with the City and State, a rigorous monitoring program designed to minimize the potential adverse effects of leaching and runoff and to assure proper turf management. This program will include making available to appropriate enforcing agencies those records related to fertilizer and biocide applications and the results of the monitoring program. In addition to protecting the aquifer, these measures are expected to be cost effective and in the best interest of the developer/operator.

We appreciate your comments. For your information, your letter together with this response will be included in the Final EIS.

Sincerely,



WILLIAM E. WANKET

cc: Benjamin B. Lee, Chief Planning Officer

Encl: (1)

April 7, 1989

EIGHT (8) CONDITIONS APPLICABLE TO THIS NEW GOLF COURSE DEVELOPMENT

Conditions:

1. The owner/developer and all subsequent owners shall establish a groundwater monitoring plan and system which shall be presented to the State Department of Health for its approval. The groundwater monitoring plan and system shall minimally describe the following components:
 - a. A system of monitoring wells constructed throughout the site. These monitoring wells shall extend approximately ten (10) feet below the water table.
 - b. A routine groundwater monitoring schedule of at least once every six (6) months and more frequently, as required by the State Department of Health, in the event that the monitoring data indicates a need for more frequent monitoring.
 - c. A list of compounds which shall be tested for as agreed to by the State Department of Health. This list may include, but not be limited to the following: total dissolved solids; chlorides; PH; nitrogen; phosphorus; or any other compounds associated with fertilizers, biocides or effluent irrigation.
2. A baseline groundwater data shall be established as described in this paragraph. Once the test well sites and list of compounds to be monitored for have been determined and approved by the State Department of Health, the owner/developer shall contract with an independent third-party professional (approved by the State Department of Health) to have the groundwater sampled and its data reported to the State Department of Health. Testing of the groundwater shall be done by a certified laboratory.
3. If the data from the monitoring wells indicate the presence of the measured compound and/or the increased level of such compound, the State Department of Health can require the owner/developer or subsequent owner to take immediate mitigating action to stop the cause of the contamination. Subsequently, the developer/owner or subsequent owner shall mitigate any adverse effects caused by the contamination.
4. Owner/developer shall provide sewage disposal by means of connection to the public sewer system; or by means of a wastewater treatment works providing treatment to a secondary level with chlorination. Effluent from this wastewater treatment works may be used for golf course irrigation, subject to Condition #3. The entire system shall be approved by the State Department of Health in conformance with Administrative Rules Title 11, Chapter 62, Wastewater Treatment Systems, effective December 10, 1988.

5. If a wastewater treatment works with effluent reuse becomes the choice of wastewater disposal, then the owner/developer and all subsequent owners shall develop and adhere to a Wastewater Reuse Plan which shall address as a minimum, the following items:

a. Management Responsibility. The managers of the irrigation system using reclaiming wastewater shall be aware of the possible hazards and shall evaluate their system for public health, safety, and efficiency. They must recognize that contact with the reclaimed wastewater from treated domestic sewage poses potential exposure to pathogenic organisms which commonly cause infectious diseases (bacteria, viruses, protozoa, and helminths or worms).

b. General Recommendations

- 1) Irrigated areas should be no closer than 500 feet from potable water wells and reservoirs.
- 2) Irrigated areas should be no closer than 100 feet from any private residence.
- 3) Application rates should be controlled to minimize ponding. Excess irrigation tailwater in the reclaimed wastewater irrigation area shall be contained and properly disposed. An assessment should be made of the acceptable time and rate of application based on factors such as type of vegetation, soil, topography, climate and seasonal variations.
- 4) Effluent holding/mixing ponds shall be designed to prevent the infiltration of the wastewater into the subsurface. The holding/mixing ponds shall be made impervious.
- 5) Irrigation shall be scheduled such that the public is not in the vicinity and the soil is sufficiently dry to accept the irrigation water.
- 6) Permanent fencing or barriers shall be erected around polishing or holding ponds to prevent public entry or stray feral and tame animals from gaining access to the ponds.
- 7) Adequate irrigation records shall be maintained. Records should include dates when the fields are irrigated, rate of application, total application and climatic conditions. Records should also include any operational problems, diversions to emergency storage or safe disposal and corrective or preventive action taken.
- 8) The holding/mixing ponds shall be periodically monitored for the purpose of detecting leakage into the subsurface. If leakage is detected, corrective action shall be immediately taken.

c. Adequate Notice. Appropriate means of notification shall be provided to inform the employees and public that reclaimed wastewater is being used for irrigation on the site.

- 1) Posting of conspicuous signs with sufficient letter size for clear visibility with proper wording should be distributed around the use areas.
 - 2) Signs shall be securely fastened. Periodic surveillance shall be conducted to assure permanent posting at all times. Immediate replacements shall be made when necessitated by deterioration, vandalism or misuse.
- d. Adequate Employee Education. Employees or users should be cautioned and warned of the potential health hazards associated with the ingestion of reclaimed wastewater being used at the site.
- 1) Employees should be warned that the ingestion of reclaimed wastewater is unsafe.
 - 2) Employees should be protected from direct contact of the reclaimed wastewater. If necessary, protective clothing should be provided.
 - 3) Employees should be informed of the following:
 - o The irrigation water is unsafe for drinking or washing.
 - o Avoid contact of the water or soil with any open cuts or wounds.
 - o Avoid touching the mouth, nose, ear or eyes with soiled hands, clothes or any other contaminated objects.
 - o Be aware that inanimate objects such as clothes or tools can transport pathogenic organisms.
 - o Always wear shoes or boots to protect feet from the pathogenic organisms in the soil or irrigation water.
6. Use of electrical golf carts is recommended. It is recognized that underground storage tank(s) to store gasoline for gas driven golf carts will impose potential risks to the groundwater. If gasoline-driven golf carts are to be utilized, the developer/owner must meet all federal requirements in the installation of any underground storage tank.
7. Buildings designated to house the fertilizer and biocides shall be bermed to a height sufficient to contain a catastrophic leak of all fluid containers. It is also recommended that the floor of this room be made waterproof so that all leaks can be contained within the structure for cleanup.
8. A golf course maintenance plan and program will be established based on "Best Management Practices (BMP)" in regards to utilization of fertilizers and biocides as well as the irrigation schedule. BMP's will be revised as an ongoing measure. The golf course maintenance plan will be reviewed by the State Department of Health prior to implementation.

If there are any questions regarding the eight (8) conditions mentioned here, please contact Mr. James K. Ikeda at 548-6455. We ask your cooperation in the protection of Hawaii's valuable groundwater resource.

Kahuku Farmers Association
P.O. Box 206
Kahuku, Hawaii 96731

January 30, 1990

William E. Wanket, Inc.
Pacific Tower 660
1001 Bishop Street
Honolulu, Hawaii 96813

Dear Mr. Wanket:

Re: EISPN Country Courses at Kahuku

Members of the Kahuku Farmers Association currently farms on 250 acres of land in Kahuku and has done so for the past 20 years. We are very familiar with the many obstacles a farmer need to overcome in order to farm successfully.


We, as a group, occupy the best possible agricultural land in Kahuku with level terrain and an abundant water source nearby. Even with these advantages the farmers are hard pressed and constantly struggling to make their ends meet.

The Punamano area was once planted in sugarcane but was not considered productive lands. Following the close of the plantation an effort was made to grow cattle feed but this too failed after several years. This particular land has laid fallow for the past 12-15 years.

The Malaekahana land poses severe problems for farmers requiring excessive pumping to bring irrigation water to the mauka section. As farmers neither of the proposed golf course sites would be our choice for farming.

Presently, both parcels are overgrown with weeds and is an eye-sore. We would not object to golf courses as it would preserve the open space nature of the rural areas and present an esthetically pleasing landscape. The Kahuku Farmers, however, does not support the construction of homes on the proposed sites.

Thank for the opportunity to comment.

Very truly yours,

Norwood Conner, President
Kahuku Farmers Association

WILLIAM
E.
WANKET
INC.

Land Use Consultant

February 2, 1990

Mr. Norwood Conner
President
Kahuku Farmers Association
P.O. Box 206
Kahuku, Hawaii 96731

**RE: Environmental Impact Statement Preparation Notice for the
Proposed Country Courses at Kahuku - Response to Comments
Received**

Dear Mr. Conner:

Thank you very much for your letter of January 30, 1990 expressing the Association's support for the Country Courses at Kahuku. Our studies agree with your statements on the agricultural suitability of these lands and the open space benefits of the proposed project.

We regret that your letter will not appear in our Draft EIS, as the project is in the final stages of printing. However, the letter, together with this response, will be published in the Final EIS.

We appreciate your comments and thank you again for taking the time to review the project.

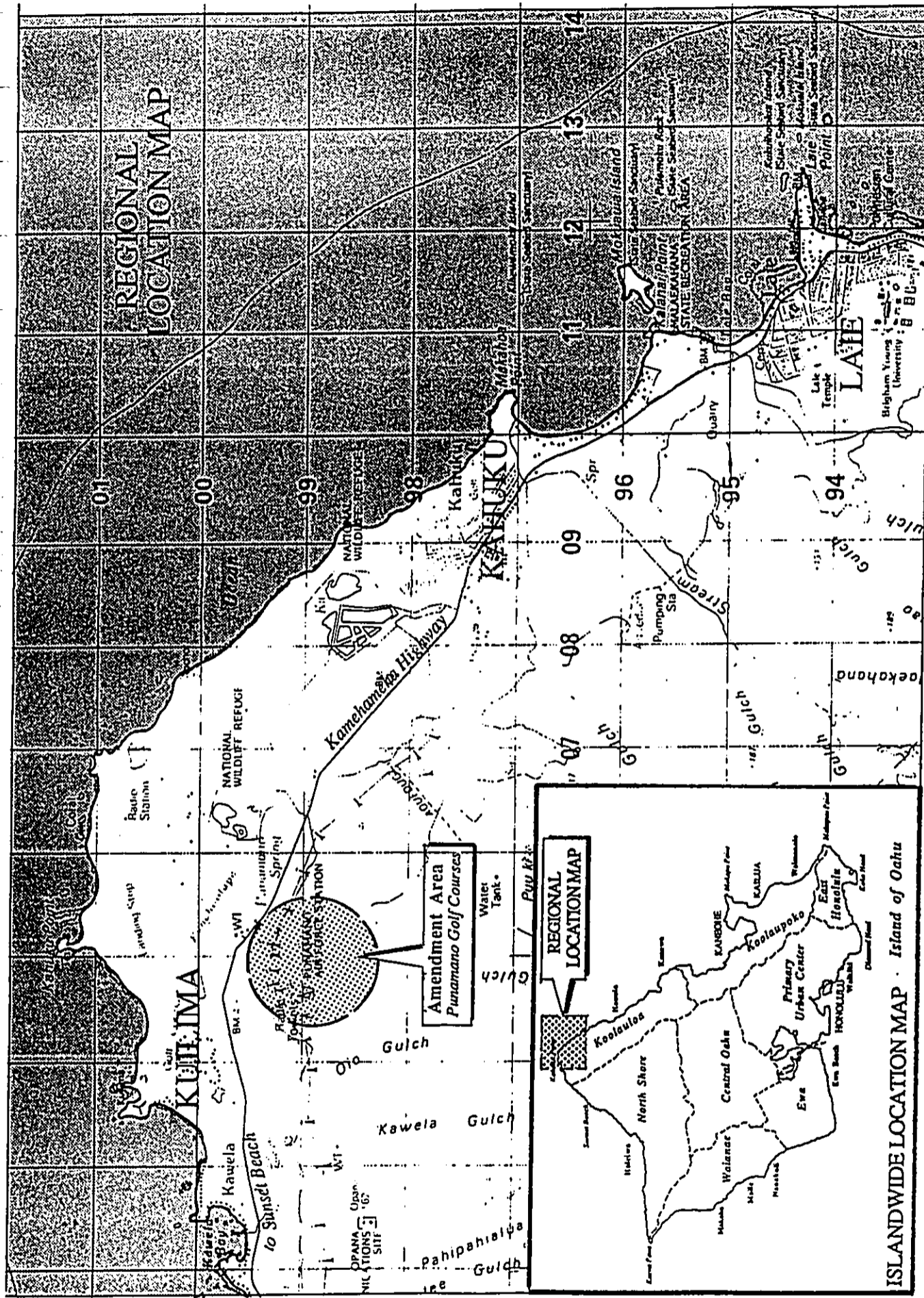
Sincerely,


WILLIAM E. WANKET

cc: Benjamin B. Lee, Chief Planning Officer

Pacific Tower
Suite 660
1001 Bishop Street
Honolulu, HI 96813
Phone
(808) 533-4937
FAX 521-5410

