

MARYANNE W. KUSAKA
MAYOR



CESAR C. PORTUGAL
COUNTY ENGINEER
TELEPHONE 241-6600

RUSSELL SUGANO
ACTING DEPUTY COUNTY ENGINEER
TELEPHONE 241-6631

AN EQUAL OPPORTUNITY EMPLOYER
COUNTY OF KAUAI

DEPARTMENT OF PUBLIC WORKS
4444 RICE STREET
MO'IKEHA BUILDING, SUITE 275
LIHU'E, KAUAI, HAWAII 96766

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OFFICE OF ENVIRONMENTAL
QUALITY CONTROL

September 11, 1997

Mr. Gary Gill
State of Hawaii
Office of Environmental Quality Control
235 South Beretania Street, 7th Floor
Honolulu, Hawaii 96813

**RE: KOLOA TO POIPU BYPASS ROAD
FROM WELIWELI ROAD TO MALUHIA ROAD
FINAL ENVIRONMENTAL ASSESSMENT/FINDING
OF NO SIGNIFICANT IMPACT
TAX MAP KEYS: PORTIONS OF 2-8-02,-03,
-04, -05, AND -25
KOLOA, KAUAI, HAWAII**

The County of Kauai Department of Public Works has reviewed the comment letters received during the public review period and has determined that the project qualifies as a Finding of No Significant Impact. Please publish notice of this in the September 23, 1997 issue of your Environmental Notice.

Please contact Kenneth Kitabayashi at (808) 241-6622 if you have questions.

Very truly yours,


CESAR C. PORTUGAL
County Engineer

KK/llv

cc: Earl Matsukawa, Wilson Okamoto & Associates, Inc.

FILE COPY SEP 23 1997

1997-09-23-KA-PEA-Koloa to
Poipu Bypass Road

Final Environmental Assessment

*Koloa to Poipu Bypass Road
From Weliweli Road to Maluhia Road*

Koloa, Kauai, Hawaii

Prepared for:

*County of Kauai
Department of Public Works*

Prepared by:

Wilson Okamoto & Associates, Inc.

September 1997

*Final Environmental Assessment
(Finding of No Significant Impact)*

*Koloa to Poipu Bypass Road
From Weliweli Road to Maluhia Road*

Koloa, Kauai, Hawaii

Prepared for:

*County of Kauai
Department of Public Works
4444 Rice Street
Mokihana Building, Suite 275
Lihue, Hawaii 96766*

Prepared by:

*Wilson Okamoto & Associates, Inc.
1907 South Beretania Street, Suite 400
Honolulu, Hawaii 96826*

September 1997

FEDERAL HIGHWAY ADMINISTRATION
FINDING OF NO SIGNIFICANT IMPACT FOR

KOLOA-POIPU BYPASS ROAD
FROM WELIWELI ROAD TO MALUHIA ROAD
Project No. STP-0700(37)

The FHWA has determined that the proposed alternative will have no significant impact on the human environment. This FONSI is based on the attached EA which has been independently evaluated by the FHWA and determined to adequately and accurately discuss the need, environmental issues, and impacts of the proposed project and appropriate mitigation measures. It provides sufficient evidence and analysis for determining that an EIS is not required. The FHWA takes full responsibility for the accuracy, scope, and content of the attached EA.

9/10/97
Date of Approval

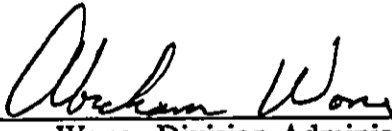

Abraham Wong, Division Administrator
Federal Highway Administrator

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- Appendix G Updated Acoustic Study for the Koloa-Poipu Bypass Road Project, Koloa, Kauai, Hawaii, Prepared by Y. Ebisu & Associates, February 1996
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- Appendix I Archaeological Investigation for Environmental Assessment of the Proposed Koloa/Poipu Bypass Road, Koloa, Weliweli, Kauai, Prepared by Cultural Surveys Hawaii, August 1996
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Chapter 1

PURPOSE AND NEED FOR THE ACTION

CHAPTER 1 PURPOSE AND NEED FOR ACTION

1.1 Purpose

The purpose of the proposed action is to provide a road link between the present terminus of the Koloa Bypass Road at Weliweli Road to a point on Maluhia Road north of the town of Koloa. The action will complete the Koloa-Poipu Bypass Road which will allow vehicular traffic travelling between Poipu and Kaunualii Highway to bypass Koloa town.

Prior to the construction of the Koloa-Poipu Bypass Road, the three major roadways in the area, including Maluhia, Koloa, and Poipu Roads, converged in Koloa Town where various turning movements are required for motorists to select the route leading to their destinations. As rapid urbanization of the Koloa-Poipu area has progressed since the 1970's, traffic congestion and delays at key intersections increased within the town.

In 1989 and 1991, the State Legislature appropriated \$1.4 million, matching the \$1.4 million in County funds, for the construction of the Koloa Bypass Road and construction began in 1992. The southern portion of the roadway from Poipu to Weliweli Road was completed in 1993. The State appropriated an additional \$2 million in 1994 to complete the remainder of the road, however, the Governor of Hawaii subsequently rescinded State support, citing budgetary shortfalls related to the slumping economy.

The present terminus of the Koloa-Poipu Bypass Road at Weliweli Road does not bypass Koloa Town. Instead, motorists travelling between the bypass road and Kaunualii Highway must use Weliweli Road and enter Koloa town where they access Maluhia Road to the highway. Thus, the partial completion of the Koloa-Poipu Bypass Road has resulted in Weliweli Road becoming a fourth major roadway converging in Koloa.

1.2 Project Need

1.2.1 Population Growth/Projections

According to the U.S. Census, the population of the Koloa-Poipu area increased by 23 percent between 1970 - 1980 and 26 percent between 1980 - 1990. The projected growth rate for the area is 20 percent between 1990 - 2000 and 18 percent between 2000 - 2010 according to the Office of State Planning in its 1992 State Land Use Boundary review.

1.2.2. Planning Background

Koloa-Poipu-Kalaheo Development Plan

The need for the Koloa-Poipu Bypass Road has been recognized since the 1970's. It is depicted as one of several vehicular circulation systems recommended in the Koloa-Poipu-Kalaheo Development Plan which was prepared in 1978 and adopted by County ordinance in 1983. Notably, under the topic of Physical Implementation - Infrastructure, the Plan states:

Proposed improvements to infrastructure will insure a functional, coordinated circulation system. While there is obvious flexibility in the precise location and detailed design of recommended improvements, there is little or no flexibility in the system itself. Variations from or abandonment of critical elements such as... the alternative bypass routes from Maluhia road to Poipu will seriously impair the function of the entire system.

The circulation system as proposed should be adopted by ordinance and no variation to the implementation of the system permitted without a complete analysis of impact on the system and a feasible alternative solution which accomplishes the same functional objectives.

Kauai County General Plan

The 1980 update of the Kauai County General Plan stressed that infrastructure upgrades were required and recommended a resource management system that would provide a basis for determining capital improvement programs, infrastructure, master plans and so forth. It also recommended an optimal population growth rate of 2.25 percent so as to achieve a 1990 population for the County of 49,000 persons. The actual 1990 population was 51,200.

Regional maps on the General Plan designate the following recommended land uses for Koloa-Poipu:

- Urban Residential in west Poipu and Koloa Town itself;
- Resort in east Poipu and south of Koloa Town;
- Agricultural to the west and east of Koloa Town; and'
- Open to the north of Koloa.

1.2.3 Development Activity

Rapid residential and resort development in the Koloa-Poipu area prior to Hurricane Iniki in 1992 reflects the population growth of over 20 percent in each of the two preceding decades. Since the hurricane, the emphasis has been on restoring the damaged visitor units to their pre-Iniki conditions. Of the major resorts in the area, only the Hyatt has reopened. The Sheraton Kauai Resort, with 417 rooms, is scheduled to re-open in November 1997. Renovations are on-going but with no firm reopening date for the Waiohai Beach Resort and the Poipu Beach Hotel which collectively account for an additional 565 rooms.

Residential restoration following the hurricane has largely been completed for the island. Future residential development in the Koloa-Poipu area includes the Kukuiula development on the western side of Poipu. Phase I covers 727 acres and involves approximately 1,200 single-family units and 500 multi-family units, a golf course and 14 acres of commercial space. The developers are cautiously targeting implementation of Phase I in five years. Phase II encompasses 325 acres and involves 1,200 single- and multi- family units as well as a town center with visitor accommodations around a 75-acre marina.

The other residential development planned in the area proposes the addition of approximately 200 single family and 500 multi-family units to the Kiahuna Golf Course development on the west side of Poipu Road. The implementation schedule for this project is uncertain.

1.2.4 Transportation Studies

Kauai County Highway Planning Study

The Kauai County Highway Planning Study (Final Report, October 1990) prepared by the State of Hawaii Department of Transportation and the County of Kauai Department of Public Works and Planning Department identified the Poipu/Lawai/Koloa area as one of six specific areas of potential congestion, citing:

The extensive planned residential, visitor, and commercial developments in this area will result in volume to capacity (V/C) ratios of 1.00 on all primary streets: Poipu Road, Koloa Road and Maluhia Road. The travel demand model projects that the low speeds and increased levels of activity in the Koloa Town area would increase delays and thus travel time along Maluhia Road to such a degree that some motorists travelling from Lihue to Poipu would use the Kaunualii Highway to Koloa Road route.

The study ranked the Koloa-Poipu Bypass Road seventh in priority among 19 recommended projects on the island, stating:

- Priority 7: *The construction of a two-lane north-south connector located east of Poipu Road, providing a connection between Poipu and the portion of Maluhia Road north of Koloa town. (See Figure 1-1).*

Other recommended projects in the Koloa-Poipu area, by priority ranking included:

- Priority 13: *The proposed widening of Maluhia Road from Kaumualii Highway to Koloa Road to four lanes (This would increase the capacity of Maluhia Road between the Koloa-Poipu Bypass Road and Kaumualii Highway);*
- Priority 16: *The construction of a two-lane bypass highway through the Poipu/Koloa area (This road would connect with the Koloa-Poipu Bypass Road approximately midway along its length and extend westward across Poipu Road to a second north-south connector highway between Koloa Road and Lawai Road);*
- Priority 17: *The proposed two-lane north-south connector highway (referred to above) located west of Poipu Road which would connect Lawai Road to Koloa Road at a point north of its current intersection with Poipu Road (This road would provide a second route bypassing Koloa Town on the west side of Poipu Road);*
- Priority 18: *The construction of the bypass highway providing two lanes from Poipu to Hanapepe (This road would extend the highway mentioned in Priority 16 westward to Hanapepe); and,*
- Priority 19: *The proposed completion of the bypass road connecting Kaumualii Highway (west of Puhi) to Poipu with four lanes (This highway would extend the highway mentioned in Priority 16 eastward toward Puhi.*

Kauai Long-Range Land Transportation Plan (Draft Report)

In November 1995, the State Department of Transportation, in cooperation with the Kauai Departments of Public Works and Planning, published the Kauai Long-Range Land Transportation Plan (Draft Report). The plan involved development of traffic forecasts through the year 2020 based on land use projections through that year. These forecasts accounted for the impacts of Hurricane Iniki on land uses as related to housing and employment. In this plan, the proposed action was assumed to have been completed and is viewed as a necessary component for future long-range planning. Building upon this assumption, a variety of additional road improvement alternatives were assessed.

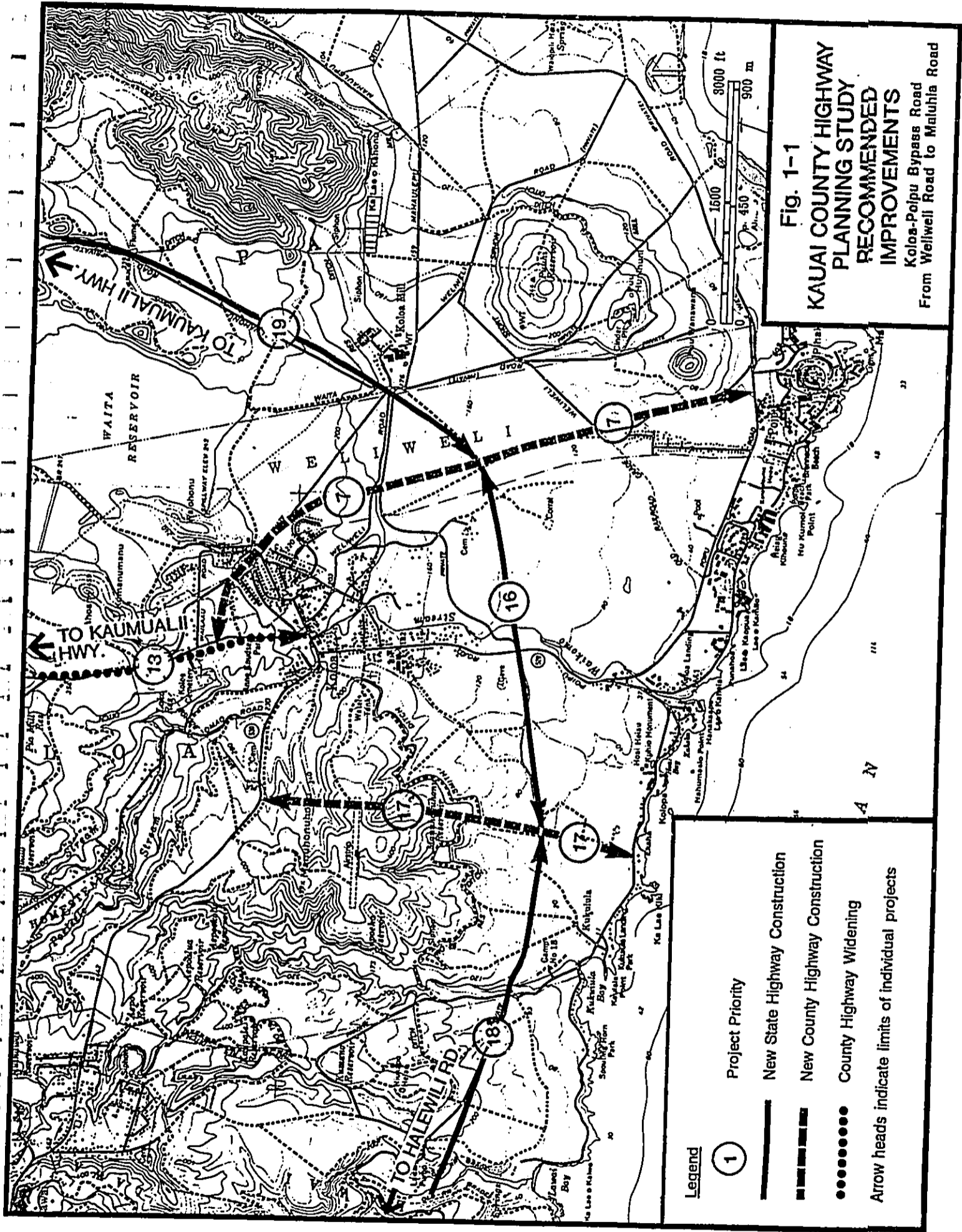


Fig. 1-1
KAUAI COUNTY HIGHWAY
PLANNING STUDY
RECOMMENDED
IMPROVEMENTS
 Koloa-Poipu Bypass Road
 From Wellwell Road to Maluhia Road

Legend

1 Project Priority

———— New State Highway Construction

----- New County Highway Construction

..... County Highway Widening

Arrow heads indicate limits of individual projects

The Plan's Year 2020 recommendations in the Koloa Poipu area, portions of which are illustrated in Figure 1-2, are comparable to those contained in the 1990 Kauai County Highway Planning Study. The plan describes implementation in three phases (Phase 1 - 1996 to 2000, Phase 2 - 2001 to 2005 and Phase 3 - 2006 to 2020) but the Koloa-Poipu area improvements are only in Phase 3:

- *Construct a new two-lane connector road between Port Allen and Poipu;*
- *Construct ... the Poipu to Kipu (west of Puhi) ... connector road to (complete) the Poipu-Nawiliwili connector road;*
- *Widen the east Koloa-Poipu Bypass Road to a four-lane undivided roadway (between Poipu Road and Weliweli Road); and*
- *Widen Poipu Road to a four-lane divided roadway between Lawai Road and the east Koloa-Poipu Bypass Road.*

Although the recommended alternative did not include construction of the West Koloa-Poipu Bypass Road, it notes that for the Koloa-Poipu area, *circulation roadways are needed to serve local neighborhood traffic desiring to bypass Koloa town. A loop roadway could be formed by the following roads:*

- *East Koloa-Poipu Bypass Road, between Maluhia Road and the Port Allen-Poipu connector road;*
- *West Poipu Bypass Road, from Maluhia Road to the Kukuiula mauka project road; and*
- *Proposed Port Allen-Poipu connector road, between the east Koloa-Poipu Bypass Road and the West Poipu Bypass Road.*

Notably, the circulation system created by this loop places the West Koloa-Poipu Bypass Road opposite Maluhia Road from the terminus of the East Koloa-Poipu Bypass Road which the proposed action would determine.

1.2.5 The Proposed Action

With the partial completion of the Koloa-Poipu Bypass Road, traffic patterns in the area have changed. In addition to Poipu, Koloa and Maluhia Roads, which have historically converged on Koloa, Weliweli Road has now also become a major traffic route into the town since it connects to the present terminus of the bypass road.

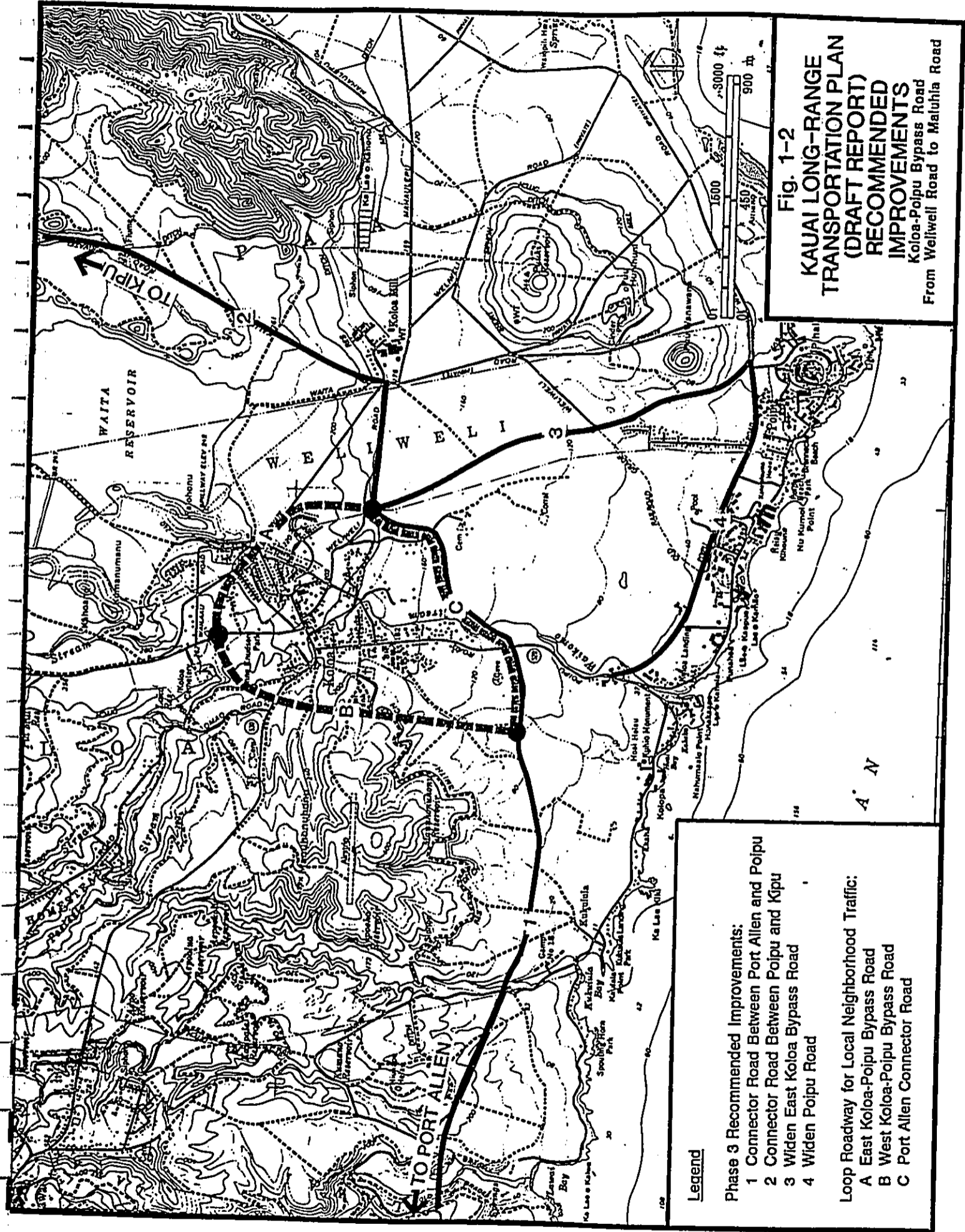


Fig. 1-2
KAUAI LONG-RANGE
TRANSPORTATION PLAN
(DRAFT REPORT)
RECOMMENDED
IMPROVEMENTS
 Koioa-Poipu Bypass Road
 From Wellwell Road to Maluhia Road

- Legend**
- Phase 3 Recommended Improvements:**
- 1 Connector Road Between Port Allen and Poipu
 - 2 Connector Road Between Poipu and Kipu
 - 3 Widen East Koioa Bypass Road
 - 4 Widen Poipu Road
- Loop Roadway for Local Neighborhood Traffic:**
- A East Koioa-Poipu Bypass Road
 - B West Koioa-Poipu Bypass Road
 - C Port Allen Connector Road

A highway capacity analysis conducted by Wilson Okamoto & Associates, Inc. in April of 1997 indicates that Maluhia, Koloa and Weliweli Roads presently carry relatively high traffic demand during the a.m. and p.m. peak hours of traffic, resulting in undesirable delays for motorists. The critical movement at the intersection of Maluhia and Koloa Roads is the southbound left-turn movement from Maluhia Road to eastbound Koloa Road. During the present a.m and p.m. peak hours of traffic, the left-turn movement operates at a Level of Service (LOS) "D" and LOS "F," respectively. Should the proposed action be implemented, the traffic volumes for this particular movement are expected to decrease, hence, LOS and traffic operating conditions should improve. The proposed action is expected to attract and divert a large portion of the traffic demand from Maluhia, Koloa and Weliweli Roads.

The traffic volumes on the roadways in the Koloa-Poipu area are expected to increase in the future with or without the proposed action. Based on traffic volume data from "Traffic Survey Data, Island of Kauai," prepared by the State Department of Transportation, the historical trend of vehicular volume is an increase of one percent per year. Without the proposed action, future traffic demand would further deteriorate traffic operating conditions of the critical intersections in Koloa.

Another need for the proposed action is the safety of the roads. The existing roads are generally two-lane, two-way local roadways with segments of curvilinear alignments that may reduce safety should traffic volumes increase as forecasted. Road improvements and intersection controls may be required should the proposed action not be implemented. While such improvements could address traffic safety, they would not alleviate traffic congestion and delays.

Chapter 2

ALTERNATIVES TO THE PROPOSED ACTION

CHAPTER 2 ALTERNATIVE ACTIONS

2.1 Proposed Alternative

The proposed action illustrated in Figure 2-1 involves the construction of a 1.9 kilometer (km) (1.2 mile)¹ roadway from the terminus of the existing Phase I portion of the Koloa-Poipu Bypass Road at Weliweli Road to Maluhia Road, approximately 0.40 km (0.25 mile) north of its intersection with Koloa Town Road. The alignment would traverse an undeveloped pasture, curving northwest to border the Waikomo residential subdivision. Behind the homes on Mamaki Street, the proposed road would parallel, and partially overlap an existing unpaved cane haul road. A portion of the cane haul road would be realigned to accommodate the new roadway.

2.2 Other Alternatives

2.2.1 No Action

The no action alternative would involve no further improvements to complete the Koloa-Poipu Bypass Road which presently terminates at Weliweli Road. Traffic using the existing Phase I bypass road between Poipu Road on the coast and Maluhia Road will continue to use Weliweli Road and Koloa Road in Koloa Town. The purpose of the bypass road, however, is to provide a connection to Maluhia Road north of Koloa town, thereby reducing the potential for traffic congestion in the town. Thus, the no action alternative would not fulfill the purpose or need for the proposed action.

2.2.2 Alternative 1

Alternative 1, also illustrated in Figure 2-1, would be similar to the preferred alternative from the Weliweli Road intersection to the Waihohonu Stream crossing. Beyond the crossing, however, instead of diverging from the cane haul road, the alternative alignment would continue to parallel the existing cane haul road to the point at which it again intersects Wailaau Road. Wailaau Road would be improved from that intersection west to its intersection with Maluhia Road, serving as the final link for the bypass road. By improving this segment of Wailaau Road, construction of a new roadway through existing sugar cane fields north of the Waihohonu Stream crossing would be unnecessary. The length of the proposed road would be about 2.01 km (1.25 miles) from Weliweli Road to Maluhia Road. This alternative was abandoned because the intersection of Wailaau Road at Maluhia Road does not provide adequate sight-distance for motorists at the intersection, due to the grade and curvature of Maluhia Road. Mitigation of sight-distance limitations would require acquisition of residential yards along Maluhia Road.

¹ Dual units are shown with metric expressed as the primary unit and the English equivalent noted in parenthesis, as required by the FHWA.

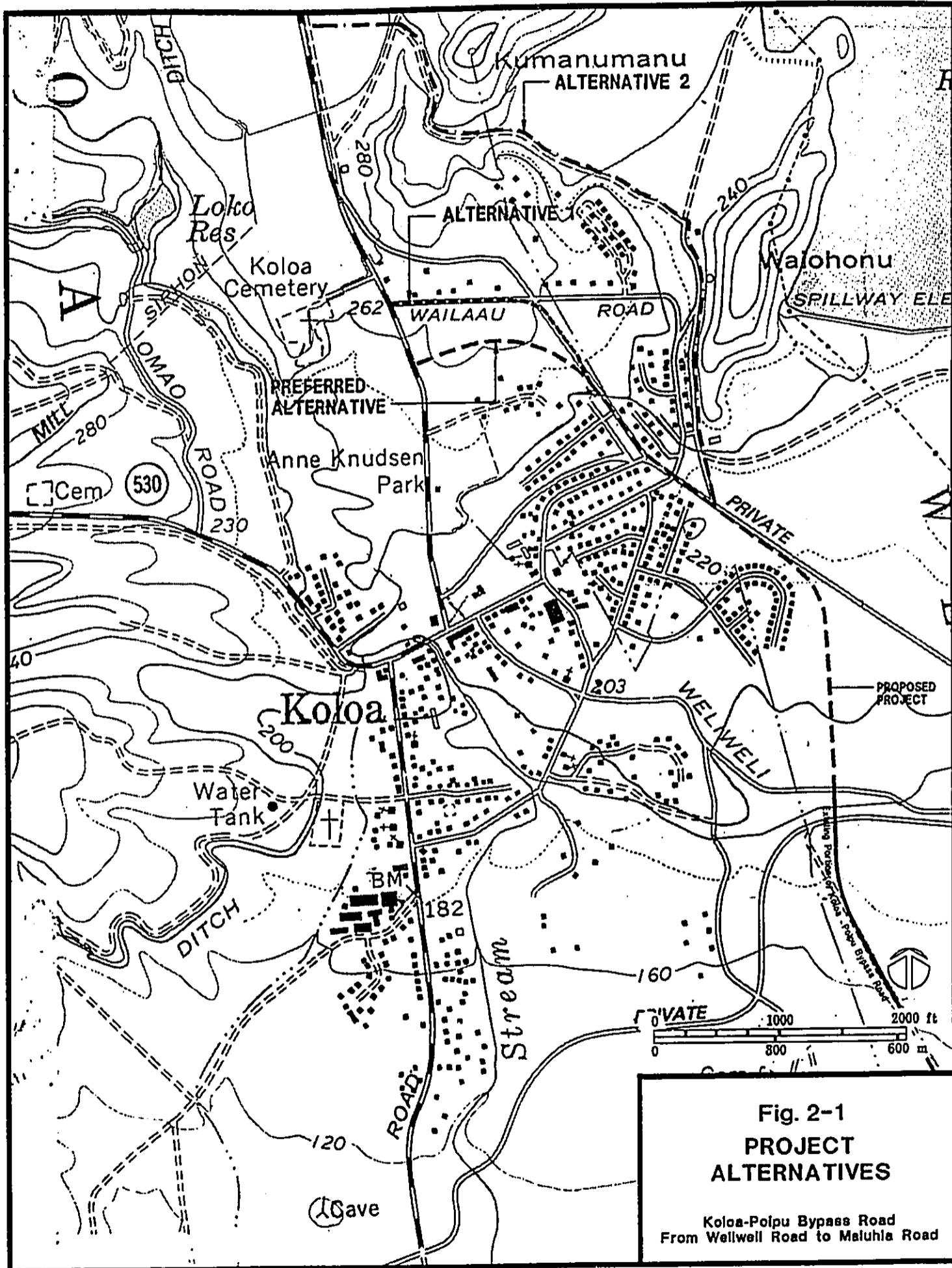


Fig. 2-1
PROJECT
ALTERNATIVES

Koloa-Poipu Bypass Road
From Wellwell Road to Maluhia Road

Moreover, the recommended terminus of the future West Koloa-Poipu Bypass Road opposite the currently proposed bypass road would be undesirable at this point because of the proximity and impact to a nearby cemetery.

2.2.3 Alternative 2

Alternative 2, also shown in Figure 2-1, was considered as a means of minimizing potential impacts on residences which are located near the cane haul road in the vicinity of its southern intersection with Wailaau Road to the Waihohonu Stream crossing. Such an alignment for the proposed road would improve an existing road which skirts the base of a hill known as Waiohono and continues toward Maluhia Road on the southern side of a hill known as Kumanumanu. The connection to Maluhia Road would be made about 457.2 meters (m) (1,500 feet) north of the intersection of Maluhia Road and Wailaau Road. The length of the Alternative 2 alignment would be 2.93 km (1.85 miles) from Weliweli Road to Maluhia Road. While this alignment avoids some residences near the cane haul road, it would pass near other residences at the base of Waiohono Hill. This alternative was abandoned because it would be much longer and costlier than the preferred alternative, as shown in Table 2-1 which compares the order-of-magnitude construction cost estimates of the various alternatives. In particular, the cost for road widening at the base of Waiohono Hill would be substantial due to the amount of cutting into the hill that would be required.

Alternative	Approximate Length	Estimated Cost (In Millions)
Proposed Alternative	1,706.8 m (5,600 lf)	\$3.0
Alternative 1 *	1,828.7 m (6,000 lf)	\$3.8
Alternative 2	2,743.1 m (9,000 lf)	\$4.9

* Includes site distance improvements to Maluhia Road

Chapter 3

DESCRIPTION OF THE PROPOSED ACTION

CHAPTER 3 DESCRIPTION OF THE PROPOSED ACTION

3.1 Overview

The project is located in the south-central portion of Kauai, between the Poipu area and Koloa Town, and lies within the Koloa and Weliweli ahupuaa (a traditional Hawaiian land subdivision). The proposed action involves the construction of a 1.9 km (1.2 mile) roadway from the terminus of the existing Phase I portion of the Koloa-Poipu Bypass Road at Weliweli Road to Maluhia Road at a point, approximately 0.40 km (0.25 mile) north of its intersection with Koloa Town Road. The proposed roadway would extend the existing Koloa-Poipu Bypass Road north across Weliweli Road through a pasture, curving northwest to skirt the Waikomo residential subdivision. Behind the homes on Mamaki Street, the proposed road will parallel, and partially overlap an existing unpaved cane haul road. Where the proposed road will overlap the cane haul road, the cane haul road will be realigned alongside it. (See Figures 3-1 through 3-3, and Photographs 1 through 6).

Running parallel to the existing cane haul road, the proposed road will cross Wailaau Road, then Waihohonu Stream. In an existing sugar cane field, immediately north of the Waihohonu Stream crossing, the proposed road will diverge from the cane haul road, curving west and intersecting with Maluhia Road where it will terminate.

Most of the proposed road will occupy a 18.3 meters (60-foot) wide right-of-way. In the typical roadway section (Figure 3-4), two 3.66 meters (12-foot) wide asphalt-paved traffic lanes will lie on either side of the roadway centerline. These traffic lanes will be flanked by an additional 1.8 meters (6 feet) of pavement forming the shoulder of the road. The shoulder will accommodate emergency pull-offs as well as bicyclists and pedestrians. The unpaved area beyond the roadway shoulders to the limits of the rights-of-way will be graded to accommodate surface drainage from the road. Street lighting will be provided near the intersections of Maluhia and Wailaau Roads. Drainage facilities will be provided near the Wailaau Road intersection.

3.2 Cane Haul Road Realignment

A portion of the existing unpaved cane haul road will be realigned slightly to accommodate the proposed road. The realigned section of the cane haul road will extend approximately 1,700 feet from where the proposed road approaches the cane haul road to its intersection with Wailaau Road. The cane haul road will parallel the proposed road on its north east side. A 1.8 meters (6-foot) wall will be constructed as a separation barrier between the cane haul road and the proposed roadway. The separation barrier is intended to prevent motorists travelling north-bound on the bypass road at night from being disoriented by on-coming headlights of vehicles

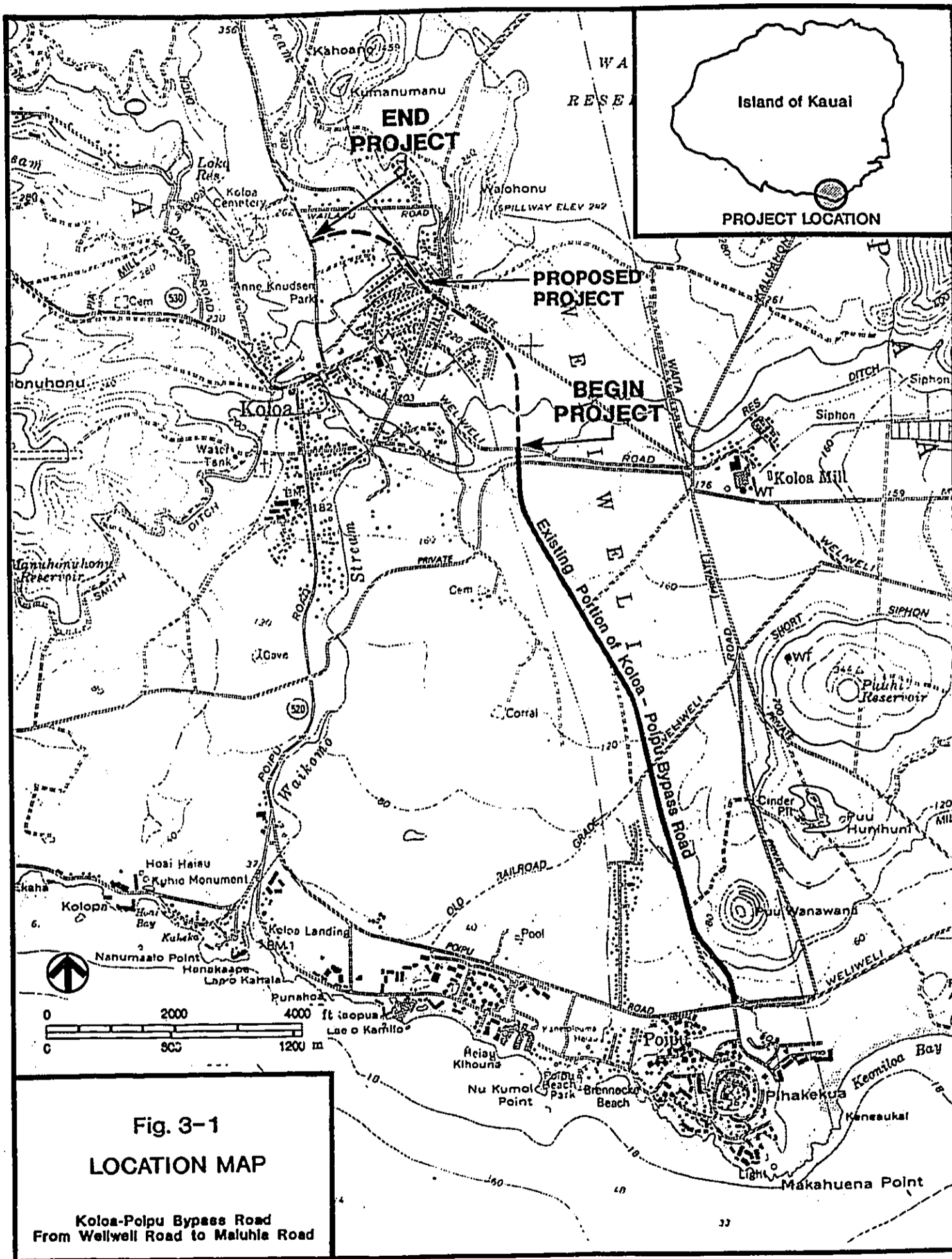
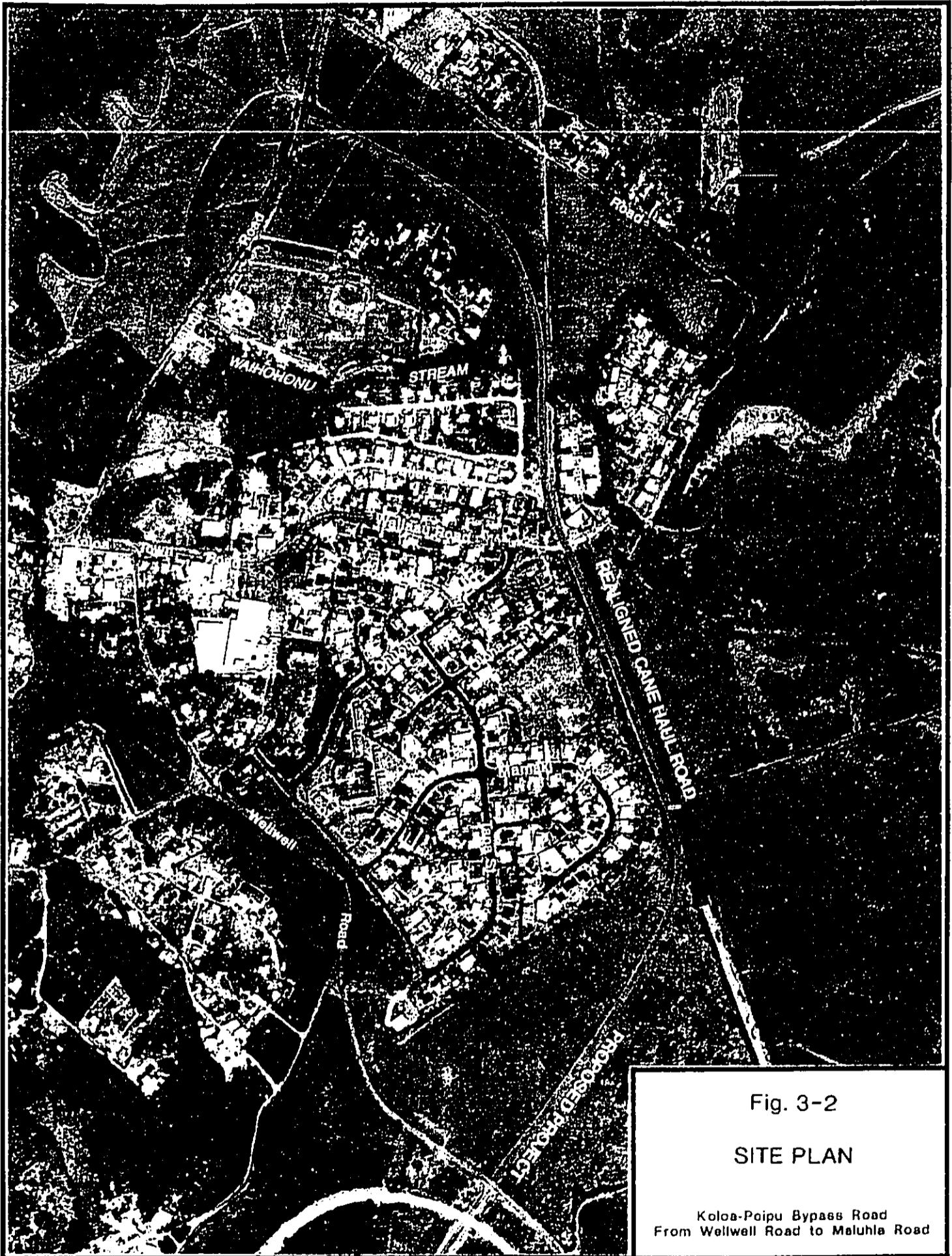


Fig. 3-1
LOCATION MAP

Koloa-Poipu Bypass Road
From Wellwell Road to Maluhie Road



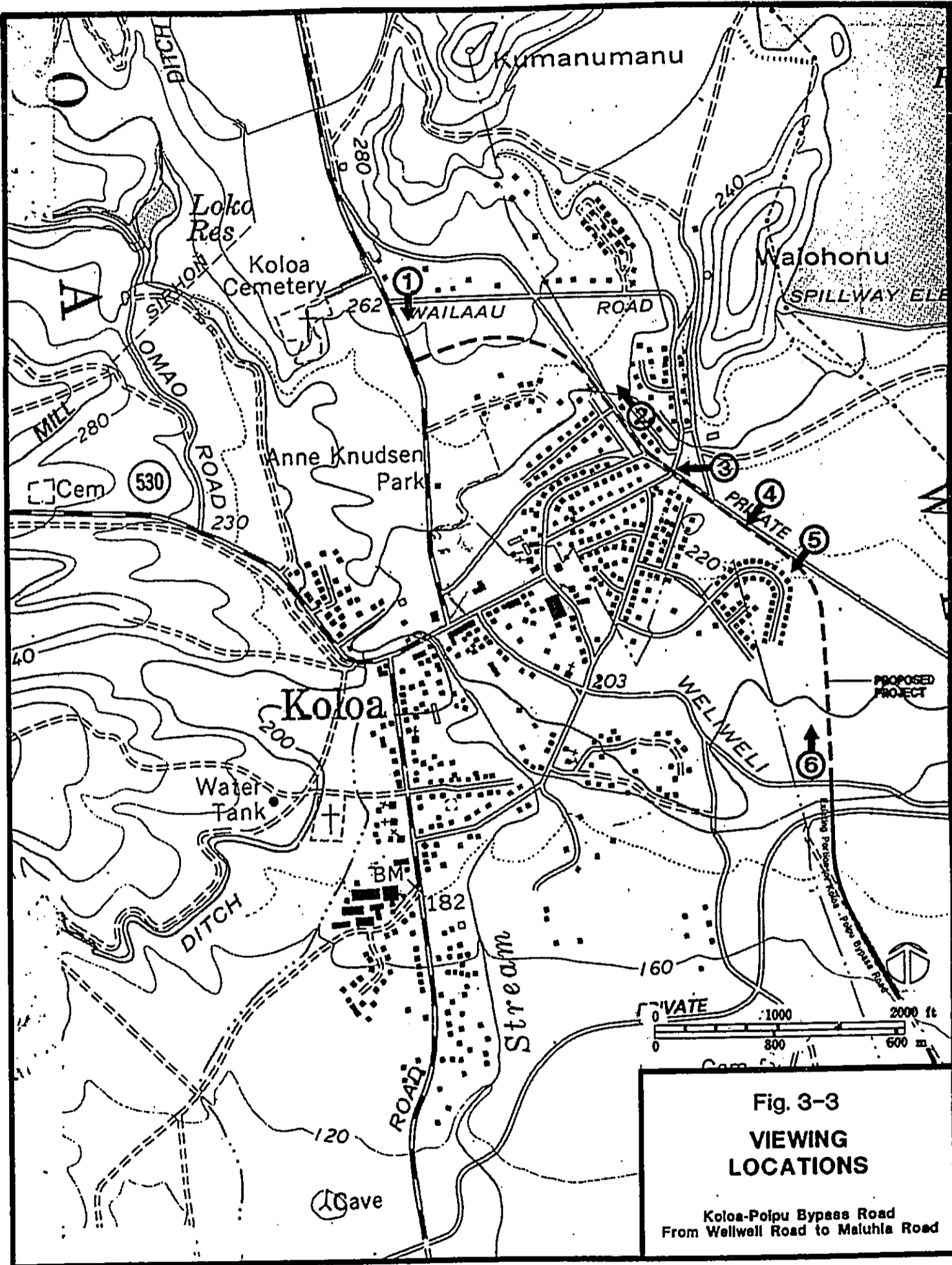
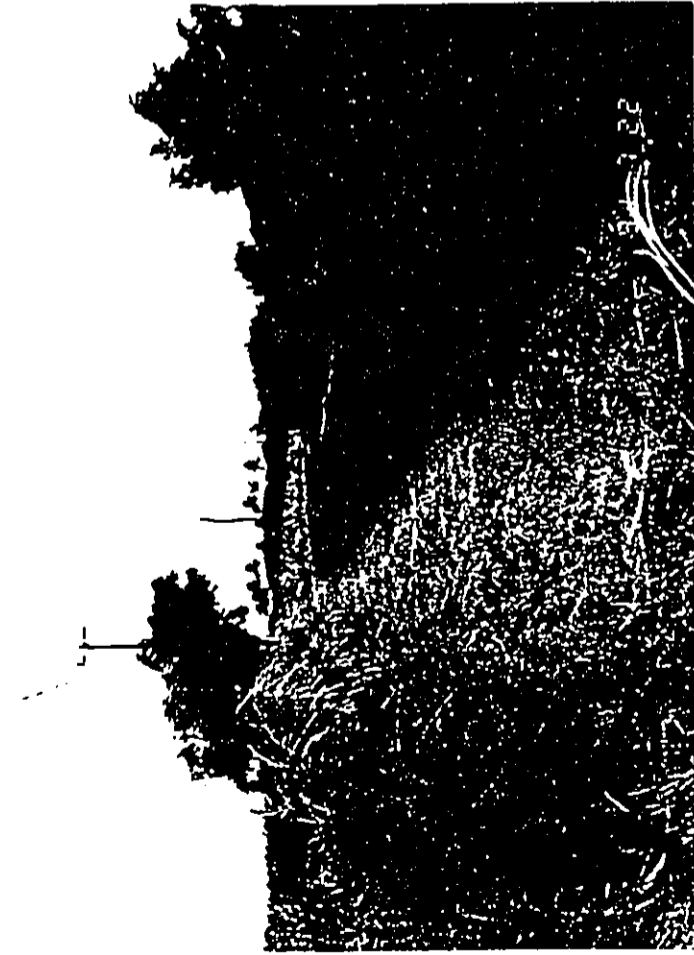


Fig. 3-3
VIEWING
LOCATIONS
 Koloa-Poipu Bypass Road
 From Wellwell Road to Maluhia Road

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1 Looking south along Maluhia Road at proposed connection point with the proposed bypass road.

2 Cane haul road looking north toward Waihohonu Stream.

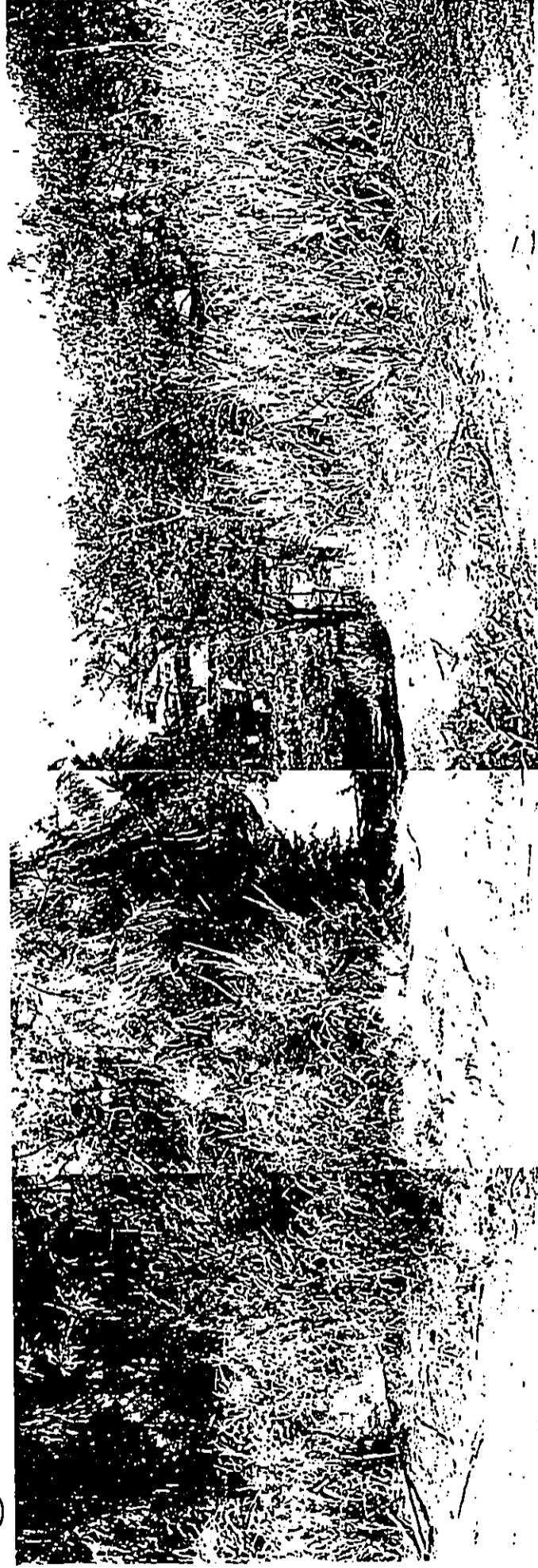


3 Cane haul road at intersection with Wailaau Road looking north.

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4 Looking west at proposed bypass road corridor along Waikomo Neighborhood Park.

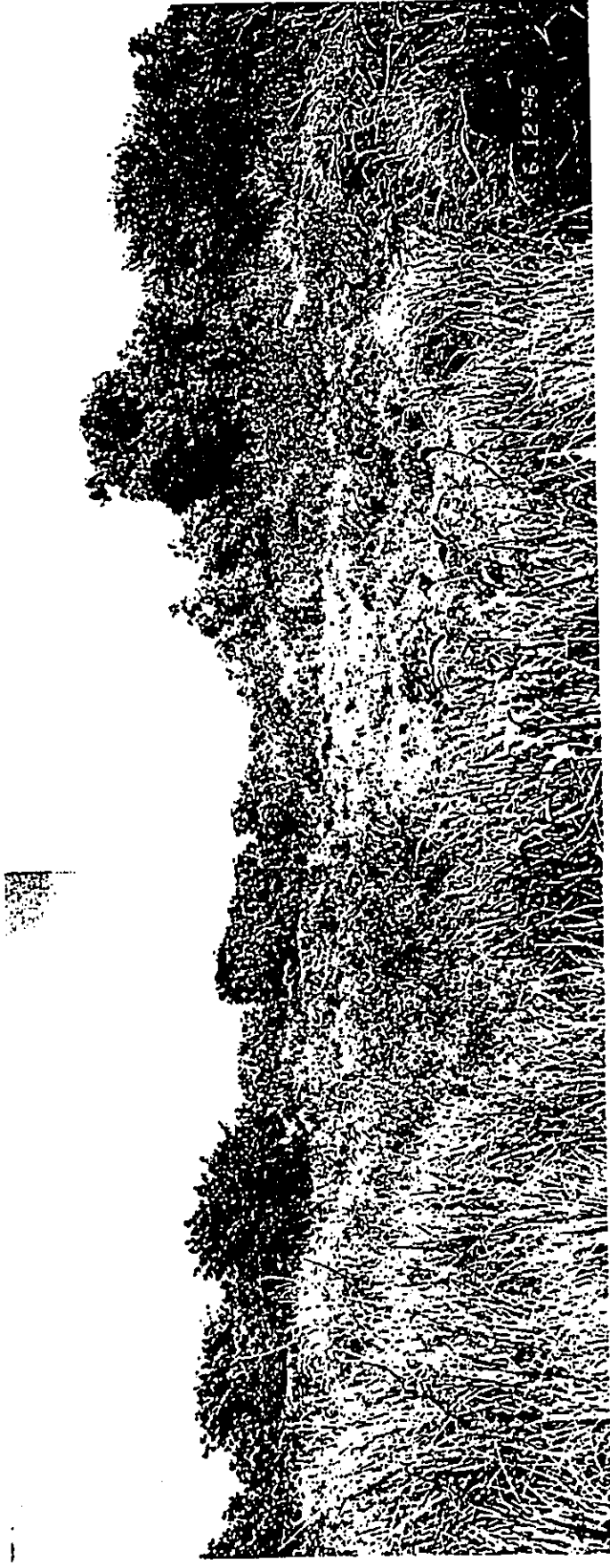


5 Looking west at Waikomo Subdivision from cane haul road.

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6 Proposed bypass road corridor within pasture land area looking north.

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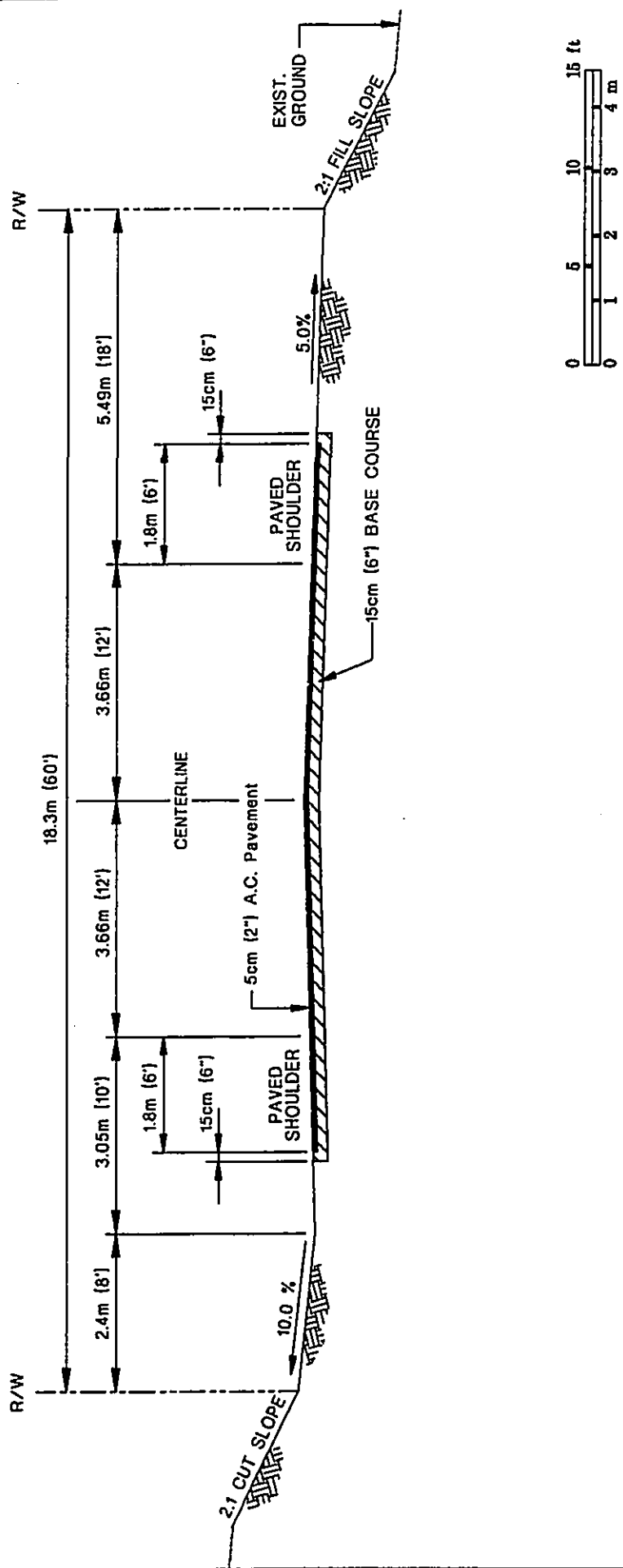


Fig. 3-4
TYPICAL ROADWAY SECTION
 Koloa-Poipu Bypass Road
 From Wellwell Road to Maluhia Road

proposed roadway. The separation barrier is intended to prevent motorists travelling north-bound on the bypass road at night from being disoriented by on-coming headlights of vehicles travelling south-bound on the cane haul road. For motorists unfamiliar with the bypass road, such on-coming headlights in what might be perceived as the right lane of the bypass road could be disorienting and result in unwarranted and potentially dangerous maneuvers. The separation wall will be located opposite the noise attenuation barrier near the Waikomo Subdivision from the point at which the two roads meet to the intersection at Wailaau Road.

3.3 Intersections

The intersections at Weliweli Road, Wailaau Road and Maluhia Road will be at the existing road grades. At Weliweli Road, the corners of the intersection will be rounded to facilitate south-bound right turns onto Weliweli Road and west-bound right turns from Weliweli Road onto the proposed road. The right-of-way boundaries flare to follow these rounded corners. Excluding the flare, the proposed road right-of-way immediately north of the intersection will have a width of 24.4 meters (80-feet) to accommodate a right-turn-only lane and a left-turn storage lane, both in the south-bound direction. The widened right-of-way tapers to the typical 18.3 meters (60-feet) width approximately 152.4 meters (500 feet) to the north of the intersection. Stop signs facing traffic on Weliweli Road will give traffic on the proposed road the right-of-way. (See Figure 3-5).

At the proposed Wailaau Road intersection, all four corners will be rounded for right-turns from the respective traffic lanes. Correspondingly, the rights-of-way boundaries flare to follow these rounded corners. North-bound traffic on the proposed bypass road will be provided with a left-turn storage lane onto Wailaau Road, while south-bound traffic have a left-turn storage lane and a right-turn-only lane onto the respective west and east-bound lanes of Wailaau Road. The widened rights-of-way for the proposed road near the intersection is approximately 21.3 meters (70 feet) on both the north and south sides, excluding the flare, and taper to the typical 18.3 meters (60 feet) approximately 152.4 meters (500 feet) to the north and south, respectively. Stop signs facing traffic on Wailaau Road will give traffic on the proposed road the right-of-way. (See Figure 3-6).

At the proposed Maluhia Road "T" intersection, both corners will be rounded for west-bound traffic on the proposed road to turn right onto Maluhia Road and for north-bound traffic on Maluhia Road to turn right onto the proposed road. In the west-bound direction of the proposed road, the left lane will be exclusive for left-turns south on Maluhia Road and the right lane will be for right-turns only onto northbound Maluhia Road. Excluding the flare, the right-of-way width on the proposed road is approximately 24.4 meters (80 feet), tapering to the typical 18.3 meters (60 feet) approximately 152.4 meters (500 feet) to the east. At the intersection, Maluhia Road on the south side will be widened to provide an exclusive right-turn lane onto the proposed road and to accommodate a painted "island" dividing north and south bound traffic lanes. On

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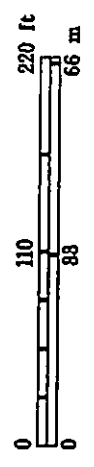
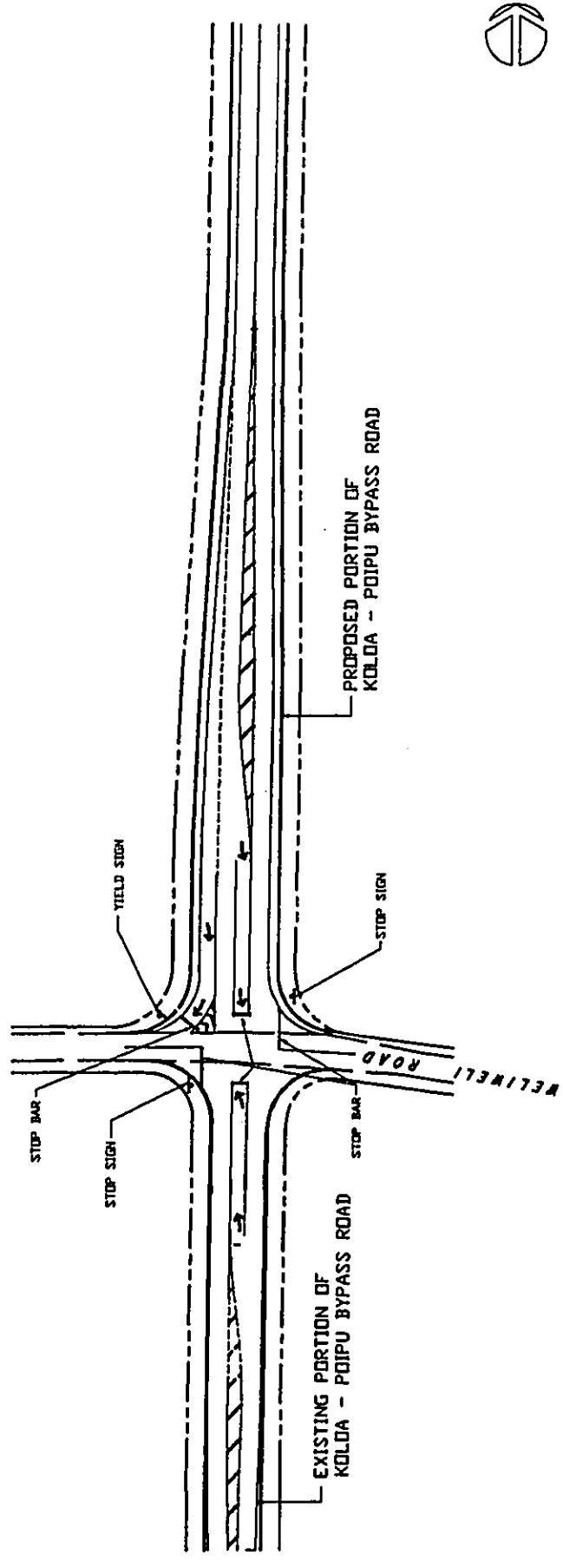


Fig. 3-5
INTERSECTION PLAN
AT WELIWELI ROAD
Koloa-Poipu Bypass Road
From Wellwell Road to Mauhia Road

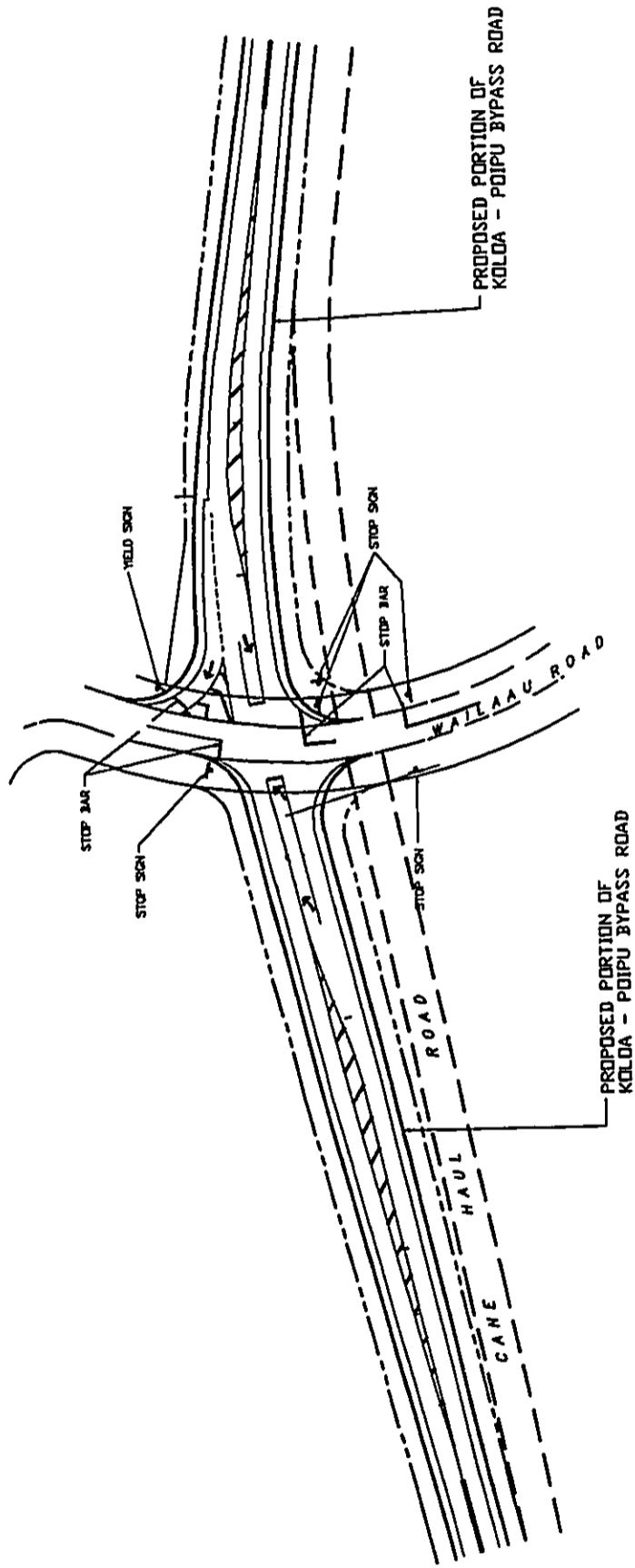


Fig. 3-6
INTERSECTION PLAN
AT WAILAAU ROAD
 Koloa-Poipu Bypass Road
 From Wellwell Road to Maluhia Road

the north side of the intersection, Maluhia Road will be widened to include a merging lane for traffic entering from the proposed road and a left turn storage lane for traffic entering the proposed road. Signage will provide through traffic on Maluhia Road with the right-of-way. (See Figure 3-7).

3.4 Waihohonu Stream Crossing

The crossing of Waihohonu Stream will be constructed by casting a covered reinforced concrete culvert over which the road will be built. The culvert will be approximately 12.2 meters (40-feet) wide and 1.8 meters (6 feet) deep with a center dividing wall along its length of approximately 18.3 meters (60 feet). (See Figure 3-8 and 3-9). Required approvals have been obtained for this component of the project from the Department of the Army Corps of Engineers, Department of Health and the Department of Land and Natural Resources.

3.5 Noise Attenuation Barrier

Based on a noise study prepared by Y. Ebisu and Associates, the County of Kauai intends to install noise abatement measures in the form of reinforced concrete barriers at residential developments along portions of the Waikomo Subdivision, and northwest of the Wailaau Road intersection (See Figures 3-10 and 3-11). Preliminary indications of likely abatement measures are based upon preliminary design for a barrier of 1.8 to 2.1 meters (6 to 7 feet) high and 859.5 meters (2,820 feet) long at a cost of approximately \$480,000 that will reduce the noise level by a minimum of 5 dB for 21 residences.

The need for the noise barriers was determined based on forecasted traffic noise levels in the year 2010 at noise-sensitive receptor locations; primarily residential areas along the proposed bypass road. Where noise mitigation measures are required, the use of noise barriers was tested via computer modelling to assure that the recommended barriers would effectively mitigate adverse noise impacts. (See Appendix G, Updated Acoustic Study for the Koloa-Poipu Bypass Road Project, February 1996).

In general, the need for noise mitigation is based upon the projected increase in background noise levels and exceedance of the 65 Ldn and 67 Leq regulatory threshold for the Federal Housing Administration/Housing and Urban Development (FHA/HUD) and the FHWA, respectively. However, where use of these thresholds results in a significant increase in background ambient noise levels at residences which are located in quiet communities, such as the Waikomo and Weliweli Subdivisions, the FHWA 57 Leq criteria is used as a more conservative noise abatement threshold in determining the need for mitigation. In addition, the effectiveness of the sound barrier in achieving a minimum noise attenuation of 5 dB is used for purposes of federal funding assistance.

In the vicinity of the Waikomo Subdivision, a noise barrier will be constructed on the southwest side of the road which is adjacent to the subdivision. The barrier will stand approximately seven feet above the finished grade of the road within the edge of the proposed road right-of-way. It will begin near the point where the proposed road adjoins the existing cane haul road and extend

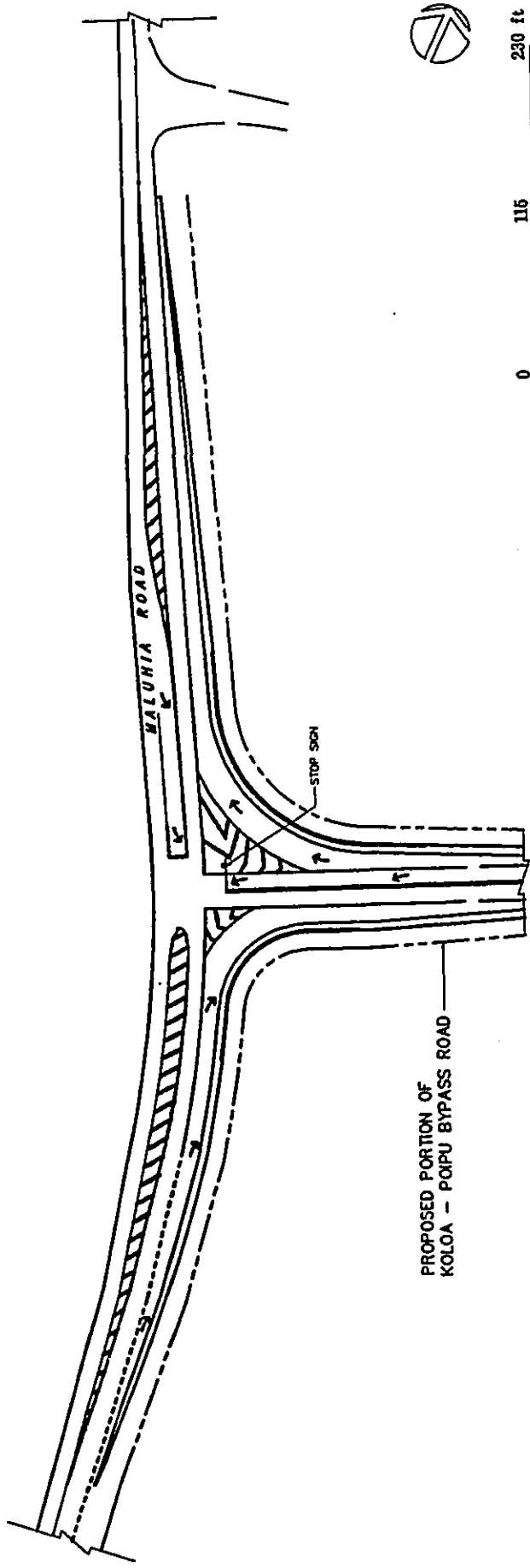


Fig. 3-7
**INTERSECTION PLAN
 AT MALUHIA ROAD**
 Koloa-Poipu Bypass Road
 From Wellwell Road to Maluhia Road



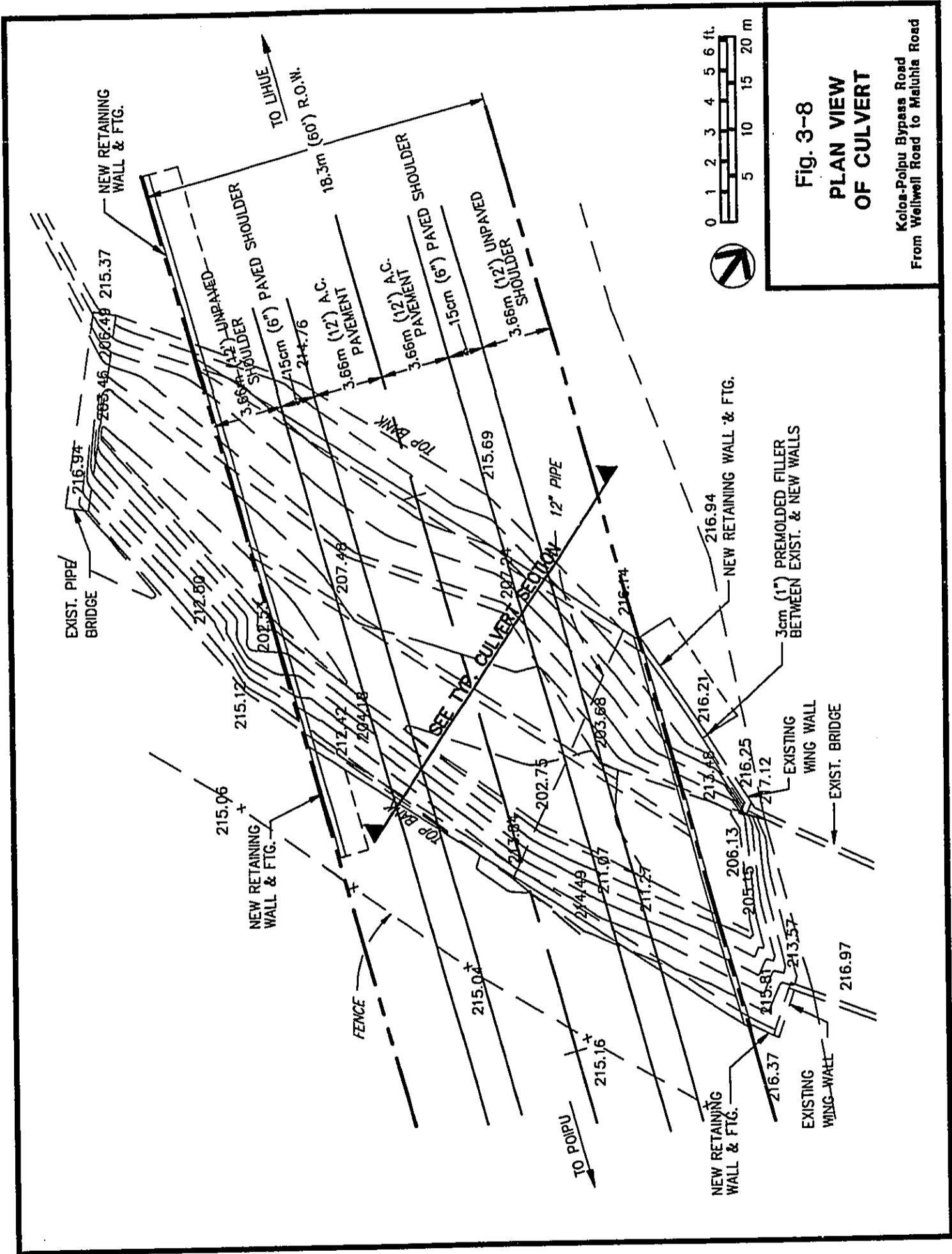


Fig. 3-8
PLAN VIEW
OF CULVERT

Koloa-Poipu Bypass Road
 From Wellwell Road to Maluhia Road

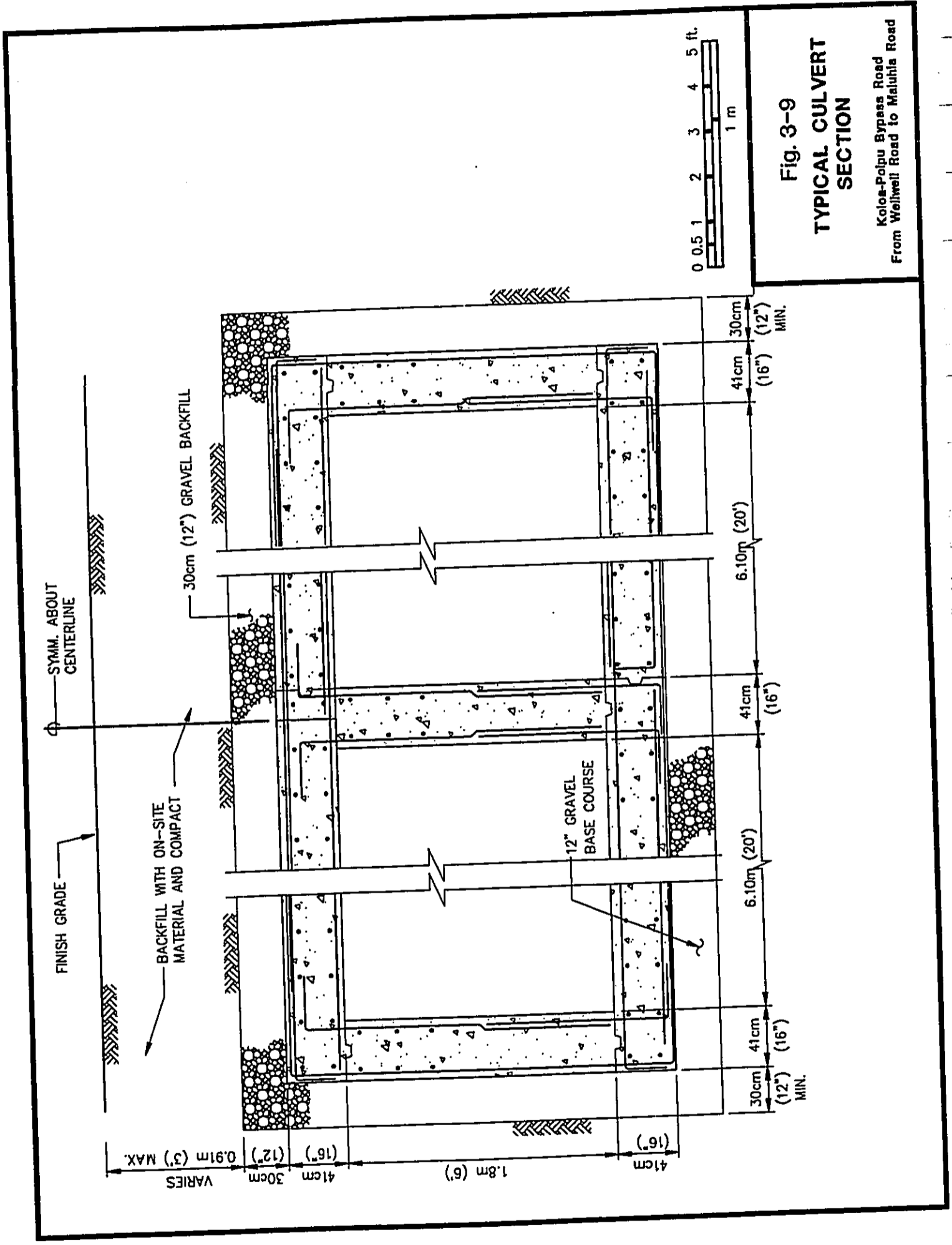


Fig. 3-9
TYPICAL CULVERT SECTION
 Koloa-Poipu Bypass Road
 From Wellwell Road to Maluila Road

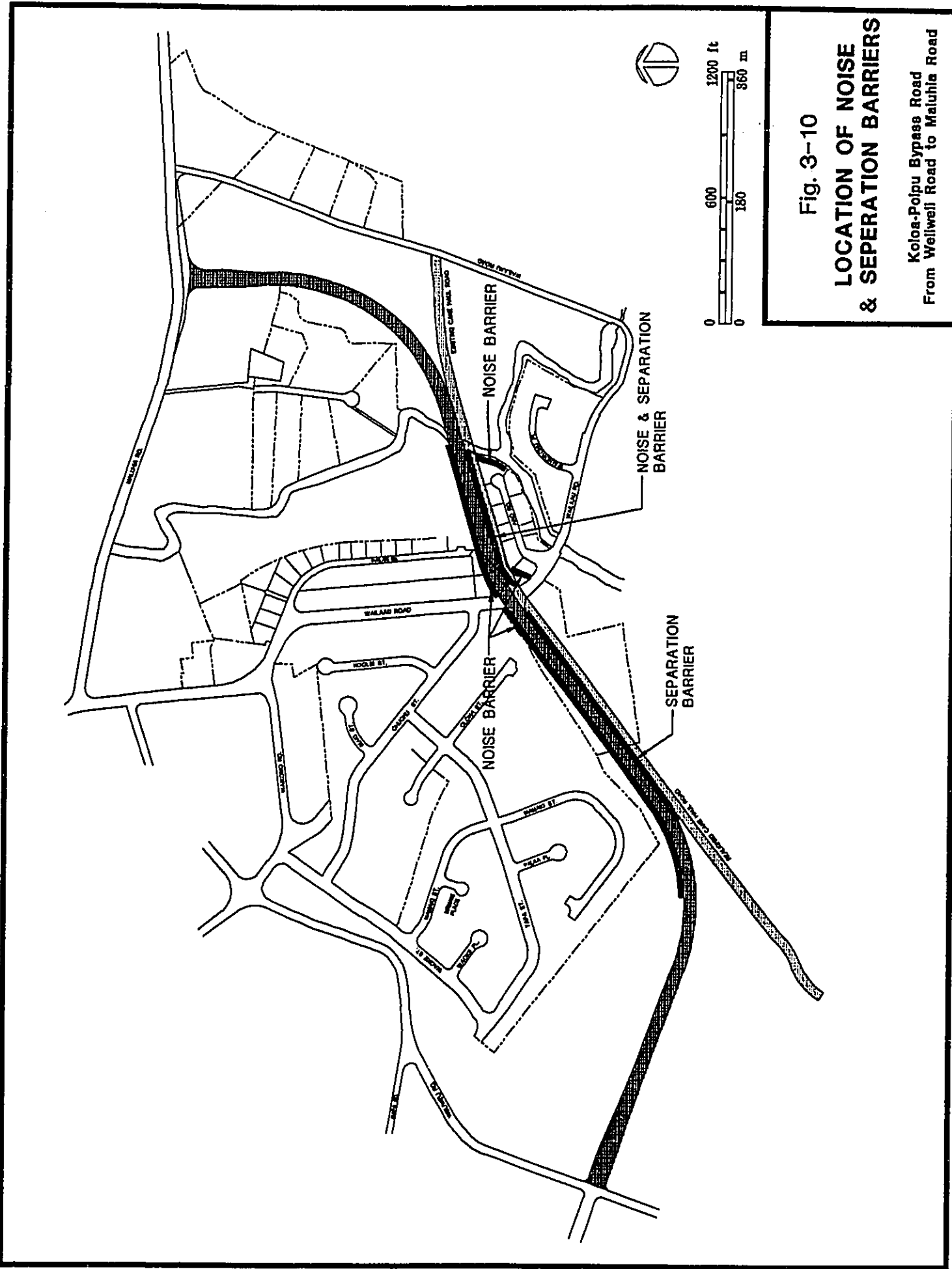


Fig. 3-10
LOCATION OF NOISE
& SEPERATION BARRIERS
 Koloa-Poipu Bypass Road
 From Wellwell Road to Maluhia Road

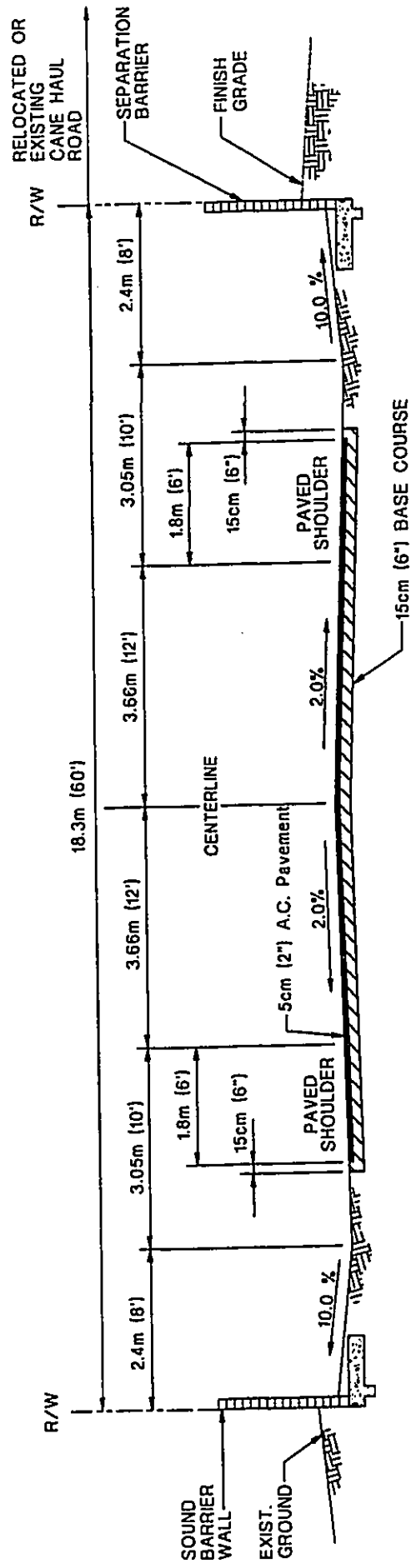


Fig. 3-11

TYPICAL ROADWAY SECTION AT SOUND BARRIER WALLS

Koloa-Polpu Bypass Road
From Wellwell Road to Maluhle Road

approximately 213 meters (700 feet) to the northwest to its convergence with the southern corner of the County park.

