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WATER AND LAND DEVELOPMENT
WATER RESOURCE MANAGEMENT

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

SEP 26 1996

MEMORANDUM

TO: Gary Gill, Director
Office of Environmental Quality Control

FROM: Dean Uchida, Administrator
Division of Land

SUBJECT: Negative Declaration for Radio Tower at Koloa, Kauai, TMK's 2-9-2:01 and 3-4-6:1

The Division of Land and Natural Resources has reviewed the comments received during the 30-day public comment period which began on August 8, 1996. The agency has determined that this project will not have significant environmental effect and has issued a negative declaration. Please publish this notice in a forthcoming OEQC Bulletin.

We have enclosed a completed OEQC Bulletin Publication Form and four copies of the final EA. Please contact Don Horiuchi if you have any questions.

Enc.

1996-10-23-KA-FEA-Radio Tower at Koloa-CUP

OCT 23 1996

FILE COPY

RECEIVED
DIVISION OF
LAND MANAGEMENT

SEP 24 11 50 AM '96

THE KEITH COMPANIES

4075-1/esk

Alston
Hunt
Floyd
& Ing

Attorneys at Law
A Law Corporation

18th Floor Pacific Tower
1001 Bishop Street
Honolulu Hawaii 96813
Tel: (808) 524-1800
Fax: (808) 524-4591

Mr. Don Horiuchi
Land Division
Department of Land and Natural
Resources
1151 Punchbowl Street, Room 220
Honolulu, Hawaii 96813

HAND DELIVER

FINAL
ENVIRONMENTAL ASSESSMENT
FOR
PROPOSED RADIO TOWER
CONSERVATION USE PERMIT APPLICATION

TMK: (4) 2-9-02:01 and 3-4-06:01
Kauai, Hawaii

Applicant
Stangl Broadcasting, Inc.
P. O. Box 1957
Honolulu, HI 96805

Prepared by
Alston Hunt Floyd & Ing
Pacific Tower, Suite 1800
1001 Bishop Street
Honolulu, HI 96813

and

The Keith Companies - Hawaii, Inc.
4479 Rice Street, Suite 202
Lihue, HI 96766

September 20, 1996

Job No. 60448.003

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LIST OF EXHIBITS

APPENDIX

I. GENERAL INFORMATION

A. Applicant

Stangl Broadcasting, Inc.
P. O. Box 1957
Honolulu, HI 96805

B. Agent

Everett S. Kaneshige, Esquire
Alston Hunt Floyd & Ing
Attorneys at Law, A Law Corporation
18th Floor, Pacific Tower
1001 Bishop Street
Honolulu, Hawaii 96813

C. Approving Agency

Department of Land and Natural Resources
State of Hawaii
Board of Land and Natural Resources
P. O. Box 621
Honolulu, Hawaii 96809

This Assessment has been prepared pursuant to Chapter 343 and 344, Hawaii Revised Statues, and in accordance with Title 11, Chapter 200, and Title 13, Chapter 5 of the Hawaii Administrative Rules.

D. Project Location

Haupu Ridge, Haupu Forest Reserve,
Koloa and Lihue, Kauai, Hawaii

E. Tax Map Keys

TMK: (4) 2-9-02:01 and 3-4-06:01
Koloa and Lihue, Kauai, Hawaii

F. Property Owner (see appendix A)

Grove Farm Company, Incorporated
P.O. Box 2069
Lihue, Kauai, Hawaii 96766-7069

G. Project Description

The Applicant, Stangl Broadcasting, Inc. (SBI), proposes to construct a radio tower for a multiple use antenna along the Haupu Ridge in Kauai, Hawaii on the ridge between Koloa and Lihue. The proposed tower is a typical triangular single uniform cross-section antenna with a face of two feet and approximately 250 feet in height, utilizing guy wires to support its width. The subject property encompasses a 21,780 square foot area, within the State Land Use Conservation District, that will be leased by the applicant from Grove Farm Company, Incorporated (Grove Farm). The applicant is submitting this Final Environmental Assessment (FEA) as part of the application for a Conservation District Use Permit.

H. Existing Uses

The subject property is currently open undeveloped land with the following land use designations:

State Land Use: Conservation
Subzone: Protective (P)
Kauai General Plan: Open (O)

II. BACKGROUND

A. Applicant

SBI is a Hawaii corporation which was founded in 1989 by B. Casey Stangl. Mr. Stangl has over a decade of experience in the radio broadcasting Industry ranging from being a top-rated DJ to an award-winning station manager. Mr. Stangl has been involved with various radio stations in Phoenix, New Orleans, San Francisco, Santa Rosa and Hawaii, Including Oahu KGU, KIKI, and KQMQ.

III. PROJECT NEED AND OBJECTIVES

A. Need for the Project

Kauai is currently under-served by radio broadcast providers with only two FM stations and two AM station located on-island. These existing stations do not offer non-commercial educational programming and are limited in their coverage of the island. Also, the existing radio towers on Kauai do not have the capability of relaying Oahu radio stations.

The proposed radio tower will provide the first on-air non-commercial educational radio service for the residents of Kauai. The FCC has granted Hawaii Public Radio (HPR) with a construction permit for a proposed station with the frequency of 90.1 Mhz, to be located in Lihue. SBI has demonstrated to the Federal Communications Commission (FCC) that the public interest will be served by the addition of at least two new FM channels on Kauai (KSRF and KAUI). One of these stations would provide service to Kekaha and Lihue, and the other

would primarily service Lihue and the communities on the northeast of the island. A third FM station may come on-line mid 1997.

SBI is also proposing to make available space on the proposed tower for county police and fire department and state civil defense two-way radio transmissions. (The County's telecommunication officer has expressed its support and interest in this project). The tower's location allows it to provide better island coverage than what is currently available for these types of signals. Additional users of the tower for two way radio transmission may include Kauai Electric and Kauai Paging and Communications.

In addition, this proposed tower will be able to support low-power television signal boosting for better reception of Oahu television stations by Kauai viewers, along with other proposed video, wireless messaging, paging and other future technologies which are emerging in current media convergence.

B. Project Objectives

The objective of the proposed project is to provide a common antenna and tower installation, capable of supporting eight FM radio stations and emergency communication services for the police, fire, and civil defense departments.

It is the goal of SBI to make effective use of FM frequency space, specifically reserved by the FCC for non-commercial educational broadcast services. These services would help fulfill the needs of the residents of Kauai and Niihau for educational, informational, and cultural radio programming.

IV. PROJECT DESCRIPTION

A. Location and Vicinity

The project site is located on the southeast side of the island of Kauai, along the Haupu Ridge which defines the Lihue - Koloa District boundary. The project site is in the vicinity of the cross-ridge power line above the cane-haul tunnel that runs through the mountain ridge of the Haupu Forest Reserve and situated where a tributary ridge runs off the south side of the main ridge (see Exhibit 1). The project site can be identified as Tax Map Keys (TMK): (4) 2-9-02:01 and (4) 3-4-06:01 (see Exhibit 2). SBI leases the site under a twenty year lease with Grove Farm Company Incorporated and has an option to extend for an additional ten years.

B. Project Description

SBI proposes to construct a radio tower for a multiple use antenna on the project site, consisting of approximately 21,780 square feet (see Exhibit 3). The proposed tower is a typical triangular single uniform cross-section antenna with a face of two feet and approximately 250 feet in height, utilizing guy wires to support its width (see Exhibit 4).

Citizens Utilities, Kauai Electric Division will supply power to the project site. Power is presently planned to be fed overhead, within an easement that will be created along the tributary ridge that runs south of the project site (See Exhibit 5).

In addition to Kauai Electric bringing power to the project site, a utility easement will be provided on site for them to access and service their last power pole and the transformers. The transformers will be within a secured fenced area and screened from views with landscape material.

C. Facility and Property Master Plan

FACILITY MASTER PLAN

The proposed radio tower will be SBI's first facility on the island of Kauai. There are no existing structures on the half-acre site. The applicant proposes to construct a single, uniform cross-section antenna, 250 feet in height with a two-foot face, that will support a transmitting antenna on the top 60 feet and a repeater located at tree line level (see Exhibit 4). Guy wires, anchored to the sides of the ridges will be used to support the tower. In addition to the tower, three 10 x 20-foot shipping containers will be placed on site near the base of the tower and underneath the guy wires along the ridge. The containers will be painted to match existing vegetation and used to house electrical and radio transformers, backup power supply, as well as maintenance equipment .

Initially, the tower will contain three full service Class C1 FM radio stations. Two stations, KAUI and KSRF have construction permits and the third station, HPR, has applied to the Federal Communications Commission (FCC) for a construction permit. One of the permitted stations will provide service to Kekaha and Lihue, and the other will provide primary service to Lihue and communities to the northeast. The proposed FM stations will provide a 1 mv/m signal to more than 99 percent of Kauai County's residents.

HPR provides non-commercial radio service, offering educational and informative radio programming. HPR will relay, from Honolulu, the 24-hour daily program schedule of KHPR, until such time a studio facility is established in Lihue. It is anticipated that HPR will be adding a second station in the near future because the facility is designed to accommodate as many stations as possible on this single antenna, as to reduce the number of required tower sites for the anticipated expansion of radio broadcasting on Kauai. Anticipated is the future addition of at least one and possibly several more FM stations as soon as initial construction is completed.

There are a number of two-way users, Police, Fire, Civil Defense, Kauai Electric, and Kauai Paging and Communications that could utilize this site that do not have a permanent location with the loss of the Mt. Kahili Civil Defense tower during Hurricane Iniki. The potential uses for the facility and anticipated schedule for implementation are shown in the table below.

POTENTIAL USES AND SCHEDULING

USE	USERS	SCHEDULE/YEAR
1 FM Station	KAUI - 103.3	Early 1997
2 FM Station	KSRF - 95.9	Early 1997
3 FM Station	TSA Sites	Mid 1997
4 FM Station	98.1 FM	Late 1997
5 FM Station	Hawaii Public Radio - 90.1	Late 1997
6 FM Station	Hawaii Public Radio - #2	Early 1999
Two-way Radio	Kauai Electric	Mid 1997
Two-way Radio	Police/Fire/Civil Defense	Late 1997
Two-way Radio	Kauai Paging and Communications	Late 1997
Low Power TV	TSA Sites	1997 through 1998
Cellular Telephone	To Be Determined	1998 through1999

The only other significant facilities that will be needed to maintain and enhance this project, during the first five years after installment of the Lihue FM stations' services, will be associated with the addition of local program production and origination facilities.

PROPERTY MASTER PLAN

Grove Farm is uncertain of any near-term or future plans of expanding existing telecommunications facilities, other than the construction of SBI's facility. The proposed facility will not be linked to the existing Motorola telecommunications facility located to the west of the project site.

D. Construction Method

The proposed project will be constructed in seven stages as follows:

1. Initially the project site will be minimally cleared and grubbed only in the locations where the tower footing, guy anchor points, storage containers, and utility poles will be placed. This work will be conducted with manual labor that will be flown-in by helicopter.

2. A backhoe will be flown-in by helicopter to dig the holes for the tower and utility pole foundations. In addition to the backhoe, manual labor will also be used to dig the holes. Once the holes have been dug, the excess soil will be hauled off the project site by helicopter.

3. A small portable concrete mixer, water in 50-gallon drums, and other materials will be flown-in by helicopter, so that concrete can be mixed at the site for each of the utility pole footings, guy wire locations and tower foundation.

4. The three shipping-type containers to be filled with the electronic equipment, will be flown in and placed in the area between the tower and where the guy anchors will be located on the northeast ridge. Once in place, the containers will be leveled and strapped down securely.

5. Once the concrete for the tower foundation and utility footings has been cured erection of the tower and utility poles will begin. The tower will be constructed by placing 12, 20-foot sections on top of the initial 10-foot base section, that will be added one at time, using a helicopter to transport and lift each section into place. As each section is added guy wires will be attached to secure it in place. Once the tower is erected, the radio antenna will be mounted flat against two faces of the tower. Meanwhile, the utility poles will also be constructed, using 20-foot sections added and bolted in place one at a time. The four utility poles will vary from 60 to 100 feet in height with the lower elevation pole being constructed on wood and the three upland ones of steel.

6. The storage containers will then be retrofitted for the electrical transformers and other necessary equipment.

7. The final stage will be stringing the electrical power wire to the site. The electrical power on the project site will run from the last power pole to the transformer pad, where the power will be stepped down from primary to secondary. The secondary power will then be run in conduit from the transformer pad to the transmitting equipment in the containers.

E. Construction Schedule and Costs

CONSTRUCTION SCHEDULE

The seven stages of construction will take approximately five months to complete, as detailed in the table below.

DATE	STAGE - ACTIVITY
11/96	1 - Ground Breaking, Clearing and Grubbing
11//96 - 12/96 12/96	2 - Digging Foundation/Footings and Hauling Excess Soil 3 - Pour Concrete Foundation and Footings
12/96 12/96 - 1/97	4 - Drop-in Storage Containers 5 - Construction of Tower with Antenna and Utility Poles
11//96 1/97	6 - Retrofit Storage Containers 7 - Bring Electrical Power to Project Site
2/97	PROJECT COMPLETE

CONSTRUCTION COSTS

ITEM	COST
1 - Tower Structure	$ 30,000
12-paneled Antenna	83,000
Labor and Other Materials	60,000
3 - Shipping Containers	10,000
Miscellaneous Contingency Funds	10,000
TOTAL	**193,000**

F. Access and Maintenance

There are no existing roadways or trails leading to the project site. Because of the damp weather conditions and the steep terrain, access to the project site for periodic maintenance will be via helicopter.

The need to access the site will be minimal, since the proposed facility will be un-manned and operated by remote control from various locations and should only require quarterly maintenance visits.

V. ALTERNATIVES CONSIDERED

A. Other Locations

Although alternative sites were considered, such as the Kilohana Crater where two other radio towers are located, Eleele industrial area and others, these sites did not offer the most optimum overall island coverage. Extensive state-of-the-art computer studies of various locations on the island of Kauai have resulted in the determination that the location along the Haupu Ridge will provide coverage of the majority of the island population, including many who do not receive primary FM coverage at present. From the proposed site, it is estimated that radio broadcasts will be received as far north as Princeville and as far west as Kekaha. Thus, the suitability of the property for maximum coverage of the island was the key factor in its selection.

There is an existing Motorola telecommunications facility located approximately one mile from the project site, on Mt. Laaukahi. It is anticipated that the proposed facility will not interfere with the operations of the Motorola facility. The Motorola site, to the west on the same ridge line, is already operating at its anticipated capacity, and is limited to single-phase power supply currently in place.

B. No Action

If the proposed multi-use site and antenna is not constructed, FM and emergency and other private two-way radio service on Kauai will continue to be limited. In addition, the quality of broadcast services will not have the opportunity to improve or expand with future technological demands.

VI. EXISTING CONDITIONS

A. Setting

The project site is located where a tributary ridge meets the main ridge, on the south side of the Haupu Ridge. The tributary ridge that runs perpendicular off the main ridge provides a roughly triangular area for the tower and its tie-downs. The ridges are fairly level on top, with slopes of 40 percent or greater off either side. The elevation of the project site is approximately 1,240 feet above mean sea level (msl) (see Exhibit 3). To the east of the project site the ridge continues until it meets the ocean, with Mt. Haupu, elevation 2,297 feet above msl, being the highest point. To the west the ridge continues curving north ending in the vicinity of Kaumualii Highway and Knudsen's Gap.

B. Land Use Designations

The project site, encompassing 21,780 square feet, is within the Conservation State Land Use District, with a Protective (P) subzone classification (see Exhibit 5). The objective of this subzone is to protect valuable resources in designated areas such as restricted watersheds, marine, plant, and wildlife sanctuaries, significant historic, archaeological, geological, and volcanological features and sites, and other designated unique areas, as stated in Title 13, Chapter 5, Section 11 of the Hawaii Administrative Rules. The entire project area is zoned Open (O), as part of the Haupu Forest Reserve under the Kauai General Plan.

C. Existing and Surrounding Land Uses

The project site is on Grove Farm's property which is vacant and undeveloped land. Located one and one-half miles to the north of the project site is the town of Kipu surrounded by agricultural land, which Grove Farm uses to cultivate sugar cane. A small airstrip is located three-quarter miles to the north, which is leased to McBryde Sugar Company. Located three-quarter miles to the south is the Waita Reservoir surrounded by agricultural land currently leased by McBryde Sugar Company for sugar cane. Sugar cane is being phased out in this area by the end of 1996. Grove Farm plans to use this land for alternative or diversified agricultural crops. Approximately one mile west of the project site, within the forest reserve and conservation district, is Motorola's existing telecommunications facility at Mt. Laaukahi. The nearest inhabited areas are Koloa town located two miles south and Puhi located three miles east of the project site.

VII. PHYSICAL AND NATURAL ENVIRONMENT

A. Flora

EXISTING CONDITIONS

A botanical survey of the entire proposed project site was conducted for the presence of rare or endangered plant species. Special care was taken to survey for the endangered or rare plant species noted from the region by The National Tropic Botanical Garden (Brighamia insinis, Delissea rhytidosperma, Lipochaeta micrantha var. exigua, Munroidendron racemosum, Hedyotis fluviatilis, Hibiscus kokio ssp. kokio and a Lobelia sp.) and the Fish and Wildlife Service (Lipochaeta micrantha var. micrantha, Melicope haupuesis, and Pteralyxia kauaiensis). None of these species were found in the project site or on the surrounding slopes.

PROBABLE IMPACTS

Based on the vegetation survey and the absence of any endangered plant species on the Koloa Radio Tower site, it appears that there would be no major negative impacts on the native flora of this area. For further detail refer to the full Vegetation Report (see Appendix F). Page two on the Vegetation Report under Project Recommendations states that careful consideration should be taken so that no construction disturbance or graded material impact the north-facing slope outside this project area due the "good habitat". It further states the "Avoiding this area should not be a problem since most of the tower site is on the southern slopes".

B. Fauna

EXISTING CONDITIONS

A bird survey of the entire proposed project site was conducted during the prime nesting period (September 15, 1996) for the presence of endangered or threatened bird species. No signs of Newell's Shearwater (Puffinus auricularis newelli) or Hawaiian Darkrumped Petrel (Pterodroma phaeopygia sandwhichensis) were found. Additionally, no burrows that might indicate the area had been previously used by nesting seabirds were found. Birds seen at the site or down slope were either common introduced species or the native White-tailed Tropicbird. None of these species are endangered or threatened. For further detail refer to the full report titled "Report on a Bird Survey of the proposed Stangl Broadcasting Radio Tower site" (see Appendix G). In addition it should be noted that approximately one mile northwest of the project is a mountain area generally known to be Newell's Shearwater endangered bird species habitat.

PROBABLE IMPACTS

None of the fauna on site is classified as rare or endangered. The project site does not appear to be a habitat for the Newell's Shearwaters. As stated by Mr. Tom Telfer, Wildlife Manager, for DLNR, Division of Forestry and Wildlife, Kauai District, in his September 12, 1996

letter found on page 31 of this document, DLNR "have not found such towers or guy wires to be a significant problem to these birds on Kauai as similar towers." In addition to the birds keeping grading disturbance to the ground soil at a minimal, it is anticipated that the proposed tower should not adversely impact any existing fauna.

C. Soil and Geology

EXISTING CONDITIONS

An on-site geotechnical investigation of the project site revealed the existing topsoil to be mostly silty clay and the area below two feet to consist of mainly basalt. The geotechnical engineer's findings indicate that the project site is suitable for construction of the proposed tower structure, with a sub-base and base material having an excellent bearing capacity for footings and tie downs (see Appendix C).

PROBABLE IMPACTS

Impacts to the soil and geology of the site will be minimal to none, as the existing topography at the top of the ridge is relatively flat and grading will be minimal. The disturbance to the soil will only be in the areas where the footings for the tower and guy wire tie-downs will be placed.

D. Archaeological and Cultural Resources

EXISTING CONDITIONS

An Archaeological survey of the entire project site was conducted for surface features. No significant historic sites were found. On the basis of this surface survey's negative finding, no subsurface testing was conducted. An archaeological report for the subject site was prepared by Cultural Surveys Hawaii and was recently approved by DLNR-SHPD. Based on this field inspection of the project area, which stated that this area was poorly suited for religious or temporary habitation sites, as no historic sites were identified, there was a lack of exposed outcrops, and the elevation of the project was remote. The report concludes that there ware no cultural resources present on the site and no further archaeological work is recommended (see Appendix D).

PROBABLE IMPACTS

The proposed project will not have any impact on existing archaeological or cultural resources, since no significant historic sites were found at the project site.

E. Air Resources

EXISTING CONDITIONS

The ambient air quality of the existing project area is relatively undisturbed as it is natural open undeveloped land. Weather conditions of the mountain ridge make the project area damp cool and windy at times.

PROBABLE IMPACTS

Short term impacts to the air quality will only occur during construction of the tower and related improvements. Fugitive dust emissions and petroleum from exhaust resulting from construction vehicles should not have any long term negative impact on the air quality, as disturbance to the soil will not be significant during construction. After construction is completed, the tower and the related improvements will not have any impact on the ambient air quality.

F. Noise Environment

EXISTING CONDITIONS

Currently the project area is occasionally affected by helicopter and aircraft noise from the Lihue Airport located approximately six miles away. Helicopters periodically visit the Motorola site located west of the project area. Commercial aircraft flying into or from Lihue Airport, or small aircraft using the private airstrip north the project, may contribute to the noise environment of the project area. Both helicopters and other small aircraft are used in the surrounding area of the project for agricultural activities.

PROBABLE IMPACTS

Short term noise impacts will occur during construction activities. Construction related noise will be generated by the use of backhoes and helicopters to access the site. Once the project is complete there will be occasional noise impacts from periodic maintenance visits via helicopter. There is no audible sound produced by the proposed antenna, transmitter, or generators and therefore the project will not have any adverse impact on the noise environment of the project area.

G. Electric and Magnetic Fields

EXISTING CONDITIONS

There are no known electromagnetic radiation fields present on the project site.

PROBABLE IMPACTS

The Federal Communication Commission (FCC) will require each station located at the project site to address the issue of non-ionizing radiation and exposure to workmen and the general public as part of the FCC licensing process.

The antenna design and transmitting equipment chosen will be selected to comply with all applicable FCC regulations and ANSI guidelines. Procedures will be established in accordance with the Office of Science and Technology, Bulletin 65.

Depending on the height of the tower, the design, the placement of the antennas, the risk of exposure to electromagnetic radiation or electromagnetic fields may or may not be hazardous. Each radio station that installs an antenna on the tower should assess the possible human risks or negative environmental impacts before installation.

H. Natural Hazards

EXISTING CONDITIONS

Due to the elevation of the project area, the only potential natural hazard would be from high winds and hurricane damage.

PROBABLE IMPACTS

The proposed radio tower has been designed and will be installed to accommodate high winds in excess of 200 miles per hour and should not adversely impact any other potential natural hazards in the project area.

I. Visual Resources

EXISTING CONDITIONS

The Haupu Ridge is visible from the north from the plain area below, which includes Kaumualii Highway. From the south (Koloa side) the main ridge, including the tributary ridge where the proposed tower will be located, is visible from the plain area below, which includes both Koloa and Poipu communities. Along Maluhia Road (Tree Tunnel) it is also visible from various locations. In addition, the Motorola tower site is visible from both the north views and Maluhia Road views.