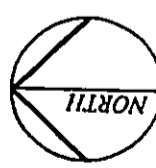
FIGURES

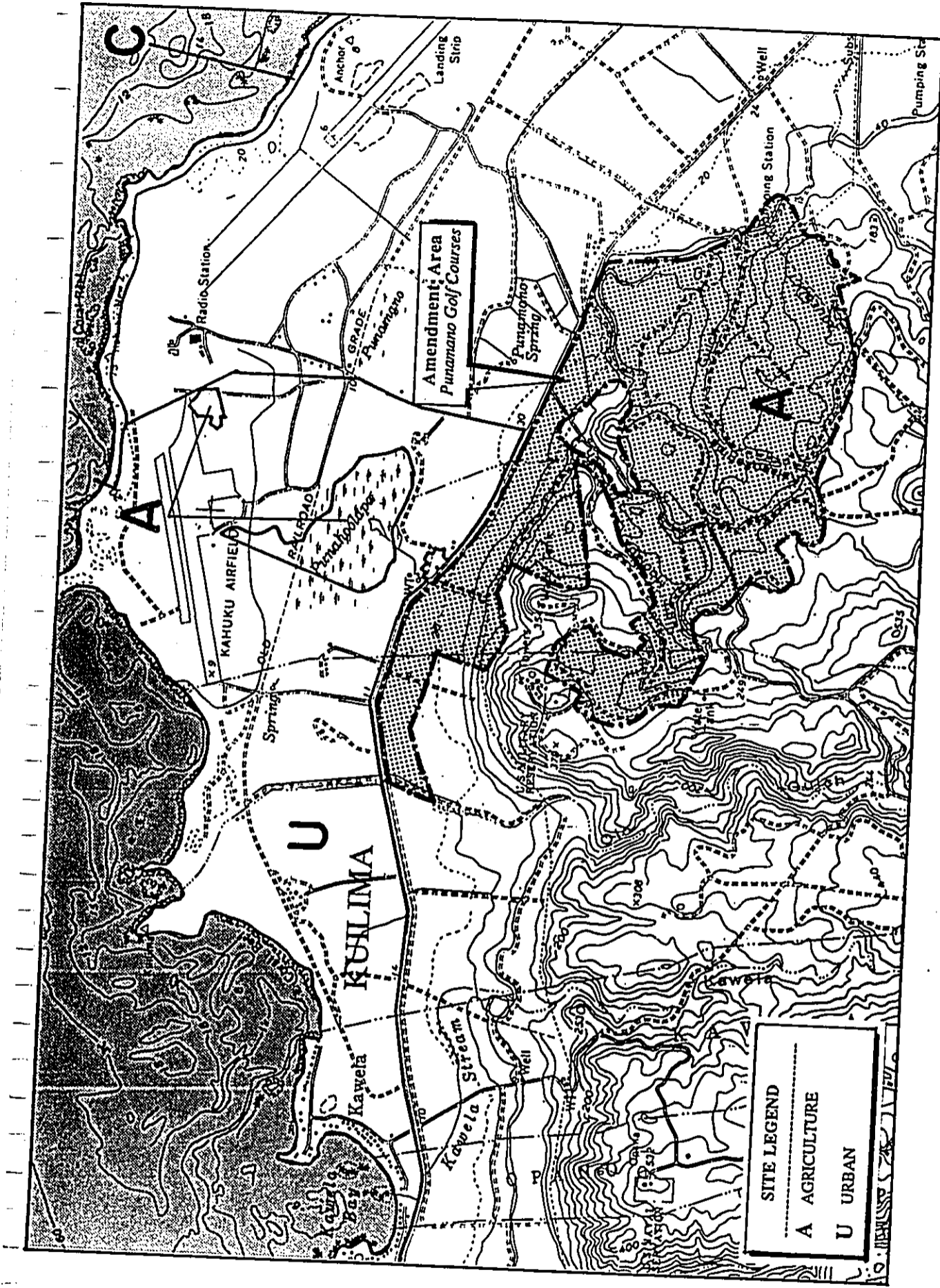


prepared for: *The Estate of James Campbell*
 prepared by: *Michael S. Chu, Land Architect*

The Country Courses at Kahuku
ISLANDWIDE & REGIONAL
LOCATION MAPS

FIGURE 1

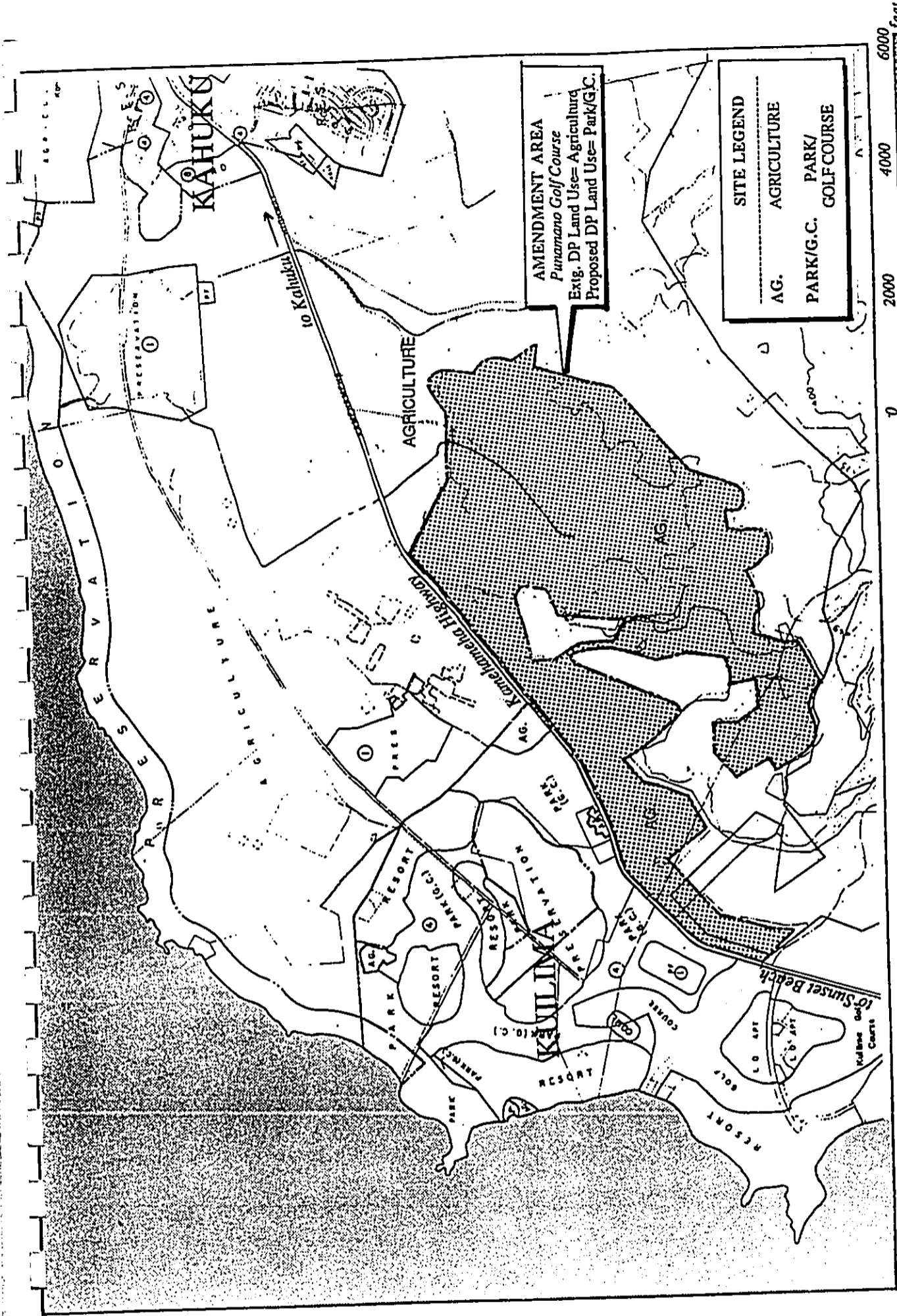




The Country Courses at Kahuku
STATE LAND USE

prepared for: *The Estate of James Campbell*
 prepared by: *Michael S. Chu, Land Architect*

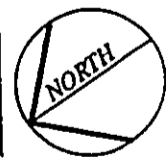
FIGURE 2

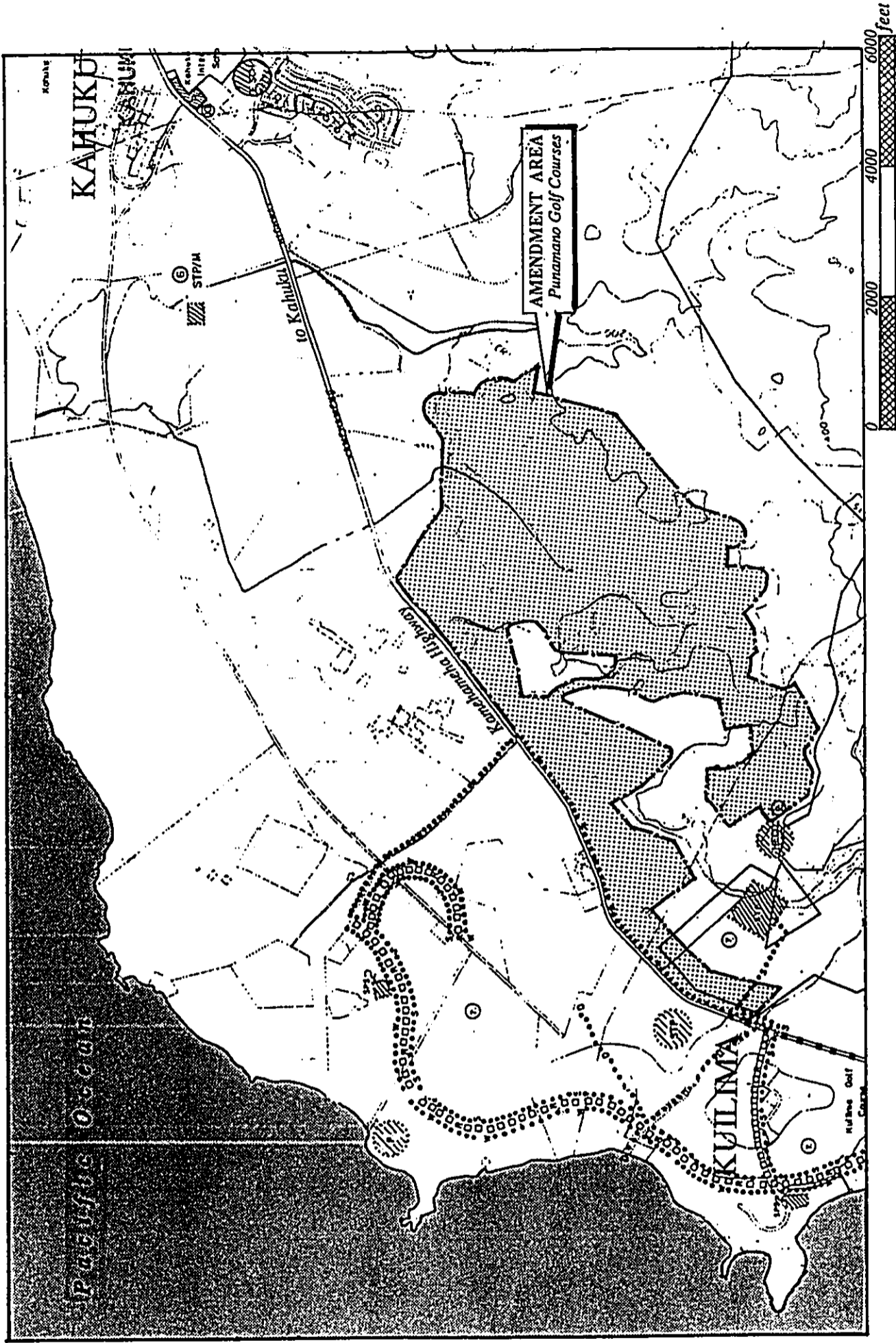


prepared for: *The Estate of James Campbell*
 prepared by: *Michael S. Chiu, Land Architect*

FIGURE 3

The Country Courses at Kahuku
EXISTING DEVELOPMENT PLAN MAP
 (KOOLAULOA LAND USE MAP)