There, the wall and right-of-way will job about 15.2 meters (50 feet) toward to proposed road. Although the effectiveness of the noise barrier is slightly diminished by being located closer to the road, the jog will maximize the size of an approximately 2,374.21-square meter (25,540-square foot) remnant parcel created between the existing park boundary and proposed barrier. The County plans to improve this remnant parcel as an expansion to the park. A Section 4(f) evaluation will not be required because the park will be positively improved as a result of the proposed project.

Continuing for approximately 162 meters (530 feet) along the County park to its northern boundary, where the depth of the remnant parcel is narrower due to the curvature of the road, both the wall and right-of-way will jog a few feet back toward the residences to maximize its sound attenuating benefit and continue for another 97.54 meters (320 feet) at a height of 1.8 meters (6 feet) above the finished road grade to the Wailaau Road intersection where it will terminate.

Beyond the Wailaau Road intersection, the proposed road will be flanked by two sound barriers within the right-of-way, extending northward at a height of 1.8 meters (6 feet) to the Waihohonu Stream crossing where they will terminate. The barrier on the west side of the proposed road will extend for approximately 237.7 meters (780 feet) while the wall on the east side will be approximately 219.5 meters (720 feet) long.

Another noise barrier will be provided on the northeast corner of the intersection of Wailaau Road and the proposed road. The barrier will stand 1.8 meters (6 feet) tall and will extend for approximately 24.4 meters (80 feet), replacing an existing rock wall bordering a residence. The barrier will attenuate noise emanating from the proposed road east of the Wailaau Road intersection. Still another 1.8-meter (6-foot) barrier approximately 25.9 meters (85 feet) long will be constructed on the east side of the proposed road parallel to the Waihohonu Stream. This barrier will attenuate noise emanating from the proposed road in the northwest of the stream and in the vicinity of Wailaau Road

The County of Kauai will own and maintain the proposed separation and noise barriers.

A public workshop was held on March 20, 1997 at the Koloa Community Center to familiarize community residents about the project, specifically regarding the placement of noise and separation barriers. The workshop was attended by 22 community residents and business representatives. Two comment letters were received in response to the workshop and, together with response letters and the meeting roster, are included as Appendix A.

3.6 Land Ownership

Lands within the proposed roadway corridor are primarily owned by A.F. Knudsen Trust and Grove Farm Co. Inc., and can be described in two segments. The first segment (approximately 1,432.6 meters or 4,700 feet) from Weliweli Road to the Waihohonu Stream crossing is owned by Grove Farm Co. Inc., with the exception of two parcels located between Wailaau and Wailani Roads which were acquired from private individual land owners by the County of Kauai. Lands owned by Grove Farm Co. will be dedicated to County of Kauai prior to construction. The second 518.16-meter (1,700-foot) segment from the Waihohonu Stream crossing to the road terminus at Maluhia Road is owned by A.F. Knudsen Trust and leased by McBryde Sugar Company. Other lands within the project vicinity are owned by individual private owners as well as the County of Kauai. The County of Kauai will comply with all requirements for the disposition of required rights-of-way prior to the bidding and construction process. (See Figure 3-12).

3.7 Construction Cost and Schedule

It is estimated that the project will cost \$3 million to construct. The commencement date for construction is contingent upon the issuance of a Finding of No Significant Impact (FONSI). The total construction period is estimated to be completed within about 12 months.

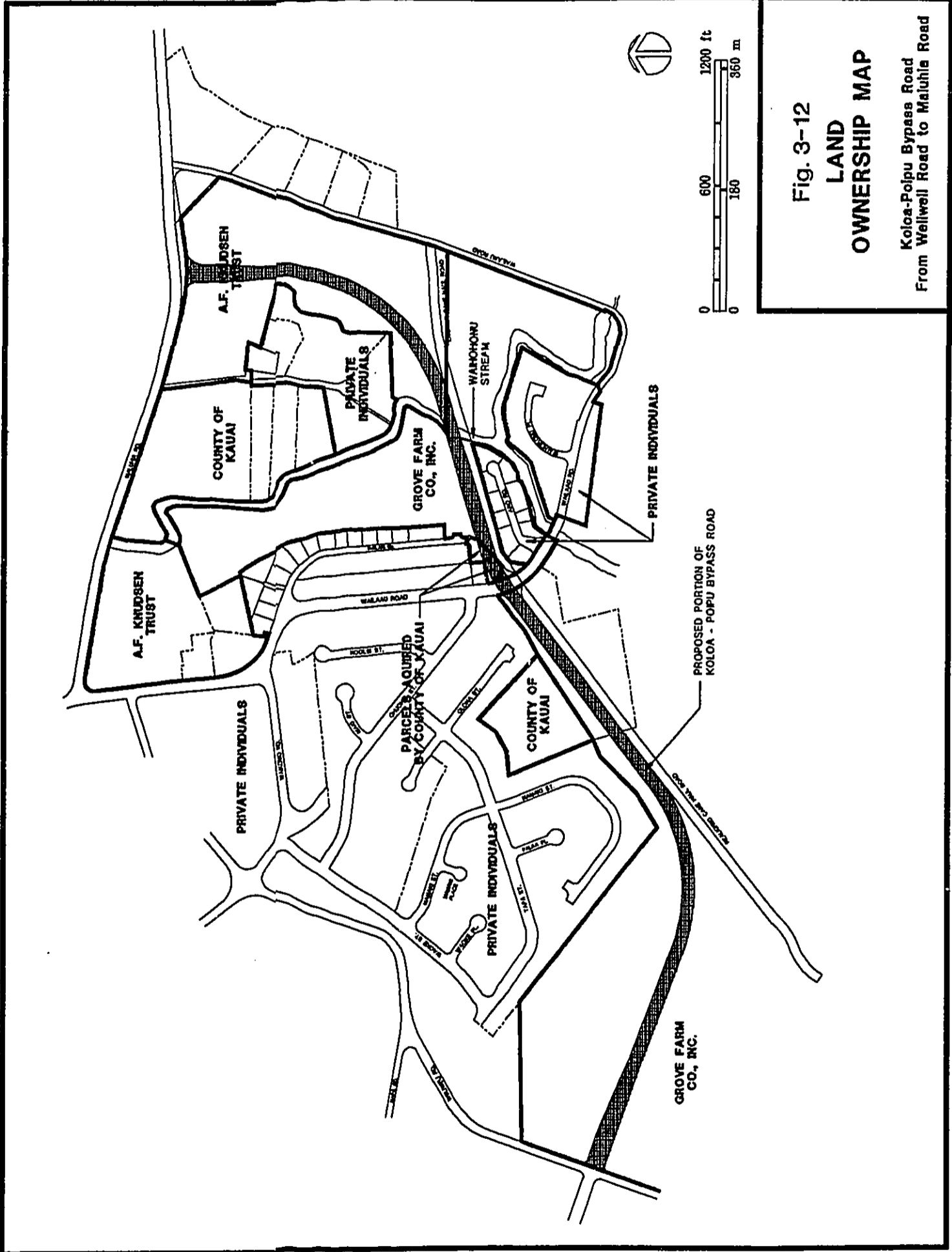


Fig. 3-12

LAND OWNERSHIP MAP

Koloa-Popu Bypass Road
From Wellwell Road to Maluhia Road

Chapter 4

***EXISTING ENVIRONMENT, IMPACTS
AND MITIGATION MEASURES***

CHAPTER 4 EXISTING ENVIRONMENT, IMPACTS AND MITIGATION MEASURES

4.1 Climate

The climate in the area is characterized as semi-tropical with two seasons. The summer period from May through September is generally warm and dry, with predominantly northeast trades. In contrast, the winter season from October through April is associated with lower temperatures and greater rainfall. The tradewinds are less prevalent during this period. The average annual temperature is about 75 degrees Fahrenheit (° F), while the average rainfall is about 40 to 50 inches per year.

According to wind data collected from the nearest monitoring station at Lihue Airport, on an annual basis, tradewinds from the northeast and east-northeast prevail 57% of the time, while low wind speeds, less than 10 miles per hour, occur about 28% of the time.

Impacts

The project will not result in adverse impacts to climate.

4.2 Topography

The land along the proposed roadway alignment is generally flat with average slopes between 2 to 3 percent. In contrast, two prominent features near the project, the Waiohonu Hill and adjacent Waita Reservoir², are characterized by relatively steep side slopes. Waiohonu Hill is located approximately 1,500 feet northeast of the project, and ranges from 240 feet at its base to about 360 feet at its high point. Situated immediately to the east of Waiohonu Hill is the Waita Reservoir, located approximately 3,000 feet to the northeast of the project. Built in 1906, the Waita Reservoir is a 28-foot high earthfill dam, with base and top elevations of 219 and 247 feet, respectively.

Impacts and Mitigation Measures

The existing topography is generally flat but uneven along some sections of the road alignment. Excavation and fill activities will be required only to the extent that a uniform road surface can be constructed. Such activity will be limited to the road right-of-way. The Waiohonu Hill and Waita Reservoir will not be impacted by the project alignment. All grading work shall be conducted in accordance with County of Kauai Ordinance No. 262 regarding Grading, Grubbing, Stockpiling, and Soil Erosion and Sedimentation.

² Department of the Army, Phase I Inspection Report National Dam Safety Program, Waita Reservoir, Kauai, Hawaii, May 31, 1978, page 23.

4.3 Geology

The island of Kauai was formed by a single large shield volcano. During the Tertiary period, basaltic lavas of the Waimea Canyon Volcanic Series built a roughly circular island to a height of more than 17,000 feet above the surrounding sea floor. Following a long period of erosion and subsidence, vulcanism was renewed during the Pleistocene epoch with the Koloa Volcanic Series³.

The project area is largely underlain by the Koloa volcanic series, which also underlies about half of the eastern part of the island forming broad aprons from the east of Koloa to Waimea Canyon as well as along the northeaster coast of the island. Both pahoehoe and a'a lava flows are present, and in the dry area near Koloa their surfaces are so well-preserved that they appear very recent⁴.

Approximately 40 vents of the Koloa Volcanic Series have been recognized, scattered widely over the eastern two-thirds of the island. Others are assumed to have existed to feed the lava flows that at several places poured down from the central uplands, but they either are hidden in the dense vegetation or have been destroyed by erosion. Many of the vents are aligned in roughly north-south rows⁵. Several of these vents are indicated southeast of the project site.

Impacts and Mitigation Measures

Impacts to subsurface conditions as a result of the project are anticipated to be negligible. As aforementioned in Section 4.2, excavation and fill activities will be required only to the extent that a uniform road surface can be constructed, and only within the road right-of-way. Should any lava tube be encountered, however, the U.S. Fish and Wildlife Service has expressed concern regarding potential impacts to candidate species of cave-dwelling spiders discussed subsequently in Section 4.8.2.

4.4 Soils

The soils along the first 2,500 feet of the road alignment are associated with the Waikomo series, characterized as well-drained, stony and rocky, having been developed through material weathered from basic igneous rock. Generally, the surface layer is very dark grayish-brown stony silty clay about 14 inches thick. The subsoil is reddish-brown stony heavy silty clay loam

³ *Geolabs-Hawaii, Preliminary Soil Investigation Koloa-Poipu Connector Road, Koloa, Kauai, Hawaii, February 16, 1982, page 6.*

⁴ *Macdonald, Gordon, et al., Volcanoes in the Sea The Geology of Hawaii, Second Edition, 1986, page 460.*

⁵ *Macdonald, Gordon, et al., Volcanoes in the Sea The Geology of Hawaii, Second Edition, 1986, page 458.*

about 6 inches thick. Permeability is moderate and the erosion hazard is slight. Bedrock is encountered approximately 20 inches below the surface. Soils along the approach to Waihohonu Stream in the vicinity of the proposed culvert crossing are comprised primarily of the Pohakupu soil series (silty clay loam). The composition of soils ranges at different depths from tan fine sandy silt to dark brown gravelly silty sand. During the course of sugar cane planting and harvesting activities, some runoff occurs which may carry high levels of suspended solids into Waihohonu Stream. Beyond the stream crossing, the soil series transitions to the Lihue soil series, comprised on silty clay with moderate slopes. (See Figure 4-1, Soils Map).

4.4.1 Agricultural Lands of Importance to the State of Hawaii (ALISH)

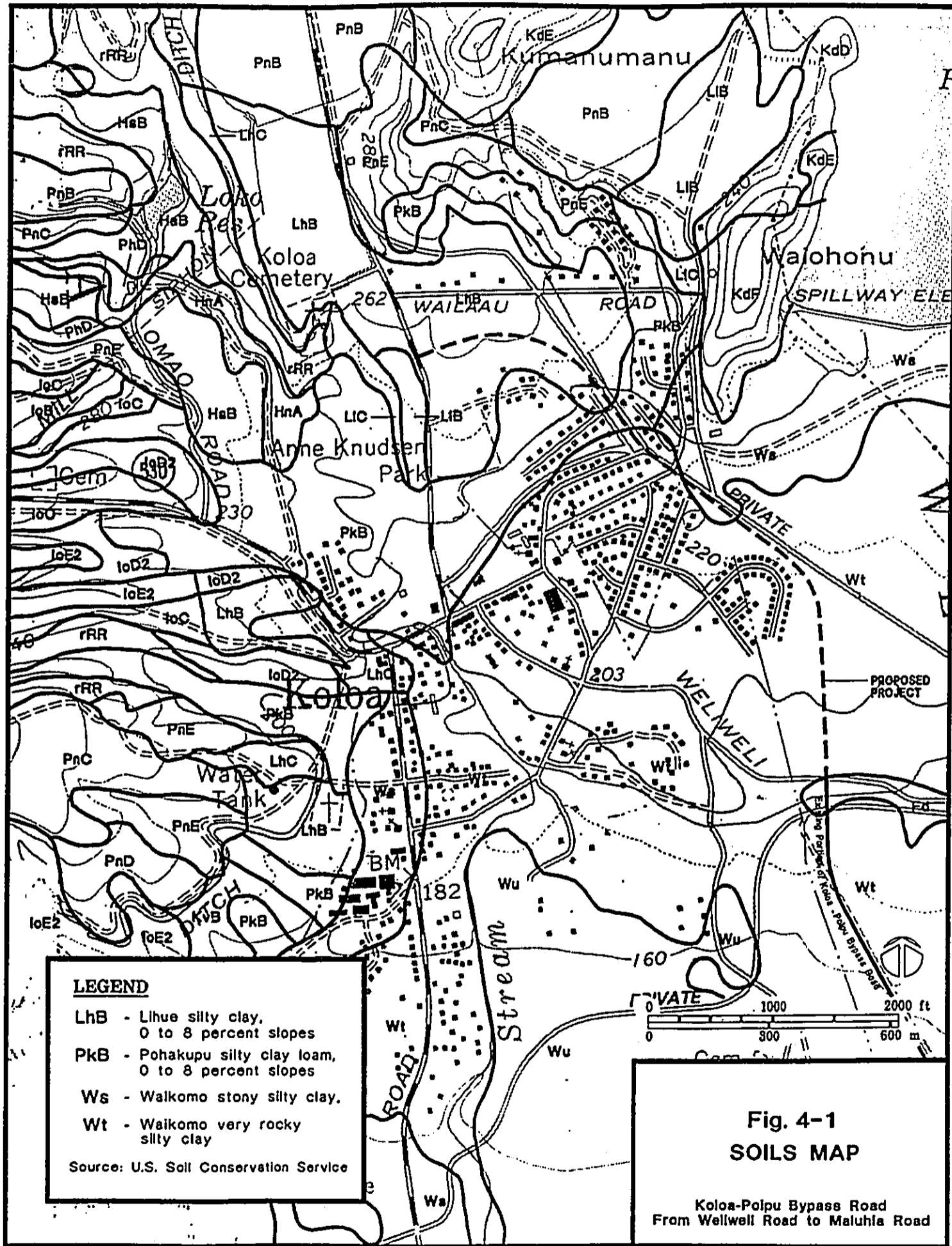
The State Department of Agriculture produced a series of maps which identifies agricultural lands of importance to the State of Hawaii (ALISH). The ALISH designations indicate the physical suitability of lands to support agricultural activities, but do not reflect any consideration of the marketability of potential agricultural crops.

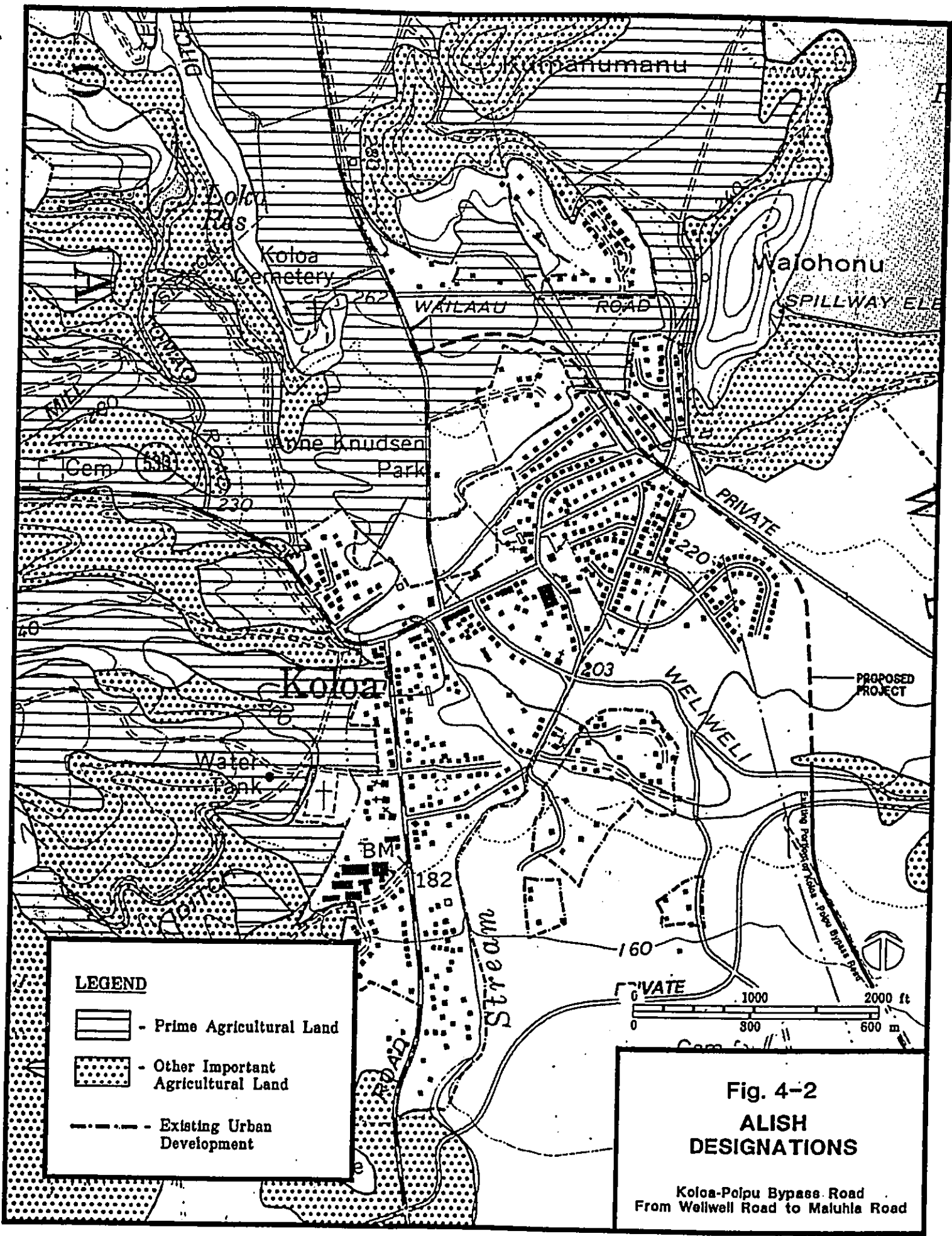
Impacts and Mitigation Measures

Grubbing and grading activities for the 1.2-mile proposed roadway will encompassing an area of approximately 8.7 acres. The fill material associated with the culvert structures will consist primarily of base coarse material, concrete, and rebar. Subsequent to completion of the project, all excess material will be removed from the road and stream areas, and returned to their original condition. As aforementioned in Section 4.2, all grading work will comply with County of Kauai Ordinance No. 262 regarding Grading, Grubbing, Stockpiling, and Soil Erosion and Sedimentation. Approximately 1,700 feet of the northernmost portion of the roadway currently lie within an area designated as "prime agricultural land" (See Figure 4-2, ALISH Designations). Consultation with the State of Hawaii Department of Agriculture indicated no concerns regarding the proposed project (Telephone Communication, July 1996). In addition, during the pre-assessment consultation process, the U.S. Department of Agriculture, Natural Resources Conservation Service had no comments on the agricultural resources in the project area (Telephone Communication, February 1997).

4.5 Hydrology

The *Environmental Reconnaissance Survey of Waihohonu Stream, Koloa Kauai*, was prepared by AECOS, Inc. in August 1994 in conjunction with permits approved by the Department of Health (DOH) Clean Water Branch, and Department of Land and Natural Resources Commission on Water Resources Management (DLNR CWRM). Excerpts from the survey report are discussed below, while the report in its entirety is included as Appendix E.





Surface water resources in the project vicinity include the Waihohonu Stream, an intermittent stream which arises in the general area of Knudsen Gap with tributaries forming at about the 1,000 foot elevation. Waihohonu Stream flows southward, parallel to Maluhia Road between Kaunualii Highway and Koloa Town. The stream drains the Koloa Aquifer System in the Lihue Aquifer Sector, which has an estimated sustainable yield of 30 million gallons per day (mgd) (Correspondence from Department of Land and Natural Resources, June 30, 1997 and July 22, 1997, Appendix C). Most of this area is currently in agriculture, with portions of these cultivated lands designated a erosion prone. Major streams and most minor streams in this system are sustained primarily by ground water drainage from high level dike aquifers in the interior and perched aquifers in the lowlands.

A portion of Waihohonu Stream below Mauka Reservoir (which is situated approximately 3.5 miles north of the project) flows through a steep-sided canyon which is heavily vegetated. The stream enters the canyon just after crossing under Maluhia Road and flows into cane fields at about the 400-foot elevation. The stream enters a second, smaller canyon about 1.6 miles north of Koloa town, at approximately the 300-foot elevation and, subsequently, a portion of the stream is diverted to the Waita Reservoir. The remainder of the stream continues beneath Wailau Road, traverses cane fields and the Waikomo residential subdivision on the northeast side of Koloa town. At the base of the Waita Reservoir Spillway, the stream is joined by waters from the reservoir, and flows southwest adjacent to Anne Knudsen Park and beneath Maluhia Road where it is contained within a modified flood control channel. The stream subsequently joins Waikomo Stream which flows through the center of Koloa town and continues south toward Poipu, discharging into a small embayment at Koloa Landing.

Impacts and Mitigation Measures

A new culvert crossing at Waihohonu Stream is necessary to provide safe vehicular access over the waterway. Stream flow data is currently not available, however, the culvert has been designed to accommodate flows from storm events. The capacity of the culvert is based on the largest cross-sectional areas of the stream within the immediate vicinity of the culvert. It is anticipated that the stream itself will overflow, and upstream bridges will overtop before the culvert reaches its maximum capacity.

A Stream Channel Alteration Permit (SCAP) was approved by the State Department of Land and Natural Resources Commission on Water Resource Management (CWRM) on March 1, 1995 and expired on February 27, 1997. Subsequently, a request to extend the SCAP coverage was approved on August 13, 1997. A Nationwide Permit (NP) for Road Crossing was approved by the Corps of Engineers on June 6, 1995. However the project will require reissuance of the permit under the new Nationwide Permit Program which was initiated in February 1997. The Corps of Engineers is currently in the process of approving the new Nationwide Permit for the project. The State Department of Health

determined that the project was in compliance with objectives of the Federal Clean Water Act based on the relatively minor scope of the culvert crossing and the appropriate mitigative measures proposed in the application, and on May 17, 1995 issued a waiver in lieu of a Water Quality Certification (See Appendix D for correspondence).

According to the State Department of Health, the project is located over an aquifer that has been classified as a potable groundwater source with a potential for future drinking water use. The aquifer is also characterized as irreplaceable and highly vulnerable to contamination. The DOH recommended that Best Management Practices (BMPs) be applied during the construction and maintenance phases of the project including: 1) Measures to address construction activities; 2) Safe and proper usage of herbicides, if needed, for maintenance measures; 3) Proper storage and disposal of any toxic or hazardous chemicals used during the construction and maintenance phases (Letter dated February 27, 1997, See Appendix B).

4.6 Flood Hazard

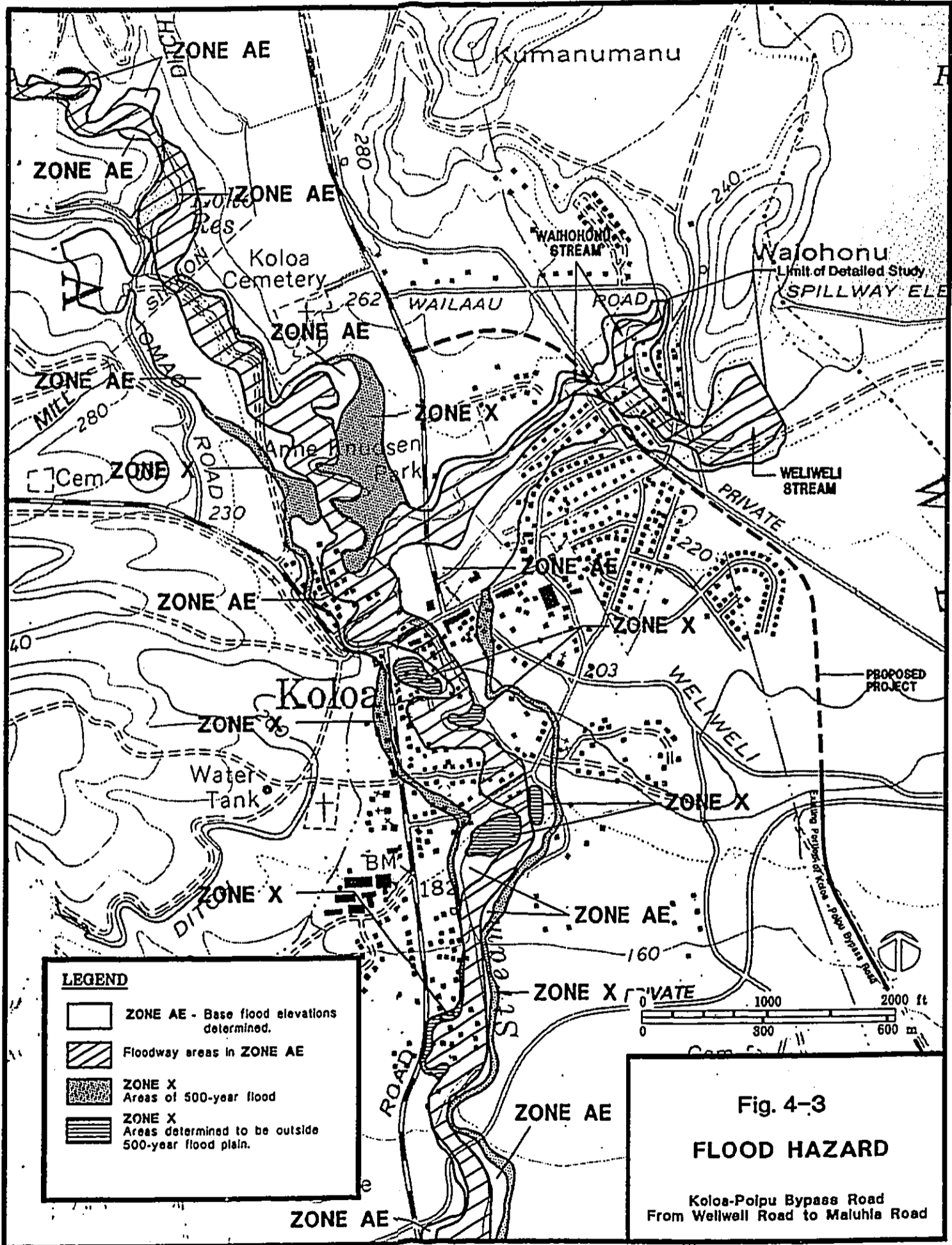
The proposed roadway lies largely within areas of minimal flooding. The area of the road near Waihohonu Stream crossing is, however, within the designated floodplain area Zone AE according to the Flood Insurance Rate Maps (FIRM) administered by the Federal Emergency Management Agency (See Figure 4-3, Flood Hazard Map). Zone AE indicates special flood hazard areas subject to inundation by the 100-year flood for which base flood elevations have been determined. The FIRM also indicates that Waihohonu Stream lies within a floodway area of Zone AE. The remainder of the project is located in Zone D, an area in which flood hazards are undetermined.

Impacts and Mitigation

The project is subject to the appropriate policies and requirements of Executive Order 11988 set forth by FEMA regarding Floodplain Management (See Section 4.15.1.7 below). The proposed road alignment is designed to mitigate the potential for adverse impacts to the floodplain. In addition to being located at an existing road crossing at Waihohonu Stream, the proposed alignment at this location minimizes the area of encroachment into the floodplain.

4.7 Water Quality

Water quality data were collected by AECOS, Inc. from Waihohonu and Weliweli Streams as part of the aforementioned *Environmental Reconnaissance Survey of Waihohonu Stream, Koloa Kauai*. Excerpts from the report regarding water quality are provided below. The report can be found in its entirety as Appendix E.



Water quality measurements were required in conjunction with an application for Water Quality Certification (WQC) for the new culvert crossing at Waihohonu Stream. Administered by the DOH, the WQC is required in conjunction with a Department of the Army Nationwide Permit (issued by the U.S. Army Corps of Engineers on June 6, 1995, and currently being processed for reissuance under the new Nationwide Permit program) pursuant to the Federal Clean Water Act (CWA). Based on the relatively minor scope of the culvert crossing, and the appropriate mitigative measures proposed in the application, the DOH determined that the project was in compliance with objectives of the CWA and on May 17, 1995, issued a waiver in lieu of the WQC. (See Appendix D). The water samples were taken at four locations, three along Waihohonu Stream and one along Weliweli Stream (See Figure 4-4, Locations of Water Sampling Stations), as follows:

Station 1: Waihohonu Stream just upstream of the diversion point to Waita Reservoir;

Station 2: Waihohonu Stream immediately downstream of the Wailau Road crossing;

Station 3: Weliweli Stream downstream of the Wailau Road crossing; and

Station 4: Waihohonu Stream just upstream of the Maluhia Road Bridge.

The samples were subsequently analyzed for six basic water quality characteristics, including temperature, dissolved oxygen, pH, conductivity, turbidity and total suspended solids, as well as four nutrient characteristics including ammonia, nitrate+nitrite, total nitrogen, and total phosphorus.

As summarized in Table 4-1, temperatures were not unusual, ranging from 71 to 74° F, and were indicative of seasonal influences, time of day, and local shading. Dissolved oxygen (DO) values were generally low indicating poor stream conditions, particularly at Stations 2, 3, and 4. Values for pH were relatively neutral and therefore not unusual. Conductivity values indicated a low dissolved ion content, although Weliweli Stream (Station 3) was notably higher than Waihohonu Stream. Station 3 also showed high values for turbidity and total suspended solids (TSS). The reduction in turbidity and TSS at Station 4 was not unusual as the heavy vegetation in the stream bed was probably an effective filter.

The four nutrient water quality characteristics were also analyzed. Referring to dissolved and/or particulate substances which are related to biological productivity, nutrients stimulate plant growth and comprise organic matter. As indicated in Table 4-2, the nutrients levels observed at all four sample locations indicate varying concentrations and ratios of dissolved to total nitrogen as well as nitrogen to phosphorus, suggesting a complex situation with respect to inputs and uptake along these stream reaches. Notably, the low dissolved nitrates and high total nitrogen and total phosphorus at Station 3 were consistent with a large shallow reservoir (Waita

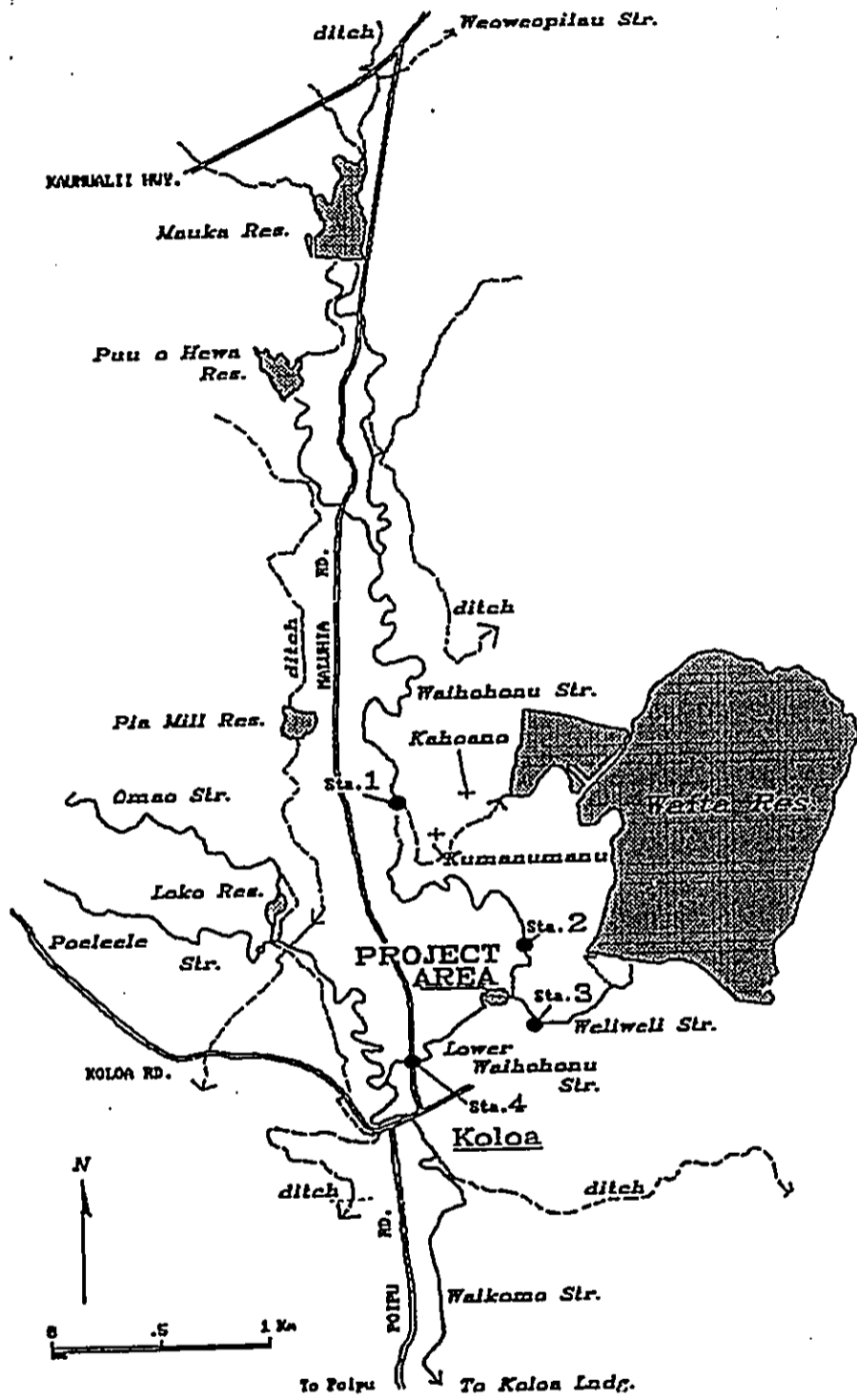


Fig. 4-4
LOCATIONS OF WATER
SAMPLING STATIONS

Koloa-Polpu Bypass Road
 From Wellwell Road to Maluhia Road

Source: AECOS, Inc., 1994

Reservoir), and the high ammonia level was indicative of sluggish flow and low dissolved oxygen content.

	Temperature (° F)	DO (mg/L)	pH (pH units)	Conductivity (µmhos/cm)	Turbidity (ntu)	TSS (mg/L)
Station 1	72.1	6.67	7.02	75.8	5.43	1.8
Station 2	70.7	2.12	7.04	97.0	19.00	8.4
Station 3	72.1	1.57	6.80	158.9	58.30	15.2
Station 4	73.9	3.77	6.94	98.4	5.22	1.4

Key: DO=Dissolved Oxygen TSS=Total Suspended Solids mg/L=milligrams per liter
µmhos/cm=micrograms per centimeter

	Ammonia (µg/NL)	Nitrate+ nitrite (µg/NL)	Total nitrogen (µg/NL)	Total phosphorus (µg/PL)
Station 1	26	110	208	2
Station 2	61	29	217	29
Station 3	98	5	412	48
Station 4	35	425	614	8

Based on results of the water quality analysis, Waihohonu Stream is determined by AECOS, Inc. to be a highly degraded, modified, intermittent stream. Agricultural practices and residential debris, although not irreversible, have impacted stream water quality and flow characteristics.

Impacts and Mitigation Measures

No major long-term adverse impacts to the water quality are anticipated as a result of the overall project. During the construction in and around the culvert crossing however, short-term impacts may occur as a result of increased turbidity. To mitigate impacts

associated with in-stream construction activity, a best management practices (BMP) plan was prepared and accepted as part of the WQC. In addition, to address possible impacts associated with construction of the road approaches to the culvert crossing, a BMP plan was also prepared for the National Pollutant Discharge Elimination System (NPDES) Permit for Stormwater Associated with Construction Activities. The BMPs include erosion and sediment controls as well as stormwater management controls to mitigate potential impacts to water quality. Local grading will be used to direct runoff away from any areas of the stream and bank where vegetation has been removed. In addition, a combination of silt fences and detention basins will be placed along the 1.2-mile route to minimize movement of sediment from portions of the project area subject to soil disturbance. Silt fences will be employed with particular attention in the vicinity of Waihohonu Stream to prevent silt from entering the stream.

4.8 Flora and Fauna Resources

Flora and fauna surveys were conducted in March and July 1996, respectively, by Botanical Consultants in conjunction with this EA. The purpose of the surveys was to characterize the vegetation, and to note the presence of any rare or endangered flora or fauna species. Portions of the survey report are discussed below, while the report in its entirety is included as Appendix F.

4.8.1 Flora

Three vegetation types were found along the proposed 1.2-mile, 60-foot road right-of-way:

- a) Rocky Pasture: The area from Weliweli Road to the point of where the proposed road approaches the existing cane haul road is described as rocky pasture, crossing over an old pahoehoe lava flow which is obscured by the dense growth of shrubby vegetation. Koa haole, Java plum (*Zyzygium cumini* (L.) Skeels.), common guava (*Psidium guajava* L.), lantana (*Lantana camara* L.), Kolomona (*Senna surattensis* (N.L. Burm.) H. Irwin & Barneby), and many species of grasses are also found in this area. The most common grasses are Guinea grass (*Panicum maximum* Jacq.), natal redtop (*Rhynchelytrum repens* C.E.Hubb.), and Indian dropseed (*Sporobolus diander* (Retz.) P. Beauv.).
- b) Urban Area: From the point where the proposed road meets and parallels to an existing cane haul road culvert crossing at Waihohonu Stream, the area has been cleared of all vegetation, or is overgrown pasture land. In the cleared areas, castor bean shrubs (*Ricinus communis* L.) are regenerating, and in the overgrown areas, koa haole and California grass (*Brachiaria mutica* (Frossk.) Staph.) provide fodder for occasional grazing by livestock. There are also many landscape type trees and shrubs in this area, characteristic of more "urban" areas.
- c) Abandoned Cane Fields: The area from the existing culvert crossing to Maluhia Road is characterized by abandoned sugarcane (*Saccharum officinarum* L.) fields, with a wide variety

of adventive or weedy species invading the fields. Sixteen species of weedy grasses were found and a few scattered koa haole (*Leucaena leucocephala* (Lam.) deWit) and Chinese banyan trees (*Ficus microcarpa* L.) were in the initial stages of growth;

No candidate, proposed, or listed threatened or endangered species as set forth in the Endangered Species Act of 1973, as amended (16 U.S.C. 1531-1543) (USFWS 1993), were found along the proposed road right-of-way. A complete list of plant species documented at the project site is included in the report.

During the pre-assessment consultation for this EA, the U.S. Fish and Wildlife Service also indicated that there are no records of wetlands, threatened, endangered, proposed or candidate species at the project site. (See Appendix B).

Impacts

No major long-term adverse impacts are anticipated as a result of the project.

4.8.2 Fauna

No threatened or endangered fauna species were found along the proposed right-of-way. The entire project vicinity has been extensively modified from its original state. As such, the three vegetation types described along the proposed road right-of-way presently do not provide a suitable habitat for native bird species. However, the area does support a variety of non-native species. Thirteen species of introduced, commensal, seed-eating birds were found on and around the project vicinity, including: Japanese White-eye (*Zosterops japonicus*); House Sparrow (*Passer domesticus*); Common Waxbill (*Estrilda astrild*); Chestnut Mannikin (*Lonchura malacca*); Nutmeg Mannikin (*Lonchura punctlata*); Northern Cardinal (*Cardinalis cardinalis*); Spotted Dove (*Streptopelia chinensis*); Zebra Dove (*Geopelia striata*); Rock Dove (*Columba livia*); Common Myna (*Acridotheres tristis*); Ring-Necked (Common) Pheasant (*Phasianus colchincus*); California Quail (*Callipepla californica*); and Cattle Egret (*Bubulcus ibis*).

The greatest variety of bird species was recorded in the Rocky Pasture area, although the largest number of birds was observed in the Urban Area. The very small seed eaters such as the waxbill, chestnut mannikin, and nutmeg mannikin are the most widely distributed. No rats or house mice were seen, however, many rat and mouse droppings were found in an abandoned garage in the Urban Area, suggesting the presence of the black rat (*Rattus rattus*) and house mouse (*Mus musculus*).

In response to the pre-assessment consultation for this EA, the U.S. Fish and Wildlife Service, indicated that the federally threatened Newell's shearwater (*Puffinus auricularis newelli*) may traverse through the vicinity of the project area, however the project should not affect these birds. In addition, the Kauai cave wolf spider (*Adelocosa anops*) and the Kauai cave amphipod (*Spelaeorchestia koloana*), which are candidate species for Federal listing, are found only in the

Koloa lava series on the island of Kauai. While these animals are not recorded from the project area, numerous lava tubes occur in the Koloa area in the vicinity of the project. On January 20, 1997, the USFWS conducted a survey of the project site during which no lava tube entrances were discovered.

Impacts

No major long-term adverse impacts are anticipated as a result of the project. According to the USFWS, while no lava tube entrances were discovered, the proposed road will likely cross areas that have lava tubes and cave animals beneath them. If a lava tube is exposed during the construction of the road, construction will cease and the USFWS will be contacted immediately to conduct a survey for these cave animals. The USFWS will concur with a Negative Declaration determination provided the recommendation for surveys of any caves exposed during construction is incorporated into the project design (See Appendix B). In addition, consultation with the USFWS in conjunction with the U.S. Army Corps of Engineers Nationwide Permit indicated that the project would have no impact on flora and fauna resources in the area.

4.8.3 Aquatic Fauna

An aquatic fauna survey was conducted by AECOS, Inc. as part of the aforementioned *Environmental Reconnaissance Survey of Waihohonu Stream, Koloa Kauai*. Excerpts from the report regarding aquatic fauna are discussed below. The report can be found in its entirety as Appendix E.

The aquatic fauna survey was conducted in conjunction with the processing of the Stream Channel Alteration Permit (SCAP) for the culvert crossing at Waihohonu Stream. The SCAP was approved on March 1, 1995 following DLNR CWRM's public hearing on February 15, 1995. The permit expired on February 27, 1997, and subsequently a request to extend the SCAP coverage was approved on August 13, 1997.

Observations were made at eight sites along Waihohonu Stream, and one site within Weliweli Stream. The survey included several miles of the stream from the uppermost site located just downstream of Mauka Reservoir, to the confluence with Waikomo Stream within the Waikomo residential subdivision. A list of aquatic fauna and plant species recorded during the survey is provided in the report.

Notably, two native aquatic species, a shrimp (*Atyoida bisulcata*) and a goby (*Awaous stamineus*) are commonly known to occur in Waikomo Stream of which Waihohonu is a tributary. These same species are believed to occur in Waihohonu, although the better stream habitats are located considerably upstream of the project site. There, the urban influences are absent and stream flow may be constant.

Impacts and Mitigation Measures

As aforementioned in Section 4.7, construction activities in and around the new culvert structure may result in short-term localized erosion and turbidity impacts in the Waihohonu Stream. However, it is noted that Waihohonu Stream has been greatly modified, with a high alien species diversity of both stream biota and riparian vegetation in the project area. Agricultural practices and residential debris have impacted stream water quality and flow characteristics. The BMP plans approved by the DOH in conjunction with the WQC and NPDES General Permit waivers will mitigate potential impacts to the water quality.

The proposed highway culvert will be constructed in a manner which does not interfere with native stream faunal migrations. Pursuant to a condition of the SCAP approved for the new culvert crossing, the culvert configuration provides for the migration of amphidromous aquatic life through Waihohonu Stream. This configuration was deemed acceptable to the Aquatic Resources Division of DLNR.

4.9 Noise

An Acoustic Study was prepared by Y. Ebisu and Associates in February 1996 for the proposed bypass road, and is included herein as Appendix G. A prior study was prepared in November 1992 to evaluate Phase I of the bypass road from Poipu Road to Weliweli Road, which was dedicated in November 1993. The subsequent 1996 study supplemented the 1992 study, focusing on Phase II of the proposed bypass road. Summarized below are portions of the acoustic report discussing Phase II.

4.9.1 Existing Ambient and Traffic Noise Levels

Noise-sensitive land uses within the project area include residences in the Waikomo Subdivision and the older section of Koloa Town, including the areas near the Wailaau Road intersection, Waihohonu Stream crossing, and Maluhia Road intersection.

Existing background ambient and traffic noise levels were measured at four locations (C, D, E, and F) along the proposed roadway to provide a basis for describing the existing background ambient noise levels and for determining the project's traffic noise contributions (See Figure 4-5 and Table 4-3). The noise measurements were performed during November 1992 and November 1993, prior to and following construction of the first increment of the bypass road.

Waikomo Subdivision (Location C): Background ambient noise levels in the vicinity of the Waikomo Subdivision are determined by heavy trucks along the cane haul road, aircraft, and the natural sounds of wind, foliage, and birds. During harvesting season of the north and east sugar cane fields, cane haul trucks are the dominant noise source for those residences which are closest to the proposed road alignment. Due to the number of fields serviced by this cane haul road,

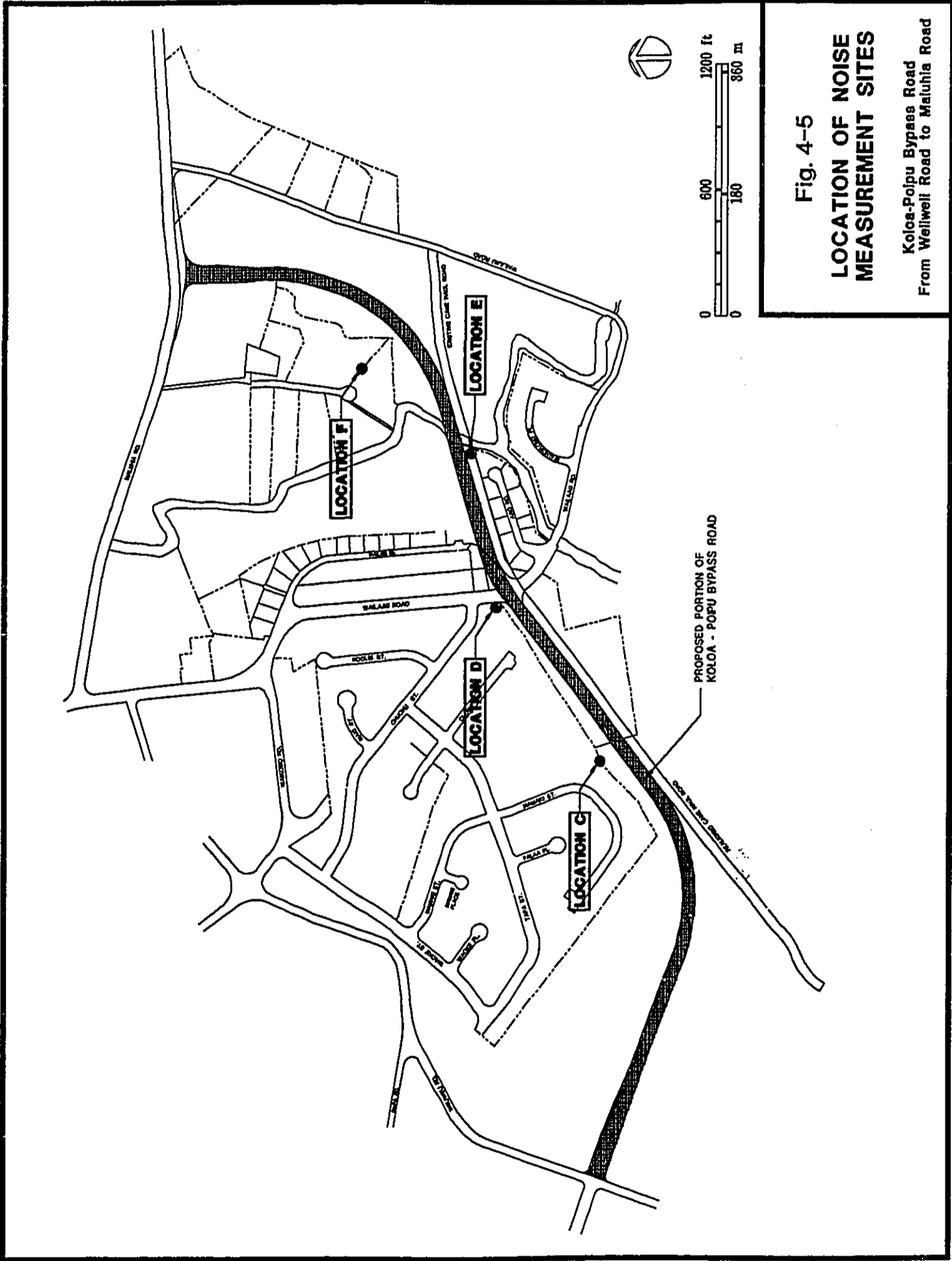


Fig. 4-5

LOCATION OF NOISE MEASUREMENT SITES

Koloa-Poipu Bypass Road
From Wellwell Road to Maluhia Road

Location	Measured Leq (dB)
C. 135-ft. from the center-line of Cane Haul Rd. near Mamaki St. (11/16/93)	43.8
D. 165 ft. from the center-line of Cane Haul Rd. at intersection of Wailaau Rd. & Ohuohu St. (11/16/93)	54.3
E. 20-ft. from the center-line of Cane Haul Rd. near Weliweli Stream (11/16/93)	48.5
F. 590 ft. from the center-line of Cane Haul Rd. at Koloa Park (11/16/93)	44.6

Source: Y. Ebisu and Associates, February 1996

trucks pass the residences approximately 2.2 months per year. This translates to an annually averaged existing noise levels of approximately 60 Ldn at the residences closest to the cane haul road.

Koloa Town (Locations D through F): Background ambient noise levels in the vicinity of the older sections of Koloa Town are dominated by heavy trucks along the cane haul road, traffic along Wailaau and Maluhia Roads, and the natural sounds of wind, foliage and birds. During the harvesting season of the north sugar cane fields, cane haul trucks are the dominant noise source for residences closest to the proposed road alignment. Typical noise levels at these homes during the harvest season are similar to those described for the Waikomo Subdivision, and range from 56 to 63 Ldn.

Impacts and Mitigation Measures

During the short-term construction period, the project will comply with the provisions of Hawaii Administrative Rules, Chapter 11-46, regarding Community Noise Control which includes the following:

The contractor must obtain a noise permit if the noise level from the construction activities are expected to exceed the allowable levels of the regulation as stated in Section 11-46-6(a);

Construction equipment and on-site vehicles requiring an exhaust of gas or air must be equipped with mufflers as stated in Section 11-46-6(b)(1)(A); and

The contractor must comply with the conditional use of the permits as specified in the regulations and conditions issued with the permit as stated in Section 11-46-7(d)(4).

To evaluate the potential long-term impacts of the preferred alternative, future Leq under the No Build and build alternatives were projected using Stamina 2.0, computerized version of the Federal Highway Administration (FHWA) Highway Traffic Noise Prediction Model Report FHWA -Rd-77-108 (1994).

Future traffic noise levels for year 2010 conditions along the proposed road were developed at existing noise sensitive developments in the vicinity of the road. The traffic volumes and mix along the proposed road were projected based on the Kauai County Highway Planning Study prepared by Kaku Associates in June 1990, as well as 1991 24-hour traffic counts and vehicle type classification counts from the State Department of Transportation.

By the year 2010, predicted noise levels within the Waikomo Subdivision are anticipated to range from 59 to 63.7 Leq, and noise levels beyond the subdivision to Waihohonu Stream are predicted to range from 54 to 63 Leq by the year 2010. These noise levels are within the noise standards for FHA/HUD and FHWA, 65 Ldn and 67 Leq respectively. However, noticeable increases in existing ambient noise levels at residences along the road are expected to occur by the horizon year. Based on the study completed to date, the County of Kauai intends to install noise abatement measures in the form of reinforced concrete barriers at portions of the Waikomo Subdivision, and northwest of the Wailaau Road intersection. Preliminary indications of likely abatement measures are based upon preliminary design for a barrier of six to seven feet high and 2,820 feet long at a cost of approximately \$480,000 that will reduce the noise level by a minimum of 5 dB for 21 residences.

Sound attenuation barriers will be constructed near the Waikomo Subdivision and the older section of Koloa Town fronting the proposed bypass road will be required in order to meet the FHA/HUD, as well as FHWA standards for residences (See aforementioned Figure 3-10). The minimum height of the sound attenuation barrier will be six feet throughout its length, except for an approximately 400-foot section in the Waikomo Subdivision where the minimum height will be seven feet. If during final design noise conditions

substantially change, such abatement measures may not be provided. A final decision on the installation of abatement measures will be made upon completion of the project design.

The need for the noise barriers was determined based on forecasted traffic noise levels in the year 2010 at noise-sensitive receptor locations; primarily residential areas along the proposed bypass road. Where noise mitigation measures are required, the use of noise barriers was tested via computer modelling to assure that the recommended barriers would effectively mitigate adverse noise impacts. (See Appendix G, Updated Acoustic Study for the Koloa-Poipu Bypass Road Project, February 1996).

In general, the need for noise mitigation is based upon the projected increase in background noise levels and exceedance of the 65 Ldn and 67 Leq regulatory threshold for the Federal Housing Administration/Housing and Urban Development (FHA/HUD) and the FHWA, respectively. However, where use of these thresholds results in a significant increase in background ambient noise levels at residences which are located in quiet communities, such as the Waikomo and Weliweli Subdivisions, the FHWA 57 Leq criteria is used as a more conservative noise abatement threshold in determining the need for mitigation. In addition, the effectiveness of the sound barrier in achieving a minimum noise attenuation of 5 dB is used for purposes of federal funding assistance.

As aforementioned in Section 3.5, a public workshop was held on March 20, 1997 to familiarize community residents about the project, specifically regarding the placement of noise and separation barriers. The workshop was attended by 22 community residents and business representatives. Two comment letters were received in response to the workshop and, together with response letters and the meeting roster, are included as Appendix A.

4.10 Air Quality

An Air Quality Impact Report was prepared in July 1996 by J.W. Morrow to assess the impact of the proposed bypass road on air quality on a local and regional scale. Excerpts from the survey report are discussed below, while the report in its entirety is included as Appendix H.

4.10.1 Existing Ambient Air Quality

Currently, there is one DOH air monitoring site on the island of Kauai at Lihue, but only PM₁₀ is measured. Generally, PM₁₀ levels are well below the 50 $\mu\text{g}/\text{m}^3$ annual and 150 $\mu\text{g}/\text{m}^3$ 24-hour State and Federal ambient air quality standards (AAQS).

On the afternoon of June 12 and the morning of June 13, 1996, air sampling was conducted for CO in the vicinity of the intersection of the proposed bypass road with Maluhia Road. The sampling site was established on the west side of the road within 10 meters of the traffic lanes. A continuous CO instrument was set up and operated during the morning and afternoon peak traffic hours. An anemometer and vane were installed and operated to record onsite surface

wind conditions during the sampling. A simultaneous manual count of traffic was also performed.

Afternoon CO concentrations averaged about 1.6 milligrams per cubic meter (mg/m^3), while morning average concentrations were slightly less at $1.0 \text{ mg}/\text{m}^3$. Both values are well within the State and Federal 1-hour AAQS of 10 and $40 \text{ mg}/\text{m}^3$, respectively, as well as the 8-hour standards of 5 and $10 \text{ mg}/\text{m}^3$, respectively.

Impacts and Mitigation Measures

During construction of the proposed road and relocation of the cane-haul road, air pollutant emissions will be generated onsite and offsite due to vehicular movement, grading, concrete and asphalt batching, and general dust-generating construction activities. In addition, construction vehicular activity will increase automotive pollutant concentrations along the existing roadways as well as on the project site itself. The site preparation and earth moving will create particulate emissions as will onsite road construction. Construction vehicles movement on unpaved on-site roads will also generate particulate emissions. EPA studies on fugitive dust emissions from construction sites indicate that about 1.2 tons per acre per month of activity may be expected. However, onsite soils are likely to be silty clays with a higher silt content than the "moderate" silt content cited above. In conjunction with a slightly drier local climate, this suggests a potential for greater fugitive dust emissions than that estimated by the EPA.

Due to the proximity of residences on the downwind (southwest) side of the proposed bypass road, encompassing about half of its length, dust control will be particularly important. As recommended by the State Department of Health, the construction activities will comply with provisions of Hawaii Administrative Rules, Chapter 11-60.1-33 regarding Fugitive Dust. DOH recommended that the contractor provide adequate means to control dust from road areas during the various phases of construction activities which may include: a) providing an adequate water source at the project site; b) landscaping and rapid covering of bare areas with grass or other groundcover, including slopes; c) controlling dust from roadway shoulders, unpaved areas beyond the shoulders, project entrances, and access roads; d) providing adequate dust control measures during weekends, after hours, and prior to daily startup of construction; and e) controlling dust from debris being hauled (Letter dated February 27, 1997, See Appendix B).

Upon its completion and use as a roadway, the project can be considered an "indirect source" of air pollution as defined in the Federal Clean Air Act since its primary association with air quality is its inherent attraction for mobile sources such as motor vehicles. A mobile source impact analysis was conducted based on the Kauai Long-Range Transportation Plan prepared by Austin Tsutsumi and Associates in November, 1995. Peak-hour traffic volumes were extracted from that plan and used to estimate air quality impacts for existing (1996) and future (2020) scenarios for with and without the project.

With completion of the project, a 50% diversion of traffic from Maluhia Road to the new bypass road was assumed. Results of the air quality modeling analysis indicated that the project will comply with both State and Federal 1-hour and 8-hour CO standards.

4.11 Archaeological and Historical Resources

An Archaeological Reconnaissance Survey for the proposed project was conducted by Cultural Surveys Hawaii in July 1996 and is attached as Appendix I.

The reconnaissance survey was conducted to locate archaeological resources within the project area. The study included a literature search including a review of archaeological reports related to the project area, and a field inspection of the project site to assess current conditions and the likelihood of extant surface and subsurface archaeological sites. The survey was conducted along the length of the proposed bypass road alignment within a corridor ranging in width of approximately 100 to 150 feet.

4.11.1 Reconnaissance Results

No surface archaeological resources were located within the proposed bypass road corridor during the site survey. Except for pasture land located within the southeasternmost portion of the proposed road corridor, all the land within the remainder of the corridor is or was formerly in sugar cane cultivation and residential use. The only surface features found during the survey were a few outcrops and bulldozed rock piles within the pasture land area. The potential for subsurface archaeological resources within the proposed bypass road corridor are unlikely due to the existing bedrock surface and previous land uses which have destroyed any cultural remains that may have existed.

No historical sites were found in the project area, therefore, the State Historic Preservation Officer has determined that the project will have "No Effect" on historic sites (see letter dated January 29, 1997 in Appendix J). A subsequent letter from that office commenting on the Draft EA concurred with their earlier determination (see letter dated July 9, 1997 in Appendix C). In addition, the Kauai office of the DLNR State Historic Preservation was contacted as a follow-up to concerns raised regarding the potential of finding archaeological remains within lava tubes which may exist beneath the project site. The Kauai office indicated that there was minimal probability of finding significant remains such as human habitation or human burials (Staff contact via telephone, August 28, 1997).

Impacts and Mitigation Measures

Potential impacts to any archaeological or historic resources that may be located within the proposed bypass road corridor will be mitigated by complying with Federal and State regulations for the management of such resources. Based on the absence of any archaeological surface sites and the degree of previous ground disturbance (i.e., sugar cane

cultivation, residential use, and bulldozed pasture land), no further archaeological investigation is recommended for the proposed project area. Should any archaeological or historic resources, including human burials, be uncovered during the construction activity, all work in the vicinity will cease and the Hawaii State Preservation Officer (SHPO) will be contacted. Archaeological or historic resources discovered would be treated in accordance with a Memorandum of Agreement (MOA) which would be drafted among the County of Kauai Department of Public Works, the SHPO, the FHWA, the Office of Hawaiian Affairs (OHA), and the Advisory Council on Historic Preservation (ACHP). The draft MOA would be accompanied by an archaeological data recovery plan and an archaeological mitigation plan. If necessary, a burial treatment plan would also be prepared and incorporated into the MOA to comply with the Native American Graves Protection and Repatriation Act of 1990.

4.12 Views

Views along the proposed bypass road corridor consists primarily of open vegetated areas and residential development. The southern portion of the corridor offers expansive views of open pasture lands with a few residences in the distance, and an expansive vista southward. Along the central portion of the corridor which traverses through the fringes of Koloa Town, the view transitions to residential in nature. Continuing northward, the views are again expansive as the corridor traverses through open vegetated areas formerly under sugar cane cultivation.

Impacts and Mitigation Measures

Although the proposed road and walls will not obstruct scenic viewplanes, it may reduce the aesthetic qualities of the area with its approximately 36-foot wide paved alignment.

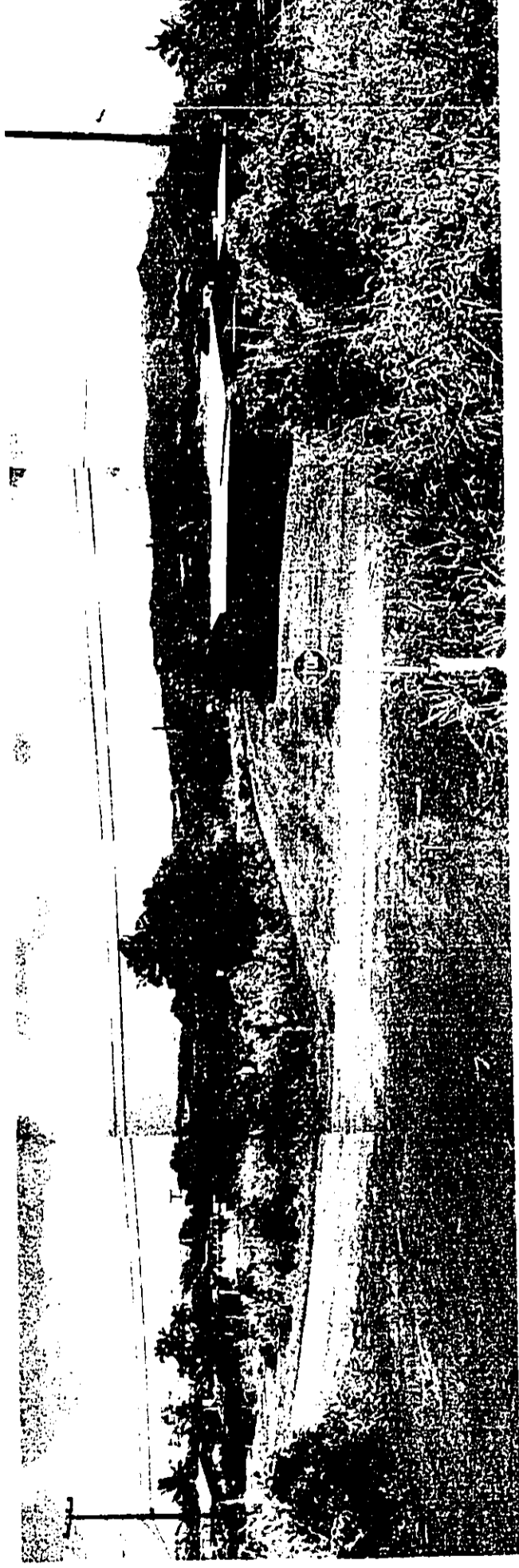
A computerized visual simulation was prepared for the intersection of the proposed road at Wailaau Road to illustrate the visual impact of the proposed roadway and noise attenuation and separation walls to the nearby area (See Photographs 7 and 8). As shown in the photographs, the resulting view would be similar to that seen with perimeter walls which are currently allowed in residential areas.

4.13 Social and Economic Environment

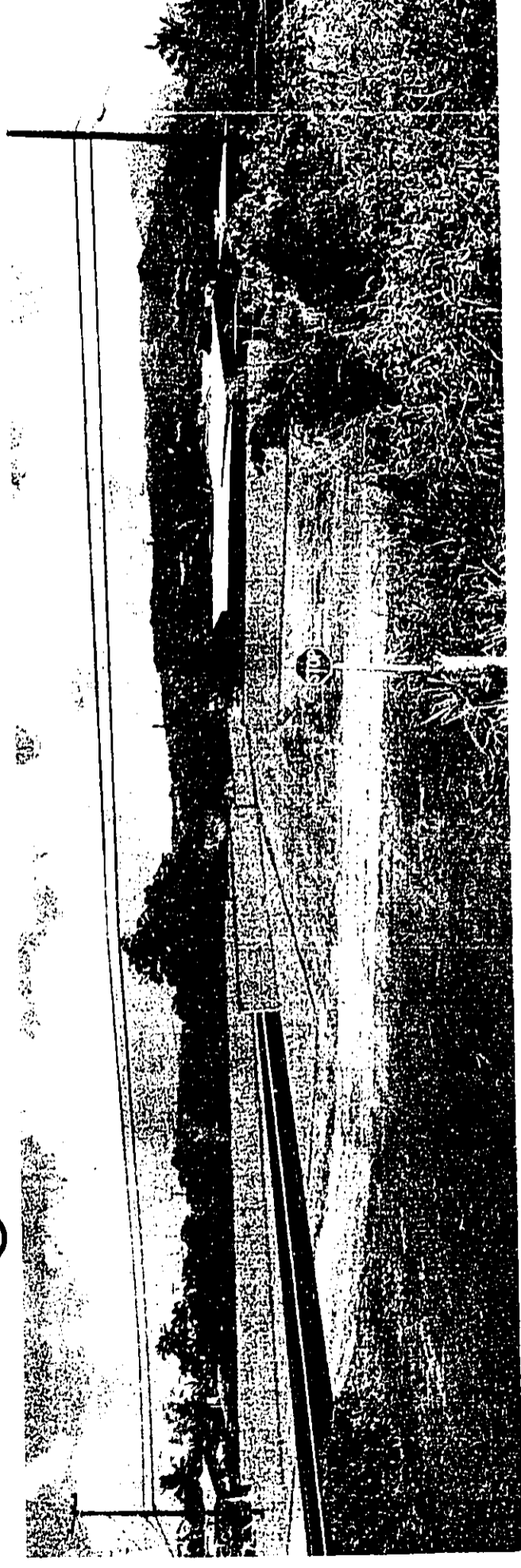
A Social Impact Assessment (SIA) was prepared by Earthplan in July 1996 for the project. A summary of the SIA is included in the following sections, which the report in its entirety is provided as Appendix J.

Mainly residential in nature, Koloa is an historic rural town comprising clusters of well-maintained plantation homes that date back to the early part of this century. The local post office, and a scattering of small shops, banks, and eateries can be found in the town center. Koloa is credited as being the birthplace of the Hawaiian sugar industry. In 1835, three

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7 Existing condition facing north at intersection of proposed road and Wailaau Road.



8 Computerized visual simulation illustrating proposed roadway and walls at same intersection.

Americans established Ladd and Company, the first sugar plantation in the islands, at a site near the present intersection of Maluhia and Koloa Roads. Just on Koloa's eastern outskirts, Koloa Sugar Mill, owned by Alexander & Baldwin's (A&B) McBryde Sugar Company, continues to operate, though its closure is scheduled for later this year.

In stark contrast to Koloa, Poipu is mostly a modern resort community that sprawls along the southern coastline. Large anchor hotels include the Hyatt, the Sheraton and the Waiohai, but several more accommodations are spread throughout the length of the shoreline. Pockets of upscale private homes are interspersed amongst the resorts, and Poipu Shopping Center with its small boutiques aimed at the visitor market is located near Poipu's western end. Even though initial resort development occurred in the area as early as the 1960s, they have undergone substantial renovation following Hurricane Iniki in 1992.

4.13.1 Recent Demographic and Housing Characteristics

4.13.1.1 Population & Housing Trends

As Table 4-4 shows, Koloa-Poipu has experienced a population gain since 1970 while losing several hundred housing units between 1980 and 1990. This at least in part attributable to the destruction caused by Hurricane Iwa in 1982. By 1990, the Koloa-Poipu population had reached 4,900.

	1970	1980	1990	Avg. Annual Growth Rate	
				1970-1980	1980-1990
Population:					
Kauai	29,761	39,082	51,177	2.8%	2.7%
Koloa-Poipu	3,141	3,879	4,900	2.1%	2.4%
Housing:					
Kauai	9,021	14,828	17,613	5.1%	1.7%
Koloa-Poipu	1,001	2,049	1,790	7.4%	-1.3%

Source: Earthplan, 1996

The overall Koloa-Poipu Study Area population of 4,900 persons in 1990 resembled that of the County's in terms of age and ethnic distribution. The Study Area 1990 median age of 34.8 compares to County's 1990 median age of 33.9 year. In terms of ethnicity, the Koloa-Poipu

percentages of Caucasians (forty one percent) and Japanese (twenty one percent) was slightly higher than the islandwide percentage of thirty five percent and twenty percent, respectively, while there were slightly fewer Hawaiians (ten percent) in Koloa-Poipu than islandwide (fifteen percent).

In terms of residential stability, Koloa-Poipu tended to be slightly more stable than the islandwide profile. Fifty-nine percent of Koloa-Poipu's residents had lived in the same house in 1985, compared to 57 percent islandwide. By contrast, however, Koloa-Poipu had proportionally more in-migrants from another state (fourteen percent) compared to Kauai (twelve percent).

The combination of high median age, comparable proportion of college graduates, and high proportion of in-migrants from other states is indicative of the high proportion of retirees living in Poipu.

4.13.1.2 Households and Families

Koloa-Poipu boasted just over 1,600 households, accounting for ten percent of all Kauai households.

1990 median household income in Koloa-Poipu was \$38,942; this was much higher than the islandwide median of \$37,425. Another indicator of relatively higher incomes in Koloa-Poipu is that only four percent of its households rely upon public assistance income, compared with seven percent of County households.

The Koloa-Poipu poverty rate of four percent in 1990 was almost on par with the islandwide average of five percent. The median family income of \$43,304 was higher than the islandwide median family income of \$41,099.

Koloa-Poipu's 1990 housing stock of 1,790 units had a ten percent vacancy rate, which was about a third higher than the Kauai County rate of seven percent. This higher vacancy may stem from units reserved for visitor use, and secondary part-time homes of absentee owners.

Housing costs in Koloa-Poipu were higher than that of the islandwide housing stock. The median monthly rent of \$583 was \$50 above the island median rent. Home values were distinctly more costly -- the Koloa-Poipu median value of \$195,800 was nearly \$25,000 above the Kauai median of \$171,500.

4.13.1.3 Labor Force

The Koloa-Poipu 1990 labor force patterns were generally similar to the islandwide characteristics, with the following notable differences:

- o At a 1.5 percent rate, Koloa-Poipu's 1990 unemployment was almost nonexistent; the County's 1990 unemployment rate was 3.6 percent; and
- o Over one-fourth of Koloa-Poipu workers were professionals, compared to 22 percent islandwide.

Since the 1990 census, the effects of Hurricane Iniki in 1992 have caused a marked increase in unemployment in Kauai island and in Koloa Poipu. In the three years following Iniki, the islandwide unemployment rate soared at 11.1, 12.7, and 11.5 percent. As of May 1996, the islandwide unemployment rate was estimated at 11.2 percent. In Koloa-Poipu, the unemployment rate was estimated at 4.9 percent, which suggests that some economic recovery is occurring for area residents.

4.13.2 Urbanization

In 1992, the Office of State Planning (OSP) conducted a statewide policy-oriented examination of land use district classifications. This Five-Year Boundary Review allows the State Land Use Commission to review urbanization proposals in the context of a long term planning horizon.

The Boundary Review projected Koloa-Poipu's population increase at 20 percent between 1990 and 2000, and 18 percent between 2000 and 2010. This represents a slowdown compared to the heady growth of the last two decades; previously there was an approximate 25 percent population increase for both the periods 1970 to 1980, and 1980 to 1990.

The Boundary Review's projections, taken with the present supply of urbanized lands and remaining vacant developable lands, estimates an additional 500 acres above the current urbanized acreage is needed to meet demand; this represents about one-fifth of the total County demand. After the Lihue and Kapaa regions, this is the third highest level of demand on the island.

4.13.3 Kauai General Plan

Kauai County established a General Plan in 1971 to legislate the controlled management of the island's development.

Regional maps in the General Plan designate the following recommended land uses for Koloa-Poipu:

- o Urban Residential in west Poipu and Koloa Town itself;
- o Resort in east Poipu and south of Koloa Town;
- o Agricultural to the west and east of Koloa Town; and
- o Open to the north of Koloa.

4.13.4 Major Developments Independent of the Project

4.13.4.1 Resorts

Resort projects center on the restoration of damaged visitor units to their pre-Iniki condition. The Koloa-Poipu area was particularly hard hit by the hurricane and only one of its major resorts, the Hyatt, is open for business. Of Kauai's four major unopened tourist properties, three of them are in Poipu, and they include the Waiohai Beach Resort, Poipu Beach Hotel, and the Sheraton Kauai Resort.

In May 1993, both the Waiohai Beach Resort and the adjacent Poipu Beach Hotel were bought by Renaissance Hotels. Renovation is ongoing but no firm date for reopening is available. Collectively, the two hotels will account for 565 visitor units staffed by 450 full- and part-time workers.

The Sheraton Kauai Resort is slated to come back on-line in November 1997, which will increase the region's hotel inventory by 415 units. An 18-unit wing of the hotel existent prior to Hurricane Iniki will be demolished as part of the resort's landscaping improvements. The Sheraton's re-opening should add approximately 300 full- and part-time workers to the Koloa-Poipu labor force.

4.13.4.2 Agriculture

The McBryde Sugar Company, which is part of Alexander and Baldwin, accounts for almost 7,200 acres of land in Koloa-Poipu. Approximately 1,200 acres are owned outright by the company, about 4,000 acres are leased from Grove Farm, and the other 2,000 acres are leased from Knudsen Estate.

Alexander and Baldwin plans to phase out its McBryde operation around September 1996 due to a combination of low sugar yields and net losses of \$22 million in the past five years. Some 45 plantation workers have already been laid off, and closure will cost another 210 jobs.

After shutdown, the A&B-owned McBryde acreage will continue to be used for agricultural crops, such as corn and coffee, which would complement A&B's current 600 acres in coffee on land lease from Grove Farm.

Grove Farm and Knudsen Estate lands leased from McBryde will also likely retain agricultural uses.

4.13.5 Community Issues

Three sources were used in the preparation of the issues analysis. First, public correspondence and testimony on the Koloa-Poipu Bypass Road since 1992 were reviewed. The second source of information was the printed media related to the proposed project. Third, interviews were conducted with various members of the community including:

- o Koloa-Waikomo residents
- o Landowners of large parcels near the bypass
- o Community and business organizations
- o Public facilities and service providers

In interviews held with nineteen members in the Koloa-Poipu community, fourteen favored the proposed section of the Koloa-Poipu Bypass Road. The following summarizes reasons for supporting this particular alignment:

- o The completed bypass is part of the solution to regional traffic congestion.

Those interviewed felt that the combination of Poipu Road improvements and the bypass road will help solve existing and expected traffic congestion. It was felt that the proposed bypass road will divert some of this traffic away from the town, and that it fits in with other roadway improvements.

- o This particular alignment is the result of many years of discussion and compromise.

Those interviewed acknowledged that no route will please everybody, but they strongly felt that this route is the most acceptable. They felt that the County has responded to all concerns, including noise barriers and a recent realignment.

It was further pointed out that Grove Farm has helped in this solution by selling the remnant parcels between the bypass road and cane haul road to residents who live nearby. These parcels are reportedly being farmed by the residents, and Grove Farm is selling the land for \$1 per square foot.

- o The propose bypass road is needed for emergencies.

Those interviewed felt that the proposed section of the bypass road is needed for emergency vehicles and evacuation. Interviewers remembered the Hurricane Iniki situation, where area residents were gridlocked on Poipu Road in their effort to evacuate the area.

- o The project is expected to help, rather than hurt, Koloa businesses.

Those interviewed felt that the traffic congestion around Koloa Town discourages potential customers, and does not add to clientele. It was hoped that the new bypass road will reduce the number of cars on Poipu Road, and therefore encourage more pedestrian activity.

Five people, three of whom are residents in the Waikomo Subdivision, criticized the proposed bypass roadway. Reasons for their opposition include the following:

- o The project will negatively impact an existing residential subdivision.

Those who live near the proposed alignment continue to fear the noise and dust impacts which could be generated during construction. They were also concerned about ongoing noise from vehicles on the road, and were not sure that the noise barriers would sufficiently attenuate the noise.

- o There are other, more acceptable, routes.

Three alternative routes were suggested by those who did not like this alignment. One alternative was to widen and realign Weliweli Road so that it goes into Koloa town. Another alternative was to route the bypass road further north on Maluhia Road, thereby avoiding residential areas. The third alternative suggested was to take the bypass road directly to Kaumualii Road; this would be a more efficient route for emergencies and evacuation.

- o The project will hurt Koloa businesses.

Those opposed to the proposed bypass road feared that, in diverting traffic away from the town, the project would take business away from Koloa Town businesses.

The analysis found that the proposed bypass road is considered a positive addition to the Koloa-Poipu region by people who would use the road themselves, who live near the existing Poipu Road, or whose activities or businesses would benefit from having an alternate mauka-makai route in this region.

The problems with the bypass road stem from an expectation of a decrease in one's quality of life. Nearby residents fear that their living conditions will be negatively altered by the construction and existence of the proposed section of the bypass road, and business people are apprehensive that their establishments will have less customers. Even though the various concerns raised by these residents have been addressed over the years, these people continue to

have apprehensions about the bypass. This suggests that they simply prefer that the bypass road be moved out of their neighborhood and into a less intrusive area.

Impacts and Mitigation Measures

Growth and Settlement Patterns: In the Koloa-Poipu region, major populations growth is already projected and expected. In the Five-Year Boundary Review, the Office of State Planning estimates an additional 500 acres of urban-zoned acreage to meet demand. This is the third highest level of demand among Kauai's planning areas. The Kauai General Plan also recommends growth in the region. Poipu is slated for urban residential and resort uses, and Koloa Town is planned for mostly residential uses, with limited report uses planned for an area south of the town.

Given the direction of public policy, the proposed bypass road is not expected to cause growth beyond that which is anticipated for this region. Rather, the proposal has long been considered part of the future of Koloa-Poipu. The Koloa-Poipu Development Plan, which is almost 20 years old, envisioned a bypass road as an essential ingredient for the future of the region.

The proposed section of the Koloa-Poipu Bypass Road is not anticipated to have a major influence in regional settlements patterns. In particular, the agricultural land abutting the proposed bypass road is expected to remain in some form of agriculture, unless State Land Use designations are revised, the Kauai General Plan is amended and lands are rezoned. Landowners of parcels near the bypass road have indicated that they plan to continue agricultural activities on their properties near the proposed roadway.

Impacts on the Neighboring Community: The proposed bypass road will traverse through a portion of the Waikomo Subdivision. Some residents of this community have strongly voiced their opposition to the proposal because of several problems they anticipate. Although the County has realigned the proposed roadway and established an additional 50-foot wide buffer between the roadway and adjacent homes, there may still be short- and long-term impacts on this residential area resulting from the presence of a new bypass road.

Construction of the proposed bypass road will occur over a one-year period. Construction activities will generate noise and dust, and increase the intensity of daily activity in the area. These effects may negatively affect the quality of life of nearby residents. People who stay at home during the day, such as senior citizens and parents with young people, will be especially subjected to these impacts.

Adherence to public regulations regarding construction activities will help minimize impacts. In addition, the County will work with the Waikomo residents to mitigate impacts. Residents will provide a construction schedule so that they know what to expect. Further, there will be a County Department of Public Works contact person who would handle complaints and facilitate solutions.

In the long term time frame, the bypass road will introduce traffic which is non-localized. With the bypass road, people who have little or no interest in the neighborhood will pass through the area. Further, as experienced in neighborhoods along the existing portion of the Koloa-Poipu Bypass Road, there will likely be an increase in noise generated by motor vehicles. These changes will negatively and irrevocably alter the currently quiet neighborhood ambience. Mitigation measures such as noise attenuation efforts and buffer zones will help lessen such impacts, but will not return the area to its original character.