PROBABLE IMPACTS

The proposed tower structure will incorporate design concepts to minimize the visual impact it will have on the environment. The single uniform cross-section antenna will have a face of approximately two feet wide and a height of 250 feet, which is significantly narrower than the existing Motorola tower. From the north only 230 feet of the tower will be visible, because the base elevation of the tower site will be approximately 20 feet below the height of the main

ridge. The guy wires used to support the tower structure, which will be less than an inch in diameter, are therefore virtually invisible from any of the public vista points.

Prior to construction, SBI coordinated with the Federal Aviation Administration (FAA) to determine the safety impact on air navigation of the proposed tower structure. If possible, the structure will be constructed without lighting (typically red aviation beacon) and painted green or sky blue, to blend in with the surrounding environment. If FAA air traffic safety criteria determines that the structure will have to be lighted, it is anticipated that one red aviation beacon light at the top of the tower may be requirement. It is possible that FCC air traffic safety criteria may determine the structure may have to be painted safety red and white. However, in no event will strobe-type lighting, or bright white lighting be utilized beyond that which is considered prudent for safety.

The three 10 x 20-foot long shipping containers will be painted to match the surrounding environment and the area around the containers will be landscaped with plant materials to ensure that they will not have a negative visual impact on surrounding view planes.

A visual analysis of the proposed tower was conducted from two locations, View 'A' - Kaumualii Highway at Halfway Bridge looking south and View 'B' - Waikomo Park, Koloa, looking north (see Exhibit 6). The proposed tower is partially visible from Maluhia Road (Tree Tunnel) approximately two miles from the project site, as you look east between pockets of vegetation.

VIEW 'A' - KAUMUALII HIGHWAY AT HALFWAY BRIDGE

This view was taken from the closest highway, approximately two miles from the project site. From this distance and on a clear day, the tower is barely visible and the guy wires will be virtually invisible to anyone driving by on the highway (see Exhibit 7).

VIEW 'B' - WAIKOMO PARK, KOLOA, LOOKING NORTH

This view was taken from the closest inhabited area, Waikomo Park on the north end of Koloa Town, approximately two miles from the project site. As similarly shown in View 'A', the tower will be barely visible to anyone inhabiting Koloa and the surrounding communities (see Exhibit 8).

Due to the general weather conditions at the project site, it is anticipated that the tower will only be visible fifty percent of the time. At night, if required by the FCC the only visible item may be a red aviation beacon on top of the tower. Additionally, considering that even on a clear day the tower will be barely visible, it can be concluded that the proposed tower should not have a negative visual impact on the major view corridors of the surrounding environment.

VIII. INFRASTRUCTURE AND PUBLIC FACILITIES

A. Traffic

EXISTING CONDITIONS

The subject property is not accessible by public or private roads. The nearest roadway from the north is a private dirt (haul cane) road used for agricultural purposes and is accessed via

Kaumualii Highway near Halfway Bridge. To the south of the subject property the nearest road is located one-half mile away and consists of a private dirt (haul cane) road used for agricultural purposes that continues through a tunnel in the mountain.

PROBABLE IMPACTS

Since the project site will be unmanned and will be accessed via helicopter, the project will not have any impact on existing traffic conditions.

B. Electricity

EXISTING CONDITIONS

The Kauai Electric Division of Citizens Utilities (KE) has an existing 100-foot steel pole transmission line that runs over the ridge, one-quarter mile west of the project site. This line is used as a back-up line to feed Lihue or back-feed Koloa, should an outage occur. The McBryde Sugar Company, Ltd. has a distribution line, on wooden poles, that brings electrical service to the Motorola tower site located one mile away from the project site.

PROBABLE IMPACTS

KE proposes to install a new distribution line within a designated easement to bring electrical power to the proposed site. This new line will require installing three new steel poles ranging in height from 60 to 100 feet, similar to the existing poles used in KE's cross-ridge transmission line and one wood pole at the southern base of the hill. Actual heights will depend on a final topographic survey as well as the heights of existing vegetation. In limited cases, trees may need to be trimmed to install the power line. Only three of the four poles will be within the State Conservation District, one pole in the Protective subzone and two in the Limited subzone (see Exhibit 5).

The base of the poles will be approximately 24 inches in diameter and will vary depending on the strength requirements for each of them. Pole foundations are estimated to be approximately five feet by five feet and 15 feet deep. Pole framing will be vertical in configuration and the phase conductors will be spaced four feet apart with the neutral wire located at six feet below the lowest phase conductor. Conductor wire will be #4/0 all aluminum alloy.

It is not anticipated that the four additional electrical poles or powerline will have an adverse effect, as disturbance to the surround environment will be kept to an absolute minimal.

C. Water and Wastewater

EXISTING CONDITIONS

There are no existing potable water or wastewater facilities on the subject property or in the project area.

PROBABLE IMPACTS

The proposed project will be unmanned and operated by remote control, therefore will not require water or wastewater service.

D. Solid Waste

EXISTING CONDITIONS

Any solid wastes that might be generated by agricultural activities in the vicinity of the project area is hauled to the Kekaha sanitary landfill site.

PROBABLE IMPACTS

Since no one will be present, the proposed project is not expected to generate any solid waste. Any solid waste that might be generated will be during construction or maintenance visits and will be transported off the ridge via helicopter then hauled by truck to the Kekaha sanitary landfill.

E. Public Facilities

EXISTING CONDITIONS

The closest police and fire stations are in Koloa, located approximately three miles from the project site. The closest public school to the project site is Koloa Elementary located approximately three miles away in Koloa. The closest hospital facility is Wilcox Memorial Hospital located in Lihue, approximately 7.5 miles from the project site.

PROBABLE IMPACTS

The proposed radio tower is not anticipated to burden existing police and fire protection services and facilities in the project area. The proposed radio tower will not generate additional school enrollment nor impact the existing schools in the project area. The project should not impact current hospital facilities in the project area.

IX. SOCIAL AND ECONOMIC FACTORS

A. Social Benefits

EMERGENCY COMMUNICATIONS

The proposed tower will be able to offer improved two-way radio service to the County of Kauai Police and Fire Departments, as well as State Civil Defense. In times of a natural disaster it will be beneficial to have additional emergency communications capabilities.

PUBLIC RADIO

In answer to substantial public demand, HPR has decided to implement full service FM coverage of Kauai, as one of the two proposed radio stations with Stangl Broadcasting, Inc. (see Letters of Support, Appendix E). Additionally, with the establishment of a new station in Lihue, HPR will be able to expand radio services to an additional five percent of Hawaii's population. Current HPR programming, offered 24 hours daily, serves to educate, inform, provide intellectual and aesthetic enlightenment, and generally enriches the quality of life. The HPR station would initially relay the 24-hour broadcasts of KHPR (88.1 FM) in Honolulu. As resources permit, studio facilities would be developed on Kauai, allowing their broadcasts to better serve the particular needs of the community.

OTHER BENEFITS

The proposed tower will ultimately be able to support low-power television, video, wireless messaging, and other capabilities future technologies might demand and has been strategically located to do so. Furthermore, this may eliminate the construction of future towers within this protected subzone.

B. Economic Benefits

Initially the local community will benefit economically from the construction as local citizens, such as construction workers and technical consultants, will be utilized to obtain permits and construct the proposed project. Additional benefits will be enjoyed by the establishment of a local programming studio and a remote program engineering staff in Puhi or Lihue, in connection with the stations which would utilize the tower. Ultimately employment opportunities will be generated by the potential expansion of the broadcast industry from the proposed tower.

X. COMPLIANCE WITH COUNTY LAND USE PLANS

A. Kauai General Plan

The project site is designated under the County of Kauai's General Plan as Open (O). The Kauai General Plan Update Ordinance No. 461 describes the Open designation as lands which "shall remain predominately free of development involving buildings, paving, and other similar construction. Where such construction is permitted. . ., they shall be clearly incidental to the prevalent nature of the surrounding open areas. The intent of the open designation is to preserve, maintain or improve the natural characteristics of non-urban land and water areas that are of significant value to the public as scenic or recreational resources." One of the goals to be attained by the General Plan Update, Section 2.01 A.4, is "to create opportunities for greater fulfillment of life through the development of a broad spectrum of educational and cultural pursuits."

The proposed tower will comply with the open designation, as an incidental element to the project area and barely visible from most view corridors. The proposed tower will potentially offer a wide variety of services including both educational and emergency, which will help to maintain the Kauai General Plan's referenced goal.

XI. DETERMINATION

The proposed radio tower project will comply with the following criteria, as set forth in the Hawaii Administrative Rules, Title 13, Department of Land and Natural Resources, Subtitle 1 Administration, Chapter 5, Conservation District (13-5-30):

(c) In evaluating the merits of a proposed land use, the department or board shall apply the following criteria:

(1) The proposed land use is consistent with the purpose of the conservation district;

The proposed project will result in a minimal disturbance to the existing physical environment and social area which is consistent with the intent to conserve, protect and preserve the natural resources of the conservation district.

(2) The proposed land use is consistent with the objectives of the subzone of the land on which the use will occur;

The proposed project consists of a communication system which benefits the public and is allowable in the protective zone. The proposed project will not impact existing watersheds, marine, plant, and wildlife sanctuaries, significant historic, archaeological, geological, and volcanological features and sites, and other designated unique areas within this subzone.

(3) The proposed land use complies with provisions and guidelines contained in chapter 205A, HRS, entitled "Coastal Zone Management," where applicable;

The proposed project is not located in the "Coastal Zone Management" area, thus will not have any direct impact on it.

(4) The proposed land use will not cause substantial adverse impact to existing natural resources within the surrounding area, community or region;

The proposed communication facility will not adversely impact the existing and surrounding environment, as it will be an incidental element in the surrounding environment.

(5) The proposed land use, including buildings, structures and facilities, shall be compatible with the locality and surrounding areas, appropriate to the physical conditions and capabilities of the specific parcel or parcels;

Because of its minimal impact on the physical and natural environment, the proposed project is compatible with the locality and surrounding areas.

(6) *The existing physical and environmental aspects of the land, such as natural beauty and open space characteristics, will be preserved or improved upon, whichever is applicable;*

The natural beauty and open space characteristics of the project area will be preserved because of the minimal physical and visual impact of the proposed project. Due to the narrow design of the tower and landscaping to conceal the storage containers, and electric transformers there will be minimal visual impacts. The project site will be unmanned and operated by remote control, therefore it will not require any roadways or public facilities, thus having a minimal physical impact.

(7) *Subdivision of land will not be utilized to increase the intensity of land uses in the conservation district; and*

The proposed project will not subdivide land to intensify the land use in the conservation district.

(8) *The proposed land use will not be materially detrimental to the public health, safety and welfare.*

The proposed project will not be detrimental to public health, safety, and welfare, due to its remote location and radiation emission of 25% less than the FCC maximum allow for this type of facility. In fact the project will have a beneficial impact because it will provide expanded two-way radio service to Police and Fire Departments and State Civil Defense, as well as offering additional radio broadcast services and the first non-commercial educational radio service to Kauai,.

Based on the foregoing, a "Negative Declaration" is requested for this application, as defined by Title 11, Department of Health, Chapter 200, Environmental Impact Statement (EIS) Rules, subchapter 2 (11-200-2), as "a determination by an agency that a given action not otherwise exempt does not have a significant effect on the environment and therefore does not require the preparation of an EIS."

In addition, as seen with the Motorola tower that is located on the adjacent ridge, it is believed that the proposed tower will be compatible with the surrounding environment, while bringing much needed and valuable resources to the island of Kauai. We respectfully request your favorable consideration in this matter.

XII. RESPONSONSE TO COMMENTS OF DRAFT ENVIRONMENTAL ASSESSMENT

TABLE D. E. A. RESPONSE TO COMMENTS			
Letter of Comment Author	**Number of pages**	**Letter Recipient**	**Letter of Response, # of pages**
Gary Gill, Director, Office of Environmental Quality Control	2	**Michael D. Wilson,** Director, Department of Land and Natural Resources	5
Don Hibbard, Administrator, Historic Preservation Division	2 1 1	**Nancy McMahon,** Cultural Surveys Hawaii, Inc. **Dean Uchida,** Administrator, Land Division **Victoria Creed,** Cultural Surveys Hawaii, Inc.	1
David H. Lorence, Senior Research Botanist, NTBG	2	**Everett Kaneshige, Esquire and Don Horiuchi**	1
Brooks Harper, Field Supervisor, U.S. Dept. of the Interior	2	**Don Horiuchi,** Dept. of Land and Natural Resources	1
Martha Ross, Deputy Administrator, Office of Hawaiian Affairs	1	**Everett Kaneshige, Esquire**	1
Thomas C. Telfer, District Wildlife Manager, DLNR	2	**E. Andrew Daymude, ASLA**	1
Lawrence Miike, Director of Health, State of Hawaii, Department of Health	2	**Michael D. Wilson,** Director of Department of Land and Natural Resources	6

BENJAMIN J. CAYETANO
GOVERNOR

GARY GILL
DIRECTOR

STATE OF HAWAII
OFFICE OF ENVIRONMENTAL QUALITY CONTROL

[redacted]

July 18, 1996

Michael D. Wilson, Director
Department of Land and Natural Resources
P.O. Box 621
Honolulu, Hawaii 96809

Attention: Don Horiuchi

Dear Mr. Wilson:

Subject: Draft Environmental Assessment (EA) for Koloa, Kauai, Radio Tower; TMK: 3-4-6: 1

Please include the following in the final EA:

1. Exhibit 1 Location map clearly shows the project site to be on Kaumualii Highway and in the Lihue judicial district. Please clarify the site's location in the text or correct Exhibit 1 if it is incorrect.

2. What tower is pictured in Exhibits 7 and 8?

3. Consult with government agencies, including the Kauai Planning Department, and any interested community groups or individuals and document your contacts.

4. Include a realistic timeline that takes into account the review and processing time for HRS Chapter 343, the Conservation District Use Permit and any other required permits. Please bear in mind that project activity cannot begin until all permits have been obtained.

5. Will any measures be incorporated in the design or installation of the tower to prevent hurricane damage?

20

6. A discussion of findings and reasons, according to the significance criteria listed in HRS Title 11-200-12, that support the anticipated Finding of No Significant Impact (FONSI) determination. You may use the enclosed sample as a guideline.

If you have any questions, call Nancy Heinrich at 586-4185.

Sincerely,

GARY GILL
Director

Enc.

c: Stangl Broadcasting, c/o Everett Kaneshige
Keith Companies

7/19/96

This enclosure was inadvertently omitted from our consent letter on the KOLOA RADIO TOWER draft env. assessment.

September 19, 1996

Mr. Gary Gill, Director
Office of Environmental Quality Control
220 South King Street, fourth floor
Honolulu, Hawaii 96813
Telephone (808) 586-4185
Facsimile (808) 586-4186

Subject: **Draft Environmental Assessment (EA) for Koloa, Kauai, Radio Tower;**
TMK: 3-4-6: 1, 2-9-02:01

Attention: Gary Gill

The following are Comments (bold/italics) and Responses to points requested by your Department to be included in the final EA:

1. ***Exhibit 1 Location map clearly shows the project site to be on Kaumualii Highway and in the Lihue judicial district. Please clarify the site's location in the text or correct Exhibit 1 if it is incorrect.*** Portions of the project site being leased by Stangl Broadcasting from Grove Farm actually straddle both the Koloa and Lihue district boundaries. However, the tower itself and most of the hardware will be located on the Koloa side. Please refer to Exhibit 1 for a graphic depiction.

2. ***What tower is pictured in Exhibits 7 and 8?*** Shown in Exhibits 7 and 8 is a computer simulation of the proposed tower and site. The backgrounds are scanned images from 35mm photographs, and the radio tower that has been electronically superimposed on to the background of the project site. These images depict a post construction view and should be considered as renderings.

3. ***Consult with government agencies, including the Kauai Planning Department, and any interested community groups or individuals and document your contacts.*** The project planners, The Keith Companies, have consulted with various officials. Most of this work took place at the onset of this project in late 1995 and early 1996. A partial listing of these County offices are: Planning - Dee Crowell, Planning Director, and Miles Hironaka of his staff; Steve Oliver, County Engineer; Mayor's Office - Millie Wellington, Public Information Officer; Department of Public Works - Dexter Takashima, Telecommunications Officer; and Captain Kano of the County Fire Department.

4. ***Include a realistic timeline that takes into account the review and processing time for HRS Chapter 343, the Conservation District Use Permit and any other required permits. Please bear in mind that project activity cannot begin until all permits have been obtained.***

Planning
Engineering
Environmental Services
Land Surveying
Public Works
Water Resources
Construction

[illegible]

4. (Con't) *RESPONSE:* (See chart below)

Description of Work Effort	State Date	Finish Date
Design/Permits/Contracts		
[illegible]	[illegible]	[illegible]
Soils Survey	9/95	10/95
Archeology Survey	8/95	10/95
Environmental Analysis (EA)	7/95	3/96
Management Plan	3/96	4/96
KE Agreement ($35K)	3/96	5/96
CDUA Submittal	4/96	5/96
Topographic Survey	5/96	6/96
CDUA Approval	5/96	(10/96)
Final Design of Antenna	3/96	(11/96)
KE Line Extension Agreement	7/96	(8/96)
Finish Distribution Design	3/96 & 6/96	9/96
Final Design For Tower	7/96	(11/96)
KE Approval of HEC Design	7/96	(7/96)
KE Grant of Easements	(8/96)	(8/96)
Bid Construction of Distribution and Order Materials for Project	(10/96)	(10/96)
KE to Award Construction of Distribution System	(11/96)	(11/96)
Award Contract For Tower	(11/96)	(11/96)
Construction		
[illegible]	[illegible]	[illegible]
Retrofit of Storage Container	(10/96)	(11/96)
Ground Breaking	(11/96)	(11/96)
Footings & Foundation	(11/96)	(12/96)
Construction of Tower	(11/96)	(1/97)
Place Storage Containers	(12/96)	(12/96)
Installation of Antenna	(1/97)	(1/97)
KE Contractor to Install Distribution Poles String Power to Site via Transmission Poles	(11/96)	(1/97)
On The Air (broadcast date)	since 1992	(2/97)
		Aug 5

All dates in parenthesis are proposed

5. ***Will any measures be incorporated in the design or installation of the tower to prevent hurricane damage?*** In order to prevent or minimize damage as a result of a hurricane to the radio tower, it has been designed to withstand heavy wind loads. The backing on the tower itself is of a mesh-type design instead of a solid-type backing, and this design element will significantly reduce the wind load on the tower itself. The tower design has taken into consideration many attributes of radio towers that have been designed for and exist on the island of Guam. The radio towers on Guam often withstand high winds and adverse weather conditions. Additionally, the storage containers that will house the radio transmitting equipment will also be equipped with hurricane straps. This hardware will include metal straps that are connected to the storage containers and anchored into the earth on either side. This will prevent any type of uplifting caused by severe updrafts.

6. ***A discussion of findings and reasons, according to the significance criteria listed in HRS Title 11-200-12, that support the anticipated Finding of No Significant Impact (FONSI) determination. You may use the enclosed sample as a guideline.*** Pursuant to the findings in the Environmental Assessment, it is our opinion that the proposed project would not have a significant effect on the environment, and therefore, preparation of an Environmental Impact Statement is not required. The "Significance Criteria," Section 12 of Hawaii Administrative Rules Title 11, Chapter 200, "Environmental Impact Statement Rules," were reviewed and analyzed. Based on the analysis, the following were concluded:

   a) ***No irrevocable commitment to loss or destruction of any natural or cultural resource would result.*** The proposed project will not have any impact on existing archaeological or cultural resources, since no significant historic sites were found at the project site. No significant natural resources are present.

   b) ***The action would not curtail the range of beneficial uses of the environment.*** Because of the project's minimal impact on the physical and natural environment, it is not anticipated to have any negative effect on the range of beneficial uses of the environment.

   c) ***The proposed action does not conflict with the State's long term environmental policies or goals and guidelines.*** The State's environmental policies and guidelines are set forth in Chapter 344, Hawaii Revised Statutes, "State Environmental Policy." Two broad policies are espoused: conservation of natural resources, and enhancement of the quality of life. The proposed project does not consume any significant natural resources, and will improve the quality of life by offering potentially a wide variety of services including educational, entertainment, and emergency communications.

   d) ***The economic or social welfare of the community or state would not be substantially affected.*** Construction of the radio tower would result in temporary economic benefits to the construction industry and indirectly to other economic sectors as well. Operation of the radio tower will offer improved two-way radio service to the County of Kauai Police and Fire Departments, as well as State Civil Defense during times of disaster. In addition, the radio tower will offer additional radio broadcast services and the first non-commercial educational radio service to Kauai.

   e) will not be detrimental to public health, safety and welfare, due to its remote location and very limited radiation emission impacts. In fact, the project will have a beneficial impact because it will provide expanded two-way radio service to Police and Fire Departments and State Civil Defense, as well as offering additional radio broadcast services and the first non-commercial educational radio service to Kauai.

   f) ***No substantial secondary impacts, such as population changes or effects on public facilities, are anticipated.*** The proposed radio tower is not anticipated to burden existing police and fire protection services and facilities in the project area or even the County for that matter. The proposed tower will not generate additional school enrollment nor impact the existing schools in the project area. Nor should this project impact current hospital facilities in the project area.

   g) ***No substantial degradation of environmental quality is anticipated.*** The proposed communication facility will not adversely impact the existing and surrounding environment, as it will be an incidental element in the surrounding environment.

   h) ***The proposed action does not involve a commitment to larger actions, nor would cumulative impacts result in considerable effects on the environment.*** The proposed project is self-contained and independent of other similar proposed projects of this type. In addition, it does not require any other support type, either environmental or man made.

   i) ***No rare, threatened, or endangered species or their habitats would be affected.*** On September 15, 1996 a on site field survey of the flora and fauna was performed by Phil Bruener of Brigham Young University, Hawaii and Timothy Molley of University of Hawaii, Manoa. The results of their survey's revealed that none of the flora or fauna occuring within the proposed radio tower site is classified as endangered or threatened. Additionally, the fauna survey did not reveal any signs of current or past nesting of the Newell's Shearwater. The full reports will be included as appendixes F and G of the Final Environmental Assessment (FEA).

   j) ***Air quality, water quality or ambient noise levels would not be detrimentally affected.*** Short term impacts to the air quality will only occur during construction of the tower and power poles. Fugitive Dust emissions and petroleum from exhaust resulting from construction vehicles should not have any long term negative impact on the air quality, as disturbance to the soil will not be significant during construction. After construction is completed, the tower and the related improvements will not have any impact on the air quality. Short term noise impacts will occur during construction activities. Construction related noise will be generated by the use of bobcat-type machinery and helicopters to access the site. Once the project is completo, there will be occasional noise impacts from periodic maintenance visits via helicopter. There is no audible sound produced by the proposed tower, antenna, transmitter, or generators and therefore the project will not have any adverse impact on the noise environment of the project area.

k) *The project would not affect environmentally sensitive areas, such as flood plains, tsunami zones, erosion-prone areas, geologically hazardous lands, estuaries, fresh* project site is located on the ridge between the Koloa and Lihue districts. Tsunami inundation is not a concern due to the elevation at 1237 feet above sea level. Seismic risks are minimal on the island of Kauai due to the age of the island. The volcanic hazards are comparable to those in Hilo.

If you have further questions or concerns related to this response please contact me.

Sincerely,
The Keith Companies-Hawaii, Inc.