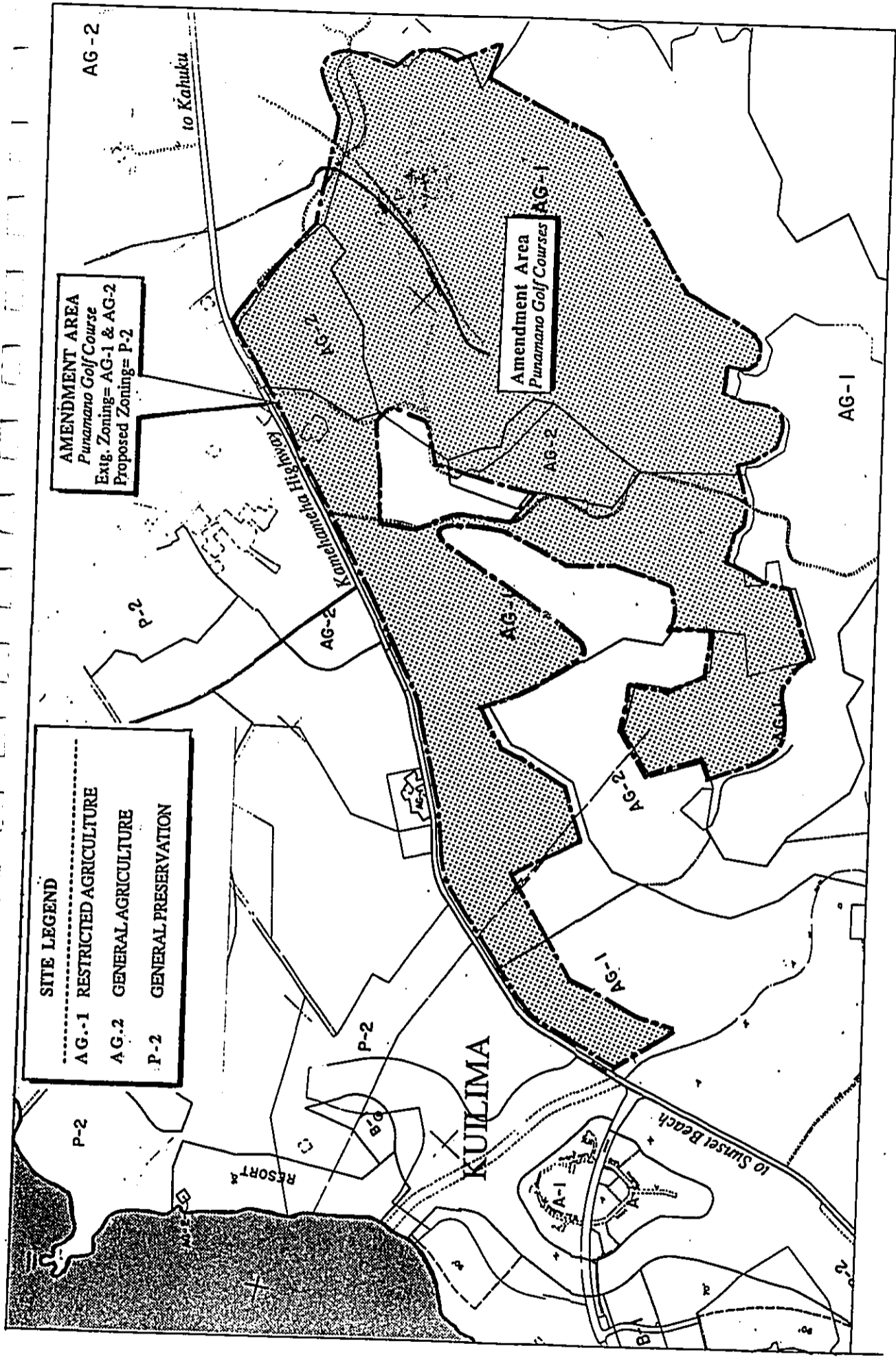


The Country Courses at Kahuku
EXISTING PUBLIC FACILITIES MAP
 (KOOLAULOA PUBLIC FACILITIES MAP)

prepared for: *The Estate of James Campbell*
 prepared by: *Michael S. Chu, Land Architect*

FIGURE 4



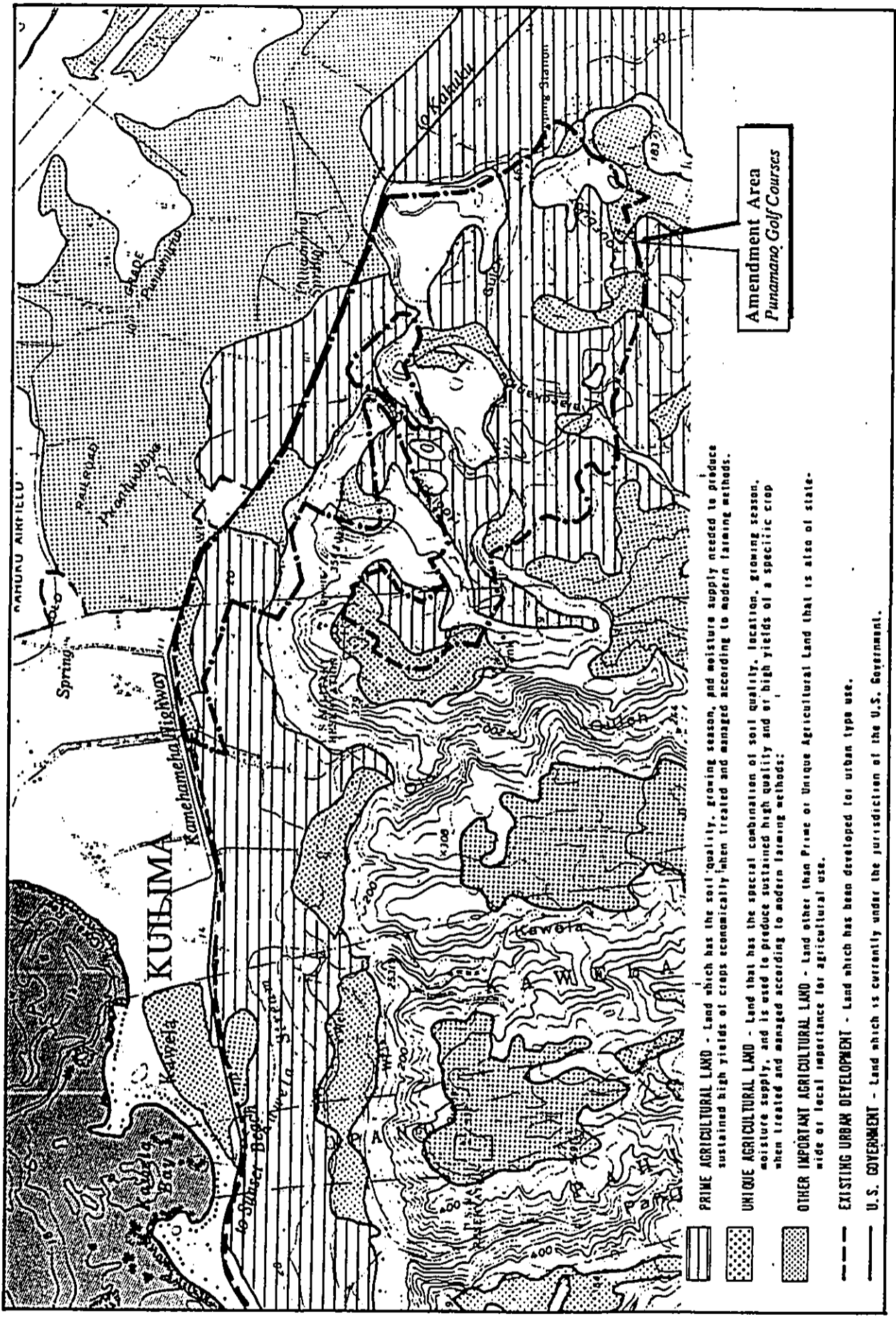


The Country Courses at Kahuku
 EXISTING ZONING

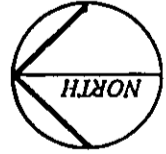
prepared for: The Estate of James Campbell
 prepared by: Michael S. Chui, Land Architect

FIGURE 5



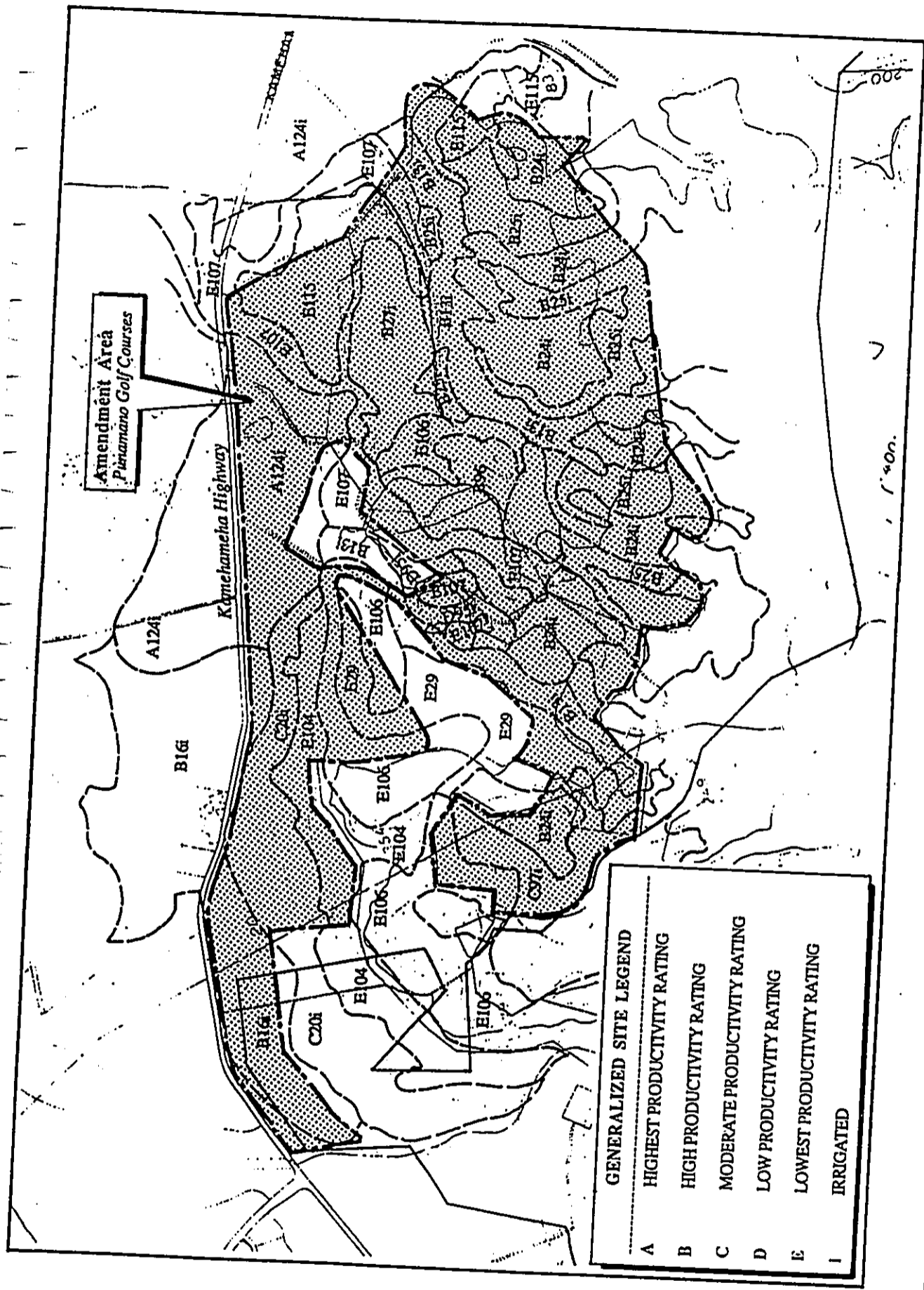


The Country Courses at Kahuku
SOIL CLASSIFICATIONS
 (AGRICULTURAL LANDS OF IMPORTANCE
 TO THE STATE OF HAWAII)



prepared for: *The Estate of James Campbell*
 prepared by: *Michael S. Chu, Land Architect*