It is noted that partial mitigation regarding neighborhood impacts has been undertaken by an independent third part. Grove Farm is selling the remnant parcels between the bypass road and cane haul road to residents who live nearby. These parcels are reportedly being farmed by the residents, and Grove Farm is selling the land for \$1 per square foot.

Displacement: To accommodate the proposed road, the County acquired two privately-owned properties to the immediate west of the existing cane haul road on the north corner of the Wailana Road intersection. Collectively, these properties contained structures that housed three renter households with a total of eight people. One household contained four persons, and the other two households comprised two persons each.

The land acquisition and relocation program were conducted in accordance with the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970, as amended, and relocation resources were available to all residential relocatees without discrimination. Negotiations for relocation were initiated in early 1994 to allow ample time in finding comparable accommodations before the end of that year. By mid-1994, the four-person household was relocated to a larger home north of Lihue, and the two-person households were both relocated to Kalaheo. No further displacement impacts are anticipated as a result of the proposed action.

Impact on Koloa Town Businesses: The proposed bypass road is intended to decrease traffic volume along Poipu and Koloa Roads. Several businesses are located along the Koloa Town portion of this roadway system and they may be affected by the proposed bypass road.

Decreasing traffic volumes along a highway, however, does not necessarily lead to decreased clientele for business establishments. A bypass road can benefit businesses along the original road, as follows:

o **Improved Accessibility**

If traffic congestion is severe, potential clientele often choose to visit establishments away from the congested areas because of easier access.

o **Increase Operational Efficiency**

Less traffic on the road can lead to more efficiency in the way businesses may operate. The time needed to transport goods to commercial areas, and to transport visitors to and from hotels may be lessened if traffic conditions were improved.

Employment and Wages: To be incurred over a twelve-month period, construction costs for the proposed bypass road are estimated at \$3 million based on current dollars.

Approximately 75 jobs will be generated by the construction of the proposed bypass road. Of these, 27 are direct jobs, which include on-site employment and off-site support personnel in offices, warehouses and base yards. The other 49 jobs are indirect or induced. The indirect jobs would be created by firms directly involved with the project, and their purchase of goods and services from statewide vendors and providers. Induced jobs are created by worker expenditures on statewide goods and services.

It is estimated that the project will generate approximately \$2.5 million in wages. Approximately \$1.1 million will be paid in wages to direct employees, and another \$1.3 million for indirect and induced jobs.

4.14 Relationship Between the Proposed Action and the Objectives of the Federal, Regional, State and Local Land Use Plans, Policies and Controls for the Areas of Concern

4.14.1 Federal

4.14.1.1 National Environmental Policy Act

This Environmental Assessment (EA) has been prepared in compliance with 40 Code of Federal Regulations (CFR) Parts 1500-1508, National Environmental Policy Act (NEPA) and 23 CFR Part 771, Federal Highways Administration (FHWA) requirements.

4.14.1.2 Coastal Zone Management (CZM) Program Federal Consistency Review

The National Coastal Zone Management Act of 1972 (P.L. 92-583), as amended (P.L. 94-370) requires Federal agencies to conduct their planning, management, development, and regulatory activities in a manner consistent with the State of Hawaii's CZM Program. Hawaii's CZM Program, established pursuant to Chapter 205A, Hawaii Revised Statutes, as amended, was Federally approved in 1977, and is administered by the State of Hawaii Office of Planning (OP).

A CZM Certification was pre-approved in conjunction with the Department of the Army Nationwide Permit, and as such, did not require a separate application approval. However, based on guidelines in the *Hawaii Coastal Zone Management Program Federal Consistency Procedures Guide*, a consistency certification with the State of Hawaii CZM Program is required for the proposed action since it constitutes a Federal action affecting lands in the coastal zone. OP must determine the project's consistency with the enforceable policies of the Hawaii CZM program. These policies encompass nine broad concerns such as impact on recreational resources, historic and archaeological resources, coastal scenic resources and open space, coastal ecosystems, coastal hazards, management of development, public participation, and beach protection. A CZM consistency certification for the proposed project will be prepared by the County of Kauai Department of Public Works and submitted to the OP for review and approval.

The Hawaii CZM Program, pursuant to Chapter 205A, HRS, provides for the beneficial use, protection, and development of Hawaii's coastal zone. The objectives and policies of the CZM Program involve the aforementioned nine areas, which relate to the proposed roadway project are as follows:

1. *Recreational Resources*

Objective: Provide coastal recreational opportunities accessible to the public.

Policy B: Provide adequate, accessible, and diverse recreational opportunities in the coastal zone management area.

The proposed roadway will complete the Koloa-Poipu Bypass Road which will provide an alternative route for vehicles traveling to the Poipu area located along the southern coast of the island.

2. *Historic Resources*

Objective: Protect, preserve, and, where desirable, restore those natural and manmade historic and prehistoric resources in the coastal zone management area that are significant in Hawaiian and American history and culture.

Policy C: Support state goals for protection, restoration, interpretation, and display of historic resources.

No historical sites were found in the project area, therefore, the State Historic Preservation Officer has determined that the project will have "No Effect" on historic sites. Based on the absence of any archaeological surface sites and the degree of previous ground disturbance (i.e., sugar cane cultivation, residential use, and bulldozed pasture land), no further archaeological investigation is recommended for the proposed project area. However, should any archaeological or historic resources, including human burials, be uncovered during the construction activity, all work in the vicinity will cease and the Hawaii State Preservation Officer (SHPO) will be contacted.

3. Scenic and Open Space Resources

Objective: Protect, preserve, and where desirable, restore or improve the quality of coastal scenic and open space resources.

Policy C: Ensure that new developments are compatible with their visual environment by designing and locating such developments to minimize the alteration of natural landforms and existing public views to and along the shoreline.

The project is located approximately two miles inland of the Poipu shoreline and therefore will not impact coastal views. Views along the proposed bypass road corridor consists primarily of open vegetated areas and residential development. Although the proposed road and walls will not obstruct scenic viewplanes, they may reduce the aesthetic qualities of the area with its approximately 36-foot wide paved alignment. However, the view of the proposed walls would be similar to that seen with perimeter walls which are currently allowed in residential areas.

4. Coastal Ecosystems

Objective: Protect valuable coastal ecosystems, including reefs, from disruption and minimize adverse impacts on all coastal ecosystems.

Policy C: Minimize disruption or degradation of coastal water ecosystems by effective regulation of stream diversions, channelization, and similar land and water uses, recognizing competing water needs.

The project will require a culvert crossing at Waihohonu Stream. Construction activities in and around the new culvert structure may result in short-term localized erosion and turbidity impacts in the Waihohonu Stream. However, it is noted that Waihohonu

Stream has been greatly modified, with a high alien species diversity of both stream biota and riparian vegetation in the project area. Agricultural practices and residential debris have impacted stream water quality and flow characteristics. The BMP plans approved by the DOH in conjunction with the WQC and NPDES General Permit waivers will mitigate potential impacts to the water quality.

As aforementioned in Section 4.5 and 4.8.3, a Stream Channel Alteration Permit (SCAP) was approved by the State Department of Land and Natural Resources Commission on Water Resource Management (CWRM) on March 1, 1995 and expired on February 27, 1997. Subsequently, a request to extend the SCAP coverage was approved on August 13, 1997. A Nationwide Permit (NP) for Road Crossing was approved by the Corps of Engineers on June 6, 1995. However the project will require reissuance of the permit under the new Nationwide Permit Program which was initiated in February 1997. The Corps of Engineers is currently in the process of approving the new Nationwide Permit for the project. The State Department of Health determined that the project was in compliance with objectives of the Federal Clean Water Act based on the relatively minor scope of the culvert crossing and the appropriate mitigative measures proposed in the application, and on May 17, 1995 issued a waiver in lieu of a Water Quality Certification.

Two native aquatic species, a shrimp (*Atyoida bisulcata*) and a goby (*Awaous stamineus*) are commonly known to occur in Waikomo Stream of which Waihohonu is a tributary. These same species are believed to occur in Waihohonu, although the better stream habitats are located considerably upstream of the project site. There, the urban influences are absent and stream flow may be constant. The proposed highway culvert will be constructed in a manner which does not interfere with native stream faunal migrations. Pursuant to a condition of the SCAP approved for the new culvert crossing, the culvert configuration provides for the migration of amphidromous aquatic life through Waihohonu Stream. This configuration was deemed acceptable to the Aquatic Resources Division of DLNR.

5. Economic Uses

Objective: Provide public or private facilities and improvements important to the State's economy in suitable locations.

The proposed project will provide a vital roadway link to the Poipu area. The project is consistent with recommendations for the implementation of public infrastructure improvements as stated in the Koloa-Poipu-Kalaheo Development Plan, Kauai County General Plan, Kauai County Highway Planning Study, and Kauai Long-Range Land Transportation Plan (Draft Report).

6. Coastal Hazards

Objective: Reduce hazard to life and property from tsunami, storm waves, stream flooding, erosion, subsidence, and pollution

Policy C: Ensure that developments comply with requirements of the Federal Flood Insurance Program.

The portion of the road at the Waihohonu Stream crossing is within the designated floodplain area Zone A according to the Flood Insurance Rate Maps. Zone A indicates special flood hazard areas subject to inundation by the 100-year flood but for which no base flood elevations have been determined. The remainder of the project is located in Zone D, an area in which flood hazards are undetermined. The proposed road alignment is designed to mitigate the potential for adverse impacts to the floodplain. In addition to being located at an existing road crossing at Waihohonu Stream, the proposed alignment at this location minimizes the area of encroachment into the floodplain.

The portion of the project located within Zones A and AE is subject to Executive Order (E.O.) 11988 regarding *Floodplain Management* as discussed in Section 4.14.1.7 below. The E.O. applies to all construction of Federal or Federally-Aided buildings, structures, roads, or facilities which encroach upon or affect the base floodplain.

The project will not affect existing tsunami, storm waves, erosion, and subsidence conditions.

7. Managing Development

Objective: Improve the development review process, communication, and public participation in the management of coastal resources and hazards.

Policy B: Facilitate timely processing of applications for development permits and resolve overlapping or conflicting permit requirements.

The project will comply with all applicable environmental permit requirements, specifically those administered by the Department of Land and Natural Resources, Army Corps of Engineers, Department of Health, and Office of Planning.

8. Public Participation

Objective: Stimulate public awareness, education, and participation in coastal management.

Policy B: Disseminate information on coastal management issues by means of educational materials, published reports, staff contact, and public workshops for persons and organizations concerned with coastal-related issues, developments, and government activities.

A public workshop was held on March 20, 1997 at the Koloa Community Center to familiarize community residents about the project. The workshop was attended by 22 community residents and business representatives. Two comment letters were received in response to the workshop.

In addition, the public was afforded an opportunity to review and comment on this EA pursuant to the requirements of Chapter 343 HRS, Section 11-200-12 of Title 11 Department of Health Administrative Rules, 23 CFR Part 771 Federal Highways Administration (FHWA), and the National Environmental Policy Act.

9. Beach Protection

Objective: Protect beaches for public use and recreation.

As aforementioned, the project is located approximately two miles inland of the Poipu shoreline. Therefore, beach resources will not be affected by the project.

4.14.1.3 National Historic Preservation Act

The proposed action will be carried out in accordance with Section 106 of the National Historic Preservation Act of 1966, as amended, and its implementing regulations set forth in 36 CFR 800. Section 106 requires Federal agencies to consider the effects of their actions on historic properties. The review process is designed to identify and evaluate historic properties, to assess the effects of the proposed action on the properties, and, if applicable, to find ways to avoid or mitigate adverse effects. Section 106 applies not only to properties listed on the National Register of Historic Places, but also to properties that meet specified eligibility criteria. This could include properties that have not been listed or discovered and even those that have not yet been discovered, especially in the case of archaeological resources. In Hawaii, Section 106 review is carried out by the State Department of Land and Natural Resources Historic Preservation Officer (SHPO).

Should any archaeological or historic resources, including human burials, be uncovered during the construction activity, all work in the vicinity will be halted and the SHPO will be contacted. Archaeological and historic resources discovered would be treated in accordance with a Memorandum of Agreement (MOA) which would be drafted among the County of Kauai Department of Public Works, the SHPO, the FHWA, the Office of Hawaiian Affairs (OHA),

and the Advisory Council on Historic Preservation (ACHP). The draft MOA would be accompanied by an archaeological data recovery plan and an archaeological mitigation plan. If necessary, a burial treatment plan would also be prepared and incorporated into the MOA to comply with the Native American Graves Protection and Repatriation Act of 1990.

4.14.1.4 National Pollutant Discharge Elimination System (NPDES) Permit, Hawaii Administrative Rules, Title 11 Department of Health, Chapter 55, Water Pollution Control

Section 402 of the Federal Clean Water Act prohibits point source pollution discharges into waters of the U.S. unless specifically permitted. The NPDES requirements for issuing permits pursuant to Section 402 is codified in Hawaii Administrative Rules Title 11 Department of Health, Chapter 55, Water Pollution Control, and is administered by the State Department of Health, Environmental Management Division, Clean Water Branch. A NPDES General Permit for Storm Water Associated with Construction Activity is required to control storm water discharges from construction sites over five acres in size, as in the case of the approximately 8.7-acre project site. The NPDES storm water permit for the proposed project was approved by the State Department of Health on May 17, 1995. The permit requires compliance with a Best Management Practices (BMP) plan and County Grading Permit and Sediment and Erosion Control Plans. Erosion and sediment control measures include constructing detention basins and installing silt fences along the 1.2-mile route to minimize movement of sediment subject to soil disturbance and to prevent silt from entering Waihohonu Stream.

4.14.1.5 U.S. Department of the Army Nationwide Permit

Nationwide permits are general permits issued by the U.S. Department of the Army on a nationwide basis to authorize minor activities with little or no paperwork. The requirements for issuing Nationwide Permits are codified in 33 CFR, Part 330. A Nationwide Permit for the proposed Koloa-Poipu Bypass Road crossing at Waihohonu Stream was issued by the U.S. Department of the Army on June 6, 1995 (See Appendix D). According to a letter dated February 7, 1997 from the Army Corps of Engineers, the project is subject to reauthorization under the new Nationwide Permit Program which was initiated in February 1997 (See Appendix B). The Corps of Engineers is currently in the process of reissuing the Nationwide Permit under the new permit program.

4.14.1.6 Section 401 Water Quality Certification (WQC)

The U.S. Army Corps of Engineers requires that, in conjunction with the Nationwide Permit, the Applicant obtain a certification from the State that the proposed project will meet the State water quality standards set forth in its guidelines. The State Department of Health is charged with the responsibility of establishing and administering a State certification system pursuant to

Section 401 of the Clean Water Act (33 USC 1344) and Section 342-32(13), Hawaii Revised Statutes. Water quality certification is required of any applicant for a Federal license or permit to conduct any activity that may result in any discharge into navigable water.

On May 31, 1995, in accordance with Section 11-54-09.1.04 of the Hawaii Administrative Rules, the State Department of Health waived the requirements of processing a Section 401 WQC, subject to conditions, based on the Department's determination that the potential impact with respect to water quality concerns resulting from the proposed project were considered to be minor.

4.14.1.7 Executive Order 11988, Floodplain Management

Executive Order (E.O.) 11988, *Floodplain Management*, signed on May 24, 1977, requires that agencies "avoid to the extent possible, the long- and short-term adverse impacts associated with the occupancy and modification of floodplains and to avoid the direct or indirect support of floodplain development whenever there is a practicable alternative." The final regulations implementing this Presidential directive is issued by the Federal Emergency Management Agency (FEMA). The E.O. applies to all construction of Federal or Federally-Aided buildings, structures, roads, or facilities which encroach upon or affect the base floodplain. Affected areas include all floodplain locations which are, as a minimum, subject to inundation by a flood with a one percent chance of occurring in any year (i.e., "100-year or base flood"). The E.O. requires that agencies avoid the base floodplain unless it is the only practicable alternative, or adjust to the base floodplain. If the base floodplain cannot be avoided, the respective agency should adjust to it in order to: "(1) reduce the hazard and the risk of flood loss; (2) minimize the impact of floods on human safety, health, and welfare; and, (3) restore and preserve the natural and beneficial floodplain values."

The proposed action is subject to the appropriate policies and requirements of E.O. 11988 since the portion of the roadway corridor crossing Waihohonu Stream is located within the designated floodplain area Zone AE of the FEMA FIRM. Zone AE indicates special flood hazard areas inundated by the 100-year flood in which no base flood elevations have been determined. The proposed road alignment is sited and designed to minimize adverse effects on the floodplain. In addition to being located at an existing road crossing at Waihohonu Stream, the proposed alignment at this location minimizes the area of encroachment into the floodplain.

4.14.2 State of Hawaii

4.14.2.1 Hawaii State Plan

The Hawaii State Plan (Chapter 226, Hawaii Revised Statutes, as amended) establishes the overall theme, goals, objectives, policies and priority guidelines for statewide planning. The

Hawaii State Plan also directs the appropriate State agencies to prepare functional plans for their respective program areas.

The proposed action is consistent with the following State Plan objectives and policies:

Section 226-17 Objectives and policies for facility systems -- transportation.

(b) *To achieve the transportation objectives, it shall be the policy of this State to:*

- (6) *Encourage transportation systems that serve to accommodate present and future development needs of communities.*
- (10) *Encourage the design and development of transportation systems sensitive to the needs of affected communities and the quality of Hawaii's natural environment.*

The proposed bypass road would provide a complete transportation route that would facilitate travel to and from Poipu for residents and visitors and alleviate potential increased traffic congestion for residents of Koloa Town. The proposed bypass road would also help to facilitate response times for emergency personnel serving the surrounding communities.

4.14.2.2 Kauai County Highway Planning Study

The *Kauai County Highway Planning Study* of October 1990 was prepared by the Se transportation route that would facilitate travel to and from Poipu for residents and visitors and alleviate potential increased traffic congestion for residents of Koloa Town. The proposed bypass road would also help to facilitate response times for emergency personnel serving the surrounding communities.

4.14.2.2 Kauai County Highway Planning Study

The *Kauai County Highway Planning Study* of October 1990 was prepared by the S the portion of Maluhia Road north of Koloa town." The connector road was one of 19 projects listed in the Study's implementation plan and was identified as one of 13 projects which were required as a result of existing or future conditions expected after the completion of development projects which have been approved or were currently under review by the County at the time of the Study.

Currently, the *Kauai County Highway Planning Study* is in the process of being updated with the preparation of the *Kauai Long-Range Land Transportation Plan* (Draft, November 1995) by the State of Hawaii Department of Transportation, in cooperation with the County of Kauai Department of Public Works and County of Kauai Planning Department. The updated Plan,

which identifies the land transportation improvements needed to support the projected growth for the island of Kauai to the year 2020, includes in its year 2020 roadway system baseline conditions the construction of the East Koloa-Poipu Bypass Road between Weliweli Road and Maluhia Road.

4.14.2.3 Stream Channel Alteration Permit

Stream channels are protected from alteration whenever practicable to provide for fishery, wildlife, recreational, aesthetic, scenic, and other beneficial instream uses unless specifically permitted. The requirements for issuing Stream Channel Alteration Permits are codified in *Hawaii Administrative Rules Title 13 Department of Land and Natural Resources, Chapter 169, Protection of Instream Uses of Water*, and is administered by the State Department of Land and Natural Resources, Commission on Water Resource Management. For the proposed project, a Stream Channel Alteration Permit to construct a culvert crossing at Waihohonu Stream was approved by the State Department of Land and Natural Resources Commission on Water Resource Management on March 1, 1995. The permit expired on February 27, 1997, and subsequently, a request to extend the SCAP coverage was approved on August 13, 1997. The Aquatic Resources Division of DLNR was consulted in conjunction with the permit to assure that the culvert configuration adequately provided for the migration of amphidromous aquatic life through Waihohonu Stream.

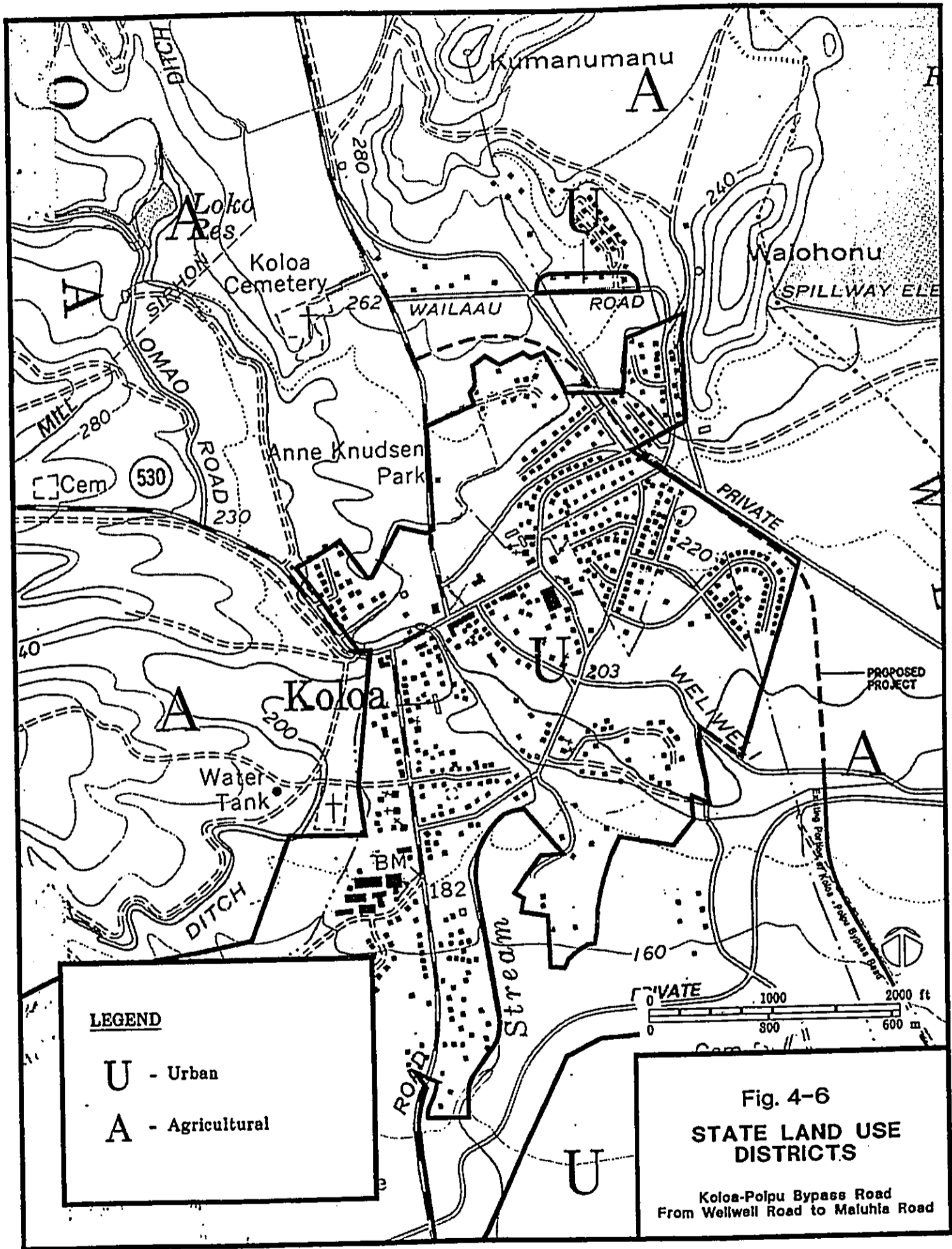
4.14.2.4 State Land Use Law, Chapter 205, Hawaii Revised Statutes

The State Land Use Law is intended to preserve, protect, and encourage the development of lands in the State for uses which are best suited to the public health and welfare of Hawaii's people. All lands in the State are classified in one of four districts by the State Land Use Commission: Urban, Agricultural, Conservation, and Rural. The State Land Use designations for the proposed project are Urban and Agricultural (See Figure 4-6, State Land Use Map). The proposed project is consistent and compatible with these land use designations.

4.14.3 County of Kauai

4.14.3.1 County General Plan

The General Plan for the County of Kauai (County of Kauai Ordinance No. 461, June 21, 1984) is the "primary policy governing long-range and comprehensive development, use and allocation of land and water resources within the County". The proposed project will be consistent with the following Plan goal (Section 2.01, Ordinance No. 461):



- To manage implementation of the General Plan through the development of social and physical infrastructure based on growth targets, priorities and efficient utilization of facilities and services.

In consonance with the land use element of the Plan, land use classifications are delineated on maps at the County of Kauai Planning Department. The proposed project is designated Urban Residential and Open (See Figure 4-7, County of Kauai General Plan).

The Urban Residential classification is defined as follows (Section 3.03, D.4., Ordinance No. 461):

"Lands included with the Urban Residential classification shall be used primarily for residential development at medium (4 to 6 units per acre) to higher densities (10 to 20 units per acre) which may require central wastewater collection and treatment facilities. Urban Residential may also contain commercial and appropriate light industrial and public service facilities necessary to support and complement community functions."

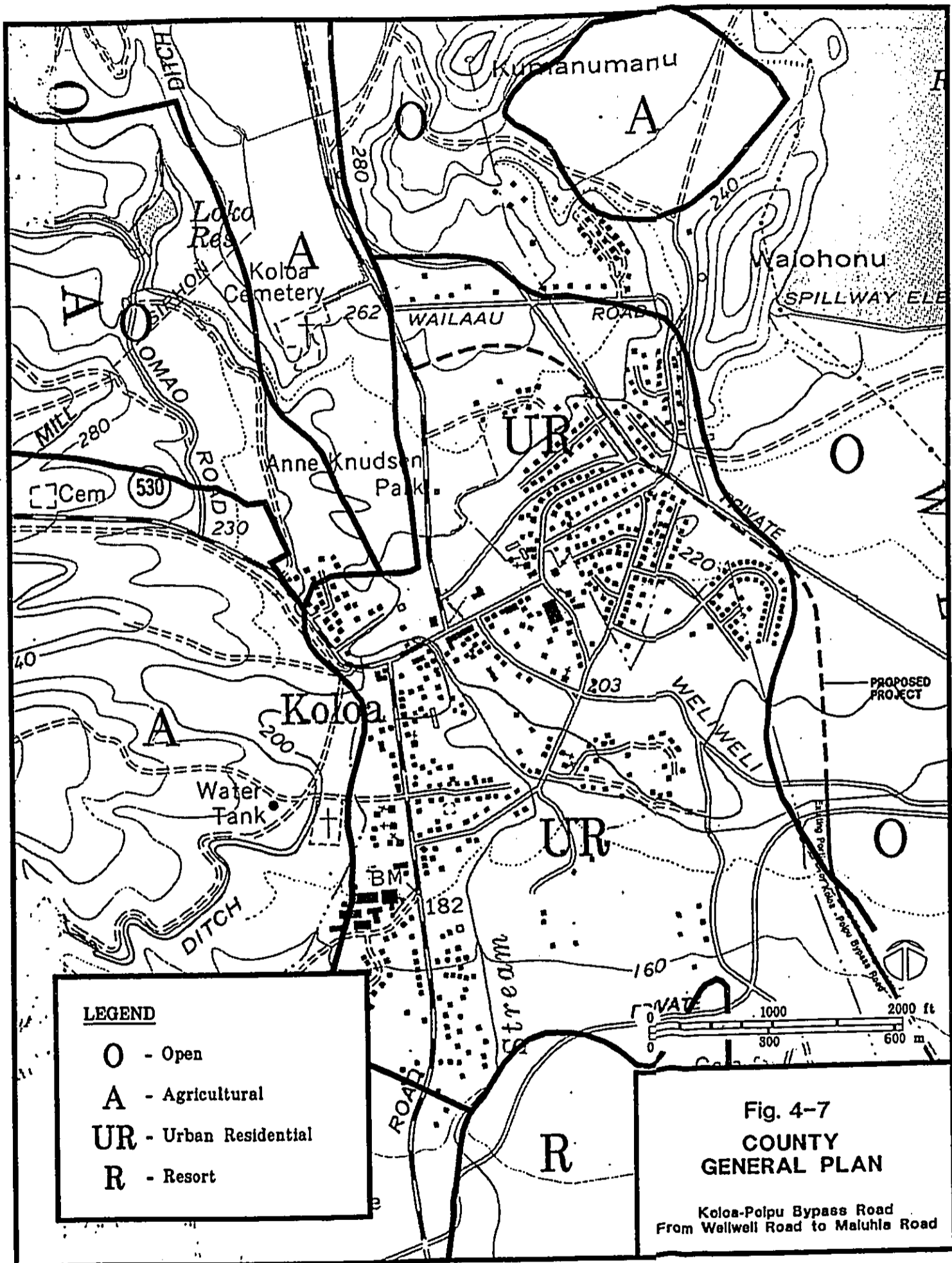
The Open classification is defined as follows (Section 3.03, D.2., Ordinance No. 461):

"Lands included within the open classification shall remain predominantly free of development involving buildings, paving and other similar construction. Where such construction is permitted (with the exception of very small lots of records), they shall be clearly incidental to the prevalent nature of the surrounding 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; or perform essential physical and ecologic functions important to the general health, safety and welfare of the public; or define and regulate use and development within potentially hazardous areas; or form a cultural, historic or archaeological resource of significant public value."

Development of the proposed project will be consistent with the General Plan Land Use classifications.

4.14.3.2 Koloa-Poipu-Kalaheo Development Plan

The County of Kauai's Koloa-Poipu-Kalaheo Development Plan, prepared in 1978 and adopted by County ordinance in 1983, provides physical, social and economic measures which relate specifically to these communities. In addition to the goals and objectives of the General Plan, the goals and objectives that provide overall guidance to the implementation of the Koloa-Poipu-Kalaheo Development Plan and with which the proposed project will be consistent are:



Transportation and Circulation

- Improve roadway patterns and linkages at points of congestion and areas of future growth.
- Encourage alternate transport systems which lessen congestion and conserve resources.

Public Facilities

- Encourage development of roads, sewerage, water facilities, drainage improvements and other public facilities necessitated by existing uses and proposed growth.

The proposed action is depicted as part of several vehicular circulation systems recommended in the Koloa-Poipu-Kalaheo Development Plan. Under Physical Implementation - Infrastructure, the Plan states: "Proposed improvements to infrastructure will insure a functional, coordinated circulation system. ...Variations from or abandonment of critical elements such as... the alternate bypass routes from Maluhia Road to Poipu will seriously impair the function of the entire system. The circulation system as proposed should be adopted by ordinance and no variation to the implementation of that system permitted without a complete analysis of impact on the system and a feasible alternative solution which accomplishes the same functional objective."

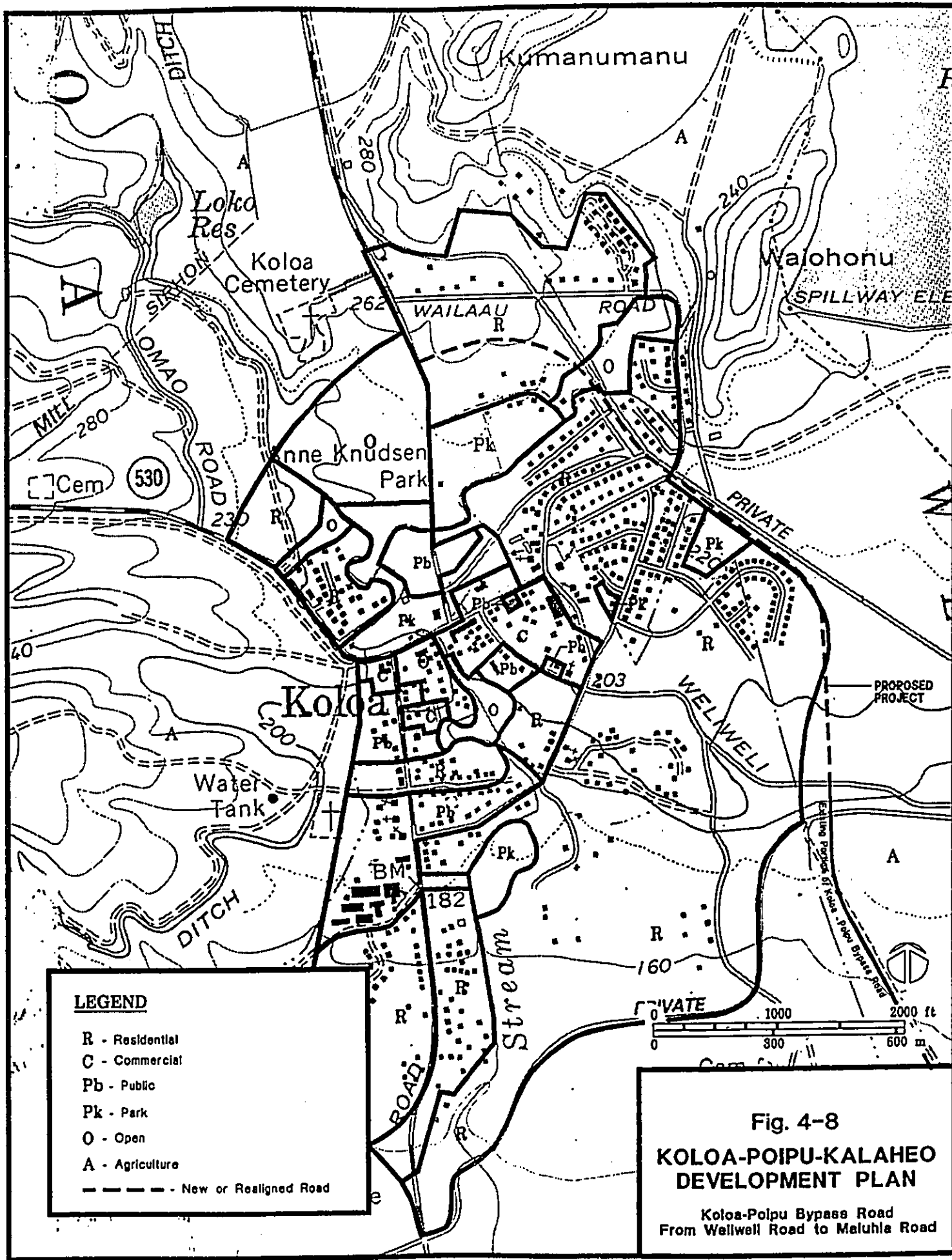
The Development Plan land use designations of the proposed project area are Agriculture, Residential and Open (See Figure 4-8, Koloa-Poipu-Kalaheo Development Plan).

4.14.3.3 County Zoning

The Comprehensive Zoning Ordinance (CZO) for the County of Kauai (County of Kauai Ordinance 164, as amended) establishes procedures for the division of the County into land use districts and creates regulations for the type, size, placement and control of structures within various zoning district classifications. The zoning designations for the lands traversed by the proposed roadway corridor include R-6 Residential District and Open District (See Figure 4-9, Kauai County Zoning Map).

4.14.3.4 Special Management Area

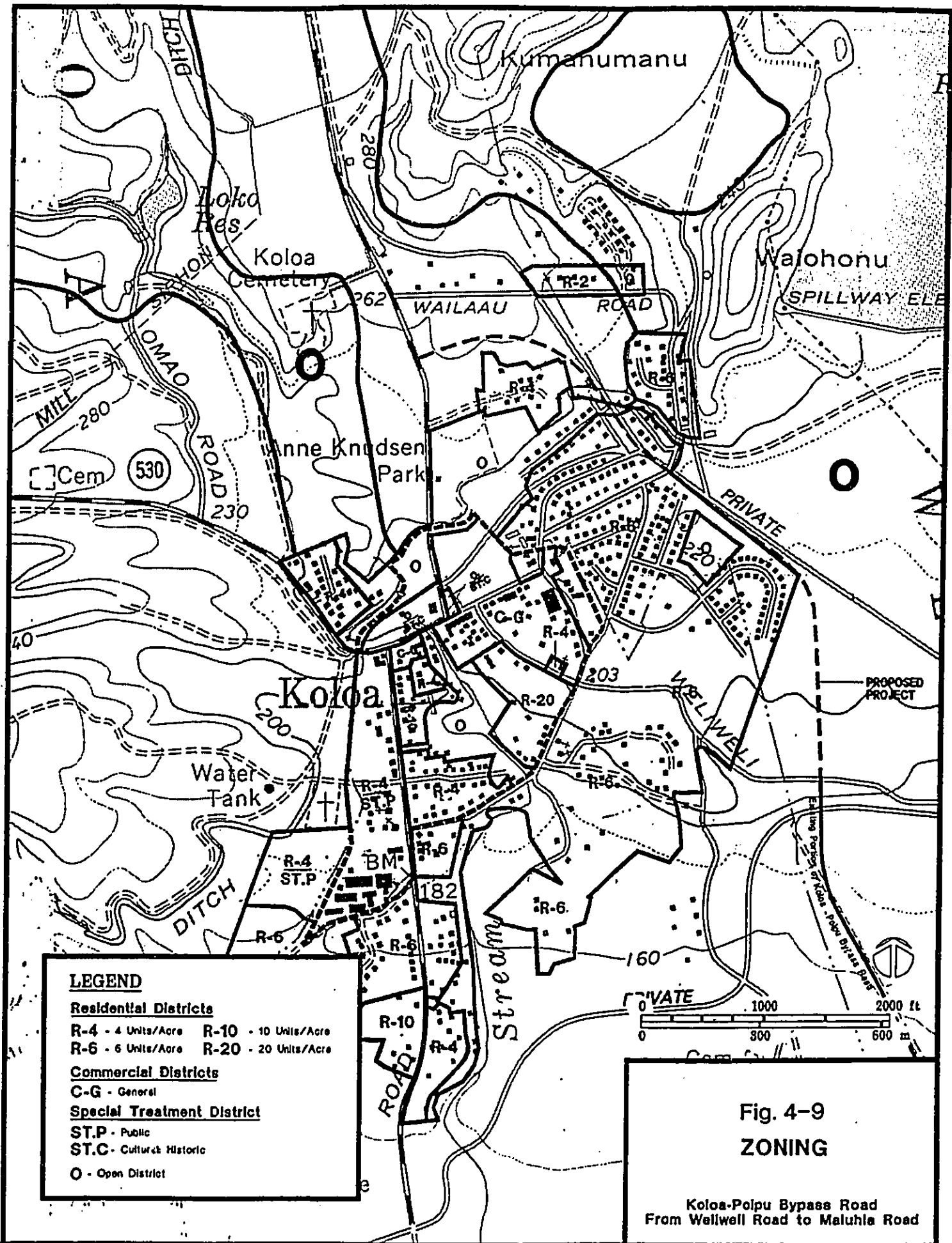
The Hawaii Coastal Zone Management (CZM) Act (Chapter 205, Hawaii Revised Statutes) is the basis of the Hawaii CZM Program as discussed previously in Section 4.14.1.2. In addition to providing for Federal Consistency Review, the Act establishes objectives, policies and guidelines upon which all counties within the State have structured specific legislation which designated Special Management Areas (SMA). Any development located within the SMA requires a County-issued SMA permit, which on Kauai is administered by the County of Kauai



LEGEND

- R - Residential
- C - Commercial
- Pb - Public
- Pk - Park
- O - Open
- A - Agriculture
- - New or Realigned Road

Fig. 4-8
KOLOA-POIPU-KALAHEO
DEVELOPMENT PLAN
 Koloa-Poipu Bypass Road
 From Wellwell Road to Maluhia Road



Planning Department. The proposed project is located outside of Kauai County's SMA boundaries.

4.14.4 Permits and Approvals

The following is a list of permits and approvals that may be required prior to project construction:

FEDERAL

Federal Emergency Management Agency (FEMA)

- Compliance with Executive Order 11988, Floodplain Management

STATE

Office of State Planning

- Hawaii Coastal Zone Management Program Federal Consistency Certification

COUNTY OF KAUAI

Department of Public Works

- Grading Permit
- Building Permit

4.15 Infrastructure

Water: An existing 8-inch waterline is located along the southern portion of Wailaau Road.

Drainage: Runoff from the project vicinity is conveyed through pasture lands, open areas and adjacent sugar cane fields, following natural drainage patterns. Existing drainage improvements in the immediate project vicinity consist of a 30-inch drainline located along the northern boundary of Wailaau Road.

Electrical and Telephone: Electric and telephone poles and overhead lines are located along Weliweli, Wailaau and Maluhia Roads. Electrical and telephone service are provided by Kauai Electric and GTE Hawaiian Telephone Company, Inc., respectively.

Impacts and Mitigation Measures

No major impacts are anticipated on the existing utility systems along the proposed bypass road corridor. As needed, the affected utility systems in the immediate project vicinity,

including electrical and telephone poles, will be relocated to allow for construction of the proposed bypass road. Any necessary utility relocation activities will be coordinated with the respective utility companies to minimize any potential conflicts with service to the adjacent areas.

Water: A dust control irrigation system consisting of a 4-inch irrigation line and sprinkler heads will be installed along the segment of the proposed bypass road corridor adjacent to the cane haul road between Waikomo Subdivision and Waihohonu Stream.

Drainage: Construction of the proposed bypass road will modify drainage patterns in the vicinity. Surface runoff along the proposed bypass road will be directed towards a proposed drainage system consisting of drainage lines, culverts, and inlets which will be constructed along the proposed corridor. Drainage culverts will be constructed at the intersection of Maluhia Road, at Waihohonu Stream and in the vicinity near Weliweli Road.

4.16 Public Facilities and Services

4.16.1 Police

The Koloa-Poipu area is in Sector 7 of the Kauai Police Department and is covered by the Waimea Substation. One officer per eight-hour shift is assigned to Sector 7. Assistance is provided by police in Lawai's Sector 8 and in Lihue's Sector 6 when necessary.

The Police Department maintains a small office in Koloa for the staff's logistical use but it is not considered an official station. There are no current plans to expand the police presence in the region.

Impacts and Mitigation Measures

The proposed bypass road is not expected to impact the level or delivery of police protection services, and will likely facilitate police access to and from the area.

4.16.2 Fire

The Koloa Fire Station near the Poipu Road-Lawai Road intersection opened in April 1995. Major equipment at the station presently includes one engine company and one engine pumper; staffing consists of five firefighters per eight-hour shift. Adequate coverage of the region requires at least one additional engine pumper and three more firefighters per shift.

Backup is provided by the Kalaheo Fire Station, which is staffed by four firefighters per shift. Aerial support is usually supplied by a private helicopter company under contract to the Fire Department. Additional helicopter aid can be requested from the Navy's Barking Sands base during crisis situations.

Impacts and Mitigation Measures

The proposed bypass road is not expected to negatively impact the delivery of fire protection services and will likely facilitate fire personnel and equipment access to and from the area.

4.16.3 Emergency Medical Services

Kauai's emergency medical services (EMS) are provided by International Life Support, Inc., which provides services under a contract with the State Department of Health. Koloa Town has one of two ambulances base in West Kauai; the other is located in Waimea. Also known as Medic 24, the Koloa ambulance unit began service in September 1992 and has two emergency medical technicians per shift, comprised of a 48-hour period. Medic 24's service area extends across the Koloa District, and includes the towns of Kalaheo and Lawai.

The proposed bypass road can benefit EMS by providing an additional route out of the area during emergencies, thereby enabling a more efficient response time.

The two medical clinics in Koloa are owned by Wilcox Memorial Hospital. The Koloa Clinic staff consists of one full-time family practitioner, one part-time internist, two nurses, and two receptionists. A part-time pediatrician may be added to the clinic in the future, if the need arises. While the two-office building is old, expansion or relocation will occur only if A&B's planned Kukuiula development creates a marked increase in the area population.

The Wilcox Memorial Hospital in Lihue is the primary full-service treatment facility for Koloa-Poipu. The hospital treats approximately 510 Koloa-Poipu residents per month, which accounts for less than 0.08 percent of the hospital's total patient volume.

The hospital contains 75 acute care beds and 100 long-term care beds, as well as a day care unit that can serve 50 dependent adults. The hospital's other services include same-day surgery, outpatient therapy, a 20-bed emergency room, and a CAT-scan facility. Wilcox also offers a cardiac rehabilitation program for island residents who have undergone heart surgery on Oahu.

The State Department of Health's Kauai Veteran's Memorial Hospital in Waimea is an alternative for Koloa-Poipu residents. Even though the hospital's service area extends to Koloa's Maluhia Road-Kaumualii Highway junction, an average of only 20 persons per month, which

currently has 24 acute care beds and 25 long-term care beds, plans to add another 16 long-term care beds and a CAT-scan facility, as well as expand its rehabilitation center.

Impacts and Mitigation Measures

The proposed bypass road is not expected to negatively impact the delivery and level of medical and hospital services for the area. The new roadway will likely benefit area residents by providing additional access to primary roadways which lead to medical clinics and hospitals.

4.16.4 Civil Defense

The only designated civil defense shelter in the Koloa-Poipu area is Koloa School, which can accommodate approximately 1,000 persons. The service population is well in excess of this capacity, so that area residents are sent to Kalaheo and Lihue for shelter during emergencies. This creates several traffic problems for evacuating vehicles.

Impacts and Mitigation Measures

The proposed bypass road will provide an additional roadway in the area, but would not necessarily improve evacuation access out of the area.

4.16.5 Educational Facilities

The two preschools in Koloa are the Koloa Early School and Koloa's Children's Center. Koloa School, which is the area's public elementary school, accommodates students from Kindergarten through Grade 6; its service area includes a portion of Lawai. The school has 410 students and 25 teachers and they occupy 24 classrooms. The nearest upper-grade school to Koloa is Kauai High & Intermediate School in Lihue. A new intermediate school from Grades 6 through 8 is planned for Puhi and will adjoin the existing Kauai Community College. Koloa-Poipu students will attend this new intermediate school when it opens in September 1999.

Impacts and Mitigation Measures

The proposed bypass road is not located near these schools, and is therefore not expected to negatively impact educational and other school activities. The proposal may facilitate travel to the intermediate and high schools outside the region.

4.16.6 Recreational Facilities

Kauai County maintains several parks in Koloa and Poipu, including:

- o Anne Knudsen District Park: This is an active eight-acre park located along Maluhia Road at Koloa's northern end. It has ball fields, basketball and tennis courts, and flood lights for night use.
- o Waikomo Neighborhood Park: This four-acre park with a soccer field is located next to the planned route of the proposed bypass road.
- o Weliweli Neighborhood Park: While this park totals nine acres, only about three acres are used for basketball and passive recreation. There are no plans to develop the remaining acreage.

In addition, the County maintains the Poipu and Brennecke Beach Parks along the Poipu shoreline.

The only State recreational area in Koloa-Poipu is the small boat facility at Kukuiula Harbor. The site includes a County comfort station, a boat launching ramp, a pier, and a parking lot. Five boats are regularly moored there, but many vessels for fishing, touring, and diving regularly utilize the harbor since it is the only ocean access for boats within fifteen miles. No other State recreation facilities are planned for the region.

The region also has two private golf courses which complement public recreational facilities. The Kiahuna Golf Course is located on Poipu Road. Its owners plan to eventually add nine holes to this 18-hole course. The Poipu Bay Resort Golf Course is part of the Hyatt Regency Resort complex. This 18-hole golf course is heavily utilized; approximately 100 rounds a day are played.

Impacts and Mitigation Measures

The proposed bypass road may impact the County's Waikomo Neighborhood Park, which is located adjacent to the proposed roadway. To mitigate impacts, the County plans to erect a wall which would help to alleviate traffic noise for park users and act as barrier between the roadway and the park.

Further, the park will be positively affected by the proposed bypass road. An approximately 25,540-square foot remnant parcel will be created between the existing park boundary and proposed barrier. The County plans to improve this remnant parcel as an

expansion to the park. A Section 4(f) evaluation will not be required because the park will be improved as a result of the proposed project.

The proposed bypass road may also have a negative effect on the Kiahuna Golf Course if it draws visitors away from Poipu Road. Currently, travelers along Poipu Road can easily see the golf course, and slightly over half of the course users are tourists. The net result of the bypass road may be positive, however, if it succeeds in allowing more tourists to conveniently access the region.

Chapter 5

IMPACTS OF THE ALTERNATIVES

CHAPTER 5 IMPACTS OF THE ALTERNATIVES

5.1 No Action

The no action alternative would not require further construction activities that would impact the environment and residential areas along the proposed alignment. On the other hand, traffic congestion in the town of Koloa would worsen as traffic increases as projected. Furthermore, implementation of future road improvements, as recommended by the *Kauai Long-Range Transportation Plan (Draft, 1995)*, would be affected as this plan assumes that the proposed action will be implemented.

5.2 Alternative 1

The environmental consequences of Alternative 1 would be similar to the preferred alternative between Weliweli Road and Waihohonu Stream. From Waihohonu Stream to Maluhia Road, the route of Alternative 1 would be along Wailaau Road. This would involve a slightly longer roadway length, at 1.25 miles, compared to the preferred alternative, at 1.2 miles. This would imply a slightly greater amount of construction and associated impacts, although this difference may be offset because Alternative 1 would improve an existing road instead of building a new road through a sugar cane field. More people would be affected by Alternative 1, however, since there are residences along Wailaau Road. Potential impacts would include noise, dust and traffic associated with construction activities as well as vehicular emissions and noise associated with subsequent use of the completed roadway.

5.3 Alternative 2

The environmental consequences of Alternative 2 would be similar to the preferred alternative between Weliweli Road and a point approximately 500 before the Wailaau Road intersection. There, Alternative 2 would diverge to the north along an existing unnamed road skirting the base of Waihohonu Hill.

The alignment of Alternative 2 is intended to avoid residences located near the preferred alternative's intersection with Wailaau Road and crossing of Waihohonu Stream. This alignment, however, would affect residences along the unnamed road.

The length of the alignment in Alternative 2, at approximately 1.85 miles, would be considerably longer than that of the preferred alternative, at 1.2 miles. Hence, more construction activity would be implied. Moreover, since this alternative would abut a hillside, considerably greater earthwork, including cutting and filling, would be required to establish the roadway at the required right-of-way width. The environmental consequences of this earthwork include removal of vegetation and associated habitats on the hillside, and the potential for erosion and resulting

siltation of drainageways. Although no botanical surveys of the hillside were conducted, it is unlikely that any endangered or threatened species would be affected. Erosion and siltation could be controlled by appropriate management practices. Nevertheless, the scale of construction would be greater than in the preferred alternative.

Chapter 6

***FINDING OF NO SIGNIFICANT IMPACT
DETERMINATION***

CHAPTER 6 FINDING OF NO SIGNIFICANT IMPACT DETERMINATION

This Final EA was prepared for review in accordance with the consultation process of Chapter 343, Hawaii Revised Statutes. Based on the significance criteria set forth in Section 200-12 of Title 11, Administration Rules, Department of Health, State of Hawaii, it is determined that the proposed project will not have a major effect on the environment, and therefore, this Finding of No Significant Impact (FONSI) will be filed with the State Office of Environmental Quality Control (OEQC).

A. Findings and Reasons Supporting Anticipated FONSI Determination

In general, construction and use of the proposed roadway will not:

1. *Involve the loss or destruction of any natural or cultural resource.*

No historical sites were found in the project area, therefore, the State Historic Preservation Officer has determined that the project will have "No Effect" on historic sites.

2. *Curtail the range of beneficial use of the environment.*

The proposed project will not curtail the beneficial uses of the environment.

3. *Conflict with the State's long-term goals or guidelines as expressed in Chapter 344, HRS.*

The proposed project does not conflict with long-term environmental policies, goals, and guidelines of the State of Hawaii. Temporary impacts associated with construction activity of the proposed project can be adequately mitigated.

4. *Substantially affect the economic or social welfare of the community or state.*

The proposed project would provide short-term economic benefits in the form of construction jobs, and long-term benefits by completing the Koloa-Poipu Bypass Road which will allow vehicular traffic travelling between Poipu and Kaunualii Highway to bypass Koloa town. In addition, the proposed bypass road can benefit EMS by providing an additional route out of the area during emergencies, thereby enabling a more efficient response time.

5. *Substantially affect public health.*

The proposed project will not affect public health.

6. *Involve substantial secondary effects, such as population changes or infrastructure demands.*

No substantial secondary effects are anticipated with the construction or operation of the proposed roadway.

7. *Involve a substantial degradation of environmental quality.*

During the short-term construction period, substantial degradation to the environment is not anticipated. Excavation and fill activities will be required only to the extent that a uniform road surface can be constructed. All grading work shall be conducted in accordance with County of Kauai Ordinance No. 262 regarding Grading, Grubbing, Stockpiling, and Soil Erosion and Sedimentation. During construction in and around the culvert crossing, short-term water quality impacts may occur as a result of increased turbidity. To mitigate impacts associated with in-stream construction activity, a best management practices (BMP) plan was prepared and accepted as part of the stream and water quality approvals for the project.

No major long-term adverse impacts to the water quality are anticipated as a result of the overall project.

8. *Cumulatively have considerable effect upon the environment.*

The proposed project is not anticipated to have a considerable cumulative effect upon the environment.

9. *Substantially affect a rare, threatened or endangered species or its habitat.*

There are no known rare, threatened or endangered flora or fauna on the property that could be adversely affected by the construction and operation of the proposed roadway. According the USFWS, while no lava tube entrances were discovered, the proposed road will likely cross areas that have lava tubes and cave animals beneath them. If a lava tube is exposed during the construction of the road, construction will cease and the USFWS will be contacted immediately to conduct a survey for these cave animals. In addition, consultation with the USFWS in conjunction with the U.S. Army Corps of Engineers Nationwide Permit indicated that the project would have no impact on flora and fauna resources in the area.

10. *Detrimentially affect air or water quality or ambient noise levels.*

Construction activities associated with the proposed project are anticipated to result in short-term impacts to noise, and air quality in the immediate project vicinity. As recommended by the State Department of Health, the construction activities will comply with provisions of Hawaii

Administrative Rules, Chapter 11-60.1-33 regarding Fugitive Dust and 11-46 regarding Community Noise Control.

Upon its completion and use as a roadway, the project will impact mobile air pollution and ambient noise levels in the project vicinity. However, results of a mobile source impact analysis conducted for the project indicate that the project will comply with both State and Federal 1-hour and 8-hour CO standards, and noise impacts will be mitigated through the use of sound attenuation walls.

11. *Affect or is likely to suffer damage by being located in an environmentally sensitive area, such as a flood plain, tsunami zone, erosion-prone area, geologically hazardous land, estuary, freshwater area, or coastal waters.*

The proposed roadway lies largely within areas of minimal flooding. The area of the road near Waihohonu Stream crossing is within the designated floodplain area Zone AE. In addition, Waihohonu Stream lies within a floodway area of Zone AE. The proposed road alignment is designed to mitigate the potential for adverse impacts to the floodplain. In addition to being located at an existing road crossing at Waihohonu Stream, the proposed alignment at this location minimizes the area of encroachment into the floodplain. The project site is otherwise not located in an environmentally sensitive area.

12. *Substantially affect scenic vistas and viewplanes identified in county or state plans or studies.*

Although the proposed road and walls will not obstruct scenic viewplanes, it may reduce the aesthetic qualities of the area with its approximately 36-foot wide paved alignment.

13. *Require substantial energy consumption.*

Construction and operation of the proposed project will not require substantial energy consumption.

Chapter 7
REFERENCES

CHAPTER 7 LIST OF EA PREPARERS

The following individual and firms participated in the preparation of the Draft EA:

Environmental Assessment:	Wilson Okamoto & Associates, Inc. Earl K. Matsukawa, AICP Frances Yamada Scott Kunioka, P.E. Laura Mau
Water Quality and Aquatic Resources:	AECOS, Inc. Eric Guinther
Flora and Fauna Resources:	Botanical Consultants Evangeline Funk, Ph.D.
Acoustic Study:	Y. Ebisu & Associates Yoichi Ebisu, P.E.
Air Quality:	J.W. Morrow Jim Morrow
Archaeological Resources:	Cultural Surveys Hawaii Hallett Hammatt William Folk
Social Impact Assessment:	Earthplan Berna Cabacungan

Chapter 8

LIST OF EA PREPARERS

CHAPTER 8 REFERENCES

- Austin Tsutsumi & Associates, Inc., *Kauai Long-Range Land Transportation Plan, Draft*, Kauai, Hawaii, November 1995.
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- U.S. Department of the Army, *Waia Reservoir, Phase I Inspection Report National Dam Safety Program*, Kauai, Hawaii, May 31, 1978.

Appendix A

**ATTENDANCE ROSTER,
COMMENT AND RESPONSE LETTERS FOR PUBLIC
INFORMATION WORKSHOP
ON MARCH 20, 1997**

APPENDIX A ATTENDANCE ROSTER AND COMMENT AND RESPONSE
LETTERS FOR PUBLIC INFORMATION MEETING

A public workshop was held on March 20, 1997 at the Koloa Community Center to familiarize community residents about the project. The workshop was attended by 22 community residents and business representatives, as indicated by the attached meeting roster. Two comment letters were received in response to the workshop and, together with response letters, are reproduced herein.

**KOLOA TO POIPU BYPASS ROAD ENVIRONMENTAL ASSESSMENT
PUBLIC INFORMATIONAL OPEN HOUSE**

Koloa Community Center
Thursday, March 20, 1997, 6:00 - 8:00 p.m.

PLEASE PRINT LEGIBLY

First Name	Last Name	Home Ph.	Work Ph.	Fax	Organization/ Company/Agency	Mailing Address	Town	Zip Code
Fred	Stor	742-6600		742-2550	Koloa Community	P.O. Box 234	Koloa	96756
Gerald	Ida	332 7071	332 5800	332 5800	CSH INC	P.O. Box 498	Lanai	96765
Tom	Seals	742-9546	742-2555	742-9455	Atlanta's Gallery	P.O. Box 490	Koloa	96756
Takeshi	Makunaka	742-6823				3818 Mendenhall St	"	"
Miyuki	Zava	742-26814				P.O. Box 482	"	"
Robert	CABUS	245-2635	245-3366	246-1074	Santa Rosa	3011 AVENUE	Lanai	96766
Connie	Swyers	332-8645	742-9298		Spang Enterprises	P.O. Box 1012 Lanai	Lanai	96766
Sheela	Seale	742-9546	742-2555	742-9455	ATLANTA GALLERY	P.O. Box 490	Koloa	96756
Frank	Habel	-	245-9178	244-9470	GROVE FRAM COMPANY, INC.	P.O. Box 2000, 7th Floor Branch,	HILO,	96721
M/M	Kyriakos	742-1190	Retired			Box 114 Koloa HI		96756
Lucille	Vercell	742-1650	Retired			1610 Makani Rd	Koloa	96756
Dorothy	Tao	332-9289	"		NA	P.O. Box 141	"	96756
HAKARU	TAO	"	"					
LEIF	STORSTRAND	821-0278	245-5003	245-5202	GOODFELLOW BROS, INC.	P.O. Box 1709, LIHUE 96766	LIHUE	96766
Bill	Campbell	395-5439	335-5563	335-5428	ABS Paper Inc	P.O. Box 3490 Lanai HI 96761		
Louis Abrams	ABRAMS	332-7900	742-9537	742-9540	ERA Charles J. Abrams	Box 57	KOLOA	96756

2

**KOLOA TO POIPIU BYPASS ROAD ENVIRONMENTAL ASSESSMENT
PUBLIC INFORMATIONAL OPEN HOUSE**

Koloa Community Center
Thursday, March 20, 1997, 6:00 - 8:00 p.m.

PLEASE PRINT LEGIBLY

First Name	Last Name	Home Ph.	Work Ph.	Fax #	Organization/ Company/Agency	Mailing Address	Phone	Zip Code
DAVID	GRANG	742-6759			Koloa Comm. Assn.	Box 726	Koloa	96752
JOHN	MONETTE	742-9269	335-9258			Box 835	KOLOA	
LOREXINE	WICHMAN	742-1030			Resident - Koloa	P.O. 929	Koloa	96756
Burt	Spoto	742-1068			"	P.O. Box 1226	"	"
William	Laacua	742-9962			"	P.O. Box 517	Koloa	96756
Anthony	RODRIGUES	742-7176			KOLOA RESIDENT	P.O. Box 1781	KOLOA	96756



Wilson Okamoto & Associates, Inc.
Earl Matsukawa
1907 South Beretania Street, Suite 400
Honolulu, Hawaii 96826

RECEIVED
APR 21 1997

WILSON OKAMOTO & ASSOC., INC.

Aloha,

I attended the Phase II Koloa to Poipu Bypass Road Public Informational Open House held March 20, 1997 at the Koloa Neighborhood Center. I spoke with all four representatives there, including Ken Kitabayashi from Kauai's Department of Public Works, about our concern as homeowners living near the proposed bypass road. My concern addressed your proposed placement of noise and separation barriers which I discovered did not include the land area around our parcel.

We own parcel TMK# 2-8-005-015 and we've enclosed your map, distributed at the Open House, with our parcel highlighted. Please notice that the proposed bypass comes 10 feet within the north corner of our boundary. We strongly feel that you must include a sound barrier adjacent to our parcel.

We're writing to you today to reiterate our desire for an additional noise study to be done regarding the area of our home. Our property is zoned R-5 and will be improved upon one day. The Phase II Koloa to Poipu bypass road will have a tremendous impact on our property value not to mention the quality of life living near the bypass especially with no noise or separation barrier. We have 2 small children and fear for their safety living near a high speed road. We understand that the speed limit will be 25 mph however I have witnessed vehicles at high speeds on the Phase I bypass road which is 25 mph so you can understand our fear of not having a separation barrier.

As I mentioned that evening my husband has been hurt and is currently in the hospital. I apologize for my late correspondence and I strongly encourage you to act upon our concern for the additional noise study.

Sincerely,

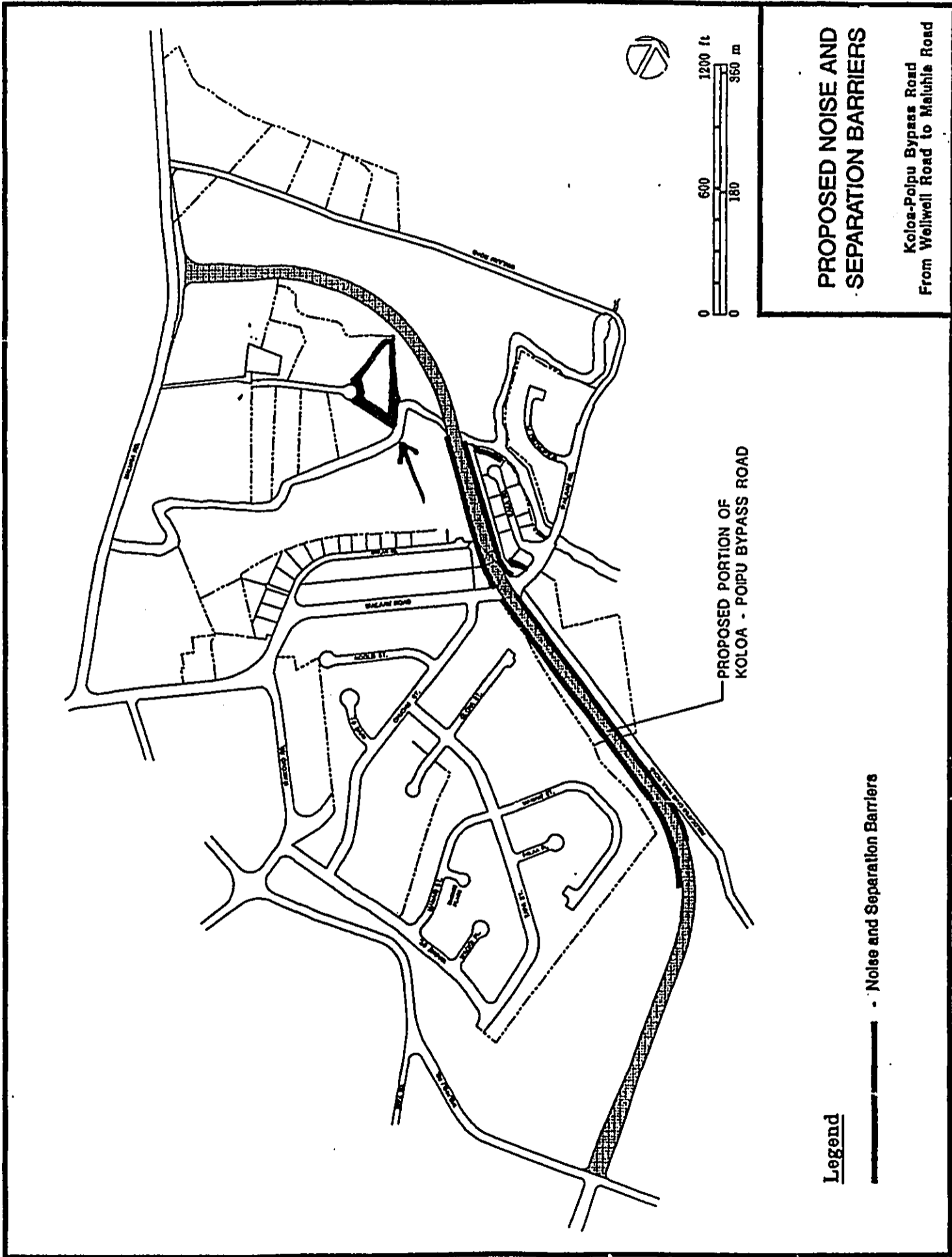
Tony & Lorraine Wichman

Tony and Lorraine Wichman

Mr/Mrs Anthony Wichman
PO Box X929
Koloa, HI 96756-0929



742-1938



PROPOSED NOISE AND SEPARATION BARRIERS

Koloa-Poipu Bypass Road
From Wellwell Road to Maluhia Road

Legend

—— Noise and Separation Barriers

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

3049-04
May 21, 1997

**WILSON
OKAMOTO**
ASSOCIATES, INC.



ENGINEERS
PLANNERS

1907 S. BERETANIA STREET
HONOLULU, HAWAII 96826
PH: (808) 946-2277
FAX: (808) 946-2253

Mailing address:
P. O. Box 3530
Honolulu, Hawaii 96811

Mr. and Mrs. Anthony Wichman
P.O. Box X929
Koloa, Hawaii 96756-0929

Dear Mr. and Mrs. Wichman:

Subject: Koloa-Poipu Bypass Road from Weliweli Road to Maluhia Road
Public Information Workshop Held on March 20, 1997

Thank you for your letter received on April 21, 1997 expressing your desire for a sound barrier at your property boundary to attenuate noise from the proposed road and to serve as a protective barrier to prevent children from entering the roadway.

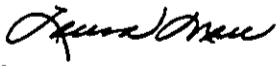
As we discussed at the public meeting, the noise study was conducted to assess noise impacts on existing residences. Due to the distance of your existing residence from the proposed road, the noise study indicates that noise will not increase to a level warranting construction of a sound barrier. We also acknowledge, however, that your property is zoned to allow construction of a residence nearer to the proposed road where it could warrant a noise barrier.

In following-up on our discussion and your letter, we determined that the Federal Highway Administration regulation which applies to the provision of noise abatement specifies that such abatement "will usually be necessary only where frequent human use occurs and a lowered noise level would be of benefit." (23 Code of Federal Regulations, Section 772.11) This regulation is interpreted to mean that only existing occupied residences would qualify for noise abatement measures. Should a residence be constructed and occupied near the proposed road before the road is constructed, an additional noise study may be warranted to determine if noise abatement will be required.

Regarding the construction of a protective barrier fronting residences, there is no requirement that such fencing be provided by the County.

We hope we have adequately responded to your comments. Your letter, as well as this response will be reproduced in the draft environmental assessment. Additional opportunities for public comment on this project will be available following publication of that document.

Sincerely,


Earl K. Matsukawa, Project Manager

cc: Kenneth Kitabayashi, County of Kauai, Department of Public Works



5400 Koloa Rd.
P.O. Box 490
Koloa, HI 96756
808-742-2555
FAX 742-9455

March 27, 1997

Mr. Ed Matsukawa
Wilson Okamoto & Associates, Inc.
1907 South Beretania St, Suite 400
Honolulu, HI 96826

RECEIVED
MARCH 27 1997

SAC

WILSON OKAMOTO & ASSOCIATES

Re: Koloa to Poipu Bypass Road, Phase II

As merchants in Koloa Town, we are opposed to the Koloa Town bypass. We feel that traffic bypassing the town will adversely affect our business. Much of Koloa Town's business is generated by visitors who, when driving through, decide to stop and explore the town and its shops. We would lose these "spontaneous" customers if the town is bypassed. The economic impact to all of the merchants has the potential to be tremendous in a time when so many of Kauai's small businesses are struggling to survive.

Our business is at the intersection of Maluhia and Koloa roads. We are open seven days a week, nine to ten hours a day. We have rarely seen what could be considered congestion or traffic problems. At 5:00 p.m. weekdays there may be, but not always, a few cars backed up on Maluhia Road to turn left onto Koloa Road. There is never any congestion for traffic turning right onto Koloa Road. This minor rush hour problem would be easily and inexpensively corrected with the installation of a traffic light at the intersection.

We feel this expensive proposed bypass to correct a problem that does not yet exist, is fiscally irresponsible in the current economic times. We would be interested in seeing the traffic study of Koloa Town indicating the type of congestion and accidents that would justify such an expenditure of taxpayer's money.

Thank you for your consideration of our opinions and we would welcome any comments from your firm.

Sincerely,

Trisha & Tom Seals
Owners

3049-04
May 21, 1997

**WILSON
OKAMOTO**

& ASSOCIATES, INC.



**ENGINEERS
PLANNERS**

1907 S. BERETANIA STREET
HONOLULU, HAWAII 96826
PH: (808) 946-2277
FAX: (808) 946-2253

Mailing address:
P. O. Box 3530
Honolulu, Hawaii 96811

Mr. and Mrs. Seals
Atlantis Gallery and Frames
5400 Koloa Road
P.O. Box 490
Koloa, Hawaii 96756

Subject: Koloa-Poipu Bypass Road From Weliweli Road to Maluhia Road
Public Information Workshop Held on March 20, 1997

Dear Mr. and Mrs. Seals

Thank you for your letter of March 27, 1997 expressing concern regarding the need for the proposed completion of the Koloa-Poipu Bypass Road and its potential impact on businesses in Koloa that are dependent on visitor traffic.

As will be documented in the forthcoming draft environmental assessment for the proposed project, the need for the bypass road was recognized as far back as the 1978 Koloa-Poipu-Kalaheo Development Plan. Subsequently, the 1990 Kauai County Highway Planning Study ranked the project as seventh in priority out of 19 projects recommended for the island. The 1995 Draft of the Kauai Long-Range Land Transportation Plan identifies the project as an integral part of future roadway improvements planned for the area.

A highway capacity analysis conducted by Wilson Okamoto & Associates, Inc. in April of 1997 indicates that Maluhia, Koloa and Weliweli Roads presently carry relatively high traffic demand during the a.m. and p.m. peak hours of traffic, resulting in undesirable delays for motorists. Particularly significant delays were identified at the intersection of Maluhia and Koloa Roads for the southbound left-turn movement from Maluhia Road to eastbound Koloa Road. Conditions are anticipated to worsen as hotels in the Poipu area re-open and as future developments such as the Kukuiula residential project are implemented.

Given the existing and projected traffic demands on these roads, and the presence of conflicting traffic movements in Koloa, traffic signalization would not necessarily increase the capacity of an intersection and could even worsen traffic congestion and delays at other intersections. The bypass road would address the problem by reducing the amount of traffic entering the intersections.

The Koloa-Poipu Bypass Road will be of particular benefit to motorists travelling in the area during the peak traffic hours. These are primarily residents of the Koloa-Poipu area and Kauai residents employed in Poipu. For visitors, Poipu

WILSON
OKAMOTO
& ASSOCIATES, INC.

3049-04
Letter to Mr. and Mrs. Seals
Page 2
May 22, 1997

Road will be the obvious access route into and out of the area since it fronts most of the existing resort areas. Unless they are seeking a more direct route into or out of Poipu, visitors may not be aware of the alternative offered by the bypass road.

We hope we have adequately responded to your comments. Your letter, as well as this response will be reproduced in the draft environmental assessment. Additional opportunities for public comment on this project will be available following publication of that document.

Sincerely,



Earl K. Matsukawa, Project Manager

cc: Kenneth Kitabayashi, County of Kauai, Department of Public Works

Appendix B

**COMMENT AND RESPONSE LETTERS FOR
PRE-ASSESSMENT CONSULTATION
WITH AGENCIES**

APPENDIX B AGENCIES CONSULTED DURING PRE-ASSESSMENT PHASE

The following agencies were consulted during the pre-assessment phase of the Environmental Assessment. Each agency was sent a copy of a project summary and a request for their comments on the project. Three agencies transmitted comment letters as indicated by the ✓, while the remaining three agencies responded with a verbal "No Comment". All written comments and responses are reproduced herein.

Federal

- U.S. Department of Agriculture - Natural Resources Conservation Service
- ✓ U.S. Department of the Army, Corps of Engineers
- ✓ U.S. Department of the Interior - Fish and Wildlife Service
- Federal Emergency Management Agency

State

- ✓ Department of Health
- Department of Transportation



IN REPLY REFER TO:

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

FEB 27 1997

Mr. Earl Matsukawa, Project Manager
Wilson Okamoto & Associates
1907 South Beretania Street, Suite 400
Honolulu, Hawaii 96826

RECEIVED
FEB 26 1997

WILSON OKAMOTO & ASSOC., INC.

Re: Pre-assessment Consultation on Koloa to Poipu Bypass Road, Weliweli Road to Maluhia Road, Review of Project Summary, 13 January, 1997, Koloa, Island of Kauai, Hawaii

Dear Mr. Matsukawa:

The U.S. Fish and Wildlife Service (Service) has reviewed the January 1997 Project Summary for pre-assessment consultation of an Environmental Assessment (EA) for the Koloa to Poipu Bypass Road, Weliweli Road to Maluhia Road, Koloa, Island of Kauai, Hawaii. This letter has been prepared under the authority of and in accordance with provisions of the National Environmental Policy Act of 1969 [42 U.S.C. 4321 *et seq.*; 83 Stat. 852], as amended, the Fish and Wildlife Coordination Act of 1934 [16 U.S.C. 661 *et seq.*; 48 Stat. 401], as amended, the Endangered Species Act of 1973 [16 U.S.C. 1531 *et seq.*; 87 Stat. 884], as amended, and other authorities mandating Service concern for environmental values. Based on these authorities, the Service offers the following comments for your consideration.

The County of Kauai Department of Public Works is proposing to construct the second phase of the Koloa to Poipu Bypass Road. This phase will connect Weliweli Road to Maluhia Road. This project will use Federal funding.

Most of the proposed road will occupy a 60-foot wide right-of-way. Two 12-foot wide asphalt traffic lanes will lie on either side of the roadway centerline. These traffic lanes will be flanked by an additional 6 feet of pavement forming the shoulder of the road. The unpaved area beyond the roadway shoulders to the limits of the right-of-way will be graded to accommodate surface

drainage from the road. The road will cross Waihohonu Stream for which a Nationwide Permit from the U.S. Army Corps of Engineers was issued on June 6, 1995.

The Service has no records of wetlands, threatened, endangered, proposed or candidate species at the proposed project site. The federally threatened Newell's shearwater (*Puffinus auricularis newelli*) may traverse through the vicinity of the project area, but the project should not affect these birds.

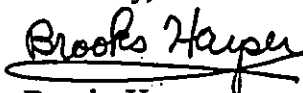
The Kauai cave wolf spider (*Adelocosa anops*), and the Kauai cave amphipod (*Spelaeorchestia koloana*) are candidate species for Federal listing. These two species are found only in the Koloa lava series on the island of Kauai. These animals are known only from a single exposed lava flow in the "very rocky" to "extremely rocky" Waikomo soil series. This area covers approximately 10.5 sq km (4 sq mi), is unweathered, and has not been covered with erosional sediments. The amphipod also occurs in a younger Mahaulepu limestone cave formed on top of a portion of the exposed Koloa series flow. These animals are restricted to the dark, moist areas of larger lava tubes and smaller subterranean spaces radiating from these lava tubes.

If the proposed road were built over lava tube habitat, the cave animals could be affected by collapsing and filling the lava tube itself, destroying surface vegetation and its associated root system, altering the seepage of surface water into the subterranean environment, and contaminating the seepage water with oils and other runoffs from the road. While these animals are not recorded from the project area, numerous lava tubes occur in the Koloa area in the vicinity of the project. On January 20, 1997, Service biologist Adam Asquith conducted a survey of the project site. While no lava tube entrances were discovered, the footprint of the proposed road will cross exposed pahoehoe lava areas that likely have lava tubes and cave animals beneath them. If a lava tube is exposed during the construction of the road, however, we would like the opportunity to conduct a survey for these cave animals.

Provided that the above recommendation for surveys of any caves exposed during construction is incorporated into the project design, the Service will concur with a Negative Declaration finding and determination that an Environmental Impact Statement is not required for the project.

We appreciate the opportunity to comment, and we look forward to seeing the draft EA. If you have questions regarding these comments, please contact Fish and Wildlife Biologist Adam Asquith at 808/541-3441.

Sincerely,



Brooks Harper
Field Supervisor
Ecological Services

3049-04
May 21, 1997

**WILSON
OKAMOTO**

& ASSOCIATES, INC.



**ENGINEERS
PLANNERS**

1907 S. BERETANIA STREET
HONOLULU, HAWAII 96826
PH: (808) 946-2277
FAX: (808) 946-2253

Mailing address:
P. O. Box 3530
Honolulu, Hawaii 96811

Mr. Brooks Harper, Field Supervisor
U.S. Department of the Interior
Fish and Wildlife Service
Ecological Services-Pacific Islands Office
300 Ala Moana Boulevard, Room 3108
Box 50088
Honolulu, Hawaii 96850

Subject: Koloa to Poipu Bypass Road
From Weliweli Road to Maluhia Road
Federal Environmental Assessment
Agency Pre-Assessment Consultation

Dear Mr. Harper:

Thank you for your letter dated February 27, 1997 (Reference AA) regarding the subject project. The information you provided regarding the potential for biological resources and habitat in the project area is duly noted, and in the event that a lava tube is encountered during construction of the project, your office will be notified immediately to conduct a survey for possible cave animals. Given the above condition, we appreciate your concurrence with a Negative Declaration finding and determination.

Your participation in the EA pre-assessment consultation process is appreciated. Should you have any questions or require additional information regarding this project please feel free to call Laura Mau or myself.

Sincerely,

Earl Matsukawa
Earl Matsukawa, Project Manager

cc: Kenneth Kitabayashi, County of Kauai, Department of Public Works



DEPARTMENT OF THE ARMY
U. S. ARMY ENGINEER DISTRICT, HONOLULU
FT. SHAFTER, HAWAII 96858-5440

January 18, 1997

REPLY TO
ATTENTION OF

Operations Branch

Mr. Earl Matsukawa
Project Manager
Wilson Okamoto and Associates, Inc.
1907 South Beretania Street
Honolulu, Hawaii 96826

RECEIVED
JAN 24 1997

WILSON OKAMOTO & ASSOCIATES

Dear Mr. Matsukawa:

This is in response to your letter of January 13, 1997, regarding the proposed Koloa to Poipu Bypass Road at Koloa, on the island of Kauai.

The proposed project would include a stream crossing at Waihohonu Stream. A Nationwide permit was issued on July 5, 1995, for the proposed stream crossing. For your information the Nationwide permits are currently being revised and are scheduled to be reissued on February 11, 1997. As indicated in our letter of July 5, 1995, if the project has commenced or is under contract by the date of reissuance, you will have 12 months to complete the activity under the present terms and conditions of the Nationwide permit.

If the project does not meet the conditions or cannot be completed within that time frame, then a letter and/or drawings should be submitted to the Corps to confirm that the project fits the terms of the revised Nationwide permit, we will be able to immediately issue a new permit.

If you have any questions, please refer to file number 970000070 and contact Mr. Benton Ching of my staff at 438-1157.

Sincerely,

Linda M. Hihara-Endo, Ph.D, P.E.
Acting Chief, Operations Branch

3049-04
May 21, 1997

**WILSON
OKAMOTO**
A ASSOCIATES, INC.



ENGINEERS
PLANNERS

1907 S. BERETANIA STREET
HONOLULU, HAWAII 96826
PH: (808) 946-2277
FAX: (808) 946-2253

Mailing address:
P. O. Box 3530
Honolulu, Hawaii 96811

Ms. Linda Hihara-Endo, Ph.D., Acting Chief
Department of the Army
U.S. Army Engineer District, Honolulu
Building 230
Fort Shafter, Hawaii 96858


Subject: Koloa to Poipu Bypass Road
From Weliweli Road to Maluhia Road
Federal Environmental Assessment
Agency Pre-Assessment Consultation

Dear Dr. Hihara-Endo:

Thank you for your letter dated January 18, 1997 regarding the subject project. As of February 11, 1997, the nationwide permit (NP) reissuance date, construction on the project had not begun nor was a construction contract awarded. We understand that the project will, therefore, require reissuance of a permit under the new NP program. Mr. Benton Ching of your office will be initiating a "courtesy review" by agencies in the near future (Staff Telephone Communication, May 14, 1997). Given that the project scope has not changed, Mr. Ching anticipates that a new NP will be approved for the project.

We appreciate your participation in the EA pre-assessment consultation process. Should you have any questions or require additional information regarding this project please feel free to call Laura Mau or myself.

Sincerely,


Earl Matsukawa, Project Manager

cc: Kenneth Kitabayashi, County of Kauai, Department of Public Works

BENJAMIN J. CAYETANO
GOVERNOR OF HAWAII



LAWRENCE MIKE
DIRECTOR OF HEALTH

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

In reply, please refer to:

February 27, 1997

97-007/epo

Mr. Earl Matsukawa, Project Manager
Wilson Okamoto & Associates, Inc.
1907 South Beretania Street, Suite 400
Honolulu, Hawaii 96826

RECEIVED
MAR 6 5 1997

Dear Mr. Matsukawa:

WILSON OKAMOTO & ASSOC., INC.

Subject: ENVIRONMENTAL ASSESSMENT (EA)
Project: Koloa to Poipu Bypass Road (3049-04)
Location: From Weliweli Road to Maluhia Road
TMK: 2-8-04: por. 2; 2-8-05: por. 2

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

Control of Fugitive Dust

The subject document proposes to complete the second phase of the Koloa to Poipu Bypass Road which involves the construction of a 1.2 mile roadway from the terminus of the existing Phase I portion at Weliweli Road to Maluhia Road, approximately 0.25 mile north of its intersection with Koloa Town Road.

The proposed road construction activities have the potential for significant fugitive dust emissions. The location map for the project indicates construction of the road to be within close proximity to the Waikomo residential subdivision in Koloa. In addition to the construction of the second phase of the Bypass Road, the applicant also proposes to realign a portion of the existing unpaved cane haul road and to construct a six-foot separation barrier wall between the cane haul road and the proposed roadway, as well as a seven-foot concrete sound barrier wall along portions of the Waikomo Subdivision. Therefore, implementation of adequate dust control measures during all phases of this project are warranted. Construction activities must comply with provisions of Hawaii Administrative Rules, Chapter §11-60.1, Section §11-60.1-33 on Fugitive Dust.