Andrew Daymude

E. Andrew Daymude
Vice President

THE KEITH COMPANIES

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
STATE HISTORIC PRESERVATION DIVISION
33 SOUTH KING STREET, 6TH FLOOR
HONOLULU, HAWAII 96813

August 5, 1996

Ms. Nancy McMahon
Cultural Surveys Hawaii, Inc.
733 North Kalaheo Avenue
Kailua, Hawaii 96734

LOG NO: 17750
DOC NO: 9607SC28

Dear Ms. McMahon:

SUBJECT: Historic Preservation Review of a Draft Report on the Archaeological Field Inspection of the Koloa Radio Project site, Paa, Lihue District, Kaua'i
TMK: 3-4-08: 01

We recently received a draft copy of the archaeological field inspection report which documents field work done at the proposed Koloa Radio Broadcast Antenna project site at Pa'a, Kaua'i (*Archaeological Field Inspection of the Koloa Radio Project Pa'e, Kona, Kaua'i.* 1995. McMahon). We provide the following review comments.

In general, we believe that the field inspection was adequate. The proposed project site on the Haupu ridge of southeast Kaua'i at about 1240 feet above mean sea level. A project site 2,500 square feet in size was surveyed and no historic sites were found. Before we can conclude that the report is final, however, there are several revisions to be made; Attachment I lists these items. Once we receive the requested revisions and corrections, we anticipate concluding that the report is final, and that the survey has been executed successfully. Replacement pages may be sent in to our office.

Should you have any questions, please feel free to call Sara Collins at 587-0013.

Aloha,

DON HIBBARD, Administrator
State Historic Preservation Division

SC:jk

ATTACHMENT I: SPECIFIC COMMENTS ON THE RECONNAISSANCE SURVEY REPORT OF THE KOLOA RADIO PROJECT SITE

Substantive Remark

Page 1, Paragraph 1: Please provide the Tax Map Key.

Page 1, Paragraph 6: The first sentence appears to be a sentence fragment; what is the literal meaning of Pa'a?

Page 3, Paragraph 4: What is the Kirch 1979 reference? It is not listed in the "References Cited" section?

STATE OF HAWAII

DEPARTMENT OF LAND AND NATURAL RESOURCES

STATE HISTORIC PRESERVATION DIVISION
33 SOUTH KING STREET, 6TH FLOOR
HONOLULU, HAWAII 96813

August 5, 1996

MEMORANDUM

LOG NO: 17742
DOC NO: 9607SC25

Aug 5 11 20 AM '96
RECEIVED
LAND DIVISION

TO: Dean Uchida, Administrator
Land Division

FROM: Don Hibbard, Administrator
Historic Preservation Division

SUBJECT: (File No. KA-2819) Chapter 6E-42 Historic Preservation Review of a Conservation Use Application for Radio Broadcast Antenna Tower at Koloa, Kaua'i
Pa'a, Koloa and Lihue Districts, Kaua'i
TMKs: 2-9-02: 01 & 3-4-08: 01

Our review is based on historic reports, maps, and aerial photographs maintained at the State Historic Preservation Division; no field inspection was made of the proposed project area.

The proposed radio tower site sits at about the 1,240-foot elevation on a ridgeline between the Lihue and Koloa Districts. The project area consists of a 2,500 square foot region along the ridge line. Recently, an archaeological reconnaissance survey was carried out at the proposed radio tower site; no historic sites were found. Once requested revisions have been made to the report documenting the reconnaissance survey, we anticipate concluding that the report is acceptable and that the survey has been successfully executed.

In view of these findings, we believe that the Conservation District Use Area permit, if approved, will have "no effect" on significant historic sites. This correspondence constitutes our concurrence letter under Chapter 6E-42, Hawaii Revised Statutes.

Should you have any questions, please feel free to call Sara Collins at 587-0013.

SC:jk

BENJAMIN J. CAYETANO
GOVERNOR OF HAWAII

STATE OF HAWAII

DEPARTMENT OF LAND AND NATURAL RESOURCES

STATE HISTORIC PRESERVATION DIVISION
33 SOUTH KING STREET, 6TH FLOOR
HONOLULU, HAWAII 96813

MICHAEL D. WILSON, CHAIRPERSON
BOARD OF LAND AND NATURAL RESOURCES

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

September 10, 1996

LOG NO: 18043
DOC NO: 9609SC14

Dr. Victoria Creed
Cultural Surveys Hawaii, Inc.
733 North Kalaheo Avenue
Kailua, Hawaii 96734

Dear Dr. Creed:

SUBJECT: Historic Preservation Review of Revised Report on the Archaeological Inspection of Koloa Radio Project Site
Pa'a, Lihue District, Kaua'i TMK: 3-4-6: 1

Thank you for the prompt submission of the revised report for the archaeological inventory survey of the Koloa Radio Project site in Pa'a, Kaua'i (*Archaeological Field Inspection of the Koloa Radio Project, Pa'a, Kona, Kaua'i [TMK 3-4-06: 01]*. 1996. McMahon). All of the requested revisions have been made acceptably. Therefore, we can conclude that the survey was successfully executed.

Should you have any questions, please feel free to call Sara Collins at 587-0013.

Aloha,

DON HIBBARD, Administrator
State Historic Preservation Division

SC:jen

25

KEI[illegible]MPA[illegible]-HA[illegible]INC.

September 13, 1996 60448.003

Don Hibbard, Administrator
Department of Land and Natural Resources
State Historic Preservation Division
22 South King Street, 5th Floor
Honolulu, Hawaii 95813

Subject: Draft Environmental Assessment for Stangl Broadcasting Koloa Radio Tower
TMK: 3-4-6:1

Dear Mr. Hibbard:

We are in receipt of your letters dated August 5, 1996, to Mr. Dean Uchida and Ms. Nancy McMahon, and September 10, 1996, to Dr. Victoria Creed, regarding the reconnaissance survey report of the Koloa Radio Tower project site.

Your confirmation of approval to the State Historic Preservation Division on the revised archaeological inventory survey is duly noted and appreciated. Thank you for participating in the review process for this assessment. Your letter and this response will be appended to the Final Environmental Assessment.

If you have any additional questions please contact us at (808) 241-5170.

Sincerely,
The Keith Companies-Hawaii, Inc.

E. Andrew Daymude
Vice President

Planning
Engineering
Environmental Services
Land Surveying
Public Affairs
Water Resources
Cultural Resources

K:\Projects\60448.003\Documents\091396 Final EA Response to Don Hibbard Letter

[illegible]

NATIONAL TROPICAL BOTANICAL GARDEN
CHARTERED BY CONGRESS TO CREATE A NATIONAL RESOURCE IN TROPICAL BOTANY

21 August 1996

Mr. Everett Kaneshige
1001 Bishop Street, Suite 1001
P.O. Box 621
Honolulu, HI 96813

Mr. Don Horiuchi
DLNR, P.O. Box 621
Honolulu, HI 96809

Dear Sirs,

By means of this letter I wish to comment on the Koloa Radio Tower that Stangl Broadcasting, Inc. proposes to construct on Haupu Ridge in Koloa, Kauai (Kauai Notices, Draft Environmental Assessments, 8 August 1996).

In the Environamental Assessment for the proposed radio tower conservation use permit application only vague generalities are given regarding the composition of the flora and vegetation at the site (pp. 9-10, under Flora, and again under the Archaeological survey). Of the few botanical names cited, a number are either misspelled or outdated names. It is obvious that the survey was very superficial and was not carried out by a trained botanist familiar with the Hawaiian flora.

My colleagues and I in the Plant Science department of the National Tropical Botanical Garden have conducted field work in the Haupu Mountain range on many occasions and believe a significant number of native Hawaiian plant taxa do occur on the summit ridge at the proposed site. Please note that the Haupu Mountain range harbors four plant taxa Federally listed as Endangered (*Brighamia insignis, Delissea rhytidosperma, Lipochaeta micrantha* var. *exigua*, and *Munroidendron racemosum*). A number of species of concern (*Hedyotis fluviatilis, Hibiscus kokio* ssp. *kokio*, and an unidentified species of *Labelia*) also occur here.

In light of this, we are concerned that if any of these plant taxa occur at the site they could be adversely impacted by the project. I request that a detailed botanical survey of the site be undertaken by a qualified botanist(s) and the results be made available to the public before permission is granted for the project to proceed.

Sincerely,

David H. Lorence
Senior Research Botanist

cc. Stangl Broadcasting, Inc., Diane Ragone, Steve Perlman

POST OFFICE BOX 340, LAWAI, KAUAI, HAWAII 96765 USA • (808) 332-7324 • FAX (808) 332-8765

26

THE KEITH COMPANIES
Hawaii Division

September 19, 1996

60448.003

David H. Lorence
Senior Research Botanist
National Tropical Botanical Garden
P.O.Box 340
Lawai, Kauai, Hawaii 96765

Subject: Draft Environmental Assessment for (EA), Koloa, Kauai Radio Tower;
TMK: 3-4-6:01, 2-9-02:01

Dear Mr. Lorence:

We appreciate your letter of August 21, 1996, expressing your concerns about the subject project. On September 15, 1996 an on site field survey of the flora was performed by Timothy Motley of University of Hawaii, Manoa. The results of the survey revealed that none of the flora occurring within the proposed radio tower site is classified as endangered or threatened. The full report will be included as appendix F of the Final Environmental Assessment (FEA).

Please find enclosed a copy of the report by Mr. Timothy Motley of University of Hawaii, Manoa for your files. Thank you for participating in the review process for this Environmental Assessment. Your letter and this response will be incorporated into the Final Environmental Assessment (FEA). If you have any additional questions please contact us at (808) 241-5170.

Sincerely,
The Keith Companies-Hawaii, Inc.

Andrew Daymude

E. Andrew Daymude
Vice President

attachments: as stated

EAD:sf

27

Planning
Engineering
Environmental Services
Land Surveying
Public Works
Water Resources
Cultural Resources

(808)241-5170 FAX (808)241-5177
4473 Pahe'e Street #204

United States Department of the Interior

FISH AND WILDLIFE SERVICE
PACIFIC ISLANDS ECOREGION
300 ALA MOANA BOULEVARD, ROOM 3108
BOX 50088
HONOLULU, HAWAII 96850
PHONE: (808) 541-3441 FAX: (808) 541-3470

In Reply Refer To: AA

AUG 23 1996

Don Horiuchi
Department of Land and Natural Resources
P.O. Box 621
Honolulu, HI 96809

Re: Draft Environmental Assessment for the Proposed Radio Tower, Conservation District Use Permit, Koloa, Kauai (TMK: (4) 3-4-06:01)

Dear Mr. Horiuchi:

The U.S. Fish and Wildlife Service (Service) has reviewed the Draft Environmental Assessment (EA) for the Proposed Radio Tower, in support of an application for a Conservation District Use Permit (CDUP), Koloa, Island of Kauai, Hawaii (TMK: (4) 3-4-06:01). The Service offers the following comments for your consideration.

Stangl Broadcasting, Inc. (SBI) is proposing to construct a radio tower for a multiple use antenna along the Haupu Ridge in Koloa. The purpose of the antenna will be to broadcast a non-commercial radio service permitted by the Federal Communications Commission (FCC). The footprint of the antenna itself would be 25-square feet. The project will also include placement of three 200-square foot storage containers and guy wire tie downs. Electrical power will also be supplied to the site, requiring installation of utility poles and power lines.

While the Draft EA addressed the flora and fauna in the vicinity of the project site, no surveys were conducted by professional biologists. Therefore, the Draft EA does not adequately describe the existing species or address the impacts the proposed project may have on these species. Without this information, the potential impacts of the proposed project on fish and wildlife resources and their habitats cannot be assessed. The following federally listed plants are known from the vicinity of the proposed project site: *Lipochaeta micrantha* var. *micrantha*, *Melicope haupuensis*, and *Pteralyxia kauaiensis*. The Haupu Mountains are also the last known location that any species of the rare Kauai endemic land snails in the genus *Carelia* were observed. The Draft EA does not address the potential impacts of the project on any of these species.

Mr. Horiuchi, cont.

The proposed project site is also within proximity of a known nesting colony of the federally threatened Newell's shearwater (*Puffinus auricularis newelli*). The breeding activity of these birds could be disrupted by construction activity associated with the project, such as helicopter flights, use of backhoe's for digging, etc. In addition, the new power lines to the radio tower are likely to cause increased collision and fallout of fledgling birds returning to the nesting site. The potential for the project to impact seabirds should be addressed, and mitigation measures identified to avoid or minimize these impacts.

The Service does not believe that the Draft EA supports a Negative Declaration or Finding of No Significant Impact. We recommend that the decision to issue the CDUP be delayed until further surveys of significant terrestrial resources are conducted and a more comprehensive impact assessment is completed. Results of these studies and evaluations should be included in a revised Draft EA and CDUP application that is resubmitted to the public for review.

We appreciate the opportunity to comment, and we look forward to reviewing the results of the terrestrial surveys and a revised EA. If you have questions regarding these comments, please contact Fish and Wildlife Biologist Adam Asquith at 808/541-3441.

Sincerely,

Karen W Rosa

for/ Brooks Harper
Field Supervisor
Ecological Services

cc: FCC, Hayward, CA
OEQC, Honolulu, HI
E. Kaneshige, Honolulu, HI
Stangl Broadcasting, Honolulu

28

The Keith Companies
Hawaii Division

September 19, 1996

60448.003

Mr. Brooks Harper
Field Supervisor
Ecological Services
United States Department of the Interior
Fish and Wildlife Service
Pacific Islands Ecoregion
300 Ala Moana Boulevard, Room 3108
P.O. Box Box 50088
Honolulu, Hawaii 96850

Subject: Draft Environmental Assessment (EA) for Koloa, Kauai, Radio Tower;
TMK: 3-4-6:01, 2-9-02:01

Dear Mr. Harper:

We appreciate your letter of August 23, 1996, expressing your concerns about the subject project. On September 15, 1996 an on site field survey of the flora and fauna was performed by Phil Bruener of Brigham Young University, Hawaii and Timothy Motley of University of Hawaii, Manoa. The results of their survey's revealed that none of the flora or fauna occuring within the proposed radio tower site is classified as endangered or threatened. Additionally, the fauna survey did not reveal any signs of current or past nesting of the Newell's Shearwater. The full reports will be included as appendixes F and G of the Final Environmental Assessment (FEA).

Please find enclosed copies of the reports by Mr. Phil Bruener of Brigham Young University-Hawaii and Mr. Timothy Motley of University of Hawaii, Manoa for your files.

Thank you for participating in the review process for this Environmental Assessment. Your letter and this response will be incorporated into the Final Environmental Assessment (FEA). If you have any additional questions please contact us at (808) 241-5170.

Sincerely,
The Keith Companies-Hawaii, Inc.

Andrew Daymude

E. Andrew Daymude
Vice President

attachments: as stated

EAD:sf

Planning
Engineering
Environmental Services
Land Surveying
Public Works
Water Resources
Cultural Resources

K:\Jobs\60448.003\Documents\092696 Final EA Response to Brooks Harper Letter

(808) 241-5170 FAX (808) 241-5177
4479 Rice Street, #204
Lihue, Kauai, Hawaii 96766

STATE OF HAWAI'I
OFFICE OF HAWAIIAN AFFAIRS
711 KAPIOLANI BOULEVARD, SUITE 500
HONOLULU, HAWAII 96813-5249
PHONE (808) 594-1888
FAX (808) 594-1865

September 03, 1996

Mr. Everett Kaneshige
Stangl Broadcasting, Inc.,
P.O. Box 1957
Honolulu, HI 96805

Dear Mr. Kaneshige:

Thank you for the opportunity to review the Draft Environmental Assessment (DEA) for the Koloa Radio Tower, Island of Kauai. The applicant is proposing to construct an 250 foot radio tower along the Haupu Ridge in Koloa, Kauai. The area for the proposed construction belongs to Grove Farm, Co. and is located on a steep terrain exposed to damp weather with no viable access except by helicopter.

After a review of DEA, the Office of Hawaiian Affairs has no objections to the proposed construction. Based on the information contained in the DEA, the proposed tower apparently bears no significant long-term adverse impacts on adjacent lands nor upon existing flora and fauna. No known archaeological remains exist and the tower will not significantly alter the landscape and/or surrounding scenery. Please contact me, or Linda K. Delaney, the Land and Natural Resources Division Officer (594-1938), or Luis A. Manrique (594-1755), should you have any questions on this matter.

Sincerely yours,
Martha Ross
Martha Ross
Deputy Administrator

LM:lm

29

KEITH COMPANIES - HAWAII, INC.

September 13, 1996

Job 60448.003

Ms. Martha Ross, Deputy Administrator
State of Hawaii
Office of Hawaiian Affairs
711 Kapiolani Boulevard, Suite 500
Honolulu, HI 96813-5249

RE: Draft Environmental Assessment for Stangl Broadcasting Koloa Radio Tower
TMK: 3-4-6:1

Dear Ms. Ross:

We are in receipt of your letter of September 3, 1996, to Mr. Everett Kaneshige related to the above Draft Environmental Assessment.

We appreciate both the time you have taken to review this project with regard to your Department's interests, and your statement noting no adverse impacts to the site as a result of the tower placement.

Sincerely,
The Keith Companies-Hawaii, Inc.

Andrew Daymude

E. Andrew Daymude
Vice President

cc: Everett Kaneshige, Esq.

Planning
Engineering
Environmental Services
Land Surveying
Public Affairs
Water Resources
Construction Services

K:\Jobs\Stangl\60448.003\Agency\081396 Response to M. Ross.OHA

(808) 521-5171 FAX (808) 521-5177
4279 Rice Street #232
Lihue, Kauai, Hawaii 96766

HAWAII DEPARTMENT OF LAND AND NATURAL RESOURCES
DIVISION OF FORESTRY AND WILDLIFE
KAUAI DISTRICT
3060 EIWA STREET, ROOM 306
LIHUE, KAUAI, HAWAII 96766-1875

September 12, 1996 IN REPLY REFER TO

E. Andrew Daymude, ASLA
Vice President
The Keith Companies, Inc.
4479 Rice Street #204
Lihue, Kauai, HI 96766

Subject: Koloa, Kauai, Radio Tower; TMK: 3-4-6: 1,2-9-02:1

Dear Mr. Daymude:

Thank you for sending the additional information on the subject radio tower.

Probably the most significant potential impact of the proposed radio tower on wildlife would be the possible night time aerial collisions of the Newell's Shearwater (Puffinus auricularis newelli), or the Hawaiian Dark-rumped Petrel (Pterodroma phaeopygia sandwichensis) with the tower itself, or its guy wires. Both of these birds are listed as threatened/endangered.

We have not found such towers or guy wires to be a significant problem to these birds on Kauai at similar towers. The birds apparently have excellent night vision, and under normal conditions can see most man-made objects when they fly to and from the sea after dark. It is primarily in situations where wires or structures are located near bright lights that there is a problem with these birds. They become temporarily blinded by the lights, and cannot see the wires and will fly into them.

In my opinion, the proposed tower and guy wires are not likely to be a significant problem for transiting night-flying seabirds if there are no bright lights associated with them. The red flashing aircraft beacon normally fitted on such towers should be o.k., as other similar towers on Kauai use them, and we have not noted any fallout associated with them.

A secondary concern is that there could conceivably be Newell's shearwater nesting burrows on the project site. If there are nests on site or very close by, they could be subject to destruction, or cave-ins during the tower construction process. Furthermore, if a nesting colony exists on the tower site, large numbers of birds would be flying to and from their nests and could be at greater risk just because of the magnitude of activity.

The risk of collision with the wires would be increased in that case. The possibility of a nesting colony at the site should be checked out on the ground by a biologist familiar with the species. One can fairly easily determine this by searching for burrows and other signs of their presence on the proposed construction site. The birds occupy the nesting grounds from April through October. A search for burrows should be made during thos months. We do know of a nesting colony that is located about one kilometer southwest of the project site.

If no nesting burrows are located on site, I feel fairly confident that the proposed tower would not pose a significant problem for wildlife in the area.

If you need further assistance on this, please contact me at 274-3433.

Sincerely,

Thomas C. Telfer

Thomas C. Telfer
District Wildlife Manager

P.S. A brochure in enclosed that describes the shearwater light attraction problem in more detail. It may be a useful resource on many of your projects. T.C.T.

KEI[illegible] OMPA[illegible]
Hawaii Division

September 16, 1996

60448.003

Mr. Tom Telfer
District Wildlife Manager
Department of Land and Natural Resources
Division of Forestry and Wildlife
4398 D Pua Loke
Lihue, Kauai, Hawaii 96766

Subject: Koloa, Kauai, Radio Tower;
TMK: 3-4-6: 01 & 2-9-02:01

Dear Mr. Telfer:

Thank you for the expeditious review and response to the additional information that we delivered to your office on September 13, 1996. It will be beneficial to the project to include your letter in the Final Environmental Assessment. On September 15, 1996 a member of my staff, along with Mr. Phil Breuner, of BYU-Hawaii, and Mr. Tim Motley of University of Hawaii, Manoa, visited the proposed radio tower site. After three hours of intense field work Mr. Breuner concluded that there was no evidence of Newell's Shearwater nesting at the subject site. Mr. Motley also did a through botanical survey and did not identify any of the rare or endangered plant species as mentioned by either the National Tropical Botanical Garden, or the U.S. Department of Interior, Fish and Wildlife Service.

Both of these two gentlemen are currently preparing their technical reports from their field reconnaissance. Once these reports become available, we will be sending you a copy of each of them for your files, as well as, incorporating them into the Final Environmental Access.

If you have any additional questions regarding this application or need any other information, please do not hesitate to call me at (808) 241-5170.

Sincerely,
THE KEITH COMPANIES-HAWAII, INC.

E. Andrew Daymude
Vice President

EAD.sl

K:\adv\Stangl\60448.003\Agency\091696 Letter Tom Telfer

Planning
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(808) 241-5170 FAX (808) 241-5177
4479 Pua Street #204
Lihue, Kauai, Hawaii 96766

31

RECEIVED
DEPT OF
LAND MANAGEMENT
SEP 10 2 54 PM '96

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

September 4, 1996

96-122/epo

TO: The Honorable Michael Wilson, Chairperson
Department of Land and Natural Resources

FROM: Lawrence Miike
Director of Health

SUBJECT: CONSERVATION DISTRICT USE APPLICATION

Applicant: Stangl Broadcasting, Inc.
File No.: None
Request: Radio Broadcast Antenna Tower
Location: Koloa, Kauai
TMK: 3-4-06: 01

Thank you for allowing us to review and comment on the subject request. We have the following comments to offer:

Land Clearing and Grubbing

The material resulting from land clearing and grubbing activities shall be disposed of at the tower site or transported to a permitted solid waste management facility. Open burning of the material is prohibited.

Should you have any questions on the above comment, please call Clyde Takekuma, Chief Sanitarian of Kauai District Health Office at 241-3323.

Electric and Magnetic Fields

The comment on VII.C. Electric and Magnetic Fields on page 12, concerning the paragraph that reads "Due to the height of the tower, the design, and placement of antennas, there will BE (sic) no risk of exposure to electromagnetic radiation fields. Thus, the proposed project will not negatively impact the physical environment, workman or the general public." This project will build an antenna tower, but no one yet knows what types of antennas will be installed on it. Without knowing the types of antennas and the types of transmissions from those antennas, no one can definitely judge the risks or negative impacts. This

paragraph and Section G are too general and gloss over the possible problems.

The paragraph should correctly read, "DEPENDING ON the height of the tower, the design, and placement of antennas, the risks of exposure to electromagnetic radiation or electromagnetic fields may or may not be hazardous. Each radio station that installs an antenna on this tower should assess the possible human health risks or negative environmental impacts before installation."