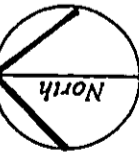
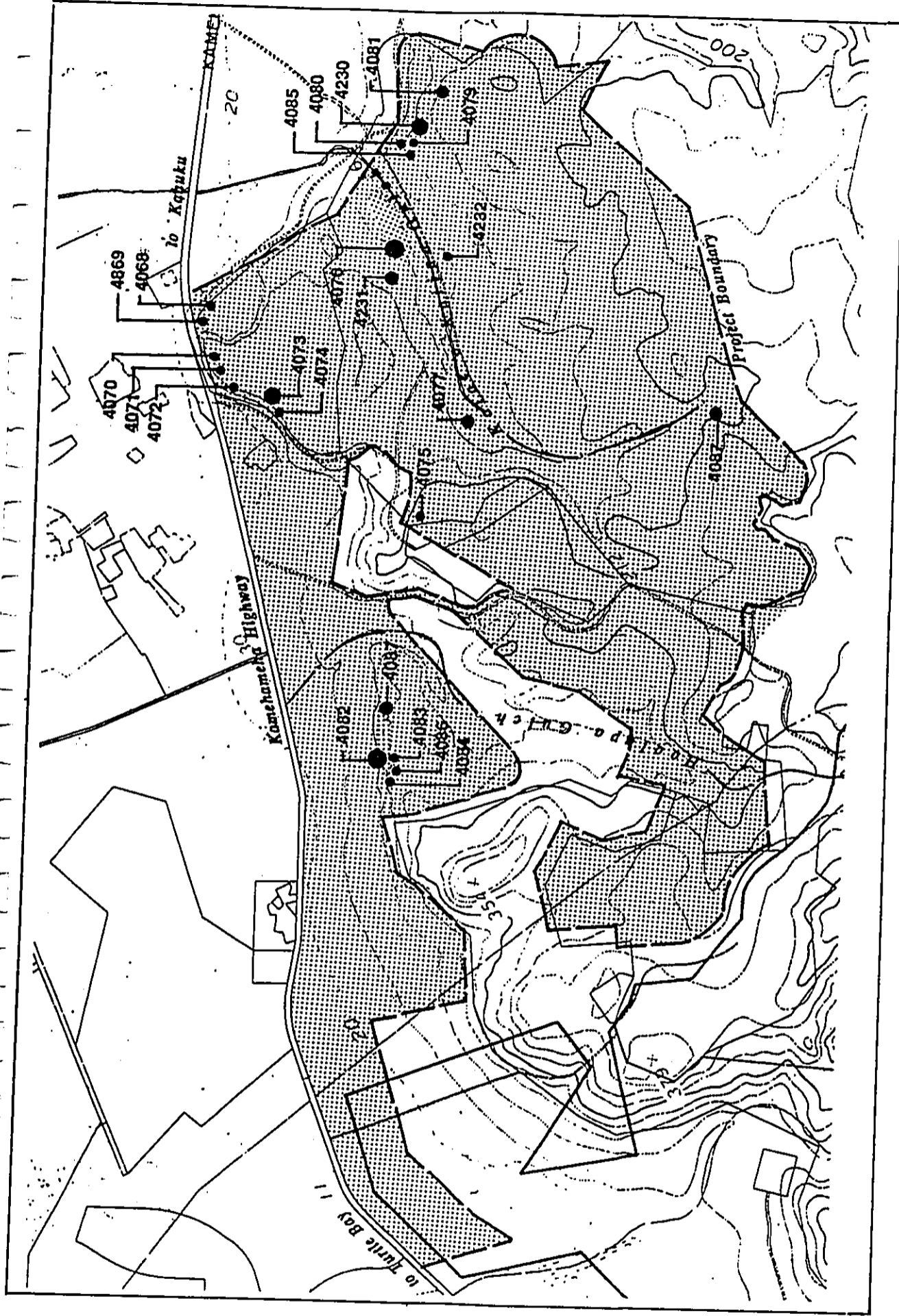
FIGURE 6



The Country Courses at Kahuku
SOIL CLASSIFICATIONS
 LAND STUDY BUREAU

Prepared for: *The Estate of James Campbell*
 Prepared by: *Michael S. Chu, Land Architect*
FIGURE 7



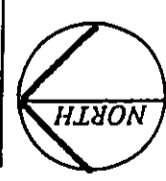
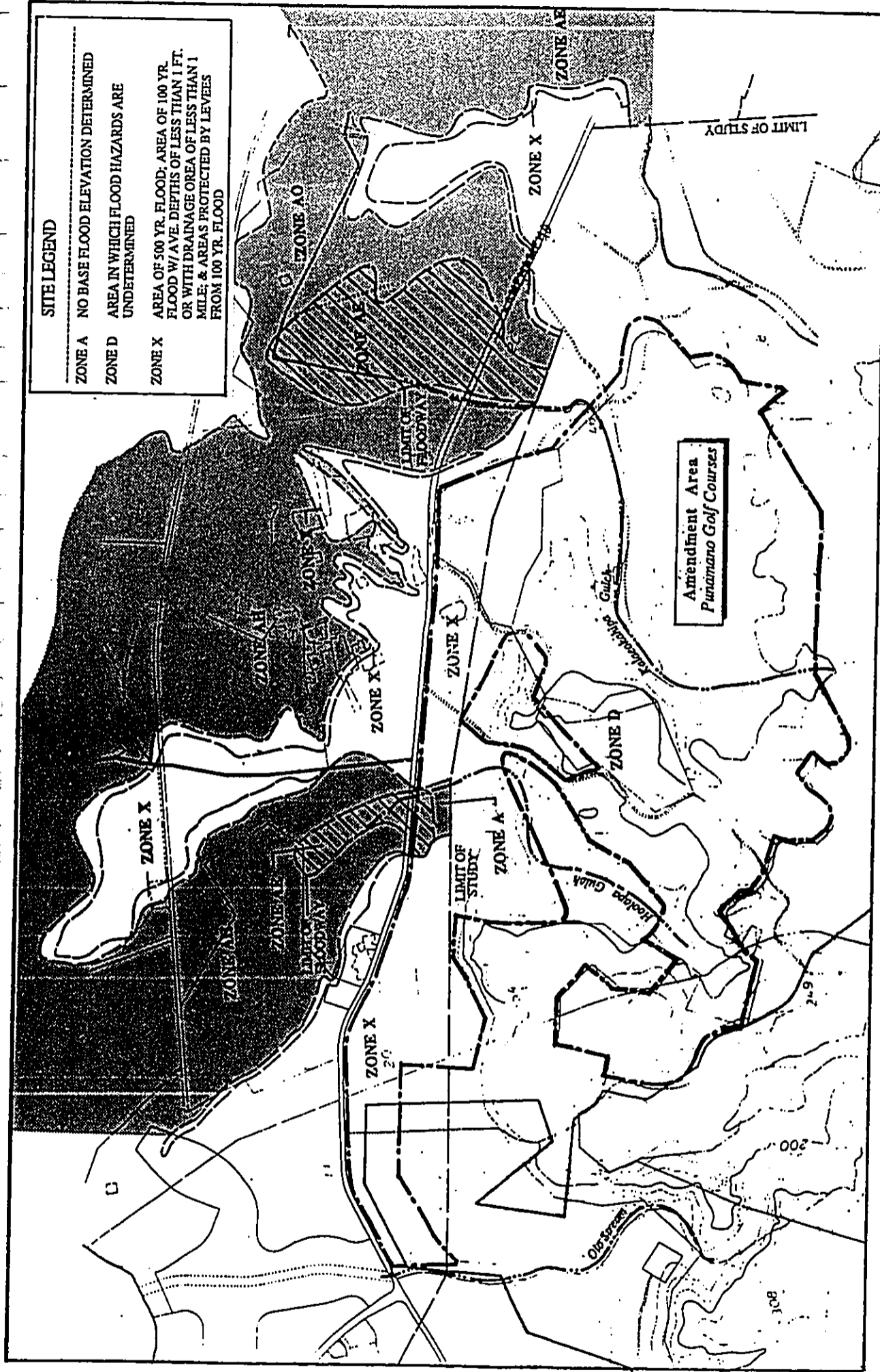


The Country Courses at Kahuku
ARCHAEOLOGICAL INVENTORY
 Reproduced from information prepared by Joseph Kennedy, Archaeologist

prepared for: *The Estate of James Campbell*
 prepared by: *Michael S. Chu, Land Architect*



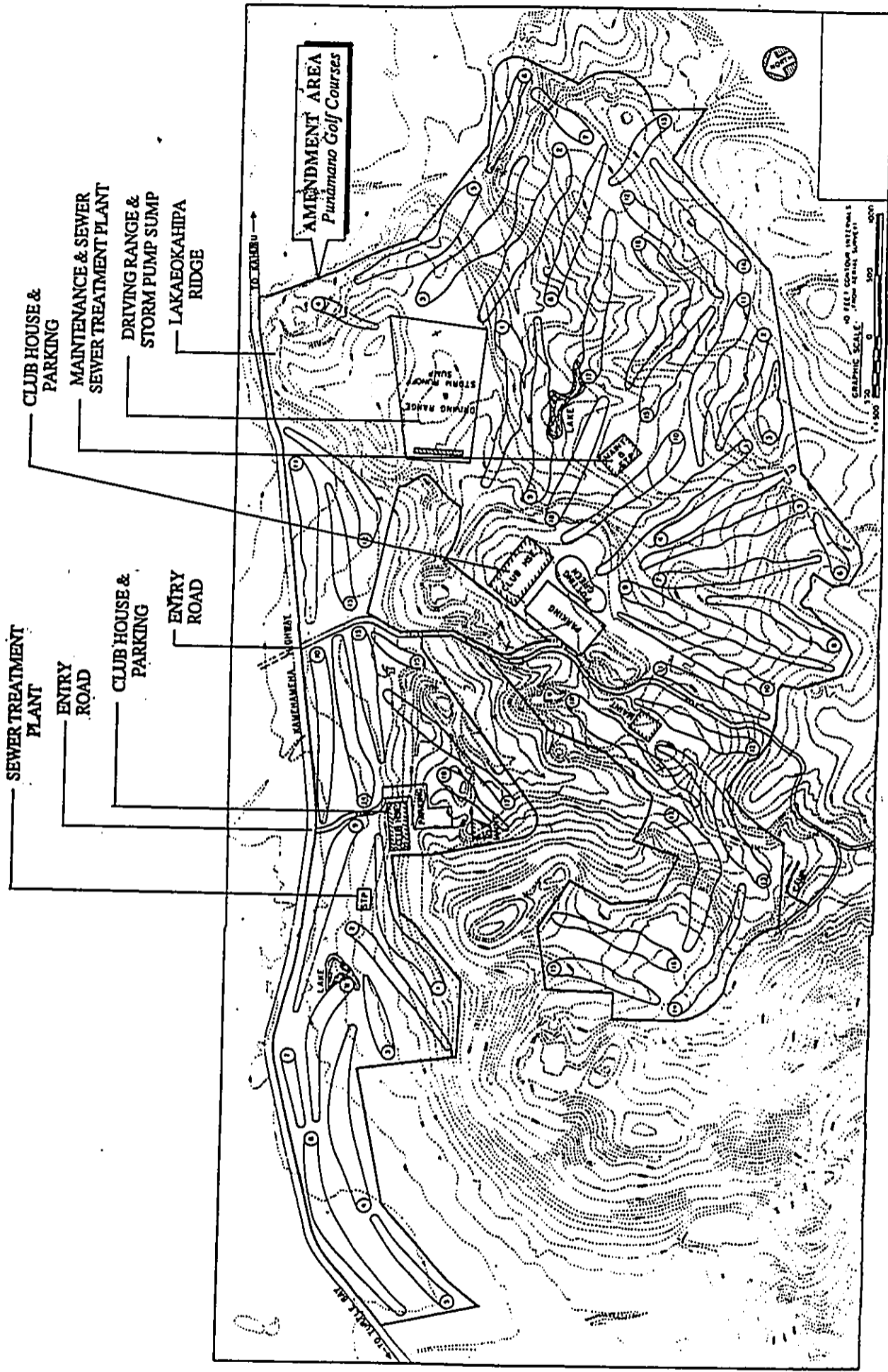
FIGURE 7A



The Country Courses at Kahuku
FLOOD ZONES
 information based on Federal Insurance Rate Maps

prepared for: *The Estate of James Campbell*
 prepared by: *Michael S. Chu, Land Architect*