Mr. Earl Matsukawa, Project Manager
February 27, 1997
Page 2

97-007/epo

The contractor should provide adequate means to control dust from road areas and during the various phases of construction activities. These means include, but are not limited to:

- a. planning the different phases of construction, focusing on minimizing the amount of dust-generating materials and activities, centralizing material transfer points and on-site vehicular traffic routes, and locating potentially dusty equipment in areas of the least impact;
- b. providing an adequate water source at site prior to startup of construction activities;
- c. landscaping and rapid covering of bare areas, including slopes, starting from the initial grading phase;
- d. controlling of dust from shoulders, unpaved areas beyond the roadway shoulders, project entrances, and access roads;
- e. providing adequate dust control measures during weekends, after hours, and prior to daily startup of construction activities; and
- f. controlling of dust from debris being hauled away from project site.

If there are any questions on these comments, please contact Ms. Susan Kihara of the Clean Air Branch at 586-4200.

Groundwater

The aquifer underlying the project is classified as a potable groundwater source with a potential for future drinking water use. It is also characterized as irreplaceable and highly vulnerable to contamination. The DOH strongly recommends that Best Management Practices (BMPs) are applied during the construction and maintenance phases of the project. BMPs should include, but are not limited to: 1) measures to address potential groundwater impacts from erosion and runoff created by construction activities; 2) safe and proper usage of herbicides, if needed, for maintenance measures; and 3) proper storage and disposal of any toxic or hazardous chemicals used during the construction and maintenance phases.

Mr. Earl Matsukawa, Project Manager
February 27, 1997
Page 3

97-007/epo

If there are any questions regarding these comments, please call
Mr. Russell Kumabe of the Environmental Planning Office (EPO) at
586-7550.

Sincerely,



BRUCE S. ANDERSON, Ph.D.
Deputy Director for Environmental Health

c: CAB
EPO(w)

3049-04
May 21, 1997

**WILSON
OKAMOTO**

A ASSOCIATES, INC.



**ENGINEERS
PLANNERS**

1907 S. BERETANIA STREET
HONOLULU, HAWAII 96826
PH: (808) 946-2277
FAX: (808) 946-2253

Mailing address:
P. O. Box 3530
Honolulu, Hawaii 96811

Mr. Bruce Anderson, Ph.D.
Deputy Director for Environmental Health
Department of Health
P.O. Box 3378
Honolulu, Hawaii 96801
Attention: Environmental Management Branch

Subject: Koloa to Poipu Bypass Road
From Weliweli Road to Maluhia Road
Federal Environmental Assessment
Agency Pre-Assessment Consultation

Dear Dr. Anderson:

Thank you for your letter dated February 7, 1997 (Reference 97-077/epo) regarding the subject project. Your recommendations on the control of fugitive dust and groundwater mitigation will be incorporated in the forthcoming Draft EA.

We appreciate your participation in the EA pre-assessment consultation process. Should you have any questions or require additional information regarding this project please feel free to call Laura Mau or myself.

Sincerely,

Earl Matsukawa
Earl Matsukawa, Project Manager

cc: Kenneth Kitabayashi, County of Kauai, Department of Public Works

Appendix C

**COMMENT AND RESPONSE LETTERS ON THE
DRAFT EA**

APPENDIX C AGENCIES AND ORGANIZATIONS COMMENTING ON THE
DRAFT ENVIRONMENTAL ASSESSMENT

A notice of availability of the EA was published in The Garden Island newspaper. The notice afforded the public an opportunity to request a public hearing for the project, however no requests were received. The Federal, State, and County of Kauai agencies listed below were sent copies of the Draft EA with a request for their comments on the project. Copies of the document were also made available to the public at the Federal Highway Administration, County of Kauai Department of Public Works, Office of Environmental Quality Control, Hawaii State Main Library, Lihue Public Library, and Koloa Public and School Library. Of the nine agencies who formally replied during the EA review period, some had no comments while other provided substantive comments as indicated by the ✓ and ✓✓, respectively. All written comments and responses are reproduced herein.

FEDERAL

Department of the Army, Corps of Engineers, Pacific Ocean Division
Department of Agriculture, Natural Resources Conservation Service
(formerly Soil Conservation Service)
Department of the Interior, Fish and Wildlife Service
Federal Emergency Management Agency

STATE

- ✓✓ Department of Land and Natural Resources
- ✓✓ Division of State Historic Preservation
- Division of Land Management
- ✓✓ Commission on Water Resource Management
- Department of Transportation
- Highways Division, Kauai Office
- Statewide Transportation Planning Office
- Department of Agriculture
- ✓✓ Office of Environmental Quality Control
- ✓✓ Department of Health
- Department of Business, Economic Development and Tourism
- Land Use Commission
- ✓✓ Office of Planning

COUNTY

- ✓ Planning Department
- ✓ Office of Economic Development

BENJAMIN J. CAYETANO
GOVERNOR



EM
ZKA
ESTHER UEDA
EXECUTIVE OFFICER

STATE OF HAWAII
DEPARTMENT OF BUSINESS, ECONOMIC DEVELOPMENT & TOURISM
LAND USE COMMISSION

P.O. Box 2359
Honolulu, HI 96804-2359
Telephone: 808-587-3822
Fax: 808-587-3827

June 25, 1997

Mr. Kenneth Kitabayashi
Chief, Engineering
Department of Public Works
County of Kauai
4444 Rice Street, Suite 275
Lihue, Hawaii 96766

RECEIVED
JUN 25 1997

WILSON GRAMATO & ASSOC

Dear Mr. Kitabayashi:

Subject: Draft Environmental Assessment (DEA) for the Koloa
to Poipu Bypass Road, Koloa, Kauai

We have reviewed the DEA for the subject project and confirm that the proposed project site, as represented on Figures 3-1, 3-2, and 4-6 of the DEA, is located within the State Land Use Urban and Agricultural Districts.

We have no further comments to offer at this time. WE appreciate the opportunity to comment on the subject DEA.

Should you have any questions, please feel free to call me or Bert Saruwatari of our office at 587-3822.

Sincerely,

A handwritten signature in cursive script, appearing to read "Esther Ueda".

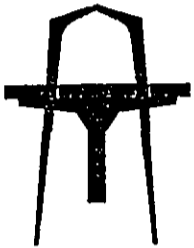
ESTHER UEDA
Executive Officer

EU:th

cc: Earl Matsukawa
OEQC

3049-04
September 3, 1997

WILSON
OKAMOTO
& ASSOCIATES, INC.



E N G I N E E R S
P L A N N E R S

907 S. BERETANIA STREET
HONOLULU, HAWAII 96826
PH: (808) 946-2277
FAX: (808) 946-2253

Mailing address:
P. O. Box 3530
Honolulu, Hawaii 96811

Ms. Esther Ueda, Executive Officer
State of Hawaii
Department of Business, Economic Development & Tourism
Land Use Commission
P.O. Box 2359
Honolulu, Hawaii 96804-2359

Subject: Koloa to Poipu Bypass Road
From Weliweli Road to Maluhia Road
Draft Environmental Assessment

Dear Ms. Ueda:

Thank you for your letter dated June 25, 1997 verifying the State Land Use designations for the project. We appreciate your time and effort in reviewing the Draft EA.

Sincerely,

A handwritten signature in cursive script, appearing to read "Earl Matsukawa".

Earl Matsukawa, Project Manager

cc: Kenneth Kitabayashi, County of Kauai, Department of Public Works
Gary Gill, Office of Environmental Quality Control

State of Hawaii
DEPARTMENT OF LAND AND NATURAL RESOURCES
Commission on Water Resource Management
Honolulu, Hawaii

EM

Mr. Kenneth Kitabayashi, Chief Engineer
County of Kauai
Department of Public Works
4444 Rice Street, Suite 275
Lihue, Kauai 96766

RECEIVED
JUL 03 1997

June 30, 1997

SUBJECT: Draft EA Koloa to Poipu Bypass Road
FILE NO.: KPDWEA.DR

WILSON OKAMOTO & ASSOC., INC.

Thank you for the opportunity to review the subject document. Our comments related to water resources are marked below.

In general, the CWRM strongly promotes the efficient use of our water resources through conservation measures and use of alternative non-potable water resources whenever available, feasible, and there are no harmful effects to the ecosystem. Also, the CWRM encourages the protection of water recharge areas which are important for the maintenance of streams and the replenishment of aquifers.

- We recommend coordination with the county government to incorporate this project into the county's Water Use and Development Plan.
- We are concerned about the potential for ground or surface water degradation/contamination and recommend that approvals for this project be conditioned upon a review by the State Department of Health and the developer's acceptance of any resulting requirements related to water quality.
- A Well Construction Permit and a Pump Installation Permit from the CWRM would be required before ground water is developed as a source of supply for the project.
- The proposed water supply source for the project is located in a designated water management area, and a Water Use Permit from the CWRM would be required prior to use of this source.
- Groundwater withdrawals from this project may affect streamflows. This may require an instream flow standard amendment.
- We recommend that no development take place affecting highly erodible slopes which drain into streams within or adjacent to the project.
- If the proposed project diverts additional water from streams or if new or modified stream diversions are planned, the project may need to obtain a stream diversion works permit and petition to amend the interim instream flow standard for the affected stream(s).
- Based on the information provided, it appears that a Stream Channel Alteration Permit pursuant to Section 13-169-50, HAR will be required before the project can be implemented.
- Based on the information provided, it does not appear that a Stream Channel Alteration Permit pursuant to Section 13-169-50, HAR will be required before the project can be implemented.
- An amendment to the instream flow standard from the CWRM would be required before any streamwater is diverted.

OTHER:

Our records show that a stream channel alteration permit was previously approved by the Commission on Water Resource Management (Commission) for the bridge crossing at Waihohonu Stream. However, this permit expired on February 27, 1997. If the project is to proceed, a new stream channel alteration permit must be obtained from the Commission.

Additionally, on page 4-6, there is mention of the Koloa Watershed in Hydrographic Area III, which has an estimated sustainable yield of 30 mgd. The correct name of the aquifer system with this estimated sustainable yield is the Koloa Aquifer System in the Lihue Aquifer Sector as identified in the Hawaii Water Plan, Water Resources Protection Plan.

If there are any questions, please contact Roy Hardy at 587-0274.

Sincerely,


RAE M. LOUI
Deputy Director

c: Earl Matsukawa, Wilson Okamoto & Associates, Inc.

3049-04
September 3, 1997

**WILSON
OKAMOTO**
& ASSOCIATES, INC.



**ENGINEERS
PLANNERS**

1907 S. BERETANIA STREET
HONOLULU, HAWAII 96826
PH: (808) 946-2277
FAX: (808) 946-2253

Mailing address:
P. O. Box 3530
Honolulu, Hawaii 96811

Mrs. Rae M. Loui, Deputy Director
State of Hawaii
Department of Land and Natural Resources
Commission on Water Resource Management
1151 Punchbowl Street, Room 227
Honolulu, Hawaii 96813

Subject: Koloa to Poipu Bypass Road
From Weliweli Road to Maluhia Road
Draft Environmental Assessment

Dear Mrs. Loui:

Thank you for your letter dated June 30, 1997 (File No. KPDWEA.DR) indicating that a new Stream Channel Alteration Permit (SCAP) is required for the subject project. As you are aware, a SCAP was previously approved for the project on March 1, 1995 and expired on February 28, 1997. Subsequently, a request to extend the SCAP coverage was approved on August 13, 1997. Your correction of the name of the aquifer we referred to in the Draft EA is appreciated. The Final EA will be revised to include the correct information. We appreciate your time and effort in reviewing the Draft EA.

Sincerely,

Earl Earl Matsukawa, Project Manager

cc: Kenneth Kitabayashi, County of Kauai, Department of Public Works
Gary Gill, Office of Environmental Quality Control

DEPT. OF PUBLIC WORKS

588 P02 JUL 15 '97 11:22

BENJAMIN J. CATTEANO
GOVERNOR OF HAWAII



STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES

STATE HISTORIC PRESERVATION DIVISION
33 SOUTH KING STREET, 8TH FLOOR
HONOLULU, HAWAII 96813

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

DEPUTES

Gilbert Coloma-Agaran

AQUACULTURE DEVELOPMENT
PROGRAM

AQUATIC RESOURCES
CONSERVATION AND

ENVIRONMENTAL AFFAIRS
CONSERVATION AND
RESOURCES ENFORCEMENT
CONVEYANCES

FORESTRY AND WILDLIFE
HISTORIC PRESERVATION
DIVISION
LAND MANAGEMENT
STATE PARKS
WATER AND LAND DEVELOPMENT

July 9, 1997

Mr. Ken Kitabayashi, Chief, Engineering
Department of Public Works
County of Kauai
4444 Rice St., Suite 275
Lihue, Kauai, Hawaii 96766

LOG NO: 19691 ✓
DOC NO: 9706NM23

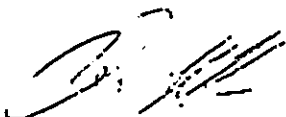
Dear Mr. Kitabayashi:

SUBJECT: Historic Preservation Review -- Draft Environmental Assessment of the Proposed Koloa/Poipu Bypass Road Koloa, Wehiweli, Ikona, Kaua'i (TMK: 2-8-02: por. 3, 2-8-03: por. 1; 2-8-04: por. 1 and 2-8-05: por. 2)

Thank you for sending us a copy of the draft EA. As your EA states, an archaeological inventory survey was conducted in 1996 by Cultural Surveys Hawaii, and no historic sites were found. Therefore, we believe that this project will now have "no effect" on significant historic sites.

If you have any questions, please call Nancy McMahon 742-7033.

Aloha,


DON HIBBARD, Administrator
State Historic Preservation Division

NM:amk

3049-04
September 3, 1997

WILSON
OKAMOTO
& ASSOCIATES, INC.



ENGINEERS
PLANNERS

1907 S. BERETANIA STREET
HONOLULU, HAWAII 96826
PH: (808) 946-2277
FAX: (808) 946-2253

Mailing address:
P. O. Box 3530
Honolulu, Hawaii 96811

Mr. Don Hibbard, Ph.D., Administrator
State of Hawaii
Department of Land and Natural Resources
State Historic Preservation Division
33 South King Street, 6th Floor
Honolulu, Hawaii 96813

Subject: Koloa to Poipu Bypass Road
From Weliweli Road to Maluhia Road
Draft Environmental Assessment

Dear Dr. Hibbard:

Thank you for your letter dated July 9, 1997 (Log No. 19691, Doc No. 9706NM23) indicating that the project will have "no effect" on significant historic sites. We appreciate your time and effort in reviewing the Draft EA.

Sincerely,

Earl Earl Matsukawa, Project Manager

cc: Kenneth Kitabayashi, County of Kauai, Department of Public Works
Gary Gill, Office of Environmental Quality Control



**DEPARTMENT OF BUSINESS,
ECONOMIC DEVELOPMENT & TOURISM**

OFFICE OF PLANNING

235 South Beretania Street, 6th Flr., Honolulu, Hawaii 96813
Mailing Address: P.O. Box 2359, Honolulu, Hawaii 96804

Ref. No. P-6799

July 10, 1997

Mr. Kenneth Kitabayashi
Chief, Engineering Division
Department of Public Works
County of Kauai
4444 Rice Street, Suite 275
Lihue, Hawaii 96766

Dear Mr. Kitabayashi:

Subject: Draft Environmental Assessment (EA)--Koloa to Poipu Bypass Road from
Weliweli Road to Maluhia Road, Koloa, Kauai, Hawaii

We have the following comments on the draft EA. In accordance with the Office of Environmental Quality Control's administrative rules, we recommend that an assessment of the project's compliance with the Coastal Zone Management (CZM) objectives and policies of Chapter 205A, Hawaii Revised Statutes, be added. This will also be necessary for the County's Federal consistency submittal for our review and approval.

We note in particular the reference to two native aquatic species, a shrimp and a goby, in Waikomo Stream. On this matter, we suggest that the EA discuss the effects of the construction of drainage lines, culverts and inlets along the road corridor on these species since Waihohonu Stream is a tributary to Waikomo Stream. There may be some positive impacts if the improvements were designed to prevent or minimize stream degradation.

If you have any questions, please contact Christina Meller of our CZM Program at 587-2845.

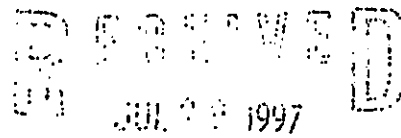
Sincerely,

Rick Egged
Director
Office of Planning

cc: Wilson Okamoto & Associates, Inc.

6131
BENJAMIN J. CAYETANO
GOVERNOR
SEIJI F. NAYA
DIRECTOR
BRADLEY J. MOSSMAN
DEPUTY DIRECTOR
RICK EGGED
DIRECTOR, OFFICE OF PLANNING

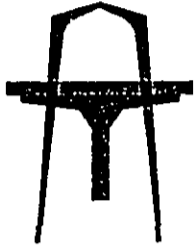
Tel.: (808) 587-2846
Fax: (808) 587-2824



WILSON OKAMOTO & ASSOCIATES, INC.

3049-04
September 3, 1997

**WILSON
OKAMOTO**
ASSOCIATES, INC.



ENGINEERS
PLANNERS

907 S. BERETANIA STREET
HONOLULU, HAWAII 96826
PH: (808) 946-2277
AX: (808) 946-2253

Mailing address:
P. O. Box 3530
Honolulu, Hawaii 96811

Mr. Rick Egged, Director
State of Hawaii
Department of Business, Economic Development & Tourism
Office of Planning
P.O. Box 2359
Honolulu, Hawaii 96804

Subject: Koloa to Poipu Bypass Road
From Weliweli Road to Maluhia Road
Draft Environmental Assessment

Dear Mr. Egged:

Thank you for your letter dated July 10, 1997 (Ref. No. P-6799) commenting on the subject project. Per your recommendation, the Final EA will include a discussion of the project's compliance with CZM objectives and policies. With regard to your comment about the two native aquatic species, the Department of Land and Natural Resources (DLNR) Aquatic Resources Division was consulted in conjunction with the Stream Channel Alteration Permit for the project. As required by the Aquatic Resources Division, the culvert structure will be constructed to allow for the stream migration of amphidromous species, including the native goby and shrimp. In addition, the potential water quality impacts and mitigative measures were addressed in Section 4.8.3 of the Draft EA. Mitigative measures proposed in the permit applications were approved by the Department of Health and DLNR to address water quality impacts associated with construction within the stream. We appreciate your time and effort in reviewing the Draft EA.

Sincerely,

Earl Matsukawa
Earl Matsukawa, Project Manager

cc: Kenneth Kitabayashi, County of Kauai, Department of Public Works
Gary Gill, Office of Environmental Quality Control

BENJAMIN J. CAYETANO
GOVERNOR OF HAWAII



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

EMA
LM
LAWRENCE MIKE
DIRECTOR OF HEALTH

In reply, please refer to:

July 19, 1997

97-007A/epo

Mr. Kenneth Kitabayashi, Chief, Engineering
County of Kauai
Department of Public Works
4444 Rice Street, Suite 275
Lihue, Hawaii 96766

RECEIVED
JUL 25 1997

WILSON OKAMOTO & ASSOC. INC.

Dear Mr. Kitabayashi:

Subject: DRAFT ENVIRONMENTAL ASSESSMENT (DEA)
Koloa to Poipu Bypass Road from Weliweli Road
to Maluhia Road
Koloa, Kauai, Hawaii

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

Noise Concerns


1. Activities associated with the construction phase of the project must comply with the provisions of Hawaii Administrative Rules, Chapter 11-46, "Community Noise Control."
 - a. The contractor must obtain a noise permit since the noise level from the construction activities are expected to exceed the allowable levels of the regulation as stated in Section 11-46-6(a).
 - b. Construction equipment and on-site vehicles requiring an exhaust of gas or air must be equipped with mufflers as stated in Section 11-46-6(b)(1)(A).
 - c. The contractor must comply with the conditional use of the permits as specified in the regulations and conditions issued with the permit as stated in Section 11-46-7(d)(4).

Mr. Kenneth Kitabayashi
July 19, 1997
Page 2

97-007A/epo

Should there be any questions on these comments, please contact
Mr. Jerry Haruno, Environmental Health Program Manager of the
Noise, Radiation and Indoor Air Quality Branch at 586-4701.

Sincerely,

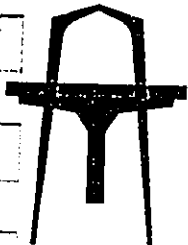


BRUCE S. ANDERSON, Ph.D.
Deputy Director for Environmental Health

c: NR&IAQB
Earl Matsukawa, Wilson Okamoto & Associates, Inc. ✓

3049-04
September 3, 1997

WILSON
OKAMOTO
ASSOCIATES, INC.



ENGINEERS
PLANNERS

177 S. BERETANIA STREET
HONOLULU, HAWAII 96826
PH: (808) 946-2277
FAX: (808) 946-2253

Mailing address:
P.O. Box 3530
Honolulu, Hawaii 96811

Mr. Bruce S. Anderson, Ph.D.
Deputy Director for Environmental Health
State of Hawaii
Department of Health
P.O. Box 3378
Honolulu, Hawaii 96801

Subject: Koloa to Poipu Bypass Road
From Weliweli Road to Maluhia Road
Draft Environmental Assessment

Dear Dr. Anderson:

Thank you for your letter dated July 19, 1997 (Ref. No. 97-007A/epo) commenting on the subject project. The Final EA will incorporate a discussion on the compliance requirements for construction-related noise. We appreciate your time and effort in reviewing the Draft EA.

Sincerely,

A handwritten signature in cursive script, appearing to read "Earl Matsukawa".

for Earl Matsukawa, Project Manager

cc: Kenneth Kitabayashi, County of Kauai, Department of Public Works
Gary Gill, Office of Environmental Quality Control

BENJAMIN J. CAYETANO
GOVERNOR



STATE OF HAWAII
OFFICE OF ENVIRONMENTAL QUALITY CONTROL

236 SOUTH BERETANIA STREET
SUITE 702
HONOLULU, HAWAII 96813
TELEPHONE (808) 688-4185
FACSIMILE (808) 688-4188

GARY GILL
DIRECTOR

EM

July 22, 1997

Mr. Cesar C. Portugal
County Engineer
County of Kauai
Department of Public Works
4444 Rice Street, Suite 275
Lihue, Hawaii 96766

RECEIVED
JUL 25 1997

WILSON DRAWING & ASSOC., INC.

Dear Mr. Portugal:

Subject: Draft Environmental Assessment for the Koloa to Poipu
Bypass Road From Weliweli Road to Maluhia Road, Koloa,
Kauai

Thank you for the opportunity to review the subject document. We
have the following questions and comments.

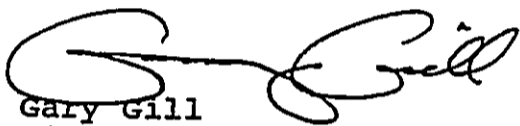
1. The project plans to build concrete walls about 7 feet high and 2,820 feet long near the Waikomo Subdivision and the older section of Koloa town. Concrete walls along this section of the roadway will degrade the visual quality of the area. Please illustrate the visual impacts of the proposed walls from the roadway and other public places. Photos of existing conditions taken from the public viewpoints are helpful in evaluating visual impacts. Renderings of future structures superimposed on photos of existing views should be provided. Appropriate mitigation measures to reduce the visual impacts, such as landscaping with native plants, must be considered.
2. The project is located in an area where lava tubes and caves may be present. Lava tubes and caves may be disturbed by the roadway project. In addition to cave dwelling organisms discussed in section 4.8.2, some of these lava tubes and caves may contain burials or other historic sites. Please consult with the State Historic Preservation Division to develop an action plan in the event a lava tube or cave is broken during construction.

Mr. Portugal
July 22, 1997
Page 2

3. State policy (HRS Chapters 26, 226, 264, 344) requires the promotion of alternative forms of transportation systems that reduce reliance on the private automobile, conserve energy, reduce pollution and provide safe accommodations for their users. Pursuant to this policy, please discuss what provisions are being made to create bicycle lanes or facilities, promote pedestrian safety and/or encourage other non-motorized modes of transportation.
4. Please justify the finding of no significant impact determination based on the criteria set forth in section 11-200-12 of the EIS rules.

Should you have any questions, please call Jeyan Thirugnanam at 586-4185.

Sincerely,



Gary Gill
Director

c: Wilson Okamoto & Assoc.

3049-04
September 3, 1997

WILSON
OKAMOTO
& ASSOCIATES, INC.



ENGINEERS
PLANNERS

1907 S. BERETANIA STREET
HONOLULU, HAWAII 96826
PH: (808) 946-2277
FAX: (808) 946-2253

Mailing address:
P. O. Box 3530
Honolulu, Hawaii 96811

Mr. Gary Gill, Director
State of Hawaii
Office of Environmental Quality Control
235 South Beretania Street, Suite 702
Honolulu, Hawaii 96813

Subject: Koloa to Poipu Bypass Road
From Weliweli Road to Maluhia Road
Draft Environmental Assessment

Dear Mr. Gill:

Thank you for your letter dated July 22, 1997 commenting on the subject project. We have prepared the following response in the respective order of your concerns:

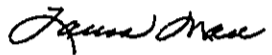
1. The Final EA will include a rendering of the proposed noise and separation barriers superimposed onto an existing photograph. We note that the public was apprised of and provided an opportunity to review the project at a workshop forum held on March 20, 1997. The placement of the proposed barriers was specifically addressed at the workshop.
2. According to their comment letter dated July 9, 1997, the Department of Land and Natural Resources State Historic Preservation Division anticipates that the project will have "no effect" on significant historic sites. However, the SHPD's Kauai office was contacted on August 28, 1997 to follow-up on your concern regarding the lava tubes and caves. They indicated that there is minimal probability of finding significant remains such as human habitation or human burials. Nevertheless, in the unlikely event that such remains are encountered during construction, work will cease in that area and the SHPD will be contacted.
3. While initial plans for the roadway called for unpaved shoulder areas, current plans have been modified to include a 6-foot paved shoulder area on both sides of the road to accommodate bicyclists and pedestrians.
4. The Final EA will include a discussion on the finding of no significant impact determination as specified in your letter.

WILSON
C KAMOTO
& ASSOCIATES, INC.

3049-04
Letter to Mr. Gary Gill
Page 2
September 3, 1997

We appreciate your time and effort in reviewing the Draft EA.

Sincerely,



Earl Matsukawa, Project Manager

cc: Kenneth Kitabayashi, County of Kauai, Department of Public Works



STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES

P.O. BOX 621
HONOLULU, HAWAII 96809
July 22, 1997

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

LD-NAV

Mr. Earl Matsukawa
Project Manager
Wilson Okamoto & Associates, Inc.
1907 South Beretania Street
Honolulu, Hawaii 96826

RECEIVED
JUL 23 1997
WILSON OKAMOTO & ASSOCIATES, INC.

Ref DEACOKPW.RCM

EM

Dear Mr. Matsukawa:

SUBJECT: Review : Draft Environmental Assessment
I. D. : STP-0700937 Koloa-Poipu Bypass Road
Project : Construct 1.2 Mile Roadway from Weiweli
Road to Maluhia Road
Applicant : County of Kauai, Department of Public Works
Location : Koloa, Island of Kauai, Hawaii
TMK : 4th/ 2-8-04: Portion of 02

Thank you for the opportunity to review and comment on the subject Draft Environmental Assessment for the proposed project.

Our Commission on Water Resource Management has the following comments to offer on the proposed project:

1. Based on the information provided, it appears that a Stream Channel Alteration Permit pursuant to Section 13-169-50, HAR, will be required before the project can be implemented;
2. Our records show that a stream channel alteration permit was previously approved by the Commission on Water Resource Management (Commission) for the bridge crossing at Waihohonu Stream. However, this permit expired on February 27, 1997. If the project is to proceed, a new stream channel alteration permit must be obtained from the Commission; and
3. Additionally, on page 4-6, there is mentioned of the Koloa Watershed in Hydrographic Area III, which has an estimated sustainable yield of 30mgd. The correct name of the aquifer system with the estimated sustainable yield is the Koloa Aquifer System in the Lihue Aquifer Sector as identified in the Hawaii Water Plan, Water Resources Protection Plan.

Page 2
Review
DEACOPKPW

Our Engineering Branch has the following comments to offer:

1. We confirmed that the portion of the road at Waihohonu Stream is located in Zone A. This is in area within the 100-year flood plain, with no base flood elevations determined. This portion of the road is also located in the floodway areas of Zone AE (area within the 100-year flood plain with base flood elevations determined).
2. The remainder of the project site is located in Zone D, an area in which flood hazards are undetermined (not areas of minimal flooding).

The Department of Land and Natural Resources has no other comments to offer on the proposed project at this time. Should you have any questions, please contact Nick Vaccaro of the Land Divisions' Support Services Branch at 1-808-587-0438.

HAWAII: Earth's best!

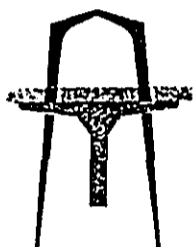
Aloha,


MICHAEL D. WILSON

c: Kauai Land Board Member
At Large Land Board Member
Kauai District Land Office
County of Kauai, Department
of Public Works

3049-04
September 3, 1997

**WILSON
OKAMOTO**
& ASSOCIATES, INC.



ENGINEERS
PLANNERS

907 S. BERETANIA STREET
HONOLULU, HAWAII 96826
PH: (808) 946-2277
FAX: (808) 946-2253

MAILING ADDRESS:
P.O. Box 3530
HONOLULU, HAWAII 96811

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

Subject: Koloa to Poipu Bypass Road
From Weliweli Road to Maluhia Road
Draft Environmental Assessment

Dear Mr. Wilson:

Thank you for your letter dated July 22, 1997 (Ref. DEACOKPW.RCM) indicating that a new Stream Channel Alteration Permit (SCAP) would be required for the subject project. As you are aware, a SCAP was approved for the project on March 1, 1995 and expired on February 28, 1997. Subsequently, a request to extend the SCAP coverage was approved on August 13, 1997. We appreciate the information you provided regarding the aquifer system and flood hazard determination and will revise the Final EA accordingly. Your time and effort in reviewing the Draft EA are also appreciated.

Sincerely,

A handwritten signature in cursive script, appearing to read "Earl Matsukawa".

Earl Matsukawa
Earl Matsukawa, Project Manager

cc: Kenneth Kitabayashi, County of Kauai, Department of Public Works
Gary Gill, Office of Environmental Quality Control

MARYANNE W. KUSAKA
MAYOR



3049-04
GERALD W. DELA CRUZ
DIRECTOR

COUNTY OF KAUAI
OFFICE OF ECONOMIC DEVELOPMENT

4280-B RICE STREET
LIHUE, KAUAI, HAWAII 96766
TELEPHONE (808) 241-6390
FAX (808) 241-6399

June 23, 1997

EM
~~SAE~~
LM

Mr. Earl Matsukawa, Project Manager
Wilson Okamoto & Associates, Inc.
1907 S. Beretania Street
Honolulu, HI 96826

RECEIVED
JUN 27 1997

WILSON OKAMOTO & ASSOC.

RE: Draft Environmental Assessment
Koloa To Poipu Bypass Road
Island of Kauai

Dear Mr. Matsukawa:

Thank you for the opportunity to comment on the above
subject. The Office of Economic Development has no comment at
this time.

If you have questions, please call me at 241-6390.

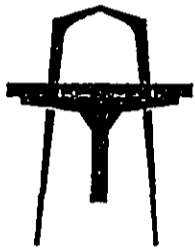
Very truly yours,

Gerald Dela Cruz
Director

cc: Kenneth Kitabayashi
County of Kauai, Department of Public Works

3049-04
September 3, 1997

WILSON
OKAMOTO
& ASSOCIATES, INC.



ENGINEERS
PLANNERS

1907 S. BERETANIA STREET
HONOLULU, HAWAII 96826
PH: (808) 946-2277
FAX: (808) 946-2253

Mailing address:
P. O. Box 3530
Honolulu, Hawaii 96811

Mr. Gerald Dela Cruz, Director
County of Kauai
Office of Economic Development
4280-B Rice Street
Lihue, Kauai, Hawaii 96766

Subject: Koloa to Poipu Bypass Road
From Weliweli Road to Maluhia Road
Draft Environmental Assessment

Dear Mr. Dela Cruz:

Thank you for your letter dated June 23, 1997 indicating that you have no comments on the subject project. Your time and effort in reviewing the Draft EA are appreciated.

Sincerely,

Earl Earl Matsukawa, Project Manager

cc: Kenneth Kitabayashi, County of Kauai, Department of Public Works
Gary Gill, Office of Environmental Quality Control

ETM

MARYANNE W. KUSAKA
MAYOR



DEE M. CROWELL
PLANNING DIRECTOR
IAN K. COSTA
DEPUTY PLANNING DIRECTOR
TELEPHONE (808) 241-6677
FAX (808) 241-6699

PLANNING DEPARTMENT

RECEIVED
JUL 22 1997

July 10, 1997

WILSON OKAMOTO & ASSOC., INC.

Mr. Earl Matsukawa
Wilson Okamoto & Assoc. Inc.
P.O. Box 3530
Honolulu, Hawaii 96811

SUBJECT: Draft Environmental Assessment - Koloa to Poipu Bypass
Road From Weliweli Road to Maluhia Road

We have no objections to the project and feel that it will be important in helping to improve traffic flows within the Poipu Koloa area. This segment of the project will complete the connection between Maluhia Road and Poipu Road.

At this point we would like to point out that the project will require subdivision approval in order to formally establish the right-of-way. Subdivision should be applied for as early in the process as possible in order to avoid site control problems and to obtain additional agency input prior to land acquisition and construction. The establishment of easements for grading, drainage, utilities, access, etc. should also be incorporated into the subdivision application.

The concerns expressed by residents in the area regarding noise are important and input should be solicited from the affected residents regarding the design and location of the sound barriers prior to finalizing its design for construction. The design of such barriers should be compatible with the residential character of the neighborhood.

Should you have any questions, please contact Keith Nitta of my staff at 241-6677.

DEE M. CROWELL
Planning Director

CC: Public Works

3049-04
September 3, 1997

WILSON
OKAMOTO
& ASSOCIATES, INC.



ENGINEERS
PLANNERS

1907 S. BERETANIA STREET
HONOLULU, HAWAII 96826
PH: (808) 946-2277
FAX: (808) 946-2253

Mailing address:
P. O. B o x 3 5 3 0
Honolulu, Hawaii 96811

Mr. Dee M. Crowell, Planning Director
County of Kauai
Planning Department
Kapule Building
4444 Rice Street, Suite 473
Lihue, Kauai, Hawaii 96766

Subject: Koloa to Poipu Bypass Road
From Weliweli Road to Maluhia Road
Draft Environmental Assessment

Dear Mr. Crowell:

Thank you for your letter dated July 10, 1997 indicating your concurrence with the subject project. We understand that a subdivision approval will be required for the project, and the County of Kauai Department of Public Works will soon be submitting a request for final subdivision map approval to your office. With regard to your comment on potential noise impacts to the nearby residences, we note that the public was apprised of and provided an opportunity to review the project at a workshop forum held on March 20, 1997. The placement of the proposed barriers was specifically addressed at the workshop. Your time and effort in reviewing the Draft EA are appreciated.

Sincerely,

Earl Earl Matsukawa, Project Manager

cc: Kenneth Kitabayashi, County of Kauai, Department of Public Works
Gary Gill, Office of Environmental Quality Control

Appendix D

**APPROVAL LETTERS FOR
STREAM CHANNEL ALTERATION PERMIT
NPDES GENERAL PERMIT
SECTION 401 WATER QUALITY CERTIFICATION
DEPARTMENT OF THE ARMY NATIONWIDE PERMIT**



State of Hawaii
COMMISSION ON WATER RESOURCE MANAGEMENT
Department of Land and Natural Resources
Honolulu, Hawaii

STREAM CHANNEL ALTERATION PERMIT

PERMIT NO: SCAP-KA-170 EXPIRATION DATE: February 15, 1997
APPLICANT: Mr. Eldon Franklin, County of Kauai, Dept. of Public Works
PROJECT: Culvert Crossing, Waihohonu Stream, Koloa, Kauai,
TMK: 2-8-04:02, 2-8-05:02

The applicant is hereby granted a permit to alter a stream channel, in accordance with the specifications and plans contained in the application, subject to the following conditions and limitations:

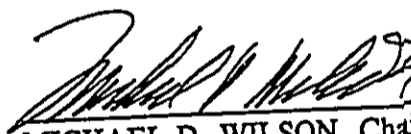
1. The permit application and staff submittal to the Commission at its meeting on February 15, 1995, shall be incorporated herein by reference.
2. The permittee shall comply with all other applicable statutes, ordinances, and regulations of the Federal, State and County of Kauai governments.
3. The permittee, his successors, and his assigns shall indemnify, defend, and hold the State of Hawaii harmless from and against any loss, liability, claim from property damage, from personal injury, or death arising out of any act or omission of the permittee or his successors, assigns, officers, employees, contractors, and agents under this permit or related to the granting of this permits.
4. The permittee shall notify the Commission, by letter, of the actual dates of project initiation and completion. The permittee shall submit a set of as-built plans to the Commission upon completion of this project.
5. Before proceeding with any work authorized by the Commission, the permittee shall submit one set of construction plans and specifications to determine consistency with the conditions of the permit and the declarations set forth in the permit application. This permit may be revoked if work is not started within one (1) year after the date of issuance or if work is suspended or abandoned for one (1) year, unless otherwise specified. The work proposed in this stream channel alteration permit application shall be completed within two (2) years unless otherwise specified. The permit may be extended by the

STREAM CHANNEL ALTERATION PERMIT
SCAP-KA-170

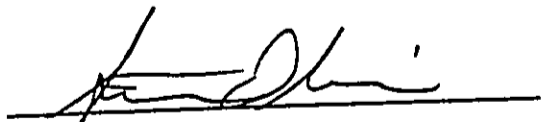
Page 2

Commission upon a showing of good cause and good-faith performance. A request to extend the permit shall be submitted to the Commission no later than three (3) months prior to the date the permit expires. If the commencement or completion date is not met, the Commission may revoke the permit after giving the permittee notice of the proposed action and an opportunity to be heard.

6. The permittee shall utilize appropriate erosion control measures during construction, and shall perform construction activities only during periods of low stream flow. The applicant shall prevent debris and construction materials, including cement, petroleum products, and other pollutants, from entering the stream. Wash and dust control water shall be properly disposed.
7. In the event that subsurface cultural remains such as artifacts, burials or deposits of shells or charcoal are encountered during excavation work, the applicant shall stop work in the area of the find and contact the Department's Historic Preservation Division (587-0045) immediately.
8. Prior to construction activities, the permittee shall submit to the Commission, a letter from the Division of Aquatic Resources (DAR), indicating DAR's concurrence on an acceptable culvert configuration which would provide for the migration of amphidromous aquatic life.


MICHAEL D. WILSON, Chairperson
Commission on Water Resource Management
Date: MAR - 1 1995

ACCEPTED:


Date: 3/7/95

BENJAMIN J. CAYETANO
GOVERNOR OF HAWAII



STATE OF HAWAII
DEPARTMENT OF HEALTH
P.O. BOX 3378
HONOLULU, HAWAII 96801-3378
May 17, 1995

LAWRENCE MIKE
DIRECTOR OF HEALTH

In reply, please refer to
EMD/CWB

Mr. Steve Oliver
County Engineer
Department of Public Works
County of Kauai
3021 Umi Street
Lihue, Kauai, HI 96766

RECEIVED
MAY 17 1995
P05147DN

WILSON OKAMOTO

Dear Mr. Oliver:

Subject: NOTICE OF GENERAL PERMIT COVERAGE
PHASE II KOLOA-POIPU BYPASS ROAD
KOLOA, KAUAI, HAWAII
TMK: 2-8-04: POR. 2
FILE NO. HI R10A481

In compliance with the provisions of the Clean Water Act, as amended, (33 U.S.C. § 1251 et seq.; the "Act") and Chapter 342D, Hawaii Revised Statutes, and Chapters 11-54 and 11-55, Hawaii Administrative Rules ("HAR"), Department of Health, State of Hawaii,

COUNTY OF KAUAI
DEPARTMENT OF PUBLIC WORKS

(hereinafter "PERMITTEE")

is authorized to discharge storm water associated with construction activity from its Phase II Koloa-Poipu Bypass Road project, located at TMK: 2-8-04: Por. 2, Koloa, Kauai, to the receiving waters named the Waihothonu Stream at Latitude 21°54'45"N, Longitude 159°27'49"W.

This Notice of General Permit Coverage (NGPC) is subject to compliance with the following conditions and requirements:

1. HAR Chapter 11-55, Appendix "C", NPDES General Permit Authorizing Discharges of Storm Water Associated with Construction Activities;
2. HAR Chapter 11-55, Appendix "A", Department of Health Standard General Permit Conditions;
3. HAR Sections 11-55-34.04(a), 11-55-34.07, 11-55-34.11, 11-55-34.12, and any other applicable sections of HAR Chapter 11-55;
4. Plans, reports, specifications and other related materials submitted in and with the Notice of Intent (NOI) dated October 5, 1994 and/or later amendments to the NOI;

Mr. Steve Oliver
May 17, 1995
Page 2

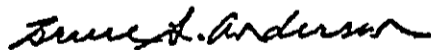
5. Site-specific plans and County approved Sediment and Erosion Control Plan(s);
6. A copy of this NGPC, enclosures, plans, reports, specifications and other related materials submitted in and with the NOI dated October 5, 1994 and/or later amendments to the NOI must be kept at the job site or at a nearby field office;
7. The Permittee shall provide the Department of Health with any general contractors' information which were not identified in the NOI. The information must include general contractor's legal name, address (location where papers can be hand-delivered), contact person, telephone and fax numbers;
8. Site-specific BMP Plan(s) and County approved Grading Permit and Sediment and Erosion Control Plans shall be submitted to the Department of Health before the activities begin; and
9. The Permittee shall notify the Department of Health upon the termination of the subject activities.

This NGPC will take effect on the date of this notice. This NGPC will expire at midnight October 28, 1997, or when amendments to the general permit are adopted, whichever occurs first.

It is the Permittee's responsibility to ensure that anyone working under this NGPC understands the NGPC's terms and conditions.

Should you have any questions regarding this NGPC, please contact Mr. Devender Narala, Engineering Section of the Clean Water Branch, at (808) 586-4309 or toll free number 1-800-468-4644, Ext. 64309.

Sincerely,



BRUCE S. ANDERSON, Ph.D.
Deputy Director for
Environmental Health

DN:sl

Enclosures: 1. HAR, Title 11, Chapter 55, Section 34 and Appendices A & C
 2. Title 40, Code of Federal Regulations Citations as Referenced in the Appendix A, Chapter 11-55, Water Pollution Control

c: DHSA, Kauai (w/o encls.)
 ✓Earl Matsukawa, Wilson Okamoto & Associates, Inc.
 (w/o encls.)

COPY

RECEIVED
JUN 21 1995

WILSON OKAMOTO & ASSOC. INC.

May 31, 1995

C0518DN

Mr. Steve Oliver
County Engineer
Department of Public Works
County of Kauai
3021 Umi Street
Lihue, Kauai, Hawaii 96766

Dear Mr. Oliver:

Subject: Section 401 Water Quality Certification (WQC) for
Phase II Koloa-Poipu Bypass Road/Waihohonu Stream
Culvert Crossing Construction Project
Koloa, Kauai
TMKs: 2-8-04:2 (por.) and 2-8-05:2 (por.)
WQC 236 / Army File No. NW 95-009

The Department of Health (Department) has completed the review of your Section 401 WQC application for the subject project.

The proposed work would involve dredging and filling activities for the proposed culvert crossing at Waihohonu Stream. This work is planned in conjunction with Phase II of the Koloa-Poipu Bypass Road.

The proposed culvert crossing includes two (2) twenty (20) foot by six (6) foot cast-in-place concrete drainage culverts. Each culvert would span the approximately 53-foot wide stream channel at a diagonal width of about 60 feet to accommodate the right-of-way of the bypass road. Included in the 60-foot right-of-way are two (2) twelve (12) foot AC paved lanes and eighteen (18) foot shoulders. The culverts would be cast-in-place in two stages, each involving one side of the stream at a time. In each stage, sheet pilings would be installed in the stream to form a coffer dam isolating a dry work area on one side of the stream. The pilings would divert the flow to the opposite side of the stream.

Mr. Steve Oliver
WQC 236 / NW 95-009
May 31, 1995
Page 2

An area of approximately 10,000 square feet would be disturbed during the dredging and backfilling activities, which would involve about 1,700 cubic yards of earthen material to accommodate the culverts. In each stage of the construction, one (1) foot cushion layer of gravel would be placed below the culverts to provide drainage and uniform bearing. Backfill would extend up to one (1) foot above the top of the culvert wall. It would consist of well-drained, self-compacting granular materials with sizing generally between 1/4 inch to 3/4 inch. The bottom slab, walls and top slab would be cast-in-place and cured. Approximately two (2) inches of asphaltic concrete would be placed atop the upper backfill layer.

The proposed work is an authorized activity under the U.S. Army Corps of Engineers' Nationwide Permit program as specified in Title 33, Code of Federal Regulations (CFR) Part 330, Appendix A, Paragraph B.14 for Road Crossings.

Based on the information contained in the Section 401 WQC application and the Best Management Practices (BMPs) plan dated October 5, 1994, the Department has determined that the potential impact with respect to water quality concerns resulting from the proposed project may be considered to be minor.

Therefore, in accordance with Section 11-54-09.1.04 of the Hawaii Administrative Rules, ~~the Department waives the requirements of a processing a Section 401 WQC with the following conditions:~~

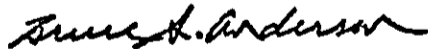
1. Either the Department of Public Works, County of Kauai, or Wilson Okamoto & Associates, Inc., shall notify the Clean Water Branch (via telephone no. 586-4309) at least three (3) working days before any construction work is to begin. You shall also inform the contractor(s) of all the specifications, BMPs plan, monitoring requirements and any other project related requirements contained in the Section 401 WQC application package;
2. All materials to be placed in State waters shall be free of waste metal products, organic materials, debris and any pollutants at toxic or potentially hazardous concentrations to aquatic life as identified in Section 11-54-04, Hawaii Administrative Rules;
3. Appropriate silt containment devices shall be deployed at the downstream end of the project to contain the suspended material prior to any in-stream work, including the temporary protective barriers construction. The temporary protective barriers shall be removed immediately after the completion of each segment of the construction work;
4. Construction debris and any other deleterious material(s) shall be contained and prevented from entering State waters;

Mr. Steve Oliver
WQC 236 / NW 95-009
May 31, 1995
Page 3

5. There shall be no discharge, either directly or indirectly, of any construction dewatering effluent into State waters. The granting of a Section 401 WQC waiver does not constitute the approval of construction dewatering effluent discharging into State waters. The construction dewatering effluent shall be properly contained or reused as appropriate. A National Pollutant Discharge Elimination System (NPDES) permit shall be obtained if construction dewatering effluent discharging into State waters is anticipated;
6. Land disposal of any debris or solid waste shall be reported on the enclosed, "Solid Waste Disclosure Form for Construction Sites" to the Department's Office of Solid Waste Management (OSWM) at P.O. Box 3378, Honolulu, Hawaii 96801-3378;
7. The Department of Public Works, County of Kauai, shall conduct the water quality monitoring in accordance with their monitoring plan dated October 5, 1994, submitted by Wilson Okamoto & Associates, Inc.;
8. The Department of Public Works, County of Kauai, shall submit two (2) copies of each water quality and discharge characteristic report(s) not later than two (2) weeks after preparation of any such report. In addition, any change(s) in the monitoring locations, frequency, dates or methods or correction(s) to data already on file with the Department shall be submitted as such change(s) or correction(s) arise; and
9. The effectiveness and adequacy of the implemented BMPs plan shall be reviewed and updated as often as needed. Any change(s) to the BMPs plan or correction(s) to information already on file with the Department shall be submitted to the Clean Water Branch as such change(s) or correction(s) arise.

Should you have any questions regarding this matter, please contact Mr. Devender Narala, Engineering Section of the Clean Water Branch, at (808) 586-4309 or toll free at 1-800-468-4644, ext. 64309.

Sincerely,



BRUCE S. ANDERSON, Ph.D.
Deputy Director for
Environmental Health

DN:sl/rg

Enclosure: Solid Waste Disclosure Form

- ✓ c: Earl Matsukawa, Wilson Okamoto & Associates, Inc. (w/o encl)
U.S. Army Corps of Engineers, Honolulu District (w/o encl)
DHSA, Kauai (w/Section 401 WQC Application Package dated
10/5/94)



DEPARTMENT OF THE ARMY
U. S. ARMY ENGINEER DISTRICT, HONOLULU
FT. SHAFTER, HAWAII 96858-5440
JUL 05 1995

3049-02

LM
EM
SAU
Will cc: Kow
Kutalanga

REPLY TO
ATTENTION OF
Regulatory Branch

JUL 07 1995

Ms. Laura Mau
Planner
Wilson Okamoto & Associates, Inc.
P.O. Box 3530
Honolulu, Hawaii 96811

Subject: Phase II Koloa-Poipu Bypass Road Crossing at
Waihohonu Stream in the city of Koloa, Kauai, Hawaii.
File Number: NW95-009

Dear Ms. Mau:

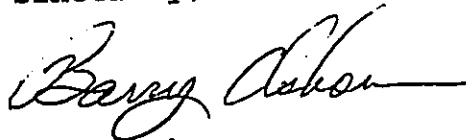
This letter is to verify that Department of the Army (DA) permit authorization for File No. NW95-009, Phase II Koloa-Poipu Bypass Road Crossing at Waihohonu Stream in the city of Koloa, Kauai, Hawaii, became valid on June 6, 1995, when we issued you a provisional nationwide permit. We received a copy of the Water Quality Certification waiver dated, May 31, 1995, on June 30, 1995. Accordingly, our letter of June 6, 1995 completed your nationwide permit authorization. To utilize this authorization the applicant must adhere to all the conditions described in the Water Quality Certification letter and the terms and conditions of the nationwide permit involved.

Our verification for the construction of an activity under a nationwide permit is valid until the nationwide permit is modified, reissued, or revoked. All of the nationwide permits are scheduled to be modified, reissued or revoked prior to January 21, 1997. Continued confirmation that an activity complies with the specifications and conditions of the nationwide permit is the responsibility of the permittee. The U. S. Army Corps of Engineers will issue a public notice announcing changes when they occur.

Furthermore, if you commence, or are under contract to commence this activity before the date that this nationwide permit is modified or revoked, you will have 12 months from the date of the modification or revocation to complete the activity under the present terms and conditions of the nationwide permit.

Call Terrell Kelley or Barry Osborn, at 438-9258,
ext. 13 or 19, if you have any questions concerning this
authorization.

Sincerely,



Barry Osborn
Regulatory Project Manger

Appendix E

***ENVIRONMENTAL RECONNAISSANCE SURVEY OF
WAIHOHONU STREAM
KOLOA, KAUAI***

***Prepared by AECOS, Inc.
August 1994***

AECOS No. 782

**Environmental Reconnaissance Survey
of Waihohonu Stream,
Koloa, Kauai**

Prepared for:

**Wilson Okamoto & Associates, Inc.
1907 So. Beretania Street
Honolulu, Hawaii 96826**

Prepared by:

**AECOS, Inc.
970 N. Kalaheo Ave., Suite C300
Kailua, Hawaii 96734**

August 1994

WAIHOHONU STREAM

INTRODUCTION

Waihohonu Stream is a tributary of Waikomo Stream on the southeastern side of the Island of Kaua'i (Figure 1). This area receives 40 to 50 inches of rain per year. Waihohonu is an intermittent stream which arises in the general area of Knudsen Gap, with tributaries arising on the east and west at around the 1000 foot elevation. Waihohonu flows southward, parallel to Maluhia Road (Hwy 520) between Kaumualii Highway and Koloa town. Weoweopilau and tributaries of Kuia Stream drain the north side of the gap into Huleia Stream. However, portions of these watersheds are intercepted by an irrigation system that feeds into Mauka Reservoir, one of two reservoirs that outflow into Waihohonu Stream and irrigation ditches in the Koloa area (Figure 2). Like many other small streams in this part of Kaua'i, Waihohonu is very much interconnected with the agricultural irrigation system, a situation which has probably existed for over a century.

Waihohonu drains the Koloa Watershed in Hydrographic Area III, a region predominantly underlain by the thick, moderately permeable flows of the Koloa volcanic series. Estimated sustainable yields within Hydrographic Area III are 30 mgd (Commission on Water Resource Management, 1992; Sam O. Hirota, Inc., 1978; State of Hawaii, 1980). Most of the Koloa Watershed is currently in agriculture (primarily sugar cultivation), with portions of these cultivated lands designated as erosion-prone. Major streams and most minor streams in this system are sustained in large measure by ground water drainage from high level dike aquifers in the interior and perched aquifers in the lowlands. The quality of surface waters in such cultivated areas can be affected by the introduction of suspended and dissolved matter generated by runoff and/or infiltration of surplus irrigation water, contributing chlorides, fertilizer salts, and possibly pesticide residues.

This assessment survey was conducted to supplement a Stream Channel Alteration Permit (SCAP) application, Department of the Army permit application, and 401 Water Quality Certification for the proposed Koloa Bypass Highway. The approximate location of a new stream culvert is shown as the "project area" in Figure 2. A preliminary field survey of the project area was conducted on May 4, 1994. Most of the survey of Waihohonu Stream was conducted on May 26, 1994.

DESCRIPTION

A portion of Waihohonu Stream below Mauka Reservoir flows through a steep-sided canyon which is heavily vegetated. The stream enters the canyon just after crossing

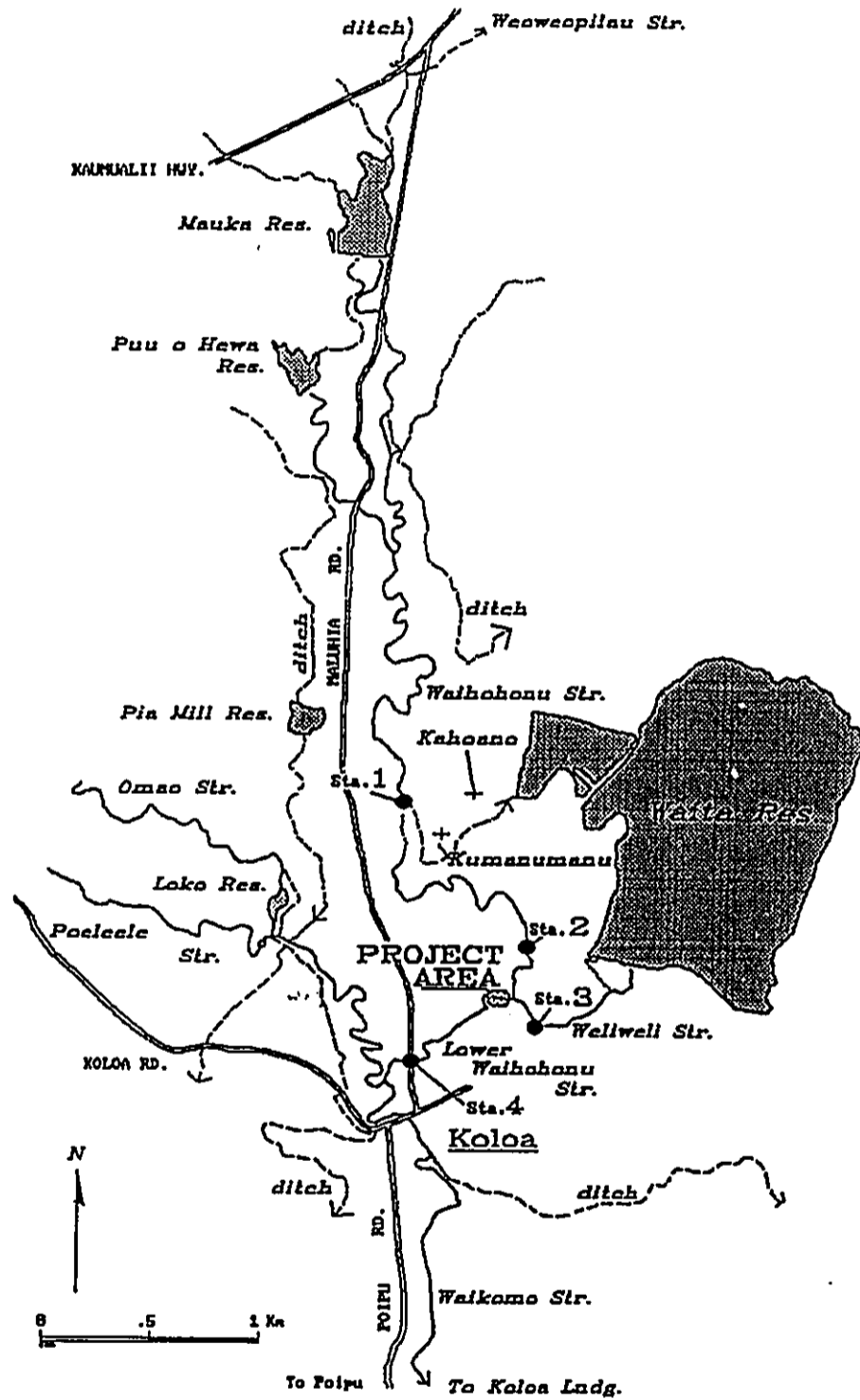


Figure 2. Location map for Waihohonu Stream showing portions of the extensive irrigation ditch and reservoir system on the watershed. Sta. 1 - 4 are water quality sample locations.

Despite the essentially 100% diversion upstream, water flow is evident where the stream exits from dense hau to cross under Wailaau Road. At this point, the stream flows through cane fields and residential areas on the northeast side of Koloa town. Just upstream of the proposed highway culvert project, the stream is joined by spillway waters (as Weliweli Stream on some maps) flowing out of Waita Reservoir (Figure 2). Combined waters from these two sources flow southwest, passing north of Koloa town beside Anne Knudsen Park and underneath Maluhia Road (Hwy. 520). In this area, the stream is contained in a modified, flood control channel, overgrown with California grass (*Brachiaria mutica*) and Guinea grass (*Panicum maximum*). The stream joins Waikomo Stream in a cane field west from the highway. Waikomo Stream is the result of the combined waters of Poelele and Omao Streams, which drain watersheds to the west of Waihohonu. From the confluence with Waihohonu, Waikomo Stream flows into the center of Koloa town and south across the floodplain to the Poipu area, discharging into the sea at the small embayment known as Koloa Landing.

PREVIOUS SURVEYS

Little written data exists on Waihohonu Stream. The stream is shown as a tributary of Waikomo Stream in Timbol and Maciolek (1978). These authors summarize a survey of Waikomo Stream made just upstream from Koloa Road in Koloa by listing two native and 5 exotic species of aquatic crustaceans and fishes. These species are included in Table 3 because the sampling location was near the confluence with Waihohonu Stream.

Waihohonu is listed in the Hawaii Stream Assessment (1990) as a tributary of Waikomo Stream (State No. 2-3-02), which is the major drainage course in Hydrographic Area III and water source for both the County water supply and McBride Sugar Company. According to the DLNR (1980), Waikomo Stream has been modified to alleviate severe flooding problems in Koloa. The investigation recommended that tributary channels feeding Waikomo Stream should be designed to allow for maximum sediment retention (i.e., winding, low velocity, unlined, with wide flood plain allowance). Implications are not clear in the report, however, regarding recommended modifications to specific tributary streams, such as Waihohonu. The Hawaii Stream Assessment (1990) summarizes Waikomo Stream as having moderate aquatic resource value and substantial riparian (riverine or stream side) resource value. The 'o'opu nakea (*Awaous stamineus*) is listed as occurring in Waikomo Stream; a summary table indicates two native species and 4 introduced species as having been recorded in "surveys" of this stream. References may include the survey by Timbol & Maciolek (1978), although the year of last survey is given as 1990.

A study by Botanical Consultants (1992) described botanical, avian, and wetland resources in a portion of Waikomo Stream around the Poipu Road and Lawai Road bridges. This area is downstream from Koloa not far above Koloa Landing (the stream

mouth). The boundaries of the "riverine system" were marked in the construction area and plants and birds in the construction area were listed. However, no aquatic biota beyond the several species of wetland indicator species (Job's tears, Hilo grass, and California grass) are mentioned. Waikomo Stream was described as "...a fast moving, intermittent stream which carries a large volume of run off during the wet season."

No historical water quality measurements for Waihohonu Stream were found. However, the Department of Health (DOH) has a (marine) water quality station at Koloa Landing near the mouth of Waikomo Stream where microbiological samples are routinely collected (E. Akizawa, CWB, DOH).

WATER QUALITY

Water quality measurements were made at four stream locations as indicated in Figure 2 (Sta. 1 through 4) for the purpose of characterizing Waihohonu Stream. Station 1 was located on Waihohonu Stream above the diversion point, the sample collected from pools just downstream of a cane haul road crossing off Maluhia Road (Hwy 520). Station 2 was located just downstream of the culverts under Wallaau Road in an area of dense hau. Station 3 represents Weliweli Stream sampled just downstream of the Wallaau Road culvert. Station 4 was again on Waihohonu Stream, just upstream from the Maluhia Road bridge at Koloa. Measurements of temperature and dissolved oxygen (DO) were made in the stream between 1015 and 1200 hours on May 26, 1994. Stations were visited in the following order (time of day): Sta. 2 (1015), Sta. 3 (1035), Sta. 4 (1130), and Sta. 1 (1200). Water samples were collected and shipped to O'ahu for processing at the laboratory. Results are presented in Tables 1 and 2.

Table 1. Basic water quality characteristics of Waihohonu Stream.

	Temperature (°C)	DO (mg/L)	pH (pH units)	Conductivity (µmhos/cm)	Turbidity (ntu)	Suspended Solids (TSS) (mg/L)
Station 1	22.3	6.67	7.02	75.8	5.43	1.8
Station 2	21.5	2.12	7.04	97.0	19.0	8.4
Station 3	22.3	1.57	6.80	158.9	58.3	15.2
Station 4	23.3	3.77	6.94	98.4	5.22	1.4

The temperatures measured (Table 1) were not unusual and reflect seasonal influences, time of day, and local shading. Dissolved oxygen (DO) values were generally low. For example, the results represent the following in relation to saturation (the amount of oxygen that could be dissolved in water at a given temperature, salinity, and air pressure): Station 1 = 79 %, Station 2 = 25 %, Station 3 = 19 %, and Station 4 = 45 %.

Values of undersaturation to the degree observed at Stations 2, 3, and 4 are suggestive of generally poor stream conditions.

pH values (Table 1) were all close to neutral and therefore not unusual. Station 3, representing Weliweli Stream, was the most deviant at 6.8 pH units (very slightly acidic). Conductivity values indicated a low dissolved ion content, although again Weliweli Stream was notably different than Waihohonu Stream. High suspended solids and high turbidity were observed only at Station 3 representing Weliweli Stream. Station 2 on Waihohonu Stream was somewhat intermediate between Weliweli Stream and the upstream and downstream points measured on Waihohonu. Reduction of turbidity and suspended solids between upstream points (Stations 2 and 3) and Station 4 is not unusual: large amounts of vegetation growing in the stream bed must filter out particulates as the water flows through.

The term "nutrients" (Table 2) refers to dissolved and/or particulate substances which are related to biological productivity. Nutrients stimulate plant growth and comprise organic matter. The abundant nutrients of significance in aquatic environments are compounds of nitrogen and phosphorus. The Waihohonu Stream locations all showed quite different concentrations of these substances and very different ratios of dissolved to total nitrogen and nitrogen to phosphorus, suggesting a complex situation with respect to inputs and uptake along the stream reaches represented here. The low dissolved nitrates and high total N and total P at Station 3 might be expected for water arising in a large, shallow reservoir (Waita Reservoir). Slightly elevated chlorides compared with source waters might result from evaporation occurring while water resides in the reservoir. The high ammonia measured here is in keeping with the sluggish flow and low dissolved oxygen content.

Table 2. Nutrient water quality characteristics of Waihohonu Stream.

	Ammonia ($\mu\text{g NL}$)	Nitrate + nitrite ($\mu\text{g NL}$)	Total nitrogen ($\mu\text{g NL}$)	Total phosphorus ($\mu\text{g P/L}$)
Station 1	26	110	208	2
Station 2	61	29	217	29
Station 3	98	5	412	48
Station 4	35	425	614	8

The elevated nitrate + nitrite at the downstream Station 4 is interesting and seems to indicate ground water infiltration that is high in nitrates. The value is somewhat unusual at this location because immediately upstream, the water flow is spread out in a soil channel choked with grasses that should be effective at stripping nitrates out of the water.

FIELD SURVEYS

A reconnaissance stream survey around the project site was conducted on the afternoon of May 4, 1994. The survey was expanded to locations further upstream and downstream on May 26. Observations were limited to accessible areas of the stream, listed below and shown in Figure 3 as survey "sites". The surveys were conducted following a period of low rainfall, although scattered light showers occurred on the 26th. The only biota collected for further examination was an alga found at Site 3. A list of aquatic animals recorded in this and other surveys in the area is given in Table 3. Appendix Table A1 lists all plant species recorded along the stream, limited however to the stream reach at and close to the project area (essentially from Site 5 to Site 8) as observed on May 26, 1994.

Site 1 is an area immediately upstream of a box culvert under Maluhia Road where Waihohonu crosses the roadway after flowing out of Mauka Reservoir. This reach is deeply shaded by hau growth, but the stream bed is massive basalt. Because of a lack of soil in the stream or on the banks the hau (*Hibiscus tiliaceus*) tends not to grow into the channel, but higher up the banks. Only the guppy (*Poecilia reticulata*) was observed in the stream here.

Site 2 is located in the middle of cane fields beneath a private bridge. The stream forms a large pool 50 to 70 cm deep. Hau is growing upstream of the pool. Within the pool are seen mosquitofish (*Gambusia affinis*) and an unidentified species believed to be a new introduction to the Hawaiian stream fauna. Several individuals of these small fish were counted on May 26: spindle shaped, 3 to 4 cm. long, marked with broken, black longitudinal bands, only the centerline band being prominent and nearly continuous, extending from the mouth, through the eye, to the caudal peduncle. Above this band along the caudal peduncle could be seen a contrasting bright coloration. Fins, including tail unmarked or colorless. The fish appear to be mid-water dwellers, regularly moving between the bottom and the surface, reacting aggressively towards the top-minnows when these are encountered. Attempts at catching the fish with a hand net failed because of the poor footing at the shore and silty bottom of the pool. The general description above based upon field observations unfortunately applies to a number of "tropical aquarium" fishes, as for example certain rasbora barbs (Cyprinidae, *Rasbora* spp.) and pencilfish (Characidae, *Nannostomus* spp.).

Site 3 is in Waihohonu Stream at a cane haul road culvert, a short distance upstream of the diversion point (see Site 4). The stream bed is narrow but exhibits good water flow over rocks. Water quality Station 1 was located here. An unidentified, filamentous alga was collected from the stream: gray-green in color, this Chlorophyta was somewhat unusual in having the basal part of the branched filaments multicellular in cross-section. In the stream at Site 3 are swordtail (*Xiphophorus helleri*), guppy, and crayfish (*Procambarus clarki*).

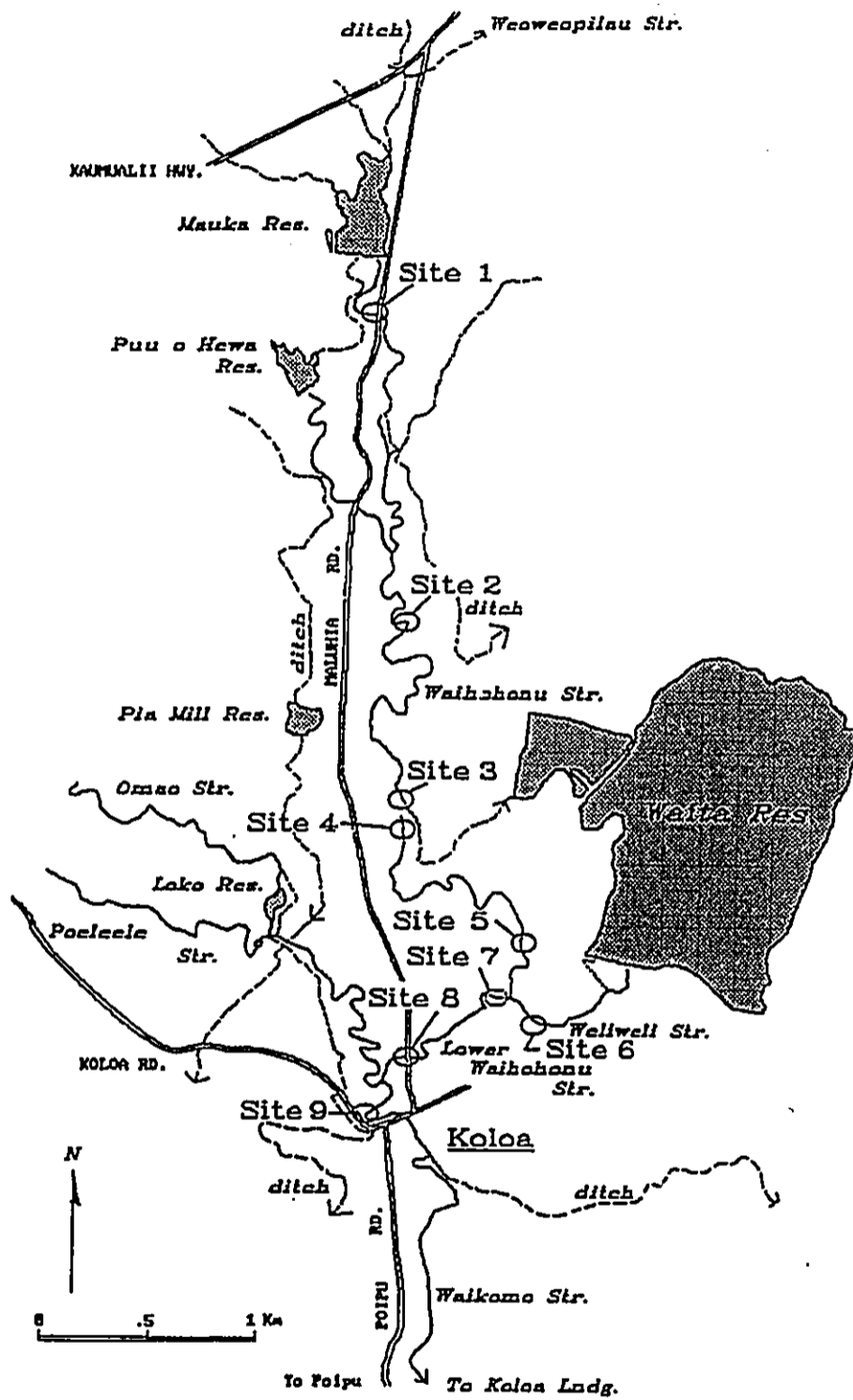


Figure 3. Map of stream observation sites on Waihohonu Stream in the Koloa area of Kaua'i.

At Site 4 upstream water is diverted into a ditch supplying the Waita Reservoir. Only marsh land remains immediately above this site. The water in Waihohonu is stagnant below the diversion. Only corbicula clams (*Corbicula fluminea*) and tilapia (*Sarotherodon* sp.) were observed in the stream, and an unidentified snail (?*Melania*) is present in the diversion channel.

TABLE 3. Checklist of aquatic animals observed or reported from Waikomo and Waihohonu Streams

Species	Common name	Status	Abundance
INVERTEBRATES			
ARTHROPODA, CRUSTACEA			
DECAPODA - ATYIDAE			
‡ <i>Atyoida bisulcata</i> (Randall)	<i>opae kala'ole</i>	end.	Abundant†
DECAPODA - CAMBARIDAE			
‡ <i>Procambarus clarki</i> (Girard)	American swamp crayfish	nat.	Occasional
MOLLUSCA			
BIVALVIA - CORBICULIDAE			
<i>Corbicula fluminea</i> (Müller)	Asiatic clam	nat.	Common
VERTEBRATES			
FISHES - CLARIDAE			
‡ <i>Clarius fuscus</i>	Chinese catfish	nat.	Common†
FISHES - CENTRARCHIDAE			
<i>Micropterus ?dolomieu</i> Lacépède	smallmouth bass	nat.	Uncommon
FISHES - CICHILIDAE			
‡ <i>Sarotherodon ?mossambica</i>	Mozambique tilapia	nat.	Common
<i>Sarotherodon ?melanotheron</i>	blackchin tilapia	nat.	Common
FISHES - GOBIIDAE			
‡ <i>Awaous stamineus</i> (Eydoux & Souleyet)	' <i>opu nakea</i>	end.	Common†
FISHES - POECILIIDAE			
<i>Gambusia affinis</i> (Baird & Girard)	mosquitofish	nat.	Abundant
‡ <i>Poecilia reticulata</i> (Peters)	guppy	nat.	Abundant
‡ <i>Xiphophorus helleri</i> Heckel	green swordtail	nat.	Common
AMPHIBIANS - RANIDAE			
<i>Rana catesbeiana</i> Shaw	American bullfrog	nat.	Occasional

‡ - Reported in Timbol and Maciolek (1978) from Waikomo Stream near the confluence with Waihohonu Stream.

† - Species not seen in present survey; abundance indicated is from Timbol and Maciolek (1978) using a three level scale.

Site 5 is located at the road crossing on Wailaau Road, just upstream and downstream of five, 36" to 48" RCP culverts beneath the road. On the downstream side, at water quality Station 2, thick stands of hau choke all but the slow flowing portion of stream water near the road. A layer of silt-covered hau leaves covers the stream bottom and the water is clear to a bottom depth of less than 50 cm. Plastic oil cans, household garbage, and appliances litter the stream. Only several introduced species are present: crayfish, mosquitofish, and possibly guppy (*Poecilia reticulata*). The waters upstream of the road form a hau-choked backwater marsh. The area may have once been used for taro cultivation. Rich soil and former walls surrounded the marsh area. Crayfish occur in the nearly stagnant pools.

Site 6 is located at the bridge crossing on Wailaau Road near Ano Place, where an old water line crosses the road on the downstream side. Red stem taro (*Colocasia esculenta*) was being grown in the stream bed and California grass (*Brachiaria mutica*), and honohono (*Commelina diffusa*) cover the banks in this residential area. Upstream, the banks and stream support white shrimp plant (*Justicia betonica*). Turbid water flowed down from upstream, draining a spillway from the Waita Reservoir.

Site 7 is located further downstream in an area of cane fields and houses where the water crosses beneath a cane haul road off Wailaau Road and below the junction of Waihohonu and Weliweli Streams. This is the general location of the proposed culvert construction. Papyrus (*Cyperus papyrus*) is growing in the stream, along with umbrella cyperus (*Cyperus alternifolius*), Job's tears (*Coix lachryma-jobi*), and primrose willow (*Ludwigia octovalvis*). The vegetation along and above the stream banks includes most of the plants listed in Appendix A1. Water clarity was obscured on May 4, but generally clear on May 26 when guppy and bullfrog (*Rana catesbeiana*) were observed.

Site 8 is located where the water crosses beneath Maluhia Road. Stream flow consists of combined waters of the Waihohonu and the Waita spillway outflow. Water quality Station 4 is located here. For at least the length of Anne Knudsen Park, the stream is contained in a modified flood control channel with earthen banks and covered with Guinea grass (*Panicum maximum*) and California grass. The vegetation beside the stream includes most of the plants listed in Appendix A1. Green swordtail, tilapia, bass (*Micropterus dolomieu*), and mosquitofish are seen in a large, open pool located under and upstream of the highway bridge. Downstream, the channel continues into cane fields where it joins Waikomo Stream.

Site 9 is located on Waikomo Stream within a residential area. This streamside vegetation consists of predominantly alien species, including California grass and honohono. The stream bottom is highly silted and thickly littered with leaves and sticks. The water is turbid and slow flowing. This site is close to the area indicated in Timbol and Maciolek

(1978) as a stream fauna inventory location. The water was very turbid on May 4 and on May 26 at the bridge under Koloa Road, a short distance downstream from Site 9.

CONCLUSIONS

Overall, Waihohonu Stream appears as a highly degraded, modified, intermittent stream with a high alien species diversity of both stream biota and riparian vegetation in the project area. Agricultural practices and residential debris, although not irreversible, have impacted stream water quality and flow characteristics. Two native aquatic species (the shrimp, *Atyoida bisulcata*, and the goby, *Awaous stamineus*) are known from Waikomo Stream, of which Waihohonu is a tributary. These same species possibly occur in Waihohonu, although the better stream habitats in Waihohonu are upstream of the diversion into Waita Reservoir, where urban influences are absent and stream flow may be more constant (although still subject to agricultural influences). The proposed highway culvert, if constructed in a manner which does not interfere with native stream faunal migrations, should have no short or long term adverse impacts on native aquatic resources or water quality.

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Appendix Table A1.
CHECKLIST OF PLANTS FOUND
ALONG WAIHOHONU STREAM
IN THE VICINITY OF KOLOA, KAUA'I.

Species	Common name	Stolus	Abundance
FERNS			
POLYPODIACEAE			
<i>Dryopteris</i> sp.	oak fern	nat.	Occasional
<i>Nephrolepis exaltata</i> (L.) Schott.	sword fern	nat.?	Uncommon
MONOCOTYLEDONES			
AGAVACEAE			
<i>Cordyline fruticosa</i> (L.) A. Chev.	ti	pol.†	Uncommon
ARACEAE			
<i>Colocasia esculenta</i> (L.) Schott	taro, <i>kalo</i>	pol.†	Uncommon
ARACACEAE			
<i>Cocos nucifera</i> L.	coconut palm, <i>niu</i>	pol.†	Uncommon
CYPERACEAE			
** <i>Cyperus alternifolius</i> L.	umbrella sedge	nat.	Common
** <i>Cyperus papyrus</i> L.	papyrus	nat.	Common
HELICONIACEAE			
<i>Heliconia rostrata</i> Ruiz & Pavon.	parrot's beak heliconia	orn.	Uncommon
LILIACEAE			
? <i>Crinum asiaticum</i> L.	crinum	orn.	Uncommon
MUSACEAE			
<i>Musa x paradisiaca</i> L.	banana	pol.†	Occasional
POACEAE (GRAMINEAE)			
* <i>Brachiaria mutica</i>	California grass	nat.	Abundant
? <i>Chloris radiata</i> (L.) Sw.	plush grass	nat.	Uncommon
** <i>Coix lachryma-jobi</i> L.	Job's tears, <i>pu'ohē'ohē</i>	nat.	Abundant
<i>Panicum maximum</i> Jacq.	Guinea grass	nat.	Abundant
PONTIDERIACEAE			
** <i>Eichhornia crassipes</i> (Mart.) Solms	water hyacinth	nat.	Occasional
DICOTYLEDONES			
ACANTHACEAE			
<i>Justicia betonica</i> L.	white shrimp plant	nat.	Common
ANACARDIACEAE			
<i>Mangifera indica</i> L.	mango	nat.	Occasional
<i>Schinus terebinthifolius</i> Raddi	Christmas berry	nat.	Occasional
ARALIACEAE			
<i>Schefflera actinophylla</i> (Endl.) Harms	octopus tree	nat.	Common

Appendix Table A1. WAIHOHONU STREAM PLANT SPECIES CHECKLIST (continued)

Species	Common name	Status	Abundance
ASTERACEAE (COMPOSITAE)			
<i>Bidens pilosa</i> L.	ki, Spanish needle	nat.	Common
<i>Crassocephalum crepidioides</i> (Benth.) S. Moore		nat.	Uncommon
? <i>Sigesbeckia orientalis</i> L.	small yellow crown-beard	nat.	Uncommon
<i>Sonchus oleraceus</i> L.	sow thistle	nat.	Uncommon
<i>Wedelia trilobata</i> (L.) Hitchc.	wedelia	nat.	Common
BALSAMINACEAE			
<i>Impatiens wallerana</i> J.D. Hook	balsam	nat.	Occasional
BIGNONIACEAE			
<i>Spathodea campanulata</i> P. Beauv.	African tulip tree	nat.	Uncommon
CAMPANULACEAE			
<i>Hippobroma longiflora</i> (L.) G. Don	star-of-Bethlehem	nat.	Occasional
COMMELINACEAE			
* <i>Commelina diffusa</i> N. L. Burm	honohono	nat	Common
CONVOLVULACEAE			
<i>Ipomoea batatas</i> (L.) Lam.	sweet potatoe	pol.	Uncommon
<i>Ipomoea ?indica</i> (J. Burm.) Merr.	koali 'awa	ind.	Occasional
<i>Merremia tuberosa</i> (L.) Rendle	wood rose	nat.	Common
CUCURBITACEAE			
<i>Momordica charantia</i> L.	balsam apple	nat.	Uncommon
EUPHORBIACEAE			
<i>Ricinus communis</i> L.	castor bean, pa'aila	nat.	Common
uniden. (at Knudsen Park)		orn.?	Occasional
FABACEAE			
<i>Leucaena leucocephala</i> (Lam.) deWit	koa haole	nat.	Common
<i>Pithecellobium dulce</i> (Roxb.) Benth.	'opiuna	nat.	Uncommon
<i>Samanea saman</i> (Jacq.) Merr.	monkeypod	nat.	Uncommon
MALVACEAE			
<i>Abutilon grandifolium</i> (Willd.) Sweet	hairy abutilon	nat.	Uncommon
* <i>Hibiscus tiliaceus</i> L.	hau	ind.?	Abundant
<i>Malvastrum coromandelianum</i> (L.) Garcke	false mallow	nat.	Uncommon
uniden. (at Anne Knudsen Park)		nat.?	Uncommon
MYRTACEAE			
<i>Psidium guajava</i> L.	guava	nat.	Occasional
<i>Syzygium cumini</i> (L.) Skeels	Java plum	nat.	Abundant

Appendix Table A1. WAIHOHONU STREAM PLANT SPECIES CHECKLIST (continued)

Species	Common name	Status	Abundance
ONAGRACEAE			
** <i>Ludwigia octovalvis</i> (Jacq.) Raven	primrose willow	pol.?	Occasional
RUBIACEAE			
<i>Paederia scandens</i> (Lour.) Merr.	<i>maile pilau</i>	nat.	Abundant
SOLANACEAE			
<i>Capsicum frutescens</i> L.	chili pepper	orn.	Uncommon
VERBENACEAE			
<i>Clerodendrum philippinum</i> Schauer	<i>pikake hohono</i>	nat.	Uncommon
<i>Stachytarpheta jamaicensis</i> (L.) Vahl.	Jamaica vervain	nat.	Uncommon

KEY:

- * - Facultative wetland species - may be found outside of wetlands.
- ** - Obligate wetland species - found only in wetlands.