Should there by any questions, please call Leslie Au of the Hazard Evaluation & Emergency Response Office at 586-4249.

c: Kauai DHO
HEER

THE KEITH COMPANIES
Hawaii Division

September 19, 1996

Mr. Lawrence Miike
Director of Health
State of Hawaii
Department of Health
P.O. Box 3378
Honolulu, Hawaii 96801

Subject: Draft Environmental Assessment (DEA) for Koloa, Kauai, Radio Tower;
TMK: 3-4-6: 1, 2-9-02:01

Dear Mr. Miike:

Thank you for your comments regarding the above mentioned project. The following are your Comments (bold/italics) and our Responses to the concerns of your Department which will be included in the Final Environmental Assessment (FEA):

1. ***Land Clearing and Grubbing: The material resulting from land clearing and grubbing activities shall be disposed of at the tower site or transported to a permitted solid waste management facility. Open burning of the material is prohibited.***

Comment acknowledged. All standard county and state laws governing construction practices will be followed during the construction activities of this project. This will include appropriate disposal of all solid waste materials.

2. ***Electrical and Magnetic Fields, This project will build an antenna tower, but no one yet knows what types of antennas will be installed on it. Without knowing the type of antenna and the types of transmissions from those antennas, no one can definitely judge the risk or negative impacts. This paragraph and section G are too general and gloss over the possible problems. The paragraph should correctly read, "Depending on the height of the tower, the design, and placement of the antennas, the risks of exposure to electromagnetic radiation or electromagnetic fields may or may not be hazardous. Each radio station that installs and antenna on the tower should assess the possible human health risks or negative environmental impacts before installation."***

The intention of paragraph G of the Draft Environmental Assessment (DEA) was not to gloss over any pertinent data for the proposed tower, the common use antenna, or this multi-use site. We agree whole heartily with your suggested alternative language and will incorporate it into the Final Environmental Assessment (FEA) as stated. "Depending on the height of the tower, the design, and placement of the antennas, the risks of exposure to electromagnetic radiation or electromagnetic fields may or may not be hazardous. Each radio station that installs and antenna on the tower should assess the possible human health risks or negative environmental impacts before installation." It should be noted that in the Stangl Broadcasting Inc. (SBI) application to the Federal Communication

(808) 241-5170 FAX (808) 241-5177
4479 Rice Street #204
Lihue, Kauai, Hawaii 96766

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Cultural Resources

Commission (FCC) for FM stations to operate from this multi-use site, and in similar application by Hawaii Public Radio, the applicants were required to address the issue of electromagnetic radiation. This issue was fully studied.

In that study, associated with the submittal to and accepted filing by the FCC, human exposure levels for up to eight maximum number power (100kW) FM stations sharing the common antenna mounted on the 250 foot tower were computed. The results demonstrated that with even this maximum number of stations operating from the antenna, the electromagnetic levels only reached 71.6% of the guideline amounts. If additional stations, beyond those covered in the initial study are to be added to the site, or if other communication users are added, certainly additional studies measurements should be made. FCC produces require such studies as part of each broadcast application.

The 250 foot tower height is needed to overcome terrain obstructions between the site and the city of license (Kekaha) of one of the proposed stations, and to maximize coverage of the populated areas of the island and relates to coverage requirements pertinent to the FCC application. All electromagnetic studies, therefore, must be conditioned upon the tower height.

We appreciate, understand, and support your concern for human health risk in the instance of any installation involving new sources of electromagnetic radiation. The reason that we did not include a detailed analysis in our Draft Environmental Assessment (DEA) was due to the preemptive nature of the federal regulations and requirements in this matter, and because we had addressed them in detail in our FCC applications. Furthermore, we did not wish to unnecessarily complicate the DEA with a detailed technical discussion of this single issue.

We are pleased to include your suggested language in the Final Environmental Assessment (FEA). I have enclosed a copy of the portion of the FCC application for KSRF (one of the stations to share this site) that details the human exposure analysis for this site, for your reference and perusal. You will note that it is based upon 800 kW (100 kW X 8) and is adjusted for radiation levels occurring at 6 feet above ground level (head height) assuming level terrain from the antenna base and concurrent identical fields from all stations. This is a worst case analysis, since in addition to the issues discussed in the attached material, the land is not level, but slopes downward in all directions from the antenna base elevation.

33

If you have further questions or concerns related to this project, please feel free to contact me at (808) 241-5170.

Sincerely,
The Keith Companies-Hawaii, Inc.

Andrew Daymude

E. Andrew Daymude
Vice President

Attachment: technical study as stated (7 pages)

THE KEITH COMPANIES

a. National Environmental Policy Act of 1969:

In 1969, Congress enacted the National Environmental Policy Act (NEPA), which requires the FCC to evaluate the potential environmental significance of the facilities it regulates and authorizes. Human exposure to Radio Frequency (RF) radiation has been identified as an issue the FCC must consider.

Beginning with the filing of applications after January 1, 1986, broadcast stations have been required to "certify compliance" with FCC prescribed guidelines on human exposure to RF radiation. The FCC is using as its processing guidelines, the American National Standard Institute's (ANSI) RF radiation protection guides (ANSI C95.1-1982). These exposure limits are expressed in terms of milliwatts per square centimeter.

These exposure limits are averaged over any six minute period and vary according to the frequency involved:

Frequency Range (Mhz.)			Power Density (mW/sq. cm)	
0.3	to	3	100	AM
3	to	30	900/(freq^2)	HF
30	to	300	1.0	VHF TV & FM
300	to	1,500	Freq/300	UHF TV
1500	to	100,000	5.0	

(Same as ANSI Standard)

Stangl Broadcasting, Inc., recognizes that compliance with the above criteria at sites involving multiple AM, FM and/or TV facilities is based upon the contributions of all such facilities. At the site discussed in this application there exists or will exist with a grant of this or other pending applications, the following facilities:

Facility	Frequency	Power		
KSRF (FM)	95.9 mHz.	100	kW	H&V
KAUI (FM)	103.7 mHz.	100	kW	H&V

The following stations have expressed initial interest in relocating to this site and sharing the common antenna at a later date:

Facility	Frequency	Power
Hawaii Public Radio CP	90.1 mHz.	100 kW H&V
Unbuilt CP	98.1 mHz.	100 kW H&V

Computer modeling of data can simplify the presentation of information used to evaluate RF exposure levels at multiple use sites:

A "worst case" spreadsheet was developed using the appropriate formulae as contained in O.S.T. Bulletin 65. Tabular field strength data is available from the antenna manufacturer at 1 degree increments. This computer program allows input of precise field strength data at increments of 1 degree below the horizontal to a maximum of 90 degrees (directly below the antenna) and computes EIRP H+V, horizontal distance, and power density in mW/cm2 for each degree of declination angle.

This information is presented in tabular form. In addition, the program produces a graphical presentation of RFR guideline compliance with power density as the ordinate and distance from the tower base in meters as the abscissa. The program also produces an elevation pattern of relative field vs. declination angle in degrees.

The computer model presents a "worst case" evaluation because the prediction is based upon the antenna exhibiting precisely concurrent radiation maxima for each frequency at precisely the same location on the ground. In the real world this is not the case, as the interbay spacing wavelength changes with frequency. Actual performance results in the various radiation maxima being spread across adjacent areas and never achieving levels as high as the computer model would indicate at any one ground location. The resulting printed information and graphs are included as Exhibit 6.

The result of this analysis is that no radiation hazard will exist, even with the "worst case" evaluation. The area at the base of the tower will be secured and posted with warning signs. Workers employed to climb the tower or work in any potential over-exposure location will not be permitted to enter the work area until cleared by the station manager or other responsible person. Appropriate warning signs will be posted to insure safety.

In addition, Stangl Broadcasting, Inc., the site administrator, will establish and enforce work rules and safety procedures applicable in a potential over-exposure area. The rules will establish how close a worker can get to the antenna when it is operating at normal power and specify the power reduction required in order to make other locations safe.

It is recognized that maintenance or installation work on or near the antennas will require the stations to completely shut down. All employees, contract and other persons having access to areas of potential exposure will be required to sign a site management guide indicating that they are aware of and will comply with all safety rules.

In the instance of this multiple use site, a single site access policy incorporating the above philosophy will be established. All procedures will be reviewed and updated as necessary on a yearly basis or earlier if circumstances warrant. Measurements of non-ionizing radiation will be made periodically to insure continued full compliance with the FCC/ANSI Radiation Guidelines.

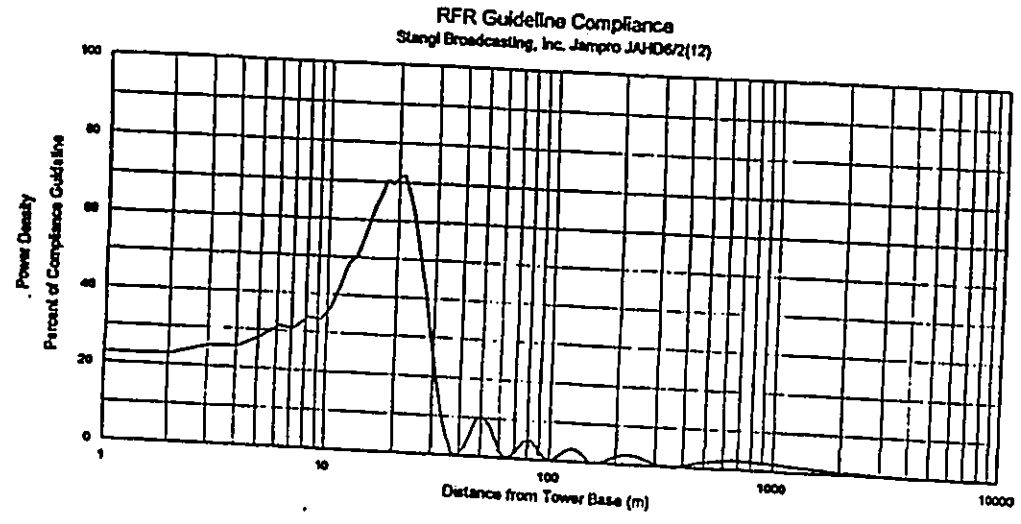
Combining all FM stations at the top of the support structure and by the use of the antenna proposed, all proposed stations may be accommodated without unsafe exposure of workers to non-ionizing radiation. The site is inaccessible to the general public. Site access is possible only via helicopter.

In view of the foregoing, this proposal is not deemed to be a major environmental action.

III ALLOCATION STUDY:

It is proposed to amend the FM Table of Allotments, 47 C.F.R. Section 73.202(b), as indicated in this application. Exhibit 7 is the pertinent portion of a computer study, the results of which indicate that, for the reference point used (the proposed site coordinates), and for the class of station proposed (Class C1), that all of the separation requirements of Section 73.207 of the Commission's Rules are fully met.

The applicant requests that the allotment of Channel 240 at Poipu, Hawaii be changed from Class A to Class C1. No other changes in the Table of Allotments are proposed in reference to this application.



Maximum Reached: 71.80%

CAUGHILL-PALITZ, INC.
HONOLULU, HAWAII

Exhibit 6 - Page 2
RF Guideline Compliance Study
Graphical Data Presentation

Stangl Broadcasting, Inc., KSRF (FM)
Poipu, Hawaii
Channel 240 100 KW E.R.P. 280 m HAAT

Project: Stangl Broadcasting, inc. Jampro JAHD6/2(12)

C/R Height AGL	58.2 m
Peak ERP (H+V)	800 kw
Maximum Reached:	71.80%

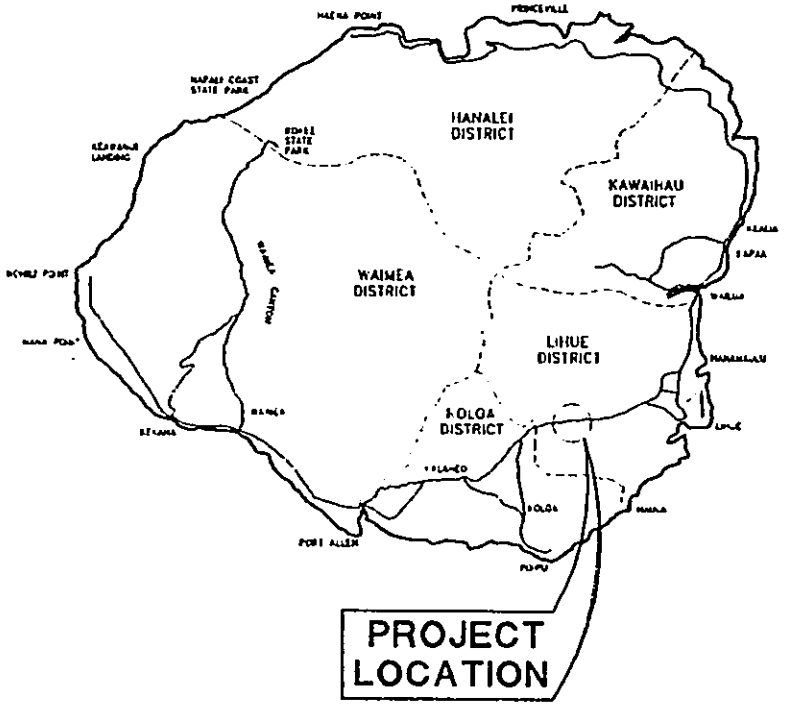
NOTE: ANTENNA C/R ADJUSTED FOR RADIATION
MEASURED AT HEAD HEIGHT (6 FEET) AGL.

CAUGHILL-PALITZ, INC.
HONOLULU, HAWAII

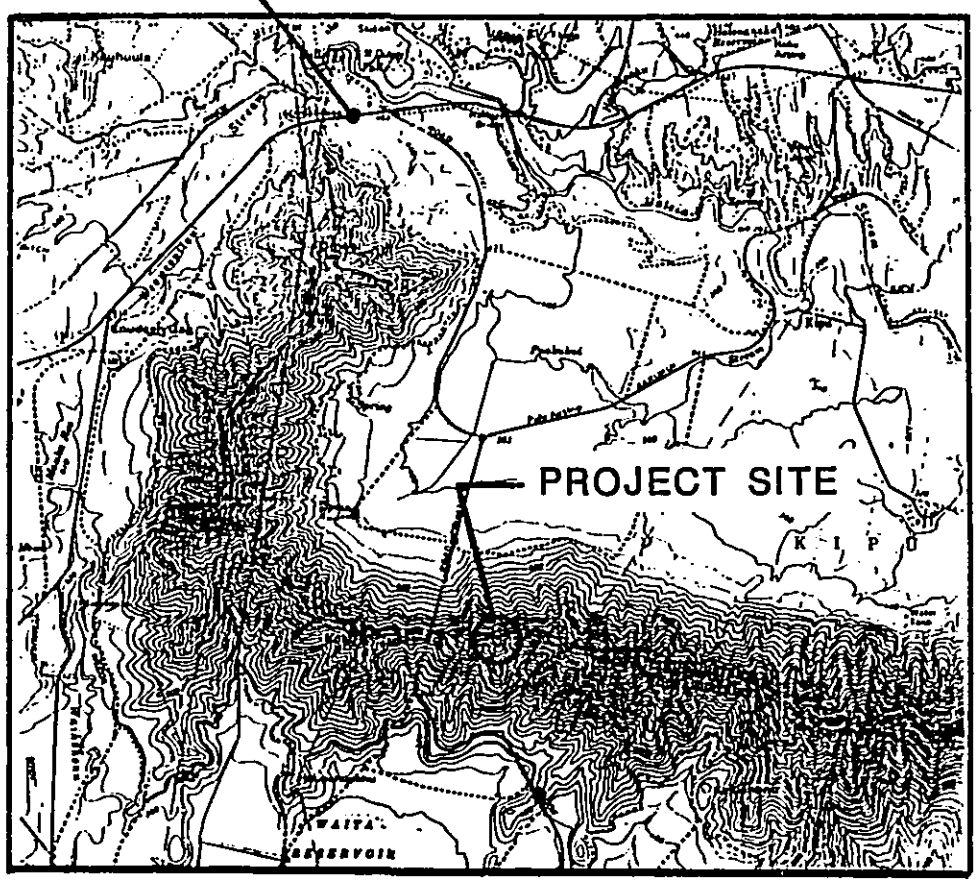
Exhibit 6 - Page 1
RF Guideline Compliance Study
Project Identification and Information

Stangl Broadcasting, Inc., KSRF (FM)
Poipu, Hawaii
Channel 240 100 KW E.R.P. 280 m HAAT

EXHIBITS



LOCATION



VICINITY

EXHIBIT 1

LOCATION & VICINITY MAP

Proposed Radio Tower
STANGL BROADCASTING, INC.

THE KEITH COMPANIES
Hawaii Division

NOT TO SCALE

60448.002
2/24/96

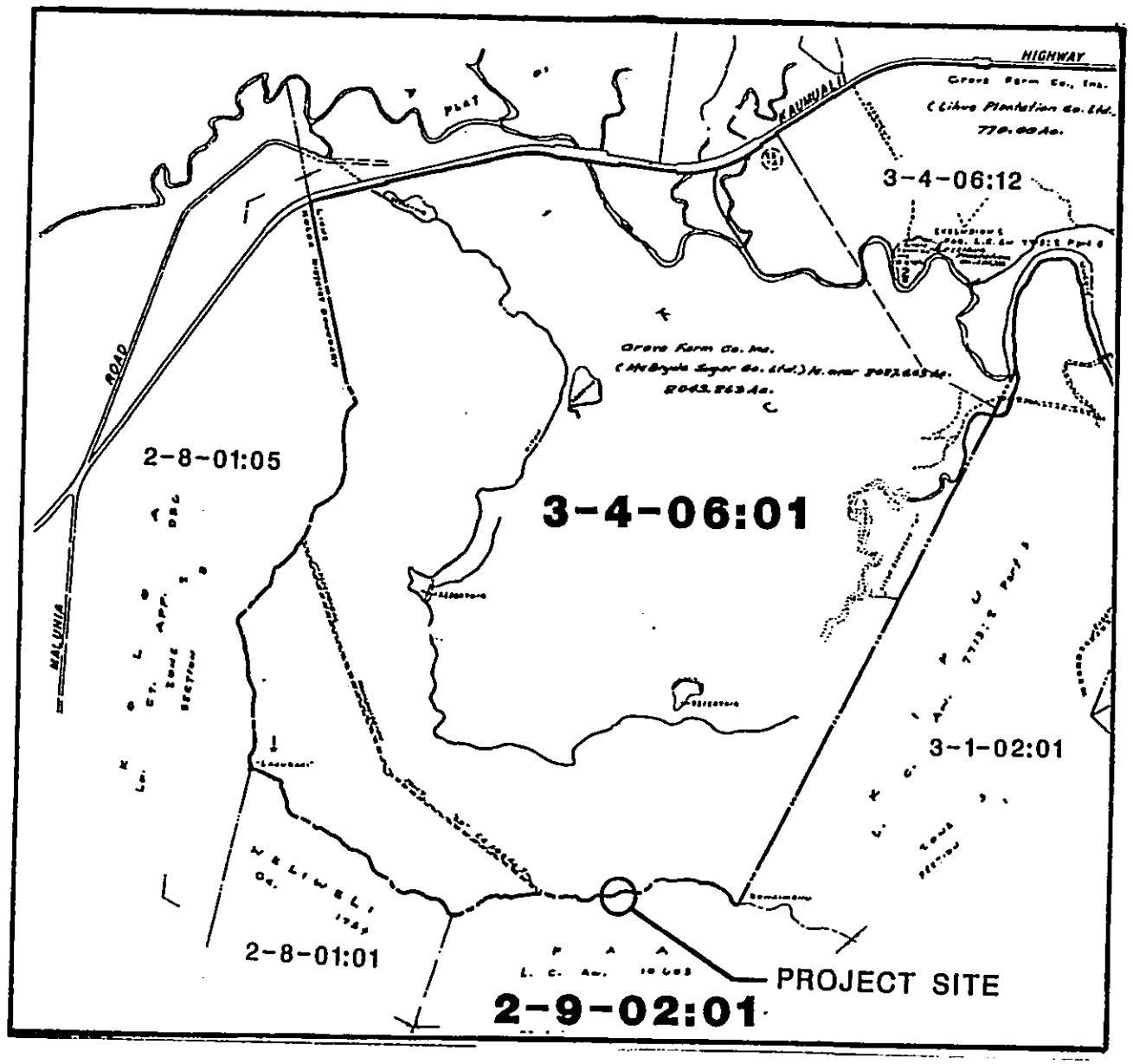


EXHIBIT 2

TAX MAP KEY

Proposed Radio Tower
STANGL BROADCASTING, INC.

THE KEITH COMPANIES
Hawaii Division

NTS.