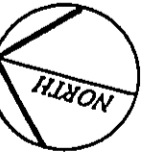
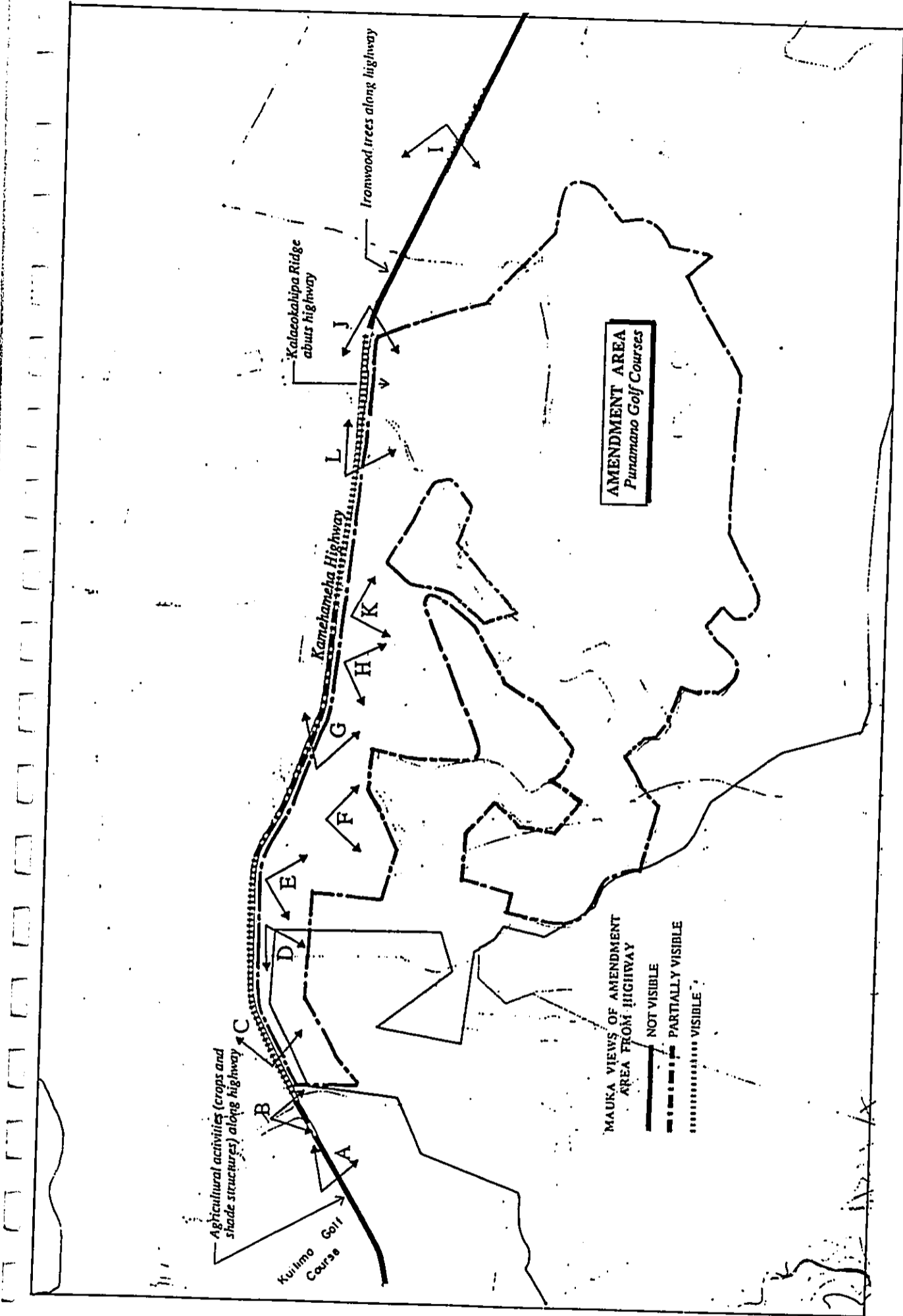
FIGURE 8.



The Country Courses at Kahuku
PRELIMINARY SITE PLAN

prepared for: The Estate of James Campbell
prepared by: Michael S. Chu, Land Architect

FIGURE 9



The Country Courses at Kahuku
PHOTO LOCATION MAP

prepared for: The Estate of James Campbell
prepared by: Michael S. Chu, Land Architect

FIGURE 10



Photo A

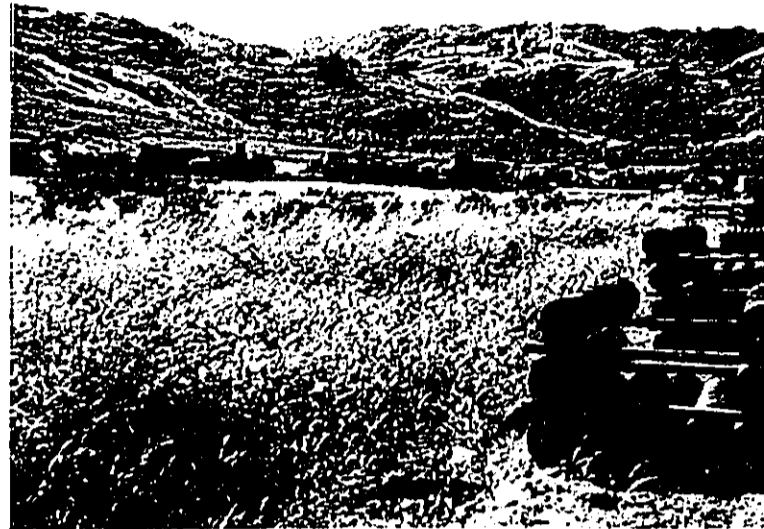


Photo D

Photo A
Roadside view of diversified agriculture operation.
Highway frontage adjacent to the project area.

Photo B
View of sewage treatment plant under construction.

Photo C
Panoramic view of the northwest end of the site.
treatment plant construction area (right).

Photo D
Northwest-facing view along highway at north
screen along most of this highway frontage.

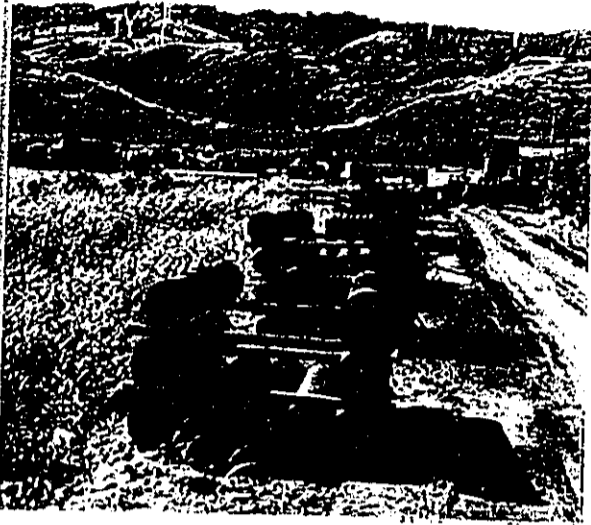


Photo B

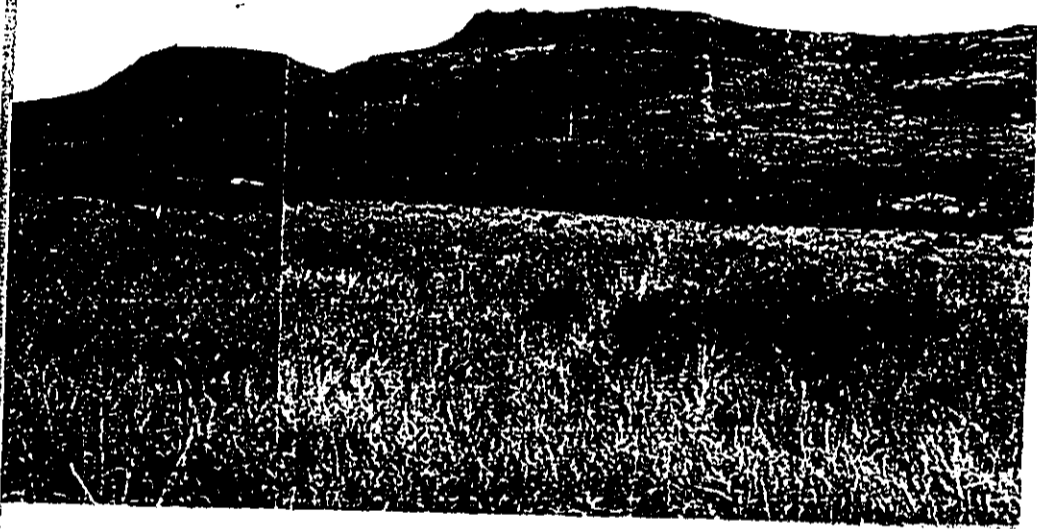


Photo C

diversified agriculture operations currently occupy portions of the Kamehameha adjacent to the project area.

treatment plant under construction next to the northwest end of the site.

of the northwest end of the site, between Kamehameha Highway (left) and sewage construction area (right).

view along highway at northwest end of site. Roadside vegetation forms partial visual of this highway frontage.

PHOTO EXHIBIT
The Country Courses at Kahuku
Punamano Golf Courses
FIGURE 11



Photo E

View across northwest portion of site. Amendment area includes foreground (Kahuku coastal plain) and areas beyond ridge tops of foothills.

Photo F

Telephoto view of prominent foothills. Utility installations occupy high points of foothills and are outside of amendment area.

Photo G

Southeast-facing view along Kamehameha Highway at middle of site frontage. Secondary vegetation forms a dense screen blocking views of the site along this portion of the highway.

Photo H

The hilltops and ridges traversing the site parallel to Kamehameha Highway are continuous except for this gap, which provides limited visual access of the site's upper plateau. Wind turbine in the background is approximately one-half mile beyond Kamehameha Highway.

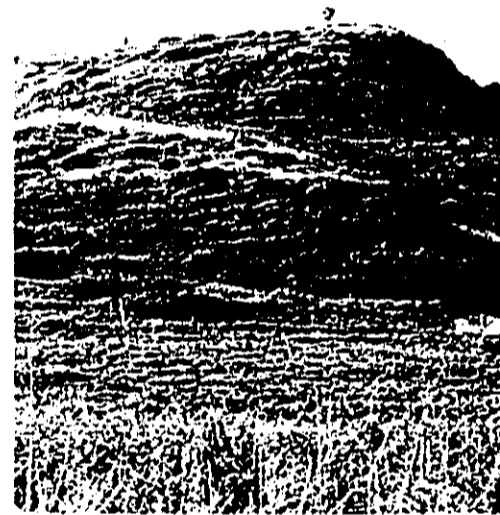
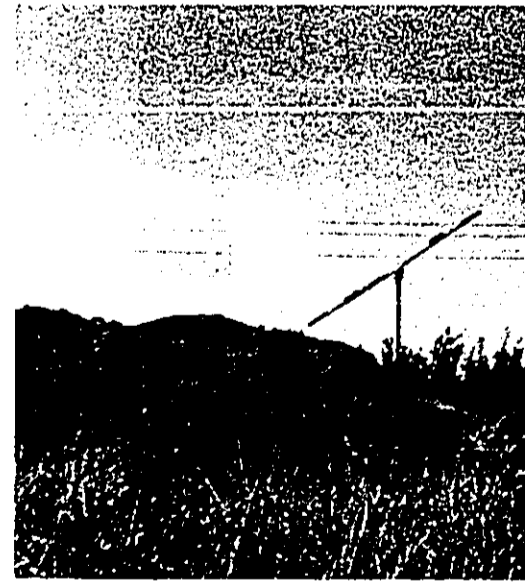
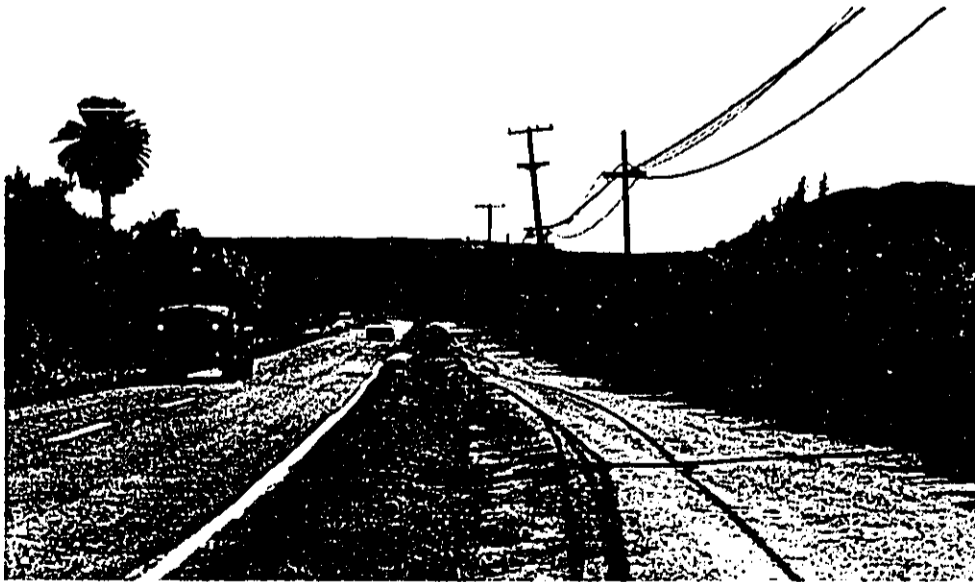