Status = distributional status

- end. = endemic; native to Hawaii and found naturally no where else.
- ind. = indigenous; native to Hawaii, but not unique to the Hawaiian Islands.
- nat. = naturalized, exotic, plant introduced to the Hawaiian Islands since the arrival of Cook Expedition, and well-established outside of cultivation.
- orn. = exotic, ornamental; plant not naturalized (not well-established outside of cultivation) or, (f) in this location, part of ornamental plantings or landscaped areas.
- pol. = polynesian introduction.

Abundance = abundance ratings are for this site and survey only.

- Uncommon - a plant found less than five times;
- Occasional - a plant that was found between five and ten times;
- Common - a plant considered an important part of the vegetation
- Abundant - plants found in large numbers, dominant or locally dominant.

Appendix F

***KOLOA-POIPU BYPASS ROAD RIGHT-OF-WAY
FLORA AND FAUNA SURVEY REPORTS***

*Prepared by Botanical Consultants
August 1996*

KOLOA-POIPU BYPASS ROAD RIGHT-OF-WAY
FLORA AND FAUNA SURVEY REPORTS

FOR
WILSON OKAMOTO & ASSOCIATES
1907 SOUTH BERETANIA STREET
HONOLULU, HAWAII 96826

BY
EVANGELINE J. FUNK, PH.D.
BOTANICAL CONSULTANTS
HONOLULU, HAWAII
1996

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WILSON OKAMOTO & ASSOCIATES

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BOTANICAL SURVEY REPORT

INTRODUCTION

Flora and fauna surveys of the Koloa to Poipu Bypass Road (Phase II), Koloa, Kauai, Hawaii, right-of-way were carried out in March and July 1996. The right-of-way is sixty feet in width and one mile and two tenths in length. Both surveys began at the northern end of the right-of-way at Maluhia Road, just south of Wailaau Road, and ended at Weliweli Road just opposite the completed Phase I Bypass Road. The purpose of the botanical survey was to characterize and describe the vegetation and to note the presence of any rare or special vegetation along this route for the completion of this segment of the bypass road. The purpose of the fauna survey was to ascertain if any rare or endangered native fauna is to be found along this right-of-way. The results of the botanical survey will be presented first, followed by the results of the fauna survey.

METHODS

A walk through survey of the right-of-way from Maluhia Road to Weliweli Road was conducted to collect data for the botanical report. All of the sixty foot wide pathway was covered.

RESULTS

Three vegetation types were found along the right-of-way. From Maluhia Road to the culvert crossing is Abandoned Sugarcane Fields; from the culvert to where the right-of-way diverges from the cane haul road is developed with some open, cleared areas; and from the cane haul road to Weliweli Road is Rocky Pasture.

The vegetation of the Abandoned Sugarcane Fields is predominately sugarcane (*Saccharum officinarum* L.) with a wide variety of adventive or weedy

species invading the field. There are no dominants. However, sixteen species of weedy grasses were found and a few scattered koa haole (*Leucaena leucocephala* (Lam.) deWit) and Chinese banyan trees (*Ficus microcarpa* L.) are beginning to appear.

In the Urban Area there are many open spaces where all of the vegetation has been removed or overgrown and grassy places where single domestic animals are pastured. In the cleared places, castor bean shrubs (*Ricinus communis* L.) are regenerating, and in the overgrown areas, koa haole and California grass (*Brachiaria mutica* (Frossk.) Staph.) provide fodder for the grazing animals. There are also many landscape type trees and shrubs in this area.

The Rocky Pasture segment of the right-of-way, from the cane haul road to Weliweli Road, crosses over an old pahoehoe lava flow which is obscured by the dense growth of shrubby vegetation. Koa haole, Java plum (*Zyzygium cumini* (L.) Skeels.), common guava (*Psidium guajava* L.), lantana (*Lantana camara* L.), Kolomona (*Senna surattensis* (N.L. Burm.) H. Irwin & Barneby), and many species of grasses are found in the Rocky Pasture. The most common grasses are Guinea grass (*Panicum maximum* Jacq.), natal redtop (*Rhynchelytrum repens* C.E.Hubb.), and Indian dropseed (*Sporobolus diander* (Retz.) P. Beauv.).

All of the plants found during the survey are included in the species list.

ENDANGERED SPECIES

No candidate, proposed, or listed threatened or endangered species as set forth in the Endangered Species Act of 1973, as amended (16 U.S.C. 1531-1543) (USFWS 1993), were found along the Koloa to Poipu Bypass (Phase II) right-of-way.

SPECIES LIST OF PLANTS FOUND ALONG THE KOLOA-POIPU BYPASS
ROAD RIGHT-OF-WAY

The plant families in the following species list have been alphabetically arranged within three groups, Pteridophyta (Ferns), Monocotyledons, and Dicotyledons. The genera and species are arranged alphabetically within families. The taxonomy and nomenclature follow that of St. John (1973) and Wagner, Herbst and Sohmer (1990). For each taxon the following information is provided:

1. An asterisk before the plant name indicates a plant introduced to the Hawaiian Islands since Cook or by the aborigines.
2. The scientific name.
3. The Hawaiian name and or the most widely used common name.
4. Abundance ratings are for this site only and they have the following meanings:
 - Uncommon = a plant that was found less than five times.
 - Occasional = a plant that was found between five to ten times.
 - Common = a plant considered an important part of the vegetation
 - Locally abundant = plants found in large numbers over a limited area. For example the plants found in grassy patches.

This species list is the result of an extensive survey of this site during the wet season (March 1996) and it reflects the vegetative composition of the flora during a single season. Minor changes in the vegetation will occur due to introductions and losses and a slightly different species list would result from a survey conducted during a different growing season.

<u>Scientific Name</u>	<u>Common Name</u>	<u>Abundance</u>
PTERIDOPHYTA (FERNS)		
POLYPODIACEAE - Common Fern Family		
<i>Phymatosorus scolopendria</i> (Brum. f.) Pichi-Serm.		Common
MONOCOTYLEDONES		
AGAVACEAE - Agave Family		
* <i>Agave sisalana</i> Perrine	Sisal	Uncommon
COMMELINACEAE - Spiderwort Family		
* <i>Commelina diffusa</i> Burm. f.	Honohono grass	Locally abundant
GRAMINEAE - Grass Family		
* <i>Brachiaria mutica</i> (Frossk.) Staph	California grass	Common
* <i>Cenchrus echinatus</i> L.	Common sandbur	Common
* <i>Chloris barbata</i> Swartz	Swollen fingergrass	Common
* <i>Chloris divaricata</i> R. Br.	Stargrass	Common
* <i>Coix lachryma-jobi</i> L.	Job's tears	Uncommon
* <i>Cynodon dactylon</i> (L.) Pers.	Bermuda grass	Locally abundant
* <i>Digitaria ciliaris</i> (Retz.) Koeler	Henry's crabgrass	Common
* <i>Digitaria insularis</i> (L.) Mez ex Ekman	Sourgrass	Locally abundant
* <i>Eleusine indica</i> (L.) Gaertn.	Wiregrass	Common
* <i>Eragrostis cilianensis</i> (All.) Link	Stinkgrass	Occasional
* <i>Panicum maximum</i> Jacq.	Guinea grass	Locally abundant
* <i>Paspalum fimbriatum</i> Kunth	Panama grass	Common
* <i>Paspalum scrobiculatum</i> L.	Ricegrass	Occasional
* <i>Rhynchelytrum repens</i> C.E. Hubb.	Natal redtop	Common
* <i>Saccharum officinarum</i> L.	Sugar	Common
* <i>Sporobolus diander</i> (Retz.) P. Beauv.	Indian dropseed	Common
LILIACEAE - Lily Family		
* <i>Hippeastrum puniceum</i> (Lam.) Voss	Barbados lily	Occasional
MUSACEAE - Banana Family		
* <i>Musa x paradisiaca</i> L.	Banana	Occasional
DICOTYLEDONES		
ACANTHACEAE - Acanthus Family		
* <i>Thunbergia fragrans</i> Roxb.	White thunbergia	Common

<u>Scientific Name</u>	<u>Common Name</u>	<u>Abundance</u>
AMARANTHACEAE - Amaranth Family		
* <i>Amaranthus spinosus</i> L.	Spiny amaranth	Occasional
ANACARDIACEAE - Mango Family		
* <i>Mangifera indica</i> L.	Mango	Uncommon
* <i>Schinus terebinthifolius</i> Raddi	Christmas berry	Common
APIACEAE - Parsley Family		
* <i>Daucus pusillus</i> Michx.	American carrot	Locally abundant
ARALIACEAE - Ginseng Family		
* <i>Schefflera actinophylla</i> (Endl.) Harms	Octopus tree	Occasional
ASTERACEAE - Sunflower Family		
* <i>Ageratum conyzoides</i> L.	Maile hohono	Locally abundant
* <i>Bidens cynapiifolia</i> Kunth	Spanish needle	Common
* <i>Caryptocarpus vialis</i> Less.		Locally abundant
* <i>Conyza bonariensis</i> (L.) Cronq.	Hairy horseweed	Occasional
* <i>Emilia coccinea</i> (Sims) G. Don	Flora's paintbrush	Common
* <i>Emilia sonchifolia</i> (L.) DC	Flora's paintbrush	Locally abundant
* <i>Erechtites hieracifolia</i> (L.) Raf. ex DC		Common
* <i>Pluchea symphytifolia</i> (Mill.) Gillis	Sourbush	Common
* <i>Sonchus oleraceus</i> L.	Sow thistle	Occasional
* <i>Synedrella nodiflora</i> (L.) Gaertn.	Nodeweed	Occasional
* <i>Taraxacum officinale</i> W. W. Weber	Dandelion	Locally abundant
* <i>Wedelia triloba</i> (L.) Jacq.	Wedelia	Locally abundant
CARICACEAE - Papaya Family		
* <i>Carica papaya</i> L.	Pawpaw	Occasional
CONVOLVULACEAE - Morning Glory Family		
* <i>Ipomoea obscura</i> (L.) Ker-Gawl.		Occasional
* <i>Ipomoea triloba</i> L.	Little bell	Occasional
CRASSULACEAE - Opine Family		
* <i>Kalanchoe pinnata</i> (Lam.) Pers.		Locally abundant
CUCURBITACEAE - Cucumber Family		
* <i>Cucumis mwlo</i> L.	Pumpkin	Uncommon
* <i>Momordica charantia</i> L.	Bitter melon	Locally abundant

<u>Scientific Name</u>	<u>Common Name</u>	<u>Abundance</u>
EUPHORBIACEAE - Spurge Family		
* <i>Chamaesyce hirta</i> (L.) Millsp.	Hairy spurge	Common
* <i>Chamaesyce hypericifolia</i> (L.) Millsp.	Graceful spurge	Locally abundant
* <i>Chamaesyce prostrata</i> (Aiton) Small	Prostrate spurge	Occasional
* <i>Euphorbia cyathophora</i> J. A. Murry	Mexican fire plant	Occasional
* <i>Phyllanthus debilis</i> Klein ex Willd.	Niruri	Common
* <i>Ricinus cummunis</i> L.	Castor bean	Common
FABACEAE - Bean Family		
* <i>Acacia farnesiana</i> (L.) Willd.	Klu	Uncommon
* <i>Alysicarpus vaginalis</i> (L.) DC	One leaf clover	
* <i>Chamaecrista nictitans</i> (L.) Moench	Partridge pea	Common
* <i>Crotalaria incana</i> L.	Fuzzy rattlepod	Common
* <i>Crotalaria pallida</i> Aiton	Smooth rattlepod	Common
* <i>Desmanthus virgatus</i> (L.) Willd.	Virgate mimosa	Common
* <i>Desmodium incanum</i> DC	Spanish clover	Locally abundant
* <i>Glycine wightii</i> (Wight & Arnott) Verdc.		Locally abundant
* <i>Indigofera suffruticosa</i> Mill.	Indigo	Common
* <i>Lablab purpureus</i> (L.) Sweet	Hyacinth bean	Locally abundant
* <i>Leucaena leucocephala</i> (Lam.) deWit	Koa-haole	Common
* <i>Macropodium lathyoides</i> (L.) Urb.	Wild bean	Occasional
* <i>Melilotus indica</i> (L.) All.		Occasional
* <i>Mimosa pudica</i> L.	Sensitive plant	Common
* <i>Pachyrhizus erous</i> (L.) Urb.	Chopsui yam	Occasional
* <i>Senna occidentalis</i> (L.) Link	Coffee senna	Common
* <i>Senna surattensis</i> (N.L. Burm.) H. Irwin & Barneby	Kolomona	Locally abundant
MALVACEAE - Hibiscus Family		
* <i>Abutilon grandifolium</i> (Willd.) Sweet	Hairy abutilon	Uncommon
<i>Hibiscus tiliaceus</i> L.	Hau	Locally abundant
* <i>Malvastrum coromandelianum</i> (L.) Garke		Uncommon
* <i>Sida rhombifolia</i> L.	Cuba jute	Common
MORACEAE - Fig Family		
* <i>Ficus microcarpa</i> L.	Chinese banyan	Occasional
MYRTACEAE - Myrtle Family		
* <i>Melaleuca quinquenervia</i>	Papaerbark	Occasional
* <i>Psidium guajava</i> L.	Yellow guava	Occasional
* <i>Zyzygium cumini</i> (L.) Skeels	Java plum	Occasional

<u>Scientific Name</u>	<u>Common Name</u>	<u>Abundance</u>
PLANTAGINACEAE - Plantain Family		
* <i>Plantago lanceolata</i> L.	Narrow-leaved plantain	Locally abundant
* <i>Plantago major</i> L.	Laukahi	Common
PORTULACACEAE - Purslane Family		
* <i>Portulaca pilosa</i> L.	Akulikuli	Occasional
RUBIACEAE - Coffee Family		
* <i>Spermacoce assurgens</i> Ruiz & Pav.	Buttonweed	Occasional
STERCULIACEAE - Stink tree Family		
<i>Waltheria indica</i> L.	Uhaloa	Common
TILIACEAE - Linden Family		
* <i>Triumfetta semitriloba</i> Jacq.	Sacramento bur	Uncommon
VERBENACEAE - Verbena Family		
* <i>Clerodendrum philippinum</i> Schauer	Pikaaaake hohono	Uncommon
* <i>Lantana camara</i> L.	Lantana	Common
* <i>Stachytarpheta dichotoma</i> (Ruiz & Pav.) Vahl	Owi	Occasional
* <i>Stachytarpheta urticifolia</i> (Salisb.) Sims		Common
* <i>Verbena litoralis</i> Kunth	Owi	Common

FAUNA OF THE KOLOA-POIPU BYPASS ROAD RIGHT-OF-WAY

Introduction

The three vegetation types found along the Koloa-Poipu Road right-of-way offer a wide variety of food resources which can be utilized by a variety of birds and small rodents. Overall, thirteen species of birds were found and supporting evidence is used to document the presence of the house mouse and rats where direct observations were lacking.

METHODS

The to document the presense of avifauna and mammals, a walk through survey was carried out. The entire right-of-way was walked from east to west and from west to east. In addition fixed station observation points (20 minutes at each station) were carried out in each vegetation type during early morning hours in order to take advantage of the higher activity levels of both birds and mammals during cooler parts of the day.

RESULTS

The three vegetation types or habitats found along the proposed Koloa-Poipu Bypass Road right-of-way are Abandoned Cane Field, Urban area, and Pasture. None of which provides suitable habitat for most native Hawaiian birds. These vegetation types are inhabited by a diverse avian fauna made up of introduced, commensal, seed-eating birds. Results of the avifauna survey are presented in Table I and although the greatest variety of bird species was found in the Pasture, the largest number of birds was found in the Urban Area. In the Urban Area there were very large flocks of common mynas and zebra doves.

Although no rats or house mice were seen, many rat and house mouse droppings were found in an abandoned garage in the Urban Area. This confirmation justifies

the inclusion of these mammals in the following species list.

LIST OF FAUNA FOUND ALONG THE KOLOA-POIPU ROAD RIGHT-OF-WAY

Mammals - House Mouse (*Mus musculus*). The house mouse is the most successful and abundant mammal in the Hawaiian Islands. Since house mouse droppings were found in a structure that opened onto the right-of-way, is safe to assume that many more mice can be found on site, especially in the grassy areas.

The house mouse is usually six to seven inches long, including its tail, and weighs approximately one ounce. Coat color varies with location.

Black Rat (*Rattus rattus*) The rat evidence found on the study site is probably from this species of rat. Other rat species in Hawaii such as the brown rat (*Rattus norvegicus*), is also known as a wharf or sewer rat and are not likely to inhabit a site as dry as the study site. The Hawaiian rat (*Rattus exulans hawaiiensis*) is more likely to inhabit sugarcane fields.

A full grown black rat is about seven inches long from its head to the base of its tail. The tail can be five to eight inches long. A mature rat weighs eight to nine ounces. No rats were seen.

<u>SPECIES</u>	<u>ABANDONED CANE FIELD</u>	<u>URBAN AREA</u>	<u>PASTURE</u>
<u>Ring-Necked Pheasant</u>	<u>X</u>		<u>X</u>
<u>Common Myna</u>	<u>X</u>	<u>X</u>	<u>X</u>
<u>Spotted Dove</u>	<u>X</u>	<u>X</u>	<u>X</u>
<u>Zebra Dove</u>	<u>X</u>	<u>X</u>	<u>X</u>
<u>California Quail</u>			<u>X</u>
<u>Common Waxbill</u>	<u>X</u>		<u>X</u>
<u>Chestnut Mannikin</u>		<u>X</u>	<u>X</u>
<u>Nutmeg Mannikin</u>	<u>X</u>		<u>X</u>
<u>Northern Cardinal</u>	<u>X</u>		<u>X</u>
<u>Cattle Egret</u>		<u>X</u>	<u>X</u>
<u>Rock Dove</u>		<u>X</u>	
<u>House Sparrow</u>	<u>X</u>	<u>X</u>	<u>X</u>
<u>Japanese White-eye</u>	<u>X</u>	<u>X</u>	

TABLE I. SUMMARY OF BIRD SPECIES AND THEIR DISTRIBUTION

AVIFAUNA-As mentioned earlier the entire site has been extensively modified from its original state and today it has almost no value as native bird habitat. However, it does support a variety of non-native species. The grasses which are so common along the right-of-way provide a rich source of food for seed eating birds. The very small seed eaters like the waxbill, chestnut mannikin, and nutmeg mannikin are the most widely distributed.

Thirteen species of birds were found on and around the study site. No threatened or endangered species were found. The annotated checklist follows the nomenclature of Pratt, Bruner and Berrett (1987).

Family Zosteropidae: White-eyes

Zosterops japonicus

White-eyes are one of the most widespread introduced bird species in Hawaii. The white-eyes seemed well adapted to this study site. They were seen in low numbers in all parts of the site.

Family Passeridae: Old World Sparrows

Passer domesticus (House sparrow)

House sparrows are sometimes called feathered mice. These streaky brown and gray birds are a familiar commensal species and were most common around the houses.

Family Estrildidae: Waxbills, Mannikins and Parrotfinches

Estrilda astrild (Common Waxbill)

The common waxbill is a small, red-billed finch with a prominent red streak from its bill to its eye. Waxbills have a long tail and brown rump. They feed on grass seeds. Large coveys of waxbills were seen feeding on the grass heads.

Lonchura malacca (Chestnut Mannikin)

These are tiny, dark birds with large, light colored bills. The bird's coat appear red in the early morning light and evening light. They to feed on grass heads. Chestnut mannikins are widely distributed along the right-of-way.

Lonchura punctilata (Nutmeg Mannikin)

These nervous, little birds have dark bills and heads. Their alternate black and white breast feathers appear gray. Nutmeg Mannikins were often seen in company with the Waxbills feeding in grassy thickets.

Family Emberizidae: Emberizine Finches

Cardinalis cardinalis (Northern cardinal)

Northern cardinals inhabit the koa haole bushes at the edge of the abandoned Cane Field and in the Pasture. The bright red coloring of the male bird make him easily recognizeable. The call of these birds is very distinctive.

Family Columbidae: Pigeons and Doves

Streptopelia chinensis (Spotted Dove)

The spotted dove is a large bird which is grayish brown with rosy blushed breast feathers. At the sides and back of the neck is a patch of black with white spots. The low, repetitive cooing of the spotted dove was heard throughout the site. Many pairs and individuals were seen feeding on the ground or perched on the power lines.

Geopelia striata (Zebra Dove)

This ground dwelling, seed eating dove is smaller and even more abundant than the spotted dove. Zebra doves were seen in large flocks on the study site. They far out number the usually very common waxbills.

Columba livia (Rock Dove)

A large flock of mixed plumage rock doves were seen to over fly the study sight during the early morning hours. They appear to come from the urbanized area.

Family Sturnidae: Starlings and Mynas

Acridotheres tristis (Common Myna)

The ubiquitous myna is a plump brown bird with a black head and tail. It has a white belly, tail tip and wing patches, and bright yellow legs, feet, bill, and eye liners. Mynas were the most commonly seen species along the right-of-way.

Family Phasianidae: Gallinaceous Birds

Phasianus colchincus (Common pheasant)

The ring-necked pheasant is a large bird. The males are quite colorful with a long pointed tail. The female is smaller and her colors are duller. Two female pheasants were seen in flight during the survey; one in the old field and one in the pasture.

Callipepla californica (California quail)

A small, dark bird with a black head plume. Generally quail are seen running in small flocks. One female was seen along the cane haul road near a large mud puddle.

Family Ardeidae: Herons, Egrets and Bitterns

Bubulcus ibis (Cattle egret)

No more than one of these large, white birds were seen flying about at any one time. The large mud puddles along the cane haul road seemed to be the attraction.

Introduced in 1957 to help control cattle insect pests, cattle egrets have proliferated and are now pests themselves.

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Appendix G

**UPDATED ACOUSTIC STUDY FOR THE KOLOA-POIPU
BYPASS ROAD PROJECT
KOLOA, KAUAI, HAWAII**

*Prepared by Y. Ebisu & Associates
February 1996*

UPDATED
ACOUSTIC STUDY
FOR THE
KOLOA-POIPU BYPASS ROAD PROJECT
KOLOA, KAUAI, HAWAII

Prepared for:

WILSON OKAMOTO & ASSOCIATES, INC.

Prepared by:

Y. EBISU & ASSOCIATES
1126 12th Avenue, Room 305
Honolulu, Hawaii 96816

FEBRUARY 1996

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CHAPTER I. SUMMARY

This study evaluated the potential noise impacts along the proposed Koloa-Poipu Bypass Road on the island of Kauai, Hawaii. The Bypass Road is anticipated to cross through residential areas in the town of Koloa near the northern end of the project, and pass near the Weliweli residential subdivision near the southern (or Poipu) end of the project. A prior study was performed in November 1992 to evaluate the first increment of the Bypass Road between Poipu and Weliweli Roads, which was dedicated in November 1993. This study includes the results of the original study plus results related to the second increment of the Bypass Road between Weliweli and Maluhia Roads.

Unavoidable increases in background ambient noise levels at the quieter agricultural areas along the Bypass Road's alignment are expected to occur. In essence, a redistribution of future traffic noise will occur from existing sections of Poipu Road, Koloa Road, and Maluhia Road to locations east of existing developments between Koloa and Poipu. This redistribution, however, will minimize future traffic noise impacts along the existing roadway corridor which crosses thru Koloa Town and passes north of the coastal developments in Poipu. Minimization of noise impacts on existing noise sensitive receptors along the Bypass Road will be accomplished through the use of adequate setback distances, reduced roadway speeds, and/or the construction of sound attenuation barriers as required. It is anticipated that potential noise impacts on future noise sensitive receptors along the Bypass Road will be mitigated through the use of sound barriers or other noise mitigation measures which are included within the individual project development plans.

Based on the results of this study, the inclusion of special noise mitigation measures are not required near the Weliweli Subdivision. The construction of sound attenuation barriers will be required near the Waikomo Subdivision and at other locations along

the Bypass Road in Koloa Town in order to meet the FHA/HUD and FHWA standards for residences.

CHAPTER II. NOISE DESCRIPTORS AND THEIR RELATIONSHIP TO
LAND USE COMPATIBILITY

A general consensus has developed for use of the Day-Night Sound Level (Ldn) in describing environmental noise in general, and for relating the acceptability of the noise environment for various land uses. The Day-Night Sound Level represents the 24-hour average sound level for a typical day, with nighttime noise levels (10:00 P.M. to 7:00 A.M.) increased by 10 decibels prior to computation of the 24-hour average.

The Ldn descriptor employs a process of averaging instantaneous A-Weighted sound levels as read on a standard Sound Level Meter, which are normally referred to as meter readings in dBA. A brief description of the acoustic terminology and symbols used are provided in APPENDIX B. The average noise level during a one hour period is called the hourly equivalent sound level, and is designated as $Leq(h)$ or Leq . The maximum A-Weighted sound level occurring during an intermittent event (or single event) is referred to as the L_{max} value. The mathematical product (or integral) of the instantaneous sound level times the duration of the event is known as the Sound Exposure Level, or L_{se} , and is analogous to the energy of the time varying sound levels associated with the intermittent noise event. Current noise standards and criteria which associate land use compatibility or adverse health and welfare effects with various levels of environmental noise are normally described in terms of Ldn rather than the single event (L_{max} or L_{se}) noise descriptors. The reasons for this are based on the relatively good correlation between the cumulative Ldn descriptor and annoyance reactions of the exposed population. However, at very low levels of environmental noise (55 Ldn or less), other attitudinal variables and biases (besides noise) of the exposed population tend to influence annoyance reactions, and the correlation between annoyance reactions and Ldn levels deteriorates.

TABLE 1, extracted from Reference 1, categorizes the various

TABLE 1
EXTERIOR NOISE EXPOSURE CLASSIFICATION
(RESIDENTIAL LAND USE)

NOISE EXPOSURE CLASS	DAY-NIGHT SOUND LEVEL	EQUIVALENT SOUND LEVEL	FEDERAL⁽¹⁾ STANDARD
Minimal Exposure	Not Exceeding 55 L_{dn}	Not Exceeding 55 L_{eq}	Unconditionally Acceptable
Moderate Exposure	Above 55 L_{dn} But Not Above 65 L_{dn}	Above 55 L_{eq} But Not Above 65 L_{eq}	Acceptable⁽²⁾
Significant Exposure	Above 65 L_{dn} But Not Above 75 L_{dn}	Above 65 L_{eq} But Not Above 75 L_{eq}	Normally Unacceptable
Severe Exposure	Above 75 L_{dn}	Above 75 L_{eq}	Unacceptable

Notes: (1) Federal Housing Administration, Veterans Administration, Department of Defense, and Department of Transportation.

(2) FHWA uses the L_{eq} instead of the L_{dn} descriptor. For planning purposes, both are equivalent if: (a) heavy trucks do not exceed 10 percent of total traffic flow in vehicles per 24 hours, and (b) traffic between 10:00 PM and 7:00 AM does not exceed 15 percent of average daily traffic flow in vehicles per 24 hours. The noise mitigation threshold used by FHWA for residences is 67 L_{eq}.

Ldn levels of outdoor noise exposure with severity classifications. A general consensus among federal agencies has developed whereby residential housing development is considered acceptable in areas where exterior noise does not exceed 65 Ldn. This value of 65 Ldn is used as a federal regulatory threshold for determining the necessity for special noise abatement measures when applications for federal funding assistance are made.

Federal agencies (HUD and EPA) recognize 55 Ldn as a desirable goal for exterior noise in residential areas for protecting the public health and welfare with an adequate margin of safety (References 2 and 3). Although 55 Ldn is significantly quieter than 65 Ldn, the lower level has not been adopted for regulatory purposes by federal agencies due to economic and technical feasibility considerations.

The U.S. Federal Highway Administration (FHWA) uses the Leq or L10 descriptors rather than the Ldn noise descriptor in assessing highway noise impacts and noise mitigation requirements (Reference 4). The L10 descriptor represents the noise level exceeded ten percent of the time during the peak traffic hour of interest. The Leq is normally evaluated during the peak traffic hour, and has been selected for use in this study. TABLE 2, which was extracted from Reference 4, presents the current FHWA Noise Abatement Criteria which are normally applied in evaluations of potential noise impacts on federally-sponsored roadway improvement projects. In general, the 67 Leq threshold for Activity Category B is applied at all residences in the vicinity of these roadway improvement projects. Where use of the 67 Leq threshold would result in a significant increase in background ambient noise levels at residences which are located in quiet communities, the FHWA 57 Leq criteria can be used as a more conservative noise abatement threshold.

TABLE 2

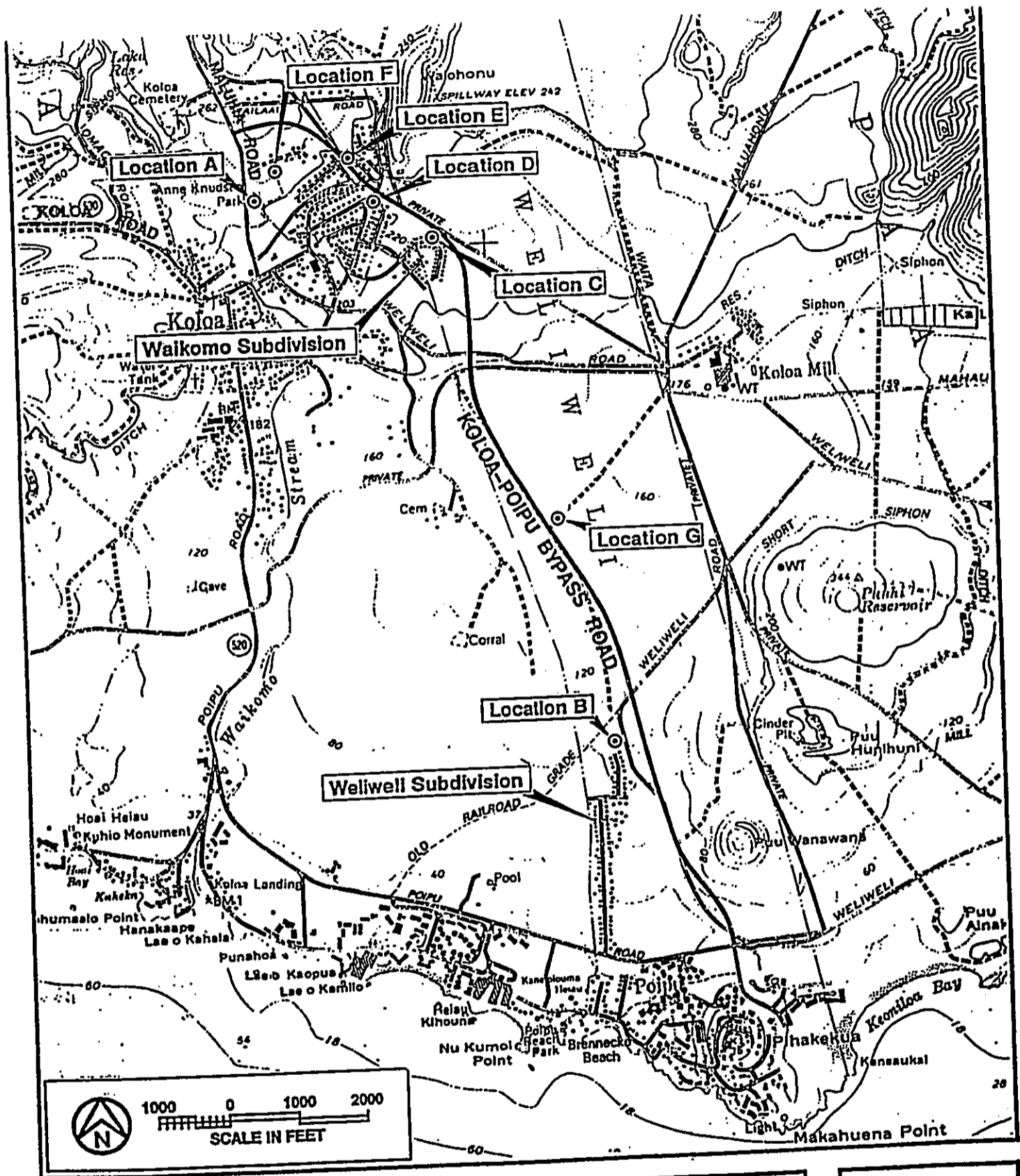
FHWA NOISE ABATEMENT CRITERIA
[Hourly A-Weighted Sound Level--Decibels (dBA)]

<u>ACTIVITY CATEGORY</u>	<u>LEQ (H)</u>	<u>DESCRIPTION OF ACTIVITY CATEGORY</u>
A	57 (Exterior)	Lands on which serenity and quiet are of extraordinary significance and serve an important public need and where the preservation of those qualities is essential if the areas are to continue to serve their intended purpose.
B	67 (Exterior)	Picnic areas, recreation areas, playgrounds, activity sports areas, parks, residences, motels, hotels, churches, libraries, and hospitals.
C	72 (Exterior)	Developed lands, properties, or activities not included in Categories A or B above.
D	-----	Undeveloped lands.
E	52 (Interior)	Residences, motels, hotels, public meeting rooms, schools, churches, libraries, hospitals, and auditoriums.

CHAPTER III. GENERAL STUDY METHODOLOGY

Existing background ambient and traffic noise levels were measured at seven locations in the project environs to provide a basis for describing the existing background ambient noise levels and for developing the project's traffic noise contributions along the alignment of the Koloa-Poipu Bypass Road. The noise measurements were performed during the month of November 1992 (prior to construction of the first increment of the Bypass Road) and during the month of November 1993 (following construction of the first increment of the Bypass Road). The background ambient noise measurements were obtained to identify possible noise impacts resulting from increases in ambient noise levels due to traffic noise from the Koloa-Poipu Bypass Road alignment. The noise measurement Locations A thru G are shown in FIGURE 1, and the measurement results are included in TABLE 3 and FIGURES 2 thru 9. Location A was a traffic noise monitoring station alongside Maluhia Road in Koloa, and Location B was a background ambient noise monitoring station in the State Park adjacent to the existing Weliweli residential subdivision. Locations C thru F were background ambient noise monitoring stations in the newer Waikomo Subdivision as well as in the older sections of Koloa Town. Location G was a traffic noise monitoring station along the completed first increment of the Bypass Road.

The Federal Highway Administration (FHWA) Traffic Noise Prediction Model (Reference 5) was used as the primary method of calculating the existing and future traffic noise levels, with model parameters adjusted to reflect terrain, ground cover, and local shielding conditions. At the noise measurement locations alongside Maluhia Road north of Koloa Town (Location A) and the new Bypass Road (Location G), the measured traffic noise levels were compared with model predictions to insure that measured and calculated noise levels for the existing conditions were consistent and in general agreement. As indicated in TABLE 3, spot counts of



KOLOA-POIPU BYPASS ROAD ALIGNMENT AND LOCATIONS OF NOISE MEASUREMENT SITES

FIGURE 1

TABLE 3

TRAFFIC AND BACKGROUND AMBIENT NOISE MEASUREMENTS

LOCATION	Time of Day (HRS)	Ave. Speed (MPH)	--Hourly Traffic Volume--			Measured Leq (dB)	Predicted Leq (dB)
			AUTO	M.TRUCK	H.TRUCK		
A. 50 FT from the center-- line of Maluhia Rd. (11/9/92).	1545 TO 1645	45	477	18	6	64.8	64.8
B. 53 FT from the center-- line of Cane Haul Road at State Park. (11/9/92)	2110 TO 2155	N/A	N/A	N/A	N/A	47.4 *	N/A
B. 53 FT from the center-- line of Cane Haul Road at State Park. (11/10/92).	0925 TO 1025	N/A	N/A	N/A	N/A	48.3	N/A
C. 135 FT from the center-- line of Cane Haul Road near Mamaki St. (11/16/93)	1225 TO 1322	N/A	N/A	N/A	N/A	43.8	N/A

Notes:

* Strong winds present (10 to 20 MPH) during measurement. Background noise of 44 dBA measured during light wind conditions

TABLE 3 (CONTINUED)

TRAFFIC AND BACKGROUND AMBIENT NOISE MEASUREMENTS

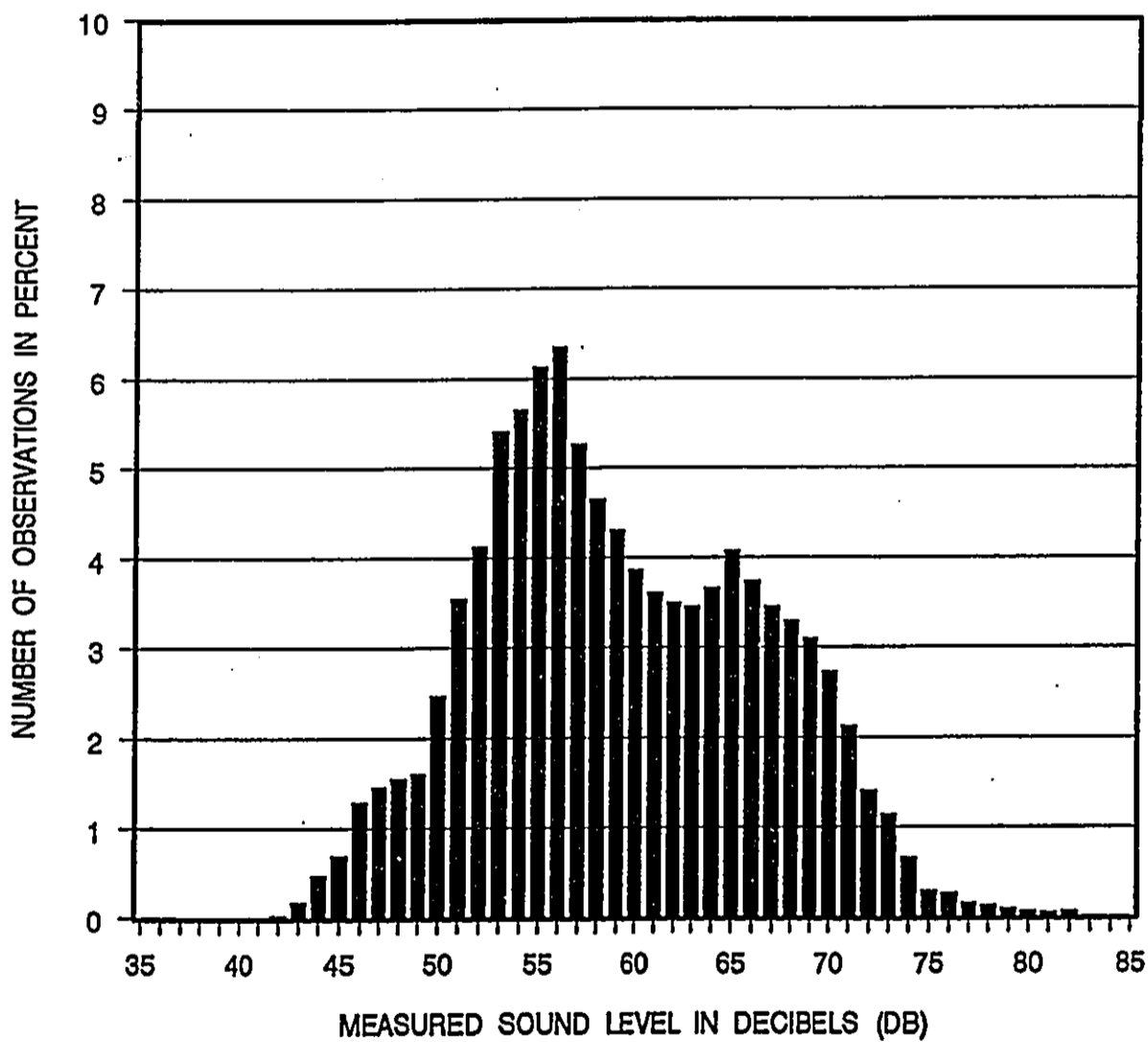
LOCATION	Time of Day (HRS)	Ave. Speed (MPH)	--Hourly Traffic Volume--			Measured Leg (dB)	Predicted Leg (dB)
			AUTO	M.TRUCK	H.TRUCK		
D. 165 FT from the center-- line of Cane Haul Road at Intersection of Wallaau Rd. & Ohuuhu St. (11/16/93)	1105	N/A	N/A	N/A	N/A	54.3	N/A
	TO 1205						
E. 20 FT from the center -- line of Cane Haul Road near Welivell Stream. (11/16/93)	0945	N/A	N/A	N/A	N/A	48.5	N/A
	TO 1045						
F. 590 FT from the center -- line of Cane Haul Road at Koloa Park. (11/16/93)	1355	N/A	N/A	N/A	N/A	44.6	N/A
	TO 1455						
G. 50 FT from the center -- line of Poipu Bypass Rd. (11/16/93)	0811	40	135	2	7	58.5	58.5
	TO 0911						

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

FIGURE 2
HISTOGRAM OF MEASURED SOUND LEVELS AT
LOCATION 'A'
(1555 TO 1655 HOURS)

DATE: NOVEMBER 9, 1992

METER RESPONSE: FAST

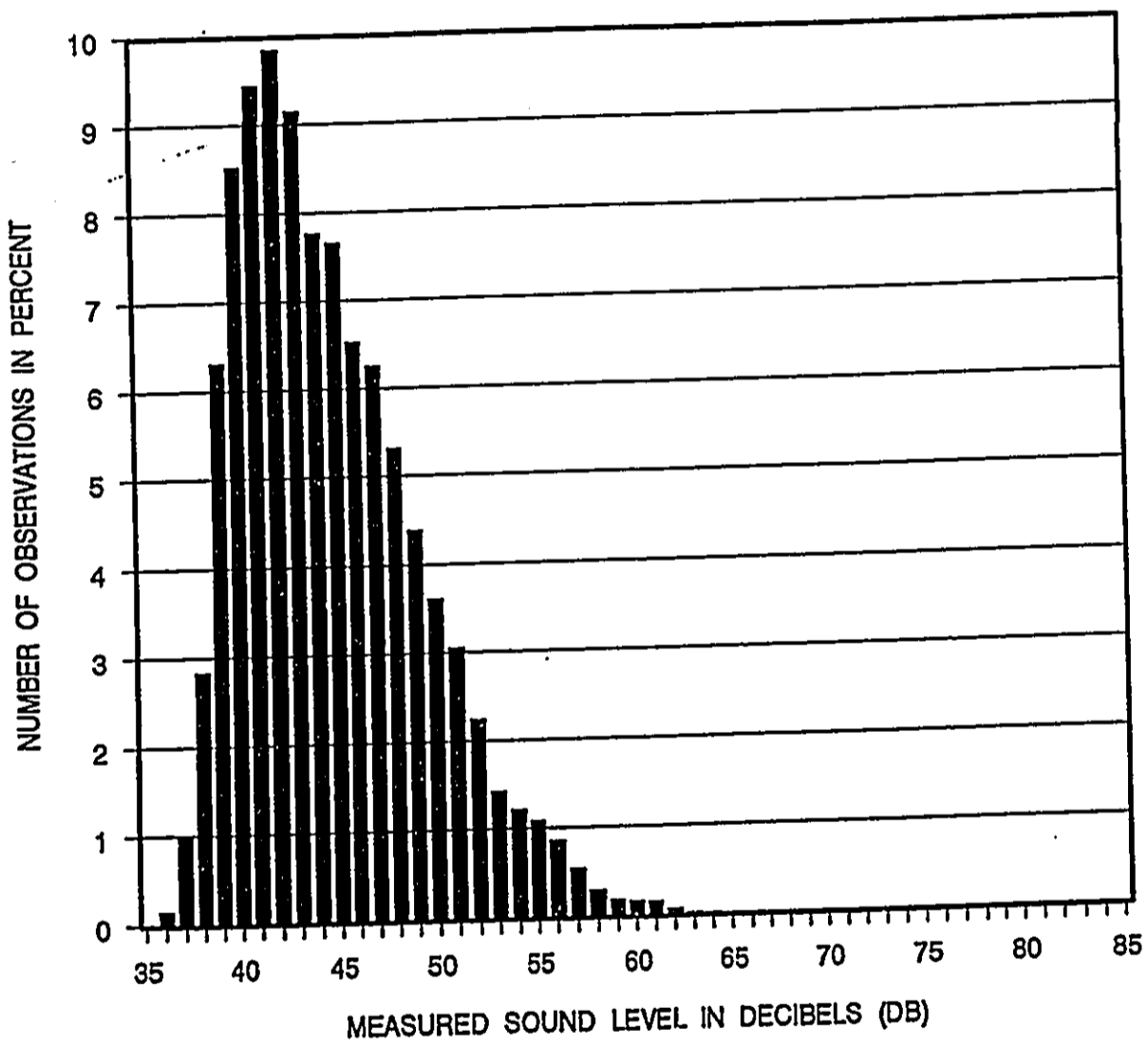


Lmax: 82.3 dBA
L10: 69.0 dBA
L50: 58.0 dBA
Leq: 64.8 dBA
Lmin: 41.7 dBA

FIGURE 3
HISTOGRAM OF MEASURED SOUND LEVELS AT
LOCATION 'B'
(2110 TO 2210 HOURS)

DATE: NOVEMBER 9, 1992

METER RESPONSE: FAST



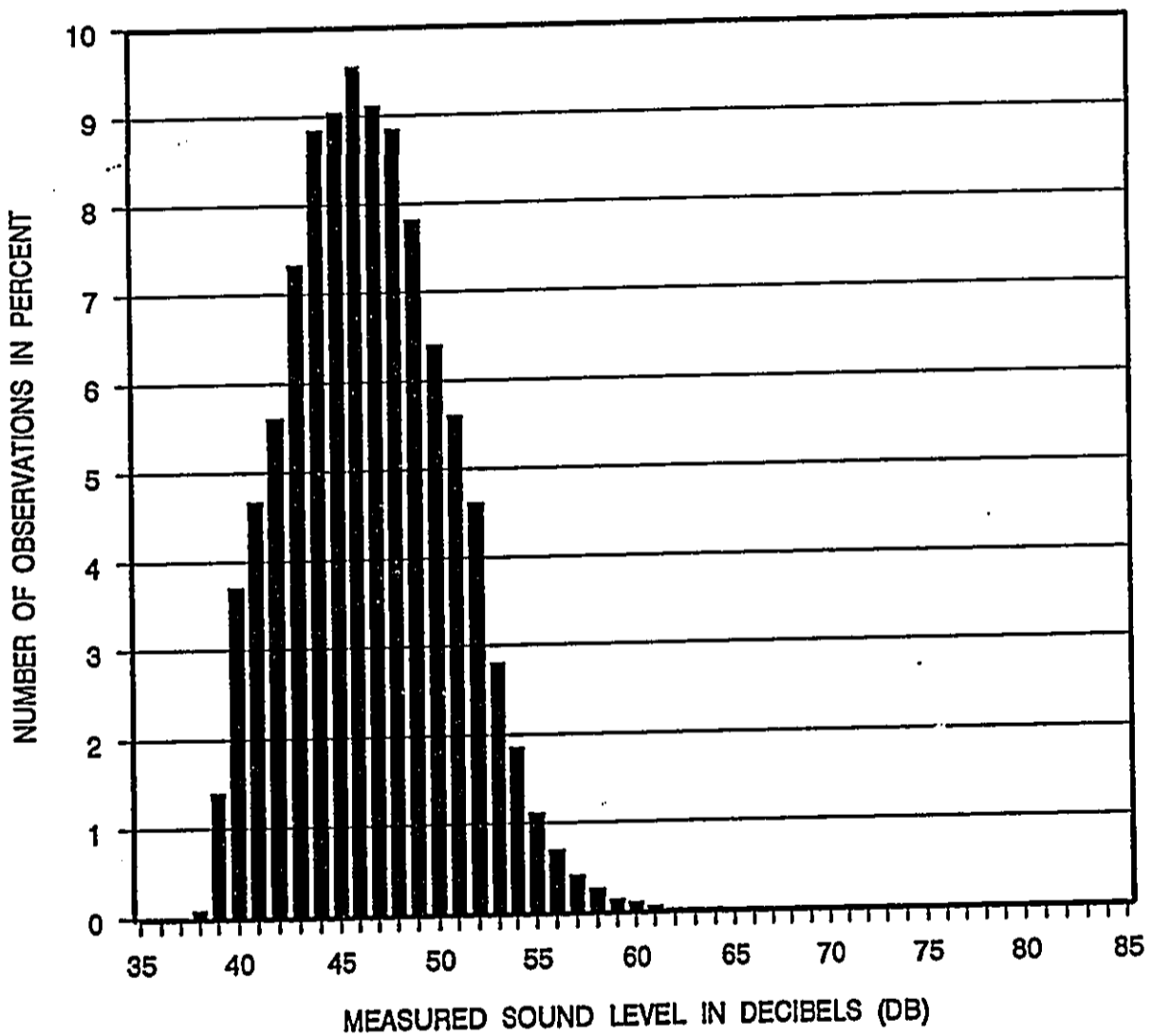
Lmax: 64.6 dBA
L10: 50.5 dBA
L50: 43.5 dBA
Leq: 47.4 dBA
Lmin: 35.6 dBA

FIGURE 4

HISTOGRAM OF MEASURED SOUND LEVELS AT
LOCATION 'B'
(0925 TO 1025 HOURS)

DATE: NOVEMBER 10, 1992

METER RESPONSE: FAST

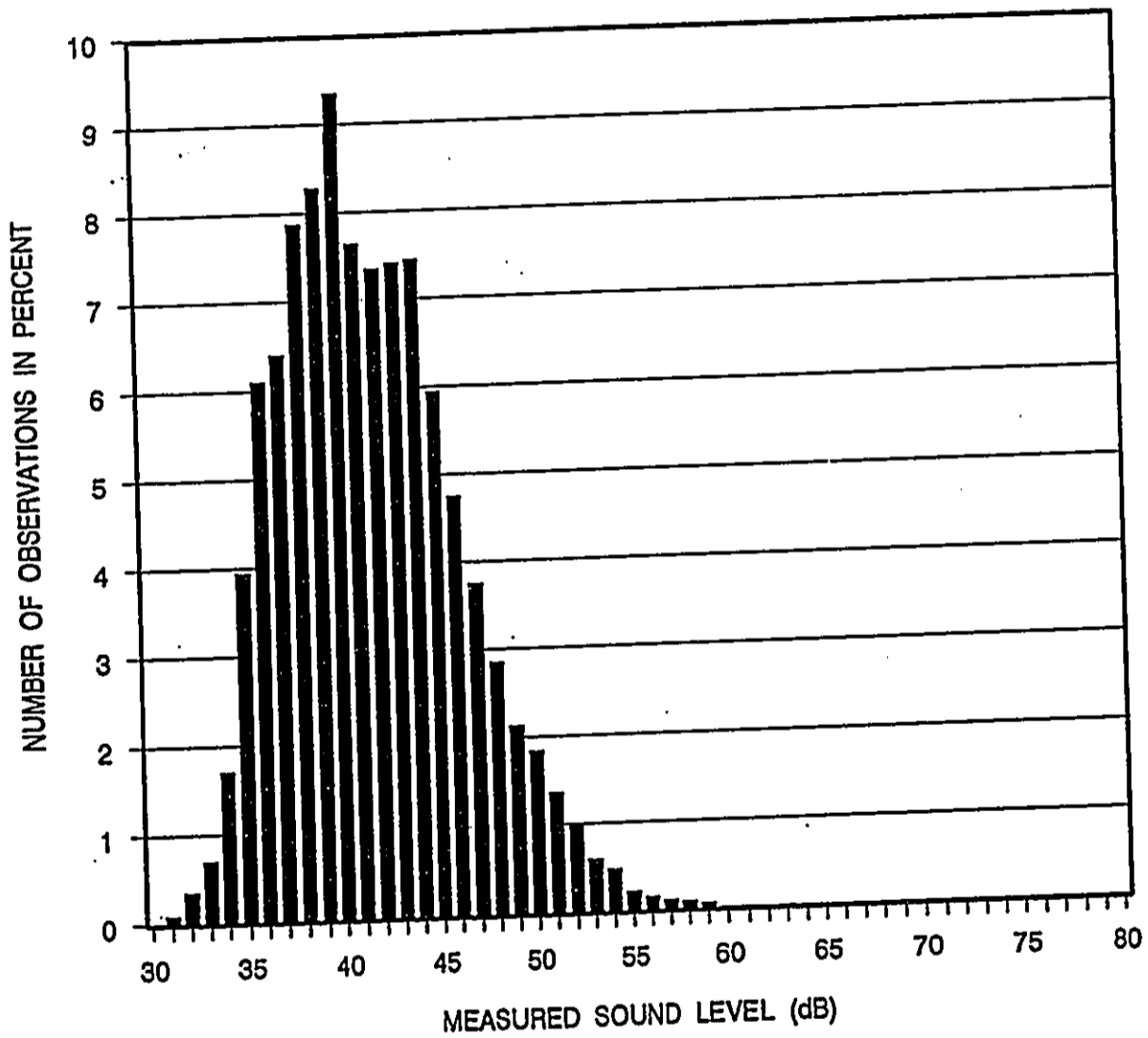


Lmax: 68.3 dBA
L10: 51.5 dBA
L50: 46.0 dBA
Leq: 48.3 dBA
Lmin: 37.7 dBA

FIGURE 5
HISTOGRAM OF MEASURED SOUND LEVELS AT
LOCATION 'C'
(1225 TO 1322 HOURS)

DATE: NOVEMBER 16, 1993

METER RESPONSE: FAST

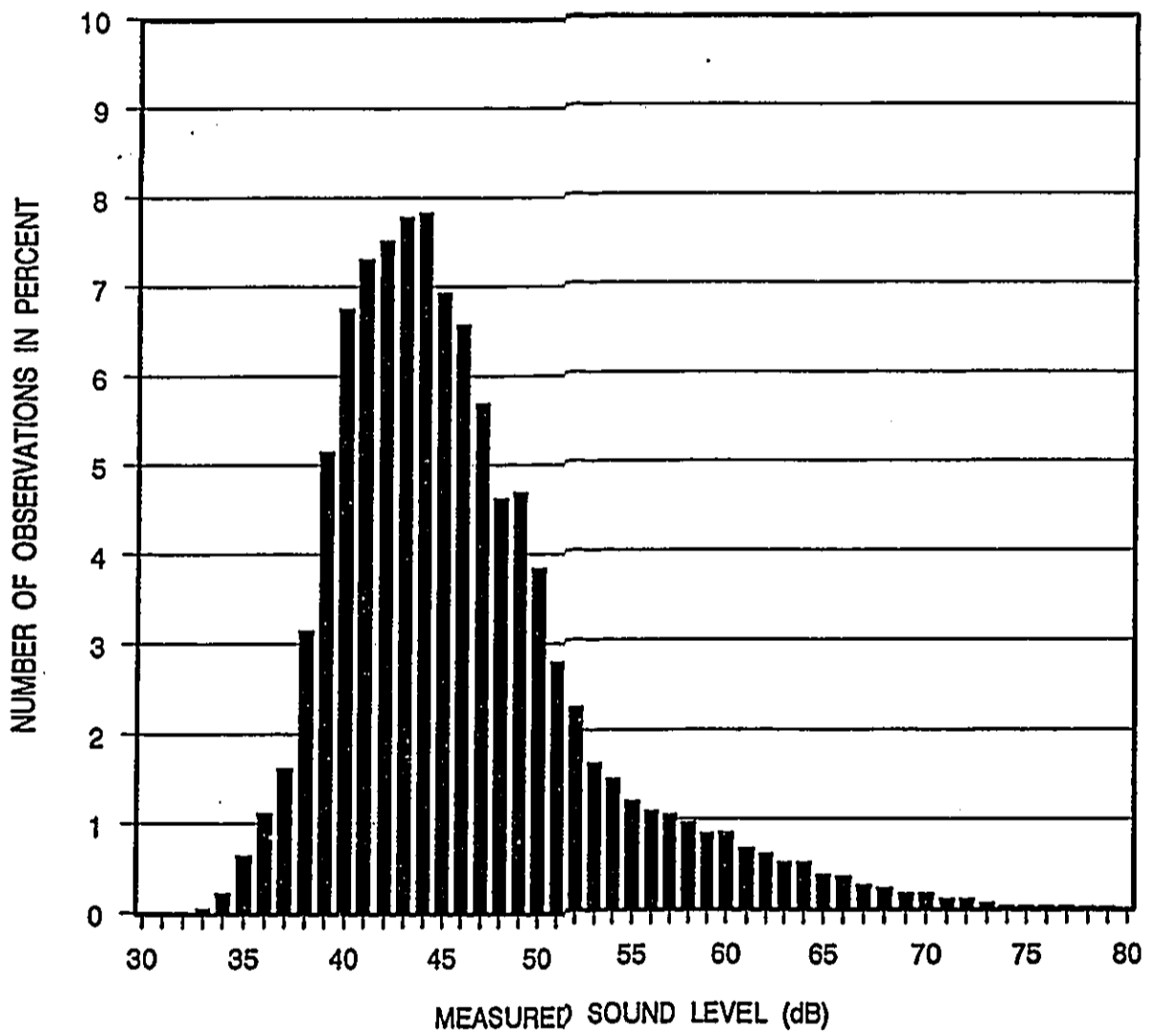


Lmax: 63.9 dBA
 L10: 47.1 dBA
 L50: 40.6 dBA
 Leq: 43.8 dBA
 Lmin: 29.9 dBA

FIGURE 6
HISTOGRAM OF MEASURED SOUND LEVELS AT
LOCATION 'D'
(1105 TO 1205 HOURS)

DATE: NOVEMBER 16, 1993

METER RESPONSE: FAST

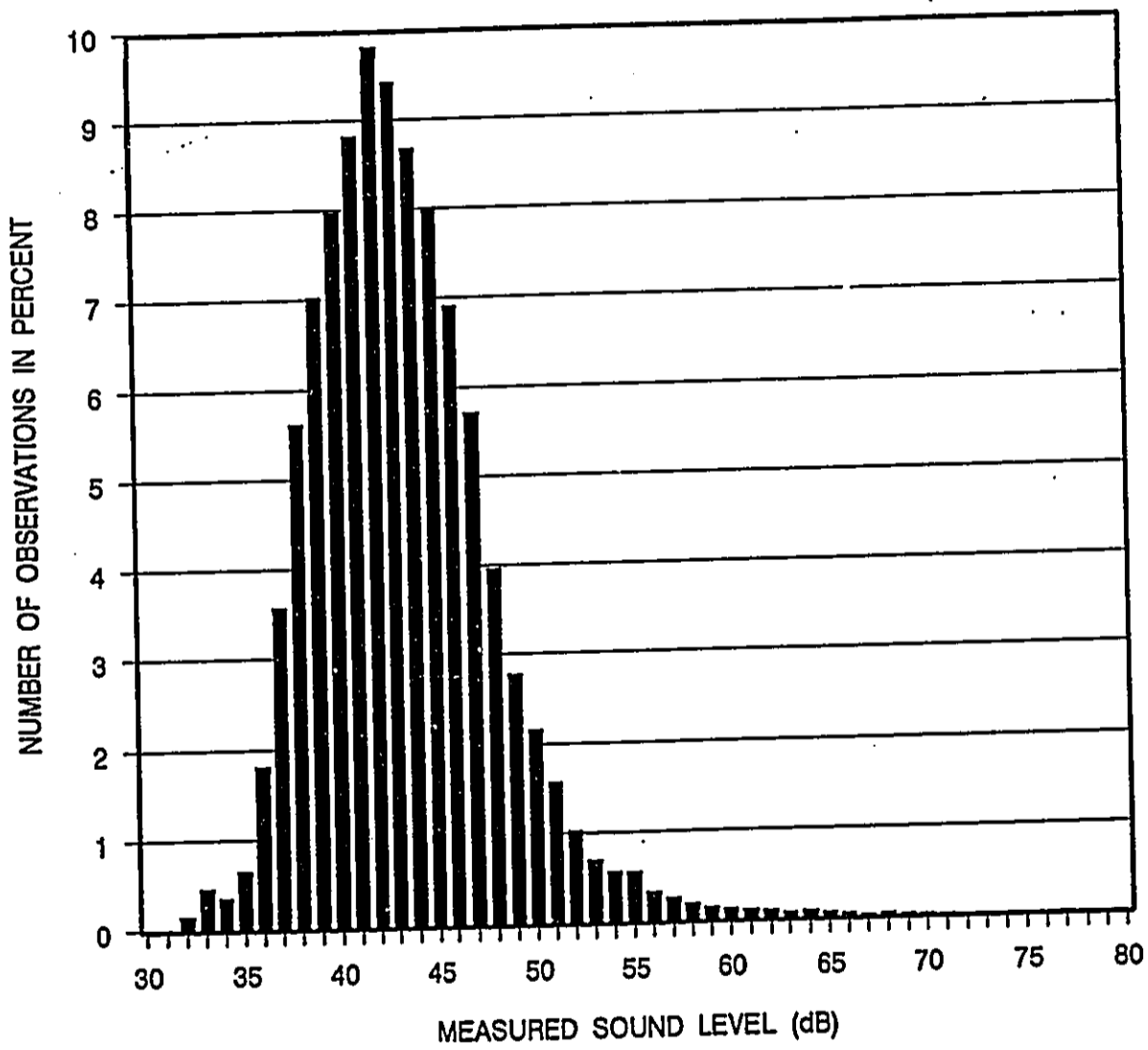


Lmax: 79.0 dBA
L10: 54.1 dBA
L50: 44.1 dBA
Leq: 54.3 dBA
Lmin: 32.4 dBA

FIGURE 7
HISTOGRAM OF MEASURED SOUND LEVELS AT
LOCATION 'E'
(0945 TO 1045 HOURS)

DATE: NOVEMBER 16, 1993

METER RESPONSE: FAST

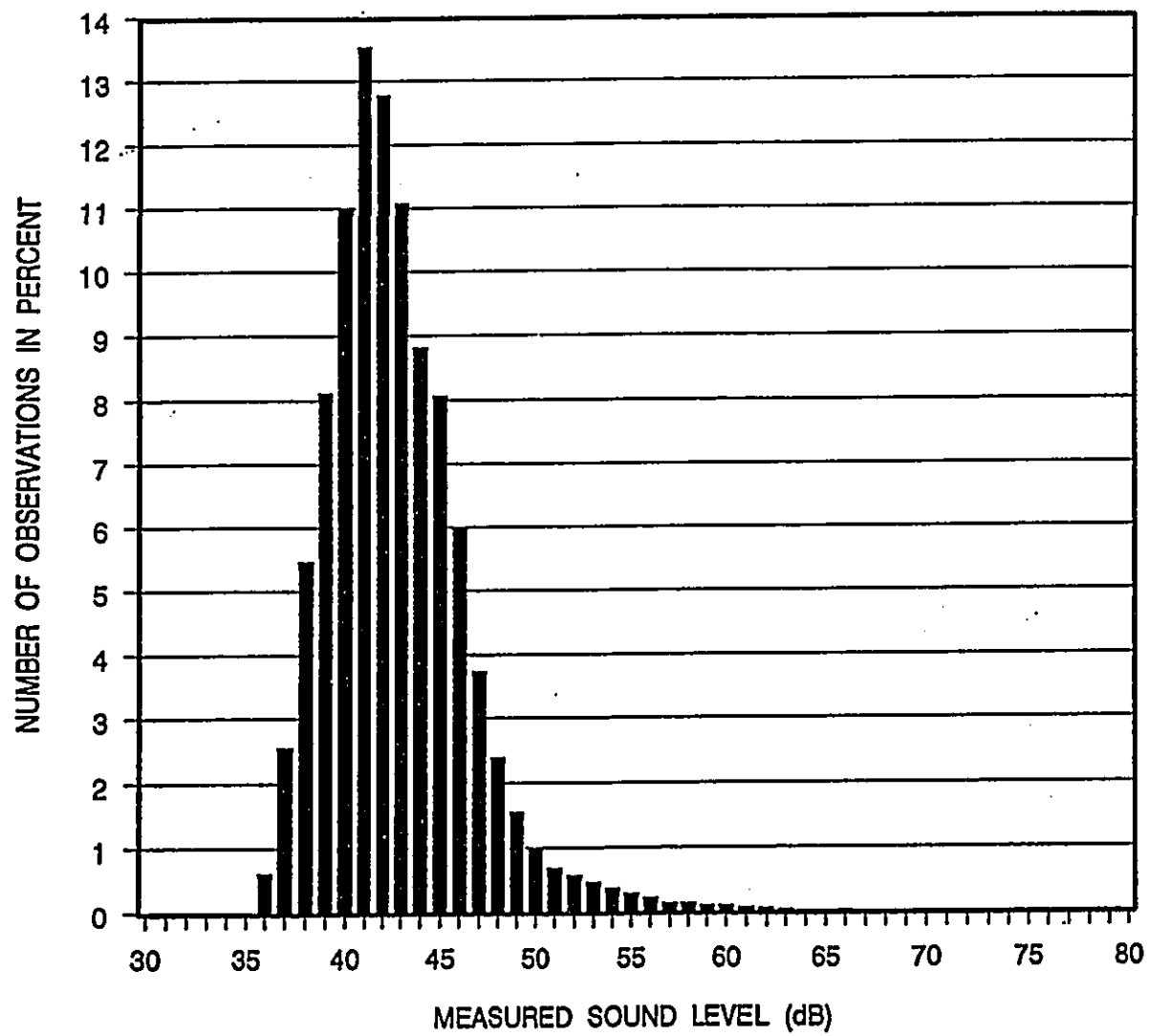


Lmax: 82.9 dBA
 L10: 48.1 dBA
 L50: 42.1 dBA
 Leq: 48.5 dBA
 Lmin: 31.1 dBA

FIGURE 8
HISTOGRAM OF MEASURED SOUND LEVELS AT
LOCATION 'F'
(1355 TO 1455 HOURS)

DATE: NOVEMBER 16, 1993

METER RESPONSE: FAST

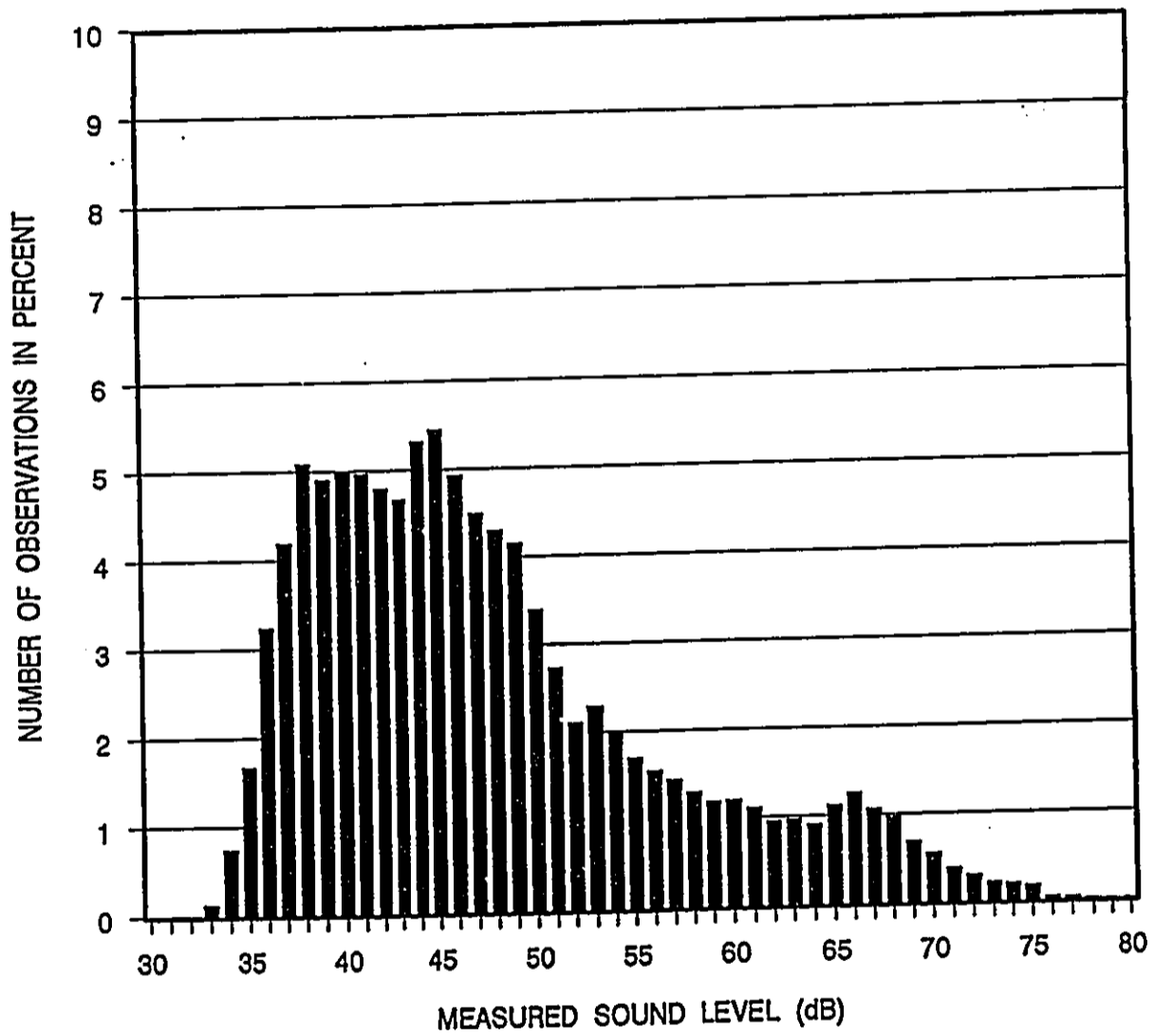


Lmax: 68.1 dBA
L10: 46.1 dBA
L50: 41.6 dBA
Leq: 44.6 dBA
Lmin: 34.7 dBA

FIGURE 9
HISTOGRAM OF MEASURED SOUND LEVELS AT
LOCATION 'G'
(0811 TO 0911 HOURS)

DATE: NOVEMBER 16, 1993

METER RESPONSE: FAST



Lmax: 80.4 dBA
 L10: 60.6 dBA
 L50: 44.6 dBA
 Leq: 58.5 dBA
 Lmin: 31.7 dBA

existing traffic volumes were obtained during the measurement periods and were used to generate the Equivalent Sound Level (Leq) predictions shown in the table. The agreement between measured and predicted traffic noise levels was considered to be good and sufficiently accurate to justify use of the highway noise model to formulate the traffic noise contours.

Future traffic noise levels for CY 2010 conditions along the Bypass Road alignment were developed at existing noise sensitive developments in the vicinity of the Bypass Road. References 6 thru 8 were used to develop the future (CY 2010) traffic volumes and mix along the Bypass Road. From Reference 6, the future 24-Hour volume along the Bypass Road was assumed to be 21,600 vehicles per day. The PM peak hour was used as the period of highest hourly traffic volumes based on Reference 7, and the future PM peak hour volume was estimated to be 1,847 vehicles per hour using a 8.55 percent PM-K Factor (ratio of PM Peak Hour to 24-Hour Volumes). Traffic mix along the Bypass Road was assumed to consist of 96 percent autos, 2 percent medium trucks, and 2 percent heavy trucks. A design speed of 30 miles per hour was assumed along the sections of the Bypass Road within 460 FT of the intersection with Wailaau Road. Along the other sections of the Bypass Road, a higher design speed of 40 miles per hour was assumed. The Equivalent (or average) Hourly Sound Level [Leq(h)] noise descriptor was used to develop the traffic noise contours as required by Reference 4. These Leq contours were also supplemented with the Ldn contours for comparison with the 65 Ldn FHA/HUD noise standard, as well as with spot calculations of Leq at existing residences alongside the Bypass Road. Data from aerial and topographic maps of the area, as well as from the Bypass Road's plans, profiles, and typical sections were used to determine terrain and local shielding effects during computations of the future traffic noise levels.

The predicted CY 2010 traffic noise levels along the Bypass Road at existing noise sensitive receptors were also evaluated in

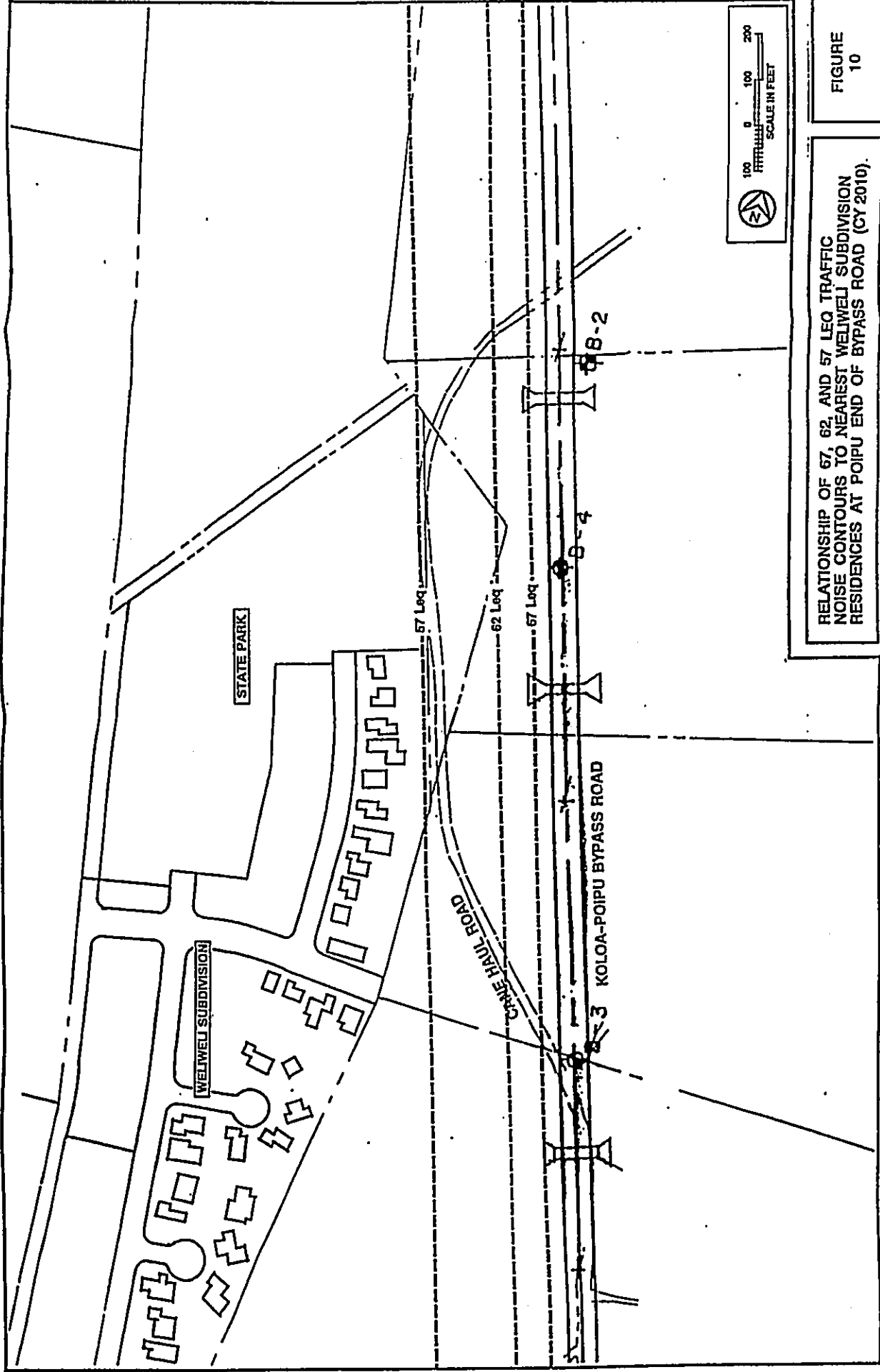
tabular format. At the existing residences of the Weliweli Subdivision, Waikomo Subdivision, and within the other sections of Koloa Town (see FIGURE 1), the predicted future traffic noise levels were compared with FHWA noise abatement criteria (see TABLE 2) to determine specific locations where noise abatement measures might be necessary. The exterior criteria of 67 Leq(h) shown in TABLE 2 was applied to all existing dwellings and the State Park near Location B. Because measured background ambient noise levels at Locations B thru F were relatively low, use of the lower 57 Leq(h) FHWA criteria was also considered for evaluating potential risks of adverse noise impacts resulting from a significant increase in the existing noise environment at residences alongside the Bypass Road. Additionally, the locations of the 57, 62, and 67 Leq(h) and the 65, 60, and 55 Ldn traffic noise contours (at 40 MPH design speed) without the benefit of shielding from natural terrain or man-made sound barriers were provided for siting future noise sensitive land uses along the Bypass Road alignment and for providing adequate buffer space between the Bypass Road and these future land uses. Where noise mitigation measures were required, the use of noise barriers was tested to determine if the barriers would be effective in mitigating adverse noise impacts.

CHAPTER IV. CY 2010 TRAFFIC NOISE ENVIRONMENT AND IMPACTS
ALONG THE KOLOA-POIPU BYPASS ALIGNMENT

General. The Year 2010 was used to describe the future traffic noise levels along the Koloa-Poipu Bypass Road. The future traffic noise environment along the Bypass Road was described by computing the noise contours of Hourly Equivalent Sound Level [Leq(h)] and Average Day-Night Sound Level (Ldn) for the CY 2010 time period. The Leq sound level contours, expressed in decibels, represent the average level of traffic noise for the PM peak hour of traffic, which was assumed to be the hour with the highest traffic noise levels. The Ldn contours were assumed to be 0.3 dB greater than the PM peak hour Leq contours. This relationship between the Ldn and Leq contours was determined from the hourly variations of traffic at the Koloa Road and Poipu Road intersection in CY 1991 (Reference 7).

Weliweli Subdivision. The relationship of the CY 2010 traffic noise contours to existing residences of the Weliweli Subdivision are shown in FIGURES 10 and 11. As indicated in the figures, both the 65 Ldn (which is the FHA/HUD noise standard) and the 67 Leq (which is the FHWA noise standard) noise contours do not extend into the existing residential lots west of the Bypass Road. Similar conclusions also apply to the State Park north of the existing residential subdivision. Because of this, traffic noise mitigation measures should not be required at the Weliweli Subdivision or State Park.

Background ambient noise levels in the vicinity of the State Park and at the Weliweli Subdivision are controlled by distant street traffic, heavy trucks along the cane haul road, aircraft, and the natural sounds of wind, foliage, and birds. During harvesting season, which occurs for a period of approximately two weeks on a two-year cycle, cane haul trucks are the dominant noise source at the existing Weliweli Subdivision residences which are



RELATIONSHIP OF 67, 62, AND 57 LEO TRAFFIC NOISE CONTOURS TO NEAREST WELIWELI SUBDIVISION RESIDENCES AT POIPU END OF BYPASS ROAD (CY 2010).

FIGURE 10

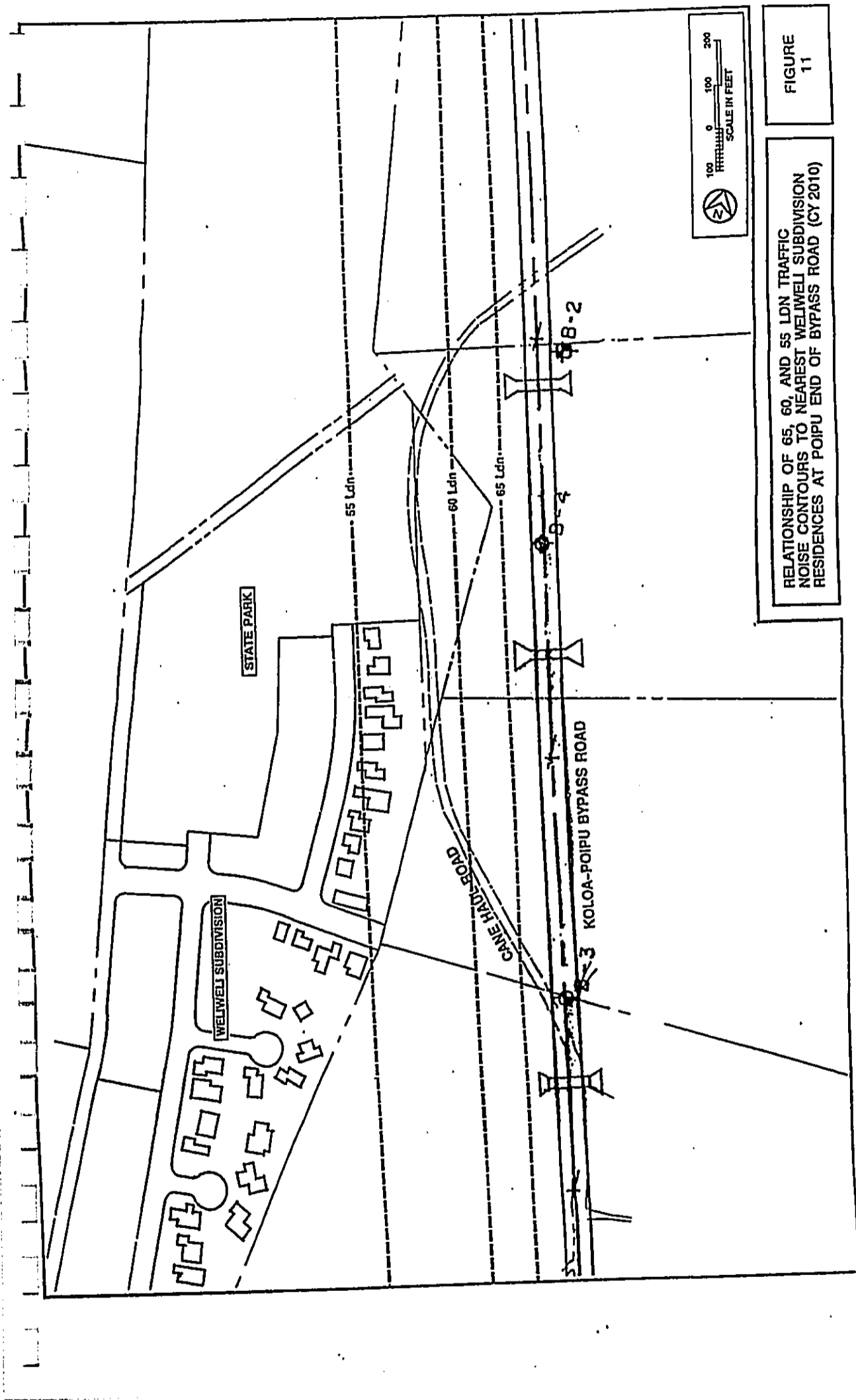


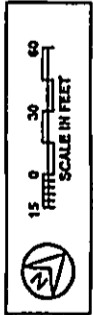
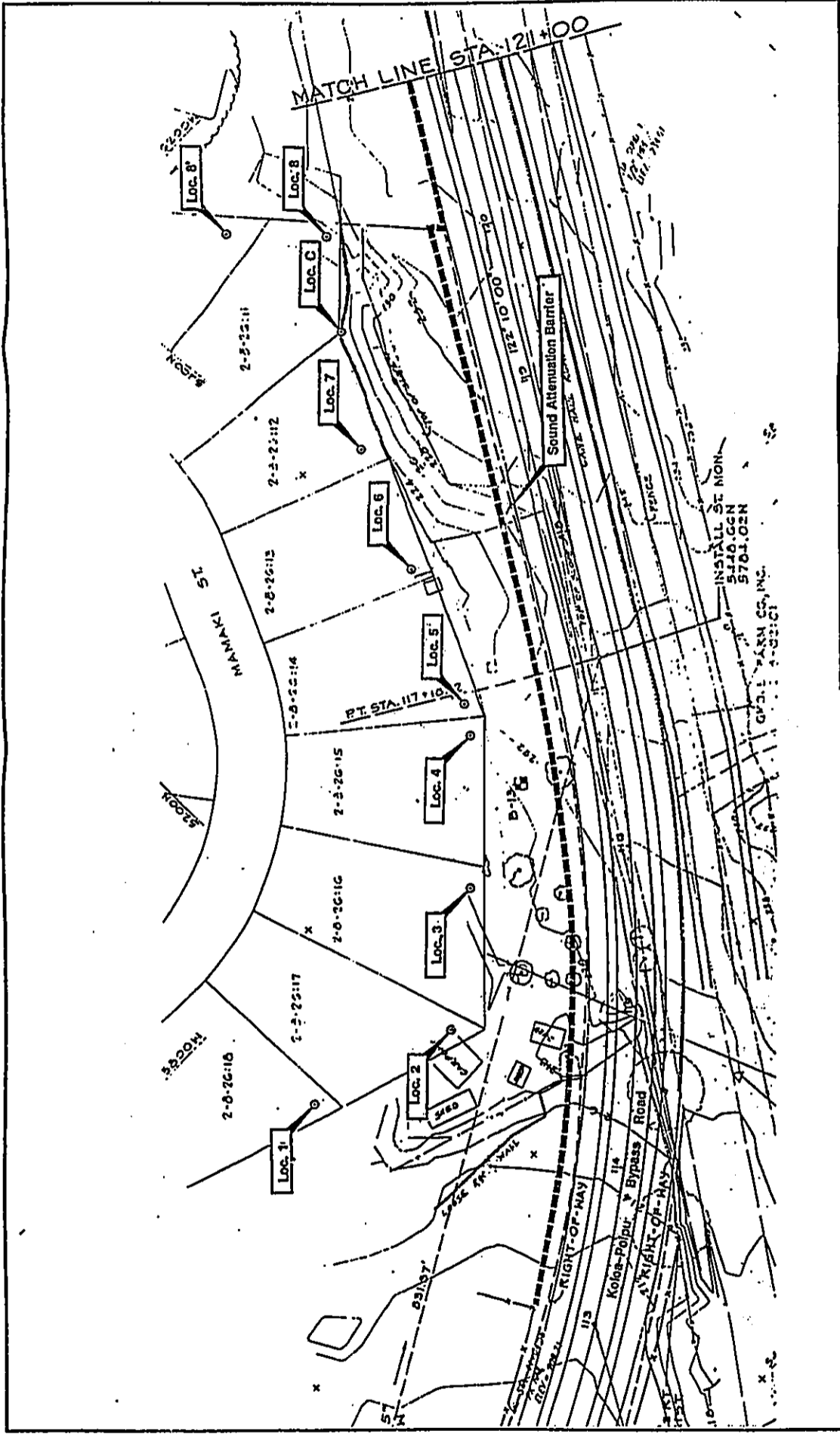
FIGURE
11

RELATIONSHIP OF 65, 60, AND 55 LDN TRAFFIC
NOISE CONTOURS TO NEAREST WELWELI SUBDIVISION
RESIDENCES AT POIPU END OF BYPASS ROAD (CY 2010)

closest to the Bypass Road alignment, and approximately 100 FT from the haul road. Typical noise levels at these homes during the harvesting season are approximately 85 dB (Lmax) during the cane haul truck passes, 60 Leq(h) for each hour, and 66 Ldn for each day of harvest. Harvesting of the sugar cane fields occurs for 3 work shifts per day, with approximately 150 inbound haul trucks per day using the cane haul road the harvest season. On an annual average basis, accounting for the nominal 2-year growing period between harvesting seasons, the estimated haul truck noise levels at the nearest Weliweli Subdivision residences is 49 Ldn.