60448.002
2/29/96

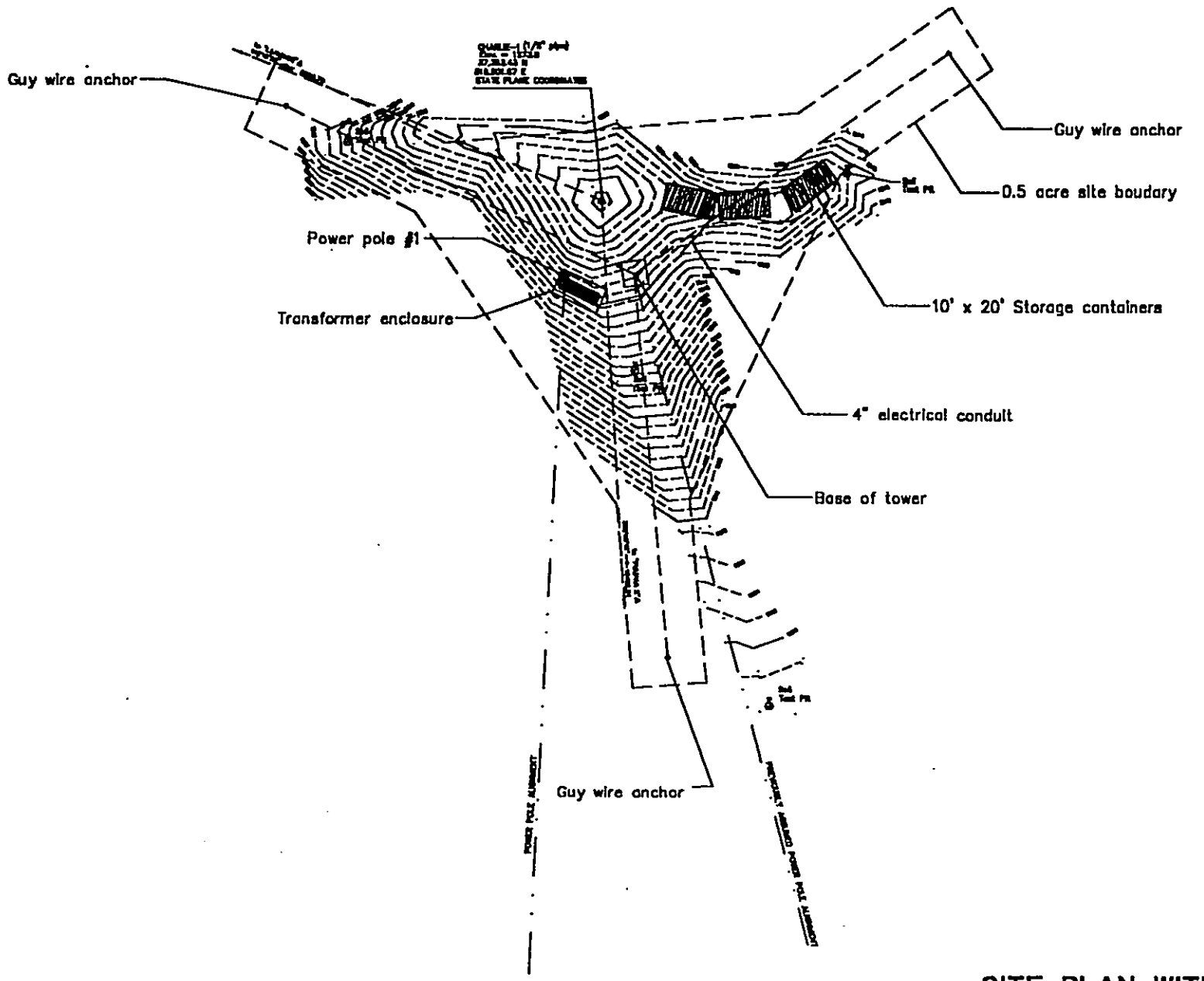
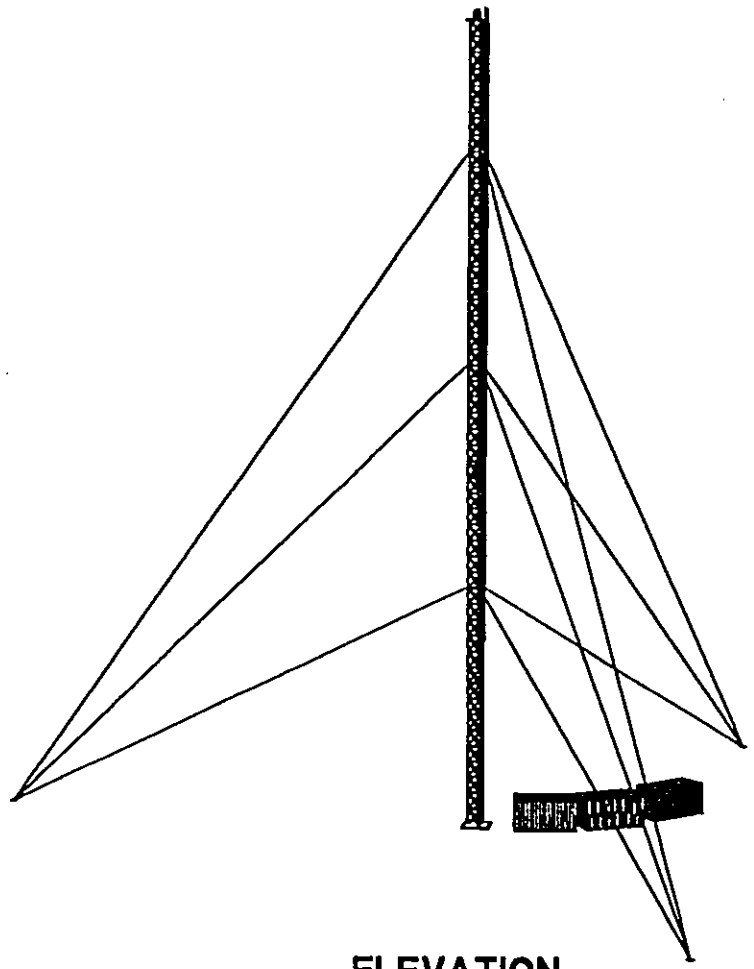


EXHIBIT 3

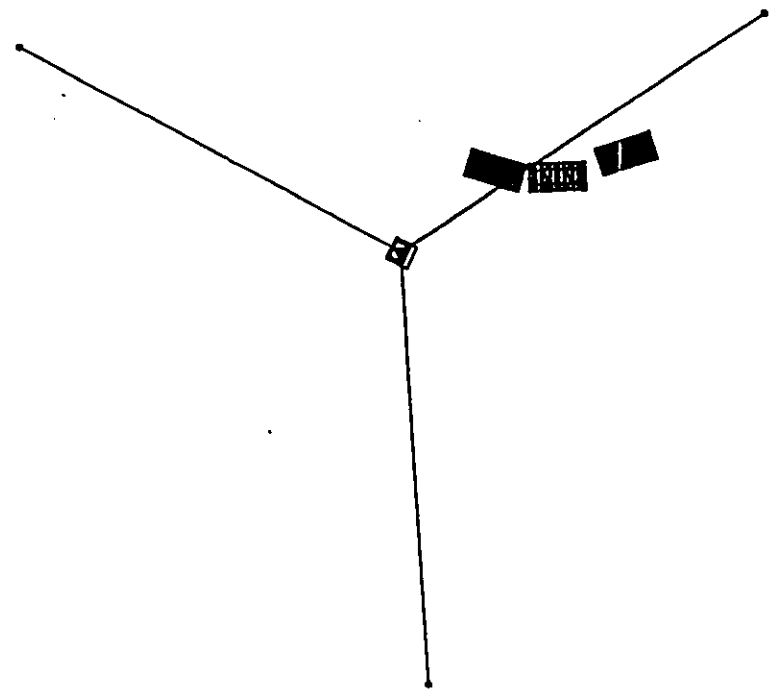
SITE PLAN WITH TOPOGRAPHY

Proposed Radio Tower
STANGL BROADCASTING, INC.

THE KEITH COMPANIES
Hawaii Division



ELEVATION



PLAN

EXHIBIT 4

PLAN AND ELEVATION OF TOWER

Proposed Radio Tower
STANGL BROADCASTING, INC.

THE KEITH COMPANIES
Hawaii Division

60448.005
1/14/96

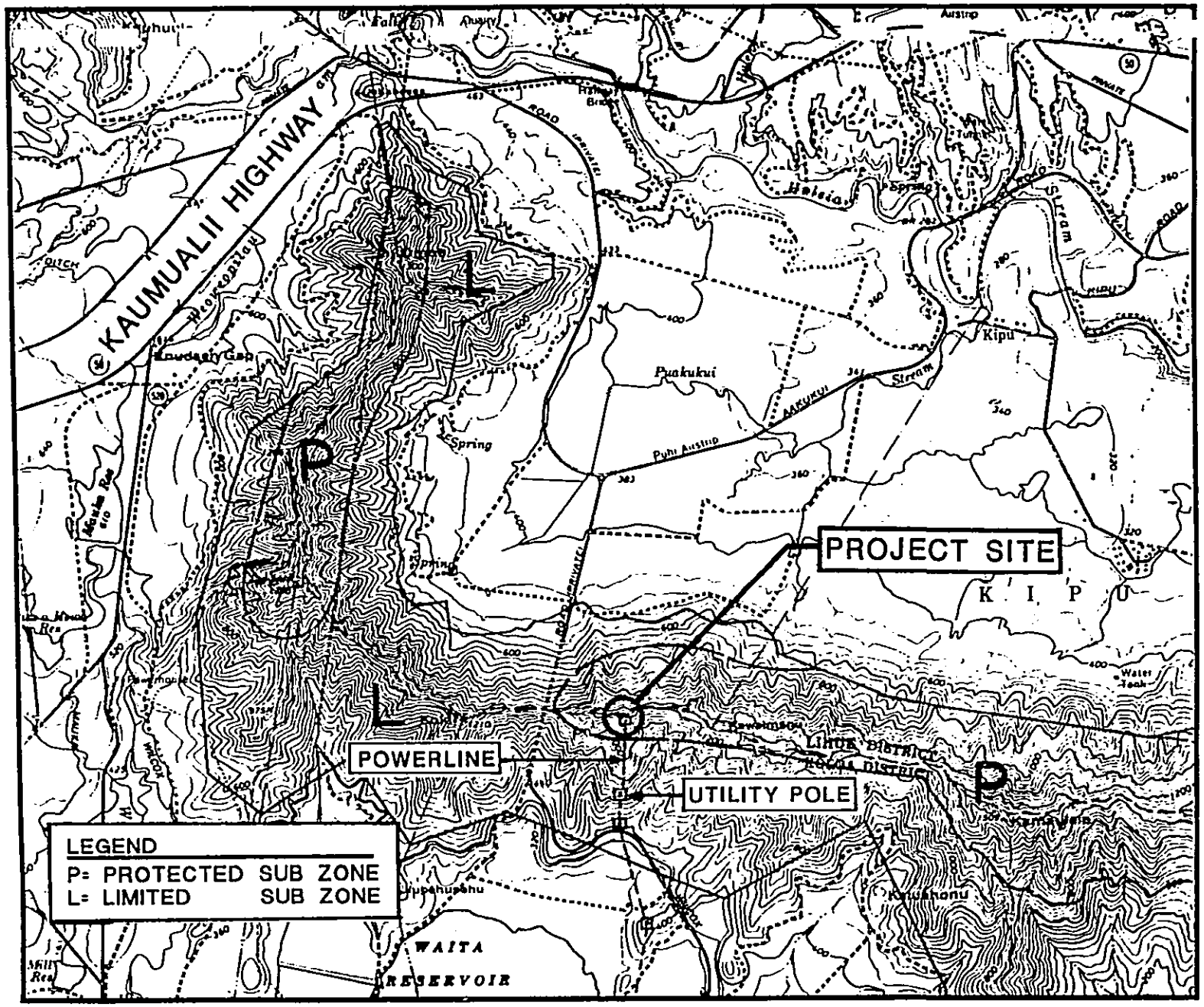


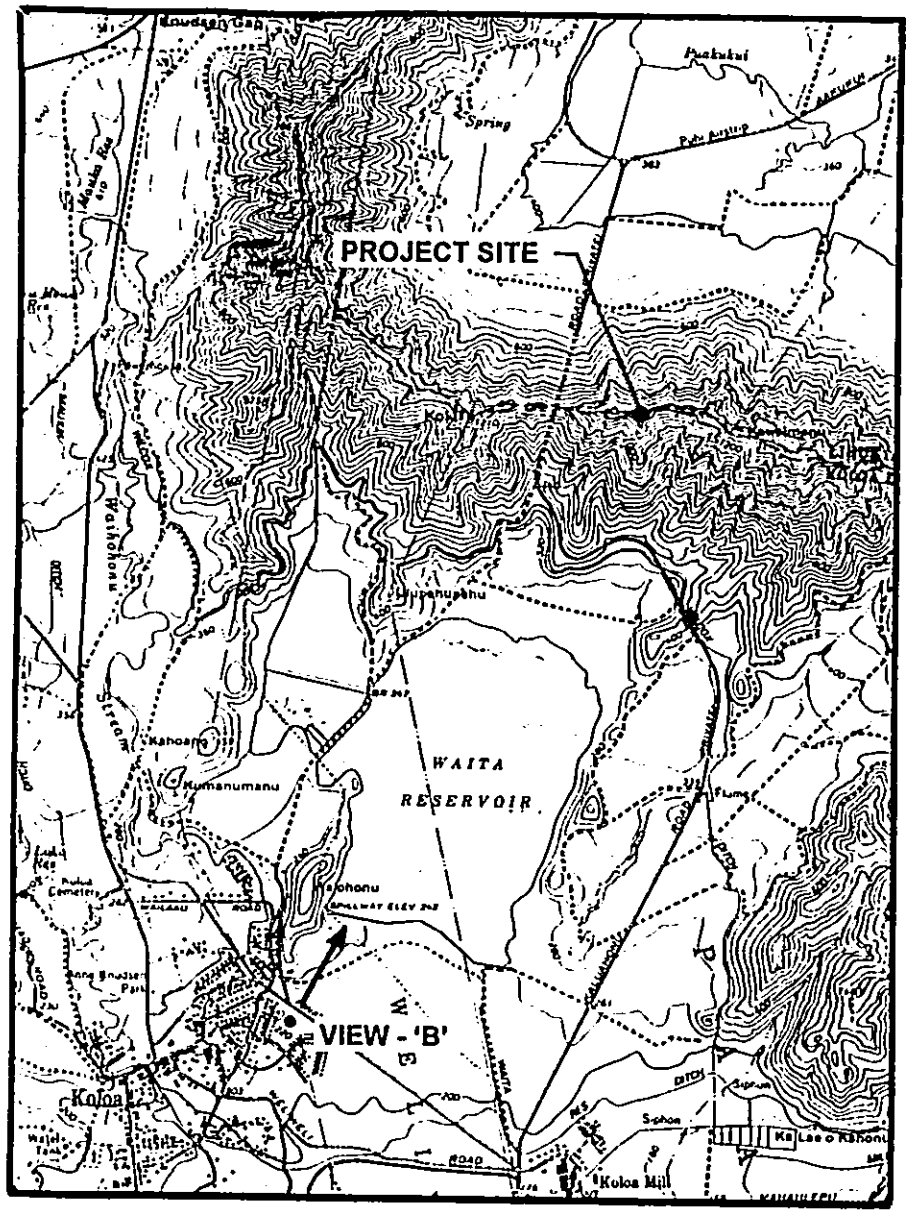
EXHIBIT 5

STATE LAND USE DISTRICTS & CONSERVATION MAP

Proposed Radio Tower
STANGL BROADCASTING, INC.

THE KEITH COMPANIES
Hawaii Division

60448.002
2/29/96



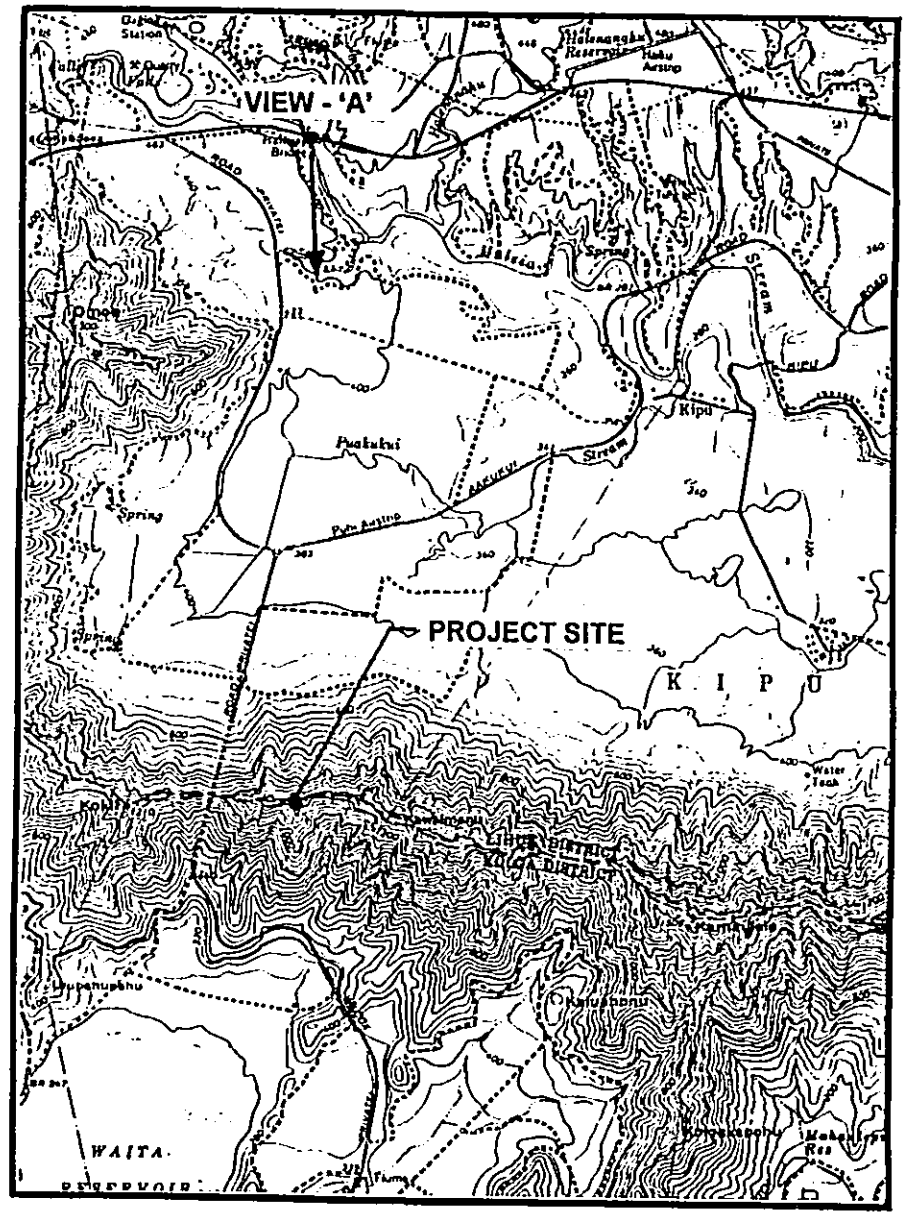


EXHIBIT 6

VISUAL ANALYSIS - KEY MAP

Proposed Radio Tower

STANGL BROADCASTING, INC.

THE KEITH COMPANIES
Hawaii Division

NOT TO SCALE

60448.00
9/25/95

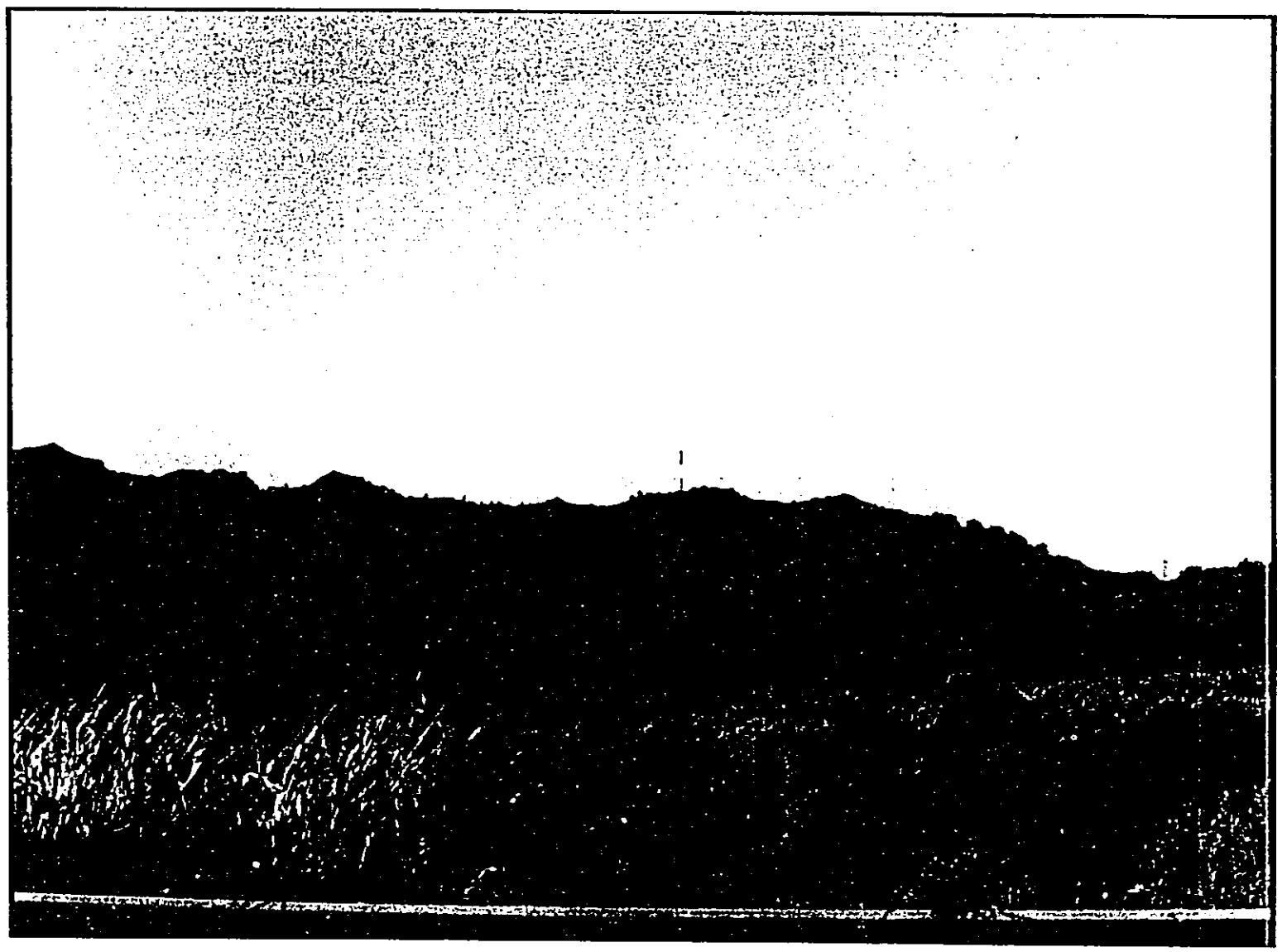


EXHIBIT 7

VIEW "A"–KAMUALII HIGHWAY AT HALFWAY BRIDGE

THE KEITH COMPANIES
Hawaii Division

Proposed Radio Tower
STANGL BROADCASTING, INC.

60448.00
9/25/95

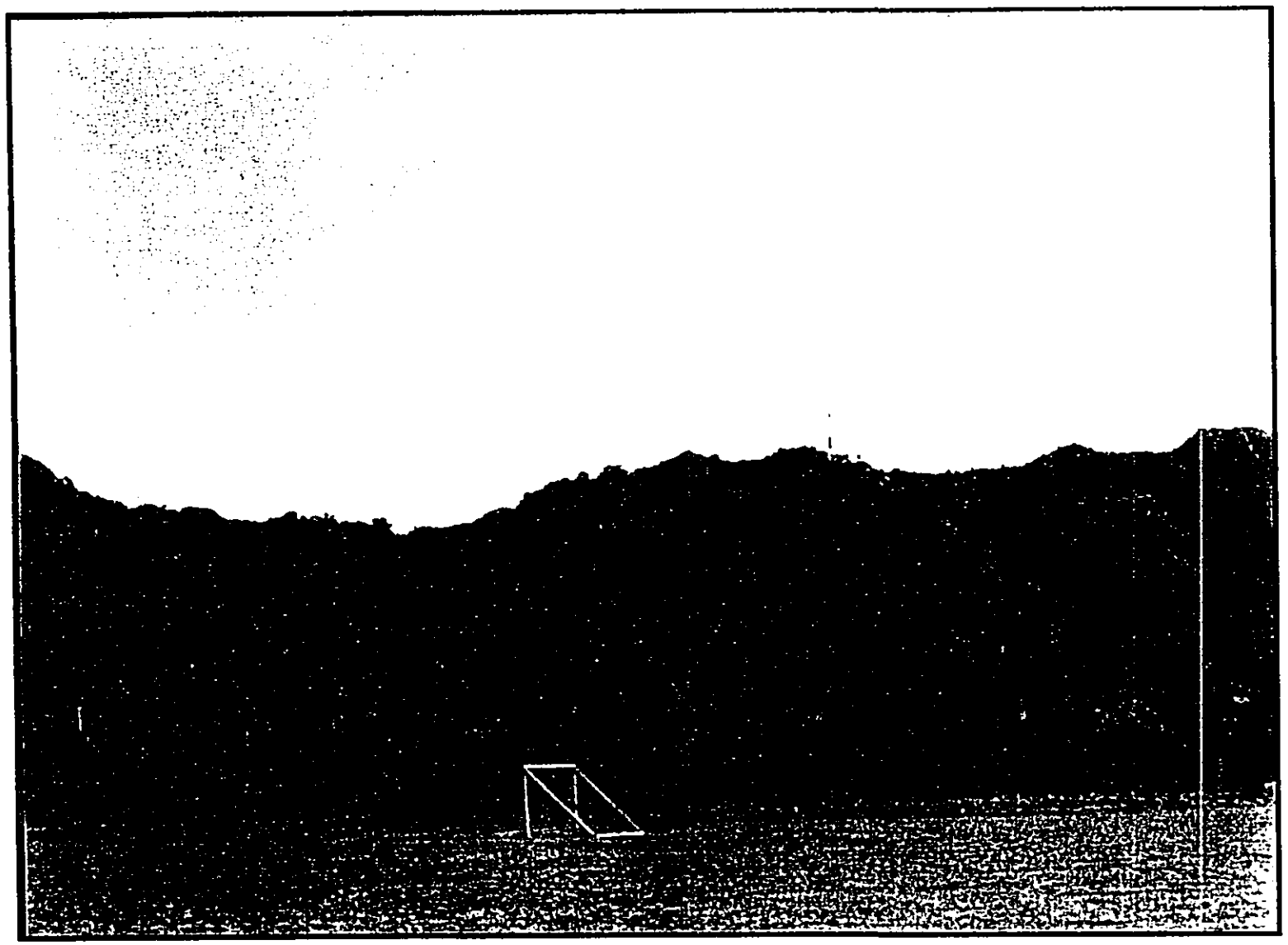


EXHIBIT 8

VIEW 'B' - WAIKOMO PARK, KOLOA, LOOKING NORTH

THE KEITH COMPANIES
Hawaii Division

Proposed Radio Tower
STANGL BROADCASTING, INC.

