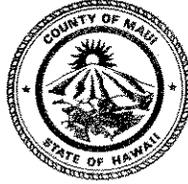


ALAN M. ARAKAWA
Mayor

MILTON M. ARAKAWA, A.I.C.P.
Director

MICHAEL M. MIYAMOTO
Deputy Director



RALPH NAGAMINE, L.S., P.E.
Development Services Administration

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Telephone: (808) 270-7745
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COUNTY OF MAUI
**DEPARTMENT OF PUBLIC WORKS
AND ENVIRONMENTAL MANAGEMENT
ENGINEERING DIVISION**

200 SOUTH HIGH STREET
WAILUKU, MAUI, HAWAII 96793

November 15, 2005

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OFC. OF ENVIRONMENTAL
QUALITY CONTROL

Ms. Genevieve Salmonson, Director
State of Hawaii-DOH
OFFICE OF ENVIRONMENTAL QUALITY CONTROL
235 South Beretania Street, Suite 702
Honolulu, Hawaii 96813

SUBJECT: FINAL ENVIRONMENTAL ASSESSMENT (FEA) FOR PROPOSED
IMPROVEMENTS TO NAHIKU ROAD, TMK (2) 1-2-003:058 (POR.)
NAHIKU, MAUI, HAWAII
JOB NO. 04-20

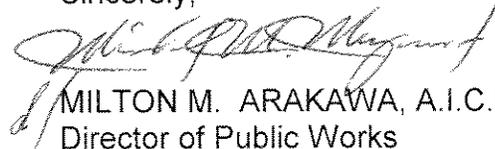
Dear Ms. Salmonson:

The County of Maui, Department of Public Works and Environmental Management has reviewed the Final Environmental Assessment (EA) for the subject project, and has determined a Finding of No Significant Impact (FONSI). Please publish notice of availability for this project in the December 8, 2005 OEQC Environmental Notice.

We have enclosed a completed OEQC Publication form and four (4) copies of the Final EA. The project summary is unchanged from that published with the Draft EA.

If you have any questions, please call Matthew Slepín of Munekiyo & Hiraga, Inc. at (808) 244-2015.

Sincerely,


MILTON M. ARAKAWA, A.I.C.P.
Director of Public Works
and Environmental Management

2005-12-08-MA-PEA NAHIKU ROAD IMPROVEMENTS

DEC - 8 2005
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HFC. OF ENVIRONMENTAL
QUALITY CONTROL

Final
Environmental Assessment

**PROPOSED IMPROVEMENTS
TO NAHIKU ROAD**

Prepared for:

November 2005

County of Maui,
Department of Public
Works and Environmental
Management


MUNEKIYOSHIRAGA, INC.

Final
Environmental Assessment

**PROPOSED IMPROVEMENTS
TO NAHIKU ROAD**

Prepared for:

November 2005

County of Maui,
Department of Public
Works and Environmental
Management


MUNEKIYO & HIRAGA, INC.

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salc/nahikurd/inalca

Executive Summary

Project Name: Proposed Improvements to Nahiku Road

Type of Document: Final Environmental Assessment

Legal Authority: Chapter 343, Hawaii Revised Statutes

Agency Determination: Anticipated FONSI

Applicable Environmental Assessment Review "Trigger": Use of State and County Lands and County Funds

Location: Maui Island
Nahiku, Hana District
TMK: (2)1-2-003:058 (por.)

Proposing Agency: County of Maui
Department of Public Works and
Environmental Management
200 South High Street
Wailuku, Hawaii 96793
Contact: Joe Krueger
Phone: (808) 270-7745

Determination Agency: County of Maui
Department of Public Works and
Environmental Management
200 South High Street
Wailuku, Hawaii 96793
Contact: Joe Krueger
Phone: (808) 270-7745

Consultant: Munekiyo & Hiraga, Inc.
305 High Street, Suite 104
Wailuku, Hawaii 96793
Contact: Matthew Slepín
Phone: (808) 244-2015

Project Summary:

The County of Maui, Department of Public Works and Environmental Management proposes improvements to Nahiku Road, in the area of its intersection with Hana Highway. Previous landslide conditions have rendered the current alignment unsafe by causing portions of the roadway to fall away into the adjacent Makapipi Gulch. Approximately 300 lineal feet of roadway will be realigned away from the gulch. Related improvements include the installation of a new guardrail and retaining wall. In addition, a new "jug handle" turn-out area will be provided on the opposite side of Hana Highway to allow westbound traffic to safely access Nahiku Road.

Preface

The County of Maui, Department of Public Works and Environmental Management proposes improvements to Nahiku Road, located in the Hana District of Maui, Hawaii. These improvements include the realignment of approximately 300 lineal feet of roadway, a new guardrail, new retaining wall, and a turn-out area at the intersection of Nahiku Road and Hana Highway, to allow westbound traffic to safely access Nahiku Road.

Since the project involves the use of State and County lands, as well as County funds, this Environmental Assessment (EA) has been prepared in accordance with the provisions of Chapter 343, Hawaii Revised Statutes and Chapter 200 of Title 11, Department of Health, Hawaii Administrative Rules, Environmental Impact Statement Rules.

Chapter 1

Project Overview

I. PROJECT OVERVIEW

A. PROJECT LOCATION, EXISTING USE, AND LAND OWNERSHIP

The County of Maui, Department of Public Works and Environmental Management (DPWEM) proposes improvements to Nahiku Road, Nahiku, Hana District, Maui, Hawaii. See Figure 1. The proposed improvements would realign a segment of the roadway into a portion of TMK (2) 1-2-003:058. Land acquisition by the County will be required. See Figure 2.