Based on the measured background ambient noise levels at Location B, plus the calculations of cane haul truck noise levels, the existing background noise levels at the Weliweli Subdivision residences closest to the Bypass Road is estimated to be approximately 50 to 55 Ldn (annually averaged). During the quiet hours, existing background ambient noise levels range from 45 to 50 Leq. During the sugar cane harvesting season, background ambient noise levels increase by at least 10 dB above these values. Because forecasted traffic noise levels from the Bypass Road are not expected to increase significantly above these existing background noise levels or exceed the 65 Ldn or 67 Leq regulatory standards, traffic noise mitigation measures should not be required at the Weliweli Subdivision or at the State Park.

Waikomo Subdivision. The relationship of the proposed Bypass Road to existing residences of the Waikomo Subdivision, Unit 4, is shown in FIGURE 12. The predicted PM Peak Hour Equivalent Sound Level (or Leq) at these residential lots (Receptor Locations 1 thru 8') are shown in TABLE 4. As indicated in the table, the 65 Ldn FHA/HUD noise standard is predicted to be exceeded at four of the lots (Locations 2 thru 5) which have lot frontages along the Bypass Road. The 67 Leq FHWA noise standard is predicted to be exceeded at three of these lots (Locations 3 thru 5). Traffic noise levels at Locations 1 thru 8' are predicted to range from 60



RELATIONSHIP OF BYPASS ROAD TO RESIDENCES AT THE WAIKOMO SUBDIVISION, UNIT 4

FIGURE 12 (REVISION 2)

TABLE 4

PREDICTED PM PEAK HOUR EQUIVALENT
SOUND LEVELS AT RESIDENCES ALONG THE
PROPOSED SECOND INCREMENT OF
THE KOLOA-POIPU BYPASS ROAD

<u>LOCATION</u>	<u>WITHOUT BARRIER LEQ (dB)</u>	<u>WITH BARRIER LEQ (db)</u>
1	60.9	57.8
2	66.5	61.0
3	67.3	61.1
4	69.9	63.4
5	68.5	61.8
6	64.5	58.8
7	62.9	58.8
8	62.6	58.5
8'	59.5	55.3
9	57.1	50.8
10	63.4	56.9
11	62.2	55.4
12	60.0	54.2
13	58.8	56.0
14	57.5	53.9
15	57.9	52.2
16	57.9	51.8
17	57.4	51.0
18	59.8	53.5
19	59.1	53.1
20	56.9	50.4
21	59.1	53.5
22	61.1	54.3
23	61.9	55.8
24	62.7	55.7
25	60.4	58.6
26	56.5	55.5
27	56.1	N/A
28	56.3	N/A
29	54.2	N/A

to 70 Leq by CY 2010. Traffic noise mitigation measures will be required along this section of the Bypass Road (Stations 113 thru 121) due to the proximity of the proposed Bypass Road Alignment to the Waikomo Subdivision.

Background ambient noise levels in the vicinity of the Waikomo Subdivision are controlled by heavy trucks along the cane haul road, aircraft, and the natural sounds of wind, foliage, and birds. During harvesting season of the north and east sugar cane fields, cane haul trucks are the dominant noise source at the subdivision residences which are closest to the Bypass Road alignment, and approximately 110 FT from the haul road. Typical noise levels at these homes during the harvesting season are similar to those described at the Weliweli Subdivision. However, because the number of fields serviced by the Waikomo Subdivision haul road is greater, haul trucks pass the Waikomo Subdivision approximately 2.2 months (instead of 2 weeks) per year. This results in an annually averaged, existing noise level of approximately 60 Ldn at the closest residences of the Waikomo Subdivision.

Based on measured background ambient noise levels at Location C near the Waikomo Subdivision, plus the calculations of cane haul truck noise levels, the existing background noise level at the Waikomo Subdivision residences closest to the Bypass Road is estimated to be approximately 60 Ldn (annually averaged). During the quiet hours, existing background ambient noise levels range from 40 to 45 Leq. During the sugar cane harvesting season, background ambient noise levels increase by at least 10 dB above these values. Forecasted traffic noise levels from the Bypass Road are expected to increase these existing background noise levels as well as exceed the 65 Ldn or 67 Leq regulatory standards as some of the lots of the subdivision. Therefore, traffic noise mitigation measures will be required at the Waikomo Subdivision.

Koloa Town. The relationships of the proposed Bypass Road to existing residences of the older sections of Koloa Town are shown

in FIGURES 13 thru 15. The predicted PM Peak Hour Equivalent Sound Level (or Leq) at these residential lots (Receptor Locations 9 thru 19, Locations 20 thru 26, and Locations 27 thru 29) are shown in TABLE 4. As indicated in the table, the 65 Ldn (which is the FHA/HUD noise standard) and the 67 Leq (which is the FHWA noise standard) levels are not expected to be exceeded at the Koloa Town lots which have lot frontages along the Bypass Road. Traffic noise levels at Locations 9 thru 29 are predicted to range from 54 to 63 Leq by CY 2010. Mitigation measures will not be required along this section of the Bypass Road (Stations 124 thru 150) to reduce traffic noise to levels below the FHA/HUD 65 Ldn noise standard. Mitigation measures may be required by FHWA, however, to minimize significant increases in the existing background noise levels attributable to the Bypass Road.

Background ambient noise levels in the vicinity of the older sections of Koloa Town are controlled by heavy trucks along the cane haul road, traffic along Wailau and Maluhia Roads, and the natural sounds of wind, foliage, and birds. During harvesting season of the north sugar cane fields, cane haul trucks are the dominant noise source at the subdivision residences which are closest to the Bypass Road alignment, and approximately 40 to 200 FT from the haul road. Typical noise levels at these homes during the harvesting season are similar to those described at the Waikomo Subdivision, and range from 63 to 56 Ldn.

Based on measured background ambient noise levels at Locations D thru F in old Koloa Town, plus the calculations of cane haul truck noise levels, the existing background noise levels at the old Koloa Town residences closest to the Bypass Road are estimated to range from approximately 50 to 63 Ldn (annually averaged). During the quiet hours, existing background ambient noise levels range from 45 to 55 Leq. During the sugar cane harvesting season, background ambient noise levels increase by at least 10 to 15 dB above these values at existing residences within 100 FT of the centerline of the cane haul road. Forecasted traffic noise

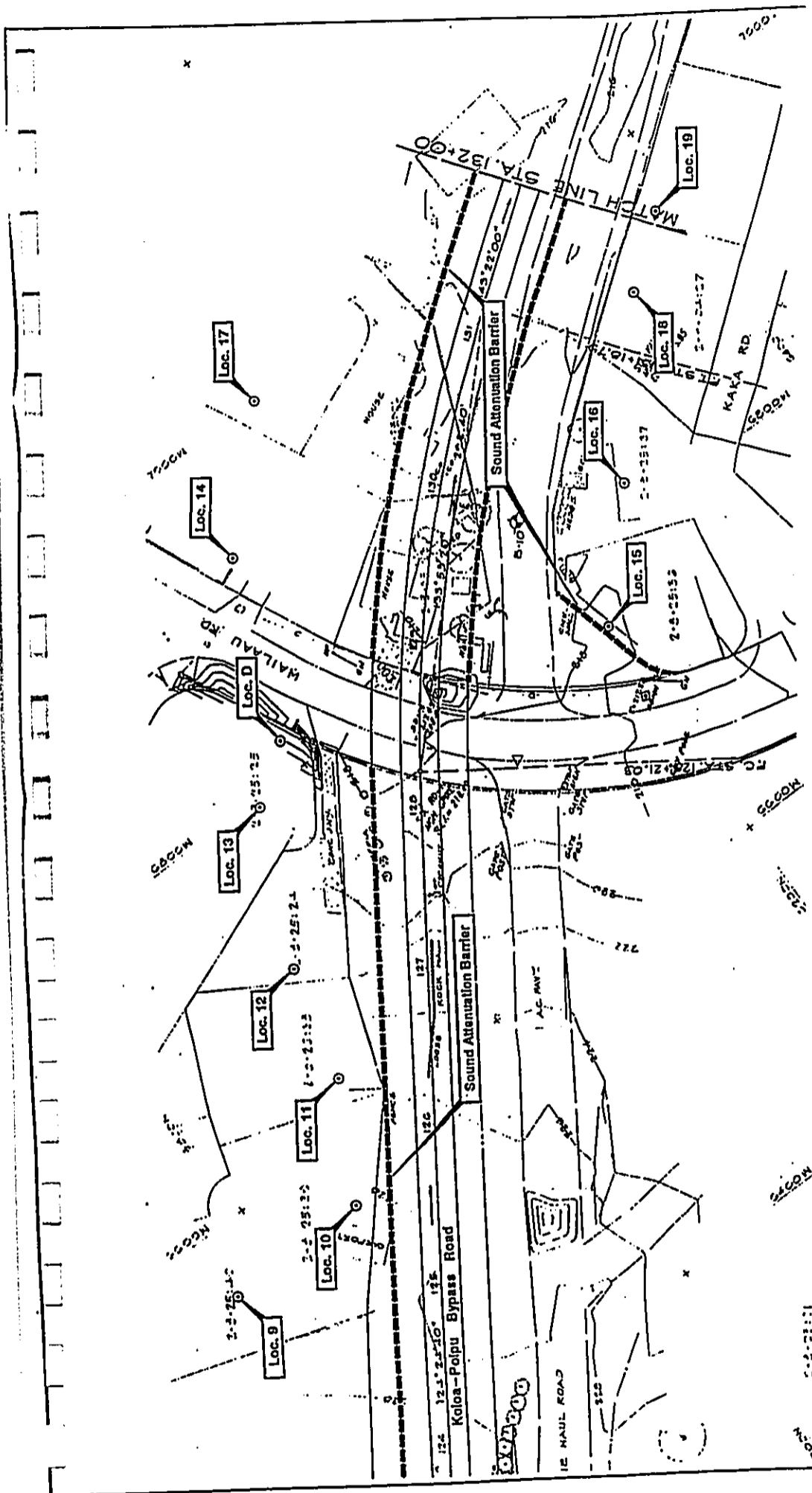
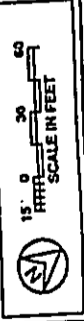


FIGURE 13

RELATIONSHIP OF BYPASS ROAD TO RESIDENCES AT THE WAILAAU ROAD INTERSECTION



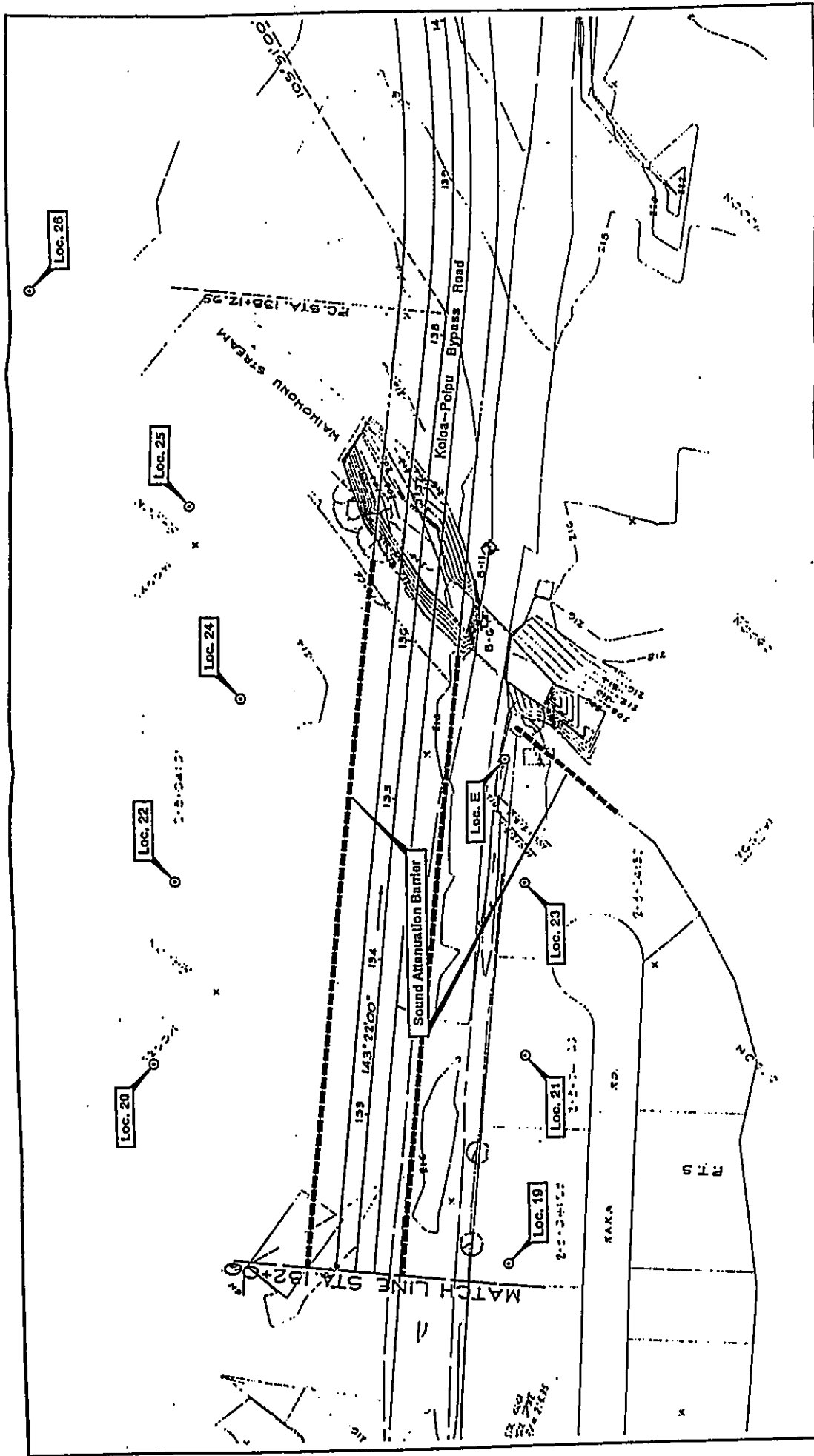
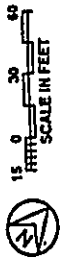
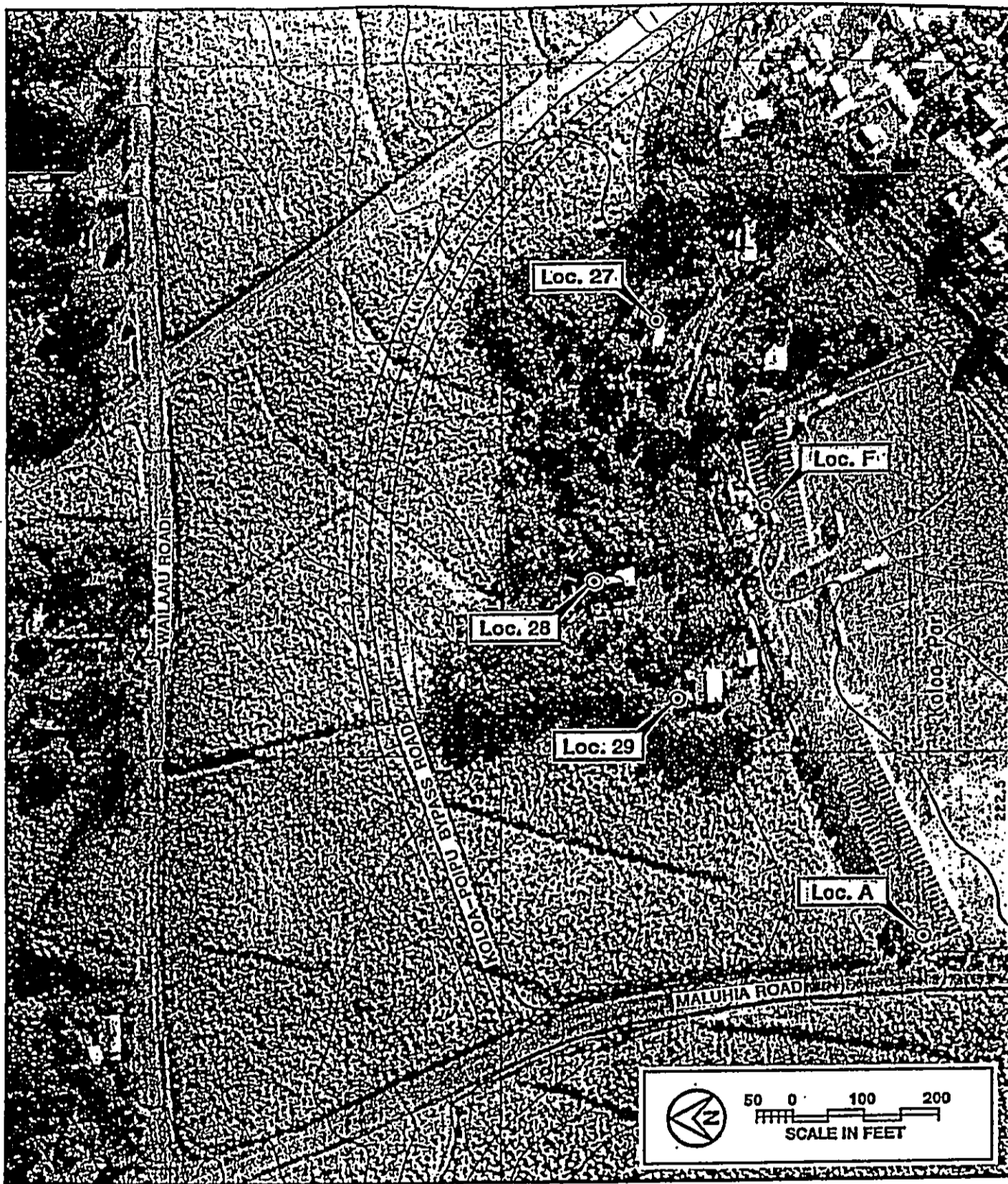


FIGURE 14

RELATIONSHIP OF BYPASS ROAD TO RESIDENCES AT THE WAIHOON STREAM BRIDGE





RELATIONSHIP OF BYPASS ROAD TO RESIDENCES AT THE MALUHIA ROAD INTERSECTION

FIGURE 15

levels from the Bypass Road are expected to increase these existing background noise levels to the range of 55 to 65 Ldn. Traffic noise mitigation measures will be required at some of the receptor locations (Locations 9 thru 25) to prevent a significant increase in existing background noise levels and/or to keep total noise levels from both the haul road and the Bypass Road from exceeding the 65 Ldn FHA/HUD noise standard.

CHAPTER V. FUTURE TRAFFIC NOISE IMPACTS AND RECOMMENDED
NOISE MITIGATION MEASURES

General. Future noise sensitive land uses which may be planned along the Bypass Road represent areas of potential adverse noise impacts if adequate noise mitigation measures are not incorporated into the planning of those projects. It is anticipated that the Bypass Road will be completed prior to the development of the now vacant lands adjacent to the new roadway, and that noise abatement measures such as adequate setbacks, sound attenuating walls or berms, or closure and air conditioning will be incorporated into these new developments as required. The predictions of highway noise levels vs. distance from the centerline of the Bypass Road (see FIGURES 10 and 11) may be used to assist the developers in providing the necessary setbacks to the Bypass Road, but the CY 2010 traffic volume forecasts should be updated as necessary.

Weliweli Subdivision. Along the Koloa-Poipu Bypass Road alignment, one of the primary areas of potential adverse noise impacts is the Weliweli Subdivision at the Poipu end of the Bypass Road. Based on this study, it was concluded that risks of adverse traffic noise impacts at this subdivision were not high and, therefore, did not warrant the incorporation of traffic noise mitigation measures within that section of the Bypass Road's construction project. However, the control of future vehicle speeds on the new Bypass Road is recommended, since traffic noise tends to increase with average vehicle speeds. The posted speed limit on the section of the Bypass Road near the Weliweli Subdivision is planned to be 35 miles per hour. The noise study analysis was performed using a slightly higher design speed of 40 miles per hour. In order to minimize risks of adverse noise impacts at the Weliweli Subdivision, control of vehicle speeds is the recommended noise mitigation measure.

Waikomo Subdivision. Traffic noise levels from the proposed Bypass Road are expected to exceed the 65 Ldn and 67 Leq noise standards at lots adjacent to the Bypass Road. For this reason, the construction of a sound attenuation barrier where indicated in FIGURE 12 is recommended. The minimum heights of the sound attenuation barrier sections and their elevations between Stations 113 and 120 of the Bypass Road are shown in TABLE 5. It will not be possible to reduce CY 2010 traffic noise levels below 57 Leq without the construction of excessively tall (greater than 9 FT in height) barriers. For this reason, control of vehicle speeds along the Bypass Road is also recommended.

Koloa Town. Traffic noise levels from the proposed Bypass Road are not expected to exceed the 65 Ldn and 67 Leq noise standards at lots adjacent to the Bypass Road. However, significant increases (from 57 Ldn to 64 Ldn and from 45 Leq to 63 Leq) in existing background ambient noise levels at existing residences along the Bypass Road are expected to occur by CY 2010. For this reason, the construction of sound attenuation barriers where indicated in FIGURES 13 and 14 is recommended. The minimum heights of the sound attenuation barrier sections and their elevations between Stations 124+20 thru 136+50 of the Bypass Road are shown in TABLE 5. It should be possible to reduce CY 2010 traffic noise levels below 57 Leq with the construction of 6 FT high barriers. Control of vehicle speeds along the Bypass Road is also recommended to minimize additional noise impacts along the road.

TABLE 5 (REVISION 2)

ASSUMED BARRIER ELEVATIONS ALONG THE
PROPOSED SECOND INCREMENT OF THE
KOLOA-POIPU BYPASS ROAD

<u>STA NO.</u>	<u>BARRIER HEIGHT</u>	<u>ELEVATION AT TOP OF BARRIER</u>
113 +00	6 FT	217.5 FT
113 +50	6 FT	218.6 FT
114 +00	6 FT	219.1 FT
114 +50	7 FT	221.2 FT
115 +00	7 FT	222.4 FT
115 +50	7 FT	224.0 FT
116 +00	7 FT	225.6 FT
116 +50	7 FT	230.5 FT
117 +00	7 FT	228.4 FT
117 +50	7 FT	229.2 FT
118 +00	7 FT	230.3 FT
118 +50	6 FT	232.0 FT
119 +00	6 FT	233.9 FT
119 +50	6 FT	235.0 FT
120 +00	6 FT	236.2 FT
120 +50	6 FT	238.0 FT
121 +00	6 FT	239.5 FT
121 +50	6 FT	238.8 FT
122 +00	6 FT	238.0 FT
122 +50	6 FT	237.5 FT
123 +00	6 FT	237.0 FT
123 +50	6 FT	236.4 FT
124 +00	6 FT	234.5 FT
124 +50	6 FT	234.0 FT
125 +00	6 FT	234.0 FT
125 +50	6 FT	233.5 FT
126 +00	6 FT	232.0 FT
126 +50	6 FT	230.6 FT
127 +00	6 FT	228.6 FT
127 +50	6 FT	226.6 FT
128 +00	6 FT	218.7 FT
128 +20	6 FT	218.6 FT

TABLE 5 (REVISION 2)
(CONTINUED)

ASSUMED BARRIER ELEVATIONS ALONG THE
PROPOSED SECOND INCREMENT OF THE
KOLOA-POIPU BYPASS ROAD

<u>STA NO.</u>	<u>BARRIER HEIGHT</u>	<u>ELEVATION AT TOP OF BARRIER</u>
128 +90	6 FT	224.4 FT
129 +00	6 FT	224.4 FT
129 +50	6 FT	224.0 FT
130 +00	6 FT	223.8 FT
130 +50	6 FT	223.6 FT
131 +00	6 FT	223.2 FT
131 +50	6 FT	223.0 FT
132 +00	6 FT	222.9 FT
132 +50	6 FT	222.7 FT
133 +00	6 FT	222.4 FT
133 +50	6 FT	222.0 FT
134 +00	6 FT	221.8 FT
134 +50	6 FT	221.6 FT
135 +00	6 FT	221.4 FT
135 +50	6 FT	221.2 FT
136 +00	6 FT	221.1 FT
136 +50	6 FT	221.0 FT

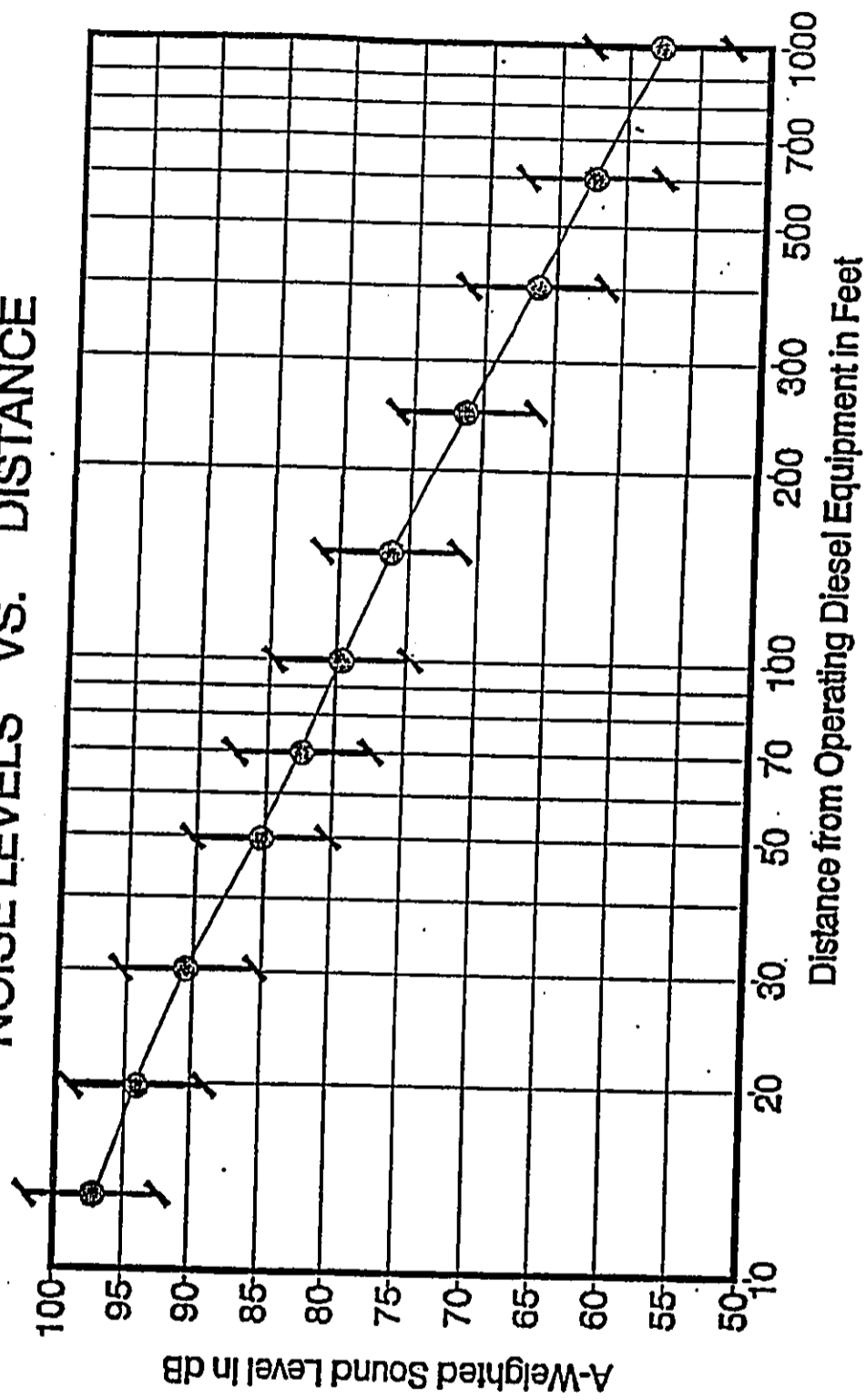
CHAPTER VI. CONSTRUCTION NOISE IMPACTS

Short-term noise impacts associated with new construction activities along the Bypass Road may occur. These impacts can occur as a result of the short distances (less than 100 FT) between existing noise sensitive receptors and the anticipated construction sites, particularly at the Koloa Town end of the Bypass Road. The total duration of the construction period for the proposed project is not known, but noise exposure from construction activities at any one receptor location is not expected to be continuous during the total construction period.

Noise levels of diesel powered construction equipment typically range from 80 to 90 dB at 50 FT distance. Typical levels of noise from construction activity (excluding pile driving activity) are shown in FIGURE 15. The impulsive noise levels of impact pile drivers are approximately 15 dB higher than the levels shown in FIGURE 15, while the intermittent noise levels of vibratory pile drivers are at the upper end of the noise level ranges depicted in the figure. Adverse impacts from construction noise are not expected to be in the "public health and welfare" category due to the temporary nature of the work and due to the administrative controls available for its regulation. Instead, these impacts will probably be limited to the temporary degradation of the quality of the acoustic environment in the immediate vicinity of the project site.

Construction noise levels at existing structures can intermittently exceed 90 dB when work is being performed at close distances in front of these structures. Along the major portion of the Bypass Road alignment, distances between the construction sites and receptors are expected to be greater than 100 FT, and construction noise levels should generally be below 80 dB or inaudible. The State Department of Health currently regulates noise from construction activities on Oahu under a permit system (Reference 9). Under current permit procedures (see TABLE 6), noisy

ANTICIPATED RANGE OF CONSTRUCTION
NOISE LEVELS VS. DISTANCE

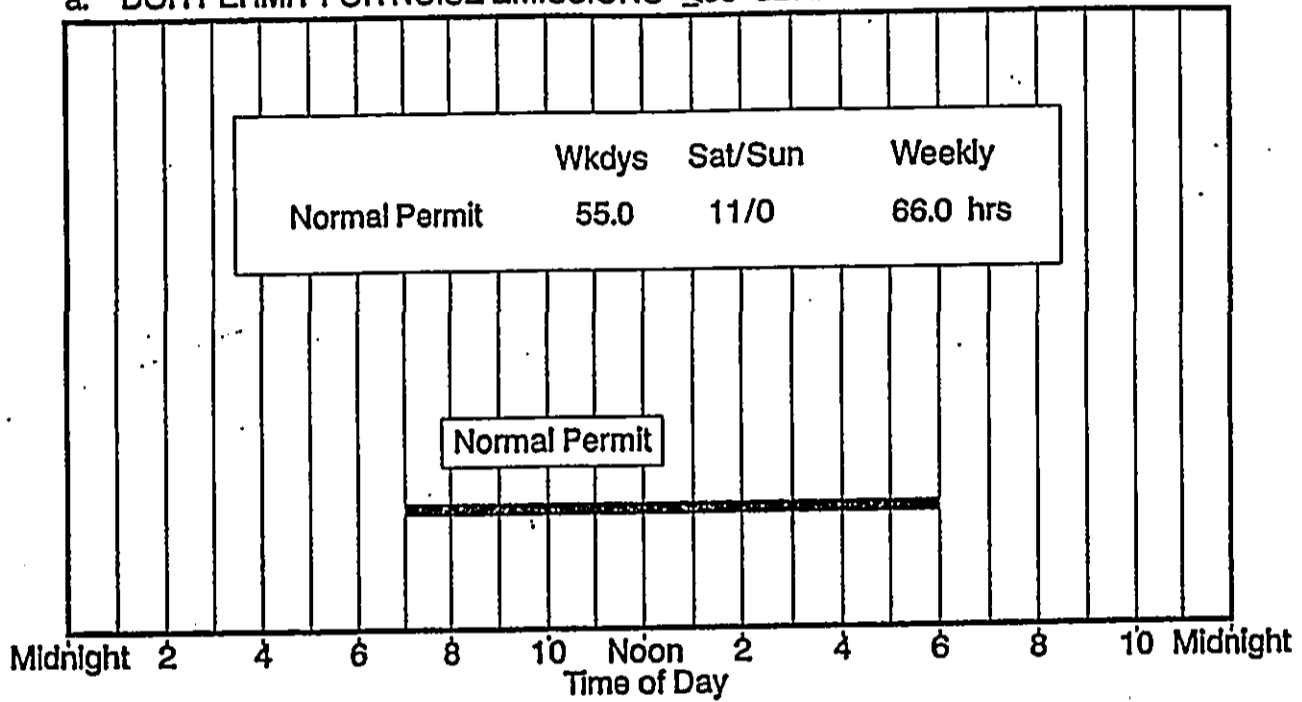


CONSTRUCTION NOISE LEVELS VS. DISTANCE

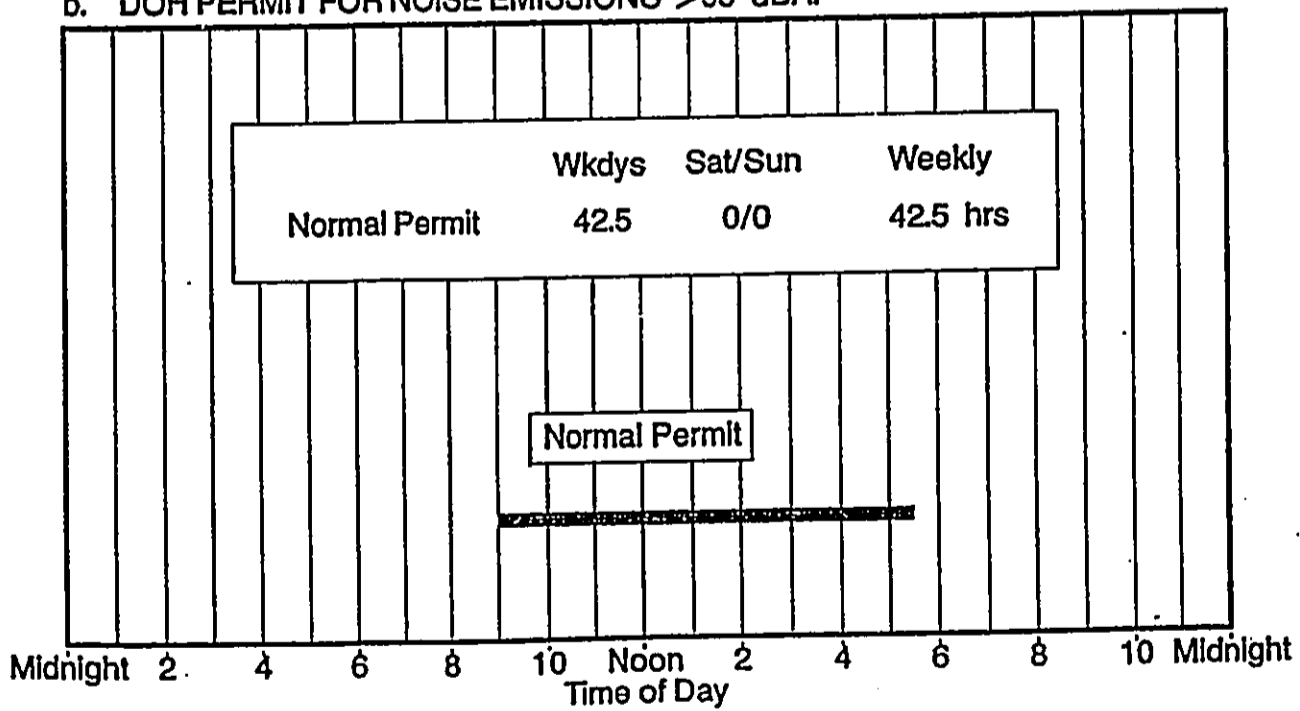
FIGURE
16

TABLE 6
AVAILABLE WORK HOURS UNDER DOH
PERMIT PROCEDURES FOR CONSTRUCTION NOISE

a. DOH PERMIT FOR NOISE EMISSIONS ≤ 95 dBA.



b. DOH PERMIT FOR NOISE EMISSIONS > 95 dBA.



construction activities which exceed 95 dB at the project boundary lines are restricted to hours between 9:00 AM and 5:30 PM, from Monday through Friday, and exclude certain holidays. These restrictions minimize construction noise impacts on noise sensitive receptors along the Bypass Road, and have generally been successfully applied. Consideration should be given to employing the curfew system of the State Department of Health regulations relating to excessive construction noise. In this way, construction noise impacts on noise sensitive receptors can be minimized.

APPENDIX B

EXCERPTS FROM EPA'S ACOUSTIC TERMINOLOGY GUIDE

Descriptor Symbol Usage

The recommended symbols for the commonly used acoustic descriptors based on A-weighting are contained in Table I. As most acoustic criteria and standards used by EPA are derived from the A-weighted sound level, almost all descriptor symbol usage guidance is contained in Table I.

Since acoustic nomenclature includes weighting networks other than "A" and measurements other than pressure, an expansion of Table I was developed (Table II). The group adopted the ANSI descriptor-symbol scheme which is structured into three stages. The first stage indicates that the descriptor is a level (i.e., based upon the logarithm of a ratio), the second stage indicates the type of quantity (power, pressure, or sound exposure), and the third stage indicates the weighting network (A, B, C, D, E.....). If no weighting network is specified, "A" weighting is understood. Exceptions are the A-weighted sound level and the A-weighted peak sound level which require that the "A" be specified. For convenience in those situations in which an A-weighted descriptor is being compared to that of another weighting, the alternative column in Table II permits the inclusion of the "A". For example, a report on blast noise might wish to contrast the LCdn with the LAcn.

Although not included in the tables, it is also recommended that "Lpn" and "LepH" be used as symbols for perceived noise levels and effective perceived noise levels, respectively.

It is recommended that in their initial use within a report, such terms be written in full, rather than abbreviated. An example of preferred usage is as follows:

The A-weighted sound level (LA) was measured before and after the installation of acoustical treatment. The measured LA values were 85 and 75 dB respectively.

Descriptor Nomenclature

With regard to energy averaging over time, the term "average" should be discouraged in favor of the term "equivalent". Hence, Leq, is designated the "equivalent sound level". For Ld, Ln, and Ldn, "equivalent" need not be stated since the concept of day, night, or day-night averaging is by definition understood. Therefore, the designations are "day sound level", "night sound level", and "day-night sound level", respectively.

The peak sound level is the logarithmic ratio of peak sound pressure to a reference pressure and not the maximum root mean square pressure. While the latter is the maximum sound pressure level, it is often incorrectly labelled peak. In that sound level meters have "peak" settings, this distinction is most important.

"Background ambient" should be used in lieu of "background", "ambient", "residual", or "indigenous" to describe the level characteristics of the general background noise due to the contribution of many unidentifiable noise sources near and far.

With regard to units, it is recommended that the unit decibel (abbreviated dB) be used without modification. Hence, DBA, PNdB, and EPNdB are not to be used. Examples of this preferred usage are: the Perceived Noise Level (Lpn was found to be 75 dB. Lpn = 75 dB). This decision was based upon the recommendation of the National Bureau of Standards, and the policies of ANSI and the Acoustical Society of America, all of which disallow any modification of bel except for prefixes indicating its multiples or submultiples (e.g., deci).

Noise Impact

In discussing noise impact, it is recommended that "Level Weighted Population" (LWP) replace "Equivalent Noise Impact" (ENI). The term "Relative Change of Impact" (RCI) shall be used for comparing the relative differences in LWP between two alternatives.

Further, when appropriate, "Noise Impact Index" (NII) and "Population Weighed Loss of Hearing" (PHL) shall be used consistent with CHABA Working Group 69 Report Guidelines for Preparing Environmental Impact Statements (1977).

APPENDIX A. REFERENCES

- (1) "Guidelines for Considering Noise in Land Use Planning and Control;" Federal Interagency Committee on Urban Noise; June 1980.
- (2) "Environmental Criteria and Standards, Noise Abatement and Control, 24 CFR, Part 51, Subpart B;" U.S. Department of Housing and Urban Development; July 12, 1979.
- (3) "Information on Levels of Environmental Noise Requisite to Protect the Public Health and Welfare with an Adequate Margin of Safety;" U.S. Environmental Protection Agency; EPA 550/9-74-004; March 1974.
- (4) Federal Highway Administration; "Procedures for Abatement of Highway Traffic Noise and Construction Noise;" 23 CFR Chapter I; Subchapter J, Part 772; July 8, 1982.
- (5) Barry, T. and J. Reagan, "FHWA Highway Traffic Noise Prediction Model"; FHWA-RD-77-108, Federal Highway Administration; Washington, D.C.; December 1978.
- (6) CY 2010 traffic forecasts along Easterly Bypass Road, Alternate 4 from Kauai County Highway Planning Study; by Kaku Associates; June 1990.
- (7) October 16-17, 1991 24-Hour Traffic Counts; Station #8-D, Koloa Road at Poipu Road; Hawaii State Department of Transportation.
- (8) October 16-17, 1991 Vehicle Type Classification Counts; Station #8-D, Koloa Road at Poipu Road (South Leg); Hawaii State Department of Transportation.
- (9) "Title 11, Administrative Rules, Chapter 43, Community Noise Control for Oahu"; Hawaii State Department of Health; November 6, 1981.

APPENDIX B (CONTINUED)

TABLE I

A-WEIGHTED RECOMMENDED DESCRIPTOR LIST

<u>TERM</u>	<u>SYMBOL</u>
1. A-Weighted Sound Level	L_A
2. A-Weighted Sound Power Level	L_{WA}
3. Maximum A-Weighted Sound Level	L_{max}
4. Peak A-Weighted Sound Level	L_{Apk}
5. Level Exceeded x% of the Time	L_x
6. Equivalent Sound Level	L_{eq}
7. Equivalent Sound Level over Time (T) ⁽¹⁾	$L_{eq(T)}$
8. Day Sound Level	L_d
9. Night Sound Level	L_n
10. Day-Night Sound Level	L_{dn}
11. Yearly Day-Night Sound Level	$L_{dn(Y)}$
12. Sound Exposure Level	L_{SE}

(1) Unless otherwise specified, time is in hours (e.g. the hourly equivalent level is $L_{eq(1)}$). Time may be specified in non-quantitative terms (e.g., could be specified a $L_{eq(WASH)}$ to mean the washing cycle noise for a washing machine).

SOURCE: EPA ACOUSTIC TERMINOLOGY GUIDE, BNA 8-14-78, NOISE REGULATION REPORTER.

APPENDIX B (CONTINUED)

TABLE II
RECOMMENDED DESCRIPTOR LIST

<u>TERM</u>	<u>A-WEIGHTING</u>	<u>ALTERNATIVE⁽¹⁾ A-WEIGHTING</u>	<u>OTHER⁽²⁾ WEIGHTING</u>	<u>UNWEIGHTED</u>
1. Sound (Pressure) ⁽³⁾ Level	L_A	L_{pA}	L_B, L_{pB}	L_p
2. Sound Power Level	L_{WA}		L_{WB}	L_W
3. Max. Sound Level	L_{max}	L_{Amax}	L_{Bmax}	L_{pmax}
4. Peak Sound (Pressure) Level	L_{Apk}		L_{Bpk}	L_{pk}
5. Level Exceeded x% of the time	L_x	L_{Ax}	L_{Bx}	L_{px}
6. Equivalent Sound Level	L_{eq}	L_{Aeq}	L_{Beq}	L_{peq}
7. Equivalent Sound Level ⁽⁴⁾ Over Time(T)	$L_{eq(T)}$	$L_{Aeq(T)}$	$L_{Beq(T)}$	$L_{peq(T)}$
8. Day Sound Level	L_d	L_{Ad}	L_{Bd}	L_{pd}
9. Night Sound Level	L_n	L_{An}	L_{Bn}	L_{pn}
10. Day-Night Sound Level	L_{dn}	L_{Adn}	L_{Bdn}	L_{pdn}
11. Yearly Day-Night Sound Level	$L_{dn(Y)}$	$L_{Adn(Y)}$	$L_{Bdn(Y)}$	$L_{pdn(Y)}$
12. Sound Exposure Level	L_S	L_{SA}	L_{SB}	L_{Sp}
13. Energy Average value over (non-time domain) set of observations	$L_{eq(e)}$	$L_{Aeq(e)}$	$L_{Beq(e)}$	$L_{peq(e)}$
14. Level exceeded x% of the total set of (non-time domain) observations	$L_{x(e)}$	$L_{Ax(e)}$	$L_{Bx(e)}$	$L_{px(e)}$
15. Average L_x value	L_x	L_{Ax}	L_{Bx}	L_{px}

(1) "Alternative" symbols may be used to assure clarity or consistency.

(2) Only B-weighting shown. Applies also to C,D,E,.....weighting.

(3) The term "pressure" is used only for the unweighted level.

(4) Unless otherwise specified, time is in hours (e.g., the hourly equivalent level is $L_{eq(1)}$). Time may be specified in non-quantitative terms (e.g., could be specified as $L_{eq(WASH)}$ to mean the washing cycle noise for a washing machine.

Appendix H

***AIR QUALITY IMPACT REPORT (AQIR)
KOLOA-POIPU BYPASS ROAD***

*Prepared by J.W. Morrow
July 1996*

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WILSON OKAMOTO & ASSOCIATES

AIR QUALITY IMPACT REPORT (AQIR)

KOLOA-POIPU BYPASS ROAD

8 JULY 1996

PREPARED FOR:

Wilson Okamoto & Associates, Inc.

and

**County of Kauai
Department of Public Works**

PREPARED BY:

**J. W. MORROW
Environmental Management Consultant
1481 South King Street, Suite 548
Honolulu, Hawaii 96814**

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J. W. MORROW

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7	Frequency Distribution of Wind Direction, Lihue, Kauai (1992)
8	Estimates of Maximum 1-Hour Carbon Monoxide Concentrations: Maluhia Road South of Wailaau Road, Peak Traffic Hours, 1996-2020
9	Estimates of Maximum 1-Hour Carbon Monoxide Concentrations: Proposed Phase II Koloa-Poipu Bypass Road, Peak Traffic Hours, 2020

1. INTRODUCTION

The County of Kauai Department of Public Works is proposing to proceed with Phase II of the Koloa - Poipu Bypass Road on the Island of Kauai (Figure 1). This phase will extend the existing 2-lane bypass road from Weliweli Road (Figure 2) across fallow fields and along an existing cane haul road to Maluhia Road (Figure 3), a distance of some 1.2 miles.

The purpose of this report is to assess the impact of the proposed highway project on air quality on a local and regional scale. The overall project can be considered an "indirect source" of air pollution as defined in the Federal Clean Air Act [1] since its primary association with air quality is its inherent attraction for mobile sources, i.e., motor vehicles. Much of the focus of this analysis, therefore, is on the traffic-related impacts on air quality. These impacts were evaluated for existing (1996) and future (2020) conditions with and without the project.

Finally, during construction of the roadway air pollutant emissions will be generated onsite and offsite due to vehicular movement, grading, concrete and asphalt batching, and general dust-generating construction activities. These impacts have also been addressed.

2. AIR QUALITY STANDARDS

A summary of State of Hawaii and national ambient air quality standards is presented in Table 1 [2, 3]. Note that Hawaii's standards are not divided into primary and secondary standards as are the federal standards.

Primary standards are intended to protect public health with an adequate margin of safety while secondary standards are intended to protect public welfare through the prevention of damage to soils, water, vegetation, man-made materials, animals, wildlife, visibility, climate, and economic values [4].

Some of Hawaii's standards (CO, NO₂, and O₃) are clearly more stringent than their federal counterparts but, like their federal counterparts, may be exceeded once per year. It should also be noted that in November 1993, the Governor signed amendments to Chapter 59, Ambient Air Quality Standards [3], adopting the federal standard for particulate matter equal to or less than 10 microns in diameter (PM₁₀). Since measurement data in Hawaii indicate that PM₁₀ comprises about 50% of total suspended particulate matter (TSP), the adoption of that federal standard with a numerical value equal to the original state TSP standard of 150 µg/m³ represents a substantial relaxation of the standard (approximately doubling it).

In the case of the automotive pollutants [carbon monoxide (CO), oxides of nitrogen (NO_x), and photochemical oxidants (O_x)], there are only primary standards. Until 1983, there was also a hydrocarbons standard which was based on the precursor role hydrocarbons play in the formation of

FIGURE 1
PROJECT LOCATION

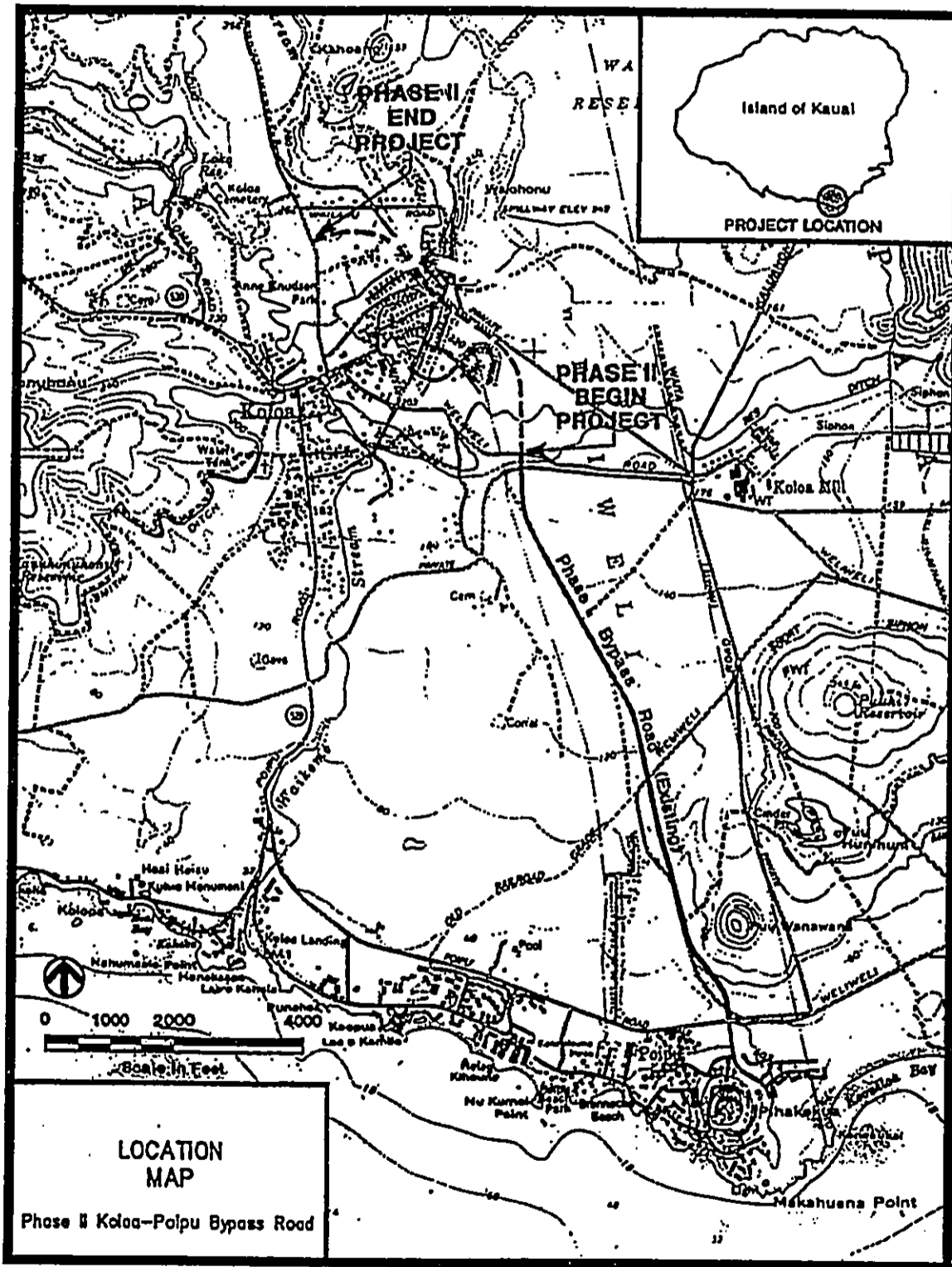
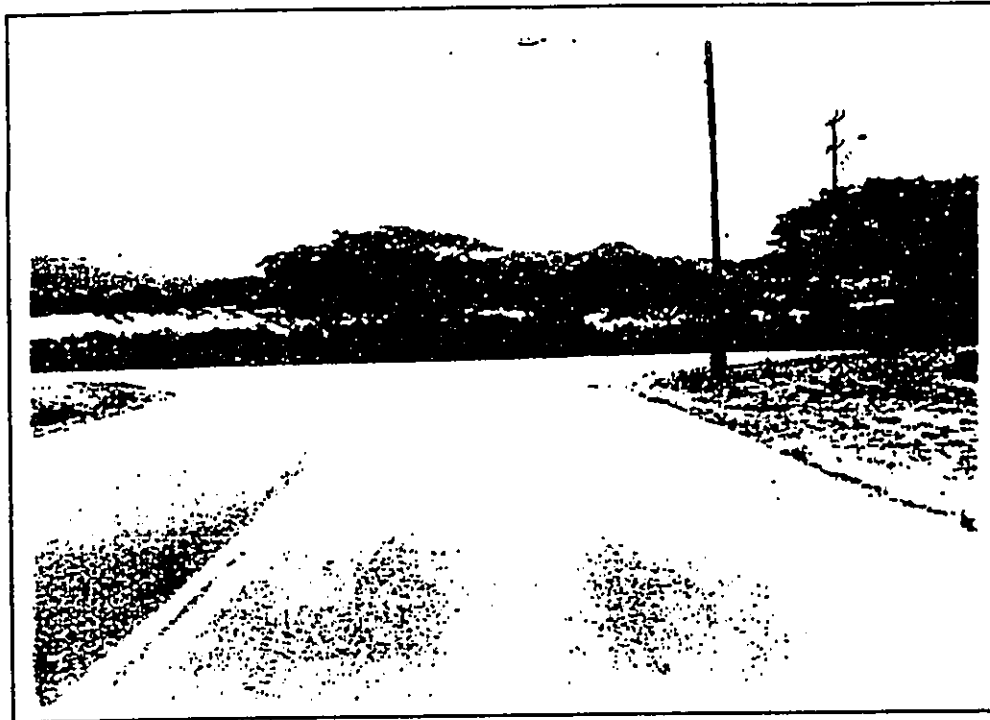


FIGURE 2

EXISTING CONDITIONS VICINITY WELIWELI ROAD
JUNE 1996

Terminus of Existing
Koloa-Poipu Bypass Road
at Weliweli Road (facing
north)



Facing south from cane haul
road toward terminus of
existing Koloa-Poipu Bypass
Road

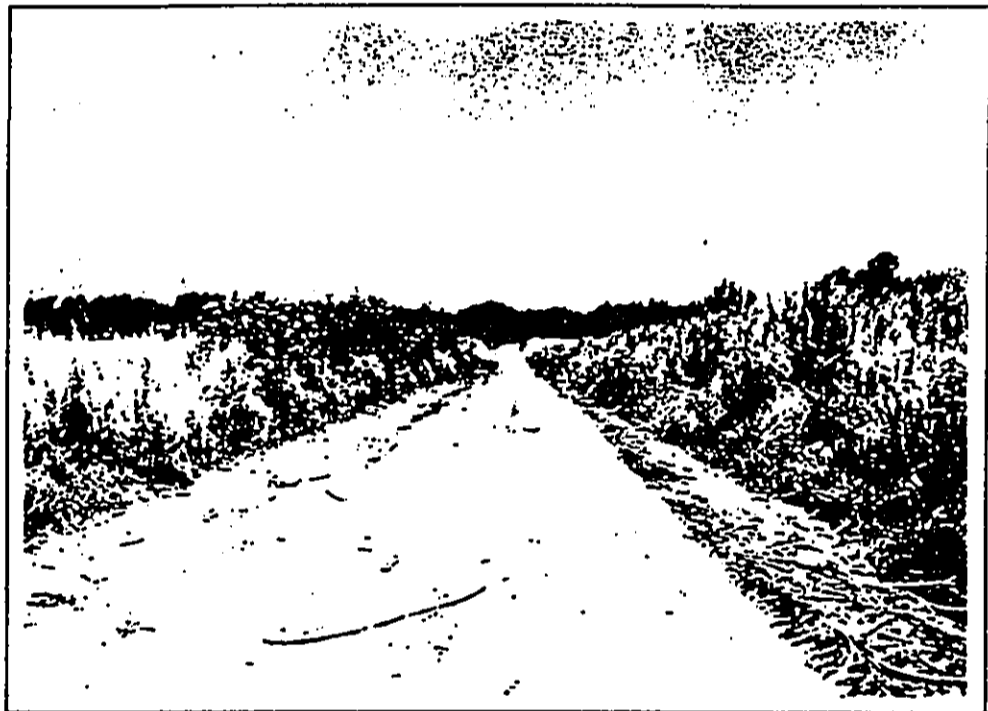
AQIR: PHASE II KOLOA-POIPU BYPASS ROAD

8 JULY 1996

FIGURE 3

EXISTING CONDITIONS VICINITY MALUHIA ROAD
JUNE 1996

Proposed Bypass Road
route along cane haul road
(facing northwest)



Section of Maluhia Road
below Wallaau Road where
proposed Bypass Road will
intersect (facing south).

TABLE 1
SUMMARY OF STATE OF HAWAII AND FEDERAL
AMBIENT AIR QUALITY STANDARDS

POLLUTANT	SAMPLING PERIOD	NAAGS PRIMARY	NAAGS SECONDARY	STATE STANDARDS
PM ₁₀	Annual	50	50	50
	24-hr	150	150	150
SO ₂	Annual	80	—	80
	24-hr	365	—	365
	3-hr	—	1,300	1,300
NO ₂	Annual	100	—	70
CO	8-hr	10	—	5
	1-hr	40	—	10
O ₃	1-hr	235	—	100
H ₂ S	1-hr	—	—	35
Pb	Calendar Quarter	1.5	—	1.5

KEY: TSP - total suspended particulate matter
 PM₁₀ - particulate matter < 10 microns
 SO₂ - sulfur dioxide
 NO₂ - nitrogen dioxide
 CO - carbon monoxide
 O₃ - ozone
 H₂S - hydrogen sulfide
 Pb - lead

All concentrations in micrograms per cubic meter ($\mu\text{g}/\text{m}^3$) except CO which is in milligrams per cubic meter (mg/m^3).

photochemical oxidants rather than any unique toxicological effect they had at ambient levels. The hydrocarbons standard was formally eliminated in January, 1983 [5].

The U.S. Environmental Protection Agency (EPA) is mandated by Congress to periodically review and re-evaluate the federal standards in light of new research findings [1]. The last such review resulted in the relaxation of the oxidant standard from 160 to 235 micrograms per cubic meter ($\mu\text{g}/\text{m}^3$) [6]. The carbon monoxide (CO), particulate matter, sulfur dioxide (SO_2), and nitrogen dioxide (NO_2) standards have been reviewed, but no new standards were proposed.

Finally, the State of Hawaii also has fugitive dust regulations for particulate matter (PM) emanating from construction activities [7]. There simply can be no visible emissions from fugitive dust sources.

3. EXISTING AIR QUALITY

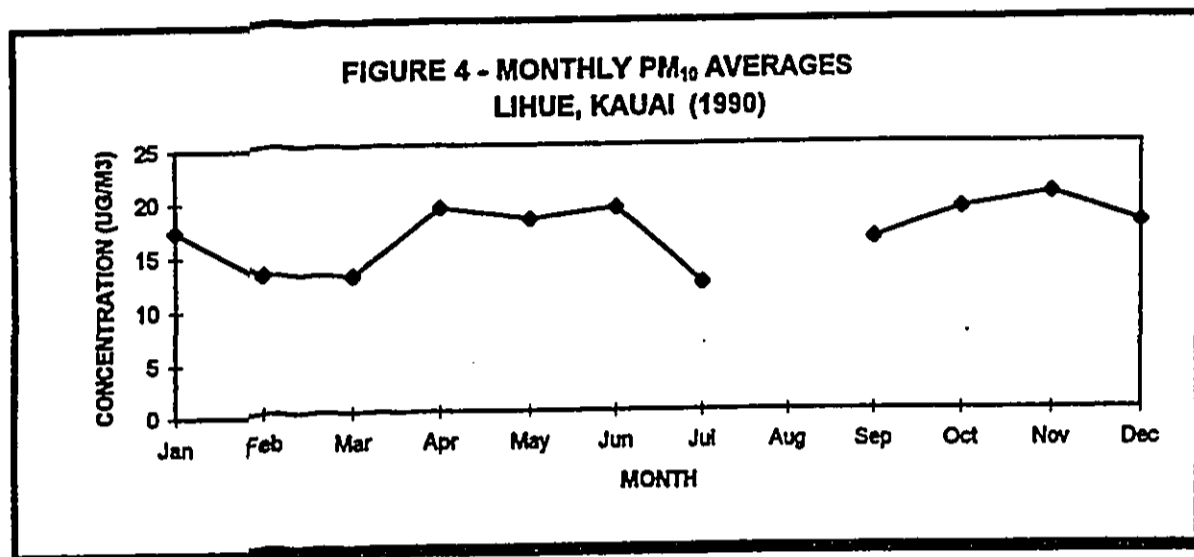
3.1 General. The State Department of Health (DOH) maintains a limited network of air monitoring stations around the state to gather data on the following regulated pollutants:

- particulate matter \leq 10 microns (PM_{10})
- total suspended particulate matter (TSP)
- sulfur dioxide (SO_2)
- carbon monoxide (CO)
- ozone (O_3)

In the case of PM_{10} and SO_2 , measurements are made on a 24-hour basis to correspond with the averaging period specified in State and Federal standards. Samples are collected once every six days in accordance with U.S. Environmental Protection Agency (EPA) guidelines. Carbon monoxide and ozone, however, are measured on a continuous basis due to their short-term (1-hour) standards. Lead concentrations are determined from the TSP samples which are sent to an EPA laboratory for analysis. It should also be noted that the majority of these pollutants are monitored only in Honolulu.

3.2 Department of Health Monitoring. Currently, there is one DOH air monitoring site on Kauai at Lihue, but only particulate matter (PM_{10}) is measured. A summary of the most recent published monthly data from that site is presented in Figure 4. Particulate matter levels are well below the 50 $\mu\text{g}/\text{m}^3$ annual and 150 $\mu\text{g}/\text{m}^3$ twenty-four hour standards.

3.3 Onsite Carbon Monoxide Sampling. In conjunction with this study, air sampling was conducted on 12 - 13 June 1996, in the vicinity of the proposed Bypass Road intersection with Maluhia Road. The sampling site was established on the west side of the road within 10 meters of the traffic lanes. A continuous carbon monoxide (CO) instrument was set up and operated during the a.m. and p.m. peak traffic hours. An anemometer and vane were installed and operated to record onsite surface wind conditions during the sampling. A simultaneous manual count of traffic was also performed. The variability of each of the parameters measured during the peak hours is clearly seen in Figures 5 and 6.



Onsite weather during the afternoon of 12 June 1996 included light (<5 mph) northeasterly winds and overcast skies (neutral atmosphere). Traffic volume at the sampling location was about 27% lower than the peak hour values reported in the latest traffic report for the area [8], probably due to school closure for the summer. CO concentrations were of the same order of magnitude as the computer-generated estimates presented in Section 6 of this report, averaging about 1.6 mg/m³.

During the morning of 13 June 1996, winds were calm to very light northeasterlies. Skies were clear and the atmosphere was stable contributing to greater dispersion of the CO emissions. Traffic volume was about 30% lower than the peak a.m. level reported in the traffic report [8]. CO concentrations were slightly lower than the previous afternoon, averaging about 1.0 mg/m³.

4. CLIMATE AND METEOROLOGY

4.1 Temperature and Rainfall. Temperatures in the project area are expected to be similar to those found elsewhere in Hawaii. Average monthly temperatures at Poipu range from 72.4 to 79.4 degrees Fahrenheit although it has dropped as low as 50° F and reached as high as 93° F [9]

While the island of Kauai is usually considered a rather wet and rainy place, the Poipu area is relatively dry with an annual precipitation of 35 inches. Based on this average and in accordance with Thornwaite's scheme for climatic classification, the area is considered subhumid[10].

FIGURE 5

P.M. PEAK HOUR CONDITIONS
MALUHIA ROAD SOUTH OF WAILAAU ROAD
12 JUNE 1996

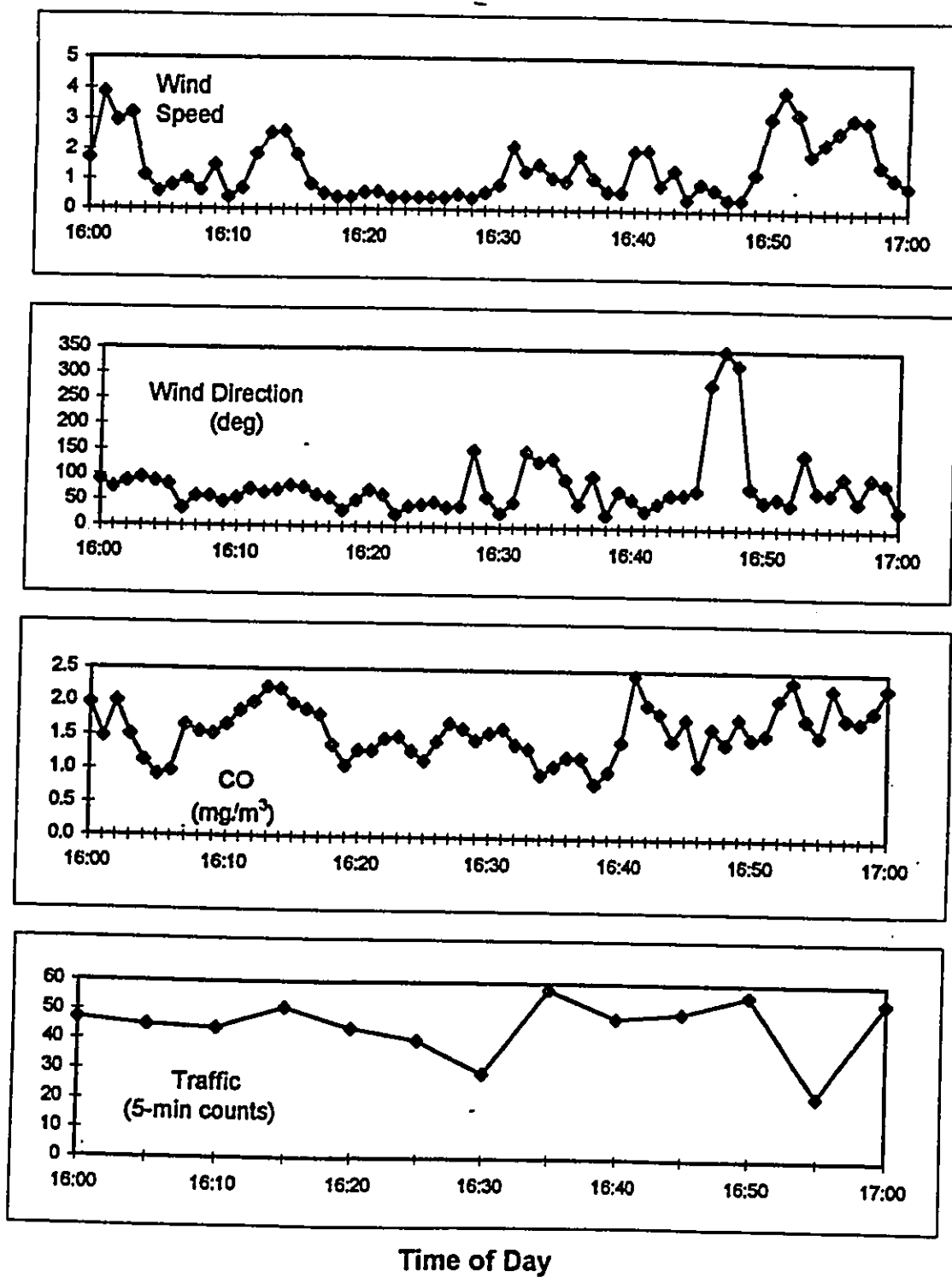
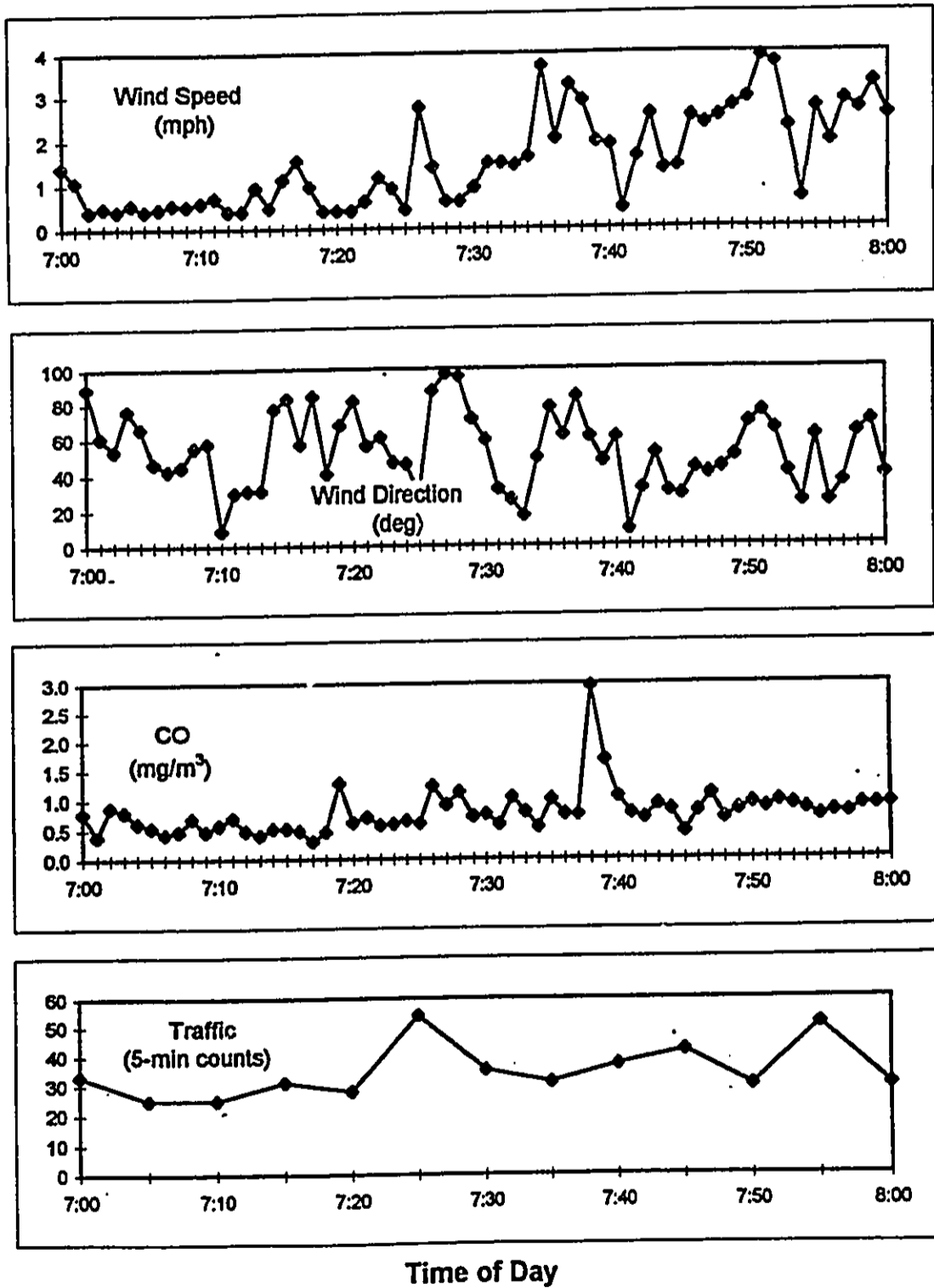
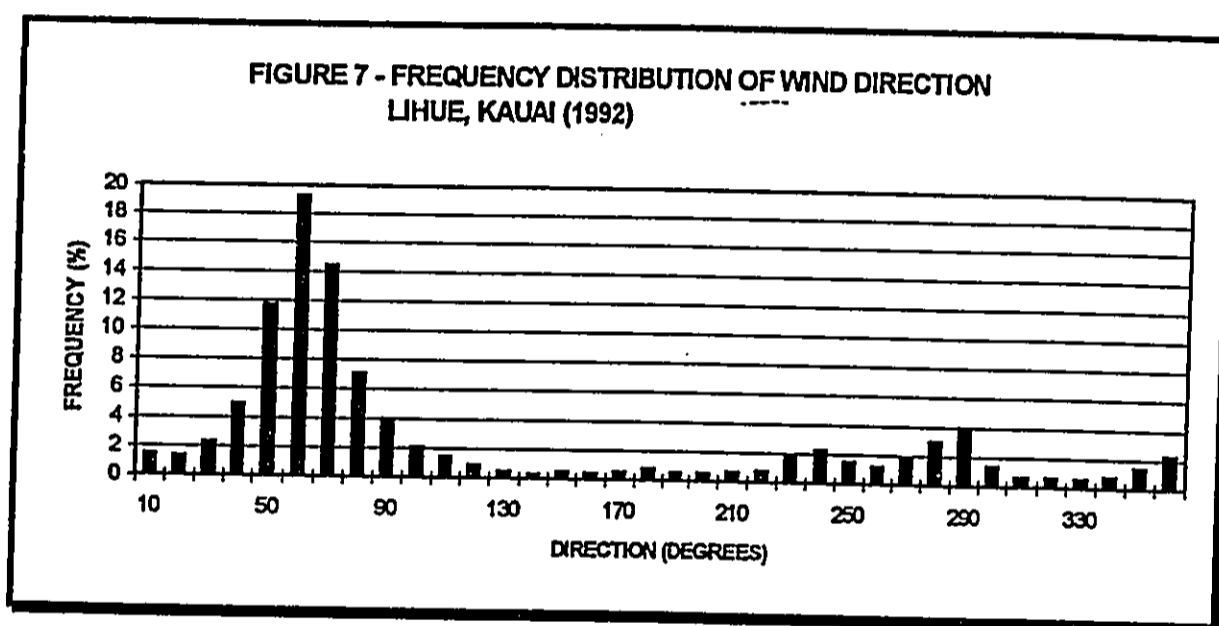


FIGURE 6
A.M. PEAK HOUR CONDITIONS
MALUHIA ROAD SOUTH OF WAILAAU ROAD
13 JUNE 1996



4.2 Surface Winds. Wind data from the nearby Lihue Airport indicate the predominance of northeast tradewinds so typical of Hawaiian Islands weather (Figure 7). On an annual basis, winds from the northeast (NE) and east-northeast (ENE) prevail 57% of the time. Low speeds, i.e., less than 4.5 m/sec (10 mph) occur about 28% of the time (Table 2). It is these gentle winds which are more conducive to pollutant concentration buildup from groundlevel sources such as vehicular traffic on highways.



5. SHORT-TERM IMPACTS

5.1 Onsite Impacts. The principal source of short-term air quality impact will be construction activity. Construction vehicle activity will increase automotive pollutant concentrations along the existing roadways as well as on the project site itself. The additional construction vehicle traffic should not exceed street capacities although the presence of large trucks can reduce a roadway's capacity as well as lower average travel speeds.

The site preparation and earth moving will create particulate emissions as will building and onsite road construction. Construction vehicles movement on unpaved on-site roads will also generate particulate emissions. EPA studies on fugitive dust emissions from construction sites indicate that about 1.2 tons/acre per month of activity may be expected under conditions of medium activity, moderate soil silt content (30%), and a precipitation/ evaporation (P/E) index of 50 [10,11].

Onsite soils are likely to be silty clays with a higher silt content [12] than the "moderate" silt content cited above. In conjunction with a slightly drier local climate (P/E Index 45), this suggests a potential for greater fugitive dust emissions than estimated by the EPA.

TABLE 2
 FREQUENCY DISTRIBUTION
 OF WIND SPEED AND DIRECTION
 LIHUE, KAUAI
 1992

DIRECTION	Wind Speed (m/sec)						All Speeds
	< 3.1	< 4.5	< 5.8	< 7.2	< 8.5	> OR = 8.5	
10	0.19	0.25	0.35	0.25	0.20	0.23	1.48
20	0.11	0.22	0.27	0.22	0.25	0.24	1.31
30	0.14	0.19	0.38	0.46	0.64	0.51	2.31
40	0.15	0.32	0.85	0.89	1.37	1.33	4.91
50	0.24	0.68	2.22	2.81	3.50	2.29	11.74
60	0.35	1.07	3.80	4.92	6.16	2.96	19.26
70	0.25	1.00	3.38	3.76	4.27	1.75	14.41
80	0.33	0.71	2.17	1.54	1.53	0.81	7.08
90	0.30	0.67	1.42	0.64	0.67	0.28	3.98
100	0.18	0.33	0.76	0.19	0.41	0.19	2.07
110	0.28	0.33	0.46	0.13	0.18	0.08	1.46
120	0.19	0.33	0.27	0.01	0.03	0.03	0.88
130	0.14	0.14	0.18	0.01	0.02	0.00	0.49
140	0.14	0.06	0.05	0.03	0.02	0.00	0.30
150	0.06	0.09	0.15	0.06	0.06	0.06	0.47
160	0.07	0.06	0.11	0.03	0.07	0.05	0.39
170	0.13	0.05	0.14	0.09	0.09	0.06	0.55
180	0.02	0.09	0.20	0.14	0.19	0.15	0.80
190	0.08	0.05	0.15	0.10	0.09	0.07	0.54
200	0.13	0.08	0.07	0.07	0.10	0.08	0.52
210	0.13	0.13	0.11	0.07	0.20	0.01	0.65
220	0.18	0.14	0.16	0.11	0.08	0.07	0.74
230	0.24	0.36	0.42	0.23	0.32	0.19	1.76
240	0.31	0.32	0.60	0.24	0.38	0.43	2.28
250	0.38	0.34	0.28	0.17	0.16	0.19	1.53
260	0.51	0.31	0.13	0.07	0.11	0.07	1.20
270	0.91	0.72	0.11	0.03	0.06	0.05	1.88
280	1.50	1.30	0.08	0.07	0.06	0.00	3.01
290	2.06	1.73	0.10	0.05	0.02	0.00	3.96
300	1.09	0.19	0.05	0.02	0.00	0.00	1.35
310	0.54	0.10	0.01	0.00	0.01	0.00	0.66
320	0.55	0.05	0.06	0.00	0.01	0.00	0.66
330	0.47	0.10	0.05	0.01	0.00	0.00	0.63
340	0.57	0.17	0.03	0.03	0.00	0.00	0.81
350	0.68	0.40	0.25	0.03	0.03	0.01	1.41
360	0.61	0.73	0.55	0.22	0.13	0.08	2.31
All Directions:	14.20	13.79	20.39	17.69	21.43	12.27	99.76

5.2 Offsite Impacts. In addition to the onsite impacts attributable to construction activity, there will also be offsite impacts due to the operation of concrete and asphalt batching plants needed for construction. Such plants routinely emit particulate matter and other gaseous pollutants. It is too early, however, to identify the specific facilities that will be providing these materials and thus the discussion of air quality impacts is necessarily generic. The batch plants which will be producing the concrete for foundations, curbing, etc. and the asphalt for roadways must be permitted by the Department of Health Clean Air Branch pursuant to state regulations [7]. In order to obtain these permits they must demonstrate their ability to continuously comply with both emission [7] and ambient air quality [3] standards. Under the recently promulgated federal Title V operating permit requirements [13], now incorporated in Hawaii's rules [7], air pollution sources must regularly attest to their compliance with all applicable requirements.