60448.00
9/25/95

APPENDIX

APPENDIX A

Grove Farm Properties, Inc.
3-2600 Kaumualii Hwy., Suite 1004
Lihue, Kauai, Hawaii 96766
Phone: (808) 245-7177 Fax: (808) 245-7158

Mr. Michael Wilson
Chairman
Board of Land and Natural Resources
1151 Punch Bowl Street
Honolulu, HI 96813

RE: Conservation District Use Permit Application for Stangl Broadcasting, Inc.
TMK: (4) 3-4-06:01, Lihue, Kauai, Hawaii

Dear Mr. Wilson:

As the _____ : _____ and authorized signatory for Grove Farm Properties, Inc., which is the legal owner of the above-mentioned property, I hereby authorize Stangl Broadcasting, Inc. and it's authorized agent, Alston Hunt Floyd & Ing, to apply for a Conservation District Use Permit, as the proposed location for a communications facility.

Sincerely,

Grove Farm Properties, Inc.

William L. Hong 15 Feb 96
Name *Date*
Title

APPENDIX A

APPENDIX B

MARYANNE W. KUSAKA
MAYOR

STEVE OLIVER
COUNTY ENGINEER
TELEPHONE 241-6600

EDMOND P.K. RENAUD
DEPUTY COUNTY ENGINEER
TELEPHONE 241-6600

AN EQUAL OPPORTUNITY EMPLOYER
COUNTY OF KAUAI
DEPARTMENT OF PUBLIC WORKS
4444 RICE STREET
MOIKEHA BUILDING, SUITE 275
LIHUE, KAUAI, HAWAII 96766

April 19, 1996

Mr. Casey Stangl
President and General Manager
Stangl Broadcasting, Inc.
P.O. Box 1957
Honolulu, HI 96850

Dear Mr. Stangl:

Thank you for this opportunity to express my support of your desire to establish a new public radio relay station on Kauai. The new station would keep Kauai "in tuned" to the rest of the state, as well as, provide a valuable public service to the community.

The new station would become a definite asset during times of emergencies and/or disasters when it is crucial to inform the public of the available assistance the local, state and federal agencies are able to provide.

Please accept my best wishes for the success of your endeavors.

Very truly yours,

STEVE OLIVER
County Engineer

DT/llv

APPENDIX C

GEOTECHNICAL INVESTIGATION

FOR

RADIO TOWER
STANGL BROADCASTING, INC.

LIHUE - KOLOA DISTRICT BOUNDARY
HAUPU FOREST RESERVE
KAUAI, HAWAII

OCTOBER 1995

APPENDIX C

SNYDER
&
ASSOCIATES
GEOTECHNICAL ENGINEERS

Project No. 9539

October 10, 1995

Stangl Broadcasting, Inc.
P.O. Box 1957
Honolulu, HI 96805

Attn: Casey Stangl

Subject: Radio Tower
Lihue-Koloa District Boundary
Haupu Forest Reserve
Kauai, Hawaii

GEOTECHNICAL INVESTIGATION

Dear Mr. Stangl:

In accordance with your authorization, Snyder and Associates has completed an investigation into the geotechnical conditions at the site of the subject project on the Lihue - Koloa District Boundary ridge in the Haupu Forest Reserve on Kauai, Hawaii.

The accompanying report presents our conclusions and recommendations based on the results of our field investigation and laboratory testing. Our findings indicate that the site is suitable for the proposed improvements provided that the recommendations contained in the report are incorporated into the plans and specifications and are implemented during construction.

Should you have any questions or require additional information, please contact this office.

Very truly yours,

SNYDER AND ASSOCIATES - GEOTECHNICAL ENGINEERS

Frederick G. Snyder, P.E.
Principal Engineer
Professional Engineer Number 6524-C

Copy: Ms. Janet Bruenig, The Keith Companies, Inc.

4374 KUKUI GROVE STREET, SUITE 102, LIHUE, KAUAI, HAWAII 96766 (808) 245-2818

TABLE OF CONTENTS

GEOTECHNICAL INVESTIGATION

RADIO TOWER - STANGL BROADCASTING, INC.

1. INTRODUCTION

A Geotechnical Investigation of the property located on the Lihue - Koloa District Boundary ridge in the Haupu Forest Reserve, Kauai, Hawaii, was conducted to determine surface and subsurface geotechnical conditions, suitability and requirements for the proposed radio tower.

This investigation included the following work:

a. Site reconnaissance, project planning and coordination;
b. Excavation of test pits and collection of relatively undisturbed soil samples (see Appendix B);
c. Laboratory testing of the collected soil samples (see Appendix B);
d. Analysis of the data and formulation of geotechnical recommendations; and
e. Preparation of this written report.

Based upon the results of this investigation, criteria have been established for site preparation, and for the design and construction of the tower foundation and guy wire anchorages, cut slopes and retaining walls.

2. SITE DESCRIPTION

The site is located along the top of the Haupu Ridge, which runs west and mauka from Nawiliwili Harbor and defines the Lihue District - Koloa District Boundary. The ridge is undeveloped and covered with thick vegetation. A perpendicular tributary ridge off the south side of the main ridge provides a roughly triangular area for the tower and its anchorages. The ridges are fairly level on top (side to side), with extremely steep slopes off either side. The ground surface is covered with a dense mat of ferns, grasses, scrub brush, and small trees.

3. GEOTECHNICAL OBSERVATIONS

A field soil exploration program was performed at the site on September 29, 1995. Four test pits were excavated by hand to depths of between 5.5 and 7.0 feet below existing ground elevation at the approximate locations shown on the Site Plan, Figure 2. The logs of the test pit excavations are presented in Appendix B.

In test pit 1, the approximate location of the western anchorage, the topsoil was a dark brown clayey silt, which was slightly moist, friable, and loose. This zone contained many fine roots and some small tree roots. At a depth of six inches a zone of multi-colored mottled clayey silt was encountered. This soil which exhibited the structure of the parent rock was slightly moist and firm to stiff. Below a depth of two feet the soil graded into multi-colored mottled highly weathered vesicular basalt. This basalt was highly jointed, blocky, moist and firm. At two and a half feet there was a four inch thick lens of brown silty clay, which was moist and soft.

In test pit 2, the approximate location of the tower foundation, the topsoil was a dark brown clayey silt. This zone was one foot thick, moist, and firm, with many fine roots and decaying organic material. Below one foot was a zone of mottled multi-colored highly weathered vesicular and dense basalt. This zone was moist, stiff, blocky, with weathering to a very moist and soft silty clay on the joints and in occasional thin lenses. Below three and a half feet was a zone of interbedded layers of gray and orange clayey silt. This zone was very moist, soft to firm, with cobbles and boulders of highly weathered vesicular and dense basalt. Below six feet was a zone of mottled black, red, and gray highly weathered vesicular and dense basalt. This zone was moist, firm, and blocky, with clayey silt in the joints.

In test pit 3, the approximate location of the eastern anchorage, the topsoil was a dark brown clayey silt. This zone was two feet thick, moist, and loose, with many fine roots. Below two feet was a mottled gray, medium brown weathered to highly weathered vesicular basalt. This zone was moist, dense, and blocky, with reddish brown clayey silt on the joints.

In test pit 4, the approximate location of the southern anchorage, the topsoil was a dark brown clayey silt. This zone was six inches thick, moist, and loose, with many fine roots. Below six inches was a mottled orange, yellow and gray, highly weathered vesicular basalt. This zone was moist, dense, and blocky, with light brown clayey silt on the joints.

Ground water was not encountered in the test pits. However, groundwater levels may fluctuate during periods of heavy rainfall.

4. CONCLUSIONS

The site is suitable for construction of the proposed tower provided the recommendations presented in this report are incorporated into the project plans and specifications, and implemented during construction.

The near surface soils, below the top soil zone, have relatively low density and are relatively weak. A conservative design locating concrete anchors on the side of the ridge away from the tower is recommended.

5. RECOMMENDATIONS

5.1 CLEARING AND STRIPPING

Building areas and areas to receive other improvements should be cleared and stripped including removal of stumps and loose, soft, or contaminated materials to a minimum depth of 12 inches below existing grade. Any exploration trenches or test pits that may have been excavated for geotechnical investigations in building areas must be re-excavated and properly backfilled. Excavations extending below final grade should be cleaned out to firm, undisturbed soil as determined by the Geotechnical Engineer.

5.2 CUT SLOPES

Cut slopes may be constructed at 1.5:1 (horizontal to vertical). Cut slopes in rock may be steeper than 1.5:1 as determined by the Geotechnical Engineer. Cut slopes should be examined by the Geotechnical Engineer during grading and evaluated for stability.

After completion of the slope grading, erosion protection should be provided on the slopes and must include slope planting, preferably with deep rooted plants on the exposed surface of the slope.

5.3 FOUNDATIONS

Structures may be supported on spread footings.

Tower footings should be founded a minimum of 7 feet below lowest adjacent grade on the native soil or rock. They should be a minimum of 24 inches in diameter, or side dimension if square.

Footings founded at a minimum depth of 7 feet may be designed for an allowable soil bearing capacity of 3000 p.s.f. for dead plus live loads. This value may be increased by one-third to allow for seismic and wind forces. Passive pressures can be assumed to act on the vertical faces of the footings. The passive pressure below one foot below grade can be computed assuming a fluid weighing 250 p.c.f. The coefficient of friction between the base of footings and the soil can be assumed to be 0.40.

Footing excavation and concrete placement should be coordinated so that holes are left open a minimum amount of time. Footing excavations should not be allowed to desiccate significantly before placing concrete and certainly not to the point of showing shrinkage cracks. Excavations should be cleared of loose soil before placing reinforcement.

5.4 CONCRETE ANCHORS

Embedded concrete anchors should be founded a minimum of 5 feet below lowest adjacent grade on the native soil or rock. They should have a side dimension of not less than 24 inches.

Anchors founded at a minimum depth of 5 feet may be designed for available soil passive pressures and moist densities. Passive pressures can be assumed to act on the vertical faces of the anchors. The passive pressure below one foot below grade can be computed assuming a fluid weighing 250 p.c.f. The coefficient of friction between the concrete and the soil can be assumed to be 0.40.

For soils in the top five feet, a moist soil density of 60 pounds per cubic foot may be used for design. Wherever possible, the anchor should be located on the side of the ridge away from the tower.

5.5 RETAINING WALLS

Retaining walls should be designed to resist lateral pressures exerted from a media having an equivalent fluid weight as follows:

Gradient of Back Slope	Equivalent Fluid Weight	
	Restrained	Unrestrained
Flat	65 pcf	50 pcf
2:1	75 pcf	60 pcf

The above criteria are based on fully drained conditions. For these conditions, we recommend that a filter material blanket be placed behind the wall. The blanket should be a minimum of 12 inches thick and should extend the full height of the wall to within 12 inches of the surface. A 4 inch perforated drain pipe should be installed in the bottom of the filter blanket and should be underlain by at least 4 inches of filter type material. Adequate gradient shall be provided to discharge water that collects behind the wall to a controlled discharge system away from the structure foundations and nearby engineered fills.

Passive soil pressures can be assumed to act against the downslope face of wall foundations. For walls on level soil, the passive pressure below one foot below grade can be computed assuming a fluid weighing 250 p.c.f. Passive pressures for walls on slopes with the supporting material sloping away from the wall should be limited to those from an equivalent fluid weighing 200 p.c.f., neglecting the upper 3 feet. The downslope edge of retaining wall foundations should be set back a minimum of 10 feet from the face of a slope which slopes away from the wall.

The coefficient of friction between the base of foundations and the soil is equal to 0.40. An allowable soil pressure of 3,000 p.s.f may be assigned to bearing soils directly beneath the wall foundation, where the base of the foundation is a minimum of 18 inches below adjacent grade.

Placement of wall backfill shall not begin until the concrete has cured for 14 days. Wall backfill shall be compacted to 90% of the maximum dry density as determined by ASTM D-1557.

6. *QUALITY CONTROL*

It is highly recommended that the owner contract with the Geotechnical Engineer to provide the services recommended in this section.

Unanticipated or changed conditions may be encountered during construction. The client is urged to retain the Geotechnical Engineer to monitor construction, and the Geotechnical Engineer agrees to assign to the monitoring function persons qualified to observe and report on the quality of work performed by contractors. Construction monitoring is a technique employed to minimize the risk of problems arising during construction. Provision of construction monitoring by the Geotechnical Engineer is not insurance, nor does it constitute a warranty or guarantee of any type. In all cases, contractors shall retain responsibility for the quality of their work and for adhering to plans and specifications.

6.1 GEOTECHNICAL REVIEW

All foundation and building plans for the proposed improvements should be reviewed by the Geotechnical Engineer prior to contract bidding to ensure that plans are reconciled with soils conditions, and sufficient time is allowed for suitable mitigative measures to be incorporated into the final specifications.

6.2 CONSTRUCTION OBSERVATIONS

The Geotechnical Engineer should observe and verify the stripping and excavation operations. During construction of the tower and anchorage foundations, the Geotechnical Engineer should observe and verify the excavations for the foundations.

6.3 NOTICE OF WORK

The Geotechnical Engineer should be notified at least ten (10) working days prior to beginning construction operations on the property in order to schedule the required manpower and equipment to coordinate the work. After project initiation, at least two (2) working days notice should be given for changes to schedule.

7. LIMITATIONS

7.1 STANDARD OF CARE

Our services consist of professional opinions and recommendations made in accordance with generally accepted geotechnical engineering principles and practices. Services performed by Snyder and Associates are conducted in a manner consistent with that level of care and skill ordinarily exercised by members of the profession currently practicing in Hawaii under similar conditions. No other representation, express or implied, and no warranty or guarantee is included or intended in this report or in any opinion, document or otherwise.

7.2 SUPPLEMENTAL RECOMMENDATIONS

The recommendations of this report are based upon the assumption that the soil conditions do not deviate from those disclosed in the test pits and from a reconnaissance of the site. Should any variations or undesirable conditions be encountered during the development of the site, supplemental recommendations, as dictated by the field conditions, should be obtained from the Geotechnical Engineer.

7.3 RESPONSIBILITY

It is the responsibility of the property owner, or his representative, to ensure that the information and recommendations contained in this report are brought to the attention of the Architect and Engineer for the project and incorporated into the plans and that the necessary steps are taken to see that the Contractor and Subcontractors carry out such recommendations in the field.

7.4 GEOTECHNICAL ENGINEER

Throughout this report, the term "Geotechnical Engineer" shall mean to include Geologist, Field Inspector, or other person operating under the direct supervision of the Principal Geotechnical Engineer.

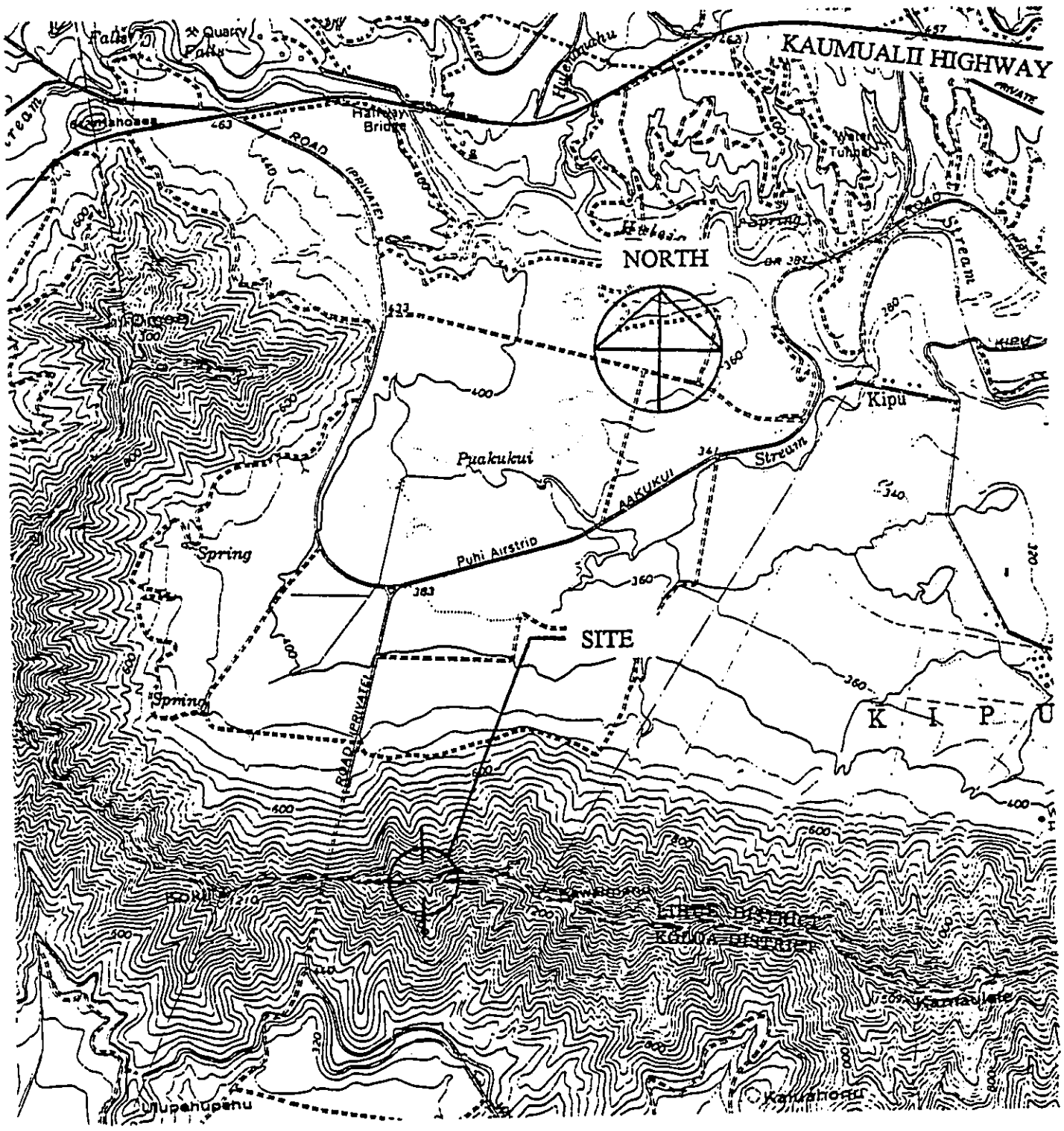
SNYDER AND ASSOCIATES - GEOTECHNICAL ENGINEERS