Photo G



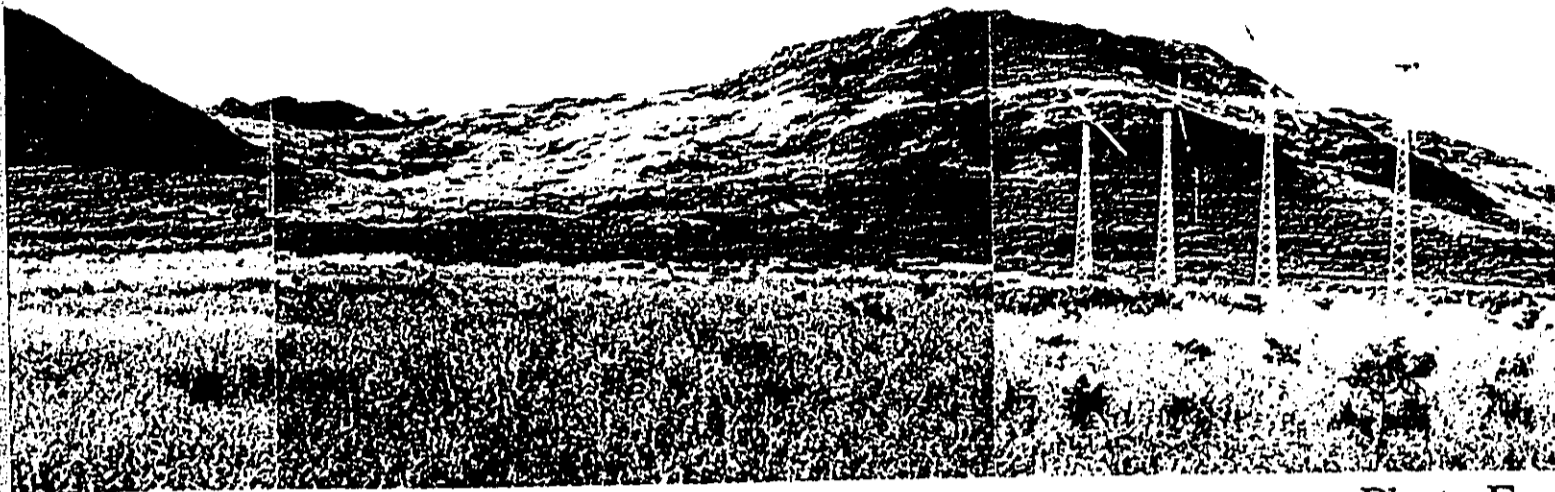


Photo E



Photo F

Photo H

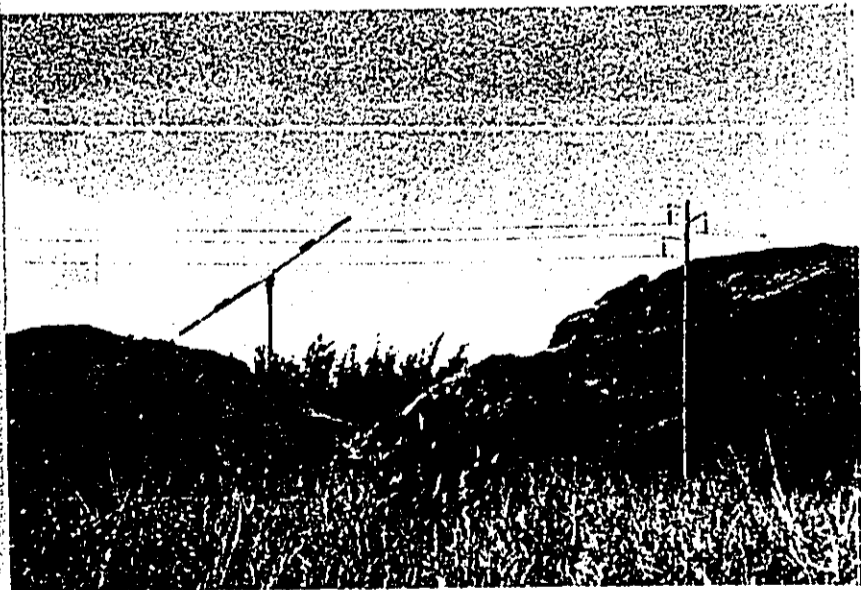


PHOTO EXHIBIT
The Country Courses at Kahuku
Punamano Golf Courses
FIGURE 12



Photo I



Photo J

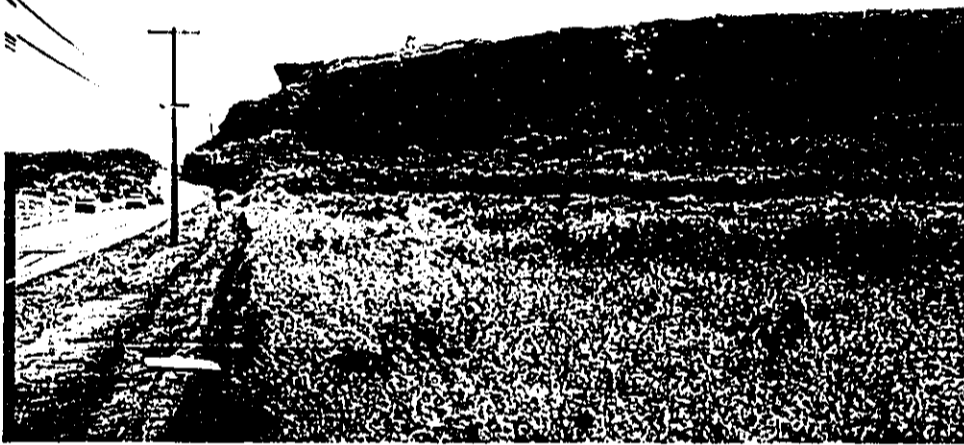


Photo L

- Photo I
East end of amendment area is screened from
- Photo J
Typical roadway views along Kamehameha
- Photo K
Panoramic view of the east end of the site, showing
- Photo L
Close-up view showing unique profile of road

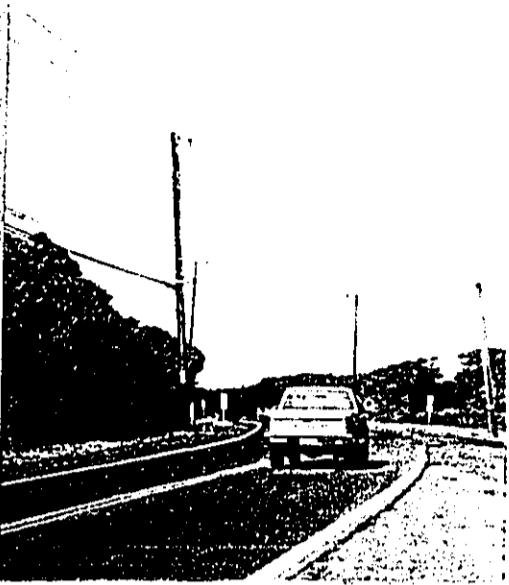


Photo J

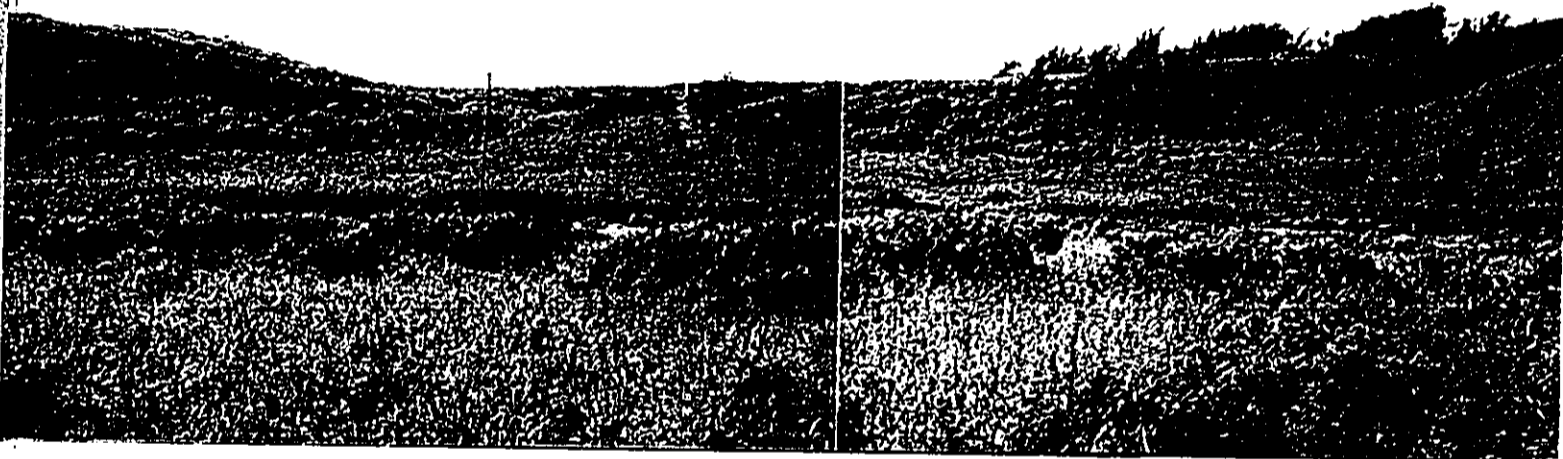


Photo K

ment area is screened from Kamehameha Highway by a dense row of Ironwood trees.

way views along Kamehameha Highway at northeast end of site.

ew of the east end of the site, showing roadside cliff abutting highway.

w showing unique profile of roadside cliff on the east end of the site.