6. MOBILE SOURCE IMPACTS

6.1 Mobile Source Activity. The long-range transportation plan cited earlier [8] served as the basis for this mobile source impact analysis. Peak-hour traffic volumes were extracted from that plan and used to estimate air quality impacts for existing conditions and future (2020) with and without the project. With completion of the project, a 50% diversion of traffic from Maluhia Road to the new Bypass Road was assumed.

6.2 Emission Factors. Automotive emission factors for carbon monoxide (CO) were generated for calendar years 1996 and 2020 using the Mobile Source Emissions Model (MOBILE-5A) [14]. To localize the emission factors as much as possible, the March 1992 age distribution for registered vehicles in the City & County of Honolulu [15] was input in lieu of national statistics. That same age distribution was the basis for the distribution of vehicle miles traveled as well.

6.3 Modeling Methodology. Due to the present state-of-the-art in air quality modeling, analyses such as this generally focus on estimating concentrations of non-reactive pollutants. For projects involving mobile sources as the principal source, carbon monoxide is normally selected for modeling because it has a relatively long half-life in the atmosphere (ca. 1 month)[16], and it comprises the largest fraction of automotive emissions.

Because of the rural nature of the area, a stable atmosphere (Category "F") [17] was assumed for the morning and a neutral atmosphere (Category "D") for afternoon peak hours. A 1 meter per second (m/sec) wind speed was also assumed as worst case meteorological conditions.

The EPA guideline model CAL3QHC [18,19] was employed to estimate near-intersection carbon monoxide concentrations. An array of 48 receptor sites at distances of 10 meters from the road edge were input to the model. A background CO concentration of 0.1 milligram per cubic meter (mg/m^3) was assumed, again due to the rural nature of the area.

The model uses an iterative process to compute CO concentration estimates for all wind directions in 10 degree increments. The net result is to identify the wind direction producing the maximum CO concentration at each receptor location.

6.4 Results: 1-Hour Concentrations. The results of this modeling are presented in Figures 8 and 9. Each figure depicts the locations of the 48 receptor sites around the respective intersections. Maximum estimated concentrations in milligrams per cubic meter (mg/m^3) for each of the evaluated scenarios are also presented along with the particular receptor location at which they were predicted. No exceedances of State or Federal 1-hour CO standards were predicted.

6.5 Results: 8-Hour Concentrations. Estimates of 8-hour concentrations can be derived by applying a "persistence" factor to the 1-hour concentrations. This "persistence" factor accounts for the fact that the worst case 1-hour meteorology and traffic volumes do not persist for 8 hours. EPA recommends calculation of a persistence factor based on actual 1-hour and 8-hour CO measurements. This was done for a recent Hawaii project [20] and yielded an average persistence factor of 0.5. Applying this factor to the maximum 1-hour estimates again indicates compliance with both State and Federal 8-hour standards.

7. DISCUSSION, CONCLUSIONS AND MITIGATION

7.1 Short-Term Impacts. Since as noted in Section 5, there is a potential for fugitive dust due to the dry climate and fine soils, it will be important for adequate dust control measures to be employed during the construction period. Dust control could be accomplished through frequent watering of unpaved roads and areas of exposed soil. The EPA estimates that twice daily watering can reduce fugitive dust emissions by as much as 50% [13]. Accelerated landscaping of completed areas will also help. Due to the proximity of many residences on the downwind (southwest) side of about half the length of the proposed bypass road, dust control will be particularly important ✓

The offsite impacts associated with preparation of construction materials (asphalt and concrete batching) will be controlled by the existing regulatory requirements for air pollution sources which will ensure that they remain in compliance with health and environmental standards.

7.2 Mobile Source Impacts. As noted in Section 6, no exceedances of State or Federal carbon monoxide standards are predicted for 2020 with the project. Predicted concentrations decline slightly with the project as compared to without it due to redistribution of traffic volumes.

FIGURE 8

ESTIMATES OF MAXIMUM 1-HOUR
CARBON MONOXIDE CONCENTRATIONS
Maluhia Road South of Wailaau Road
Peak Traffic Hours
1996 - 2020

R01 R02 R03 R04 R13 R14 R15 R16
R05 R06 R07 R08 R17 R18 R19 R20
R09 R10 R11 R12 R21 R22 R23 R24

Maluhia Road

R25	R26	R27	R28	Phase II Koloa-Poipu Bypass Road (non-existent in 1996)	R37	R38	R39	R40
R29	R30	R31	R32		R41	R42	R43	R44
R33	R34	R35	R36		R45	R46	R47	R48

Receptor Spacing
= 10 meters

Estimated Maximum Concentrations
(mg/m³)

<u>Period</u>	<u>Existing</u>	<u>Without Project</u>	<u>With Project</u>
A.M	0.9 (R9)	4.4 (R25)	3.3 (R25)
P.M	0.50 R(9)	2.70 (R9)	1.7 (R9)

FIGURE 9

ESTIMATES OF MAXIMUM 1-HOUR
CARBON MONOXIDE CONCENTRATIONS
Proposed Phase II Koloa-Poipu Bypass Road
Peak Traffic Hours
2020

R01	R02	R03	R04	R13	R14	R15	R16
R05	R06	R07	R08	R17	R18	R19	R20
R09	R10	R11	R12	R21	R22	R23	R24

Phase II Koloa-Poipu Bypass Road

R25	R26	R27	R28	R37	R38	R39	R40
R29	R30	R31	R32	R41	R42	R43	R44
R33	R34	R35	R36	R45	R46	R47	R48

Receptor Spacing
= 10 meters

Estimated Maximum Concentrations
(mg/m³)

<u>Period</u>	<u>With Project</u>
A.M	2.2 (R9)
P.M	1.4 (R9)

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J. W. MORROW

Environmental Management
Consultant


RECEIVED
AUG 09 1996.

WILSON OKAMOTO & ASSOC., INC.

August 8, 1996

MEMORANDUM

To: Francis Yamada
Wilson Okamoto & Associates

From: Jim Morrow 

Subject: Poipu-Koloa Bypass Road AQIR

Per your request, I am submitting herewith revised pages 1, 2, 10, and 13 for the subject AQIR.

JWM:jm

Enc.

1. INTRODUCTION

The County of Kauai Department of Public Works is proposing to proceed with Phase II of the Koloā - Poipu Bypass Road on the Island of Kauai (Figure 1). This phase will extend the existing 2-lane bypass road from Weliweli Road (Figure 2) across fallow fields and along an existing cane haul road to Maluhia Road (Figure 3), a distance of some 1.2 miles.

The purpose of this report is to assess the impact of the proposed highway project on air quality on a local and regional scale. The overall project can be considered an "indirect source" of air pollution as defined in the federal Clean Air Act [1] since its primary association with air quality is its inherent attraction for mobile sources, i.e., motor vehicles. Much of the focus of this analysis, therefore, is on the traffic-related impacts on air quality. These impacts were evaluated for existing (1996) and future (2020) conditions with and without the project.

Finally, during construction of the roadway air pollutant emissions will be generated onsite and offsite due to vehicular movement, grading, concrete and asphalt batching, and general dust-generating construction activities. These impacts have also been addressed.

2. AIR QUALITY STANDARDS

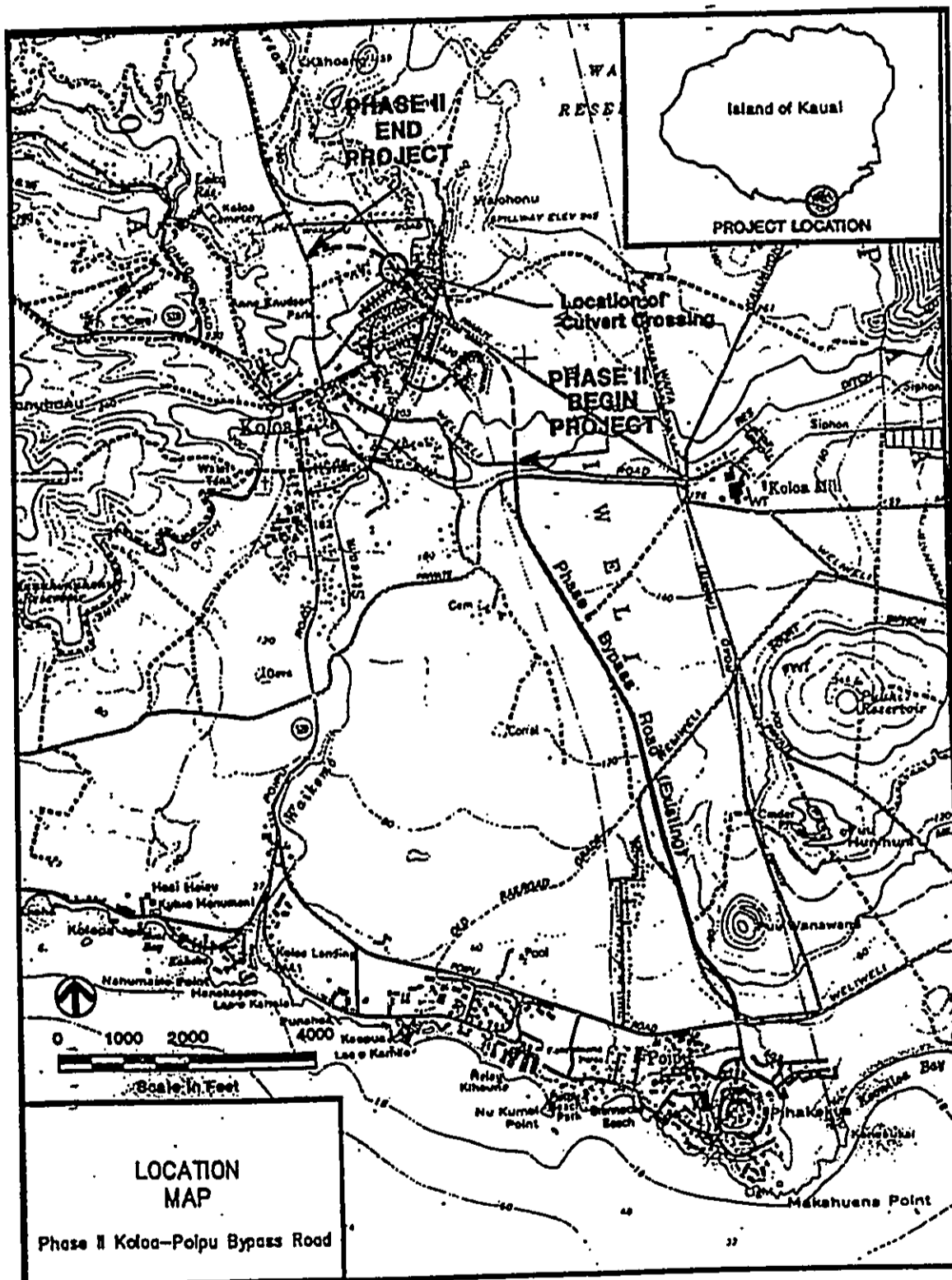
A summary of State of Hawaii and national ambient air quality standards is presented in Table 1 [2, 3]. Note that Hawaii's standards are not divided into primary and secondary standards as are the federal standards.

Primary standards are intended to protect public health with an adequate margin of safety while secondary standards are intended to protect public welfare through the prevention of damage to soils, water, vegetation, man-made materials, animals, wildlife, visibility, climate, and economic values [4].

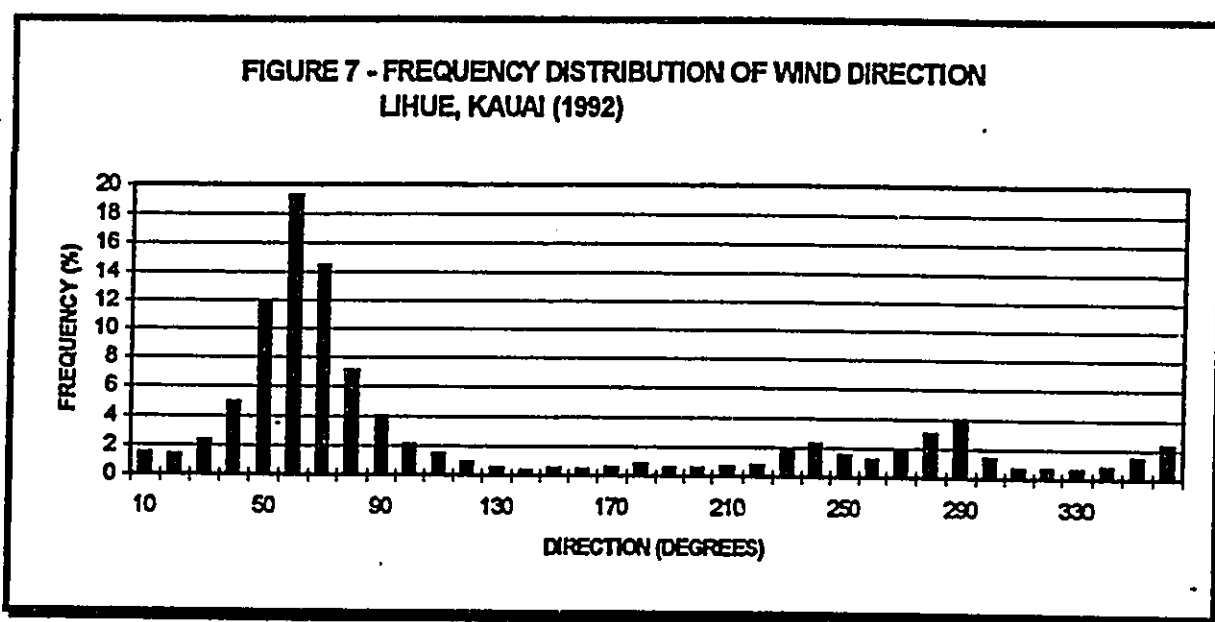
Some of Hawaii's standards (CO, NO₂, and O₃) are clearly more stringent than their federal counterparts but, like their federal counterparts, may be exceeded once per year. It should also be noted that in November 1993, the Governor signed amendments to Chapter 59, Ambient Air Quality Standards [3], adopting the federal standard for particulate matter equal to or less than 10 microns in diameter (PM₁₀). Since measurement data in Hawaii indicate that PM₁₀ comprises about 50% of total suspended particulate matter (TSP), the adoption of that federal standard with a numerical value equal to the original state TSP standard of 150 µg/m³ represents a substantial relaxation of the standard (approximately doubling it).

In the case of the automotive pollutants [carbon monoxide (CO), oxides of nitrogen (NO_x), and photochemical oxidants (O_x)], there are only primary standards. Until 1983, there was also a hydrocarbons standard which was based on the precursor role hydrocarbons play in the formation of

FIGURE 1
PROJECT LOCATION



4.2 Surface Winds. Wind data from the nearby Lihue Airport indicate the predominance of northeast tradewinds so typical of Hawaiian Islands weather (Figure 7). On an annual basis, winds from the northeast (NE) and east-northeast (ENE) prevail 57% of the time. Low speeds, i.e., less than 4.5 m/sec (10 mph) occur about 28% of the time (Table 2). It is these gentle winds which are more conducive to pollutant concentration buildup from groundlevel sources such as vehicular traffic on highways.



5. SHORT-TERM IMPACTS

5.1 Onsite Impacts. The principal source of short-term air quality impact will be construction activity. Construction vehicle activity will increase automotive pollutant concentrations along the existing roadways as well as on the project site itself. The additional construction vehicle traffic should not exceed street capacities although the presence of large trucks can reduce a roadway's capacity as well as lower average travel speeds.

The site preparation and earth moving will create particulate emissions as will building and onsite road construction. Construction vehicles movement on unpaved on-site roads will also generate particulate emissions. EPA studies on fugitive dust emissions from construction sites indicate that about 1.2 tons/acre per month of activity may be expected under conditions of medium activity, moderate soil silt content (30%), and a precipitation/ evaporation (P/E) index of 50 [10,11].

Onsite soils are likely to be silty clays with a higher silt content [12] than the "moderate" silt content cited above. In conjunction with a slightly drier local climate (P/E Index 45), this suggests a potential for greater fugitive dust emissions than estimated by the EPA.

The model uses an iterative process to compute CO concentration estimates for all wind directions in 10 degree increments. The net result is to identify the wind direction producing the maximum CO concentration at each receptor location.

6.4 Results: 1-Hour Concentrations. The results of this modeling are presented in Figures 8 and 9. Each figure depicts the locations of the 48 receptor sites around the respective intersections. Maximum estimated concentrations in milligrams per cubic meter (mg/m^3) for each of the evaluated scenarios are also presented along with the particular receptor location at which they were predicted. No exceedances of state or federal 1-hour CO standards were predicted.

6.5 Results: 8-Hour Concentrations. Estimates of 8-hour concentrations can be derived by applying a "persistence" factor to the 1-hour concentrations. This "persistence" factor accounts for the fact that the worst case 1-hour meteorology and traffic volumes do not persist for 8 hours. EPA recommends calculation of a persistence factor based on actual 1-hour and 8-hour CO measurements. This was done for a recent Hawaii project [20] and yielded an average persistence factor of 0.5. Applying this factor to the maximum 1-hour estimates again indicates compliance with both state and federal 8-hour standards.

7. DISCUSSION, CONCLUSIONS AND MITIGATION

7.1 Short-Term Impacts. Since as noted in Section 5, there is a potential for fugitive dust due to the dry climate and fine soils, it will be important for adequate dust control measures to be employed during the construction period. Dust control could be accomplished through frequent watering of unpaved roads and areas of exposed soil. The EPA estimates that twice daily watering can reduce fugitive dust emissions by as much as 50% [13]. Accelerated landscaping of completed areas will also help. Due to the proximity of many residences on the downwind (southwest) side of about half the length of the proposed bypass road, dust control will be particularly important.

The offsite impacts associated with preparation of construction materials (asphalt and concrete batching) will be controlled by the existing regulatory requirements for air pollution sources which will ensure that they remain in compliance with health and environmental standards.

7.2 Mobile Source Impacts. As noted in Section 6, no exceedances of state or federal carbon monoxide standards are predicted for 2020 with the project. Predicted concentrations decline slightly with the project as compared to without it due to redistribution of traffic volumes.

Appendix I

**ARCHAEOLOGICAL INVESTIGATION FOR
ENVIRONMENTAL ASSESSMENT OF
THE PROPOSED KOLOA/POIPU BYPASS ROAD
KOLOA, WELIWELI, KAUAI**

*Prepared by Cultural Surveys Hawaii
August 1996*

ARCHAEOLOGICAL INVESTIGATION FOR
ENVIRONMENTAL ASSESSMENT OF THE PROPOSED
KOLOA/POIPU BYPASS ROAD
KŌLOA, WELIWELI, KONA, KAUAI
(TMK: 2-8-02: por. 3; 2-8-03: por. 1; 2-8-04: por. 1
and 2-8-05: por. 2)

by

Gerald K. Ida, B.A.
Victoria S. Creed, Ph.D.
and
Hallett H. Hammatt, Ph.D.

Prepared for

Wilson Okamoto & Associates, Inc.

Cultural Surveys Hawaii
July 1996

ABSTRACT

An archaeological reconnaissance survey was conducted on an 1.2-mile corridor of a proposed bypass road within the Kōloa and Weliweli *ahupua'a*, Kauai (TMK 2-8-02: por. 3; 2-8-03: por. 1; 2-8-04: por. 1 and 2-8-05: por. 2). This proposed bypass corridor has a 60-foot right-of-way within which will be two 12-foot wide AC-paved lanes flanked by two 18-foot wide shoulder areas, of which 6 feet is also to be paved. The segment of the road alignment from Weliweli Road [to where it runs parallel with the existing cane haul road] is pasture land, and the segment from Waihohonu/Weliweli Stream to Maluhia Road is in sugar cane cultivation. The pasture land appears to have been bulldozed and there are many mechanically created rock piles. There are large areas of exposed surface bedrock with a few high outcrops. No archaeological sites were found within the proposed bypass road corridor. A remnant of a wall was found 50 feet outside of the proposed road corridor. No further archaeological investigation; neither survey nor sub-surface testing is recommended for this project area because of previous bulldozing activities and the probability of very shallow deposits.

ACKNOWLEDGEMENTS

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Cultural Surveys Hawaii would like to thank Ms. Laura Mau of Wilson Okamoto & Associates, Inc. who provided coordination and information including maps for the project.

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I. INTRODUCTION

Project Description

An archaeological reconnaissance survey was conducted by archaeologists from Cultural Surveys Hawai'i, Inc. This study, prepared for Wilson Okamoto & Associates, was conducted for a proposed bypass road corridor located on the island of Kaua'i, State of Hawai'i, in the *ahupua'a* of Kōloa and Weliweli, both part of the old district (*moku*) of Kona (Figures 1-3). This proposed bypass corridor, which traverses the east and northeast sides of Kōloa Town for a length of 6,000 linear feet, includes a 60-foot right-of-way, within which will be two 12-foot wide AC-paved lanes and two 18-foot shoulder areas, of which 6 feet adjacent to the roadway is also to be paved. The southern 1600-foot segment of the road alignment is pasture land; starting at Weliweli Road and going to the junction of the cane haul road where the cane haul road becomes the proposed road alignment. The segment from Waihohonu/Weliweli Stream to Maluhia Road is in sugar cane cultivation.

Scope of Work

The purpose of the archaeological reconnaissance survey was to locate all archaeological resources present within the project area. This has been accomplished through the following tasks:

- 1) Literature search including a review of archaeological reports related to the project area as well as historic maps and other accessible material which relate to previously designated archaeological and historical sites, as well as previous land use.
- 2) Field inspection of the property to assess current conditions and the likelihood of extant archaeological sites, both surface and subsurface.
- 3) Preparation of this report detailing results of the literature search as well as the field inspection. Presented are recommendations for further research or mitigation, as appropriate.

Methods

Three archaeologists from Cultural Surveys Hawaii's Kaua'i office performed the field survey on June 10 and 11, 1996. The project area was surveyed in one pedestrian sweep with the three archaeologists spaced approximately 30-50 feet apart within the corridor. The corridor was between 100 feet to 150 feet wide. The archaeologists proceeded from south to north. Visibility in the pasture land was generally excellent, with mostly low grass cover and occasional brush. In the few areas of taller grass, the archaeologists would walk 20 feet apart to ensure no sites escaped their attention. Photographs were taken along the corridor to record existing conditions (See Photo Appendix). Portions of the centerline were marked by surveyor stakes at intervals of 100 feet to 200 feet.

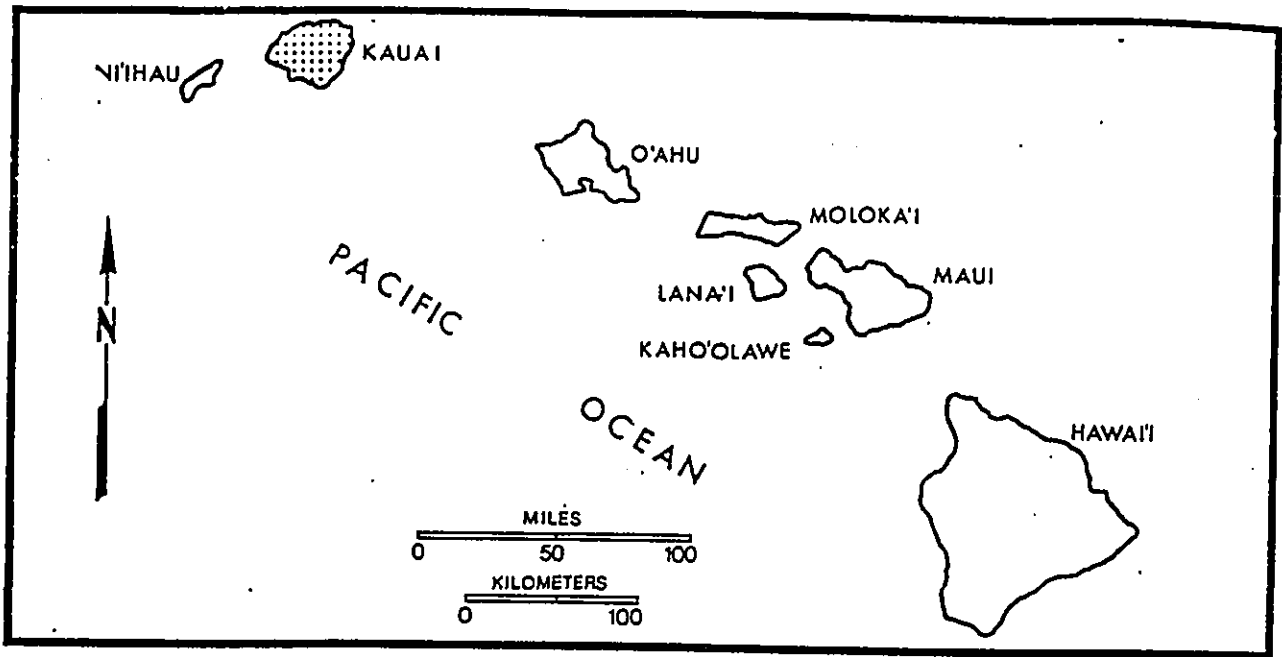


FIGURE 1
State of Hawai'i

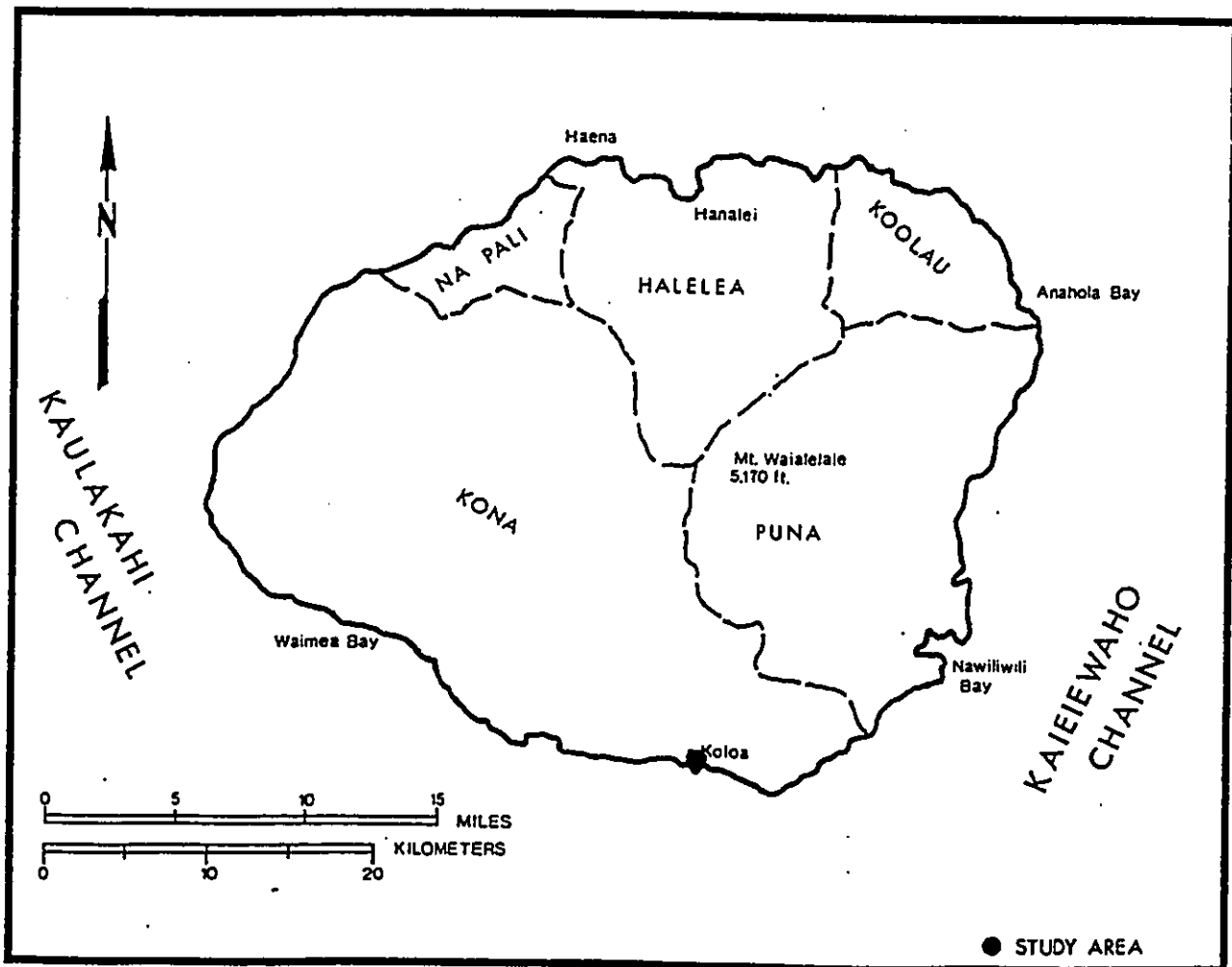


FIGURE 2
General Location Map, Kaua'i Island

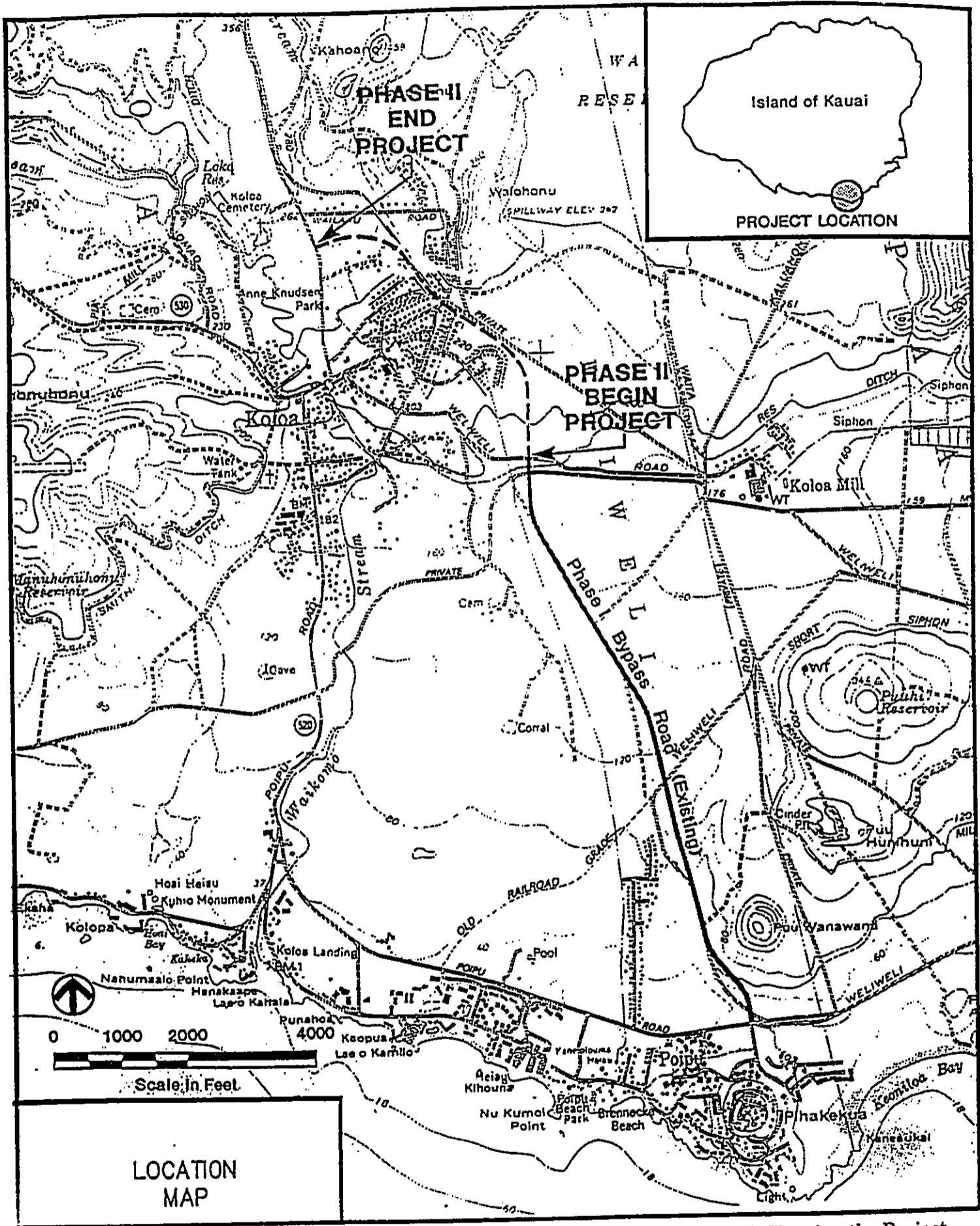


Figure 3 Portion of USGS 7.5 minute topographic map, Koloa Quad, Showing the Project Corridor

Kōloa and Weliweli Area Description

The landform in this region of Kaua'i is dominated by the broad, gently sloping pahoehoe lava flows of the post-erosional Kōloa Volcanic Series, laid down in the late Pleistocene. These lavas are little altered, but blanketed with a thin layer of soil known as Waikomo, very rocky silty clay; "developed in material weathered from basic igneous rock," ash and cinder (Foote, *et al.* 1972). Rainfall averages between 30 and 40 inches a year (Armstrong 1973); prevailing winds are from the northeast.

The phase of the proposed bypass roadway reported in this study traverses from Weliweli Road to Maluhia Road in the *ahupua'a* of Kōloa and Weliweli on the south central coast of Kaua'i. The proposed bypass alignment corridor traverses tax map keys: 2-8-02: por. 3; 2-8-03: por. 1; 2-8-04: por. 1 and 2-8-05: por. 2. The areas flanking the proposed road corridor are either under cane cultivation, have been previously bulldozed, or are in a modified residential landscape.

II. HISTORIC BACKGROUND AND PREVIOUS ARCHAEOLOGY

Historic Background

The derivatives for the place name Kōloa include: "Kō-loa, the large, soft, Hawaiian sugar cane (*S. officinarum*) once found in the area; Kōloa, "on the east bank of Waikomo Stream in Kōloa town there is a steep rock from which the district takes its name. The bank was called Pali o-Kōloa; Kōloa, after the native Hawaiian duck (*Anas wyvilliana*)" (Kikuchi 1963: 46 and Pukui et al. 1974:116). The name Weliweli does not appear in Pukui, Elbert and Mookini's *Place Names of Hawaii*, but the Hawaiian Dictionary lists various meanings as "violent, dreadful, horrible, fearful, ferocious; revered; respectful, as of the word of a chief; full of awe," as well as "numerous, immense, prolific" (Pukui and Elbert 1986). How the word became attached to the place is unknown.

Early historical and ethnographic information suggests that Kōloa was well populated during late prehistoric time. The earliest explorers, like Cook and Vancouver, used Waimea for anchorage and victualing. Their descriptions of well-maintained, watered agricultural systems on this dry Leeward coast are echoed in the early descriptions of Kōloa.

Cook states: "What we saw of their agriculture, furnished sufficient proofs that they are not novices in that art. The valley ground has already been mentioned as one continuous plantation of taro, and a few other things, which all have the appearance of being well attended to" (Cook 1784). Vancouver's description, in part, states: "...the low country which stretches from the foot of the mountains toward the sea, occupied principally with the taro plant, ...interspersed with some sugar-canes of luxuriant growth and some sweet potatoes" (Vancouver, 1798).

In 1835 two American naturalists, Thomas Nuttall and John K. Townsend, visited the Kōloa area with Townsend noting "fields of taro, yam, and maize (? probably sugar cane), irrigation networks and sweet potato patches in the dryer areas" (Townsend 1839:206). Also in the 1830s J.J. Jarves, in "Sketches of Kauai" remarked on the fields of sugar cane, taro, and, yams which indicated a more than usual attention to agriculture.

Extensive agricultural fields in this area and their well-maintained appearance indicate a relatively well-populated area. Bernice Judd in "Kōloa: A sketch of its Development" (1935) suggests that prior to European contact the population of Kōloa must have been several thousand. The first missionary census (1833) accounted for a population of 2,166 for "Kōloa," but "Kōloa" referred to the area between Wahiawa and Kalapaki.

Other evidence indicating the importance of the Kōloa area during prehistorical time includes a relatively large number of *heiau*. The Lahainaluna schools listed 14 *heiau* and 1 fishing shrine for Kōloa. Of the 14 *heiau*, at least three (3) were *Luakini* class, two (2) were *po'okanaka*, five (5) associated with fishing, two (2) medicinal, one (1) agricultural, with four (4) of unknown function (Lahainaluna 1885 HMS 43 #17).

The first missionary (Protestant Mission ABCFM) stationed at Kōloa was the Rev. Peter Gulick who moved from the Waimea Station in 1834. In 1835 a grass house some 30 by 60

feet (9.14 by 18.28 meters) was erected as the meeting house and school. Gulick also initiated sugar cane cultivation and a cattle herd for the Protestant Mission. In 1837 an adobe church was built and the first mission doctor, Dr. La Fon arrived. Dr. La Fon moved to Līhu'e in 1840 and was replaced by Dr. J. W. Smith in 1842. Dr. Smith, as both doctor and missionary, could not continue the farming activities started by the Rev. Gulick and reduced the cattle herd and sent to Honolulu 7,000 lbs. of sugar which was produced from cane grown on mission lands (Palama and Stauder 1973:22). At the time of the Mahele (ca. 1850) the ABCFM (Protestant Mission) received about 825 acres in Kōloa, some near Prince Kuhio Park and the majority around Kōloa Town.

During the Māhele of the mid-1800's which allowed private ownership of land, the project area was part of a 8,620-acre Land Commission Award to Moses Kekuaiwa for Mataio Kekuanaoa (L.C.A. #7714-B). This large acreage included all of the land in the *ahupua'a* of Kōloa which was not claimed or awarded to anyone else.

Kekuaiwa (1829-1848) was the son of Kekuanaoa (1794-1868) and the brother of Alexander Liholiho who became Kamehameha IV, and Lot Kamehameha, who would rule the islands as Kamehameha V. At an early age he was adopted by Kaikioewa who was governor of Kaua'i from 1825 until his death in 1865 (Day 1984). Land claims by the *maka'āinana* or commoners to the Land Commission required detailed descriptions and testimonies as to specific land use, however, because Kekuaiwa and Kekuanaoa were awarded this land due to their royal lineage, no detailed records exist to shed any light on the land use of this property at that time.

The proposed roadway corridor, in relation to the representation of Kōloa town on the 1918 Territorial Map of Kōloa; R.M. 1694 (Figure 4), would appear to pass from a point on the old Weliweli Road (along a railroad line), then to the east of a structure marked "office, through land marked "A. Cropp" and between two areas of Land Commission Awards - avoiding both areas where Land Commission claims were awarded (See continuous dotted line added to the 1918 map to represent the proposed bypass corridor).

In 1835, Ladd & Co., a successful American mercantile company operating out of Honolulu, signed a first-of-its-kind lease with King Kamehameha III and Kaua'i Governor Kaikioewa, which allowed them the use of a large tract of land (nearly 1,000 acres), in Kōloa for growing sugarcane and constructing a sugar mill. This was the start of the first sugar plantation in the islands (Figure 5).

As part of the lease agreement, Ladd & Co. received free use of Kōloa Landing and rights to build a road to the landing from their mill site, located about a mile and a half from the shore on Waikomo Stream (Alexander 1985). In the coming years, due to the sugar industry and the supplying of whaling ships with fresh produce, beef, pork and firewood, Kōloa would grow into the commercial center of Kaua'i, with the landing being designated the official port of entry for the island in the mid-1850's (Kuykendall 1953).

In the 1850's, Kōloa was also exporting produce such as sweet potatoes and oranges to California's booming population, the result of the gold rush. By the turn of the century, sugar from Kōloa Sugar Co., the successor to Ladd & Co., was being hauled from the mill directly to the landing by a narrow-gauge railroad, presumably across the bridge. This

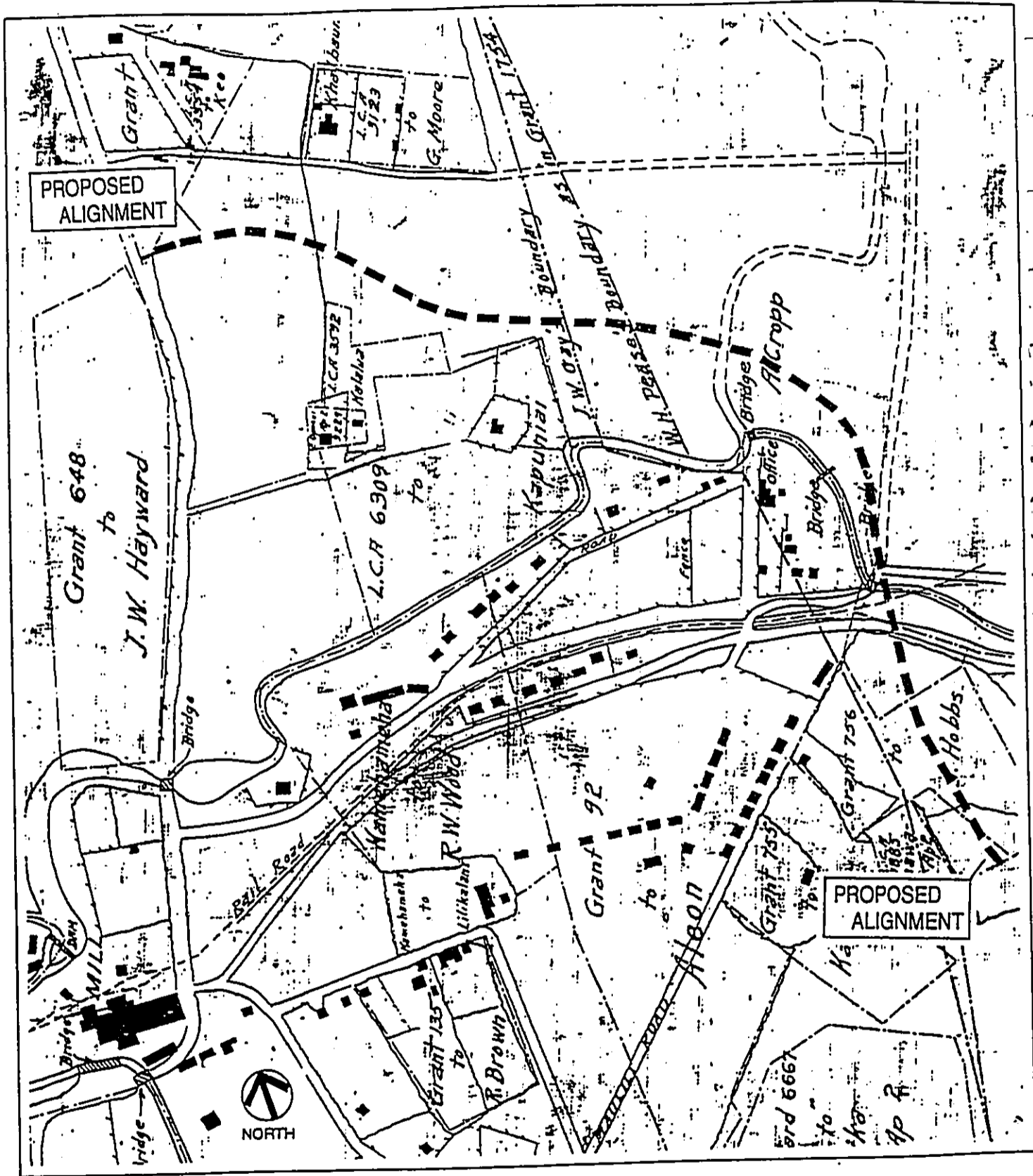


Figure 4 Portion of 1918 Map of Koloa Plantation by Buch, T.B. and E.J. Grube, Scale 1:400, Survey and Map by M.D. Monsarrat, 1891, R.M. 1694, Showing Early Koloa Town with Grants and Land Commission Awards

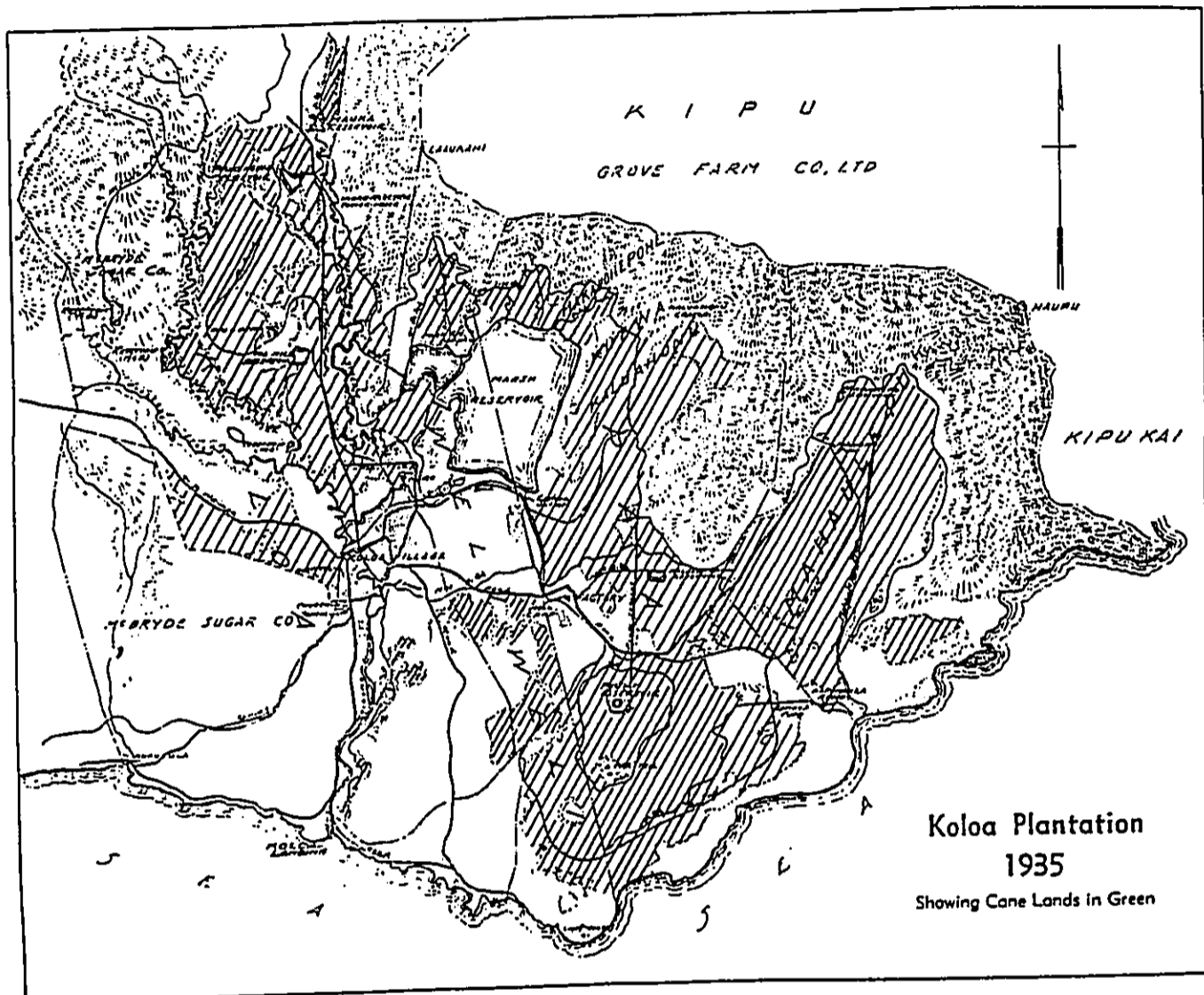


Figure 5 1935 Koloa Plantation Map Showing Cane Lands (Hatched) (Endpiece from Alexander 1985)

hauling continued until 1912 when the plantation entered into an agreement with the Kauai Railway Co. to handle the shipping of all its sugar. KRC owned the facilities at Port Allen near Hanapēpē, and from then on all of Kōloa's sugar was shipped through the west side port. The last recorded commercial use of Kōloa Landing was in 1928 (Alexander 1985, FKCSL 1985).

Previous Archaeology

Wendell C. Bennett carried out the first archaeological survey of the island of Kaua'i in 1929 in which he found a house platform, enclosures, probable fishponds, salt pans and agricultural terraces in the Kōloa-Weliweli area (Bennett 1931) (Figure 6). During the 1973-1974 State-wide Inventory of Historic Places performed by Archaeological Research Center of Hawaii (A.R.C.H.) for the State of Hawai'i, archaeological remains of Site 50-30-10-85 and 86 were briefly evaluated and placed on Reserve status until, in some future time, additional work could be done to further evaluate them.

At least ten archaeological reports were prepared resulting from work in the Po'ipu-Kōloa area between the 1960s and the early 1980s (Kikuchi 1963, A.R.C.H. 1980, Bordner 1977a, Bordner 1977b, Ching 1974a, Ching 1974b, Hammatt *et al.* 1978, Kikuchi 1980, Landrum 1984, Neller 1981, Sinoto 1975). Most of these documents are short "letter" reports detailing the results of walk-through reconnaissance surveys. By far the most ambitious of these projects was the "Archaeological and Biological Survey of the Proposed Kīahuna Golf Village Area" (Hammatt *et al.*, 1978) which recorded 583 archaeological features in a survey of 460 acres *mauka* of Po'ipu Road.

In *The Archaeology of Kona, Kaua'i* the authors, Ching, Palama and Stauder note for Weliweli that :

As plantation operations expanded, more and more land was taken for cultivation of sugar cane. Eventually the areas that were used for habitation in the ahupua' of Weliweli, Pa'a and Māhā'ulepū, were also plowed up. Other lands that were marginal for cultivation of sugar cane were used for the planting of ironwood trees, which provided a wind break from the salt laden ocean breezes. In addition the stones used for habitation sites were sold for stone walls and other building material. Some of the stones in the area were also utilized as foundations for railroad tracks and cattle boundary fences. As a result, many of the surface remains observed by Bennett and Kikuchi were already destroyed when this study took place (Ching, Palama and Stauder 1974:44).

In 1982 Robert Connolly prepared an archaeological reconnaissance report for the Kōloa-Poipu Bypass Road (Phase I) which included rough locations and brief descriptions of most of the sites on that proposed corridor. These alternates "A" and "B" were west of the route selected and are not in the area of the present proposed bypass road.

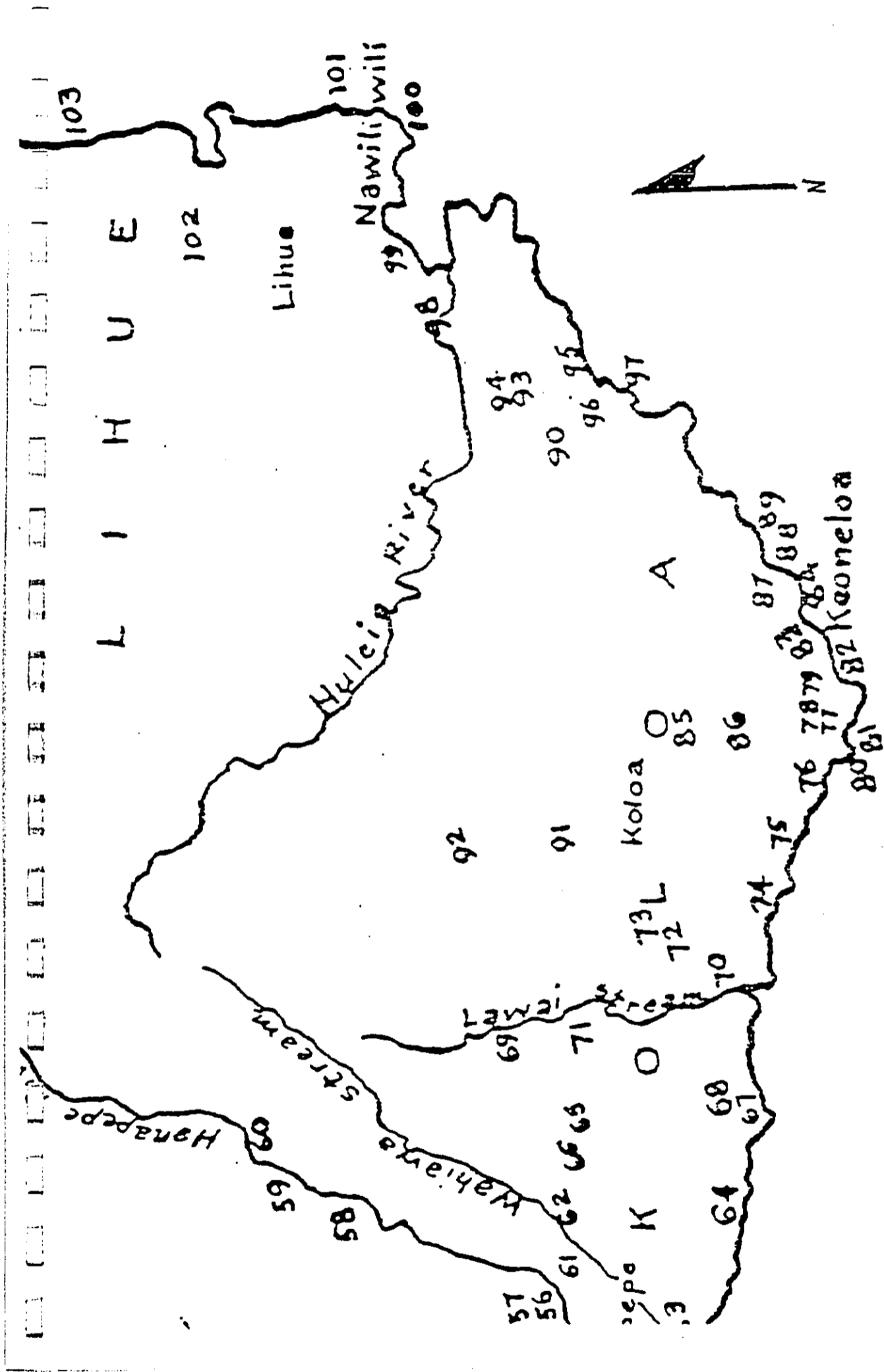


Figure 6 Enlargement of Wendell Bennett sites in the Koloa-Weiwieli Area (Bennett 1931:98)

In 1981 Dr. William Kikuchi conducted an archaeological Reconnaissance of a 66-acre parcel in Weliweli (TMK 2-8-22:6) (Kikuchi, 1981). Kikuchi recorded a number of *'auwai*, terraces, walls and habitation sites in this tract which had been extensively bulldozed. There were enough site remnants present to conclude that the area was once part of the vast prehistoric agricultural network which covered much of the rocky land in Kōloa and Weliweli.

The *makai* segment of a Po'ipu Bypass route alternative was surveyed by Cultural Surveys Hawaii for Kaua'i County (Hammatt *et. al.* 1985). This segment joined with Po'ipu Road just west of Weliweli Tract. It passed through the extreme western segment of the Kīahuna archaeological complex and was thus rejected from consideration as a viable alternative. The 1985 survey included limited testing of agriculture and small habitation features.

Cultural Surveys Hawaii conducted an archaeological inventory survey of a 1.4 mile corridor along the north side of Poipu Road for planned expansion and improvement of the road (Creed, Ida and Hammatt 1995). That project area (TMK 2-8-15, 16, 17, & 18) was located in both the *ahupua'a* of Kōloa and Weliweli. Three archaeological sites were identified within or adjacent to the *mauka* right-of-way of the road. Two of these sites represent components of the Kōloa field system previously identified throughout the Kīahuna area. The third site was the Kōloa/Weliweli Boundary Wall.

Historic Summary

The historical information indicates that although Kōloa is a relatively dry area (ca. 30 in. of rain per year), a perennially flowing Waikomo Stream allowed for fairly extensive agricultural development. Early historical accounts (Jarves: 1830, Townsend 1839, Farley 1907, Judd 1835) describe a relatively continuous, well-maintained agricultural complex of taro, yams, sweet potato, and sugar cane that was watered by an extensive *'auwai* system.

The Kōloa area became the site of Hawaii's first sugar plantation, Ladd and Co., in the mid-1830s. This brought about a general commercialization of the area, a move to a market-based society. Kōloa Landing became a busy port, not only for export of sugar and molasses, but other agricultural goods as well. Whalers stopped at Kōloa for salt, beef, pigs and squashes. The California Gold Rush was another impetus for agricultural exports with over 10,000 barrels of sweet potatoes shipped out of Kōloa.

During the mid-1800s the Kōloa area still had traditional farmers as evidenced by the *kuleana*(s) awarded and the information in the Native and Foreign Testimony(s) and Register(s). However, this information also includes reference to the growing of commercial sugar cane. This suggests that although traditional farming was still practiced (*i.e.* for subsistence), market-oriented agriculture was beginning to dominate. *Kuleana* farmers were probably selling "excess" taro to native plantation workers, with *kula* lands producing cane to be sold to the mill and sweet potatoes, yams and squashes grown to be sold for export.

It was not until the late 1890s that the *makai* area of Kōloa came under the full weight of commercial sugar cane cultivation. Kōloa Sugar Co. probably used parts of the old *'auwai*

system as it transferred small farm lands into cane cultivation. E.S.C. Handy noted the preexisting taro terraces at Kōloa and briefly describes the area: "The terrace areas of Kōloa were as follows: Maenui, and Kahukini, watered from Wailana Stream; Niihau (upper Waikomo) near the Catholic Church (Kīahuna Golf Course area) and Keaku watered from Maulele (Maulili) Stream. Now these areas are not used for taro, because the water is taken by the sugar plantation" (Handy 1940:65).

Kōloa Landing was phased out around 1925 with McBryde Sugar Co. and Kōloa Sugar Co. using Port Allen. Soon after the companies ceased to use the *makai* Kōloa fields and much of the area was converted into pasture land for cattle.

III. RECONNAISSANCE RESULTS

The survey consisted of first driving along the proposed bypass route starting from the North (*mauka*) end, and crossing Waihohonu Stream which is heavily modified with an existing bridge, culvert, pipeline and what appears to be a narrow railroad crossing. Except for pasture land in the southernmost portion of the proposed corridor, all the land within this portion of the corridor was formerly in cane cultivation.

Three archaeologists conducted a pedestrian sweep (walking approximately 30 feet apart) of the 1600 feet at the southern end of the non-staked proposed corridor (Phase II), starting at Weliweli Road near the end of the existing bypass road. They continued north flagging a center line and visually inspecting 50-100 feet on either side of the centerline. The area appears to have been bulldozed and there are many rock piles from this activity. There are also large areas of exposed surface bedrock with a few high outcrops. On the highest outcrop (approximately 2 meters high), a 3 meter-long wall remnant was found. Examination of the project map showed this remnant to lie 50' outside of the proposed bypass corridor to the east. Several areas had 7-foot high thick grass and the archaeologists walked 20 feet apart through these areas. No other sites were observed, except for the bulldozed rock piles. This sweep covered about 1600 linear feet before reaching the cane haul road which marked the beginning of cane land.

The project area map (reduced, Figure 7) shows the relationship of the following four sectional maps (Figures 8-11). The sectional maps depict the existing conditions from south to north within the proposed bypass corridor, including bulldozed pasture land, residential use and sugar cane cultivation. Photographs were taken during the reconnaissance and they are in the Photo Appendix (Appendix A). The photograph locations and directions are noted on the sectional maps.

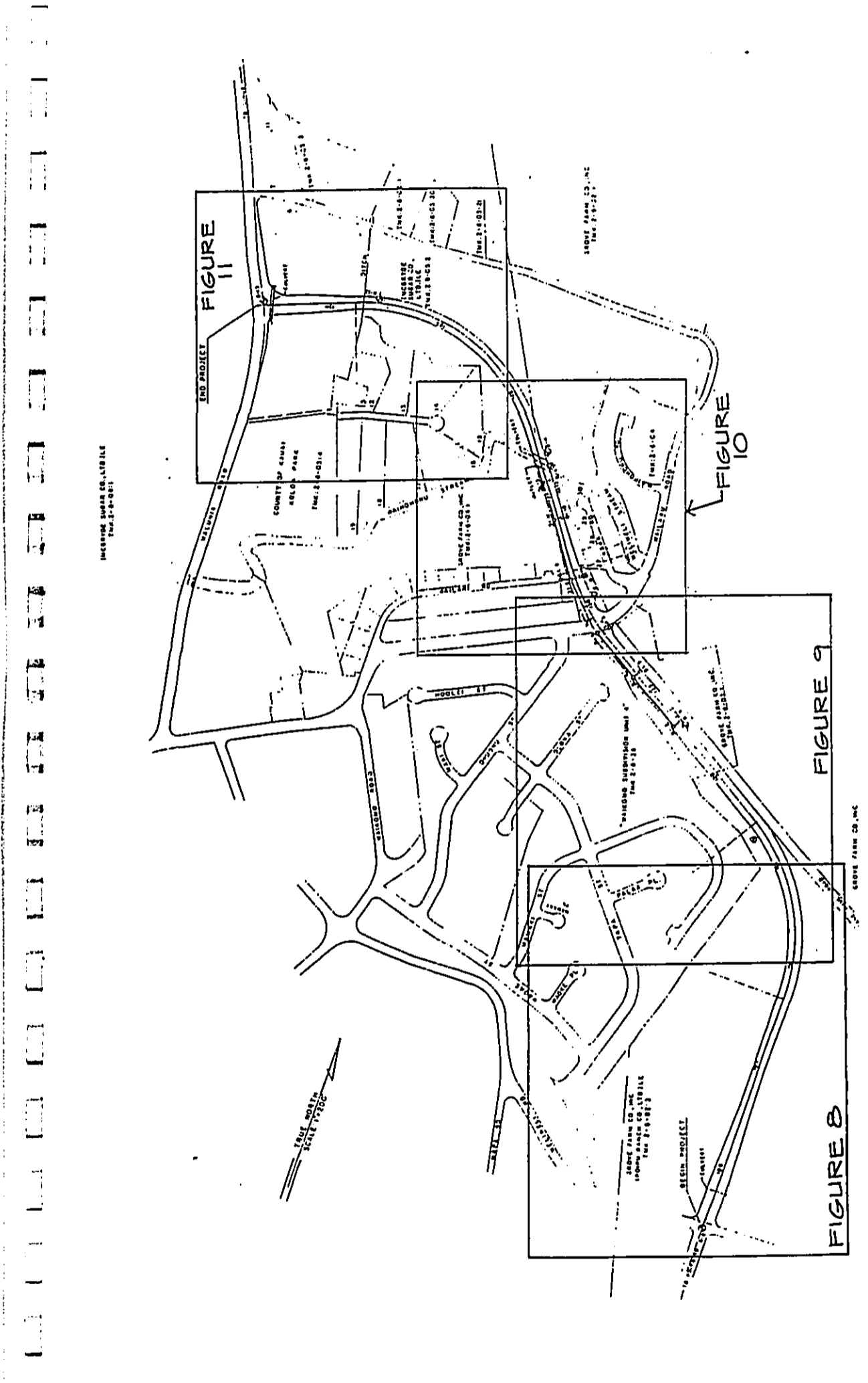


Figure 7 Project Map for Kōloa Bypass Road Corridor (Reduced) Showing Location of Sectional Maps

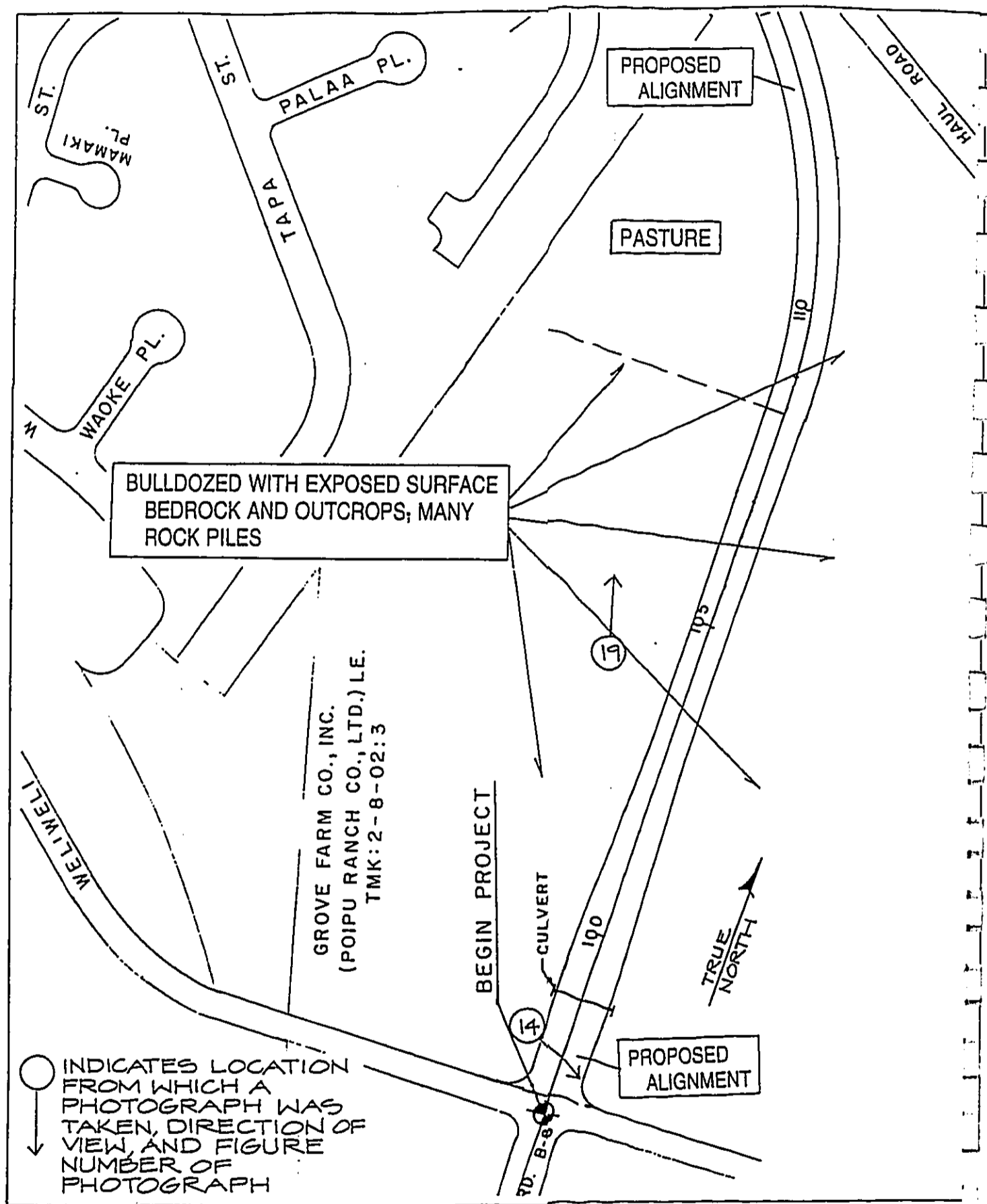


Figure 8 Project Area Map, Showing Beginning of Proposed Alignment, Scale 1"=200'

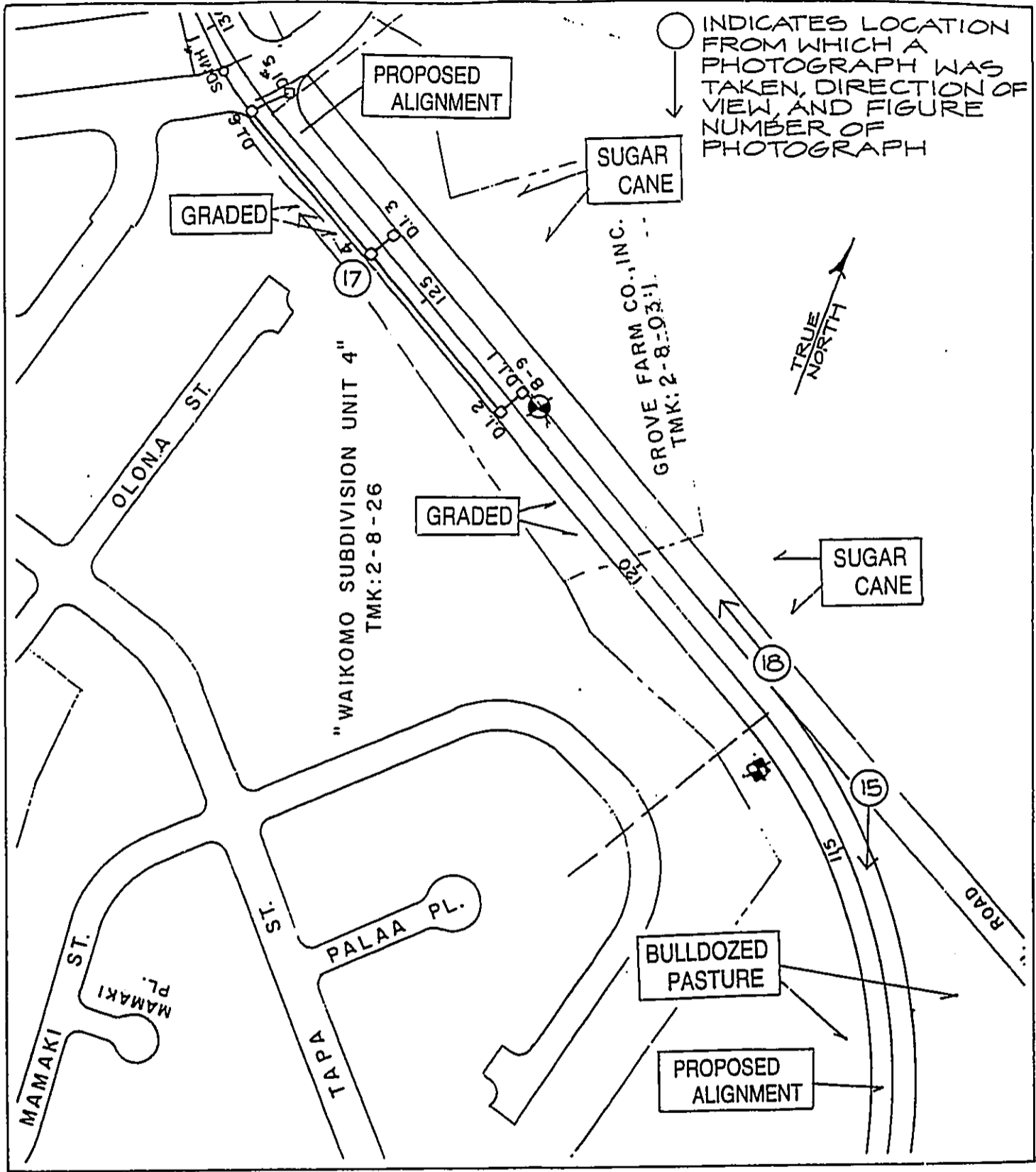
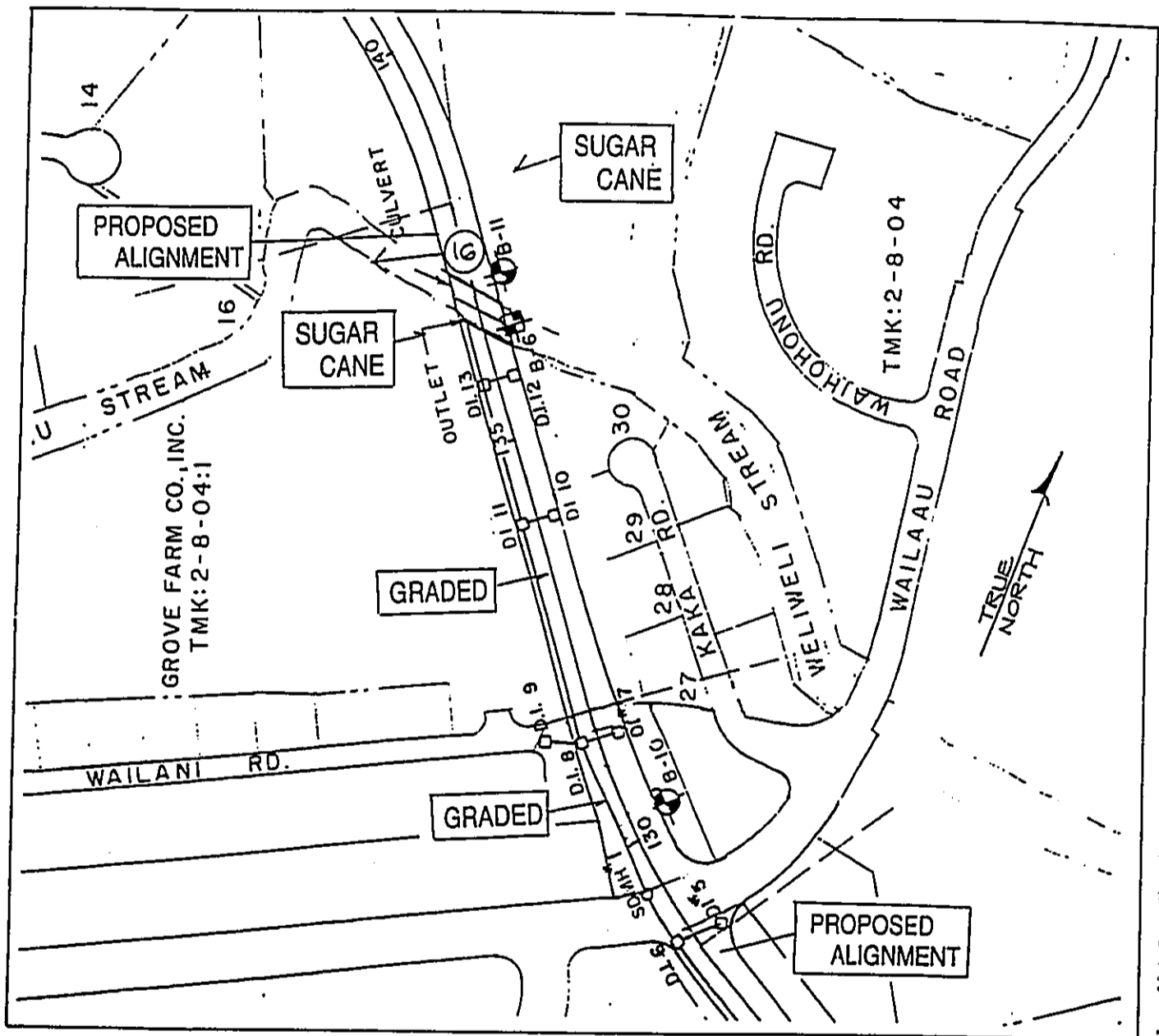
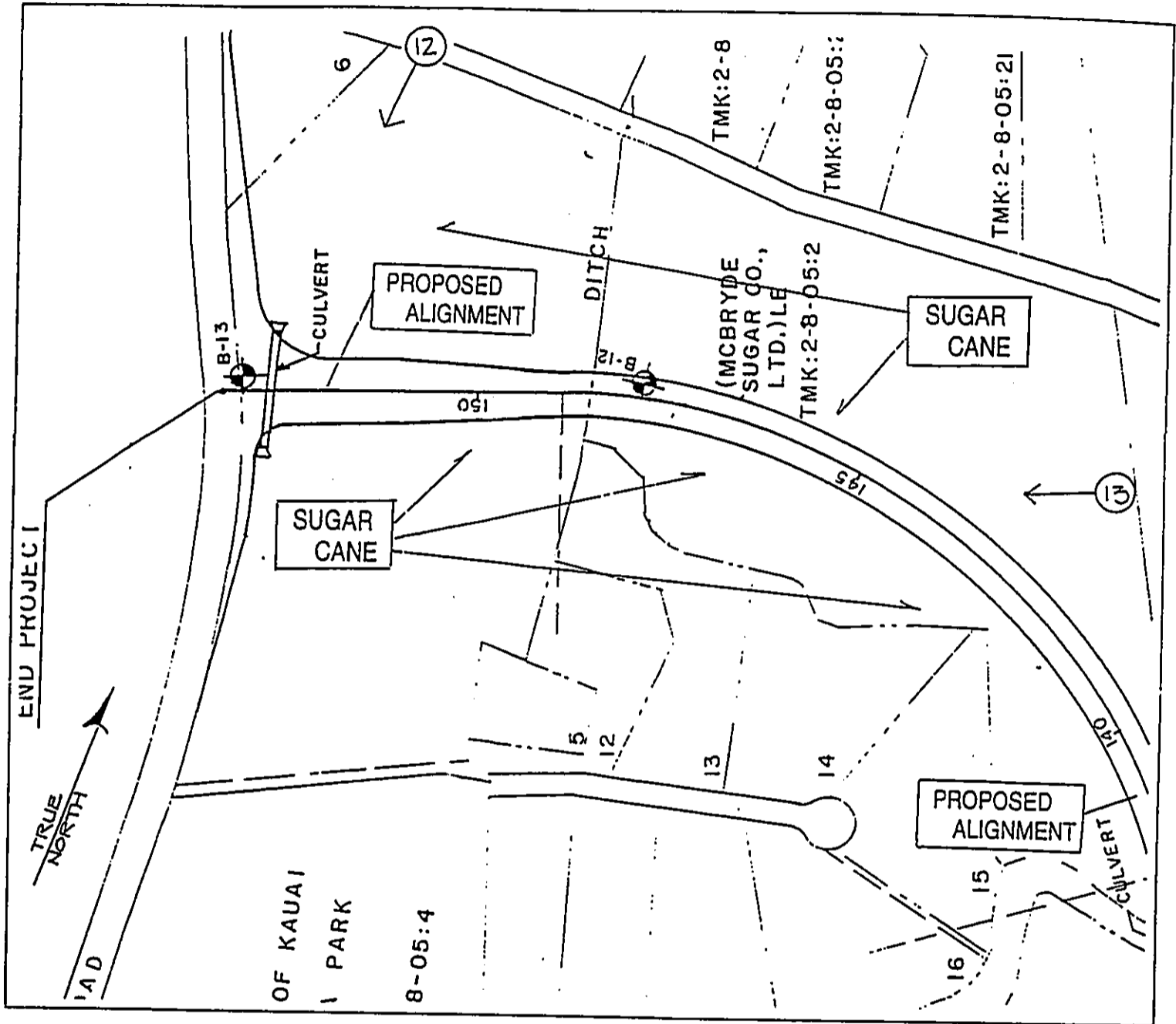


Figure 9 Project Area Map, Showing Second Section of Proposed Alignment, Scale 1"=200'



○ INDICATES LOCATION FROM WHICH A PHOTOGRAPH WAS TAKEN, DIRECTION OF VIEW, AND FIGURE NUMBER OF PHOTOGRAPH

Figure 10 Project Area Map, Showing Third Section of Proposed Alignment, Scale 1"=200'



○ INDICATES LOCATION FROM WHICH A PHOTOGRAPH WAS TAKEN, DIRECTION OF VIEW, AND FIGURE NUMBER OF PHOTOGRAPH

Figure 11 Project Area Map, Showing Final Section of Proposed Alignment, Scale 1"=200'

IV. SUMMARY AND RECOMMENDATIONS

The majority of the proposed bypass road corridor is or was formerly under cane cultivation, and residential homes or related infrastructure. At the southern end of the proposed road corridor, there is 1600 feet of pasture land which has been previously bulldozed. There are a few outcrops in the area and many bulldozed rock piles. One site, identified as a wall remnant (located 50 feet east, outside the project boundary), will not be impacted by development of the bypass road. Subsurface finds are unlikely along this proposed bypass corridor either because the present surface is bedrock or because previous land uses have destroyed any cultural remains that may have once been there.

No further archaeological investigation is recommended for this project area as it is anticipated that because of the absence of any surface sites and the degree of previous ground disturbance (*i.e.* cane cultivation, residential use, and bulldozed pasture land) there will be no effect on archaeological resources within the Kōloa Bypass Road Corridor. However, if during construction inadvertent archaeological remains, including burials, are found, work should be halted immediately in that area and the State Historic Preservation Division should be contacted at 1-800-468-4644 or 1-808-587-0047. Appendix B contains the federal law concerning historic preservation.