Frederick G. Snyder, P.E.
Principal Engineer
Professional Engineer Number 6524-C

APPENDIX A

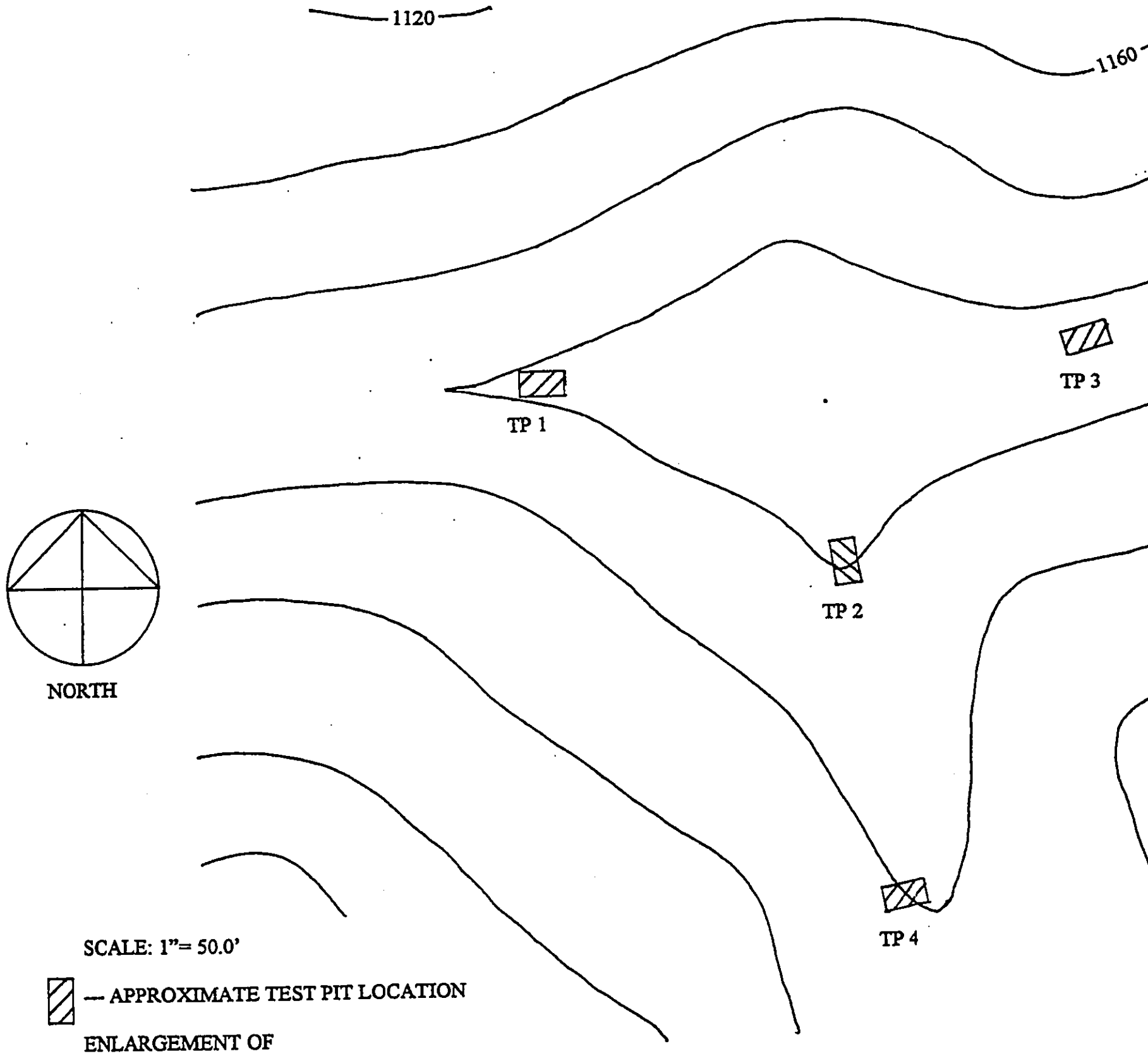
LOCATION MAP

SITE PLAN



LOCATION MAP
FIGURE 1

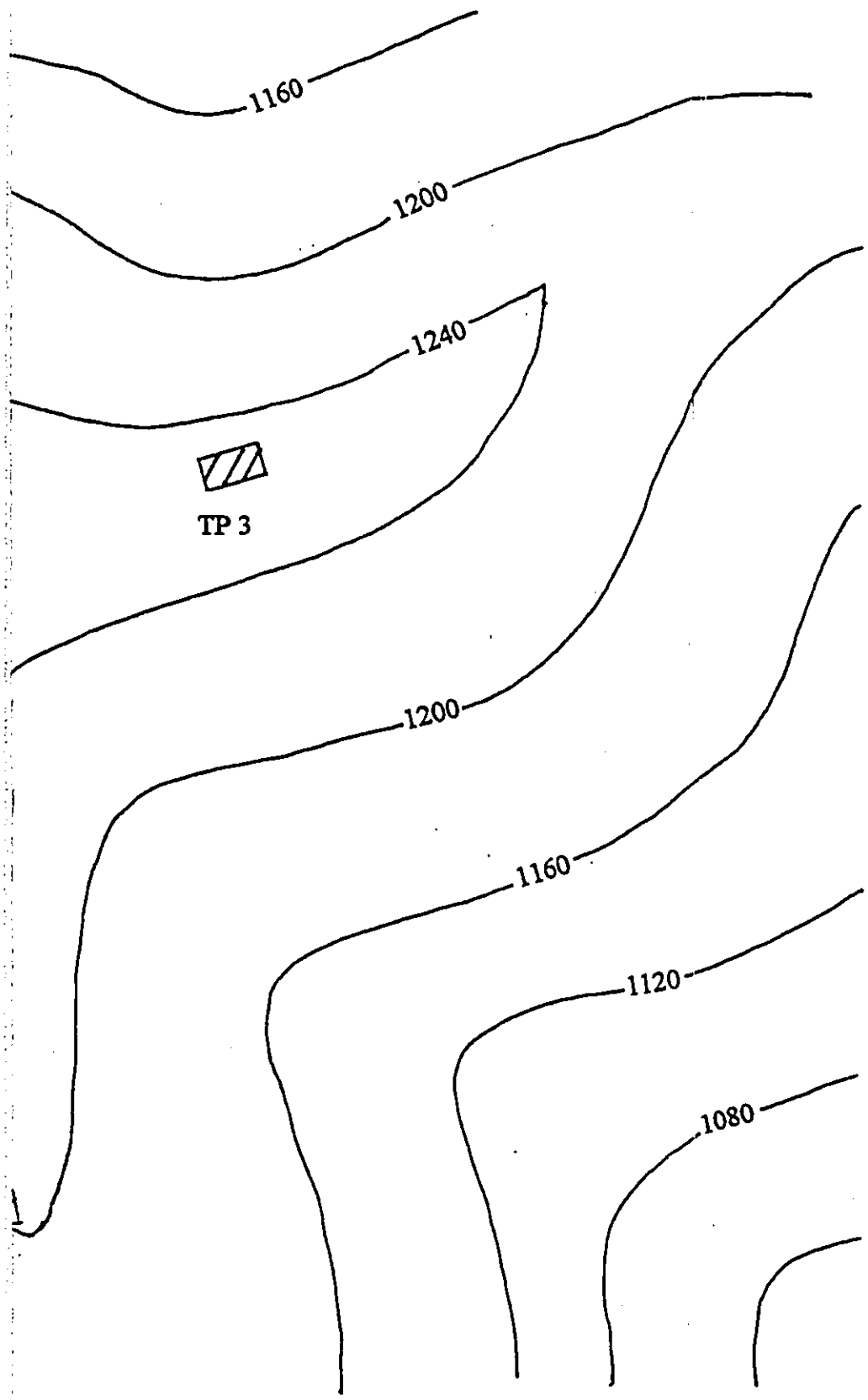
Project 9539
October 10, 1995



SCALE: 1"= 50.0'

— APPROXIMATE TEST PIT LOCATION

ENLARGEMENT OF
USGS TOPOGRAPHICAL MAP
FOR KOLOA, KAUAI, HAWAII



SITE PLAN
FIGURE 2

APPENDIX B

SUBSURFACE EXPLORATION

LOGS OF TEST PITS

LABORATORY TESTING AND DATA

SUBSURFACE EXPLORATION

Under the supervision of the Geotechnical Engineer, a field exploration program was performed at the site on September 29, 1995. A total of 4 test pits, between 5.5 and 7 feet deep, were excavated at the approximate locations shown on the site plan, Figure 2. All depths are with reference to the existing ground elevation at the time of excavation.

The exposed soils were examined and the description of the soils were recorded on the corresponding test pit log. Insitu tests were performed for bearing strength and shear strength using the Pocket Penetrometer and the Torvane, respectively. The data from these tests were recorded on the test pit log.

Relatively undisturbed samples of soil were taken at the locations shown on the test pit log. The undisturbed samples were obtained by driving steel sleeves either two or three inches in diameter into undisturbed soil using a hand held slide hammer. These samples were capped and taken to the laboratory for testing.

LOG OF TEST PIT 1

Depth (ft.)	Sample	BS	SS	Soil Description
0.0		2.0	0.6	Brown clayey SILT, moist, firm with many fine roots and decaying organic matter, topsoil.
1.0				Mottled orange, brown and gray clayey SILT, moist, firm, exhibiting the structure of the parent rock.
2.0				
		1.2	.38	Four inch lens of brown silty clay, very moist, soft At 2.5 feet grading to highly weathered vesicular BASALT, jointed, gray with multi-colored mottling, blocky.
3.0	[1-2]			
		4.0	.75	
4.0				
5.0	[1-1]			
				Probe penetrated 3 inches in BOH
6.0				
7.0				
				BOH: 5.5 feet, No water
8.0				
9.0				
10.0				

Notes:

[#] = Undisturbed Sample, 2" Sleeve
{#} = Undisturbed Sample, 3" Sleeve
(B) = Bulk Sample

BS = Bearing Strength (tons/ft^2)
SS = Shear Strength, Torvane (tons/ft^2)
BOH = Bottom of Hole

LOG OF TEST PIT 2

Depth (ft.)	Sample	BS	SS	Soil Description
0.0				Dark brown clayey SILT, moist, firm, with many fine roots and
		2.7	.75	decaying organic material, topsoil.
1.0				Mottled gray, orange, yellow highly weathered vesicular and
	[2-1]			dense BASALT, moist, stiff, blocky, weathered to clayey silt on
2.0		1.3	.37	joints and in localized zones.
				- with occasional thin lenses of silty clay, very moist and soft.
3.0				
				Interbedded layers of gray and orange clayey SILT, very moist,
4.0		0.7	.24	soft to firm, with cobbles and boulders of highly weathered
				vesicular and dense basalt.
5.0				
6.0	[2-2]	4.0		Mottled black, red, gray highly weathered vesicular and dense
	{2-3}			BASALT, moist, firm with clayey silt in the joints, blocky.
7.0				
				Probe penetrated 6 inches, average, in BOH
8.0				BOH: 7 feet, No water
9.0				
10.0				

Notes:
[#] = Undisturbed Sample, 2" Sleeve
{#} = Undisturbed Sample, 3" Sleeve
(B) = Bulk Sample

BS = Bearing Strength (tons/ft^2)
SS = Shear Strength, Torvane (tons/ft^2)
BOH = Bottom of Hole

LOG OF TEST PIT 3

Depth (ft.)	Sample	BS	SS	Soil Description
0.0				Dark brown clayey SILT, moist, firm with many fine roots,
				- top 6 inches friable and loose, topsoil.
1.0	{3-2}	1.0	.25	
2.0	[3-3]			Mottled, gray, medium brown, weathered to highly weathered
				vesicular BASALT with red staining on the joints and vesicles.
3.0		4.0		Moist and dense with reddish brown clayey SILT in the joints,
				blocky.
4.0				
5.0	[3-1]			
				Probe penetrated 3 inches in BOH
6.0				
7.0				
8.0				
9.0				BOH 5.5 feet, No water
10.0				

Notes:
[#] = Undisturbed Sample, 2" Sleeve
{#} = Undisturbed Sample, 3" Sleeve
(B) = Bulk Sample

BS = Bearing Strength (tons/ft^2)
SS = Shear Strength, Torvane (tons/ft^2)
BOH = Bottom of Hole

LOG OF TEST PIT 4

Depth (ft.)	Sample	BS	SS	Soil Description
0.0				Dark brown clayey SILT, moist, loose, friable, topsoil.
				Mottled orange, yellow and gray, highly weathered vesicular
1.0	{4-3}	0.5	.17	BASALT, moist, dense, blocky, with light brown clayey silt in
				the joints
2.0	[4-2]	2.0	.35	
3.0				
4.0				
5.0	[4-1]			
6.0				Probe penetrated 4 inches in BOH
				BOH 5.5 feet, No Water
7.0				
8.0				
9.0				
10.0				

Notes:
[#] = Undisturbed Sample, 2" Sleeve
{#} = Undisturbed Sample, 3" Sleeve
(B) = Bulk Sample

BS = Bearing Strength (tons/ft^2)
SS = Shear Strength, Torvane (tons/ft^2)
BOH = Bottom of Hole

LABORATORY TESTING

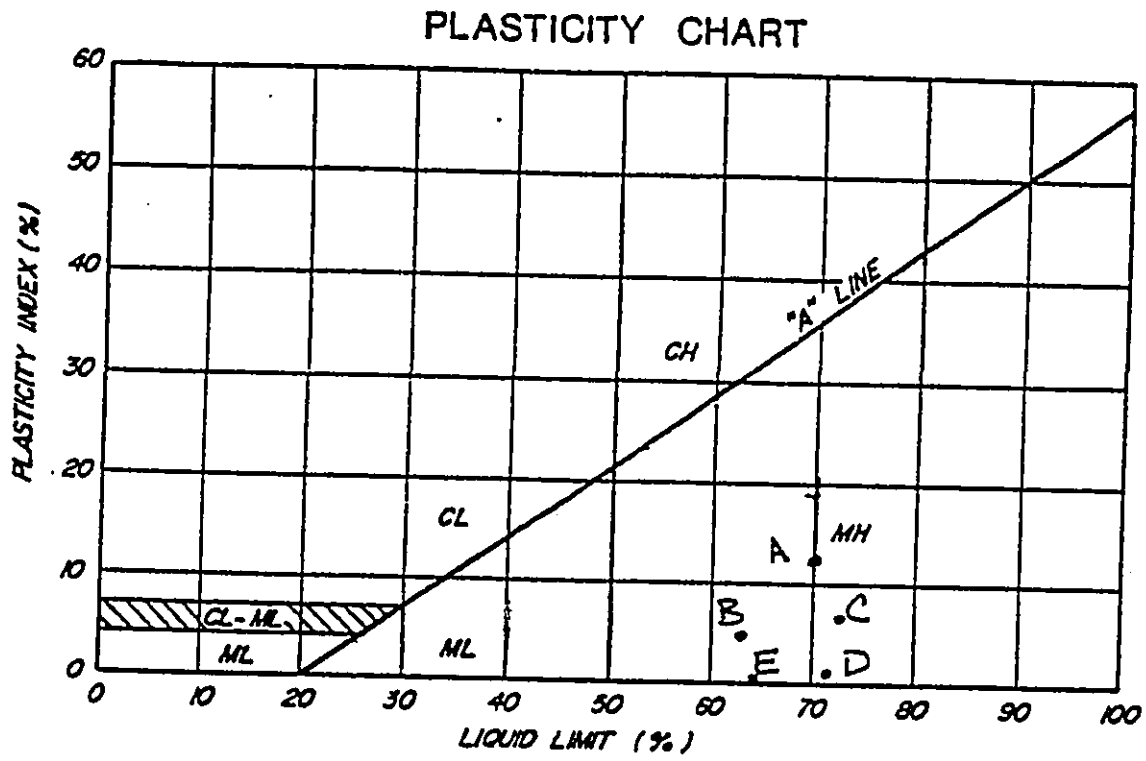
The representative samples collected during the field exploration were tested for various parameters in the laboratory. The results of laboratory testing are summarized in Table 1.

The following test procedures were conducted:

a. In-place Moisture Content according to ASTM Test Procedure D-2216.
b. In-place Dry Density according to ASTM Test Procedure D-2937.
c. Shear Strength - Unconfined compression using a modified form of ASTM Test Procedure D-2166.
d. Atterberg Limits according to ASTM Test Procedure D-4318 for liquid limit, plastic limit, and plasticity index.

TABLE 1

Test Pit Number	Sample Number	Moisture Content (%)	Dry Density (lbs/ft^3)	Unconfined Comp. (lbs/ft^2)	Liquid Limit (%)	Plasticity Index (%)
1	1-1	60	43	710	-	-
1	1-2	62	51	413	70	13
2	2-1	68	51	499	63	5
2	2-2	63	51	232	-	-
2	2-3	63	58	-	-	-
3	3-1	65	48	394	-	-
3	3-2	78	49	-	73	7
3	3-3	58	53	238	72	1
4	4-1	42	65	506	-	-
4	4-2	50	62	96	-	-
4	4-3	73	53	-	65	0



ATTERBERG LIMIT TEST DATA

KEY SYMBOL	TEST PIT NUMBER	SAMPLE NUMBER	DEPTH (FT.)	LIQUID LIMIT (%)	PLASTIC INDEX (%)	UNIFIED CLASS
A	1	1-2	3.0	70	13	MH
B	2	2-1	1.5	63	5	MH
C	3	3-2	1.0	73	7	MH
D	3	3-3	2.0	72	1	MH
E	4	4-3	1.0	65	0	MH

Notes:

CH = Highly Plastic Clay
CL = Low to Moderately Plastic Clay
MH = Elastic Silt
ML = Low Plasticity Silt

APPENDIX D

ARCHAEOLOGICAL FIELD INSPECTION OF THE KŌLOA RADIO PROJECT PA'A, KONA, KAUA'I (TMK 3-4-06:01))

by

Nancy A. McMahon, M.A., M.Ed.

Prepared for

Cultural Surveys Hawaii

Cultural Surveys Hawaii
September 1996

APPENDIX D

TABLE OF CONTENTS

LIST OF FIGURES

ARCHAEOLOGICAL FIELD INSPECTION OF THE KŌLOA RADIO PROJECT

Project Area Description

The c. 25,000 sq. foot project area is located on the southeast (*Haupu*) ridge of Kaua'i (Figure 1), with elevations ranging from 1000 to 12000 ft. above means sea level (AMSL) between *Kokii* and *Kawaimanu* peaks. Average annual rainfall in the project vicinity is estimated at 40 to 50 inches and the mean annual temperature is 75° F. (Armstrong, 1983). *Haupu* ridge separates the Līhu'e Plain from the *Kōloa-Poipu* area. The project area lies within the *ahupua'a* of *Pa'a* in the traditional district of *Kona* (TMK 3-4-06:01). Only one soil classification is present within the project area (Rough mountainous land - Rough broken land - Rock outcrop association [40-70% slopes) (Foote *et al.* 1972).

Sugarcane fields currently surround most of the lowlands around the project area. Vegetation in the project consists of lovegrass (*Fragrostis variablis*), guava (*Psidium guajava*), lauhala (*Pandanus odoratissimus*), lantana (*Lantana camara*), koa (*Acacia koa*), and shrubs *Jamaica verbium* and *Verbena utoralis*. Along the sides of the ridge and below in the valleys kukui (*Aleurites moluccana*), paperbark (*Melaleuca leucandendra*), ironwood (*Casuarina equisetifolia*), koa haole (*Leucaena leucocephala*), java plum (*Eugenia cumini*), Christmas berry (*Schinus terebinthifolius*) and ti (*Cordyline fruticosa*).

There is no road to the project are and access is primarily by helicopter.

Previous Archaeological Work

No archaeological surveys have taken place in the project area. Several surveys have been conducted in the surrounding *Kōloa* area. The earliest survey was conducted in 1928 and 1929 by W.C. Bennett (1931), which covered the entire island of *Kaua'i* and identified 202 sites. One site listed by Bennett is located on *Haupu* Summit (Site 90 - *Keolewa Heiau*). He stated that Thrum described it "as a small heiau dedicated to Laka." No other information is provided about it. It is located outside the project area, but in the vicinity.

Other previous archaeological work conducted in the general vicinity (mainly along the coastal area) includes, but is not limited to: Ching *et al.* (1974), Firor and Rosendahl (1990, 1991), Hammatt (1979, 1989, 1990), Hammatt *et al.* (1988, 1991), Kikuchi (1963, 1983, 1988), and Walker and Rosendahl (1990 a, b. 1991, 1992). Much of this work identified coastal habitation sites (permanent and temporary), agricultural field systems, religious sites and burial sites.

Summary of Historic Research

Pukui, Elbert and Mookini have assigned the literal meaning to Pā'ā of "dry, rocky." No early information on Pā'ā, however, we have good historical information for the relatively recent history of the *Kōloa* District, of which Pa'a is a part. With the arrival of missionaries, Chinese settlement, the development of plantations and the Great *Māhele*, historical data is abundant.

In 1836 Charles Titcomb and Sherman Peck planted two hills in *Kōloa* with mulberry, for the purpose of raising silkworms. After problems of a drought in 1840 and aphid infestation, the project was abandoned in 1842 (Alexander 1985). According to A.

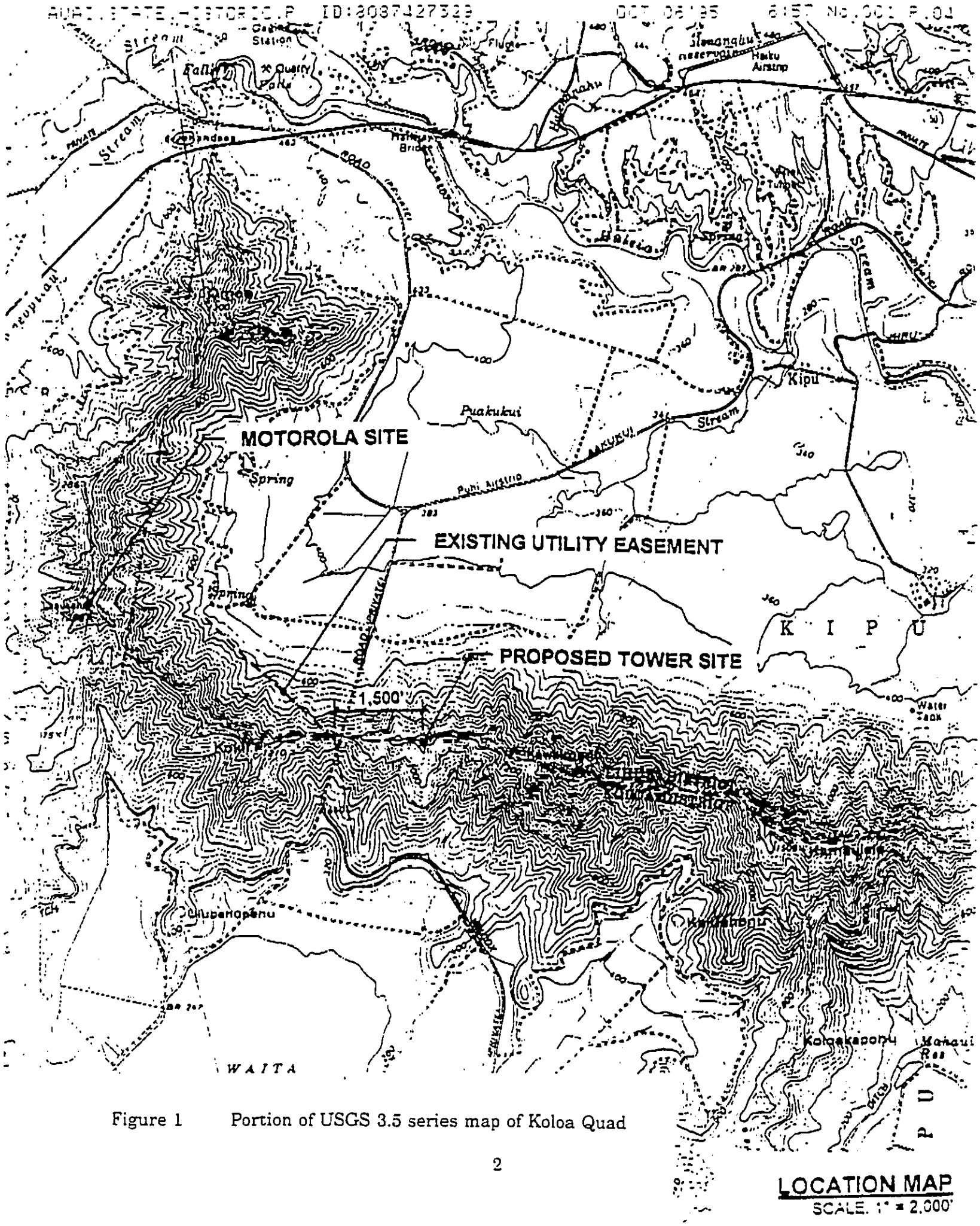


Figure 1 Portion of USGS 3.5 series map of Koloa Quad

Alexander, cane was grown in the *Kōloa* district prior to the plantation and Chinese operated mill produced sugar and molasses. Although most historical accounts cite Ladd & Co., as the first successful sugar plantations in *Hawaii*, some accounts content that the sugar industry was pioneered, developed and placed on a working and profitable basis by Chinese immigrants, who dominated the industry until the mid-1800s (Ching 1985).

Ladd & Co. started their plantation on 12 acres at *Kōloa* in 1835. After Dr. Wood became the sole owner of the company, he renamed it *Kōloa* Plantation. *Kōloa* town became a natural outgrowth of the plantation and one of the main commercial center on *Kaua'i* (Fornander 1985). Throughout the 1800s *Kōloa* Landing was the busy port. In 1948 *Kōloa* Plantation was sold to Grove Farm Co.

During the Great *Māhele*, the *ahupua'a* of *Pa'a* was awarded to *Jona Piikoi* (LCA 10605), a member of the ruling family of *Kaua'i*, but whose alignment with the *Kamehameha* line brought him the land (Ching *et al.* 1974). The *ahupua'a* encompassed over 30000 acres. *Piikoi* sold his holdings to Dr. Wood for expansion of the *Kōloa* Plantation. Few natives were granted awards for land in *Pa'a*. No awards are in the project area or located near by.

Settlement Patterns

In terms of overall site distribution, prehistoric sites are located mainly in coastal areas, in lands unmodified by sugar cane cultivation. In the *Kona* District, most inland prehistoric sites appear to have been destroyed by sugar cane cultivation. General settlement patterns correspond with settlement patterns proposed for windward areas in *Hawai'i*. Although the *Kona* District, and specifically the modern judicial *Kōloa* District is only marginally within a windward environment. Archaeological evidence for initial settlements in *Pa'a*, occurred by c. AD 300-600 (Walker and Rosendahl, 1990a, b). During subsequent centuries (AD 600-1100) settlements on the windward sides became more numerous, in response to increased population. Between AD 1100-1650, significant changes occurred in settlement patterns. Due to population pressure, settlement occurs inland and upland into the valleys and leeward areas. Agricultural field systems are created during this period (Hammatt *et al.* 1991). Temporary habitations become more permanent in marginal areas, as more land was placed in production. Preceding European contact (AD 1650-1778) elaboration of territorial and redistribution systems occurred along with further intensification of production. Population either stabilized or began to decrease after AD 1700 (Kirch 1979:307) due to effects of warfare and infanticide. During the mid to late 1800s, sweet potato, taro, breadfruit, yams, bananas and paper mulberry were cultivated in the *Kōloa* area (Walker and Rosendahl 1992).