PHOTO EXHIBIT
The Country Courses at Kahuku
Punamano Golf Courses
FIGURE 13

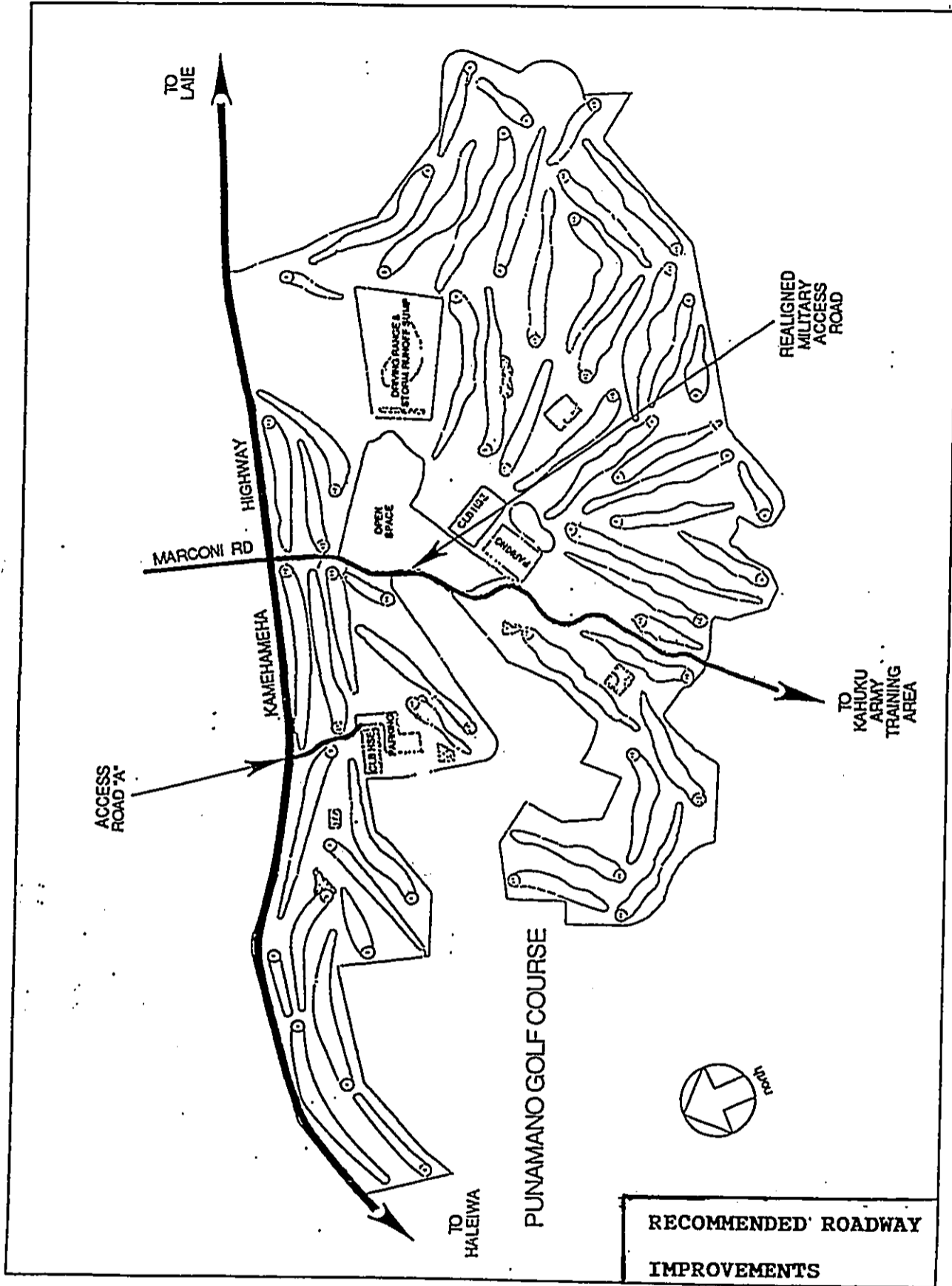


FIGURE 14

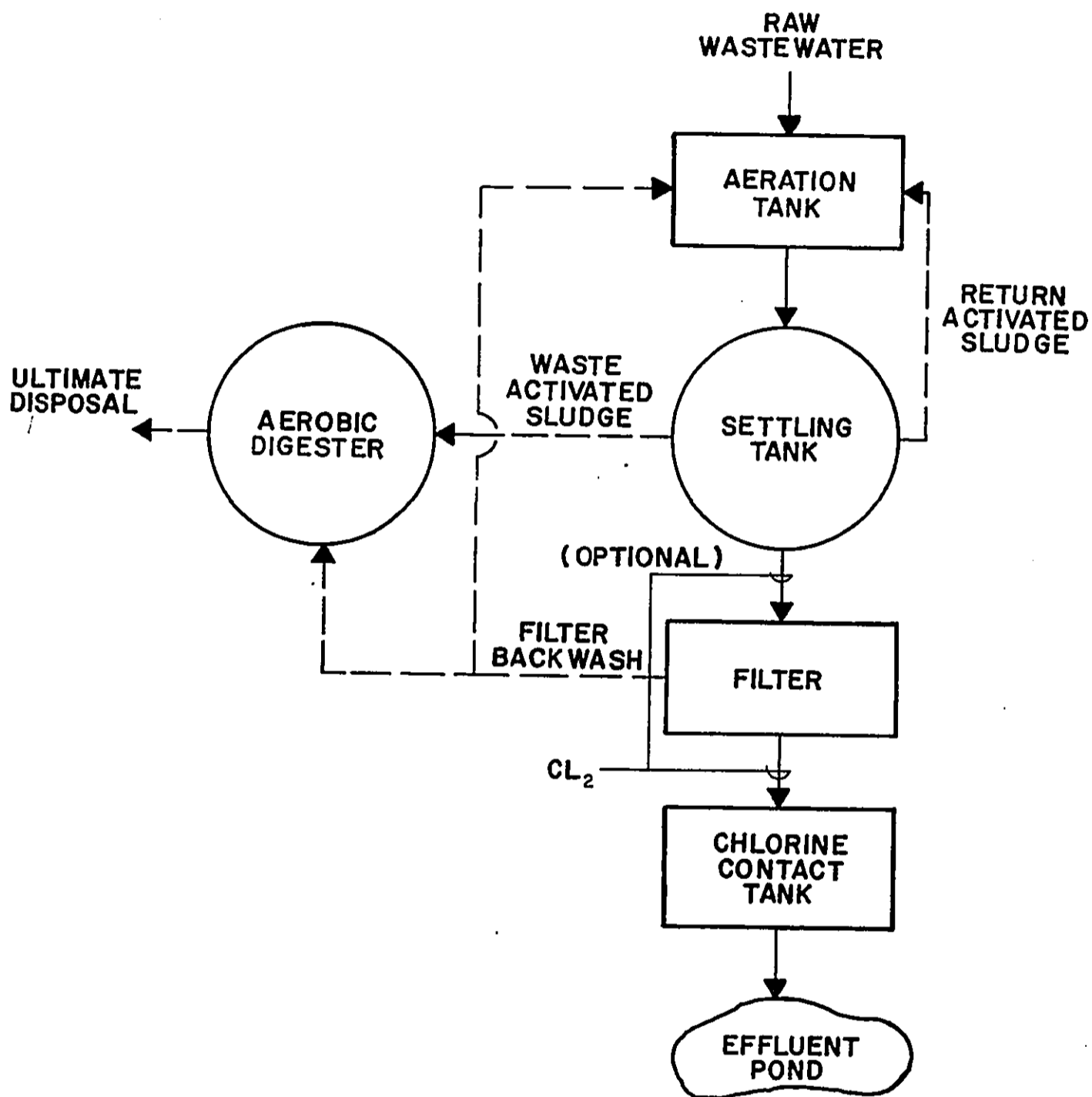


FIGURE 15

THE COUNTRY COURSES AT
KAHUKU SCHEMATIC DIAGRAM
WASTEWATER TREATMENT PLANT

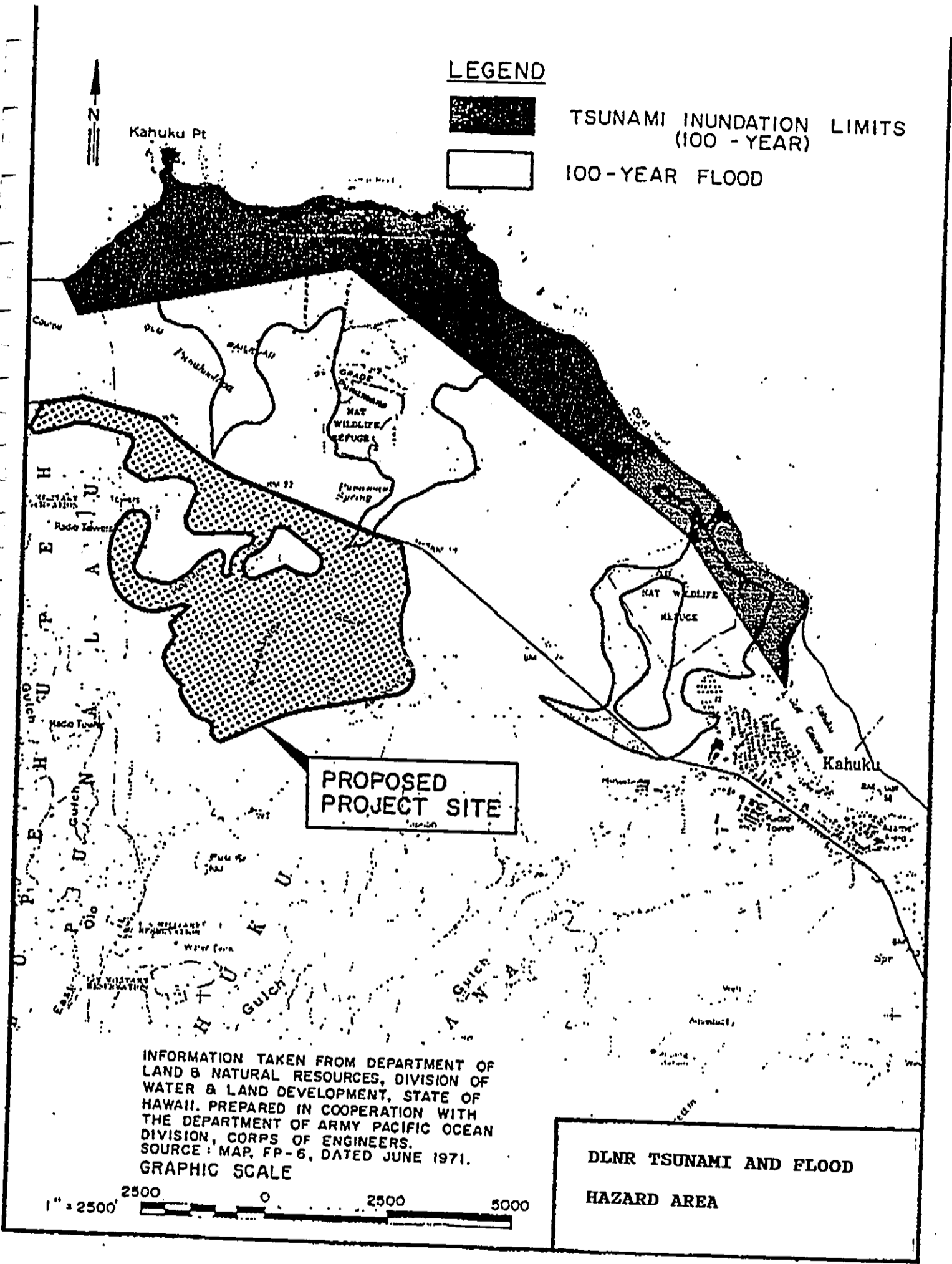


FIGURE 16

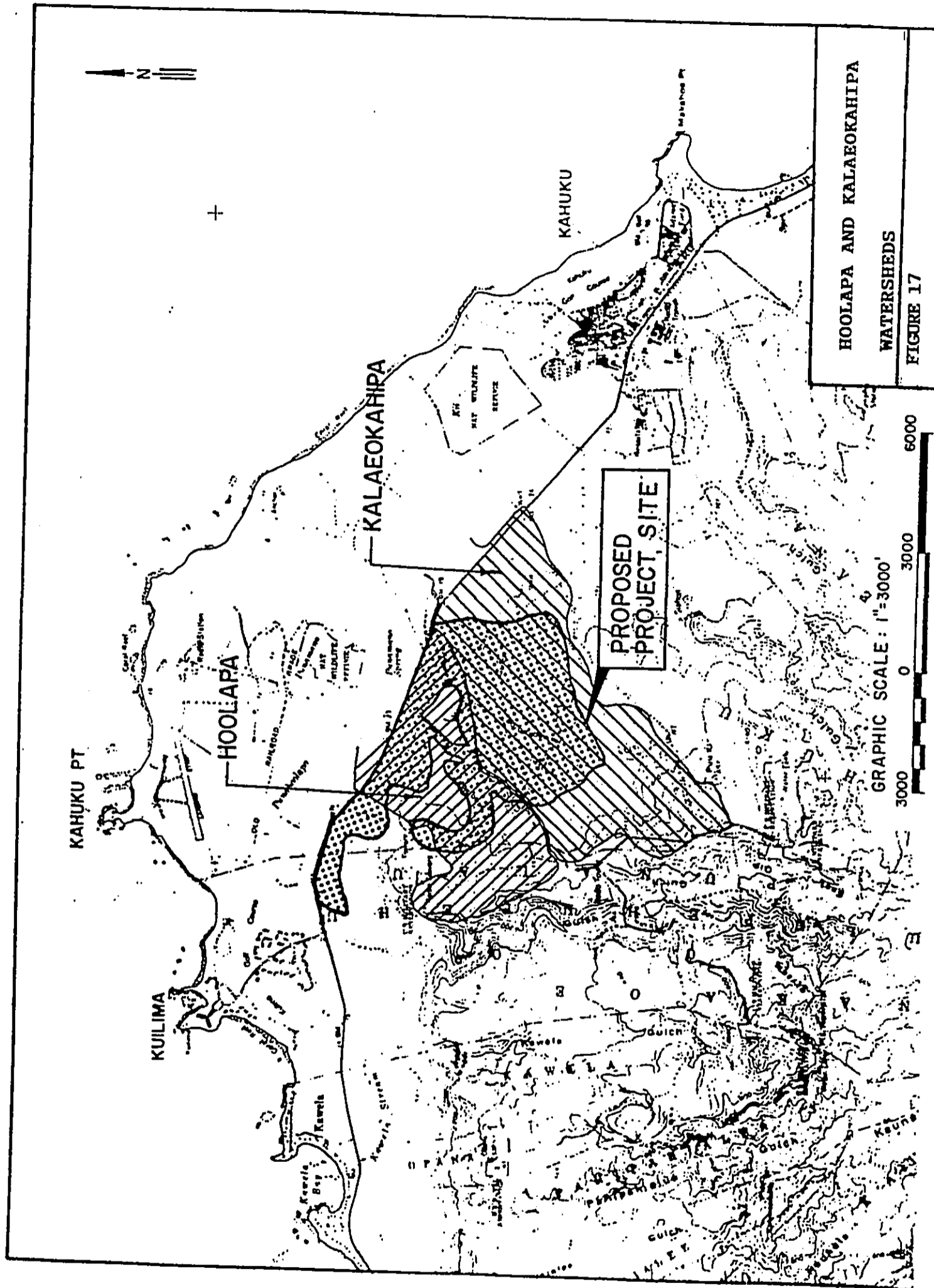
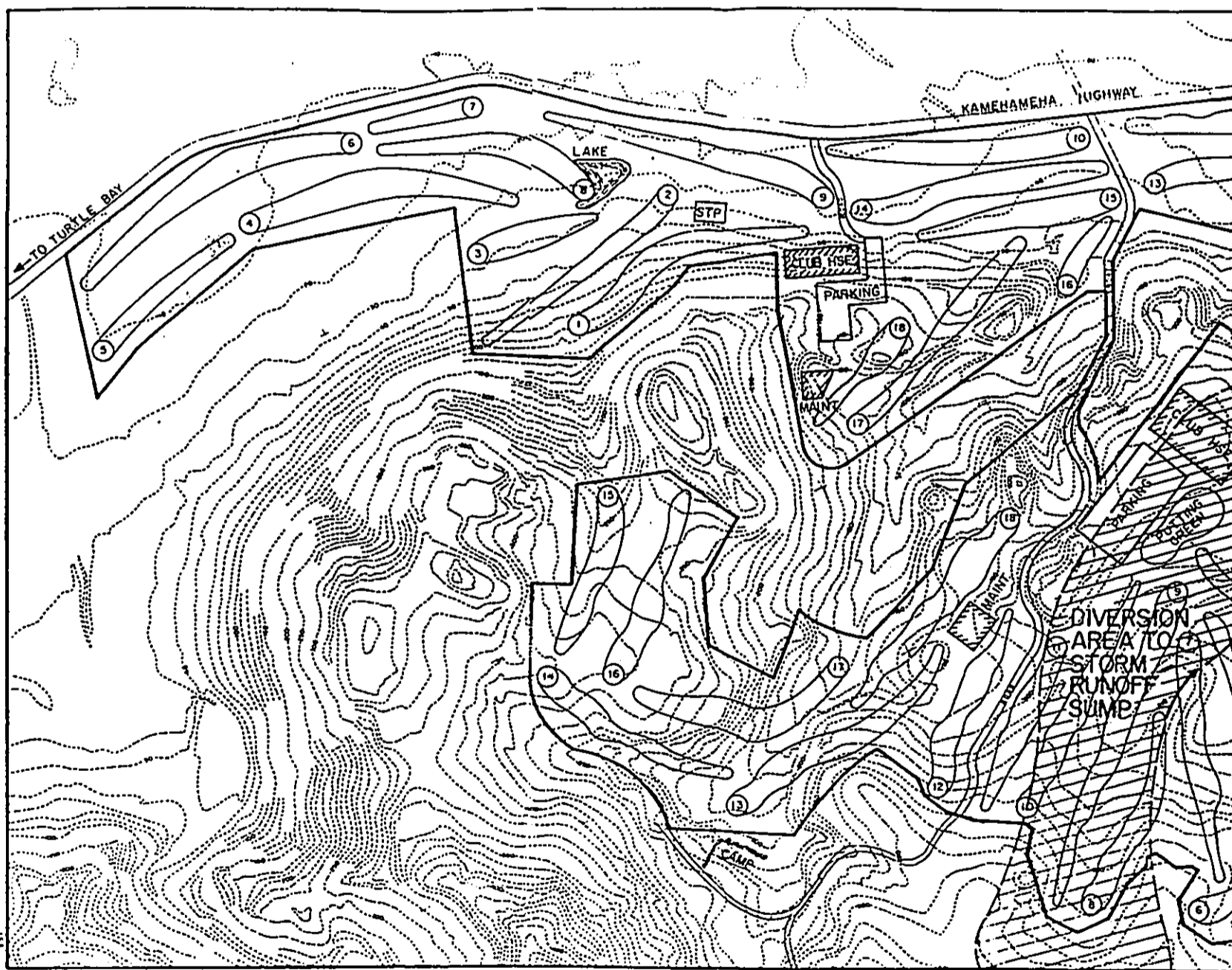


FIG.