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APPENDIX A: PHOTO APPENDIX



Figure 12 Fallow Cane Land at the North End of the Project Area, View to South

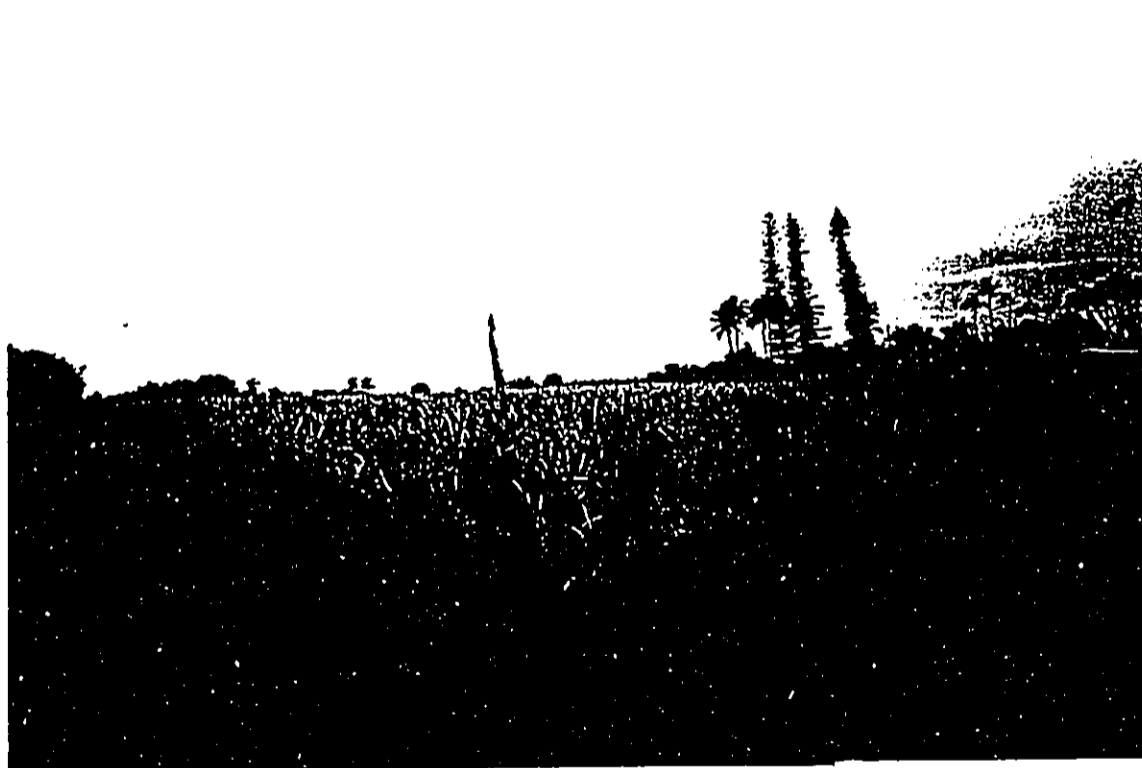


Figure 13 Fallow Cane Land within the Northern Portion of the Project Area, View to West

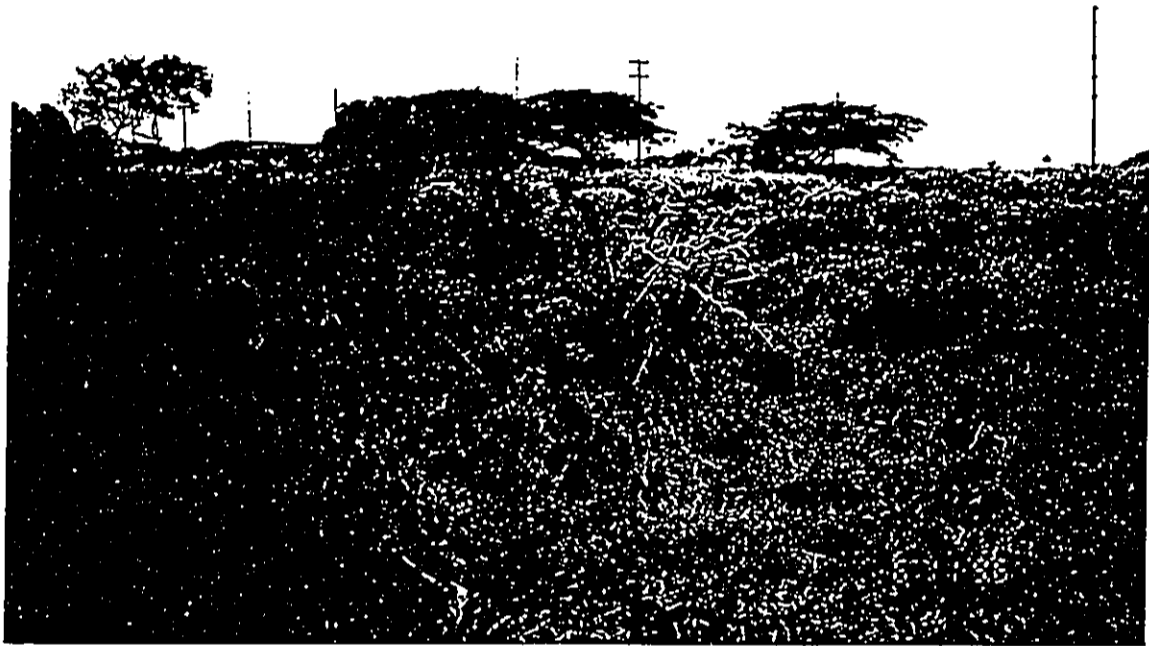


Figure 14 Bulldozed Pasture Land as Seen from Project Staring Point at Weliweili Road, View to Southeast



Figure 15 Bulldozed Pasture land along Proposed Bypass Corridor, View to South



Figure 16 Waihohonu Stream Culvert seen from Proposed Bypass Corridor, View to Southwest



Figure 17 Former Cane Land with Housing Near Olona Street in Background, View to Northwest



Figure 18 Proposed Bypass Corridor along Former Cane Haul Road, View to Northwest



Figure 19 Proposed Bypass Corridor showing Vegetation-Covered Bulldozed Rock Piles along Former Cane Haul Road, View to North

APPENDIX B: THE NATIONAL HISTORIC PRESERVATION ACT

National Historic Preservation Act of 1966, as amended (NHPA) (PL89-665)

The National Historic Preservation Act of 1966, as amended (NHPA), furnishes the framework for the identification, evaluation, protection and preservation of cultural resources. The NHPA also provides for the selection of State Historic Preservation Officers (SHPO) and an Advisory Council on Historic Preservation both of which assist in the implementation of NHPA. Section 106 and 110 of NHPA and Executive Order 11593, implemented in 1971, establish guidelines and responsibilities for Federal agencies.

Section 106 of NHPA requires that all Federal agencies take into account the effects of their undertakings on historic properties. A Federal undertaking may include the full range of Federal activities, such as construction, rehabilitation projects, Federal property transfers, etc. Whenever an undertaking has the potential to affect a cultural resource the Federal agency in charge of the project is obligated to fulfill the requirements of Section 106 and implementing regulations in 36 CFR 800 "Protection of Historic Properties."

36 CFR 800 are the regulations of the Advisory Council which define the process used by a Federal agency to meet the responsibilities set forth in Section 106 of NHPA. Four steps are involved in what is called the "Section 106 Process":

Identification and Evaluation of cultural resources - The first step in the process is to identify all the cultural resources the undertaking may affect. Secondly the agency reviews background material and contacts the SHPO and any other person who may know about cultural resources in the area. Based on that data the agency then decides if further surveys are needed and conducts them if necessary. The agency then evaluates the properties for eligibility for inclusion in the National Register.

Assessing effects - If there are National Register cultural resources, the agency has to determine in consultation with the SHPO, as well as other interested parties, what effects the undertaking will have on the resources. The following are the possibilities for determination:

No Effect: the undertaking will not affect cultural resources;

No Adverse Effect: the undertaking will affect cultural resources, but the effect will not be harmful;

Adverse Effect: the undertaking will harm one or more cultural resources.

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
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HISTORIC PRESERVATION

DIVISION
LAND DIVISION
STATE PARKS
WATER AND LAND DEVELOPMENT

January 29, 1997

Hallett Hammatt, Ph.D.
Cultural Surveys Hawaii
733 N. Kalaheo Avenue
Kailua, Hawaii 96734

LOG NO: 18853 ✓
DOC NO: 9701NM12

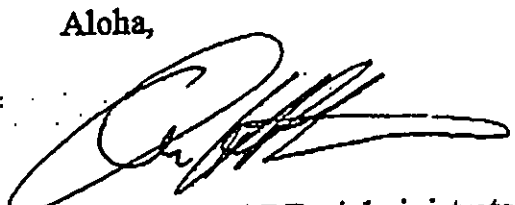
Dear Dr. Hammatt:

**SUBJECT: Historic Preservation Review – Final Report -
Archaeological Investigation for Environmental Assessment
of the Proposed Koloa/Poipu Bypass Road
Koloa, Weliweli, Kona, Kaua'i
(TMK: 2-8-02: por. 3, 2-8-03: por. 1; 2-8-04: por. 1 and
2-8-05: por. 2) (Ida, Creed and Hammatt, CSH, 1997)**

Thank you for the revised submission of the archaeological report for the Koloa/Poipu Bypass Road. It is now an acceptable report. No historic sites were found in the project area, so the project will have "no effect" on significant historic sites.

If you have any questions, please call Nancy McMahon 742-7033.

Aloha,


DON HIBBARD, Administrator
State Historic Preservation Division

NM:amk

Appendix J

***SOCIAL IMPACT ASSESSMENT FOR
KOLOA-POIPU BYPASS ROAD
FROM WELIWELI ROAD TO MALUHIA ROAD***

*Prepared by Earthplan
July 1996*

**Koloa-Poipu Bypass Road
From Weliweli Road
To Maluhia Road**

Social Impact Assessment

Prepared by Earthplan

For Wilson Okamoto and Associates

July 1996

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1. Background and Introduction

The Kaua'i County is proposing to construct a bypass road in the southern part of the island. The project requires Federal funds and an environmental assessment is being prepared to study project impacts. This social impact assessment is summarized in and appended to the environmental assessment.

This report is prepared by Earthplan whose offices are located on 81 South Hotel Street, Suite 211, in Honolulu, Hawai'i. Berna Cabacungan, principal of Earthplan, was project manager, and principal analyst and writer. Assistance was provided by two independent contractors. Paul Kiikoro was assistant project manager. He analyzed census information and public policies, conducted interviews, and gathered information on public services and other development projects. Michael Mays conducted interviews and gathered media material.

1.1 Project Description

Poipu has been planned as a visitor destination for over three decades, and resident and visitor population growth has been anticipated. Poipu is currently accessible via Poipu Road which is shared with Koloa. County officials have been planning a bypass road to relieve traffic congestion on Poipu Road. Currently, two bypass roads are in public plans -- one to the east and one to the west of Poipu Road.

The proposed project is part of the bypass road to the east of Poipu Road. The existing part of the bypass extends from a portion of Poipu Road in Poipu north to Weliwell Road. The proposed bypass road will traverse from Weliwell Road to Maluhia Road and will span 1.2 miles within a 60-foot right-of-way. The proposed road is planned to run parallel to an existing cane haul road; nearby uses include the Waikomo Subdivision, pasture land and sugar cane land.

1.2 Report Organization

Section 2 establishes the baseline social conditions by providing a historic overview, a description of the existing community, and discussion related to demographics, housing, households and families and the labor force. Section 3 extends this baseline information with information related to public policies and other major forces for change.

In Section 4, community issues are presented. Potential social impacts are identified in Section 5, and included in this discussion are the project's relationship to public policies and directions for the area; impacts on the neighboring community; displacement; impacts on Koloa Town businesses; employment and wages; and public services and facilities.

2. Profile of the Existing Community

This section establishes the social context for the proposed bypass road. Section 2.1 provides an overview of historical and existing conditions. Section 2.2 presents information related to recent demographic and housing characteristics.

2.1 Historical & Existing Conditions

2.1.1 Physical Environment

Kaua'i is a verdant, circular-shaped island located at the extreme northwest of the major Hawaiian Islands. At 553 square miles, Kaua'i is the fourth largest island in the archipelago. As the oldest of the major islands, seismic activity is minimal and its terrain is characterized by striking topographic features, such as the world-renowned Waimea Canyon and the rugged Na Pali seacliffs, caused by millennia of erosion. Rainfall is so heavy in places that Kaua'i's highest elevation, Mount Waialeale, captures almost 500 inches annually, earning the distinction of being the wettest spot on earth. ¹

In ancient times, the island was divided into five ahupua'a or pie-sliced districts: Hanalei, Kawaihau, Lihu'e, Koloa, and Waimea. Kaua'i County's five contemporary planning areas roughly coincide with their traditional counterparts. Each of these planning areas boasts fertile soils and abundant fresh water. And with 65 percent of the land area within five miles of the coast, a rich source of seafood is readily available. ² Many of the island's lush tropical habitats sustain several endemic plant and animal species.

1. *University of Hawaii, 1994.*
2. *University of Hawaii, 1994.*

2.1.2 Historic Background

Kaua'i

The first settlement of Kaua'i occurred by Marquesan voyagers approximately 1,100 years ago. The numbers of these early inhabitants were augmented about a century later by Tahitians.³ Land use remained relatively low key until European contact in the latter half of the eighteenth century. For the most part, Hawaiians on Kaua'i cultivated staple crops, especially taro, and performed several ocean-oriented activities geared towards food production.

The island's sometimes harsh climatic conditions — particularly high winds and treacherous currents — helped repel two invasions led by Kamehameha I in the late eighteenth century during his quest for dominance over the entire chain. Kamehameha's failed attacks left Kaua'i as the only island independent of the Honolulu-based dynasty.

Westerners first visited Kaua'i in 1786. Initial contact mainly involved ships reprovisioning their stocks with native foodstuffs, but soon the purchase of the island's sandalwood became the chief source of trade. Sandalwood's value in the Orient led to its rapid depletion by the 1820s, forcing the fledgling Kaua'i economy into other avenues. In particular, foreigners began acquiring land on which they experimented the efficacy of various cash crops, including coffee, tobacco, rice, pineapple, and sugar.

Kaua'i's indigenous population saw a significant decline about this time, primarily attributable to introduced communicable diseases. A secondary factor was the outmigration of many young Hawaiian men who left the island to serve as outbound sailors, removing both themselves and their potential

3. Joesting, 1984.

progeny from the population pool. As a combined result of premature death and outmigration, the Hawaiian population on Kaua'i stood at about 5,200 in 1872, which was less than half its strength 40 years previous.⁴

By the mid-nineteenth century, sugar cultivation became the dominant land use in Kaua'i. The labor-intensive nature of plantation agriculture forced land owners to import field hands from abroad, since local population levels were insufficient. The first wave of immigrant Chinese arrived in 1852, but the major influx from other nations, especially Japan, did not occur until the 1880s.⁵ Filipinos accounted for the last wave of migrant plantation laborers. Their numbers peaked in the early part of this century, following the American annexation of that country.

As with most of the State, Kaua'i slowly gravitated towards a visitor-based economy during the post-War decline of large-scale agriculture. The economic development of the island was drastically altered by Kaua'i's recent history of natural disaster, however. In 1982, Hurricane 'Iwa struck, leaving in its wake considerable damage. Residents struggled to recover from the hurricane for almost a decade when an even more catastrophic storm, Hurricane Iniki, inundated the island in September of 1992. Iniki's destruction was estimated at \$1.6 million, and came at a critical time when the statewide economy was already declining.⁶

Prior to Iniki, general trends suggested a guardedly aggressive economic atmosphere, with an upswing in visitor arrivals and the Kaua'i labor force. Both the U.S. Mainland and Japanese economies experienced sharp recessions in the early 1990s, however, the repercussions of which barely

4. Joesting, 1984.

5. Joesting, 1984.

6. Governor's Economic Recovery Committee, 1993.

touched Hawai'i in 1992 but have since been felt with full force throughout the State. The aggregate result of two crippling hurricanes and a statewide recession upon Kaua'i has been devastating.

Tourism has been the most obvious casualty, with total visitor arrivals plummeting by half in the two-year period between 1991 and 1993.⁷ The biggest slump came from westbound visitors who have always been the mainstay of Kaua'i tourism. The State has since invested heavily abroad in marketing Kaua'i as a desirable destination and that investment seems finally to be working. The latest counts for 1994 show a definite rebound in westbound visitors, despite a partial decline in eastbound visitors.⁸ Overall, the return of consumer confidence is apparent as 1994 total arrivals ended up almost third higher than in 1993.

Koloa-Poipu

The primary Study Area for this report is the Koloa - Poipu region, which is included in Census Tract 406.⁹ *Figure A* depicts the Study Area for this report.

Koloa and Poipu are separated from Lihu'e by the Hoary Head mountain range which extends from the center of the island in a southeasterly direction towards the coast. Entrance to Koloa-Poipu is gained through the Maluhia Road Tree Tunnel. The arboreal tunnel is formed by eucalyptus trees that tower up from either side of the road to form a spectacular overhead apex. The rest of the road to Koloa is bordered intermittently by wild foliage and cultivated sugar cane.

7. *Hawaii Visitors Bureau, 1994, 1993, 1992.*

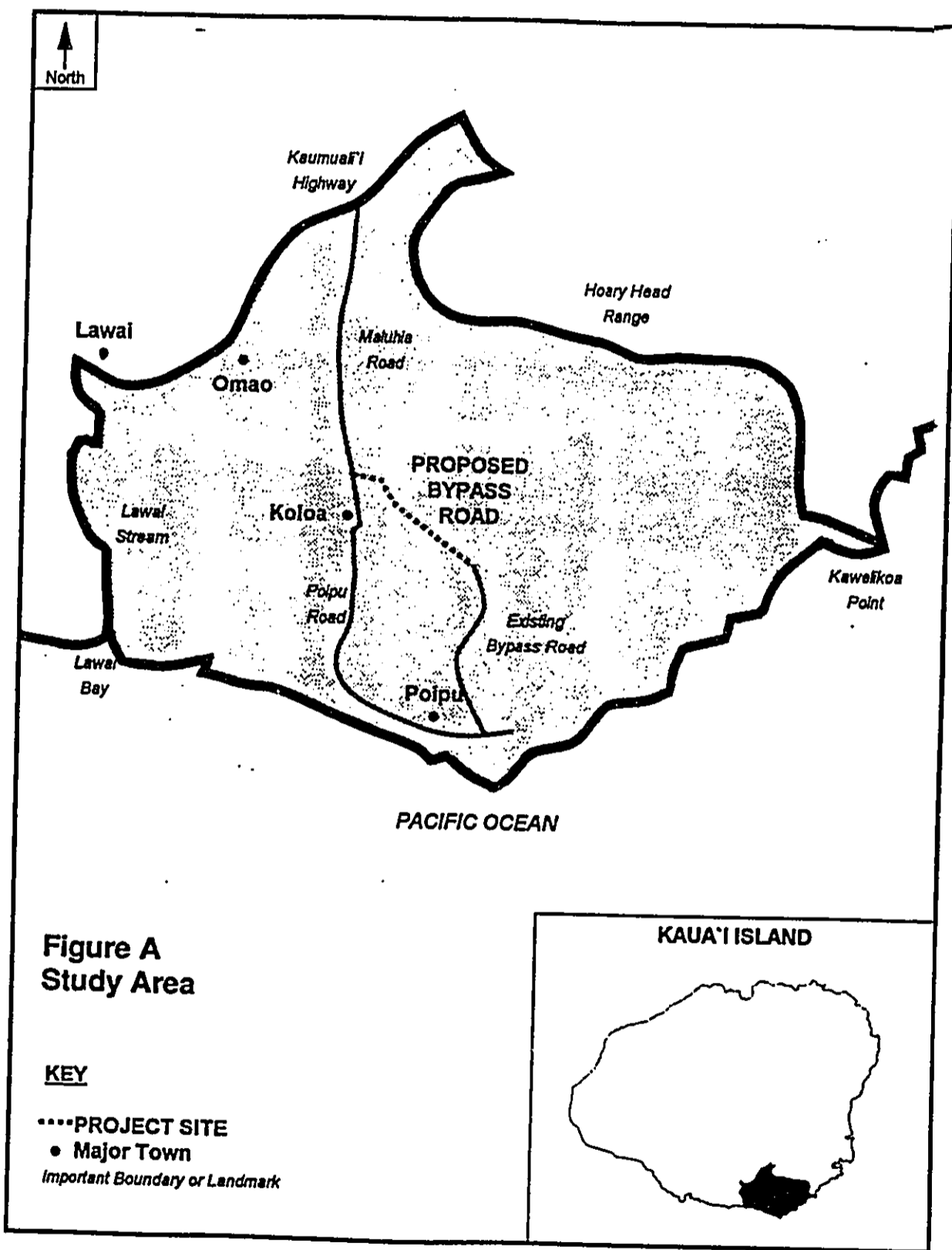
8. *Gongob, 1995.*

9. *Note that the Census Tract includes Omao and most of Lawai. The discussion on the Study Area is confined to Koloa and Poipu, however, because these are the largest communities and closest to the proposed bypass road.*

SIA for Koloa - Poipu Bypass Road from Wellwell Road to Maluhia Road

Section 2

Profile of Existing Community



Mainly residential in nature, Koloa is an historic rural town comprising clusters of well-maintained plantation homes that date back to the early part of this century. The local post office, and a scattering of small shops, banks, and eateries can be found in the town center.

Koloa is credited as being the birthplace of the Hawaiian sugar industry. In 1835, three Americans established Ladd and Company, the first sugar plantation in the islands, at a site near the present intersection of Maluhia and Koloa Roads. ¹⁰ Ladd and Company dissolved in 1845, but sugar cultivation remained the predominant agricultural activity until recent years saw experimentation in both macadamia nuts and coffee. ¹¹ As with the rest of the island, western contact caused a precipitous drop in the native Hawaiian population, so in 1850 the first immigrant laborers from China, Japan, Portugal, and the Philippines were introduced to work on the plantation. ¹²

Just on Koloa's eastern outskirts, Koloa Sugar Mill, owned by Alexander & Baldwin's (A&B) McBryde Sugar Company, continues to operate, though its closure is scheduled for later this year. Other historic landmarks in the town include Koloa Church, built the same year sugar was brought to the region, and the 1856 St. Raphael's Church, an outgrowth of the first Catholic mission to Kaua'i in 1841. Opened as the first public school on Kaua'i in 1877, Koloa School remains in service as the only educational facility in the town, despite a fire in 1973 which destroyed a large portion of its campus. ¹³

In stark contrast to Koloa, Poipu is mostly a modern resort community that sprawls along the southern coastline. Large anchor hotels include the Hyatt, the Sheraton, and the Waiohai, but several more accommodations are spread

10. Russ, 1993; Clark, 1990.

11. Clark, 1990.

12. EDAW, Inc., 1977.

13. EDAW, Inc., 1977.

throughout the length of the shoreline. Pockets of upscale private homes are interspersed amongst the resorts, and Poipu Shopping Center with its small boutiques aimed at the visitor market is located near Poipu's western end.

Even though initial resort development occurred in the area as early as the 1960s, many of Poipu's buildings appear to have been built recently; they have undergone substantial renovation following Hurricane Iniki in 1992. The south shore from Lawai to Poipu is considered one of the best diving and spearing regions on Kaua'i.¹⁴

Koloa Landing at the western end of Poipu was a major Kaua'i port during the nineteenth century, serving first as a whaling port, then as a point of entry to the islands, and then finally as a staging area for the export of sugar from Koloa Mill.¹⁵ At the turn of the century, Koloa Landing handled an average of 50 ships a year, but fell into disuse by the 1920s.¹⁶ Kukul'ula Small Boat Harbor is the only harbor still in use. It serves mainly as a small vessel launching facility for local commercial and pleasure craft.

2.3 Recent Demographic and Housing Characteristics

2.2.1 Population & Housing Trends

As *Table 1* shows, Koloa-Poipu has experienced a population gain since 1970 while losing several hundred housing units between 1980 and 1990. This at least in part attributable to the destruction caused by Hurricane 'Iwa in 1982. By 1990, the Koloa-Poipu population had reached 4,900.

14. Clark, 1990.

15. Russ, 1993.

16. Clark, 1990.

Table 1: Population & Housing Trends, 1970-1990

	1970	1980	1990	Average Annual Growth Rate	
				1970 to 1980	1980 to 1990
Population					
Kaua'i	29,761	39,082	51,177	2.8%	2.7%
Koloa-Poipu ^a	3,141	3,879	4,900	2.1%	2.4%
Housing					
Kaua'i	9,021	14,828	17,613	5.1%	1.7%
Koloa-Poipu (1)	1,001	2,049	1,790	7.4%	-1.3%

a. Includes the project area.

Source: U.S. Bureau of the Census, 1991, 1983; Hawai'i State Department of Planning and Economic Development, 1972.

Though occurring at a lesser rate, Koloa-Poipu's annual average population growth over the last two decades has kept pace with Kaua'i's as a whole. The area's housing growth significantly lags behind the island norm, however, reflecting negative growth between 1980 and 1990.

Recent estimates put Kaua'i's 1994 population at 55,700, and the Koloa District's population at 12,500.¹⁷ That means nearly a quarter of the island's populace resides in the Koloa District. Note that the Koloa District is a geographical region much larger than the Koloa-Poipu Study Area of this report.¹⁸ In 1990, Koloa-Poipu made up 43 percent of the entire Koloa District's population.

¹⁷. State DBEDT, 1996.

¹⁸. It includes all of Lawai and Kalaheo.

2.2.2 Demography

The overall Koloa-Poipu Study Area population of 4,900 persons in 1990 resembled that of the County's in terms of age and ethnic distribution.

Age-wise, Koloa-Poipu residents tended to be slightly older than the islandwide population. Proportionally, there were slightly less people under 18, and more people in the higher age categories. The Study Area 1990 median age of 34.8 years reflects this difference; the County's 1990 median age was 33.9 years.

In terms of ethnicity, Kaua'i's ethnic composition differed from the State in that the island had significantly more Filipinos than Japanese. Information in Table 2 shows that this trend was generally true of Koloa-Poipu as well. In addition, there were a marginally higher percentage of Caucasians and slightly fewer Hawaiians in Koloa-Poipu than reflected in islandwide proportions.

Table 2: Demographic Characteristics, 1990

	Total Kaua'i	Koloa - Poipu
Population	51,177	4,900
Age		
Under 5	8%	7%
5 to 17	20%	19%
18 to 44	41%	42%
45 to 64	18%	19%
65 or more	13%	14%
Median age	33.9 years	34.8 years

Table 2: Demographic Characteristics, 1990 (Continued)

	Total Kaua'i	Koloa - Poipu
Ethnicity		
Caucasian	35%	41%
Japanese	20%	21%
Hawaiian	15%	10%
Filipino	25%	22%
Other	5%	6%
Educational Attainment For Persons 25 Years & Older		
High school graduate ^a	27%	19%
College degree ^b	26%	27%
Residence in 1985 for Persons 5 Years & Over		
Same county, same house	57%	59%
Same county, different house	22%	21%
Different county	6%	4%
Different state	12%	14%
Different country	3%	1%

a. All persons with a high school diploma, but without a college degree

b. Includes all persons with an Associates, Bachelor, graduate or professional degree.

Source: U.S. Bureau of the Census, 1992, 1991.

Koloa-Poipu had substantially fewer high school graduates on the average than Kaua'i but about the same proportion of college graduates.

In terms of residential stability, Koloa-Poipu tended to be slightly more stable than the islandwide profile. Fifty-nine percent of Koloa-Poipu's residents had lived in the same house in 1985, compared to 57 percent islandwide. This trend also holds true for those who lived in the same county-different house, in a different county, and in a foreign country. The only exception is that Koloa-Poipu had proportionally more in-migrants from another state (14 percent) compared to Kaua'i (twelve percent).

The combination of high median age, comparable proportion of college graduates, and high proportion of in-migrants from other states is indicative of the high proportion of retirees living in Poipu.

2.2.3 Households and Families

Koloa-Poipu boasted just over 1,600 households, accounting for ten percent of all Kaua'i households. As *Table 3* indicates, the region had a smaller average household size at three persons, compared to the islandwide average of 3.1 persons per household. There was also slightly less crowding in Koloa-Poipu's units than the overall island.

The 1990 median household income in Koloa-Poipu was \$38,942; this was much higher than the islandwide median of \$37,425. Another indicator of relatively higher incomes in Koloa-Poipu is that only four percent of its households relied upon public assistance income, compared with seven percent of County households.

Table 3: Household & Income Characteristics, 1990

	Total Kaua'i	Koloa- Poipu
Total Households ^a	16,295	1,617
Persons per household	3.10	3.00
Crowded households ^b	16%	15%

Table 3: Household & Income Characteristics, 1990 (Continued)

	Total Kaua'i	Koloa- Poipu
With public assistance income	7%	4%
Median household income	\$37,425	\$38,942
Family Households	12,367	1,227
As % of total households	76%	76%
Married-couple families	80%	82%
Families below poverty level	5%	4%
Median family income	\$41,099	\$43,304

- a. Equivalent to the total number of occupied units.
- b. Defined as more than one person per room.

Source: U.S. Bureau of the Census, 1992, 1991.

As with the islandwide profile, over three-quarters of Koloa-Poipu households were families, and most of those families were headed by a traditional married-couple relationship. The Koloa-Poipu poverty rate of four percent in 1990 was almost on par with the islandwide average of five percent. The median family income of \$43,304 was slightly higher than the islandwide median family income of \$41,099.

2.2.4 Housing

Koloa-Poipu's 1990 housing stock of 1,790 units had a ten percent vacancy rate, which was about a third higher than the Kaua'i County rate of seven percent. This higher vacancy may stem from units reserved for visitor use, and secondary part-time homes of absentee owners. *Table 4* contains additional information about the Study Area's housing units.

Table 4: Housing Unit Characteristics, 1990

	Total Kaua'i	Koloa- Poipu
Total Housing Units	17,613	1,790
Vacant units	7%	10%
Type Of Unit		
Single-family ^a	86%	84%
Multi-family ^b	12%	14%
Other ^c	2%	2%
Total Occupied Units ^d		
Owner-occupied	59%	61%
Renter-occupied	41%	39%
Median Home Value of Owner-Occupied Units	\$171,500	\$195,800
Median Monthly Rent of Renter-Occupied Units	\$532	\$583

a. Includes both detached, stand-alone houses and attached duplexes.

b. Includes townhouses and apartments.

c. A non-conventional dwelling, such as a trailer or mobile home.

d. Equivalent to total number of households.

Source: U.S. Bureau of the Census, 1991.

Compared to the islandwide housing stock, Koloa-Poipu had similar proportions of single family (84 percent) and multi-family (14 percent) units.

Housing costs in Koloa-Poipu were higher than that of the islandwide housing stock. The median monthly rent of \$583 was \$50 above the island median rent. Home values were distinctly more costly — the Koloa-Poipu median value of \$195,800 was nearly \$25,000 above the Kaua'i median of \$171,500.

2.2.5 Labor Force

The Koloa-Poipu 1990 labor force patterns were generally similar to the islandwide characteristics, with the following notable differences:

- At a 1.5 percent rate, Koloa-Poipu's 1990 unemployment was almost nonexistent; the County's 1990 unemployment rate was 3.6 percent; and
- Over one-fourth of Koloa-Poipu workers were professionals, compared to 22 percent islandwide.

Table 5: Labor Force Characteristics, 1990

	Total Kaua'i	Koloa - Poipu
Potential Labor Force ^a	38,348	3,756
Civilian labor force	68%	69%
Armed forces	1%	0%
Not in labor force	31%	31%
Unemployed civilian labor force	3.6%	1.5%
Employed Civilian Labor Force by Occupation	25,241	2,538

Table 5: Labor Force Characteristics, 1990 (Continued)

	Total Kaua'i	Koloa - Poipu
Managerial & professional	22%	26%
Technical & sales	16%	14%
Service	33%	32%
Farming & fishing	6%	5%
Precision, craft, & operators	14%	14%
Transportation	5%	6%
Handlers, cleaners, & labor- ers	4%	3%
Mean Commute Time to Work	19.0 minutes	19.2 minutes

a. Includes all persons 16 years and older.

Despite the presence of the McBryde Sugar Company in Koloa, Koloa-Poipu actually had proportionately fewer workers employed in agriculture than the island.

The region's mean commute of 19.2 minutes, which is slightly higher than the islandwide mean, suggests that many Koloa-Poipu workers are not employed locally at the plantation or the resorts, but must commute to other parts of the island.

Since the 1990 census, the effects of Hurricane Iniki in 1992 have caused a marked increase in unemployment in Kaua'i island and in Koloa Poipu. In the three years following Iniki, the islandwide unemployment rate soared at 11.1, 12.7 and 11.5 percent. As of May 1996, the islandwide unemployment rate was estimated at 11.2 percent. In Koloa-Poipu, the unemployment rate was estimated at 4.9 percent, which suggests that some economic recovery is occurring for area residents.

3. Major Forces for Change

This section extends the baseline information about the existing community by looking at the direction for future change in the Koloa - Poipu region. Section 3.1 presents County-wide projections, followed by a discussion of public policies in Section 3.2. Major developments independent of the proposed bypass road are discussed in Section 3.3.

3.1 Countywide Projections

In recent years, the State Department of Business, Economic Development, and Tourism (DBEDT) regularly published long-range population and economic projections known as the M-K Series. This series offered county-level future scenarios based on historical and existing trends at the time of release. The last set of M-K projections for Kaua'i was run in 1988, well before the drastic effects of Hurricane Iniki could be taken into consideration. Further, the M-K did not have available the results of the 1990 Census to recalibrate its base assumptions.

In spite of these drawbacks, the M-K Series remains the best indicator of Kaua'i County growth over the long term period. Clearly, actual figures are now overstated, but the general patterns should still hold true. Table 6 contains selected M-K projections for Kaua'i County.

Table 6: Selected M-K Projections for Kaua'i County, 1990 to 2010

	Projections			Percent change	
	1990	2000	2010	1990 to 2000	2000 to 2010
Resident population	54,100	68,200	84,600	26%	24%

Table 6: Selected M-K Projections for Kaua'i County, 1990 to 2010 (Continued)

	Projections			Percent change	
	1990	2000	2010	1990 to 2000	2000 to 2010
Average visitor census	16,700	26,800	36,900	60%	38%
Civilian jobs	25,300	34,200	42,500	35%	24%

Source: State Department of Business and Economic Development, 1988.

Kaua'i's population could reach 68,200 by the end of the century, once the island returns to something akin to its normal pre-Iniki growth cycle. This translates to a net increase of 26 percent between 1990 and 2000, spurring added demand for housing and services.

Kaua'i relies more heavily on tourism than the other major islands. Consequently, it is projected that the demand for visitor units in Kaua'i County will account for 13 percent of all statewide visitor units by as early as 2000. Based on this assumption, Kaua'i's average visitor census may reach 26,800 in 2000, which is an optimistic 60 percent increase over the 1990 level. The M-K projection of 34,200 jobs by 2000 is a significant increase of 35 percent above the 1990 figure.

3.2 Public Policies

3.2.1 State Land Use Boundary Review

In 1992, the Office of State Planning (OSP) conducted a statewide policy-oriented examination of land use district classifications. The resulting Five-Year Boundary Review allows the State Land Use Commission to review

urbanization proposals in the context of an overall planning horizon, rather than evaluating the merits of isolated cases.

As part of the review process, OSP comprehensively analyzed urban areas. It gauged the sufficiency of urban-zoned lands and the ability of those lands to accommodate expected population and economic growth. The Boundary Review's population projections for Kaua'i and its districts are on Table 7.

Table 7: Five-Year Boundary Review Population Projections, 1990, 2000 and 2010 ^a

	1990	2000	2010
Kaua'i	54,100	67,800	84,600
Koloa-Poipu	13,690	16,400	19,300

a. Rounded to the nearest hundred.

Source: Office of State Planning 1992.

Koloa-Poipu's population growth is projected at 20 percent between 1990 and 2000, and 18 percent between 2000 and 2010. This represents a slowdown compared to the heady growth of the last two decades; previously there was an approximate 25 percent population increase for both the periods 1970 to 1980, and 1980 to 1990.

The Boundary Review's projections, taken with the present supply of urbanized lands and remaining vacant developable lands, suggest that an additional 2,600 acres islandwide are required by 2010 to meet demand. Within Koloa-Poipu specifically, the Boundary Review estimates an additional 500 acres above the current urban-zoned acreage is needed to meet demand; this represents about one-fifth of the total County demand. After the Lihu'e and Kapa'a regions, this is the third highest level of demand on the island.

3.2.2 Kaua'i General Plan

Kaua'i County established a General Plan in 1971 to legislate the controlled management of the island's development. Constraint of the resident population in accordance to resource and infrastructure limitations is key to the General Plan's mandate.

The last update of the Plan was authored by a consortium of private consultants in 1982, based on input from government bodies and community groups. Even prior to both Hurricanes 'Iwa and Iniki, the General Plan stresses that infrastructure upgrades are required. The Plan recommends a resource management system that would provide a basis for determining capital improvement programs, infrastructure, master plans, and so on. Target areas incorporated into this management system include housing, agriculture, industry, energy, historic resources, and transportation.

The Plan further recommends that Kaua'i foster an optimal population growth rate of 2.25 percent so as to achieve a 1990 population of 49,000 persons. This proposed population would require additional urban development of 1,100 acres and 3,750 new housing units.¹⁹ The actual 1990 population count of almost 51,200 surpassed this particular target, thus implying that more development was approved than originally intended.

Regional maps in the General Plan designate the following recommended land uses for Koloa- Poipu:

- Urban Residential in west Poipu and Koloa Town itself;
- Resort in east Poipu and south of Koloa Town;
- Agricultural to the west and east of Koloa Town; and
- Open to the north of Koloa.

19. *Planners Collaborative, 1982.*

A second update of the Kauai' General Plan is scheduled to begin this year. ²⁰

3.2.3 Koloa-Poipu Development Plan

A development plan for the Koloa-Poipu planning area in 1977 and 1978; this plan remains the most recent published document regarding County policy for Koloa-Poipu. The plan spells out general qualitative planning directions for the region in terms of a series of options.

Growth options include:

- Allocate new population and visitor and commercial facilities proportionally to existing areas; or
- Concentrate them in certain existing areas; or
- Develop entirely new areas.

Physical improvement options include:

- Improve existing infrastructure, intensify the use of already developed lands for new development, and acquire access to already developed shoreline areas; or
- Develop new infrastructure, use undeveloped lands for new development, and acquire undeveloped shoreline areas.

In addition, the plan presents two sets of social improvement options. One option is to encourage interdependence among area residents, encourage more contact between visitors and residents, and encourage availability of greater social variety. The other is to encourage independence of individuals and area communities, encourage more separation between visitors and residents, and encourage availability of greater social similarity.

20. Personal communication with Keith Nitta, Planner, Kauai' County Planning Department, June 26, 1997.

Specific options for the Koloa community include: either providing a road bypass or improving existing roads and signage; and alleviating the flood problems by improving drainage or directing development elsewhere. Specific options are also presented for Poipu. These are mostly related to the growth rate and locations of resort development.

3.3 Major Developments Independent Of The Project

3.3.1 Islandwide

Residential and Commercial

Most major residential projects are complete in the aftermath of Iniki reconstruction, but notable outstanding housing developments in various stages include Schuler Homes' Grove Farm Puhi project (713 units), Franco Mola's Grove Farm project (132 units); and Amfac/JMB's on-going development of urban-designated acres near the Lihu'e Airport.

The recent introduction of Kmart, Borders, and Wal-Mart in Lihu'e follows a statewide trend towards warehouse retail outlets.

Resort

Kaua'i tourism shows marked improvement and will continue to do so as its visitor room inventory is rebuilt; about a fifth of the pre-Iniki units have still not re-opened. At the Marriott Kauai Resort, one of the island's largest hotels, about 300 of the former 840 rooms opened in summer of 1995 under Marriott's ownership.²¹ Since October of last year, the remaining units have been steadily sold off as timeshare units of the Marriott Kauai Beach Club. As the Westin Kauai Lagoons, the hotel previously employed 1,200 persons. Only about half that number are needed to staff the resort's new scaled-down operations.²²

21. *First Hawaiian Bank, 1994.*

Section 3

North Shore's Sheraton Princeville had only just opened when Hurricane Iniki hit. Future plans for a \$3 million condominium project, a golf course, and a \$5 million condo rebuilding effort have been placed on hold until the market becomes more buoyant and the resort revamps its finances.²³

Agriculture

C. Brewer and Gay & Robinson recently merged their Kaua'i sugar ventures. A similar deal also transpired between Amfac/JMB's Lihu'e and Kekaha plantations.²⁴ These consolidated properties provide greater economies of scale and seem to guarantee sugar's presence on the island for some years to come.

The 1994 groundbreaking of the 158-acre Kekaha Agricultural Park signals a change in direction for Kaua'i's agricultural sector. Small farms in diversified crops seem to be gaining favor and are suited to coexist with the island's residential and tourist uses.

3.3.2 Koloa-Poipu

Residential & Commercial

Present residential activity in Koloa-Poipu is minimal but two plans are on the drawing board. Chief among these is the Kukui'ula development on more than 1,000 acres at the western side of Poipu. Phase I covers 727 acres and involves approximately 1,200 single-family units and 500 multi-family units, as well as an 18-hole, 220-acre golf course and 14 acres of commercial space. Approximately ten acres of the commercial site would be developed as a community shopping center and the remainder would be used for banking or

22. Salkever, 1995.

23. Salkever, 1995; and personal communication with Keith Nitta, Planner, Kaua'i County Planning Department, June 1995.

24. Salkever, 1995.

medical facilities. Phase II encompasses 325 acres, and includes 1,200 single-family and multi-family units. A town center, along with small lodgings for visitors, would be built around a 75-acre marina.

Major land use approvals have already been secured. With a sluggish market, landowner Alexander and Baldwin is exercising caution and hopes to target implementation of Phase I in five years.²⁵

Shinko assumed ownership of the Moana Corporation's **Kiahuna Golf Course** and its accompanying 90 single-family units in the early 1990s. The company has conceptual plans to add 200 single-family units and 500 multi-family units, but no definite schedule has been set.²⁶

Resort

Resort projects center on the restoration of damaged visitor units to their pre-Iniki condition. The Koloa-Poipu area was particularly hard hit by the hurricane and only one of its major resorts, the Hyatt, is open for business. Of Kaua'i's four major unopened tourist properties, three of them are in Poipu, and they include the **Waiohai Beach Resort**, **Poipu Beach Hotel**, and the **Sheraton Kauai Resort**.

In May 1993, both the **Waiohai Beach Resort** and the adjacent **Poipu Beach Hotel** were bought by Renaissance Hotels. Renovation is ongoing but no firm date for reopening is available. Collectively, the two hotels will account for 565 visitor units staffed by 450 full- and part-time workers.²⁷

25. Personal communication with Bill Campbell, Executive Vice President and General Manager of Kukul'ula Development Company, Inc., June 1996.

26. Personal communication with Miktya Satto, Manager of the Kiahuna Golf Course, June 1996.

27. Personal communication with Carol Furtado, Acting Manager, Waiohai Beach Resort, June 1996.

Section 3

The **Sheraton Kauai Resort** is slated to come back on-line in November 1997, which will increase the region's hotel inventory by 415 units. An 18-unit wing of the hotel existent prior to Hurricane Iniki will be demolished as part of the resort's landscaping improvements. The Sheraton's re-opening should add approximately 300 full- and part-time workers to the Koloa-Poipu labor force.²⁸

Agriculture

The McBryde Sugar Company, which is part of Alexander and Baldwin, accounts for almost 7,200 acres of land in Koloa-Poipu. Approximately 1,200 acres are owned outright by the company, about 4,000 acres are leased from Grove Farm, and the other 2,000 acres are leased from Knudsen Estate.²⁹

The company plans to phase out its McBryde operation around September 1996 due to a combination of low sugar yields and net losses of \$22 million in the past five years. Some 45 plantation workers have already been laid off, and closure will cost another 210 jobs. Note that McBryde owns 40 homes in Koloa Town which it rents to employees, most of whom are retirees. The plantation has assured that the retired tenants will be allowed to remain in the units, and that it will assist the other tenants in finding alternative housing.³⁰

After shutdown, the A&B-owned McBryde acreage will continue to be used for agricultural crops, such as corn and coffee, which would complement A&B's current 600 acres in coffee on land leased from Grove Farm.³¹

28. Personal communication with Peter Sit, Acting Manager, Sheraton Kauai Resort, June 1996.

29. Personal communication with Bill Campbell, Executive Vice President and General Manager of Kukul'ula Development Company, Inc., June 1996.

30. Frick, 1995.

31. Personal communication with Bill Campbell, Executive Vice President and General Manager of Kukul'ula Development Company, Inc., June 1996.

Grove Farm is likely to retain agricultural uses of its lands currently leased by McBryde. The company then intends to grant a number of new leases for lots ranging anywhere from five to 1,400 acres in size.³² Knudsen Estate has no concrete plans for its portion of the McBryde plantation, but its lands will probably remain in agriculture as well.³³

32. Personal communication with Alan Smith, Vice President and Operations Manager of Grove Farms, June 1996.

33. Personal communication with Al Toulrn, Spouse of Knudsen Estate Trustee, June 1996.

4. Community Issues

In the context of SIAs, community issues are people's reactions to a proposed action or change. Unlike social impacts, which are possible impacts due to the proposed change, community issues are opinions based on values and what is important in a given period of time. Community issues may change over time, as people's values and priorities change.

This section presents an analysis of community issues as of June 1996. Section 4.1 discusses the sources of information used in this analysis. Section 4.2 identifies issues expressed in written sources. Issues aired in interviews conducted for this study are presented in Section 4.3. Section 4.4 presents the conclusions of our issues analysis.

4.1 Sources of Information

Three sources were used in this issues analysis. First, we reviewed public correspondence and testimony on the Koloa-Poipu Bypass Road since 1992. The Koloa-Poipu Bypass Road planning process dates back to 1983 when an Environmental Impact Assessment was prepared for the project. The first portion of the bypass road, which covers the existent section from Poipu Road in the south to Wellwell Road in the north, was completed in 1993. Since this study is concerned chiefly with public reaction to the second portion of the project, Earthplan reviewed the correspondence received by the Kauai County Department of Public Works from January 1992 to the present.

The second source of information was the printed media related to the second part of the bypass, or the proposed project.

Third, we held interviews with various members in the community to see if project issues have evolved since 1992. We targeted four groups of people in these interviews:

- **Koloa - Waikomo residents**

The proposed portion of the bypass road will traverse near the Waikomo subdivision. In 1994, several residents voiced their opinion about the then-proposed alignment. This SIA effort included interviews with five people who were involved in previous efforts or who live near the currently-proposed alignment.

- **Landowners of large parcels near the bypass**

The proposed bypass road is in the vicinity of large land holdings, the future of which could be affected by the bypass and could affect existing communities. To understand the issues related to the development of land in the area, we interviewed four people who are involved with the three largest landowners in the Study Area.

- **Community and business organizations**

Organizations representing community and business interests have been reviewing the Koloa-Poipu Bypass Road for several years. We interviewed three people who are active in the major organizations in the area to understand the issues expressed by their members.

- **Public facilities and services**

The delivery of public services may be affected by the proposed bypass road. Interviews with five people who are involved in providing public services yielded information related to community issues on the proposed action.

In all, 19 people were interviewed in conjunction with this SIA, and the list is presented in *Table 8*. The interviews were informal and almost all were held in person. Interviewees were informed that their opinions would be analyzed as a group and their individual opinions were confidential.

Table 8: List of People Interviewed for This Study

Name	Affiliation
Bunt Baldwin	Spouse of Elizabeth Knudsen, a trustee of the Eric Knudsen Trust Trustee for Kukui Lono (a public golf course) Member of West Side Rotary
Bill Campbell	Executive Vice President and General Manager of Kukui'ula Development Company
Don Cataluna	Waikomo Subdivision resident Speaker in 1994 Council meeting Member of the Board of Directors of the Koloa Community Association
George Freitas	Chief of the Kaua'i Police Department
Sonny Gerardo	Administrator of the Kaua'i Civil Defense Agency
Fred Jager	President of Koloa Community Association
Joel Leach	Koloa resident
John Monette	Waikomo Subdivision resident Speaker at 1994 Council meeting
Niles Nakagawa	Pastor of Missionary Church
Marge Parker	Executive Director of Poipu Beach Resort Association
Mikiya Saito	Manager of the Kiahuna Golf Course
Takeshi Sakimae	Waikomo Subdivision resident Speaker at 1994 Council meeting
Rose Semana	Waikomo Subdivision resident whose home is adjacent to the proposed roadway alignment
Rick Shaw	Realtor with Makai Properties Member of Poipu Beach Resort Association
Allen Smith	Operations Manager for Grove Farm
David Sproat	Chief of the Kaua'i Fire Department
Ernest Sueoka	Owner of Sueoka Grocery in Koloa

Table 8: List of People Interviewed for This Study (Continued)

Name	Affiliation
Al Toulon	Spouse of Ann Knudsen, a trustee of the Eric Knudsen Trust
Alan Williams	Emergency Medical Technician, International Life Support, Inc.

The interview questions focussed specifically on the proposed bypass road. Interviewees were asked about any previous position taken on the Koloa-Poipu Bypass Road. They were then asked to discuss the pros and cons of the second portion of the bypass road, particularly as related to their own perspectives.

It is noted that issues analysis differs from statistical surveys, the latter of which are designed to focus on the frequency of reactions. Polls are valuable because they tell us about the opinions of the majority or the minority. The survey instrument is typically not conducive to dialogue, however, and the personalized reasons for these opinions are not often evident in the responses. In contrast, the only time we make reference to the quantity of opinion in issues analysis is where there is a significant difference or number, such as "almost all" or "only two people."

4.2 Issues Discussed on Record

In general, official public correspondence for this period can be divided into four broad categories, based on chronology and subject matter. These categories include drainage problems (February 1992 to March 1993); objections from Poipu Kai Resort residents (April 1993); requests to change the speed limit (December 1993 to February 1994); and objections from Koloa residents (January 1994 to February 1994). These are discussed in Section 4.2.1 through 4.2.4.

4.2.1 Drainage Problems

In February 1992, a Koloa resident wrote to the County Engineer, pointing to a severe drainage problem near his home on Wallani Road. While he did not claim the flooding to be a result of Phase I bypass road grading, he did request that drainage infrastructure be built as an additional component of Phase II since there are no such County facilities in the area. A service report was initiated by a County Councilmember in November 1992 in response to the resident's request, with the result that drainage improvements would be incorporated in the County's construction of Phase II.

4.2.2 Objections from Poipu Kai Resort Residents

In April 1993, five residents from the Poipu Kai Resort area wrote to the mayor urging in strenuous terms that Phase II of the bypass road, which is the proposed action, not be implemented. The principal reasons cited for this objection included:

- The completed Phase I portion of the road is sufficient to permit easier access from Koloa to the east end of Poipu Beach, just as Poipu Road acts as a conduit for traffic to the west end of Poipu Beach.
- Phase II will cause visitors to bypass Koloa Town's businesses, the Poipu Beach Plaza, and the Poipu Shopping Center. They felt that area merchants struggling to recover from Hurricane Iniki will be even further impacted by the loss of customers such a diversion would cause.
- A disproportionate increase in traffic in the Poipu Kai Resort area will eventuate in: (1) more traffic accidents; (2) a danger to children; (3) dust and noise pollution; and (4) a decrease in property values.

They further added that the funds allotted to Phase II would be better spent on upgrading County beaches in Poipu. This would help attract more tourists to the resorts as well as to increase residential property values.

4.2.3 Requests To Change the Speed Limit

Two residents living near the Phase I stretch of Koloa's Wellwell Subdivision wrote to the County Council in December of 1993 requesting that the speed limit for the road be dropped from 50 miles per hour (M.P.H.) to 35 miles M.P.H. in residential areas. They hoped that placing this speed restriction on traffic would reduce noise to a tolerable level until such time that the County could install a sound barrier. Copies of these communications were placed on the Council's meeting agenda as part of a resolution relating to speed on the Phase I Bypass. Cost estimates for installing warning signs and a sound wall in Wellwell Subdivision were also noted.

By February 1994, the speed limit stood at 35 M.P.H. Nevertheless a Kalaheo resident wrote to the County Council Chair requesting a return to the old speed limit of 50 M.P.H. Subsequent findings reached in the following month found that the lower speed limit should be retained due to the curvature of the bypass road and to minimize road noise in the Wellwell Subdivision.

4.2.4 Objections from Koloa Residents

The most recent round of activity was initiated by a Waikomo Subdivision resident who wrote to a County Councilmember in January 1994. In a letter written on behalf of his neighbors as well as himself, the resident agreed with the need for this portion of the bypass road, but was opposed to the proposed alignment's proximity to the property boundaries of Mamaki Street homeowners.

The existing cane haul road, he claimed, has caused considerable dust problems in the area which has been sporadically alleviated by watering the road. His primary worry was that no one would water the cane haul road once the bypass road is constructed. The resident also raised the concern of vehicular noise and safety hazards when the bypass road becomes operational. He ended with a request that the residents be given an opportunity to discuss the issue with council members.

The matter was next raised during a regular meeting of the County Council's Public Works Committee held in the Council Chambers on 16 February 1994. The Kauai County Engineer assigned to the bypass road project was at hand to field questions from members of the Committee and members of the general public in attendance.

The County Engineer stated that the County aims to erect a concrete wall to mitigate potential dust and noise generated by traffic using the bypass. The originally planned height of this wall was six feet, but the height could be increased in the event that six feet proves to be insufficient.

As to the road's proximity to the Waikomo homes, the County Engineer informed the Committee that only a limited corridor is available between the confines of Koloa Town to the west and Waita Reservoir to the east. He also mentioned that the County faces a pressing timetable in calling for bids on the project. State funds of \$1.7 million will lapse if not allocated by June 30, 1994. He added that the County was in the act of negotiating for the purchase of two lots in the projected path of the road and so was, in effect, committed to that route.

Four different Koloa residents spoke during the course of the meeting. Their comments included:

- The need for a new study, given that the original assessment was made during the early 1980s and the whole development situation

in the area has now changed. Special provision should also be made to consider the future plans of the Hurricane Iniki-damaged resorts in Poipu;

- The likelihood of runoff from the bypass road to lower-lying adjacent properties;
- Concerns that many residents may have only recently learned that the bypass road will extend to Maluhia Road; and
- The feasibility of a creating an alternative route.

The Committee members responded that there was sufficient public notice for Phase II of the project, and the community did have ample time to provide input on the proposed alignment. The question was raised as to whether the County had a legal obligation to make individual notifications to persons whose properties abut the proposed bypass. They discussed possible measures for extending the deadline for utilizing the State funds while alternate routes are considered.

Before moving on to other Committee matters, one of the members concluded discussion on the bypass road with the recommendation that the community prepare a petition which could be sent to the Council, the mayor, and State legislators. He offered the aid of Committee support staff in compiling a list of potential contacts and telephone numbers.

Exactly a week after the meeting, the Council received a petition signed by 157 Koloa townspeople prefaced with the following statement:

"We, the homeowners that will be affected by the current alignment of Poipu Bypass Road, Phase II, ask the County to re-align the road because of noise, dust, and safety problems. We, as taxpayers, also request that the State Legislature PLEASE re-appropriate State moneys that lapse on June

1994 for Poipu Bypass Road Phase II if the County cannot re-align the road by the lapse date." 34

The Department of Public Works responded to public concern in 1994 by realigning the road slightly along the portion close to the Mamaki Street lots. The County will add an extra 50-foot wide buffer between the bypass road and the homes. Further, Grove Farm Company has indicated it will sell its strip of land between the lots and the cane haul road for a nominal fee to residents who have been using the site for low-key agricultural activities. 35

Since the 1994 petition, there has been no known public correspondence received by County agencies regarding Phase II of the bypass road.

In terms of media coverage, there was no coverage of the 1994 meeting. The only coverage pertained to the Governor's decision to rescind the \$2 million earmarked for the second part of the Koloa-Poipu Bypass Road, which is the proposed project and the subject of this study. 36

Two letters to the editor strongly objected to this move. One letter, written on behalf of the Koloa Community Association, stressed the need for the bypass road, especially in light of the pending reopening of Poipu hotels. It noted that the community has worked hard to resolve issues on the project and is in consensus that the bypass road should be completed. It further pointed to the funds already expended, as well as to the need for an alternate escape route in the event of a natural disaster. 37

34. *Minutes of the 16 February 1994 meeting of the Public Works Committee of the County Council.*

35. *Personal communication with Ken Kitabayashi, Kaua'i County Engineer, County Department of Public Works, June 1996.*

36. *Frick, 1995.*

37. *Jager, 1995.*

Another letter objected to the Governor's reasoning that the bypass is not needed because "There have been no deaths so far." The writer felt that the bypass would be an important preventive measure for the entire community. ³⁸

4.3 Findings from Community Interviews

Except for five people, those interviewed favored the proposed section of the Koloa-Poipu Bypass Road. The following summarizes reasons for supporting this particular alignment:

- **The completed bypass is part of the solution to regional traffic congestion.**

Those interviewed felt that the combination of Poipu Road improvements and the bypass road will help solve existing and expected traffic congestion. They were very concerned about existing traffic delays on Poipu Road. In addition to the sheer number of cars, contributors to traffic delays included large delivery trucks, people waiting to make turns into parking lots, sightseers driving below the speed limit, and tour busses transporting tourists to Spouting Horn. It was felt that the proposed bypass road will divert some of this traffic away from the town.

It was noted that the project fits in with other roadway improvements. The shoulder of Poipu Road is being widened under a federally-funded project; this will help make it safer for bikers and runners, and the new road will provide alternate routes. Also, the Koloa Community Association and the Poipu Beach Resort Association have planted shower trees along the existing portion of the bypass road; with the proposed section, the Koloa-Poipu Bypass Road can be an attractive alternative to Poipu Road.

38. Finch, 1995.

- **This particular alignment is the result of many years of discussion and compromise.**

Those interviewed acknowledged that no route will please everybody, but they strongly felt that this route is the most acceptable. They pointed out that the community has been working on this project for several years and is tired of delays. They felt that the County has responded to all concerns, including noise barriers and a recent realignment.

It was further pointed out that Grove Farm has helped in this solution by selling the remnant parcels between the bypass road and cane haul road to residents who live nearby. These parcels are reportedly being farmed by the residents, and Grove Farm is selling the land for \$1 per square foot. Those interviewed felt that this concession, as well as the physical changes, should help mitigate impacts for nearby residents.

- **The proposed bypass road is needed for emergencies.**

Those interviewed felt that the proposed section of the bypass road is needed for emergency vehicles and evacuation. They pointed out there will be an increase in rescue requirements once the Poipu hotels are fully operational, and the new road will provide a more efficient route for ambulances and rescue vehicles. Also, interviewees remembered the Hurricane Iniki situation, where area residents were gridlocked on Poipu Road in their effort to evacuate the area.

Section 4

- **The project is expected to help, rather than hurt, Koloa businesses.**

Those interviewed felt that the traffic congestion around Koloa Town discourages potential customers, and does not add to clientele. They said that the traffic makes it difficult to access the shops, especially if you need to make a left-hand turn to enter a parking lot.

It was hoped that the new bypass road will reduce the number of cars on Poipu Road, and therefore encourage more pedestrian activity. This would be more conducive to tourist browsing, and allow local people to visit their food markets and restaurants more conveniently.

Those interviewed pointed out that the Poipu Beach Resort Association just started a shuttle between Poipu hotels and Koloa town. The group hopes to encourage visitors to patronize local shops.

Five people, three of whom are residents in the Waikomo Subdivision, criticized the proposed bypass roadway. Reasons for their opposition include the following:

- **The project will negatively impact an existing residential subdivision.**

Those who live near the proposed alignment continue to fear the noise and dust impacts which could be generated during construction. They were also concerned about ongoing noise from vehicles on the road, and were not sure that the noise barriers would sufficiently attenuate the noise.

Another concern raised was the potential damage to existing structural foundations due to earthmoving activities. It was noted that there are many lava tubes in the area, which suggests unstable soil conditions.

- **There are other, more acceptable, routes.**

Three alternative routes were suggested by those who did not like this alignment. One alternative was to widen and realign Weliweli Road so that it goes into Koloa town. This was considered a plus for Koloa businesses. Another alternative was to route the bypass road further north on Maluhia Road, thereby avoiding residential areas. The third alternative suggested was to take the bypass road directly to Kaumuali'i Road; this would be a more efficient route for emergencies and evacuation.

- **The project will hurt Koloa businesses.**

Those opposed to the proposed bypass road feared that, in diverting traffic away from the town, the project would take business away from Koloa Town businesses. They felt that the roadway system should remain as is, thereby protecting the existing commercial establishments.

In addition to the suggested alternative routes, there were two more types of recommendations from those interviewed. Supporters of the bypass road urged the County to expedite the funding process so that the traffic problem can be resolved as soon as possible.

The second recommendation, also from supporters, was related to the pouring of concrete. They cited problems with the surface of the completed section of the bypass road. They said that the concrete was poured in three sections,

and all sections settled differently. This resulted in a bumpy driving surface which makes driving uncomfortable and dangerous. It was noted that many motorists drive in the middle of the road, where the surface is smoothest.

4.4 Analysis

Our issues analysis finds that the proposed bypass road is considered a positive addition to the Koloa-Poipu region by people who would use the road themselves, who live near the existing Poipu Road, or whose activities or businesses would benefit from having an alternate mauka-makai route in this region.

The problems with the bypass road stem from an expectation of a decrease in one's quality of life. Nearby residents fear that their living conditions will be negatively altered by the construction and existence of the proposed section of the bypass road, and business people are apprehensive that their establishments will have less customers. Even though the various concerns, raised by these residents have been addressed over the years, as discussed in Sections 4.2 and 4.3, these people continue to have apprehensions about the bypass. This suggests that they simply prefer that the bypass road be moved out of their neighborhood and into a less intrusive area.

5. Potential Social Impacts

This section presents potential social impacts related to the proposed extension of the Koloa-Poipu Bypass Road. Section 5.1 discusses possible changes in growth and settlement patterns which may be caused by the bypass road. Section 5.2 presents impacts on the neighboring community, followed by a discussion on displacement impacts in Section 5.3. Section 5.4 explores impacts on Koloa Town businesses. Employment and wages are presented in Section 5.5, and impacts on public services and facilities are presented in Section 5.6.

5.1 Growth and Settlement Patterns

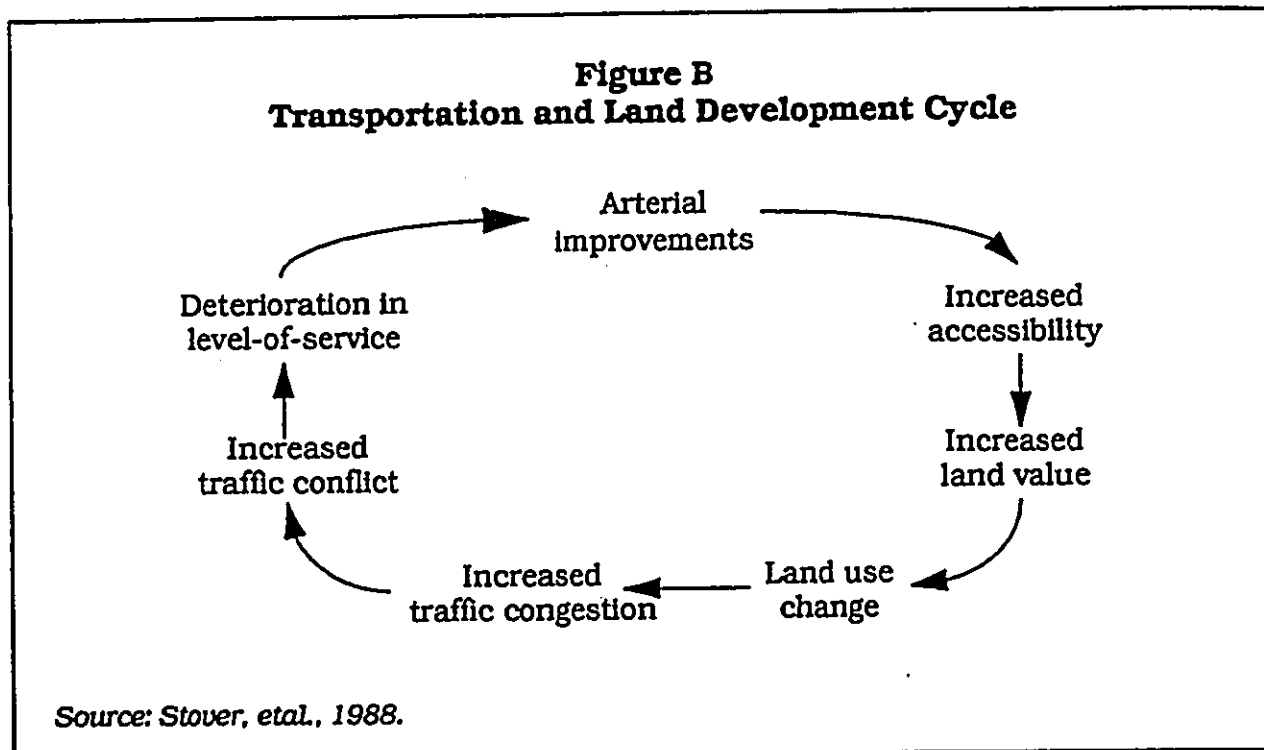
Roadways are needed to transport people from their homes to their jobs, to goods, to services, and to recreation. From a planning perspective, the scale, location and cost of transportation improvements are important considerations when forming plans and programs for the development of an area.

Although access itself does not cause development, transportation improvements are thought to affect development in two ways. First, such improvements may increase interregional accessibility. This may increase the market area of an urban region and may create a potential for accelerated development. Second, transportation improvements may affect the spatial distribution, density and timing of development along the project corridor. This can occur when a project provides or improves access to employment, shopping, goods and services.

This section opens with a discussion of the relationship between transportation and land use development in Section 5.1.1. Potential project impacts in the areas of regional development are discussed in Section 5.1.2, and Section 5.1.3 presents possible project impacts on settlement patterns in the region.

5.1.1 Relationship Between Transportation and Land Use Development

The growth and development of urban areas are influenced by a wide range of factors, and transportation projects that improve accessibility can increase the development potential of the areas served. This, in turn, can eventually lead to a need for further roadway improvements, as illustrated in *Figure B*.



The addition or improvement of highways has a wide range of implications, as follows:

- Land values often increase because of increased accessibility.³⁹ Hence, general development interest increases as nearby areas become potential sites for development.
- As the roadway Level-of-Service improves, travel speed increases

³⁹. Burkhardt, 1984.

and the market area for businesses increases as patrons are able to better access shops and businesses.⁴⁰ Increased market areas then attract new businesses.

- Employees can reach their job sites quicker, and this means less travel time and costs and could influence the choice in housing location.

Theoretically, these changes all lead to more motorists on the roads, and additional roadway and circulation improvements will eventually be needed. The actual realization of such changes requires public policies which promote or allow these land use changes, as well as landowner interest and economic ability to pursue development. These factors are discussed in the next section.

5.1.2 Relationship to Public Policies and Plans

By themselves, transportation improvements and improved access do not cause growth or development. Other factors may negate or accentuate the effects of change in accessibility. A major determinant in the growth of an area is the direction set forth in public plans and policies regarding growth management. In this context, transportation facilities can be used as growth management tools.

In the Koloa-Poipu region, major population growth is already projected and expected. In the Five-Year Boundary Review, the Office of State Planning estimates an additional 500 acres of urban-zoned acreage to meet demand. This is the third highest level of demand among Kaua'i's planning areas. The Kaua'i General Plan also recommends growth in the region. Poipu is slated for urban residential and resort uses, and Koloa Town is planned for mostly residential uses, with limited resort uses planned for an area south of the town.

40. Stover, 1990.

Given the direction of public policy, the proposed bypass road is not expected to cause growth beyond that which is anticipated for this region. Rather, the proposal has long been considered part of the future of Koloa-Poipu. The Koloa-Poipu Development Plan, which is almost 20 years old, envisioned a bypass road as an essential ingredient for the future of the region.

Since the Development Plan was published, several events strengthen the need for the proposed bypass road. In the late 1980s, the 599-visitor unit Hyatt Regency Kauai in east Poipu was granted major land use approvals. Completed in 1991, this hotel provides 865 jobs and its existence helps generate a "critical mass" effect for further change. Also, Kukui'ula, located west of Poipu Road, will house a large population, stimulate commercial activities and generate employment, thereby increasing the need for systemic roadway improvements. Although the project was delayed due to Hurricane Iniki and the economic climate, Kukui'ula is expected to be implemented when as the economy improves.

A portion of the Koloa-Poipu Bypass Road has already been constructed, and the proposed action will complete this portion of the regional circulation system.

5.1.3 Effect on Settlement Patterns

The proposed section of the Koloa-Poipu Bypass Road is not anticipated to have a major influence in regional settlement patterns. In particular, the agricultural land abutting the proposed bypass road is expected to remain in some form of agriculture, unless State Land Use designations are revised, the Kaua'i General Plan is amended and lands are rezoned. Landowners of parcels near the bypass road have indicated that they plan to continue agricultural activities on their properties near the proposed roadway.

5.2 Impacts on the Neighboring Community

The proposed bypass road will traverse through a portion of the Waikomo Subdivision. As discussed in Section 4, residents of this community have strongly voiced their opposition to the proposal because of several problems they anticipate. Although the County has realigned the proposed roadway and established an additional 50-foot wide buffer between the roadway and adjacent homes, there may still be short- and long-term impacts on this residential area resulting from the presence of a new bypass road.

Construction of the proposed bypass road will occur over a one-year period. Construction activities will generate noise and dust, and increase the intensity of daily activity in the area. These effects may negatively affect the quality of life of nearby residents. People who stay at home during the day, such as senior citizens and parents with young people, will be especially subjected to these impacts.

Adherence to public regulations regarding construction activities will help minimize impacts. In addition, the County needs to work with the Waikomo residents to mitigate impacts. Residents should be provided a construction schedule so that they know what to expect. Further, there should be a County Department of Public Works contact person who would handle complaints and facilitate solutions.

In the long term time frame, the bypass road will introduce traffic which is non-localized. Currently, this community is frequented by its residents and their visitors, along with occasional agricultural workers in the nearby fields. With the bypass road, people who have little or no interest in the neighborhood will pass through the area. Further, as experienced in neighborhoods along the existing portion of the Koloa-Poipu Bypass Road, there will likely be an increase in noise generated by motor vehicles. These changes will negatively

and irrevocably alter the currently quiet neighborhood ambience. Mitigation measures such as noise attenuation efforts and buffer zones will help lessen such impacts, but will not return the area to its original character.

It is noted that partial mitigation regarding neighborhood impacts has been undertaken by an independent third party. Grove Farm is selling the remnant parcels between the bypass road and cane haul road to residents who live nearby. These parcels are reportedly being farmed by the residents, and Grove Farm is selling the land for \$1 per square foot.

5.3 Displacement

The proposed bypass road will follow the present cane haul route through the eastern outskirts of Koloa Town, and as such will traverse Wailaau Road at a point between Ohuohu Street and Ano Place. This alignment requires County acquisition of two privately-owned properties to the immediate west of the existing cane haul road.

Based on tax map records, one lot covers 8,890 square feet; the other, 7,268 square feet. The larger lot has a six-bedroom structure which is divided into two dwelling units separated by a common garage; these structures will be demolished. The smaller property has a three-bedroom wooden structure which has been sold to a private party, and will be relocated.⁴¹

Collectively, these buildings housed three renter households with a total of eight people. One household contained four persons, and the other two households comprised two persons each.

41. *Personal communication with Ken Kitabayashi, Chief Engineering Division, Kaua'i County Department of Public Works, June 1996; and Kats Ueoka, Principal of Relocations Consulting, June 1996.*

Negotiations for relocation were initiated in early 1994 to allow ample time in finding comparable accommodations before the end of that year. By mid-1994, the four-person household was relocated to a larger home north of Lihu'e, and the two-person households were both relocated to Kalaheo.⁴² No further displacement impacts are anticipated as a result of the proposed action.

5.4 Impact on Koloa Town Businesses

The proposed bypass road is intended to decrease traffic volume along Poipu and Koloa Roads. Several businesses are located along the Koloa Town portion of this roadway system and they may be affected by the proposed bypass road.

Decreasing traffic volumes along a highway, however, does not necessarily lead to decreased clientele for business establishments. Studies have shown that, as the level-of-service improves, a bypass road can benefit businesses along the original road, as follows:

- **Improved Accessibility**

If traffic congestion is severe, potential clientele often choose to visit establishments away from the congested areas because of easier access. While this can occur for any type of business, traffic congestion can be particularly detrimental for business which attract spontaneous customers. For example, left turns into or out of a parking lot can be time-consuming in congested areas. Potential clientele may forego such businesses, and choose establishments which may be more accessible.

⁴². Personal communication with Kats Ueoka, Principal of Relocations Consulting, June 1996.

In an effort to quantify traffic impacts on businesses, a 1988 study looked at the effect of a reduction of driving speed due to traffic congestion on shopping centers. The study found that the more driving speed is reduced, the greater the reduction in the shopping centers' market area. When motorists need to reduce their driving speed from 35 m.p.h. to 23 m.p.h. (a 33 percent decrease), the market area for the shopping center decreased by 45 percent. Conversely, an increase in driving speed could lead to an increase in the market area.⁴³

- **Increased Operational Efficiency**

Less traffic on the road can lead to more efficiency in the way businesses may operate. The time needed to transport goods to commercial areas, and to transport visitors to and from hotels may be lessened if traffic conditions were improved. Further, if traffic conditions were improved, then presumably people would spend less time commuting to their workplace, and less time driving for business purposes. From a business perspective, these potential efficiency improvements could translated into cost savings.

5.5 Employment and Wages

To be incurred over a twelve-month period, construction costs for the proposed bypass road are estimated at \$3 million, based on current dollars.⁴⁴

Table 9 shows that approximately 75 jobs will be generated by the construction of the proposed bypass road. Of these, 27 are direct jobs, which include on-site employment and off-site support personnel in offices, warehouses and base yards. The other 49 jobs are indirect or induced. The indirect jobs would be created by firms directly involved with the project, and

43. *Stover, et al., 1988.*

44. *Provided by the Kaua'i County Department of Public Works.*

their purchase of goods and services from statewide vendors and providers. Induced jobs are created by worker expenditures on statewide goods and services.

Table 9: Estimated Construction Employment and Income Generated by The Proposed Bypass Road ^a

	Total
Construction Expenditure ^b	\$3,000,000
Average Expenditure Per Worker ^c	\$112,610
Workforce	
Direct ^d	27
Indirect and Induced ^e	49
Total	75
Workforce Income	
Direct ^f	\$1,120,187
Indirect and Induced ^g	\$1,343,824
Total	\$2,464,011

- a. All dollar amounts are in 1995 dollars. Some assumptions for "Average Expenditure Per Worker" and "Workforce Income" that were in 1994 dollars have been adjusted by the CPI-U change of 3.6 percent between 1994 and 1995.
- b. Construction estimate of \$3 million was provided by the Kaua'i Department of Public Works.
- c. Based on total value of statewide construction put in place in 1994 (\$3,153,301,000) and the statewide average number of construction workers at that time (29,010).
- d. Direct jobs are created by a firm's direct employment for actual project construction. These include off-site support personnel as well.
- e. Indirect jobs are created by firms directly involved with the project and their purchase of goods and services from statewide vendors and providers. Induced jobs are created by worker expenditures on statewide goods and services.
- f. Based on the average annual State construction wage of \$40,587 in 1994.
- g. Based on average annual State wage of \$26,738 in 1994.

Source: Bank of Hawaii, 1996, Hawai'i State DBED, 1987, Hawai'i State DBEDT, 1996, Hawai'i State DLIR, 1995.

It is estimated that the project will generate approximately \$2.5 million in wages. Approximately \$1.1 million will be paid in wages to direct employees, and another \$1.3 million for indirect and induced jobs.

5.6 Public Services and Facilities

5.6.1 Police Protection

The Koloa-Poipu area is in Sector 7 of the Kaua'i Police Department and is covered by the Waimea Substation. One officer per eight-hour shift is assigned to Sector 7. Assistance is provided by police in Lawai's Sector 8 and in Lihu'e's Sector 6 when necessary .

The Police Department maintains a small office in Koloa for the staff's logistical use but it is not considered an official station. There are no current plans to expand the police presence in the region. ⁴⁵

In 1995, Koloa-Poipu experienced a total of 75 traffic accidents, 20 of which were classified as major. From January through May of this year, there have been 26 accidents, of which five were major. ⁴⁶

The proposed bypass road is not expected to impact the level or delivery of police protection services, and will likely facilitate police access to and from the area.

5.6.2 Fire Protection Services

The Koloa Fire Station near the Poipu Road-Lawai Road intersection opened in April 1995. Major equipment at the station presently includes one engine company and one engine pumper; staffing consists of five firefighters per eight-

45. Personal communication with Alvin Yoshida, Inspector, Patrol Services Bureau, Kaua'i Police Department, June 1996.

46. Kaua'i Police Department, 1996.

hour shift. Adequate coverage of the region requires at least another engine pumper and three more firefighters per shift.

Backup is provided by the Kalaheo Fire Station, which is staffed by four firefighters per shift. Aerial support is usually supplied by a private helicopter company under contract to the Fire Department. Additional helicopter aid can be requested from the Navy's Barking Sands base during crisis situations.

Most of the Koloa Fire Station's calls are accident-related, and a large number are due to near-drownings at the beaches. Consequently, the Department plans to purchase a quick response jet boat for the station in 1997 with funds possibly contributed from the Poipu hotels.⁴⁷

The proposed bypass road is not expected to negatively impact the delivery of fire protection services and will likely facilitate fire personnel and equipment access to and from the area.

5.6.3 Emergency Medical Services

Kaua'i's emergency medical services, or EMS, are provided by International Life Support, Inc., which provides services under a contract with the State Department of Health. Koloa Town has one of two ambulances based in West Kaua'i; the other is located in Waimea. Also known as Medic 24, the Koloa ambulance unit began service in September 1992 and has two emergency medical technicians per shift, with each shift lasting for a 48-hour period. Medic 24's service area extends across the Koloa District, and includes the towns of Kalaheo and Lawai.

⁴⁷ Personal communication with David Sproat, Kaua'i Fire Chief, Kaua'i Fire Department, June 1996.

The majority of emergency victims are transported to Wilcox Memorial Hospital in Lihu'e due its relative proximity and ability to handle most types of situations. During routine, non-critical ambulance transfers, the patients may be transported to Kauai Veterans' Memorial Hospital in Waimea if they choose.

Poipu rates as one of the major beach recreation areas on Kaua'i, and the area's emergencies are often ocean-related. Traffic accidents are prevalent at the S-turns along Koloa Road, as well as at the junction of Maluhia Road and Kaumuali'i Highway. ⁴⁸

The proposed bypass road can benefit EMS by providing an additional route out of the area during emergencies, thereby enabling a more efficient response time.

5.6.4 General Medical Services

Koloa Facilities

The two medical clinics in Koloa are owned by Wilcox Memorial Hospital; only the Koloa Clinic actually functions as a clinic. ⁴⁹ The Koloa Clinic staff consists of one full-time family practitioner, one part-time internist, two nurses, and two receptionists. A part-time pediatrician may be added to the clinic in the future, if the need arises. While the two-office building is old, expansion or relocation will occur only if A&B's planned Kukul'ula development creates a marked increase in the area population. ⁵⁰

48. Personal communication with Alvin Williams, Emergency Medical Technician, Medic 24 (Koloa), International Life Support, Inc., June 1996.

49. Personal communication with Lin Joseph, Administrator, Wilcox Memorial Hospital, June, 1996.

50. Personal communication with Lee Euslin, President, Kauai Medical Clinic, June 1996.

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The clinic is busy and treats an average of 60 patients a day . About two-thirds of the patients are residents and the remaining are tourists. The clinic deals with a large number of injuries from ocean pastimes such as surfing, and work-related incidents at the resorts and at the sugar plantation.⁵¹

Nearby Hospitals

The Wilcox Memorial Hospital in Lihu'e is the primary full-service treatment facility for Koloa-Poipu. The hospital treats approximately 510 Koloa-Poipu residents per month, which accounts for less than 0.08 percent of the hospital's total patient volume.

The hospital contains 75 acute care beds and 110 long-term care beds, as well as a day care unit that can serve 50 dependent adults. The hospital's other services include same-day surgery, outpatient physical therapy, a 20-bed emergency room, and a CAT-scan facility. Wilcox also offers a cardiac rehabilitation program for island residents who have undergone heart surgery on Oahu. ⁵²

The State Department of Health's Kauai Veterans' Memorial Hospital in Waimea is an alternative for Koloa-Poipu residents. Even though the hospital's service area extends to Koloa's Maluhia Road-Kaumuali'i Highway junction, an average of only 20 persons per month, which represents about 2.5 percent of total patients, come from Koloa-Poipu. Kauai Veterans' Memorial Hospital, which currently has 24 acute care beds and 25 long-term care beds, plans to add another 16 long-term care beds and a CAT-scan facility, as well as expand its rehabilitation center. ⁵³

51. Personal communication with Barbara Shiba, Registered Nurse, Koloa Clinic, Kauai Medical Clinic, June 1996. -

52. Personal communication with Ltn Joseph, Administrator, Wilcox Memorial Hospital, June, 1996.

53. Personal communication with Orianna Skomoroch, Administrator, Kauai Veterans Memorial Hospital, June 1996.

Project Impacts

The proposed bypass road is not expected to negatively impact the delivery and level of medical and hospital services for the area. The new roadway will likely benefit area residents by providing additional access to primary roadways which lead to medical clinics and hospitals.

5.6.5 Civil Defense

The only designated civil defense shelter in the Koloa-Poipu area is Koloa School, which can accommodate approximately 1,000 persons. The service population is well in excess of this capacity, so area residents are sent to Kalaheo and Lihu'e for shelter during emergencies. This creates several traffic problems for evacuating vehicles.

The proposed bypass road will provide an additional roadway in the area, but would not necessarily improve evacuation access out of the area. ⁵⁴

5.6.6 Educational Facilities

The two preschools in Koloa are The Koloa Early School and Koloa Children's Center.

Koloa School, which is the area's public elementary school, serves students from Kindergarten through Grade 6; its catchment area includes a portion of Lawai. The school has 410 students and 25 teachers and they occupy 24 classrooms. ⁵⁵

54. *Personal communication with Sonny Gerardo, Administrator of Kaua'i Civil Defense Agency, June 1996.*

55. *Personal communication with Dora Hong, Principal of Koloa School, June 1996.*

The nearest upper-grade school to Koloa is Kauai High & Intermediate School in Lihu'e. A new intermediate school for Grades 6 through 8 is planned for Puhi and will adjoin the existing the Kaua'i Community College. Koloa-Poipu students will attend this new intermediate school when it opens in September 1999.⁵⁶

The proposed bypass road is not located near these schools, and is therefore not expected to negatively impact educational and other school activities. The proposal may facilitate travel to the intermediate and high schools outside the region.

5.6.7 Recreational Facilities

Existing Facilities

Kaua'i County maintains several parks in Koloa and Poipu, including:

- *Anne Knudsen District Park:* This is an active eight-acre park located along Maluhia Road at Koloa's northern end. It has ball fields, basketball and tennis courts, and flood lights for night use.
- *Waikomo Neighborhood Park:* This four-acre park with a soccer field is located next to the planned route of the proposed bypass road.
- *Wellwell Neighborhood Park:* While this park totals nine acres, only about three acres are used for basketball and passive recreation. There are no plans to develop the remaining acreage.

In addition, the County maintains the Poipu and Brennecke Beach Parks along the Poipu shoreline.⁵⁷

56. Personal communication with Warren Mizutani, Business Specialist, State Department of Education, June 1996.

57. Personal communication with Mel Nishihara, Superintendent of Parks and Recreation, Kaua'i County Department of Public Works, June 1996.

The only State recreational area in Koloa-Poipu is the small boat facility at Kukui'ula Harbor. The site includes a County comfort station, a boat launching ramp, a pier, and a parking lot. Five boats are regularly moored there, but many vessels for fishing, touring, and diving regularly utilize the harbor since it is the only ocean access for boats within fifteen miles. No other State recreation facilities are planned for the region.⁵⁸

The region also has two private golf courses which complement public recreational facilities. The Kiahuna Golf Course is located on Poipu Road. Its owners plan to eventually add nine holes to this 18-hole course.⁵⁹ The Poipu Bay Resort Golf Course is part of the Hyatt Regency Resort complex. This 18-hole golf course is heavily utilized; approximately 100 rounds a day are played.⁶⁰

Project Impacts

The proposed bypass road may impact the County's Waikomo Neighborhood Park, which is located adjacent to the proposed roadway. To mitigate impacts, the County plans to erect a wall which would help to alleviate traffic noise for park users and act as barrier between the roadway and the park.

Further, the park is currently being expanded as a result of remnant parcels created by the bypass road alignment. Approximately 0.6 acres are being added to the Waikomo Neighborhood Park.

58. Personal communication with Jeffrey Beraman, Kaua'i District Manager of the Division of Boating and Ocean Recreation, State Department of Land and Natural Resources; and Wayne Souza, Superintendent of Kaua'i State Parks, State Department of Land and Natural Resources, June 1996.

59. Personal communication with Mikiya Saito, Manager of the Kiahuna Golf Course, June 1996.

60. Personal communication with Myles Shibata, General Manager of Kawaihoa Development, July 1996.

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The proposed bypass road may also have a negative affect on the Kiahuna Golf Course if it draws visitors away from Poipu Road. Currently, travelers along Poipu Road can easily see the golf course, and slightly over half of the course users are tourists. The net result of the bypass road may be positive, however, if it succeeds in allowing more tourists to conveniently access the region.

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SIA for Koloa - Poipu Bypass Road from Wellwell Road to Maluhia Road

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