On the basis of the previous investigations in the general area and on the historical research, few prehistoric sites were expected to be identified within the project area. Agricultural features were not expected along the rocky ridge due to the lack of soil and because of the steep slope. Based on the research, it was considered possible that prehistoric religious sites would be found along the ridge, on prominent lookouts. Temporary habitation sites would be found along the lower parts of the forested ridges.

Field Methods and Procedures

On September 29, 1995, a field inspection of the proposed radio tower was conducted by Cultural Surveys Hawaii, archaeologists, Kaipo Akana and Nancy McMahon. Field work was conducted with the aid of a helicopter ride to reach the project location. Depending on the terrain (ridge width) and vegetation exposed earth and possible outcrops were examined by walking along the ridge for cultural remains. The 2500 sq. ft. project area and staging area were surveyed 100% for surface features. No significant historic sites were found. On the basis of this surface survey's negative finding, no subsurface testing was conducted.

Summary and Recommendations

The evaluation and recommendations presented within this report have been based on a field inspection of the project area. No historic sites were identified within the current project area. The lack of exposed outcrops and elevation of the project, means that this location was poorly suited for religious or temporary habitation sites. No further archaeological work is recommended.

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APPENDIX E

DANIEL K. INOUYE
HAWAII

APPROPRIATIONS
Subcommittee on Defense

COMMERCE, SCIENCE AND TRANSPORTATION

Subcommittee on Surface Transportation
and Merchant Marine

COMMITTEE ON INDIAN AFFAIRS

DEMOCRATIC STEERING COMMITTEE

COMMITTEE ON RULES AND ADMINISTRATION

JOINT COMMITTEE ON PRINTING

United States Senate
SUITE 722, HART SENATE OFFICE BUILDING
WASHINGTON, DC 20510-1102
(202) 224-3934
FAX (202) 224-6747

PRINCE KUHIO FEDERAL BUILDING
ROOM 7325, 300 ALA MOANA BOULEVARD
HONOLULU, HI 96850-4975
(808) 541-2542
FAX (808) 541-2549

101 AUPUNI STREET, NO. 205
HILO, HI 96720
(808) 935-0844
FAX (808) 961-5163

March 1, 1995

Mr. Al Hulsen
President and General Manager
Hawaii Public Radio
738 Kaheka Street
Honolulu, Hawaii 96814-3726

Dear Mr. Hulsen:

I received your letter concerning Hawaii Public Radio's application for a grant from the Public Telecommunications Facilities Program (PTFP) of the National Telecommunications and Information Administration. Thank you for bringing this matter to my attention.

You will be pleased to know that I have written to Mr. Dennis Connors, Director of the PTFP, in support of your grant application.

Please accept my best wishes for success in this endeavor.

Aloha,

DANIEL K. INOUYE
United States Senator

DKI:mlc

DANIEL K. AKAKA
HAWAII

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

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

United States Senate

WASHINGTON, DC 20510-1103

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

March 3, 1995

Mr. Al Hulsen
President & General Manager
Hawaii Public Radio
738 Keheka Street
Honolulu, Hawaii 96814-3726

Dear Mr. Hulsen:

Thank you for your recent letter advising me that Hawaii Public Radio has submitted applications to the Public Telecommunications Facilities Program at the Department of Commerce for funds to establish FM repeater stations serving the residents of Lihue and Hilo.

As one who has strongly supported public broadcasting throughout the years, I am more than happy to contact the Department of Commerce regarding the applications. It is critical that unserved residents of these areas benefit from the contributions made through public broadcasting.

Be assured I appreciate you contacting me regarding the applications. I sincerely hope that my efforts in your behalf will assist Hawaii Public Radio in reaching an additional population.

Aloha pumehana,

Daniel K. Akaka

DANIEL K. AKAKA
U.S. Senator

SECOND DISTRICT, HAWAII

WASHINGTON OFFICE
2135 Rayburn House Office Building
Washington, DC 20515-1102
(202) 225-4906
FAX (202) 225-4987

DISTRICT OFFICE
5104 Prince Kuhio Federal Building
P.O. Box 50124
Honolulu, HI 96850-4977
(808) 541-1986
FAX (808) 541-0277

Congress of the United States
House of Representatives
Washington, DC 20515-1102

March 15, 1995

VICE CHAIR
COMMITTEE ON BUDGET
COMMITTEE ON EDUCATION AND LABOR
SUBCOMMITTEES
Elementary, Secondary & Vocational Education
Postsecondary Education
Labor Management Relations
COMMITTEE ON NATURAL RESOURCES
COMMITTEE ON GOVERNMENT OPERATIONS
(on leave)

The Honorable Ronald H. Brown
Secretary of Commerce
U.S. Department of Commerce
14th and Constitution Ave., NW
Washington, DC 20230

Dear Mr. Secretary:

I write to strongly support Hawaii Public Radio, which has applied for Federal construction funds under the Public Telecommunications Facilities Program.

Hawaii Public Radio seeks your assistance in the construction of two new radio stations which would bring public radio to over 116,000 people in rural Hawaii. Repeater stations on the islands of Kauai and Hawaii would allow the over 50,000 residents of Kauai, and the more than 66,000 residents in and around the community of Hilo, Hawaii, to have access to non-commercial, educational radio.

These new stations would initially relay the 24-hour broadcasts of KHPR (88.1 FM) in Honolulu. KHPR broadcasts a wide variety of news, educational, and performance programming from, among others, National Public Radio, Public Radio International, and Hawaii Public Radio. As resources permit, studio facilities would be developed on both Kauai and Hawaii, allowing their broadcasts to better serve the particular needs of these communities, nearly seventy percent of which are ethnic minorities.

Because radio is a relatively inexpensive and easily accessible way of receiving information, these new stations would greatly expand the level of information and educational opportunities available to these rural communities.

For the above mentioned reasons, I strongly urge you to approve the assistance requested by Hawaii Public Radio.

Sincerely Yours,

Patsy T. Mink

PATSY T. MINK
Member of Congress

Bill and Mary Earle Chase
P.O. Box 691
Hanalei, HI 96714
(808) 826-6063
FAX 826-1626

May 8, 1995

Mr. Al Hulsen
Hawaii Public Radio
738 kaheka Street
Honolulu, HI 96814

Dear Mr. Hulsen

We are thrilled to hear about the plans for a public radio station on Kauai. Living on the North Shore, we can't get radio reception on KIPO or KIFO in our vehicles, and it is fuzzy at best anywhere else.

Kauai is in dire need of the proposed Lihue Station -- for the programming that already exists as well as for programs that would focus on our island.

If there is any other way we can support this project coming to fruition, please let us know.

Mahalo,

Mary Earle Chase

Bill Chase

14 May, 1995

Dear Mr. Hulsen,

Bringing Hawaii Public Radio to the island of Kauai is like a reprieve for a condemned prisoner.

If you don't live here you have no idea how terrible our local stations are and in my residential area in upper Wailua I have no other choices. My location is such that I only receive the two local stations whether it's AM or FM and as far as I can determine both stations play only Rock music with an occasional News story and Weather Forecast. Even Cable doesn't offer any relief to speak of and frequently when a station is found it drifts off the selection.

The only decent radio reception on Kauai is on a car radio where one can receive Hawaii Public Radio along with KCCN from Honolulu, Headline News and a very pleasant Hilo station located at 610 on the dial.

Please hurry ! Kauai is anxiously waiting for your arrival to our airwaves.

Most Sincerely,

Gini Stoddard
7030 Holopono Place

Doug Wilson
P.O. Box 185
Lihue, Hawaii 96766
(808) 822-4233

May 10, 1995

Mr. Al Hulsen
Hawaii Public Radio
738 Kaheka Street
Honolulu, Hawaii 96814

Dear Al:

I've listened to Hawaii Public Radio for many years when the signal is sufficiently receivable in Kauai. When I'm in Honolulu, the first thing I do is tune in HPR on the rental car radio. I applaud your current efforts to establish a station to relay the excellent programming of KHPR to our small, but highly important, island.

Needless to say, I believe a Lihue, Kauai FM station would benefit the entire community and is needed to help the people fo Kauai join, more closely, the human race.

Sincerely yours,

Doug Wilson

APPENDIX F

Koloa Radio Tower, Vegetation Report
September 18, 1996

Site Description:

The project site is located at 400 m elevation on the upper ridge of the Haupu Mountain Range on the southeast side of the island of Kaua`i. The site is north of the Waita water reservoir, which is north of the town of Koloa. The area around Haupu is agricultural fields and Eucalyptus plantings at the lower elevations. The site surveyed included three ridges and the surrounding slopes (see map).

The vegetation on site is characterized as Montane Mesic Forest. The ridges are covered by a carpet of 1 m tall uluhe fern (*Dicranopteris linearis*) with scattered emergent native and introduced trees and shrubs (15% cover). The dominant trees in the area are the introduced weeds *Albizia lebbeck* and *Hibiscus macrophyllus* which range in height from 6-11 m, the native *Acacia koa* (ht. 6-8 m) with occasional sandalwood trees (ht. 3-6 m). The two weedy trees (*Albizia* and *Hibiscus*) are fast growing aggressive species and will continue to spread in the area. *Albizia lebbeck* specimens in the area are probably only 2-4 years old, and are capable of reaching very large sizes. In disturbed areas (human and pig trails) on the ridge where the uluhe fern is no longer present, it is replaced by aggressive alien species (*Nephrolepis multiflora, Lantana camara*, and Asteraceae species).

The slopes of the ridges are a mix of two vegetation types, uluhe ferns and emergent trees like that found on the ridge and a more dense canopy of both native and introduced trees and shrubs (80-90% cover). The canopy in this area ranges from 3-11 m in height. The tree and shrub habitat contains the best native forest in the study site and is located on the north-facing slope of the ridge (see map). Although the forest is a mix of introduced and native species, the native montane mesic forest species are still abundant and well represented in this area. The slopes and gulch to the southwest of the site is covered by uluhe fern and mostly introduced species. However, there are 6-8 large sandalwood (*Santalum freycinetianum* var. *pyrularium*) trees (3-6 m) in the upper portion of the gulch (see map). The other slopes and gulch to the southeast are very disturbed and have few native species present. The dominant trees are the weedy *Albizia* and *Hibiscus*.

Special care was taken to survey for the endangered or rare plant species noted from the region by The National Tropic Botanical Garden (*Brighamia insinis, Delissea rhytidosperma, Lipochaeta micrantha* var. *exigua, Munroidendron racemosum, Hedyotis fluviatilis, Hibiscus kokio* ssp. *kokio* and a *Lobelia sp.*) and the Fish and Wildlife Service (*Lipochaeta micrantha* var. *micrantha, Melicope haupuesis*, and *Pteralyxia kauaiensis*). None of these species were found in the project site or on the surrounding slopes. I did not do an extensive search for the Kaua`i land snail *Carelia sp.* However, I was aware of its possible presence in the area and during the vegetation survey no native snails were found in the project site. While none of the endangered taxa were present in the project site, it is

recognized that good ecosystems and habitat buffers are necessary in the vicinity of these rare species to limit further decline in the populations. These concerns will be addressed in the recommendations that follow.

Project Recommendations:

The north-facing slope below the project site (see map) that contains the best native, montane, mesic species should receive the least amount of impact. This habitat is the best on the site that supports native species. By not impacting this area it would leave an area of buffer to protect rarer species further up the mountain range and would be a good habitat into which rarer species could expand their ranges if their populations dynamics improve. This habitat is where I would have expected to find the endangered species if they were present on the site. Avoiding this area should not be a problem since most of the tower site is on the southern slopes.

The small population of large sandalwood trees (see map) in the upper, southwest gulch should also be avoided if possible. These trees are vigorous and nice specimens of one of the dominant native trees in the area. They may represent a good seed source for the species in the area.

Impact and removal of the *Acacia koa* trees in the area should also be avoided when possible. They are common in the area but are the climax species in this vegetation type and so are important for the overall health of this native ecosystem.

Since the project site is on a ridge top surrounded by steep slopes, special care should be taken to avoid erosion problems. Disturbances caused by erosion removes the carpet of uluhe fern which opens habitat for invasive alien weeds. Erosion can also cause the loss of top soil which will degrade the habitat.

Finally, there should be an effort to reduce the amount of aesthetic disturbance made to the mountainside by the project. Surplus construction materials, ect. should be taken off the site after the tower is completed.

Summary:

Based on the vegetation survey and the absence of any endangered plant species on the Koloa Radio Tower site, it appears that there would be no major negative impacts on the native flora in this area. However, the recommendations in this report should be addressed to reduce the impacts that will occur during the tower construction.

Submitted by:

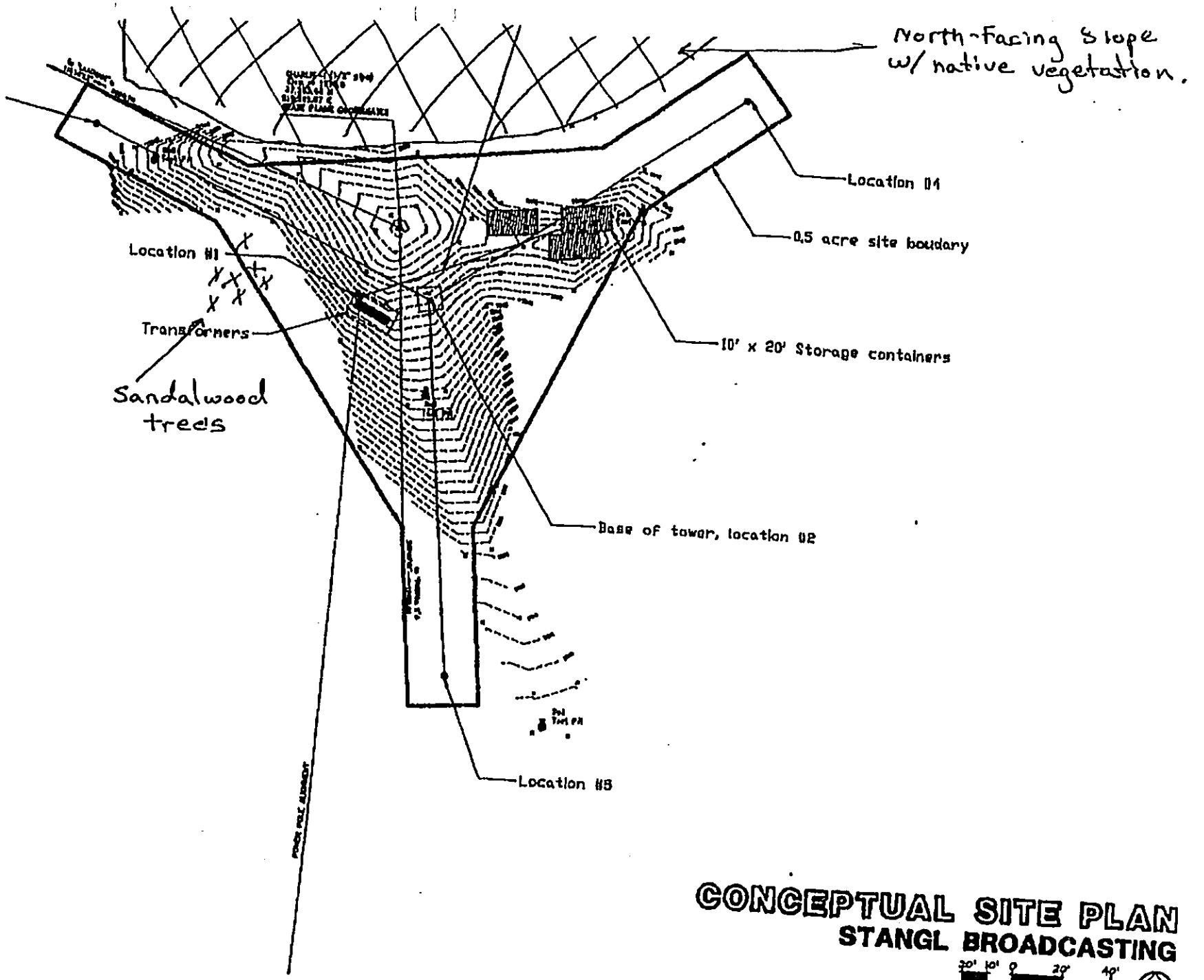
Timothy J. Motley
3190 Maile Way, Rm. 101
Honolulu, HI 96822

TAXON	COMMON NAME	STATUS*
FERNS		
Blechnum occidentale		nat
Thelypteris dentata	Downy wood fern or pala`i`iha	nat
Dicranopteris linearis	False staghorn or uluhe	ind
Nephrolepis multiflora	Sword fern	nat
Microlepia strigosa	Palapalai	ind
Odontosoria chinensis	Lace fern or pala`a	ind
Phymatosorus scolopendria	Maile-scented fern or laua`e	nat
Pteopeltis thunbergiana	Pakahakaha	ind
MONOCOTS		
Agavaceae		
Cordyline fruticosa	Ti	pol
Pleomele aurea	Hala pepe	end
Cyperaceae		
Gahnia beecheyi		end
Machaerina angustifolia	`Uki	ind
Machaerina mariscoides	`Ahaniu	ind
Dioscoreaceae		
Dioscorea pentaphylla	Pi`a	pol
Liliaceae		
Dianella sandwicensis	`Uki`uki	ind
Orchidaceae		
Spathoglottis plicata	Philippine ground orchid	nat
Pandanaceae		
Freycinetia arborea	`Ie`ie	ind
Pandanus tectorius	Hala	ind
Poaceae		
Oplismenus hirtellus	Basketgrass or honohono	nat
Panicum maximum	Guinea grass	nat
Paspalum conjugatum	Hilo grass	nat
Paspalum scrobiculatum	Rice grass or mau`u laiki	ind?
Setaria gracilis	Yellow foxtail	nat
DICOTS		
Apocynaceae		
Alyxia oliviformis	Maile	end
Rauvolfia sandwicensis	Hao	end

Asteraceae		
Ageratum conyzoides	Maile hohono	nat
Bidens sandvicensis subsp. *sandvicensis*	Ko`oko`olau	end
Conyza bonariensis	Hairy horseweed	nat
Crassocephalum crepidioides		nat
Emelia fosbergii	Pualele	nat
Elephantopus spicatus	Elephant's foot	nat
Pluchea symphytifolia	Sourbush	nat
Campanulaceae		
Cyanea spathulata subsp. *longipetiolata*		end
Ebenaceae		
Diospyros sandwicensis	Lama	end
Fabaceae		
Acacia koa	Koa	end
Albizia lebbeck	Siris tree	nat
Flacourtiaceae		
Xylosma hawaiiense	Maua	end
Malvaceae		
Hibiscus macrophyllus	Large-leaved hau	nat
Melastomataceae		
Tibouchina urvilleana	Princess flower	nat
Myrtaceae		
Eucalyptus sp. (robusta?)	Eucalyptus	nat
Psidium cattleianum	Strawberry guava	nat
Psidium guajava	Yellow guava	nat
Rhodomyrtus tomentosa	Downy or rose myrtle	nat
Proteaceae		
Grevillea robusta	Silk Oak	nat
Rosaceae		
Rubus rosifolius	Thimbleberry	nat
Rubiaceae		
Hedyotis terminalis	Manono	end
Paederia scandens	Maile pilau	nat
Psychotria mariniana	Kopiko	end
Psydrax odoratum	Alahe`e	ind
Santalaceae		
Santalum freycinetianum var. *pyrularium*	Sandalwood	end

Sterculiaceae		
Waltheria indica	ʻUhaloa	ind
Verbenaceae		
Lantana camara	Lantana	nat
Stachytarpheta urticifolia		nat

* nat = introduced and naturalized, ind = indigenous, end = endemic, and pol = Polynesian introduction.



CONCEPTUAL SITE PLAN
STANGL BROADCASTING

APPENDIX G

Brigham Young University
Hawaii Campus
Museum of Natural History

17 September 1996

E. Andrew Daymude, ASLA
Vice President
The Keith Companies, Inc.
4479 Rice St. #204
Lihue, Kauai, HI 96766
FAX (808) 241-5177

SUBJECT: Report on a bird survey of the proposed Stangl Broadcasting Radio Tower site at TMK: 3-4-6: 1,2-9-02:1, Kauai.

On 15 September I visited the proposed project site between the hours of 10am and 1pm. Weather during the field survey was clear and warm with light winds from the east. The entire site was searched as well as areas of the ridge 50 to 75 m outside the project site. Fern and brush cover the ridge and steep slopes. I spent the majority of my time searching through the dense undergrowth for evidence of nesting seabirds.

FINDINGS:

No signs of Newell's Shearwater (Puffinus auricularis newelli) or Hawaiian Dark-rumped Petrel (Pterodroma phaeopygia sandwichensis) were found. I did not locate any burrows that might indicate the area had been previously used by nesting seabirds. Four White-tailed Tropicbirds (Phaethon lepturus dorotheae) were seen soaring around the ridge. This species is not endangered or threatened. They nest in cliffs and are commonly seen on Kauai. Two introduced species of birds were recorded on the survey: Japanese White-eye (Zosterops japonicus) and Hwamei (Garrulax canorus). These species are likewise not endangered or threatened. They were heard and seen flying in the forest down slope of the project site. No native birds were noted. The elevation and habitat at the site are inappropriate for native forest birds. Wetland habitat in the form of ponds, ditches and flooded fields occurs in the lowlands on either side of the ridge. Four native and endangered waterbirds are known to occur in these wetlands. These species are: Black-necked Stilt (Himantopus mexicanus knudseni); Hawaiian Coot (Fulica alai); Common Moorhen (Gallunula chloropus sandvicensis) and Koloa (Anas wyvilliana). These birds move between wetlands. Whether or not they traverse the ridge in these movements was not determined. It is likely that if they were to cross the ridge they would choose the lowest spot rather than the higher location of the proposed radio tower.

CONCLUSIONS:

No nesting seabirds were found at the project site and nearby areas along the ridge. Likewise no evidence of previous nesting by seabirds was noted. Birds seen at

the site or down slope were either common introduced species or the native White-tailed Tropicbird. None of these species are endangered or threatened. Native and endangered waterbirds occupy the wetlands on either side of the ridge. They may cross the ridge but probably at a lower location rather than at the proposed project site. State of Hawaii, Department of Land and Natural Resources, Division of Forestry and Wildlife, District Wildlife Manager, Thomas C. Telfer in a letter addressed to E. Andrew Daymude of The Keith Companies, Inc. dated 12 September 1996 expressed the opinion that the tower could pose a potential impact through "possible night time aerial collisions". He went on to say that similar towers on Kauai had not been a "significant problem". Where problems have occurred is with "wires or structures .... near bright lights". Based on Telfers' comments and the findings of this field survey I would concur that there should be no significant impact on birds as a consequence of the proposed project.

Phil Bruner
Environmental Consultant - Faunal (bird & mammal) Surveys
Box 1775
BYU-H
Laie, HI 96762