SMITH, YOUNG & ASSOCIATES, INC • CONSULTING ENGINEERS

STORM RUNOFF DIVERSION

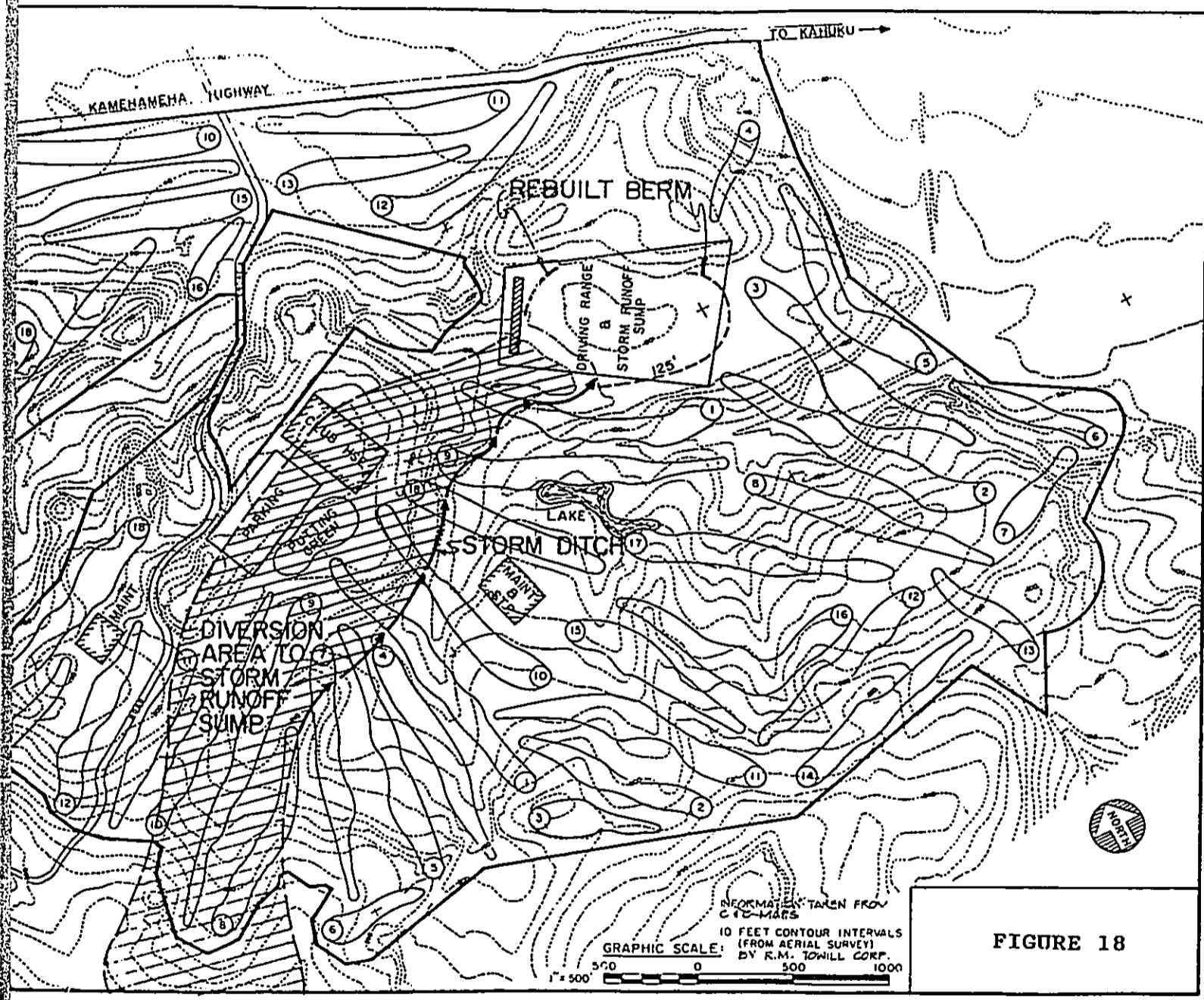
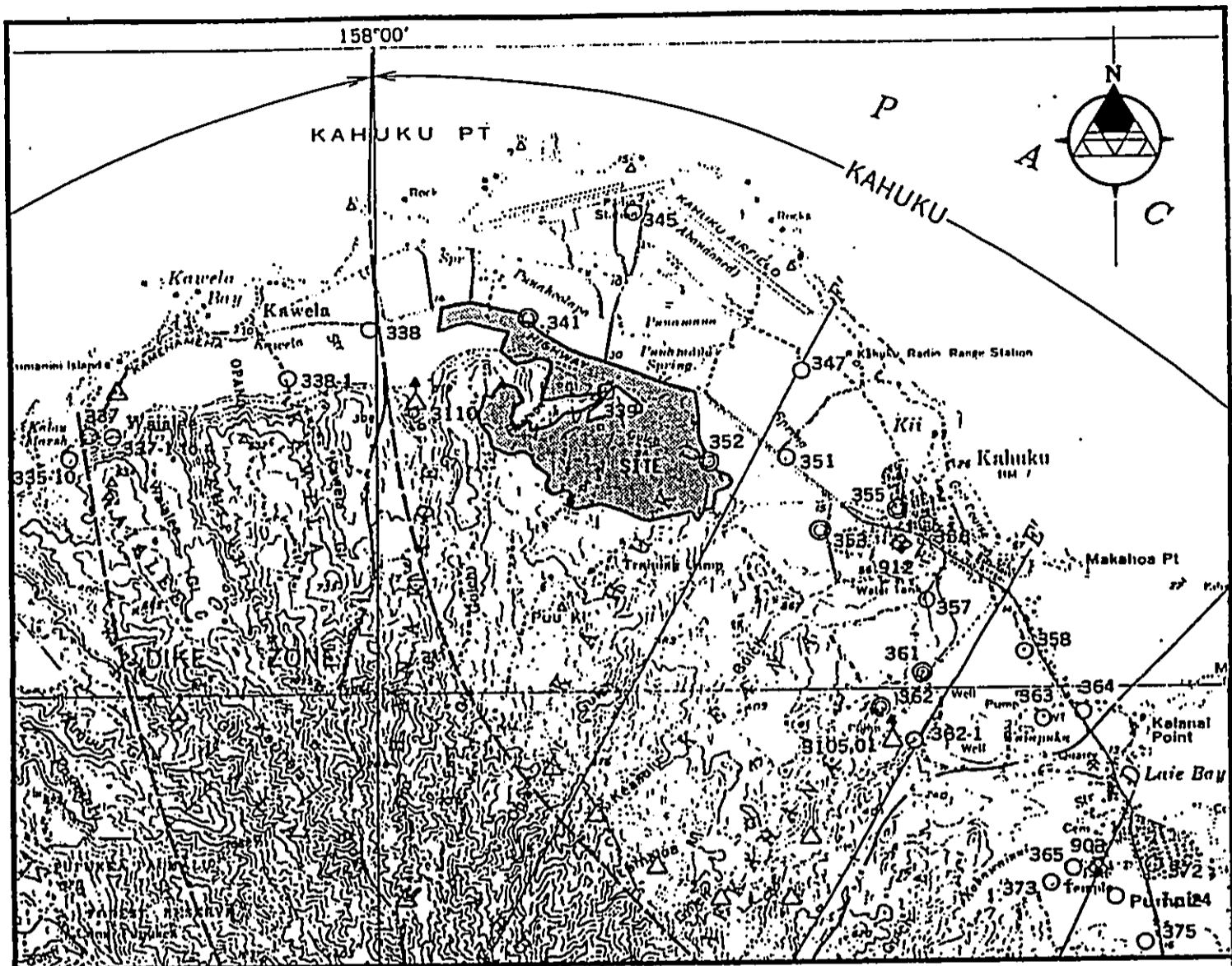


FIGURE 18

RUNOFF DIVERSION



References:
 Department of Land & Natural Resources, State of Hawaii
 U.S. Geological Survey
 "Hydrologic Map of the Kahuku Area, Oahu, Hawaii"
 Water Supply Paper 1874, Plate 1, 1969.

LOCATION OF WATER WELLS

FIGURE 19