Nahiku Road begins at Hana Highway and descends toward the coastline to terminate at Nahiku Landing, a publicly accessible facility. Land uses along its approximately 2.0 mile length, as well as the area more generally, are largely rural single-family residential. The East Maui Irrigation Company (EMI) holds ownership of large parcels of land in the project vicinity.

A portion of the proposed improvement area is owned by Stuart Brandel (TMK (2) 1-2-003:058 (por.)). The DPWEM intends to acquire that portion of the parcel necessary for the proposed realignment of Nahiku Road.

B. PROPOSED ACTION

The proposed project consists of the realignment of a section of Nahiku Road and corollary improvements. See Figure 3. The principal component of the project is the realignment of approximately 300 lineal feet of roadway mauka (south) of the existing alignment. This roadway segment begins approximately 60 feet from Nahiku Road's intersection with Hana Highway. This realignment will necessitate the provision of approximately 275 lineal feet of new guardrail on the makai (north) side of Nahiku Road (the portion being realigned), as well as of Hana Highway, connecting to the existing guardrail in the vicinity of Makapipi Gulch, between the road and Makapipi Gulch, and a new retaining wall

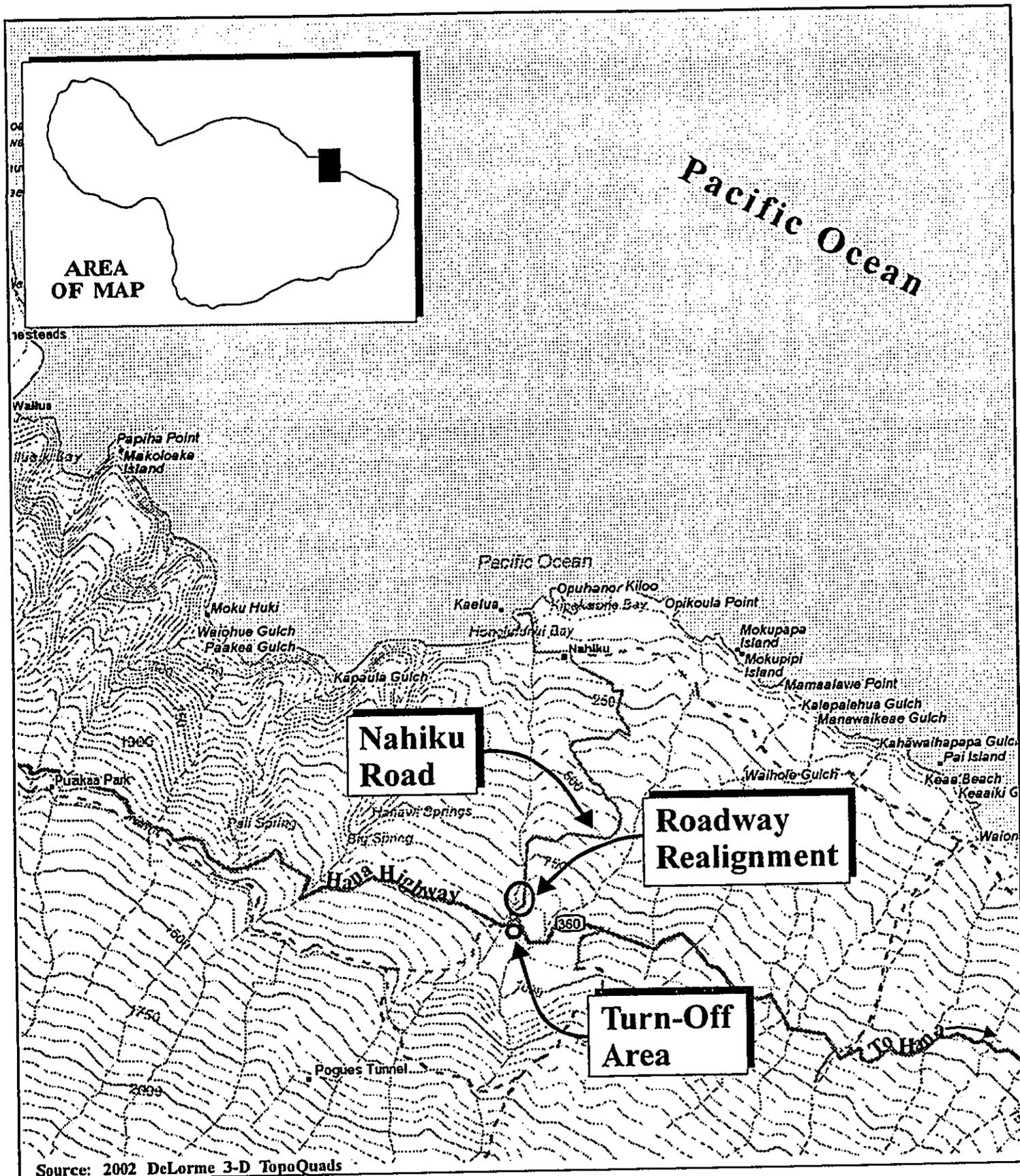


Figure 1 Proposed Improvements to Nahiku Road NOT TO SCALE
Regional Location Map



Prepared for: County of Maui, Department of Public Works and Environmental Management

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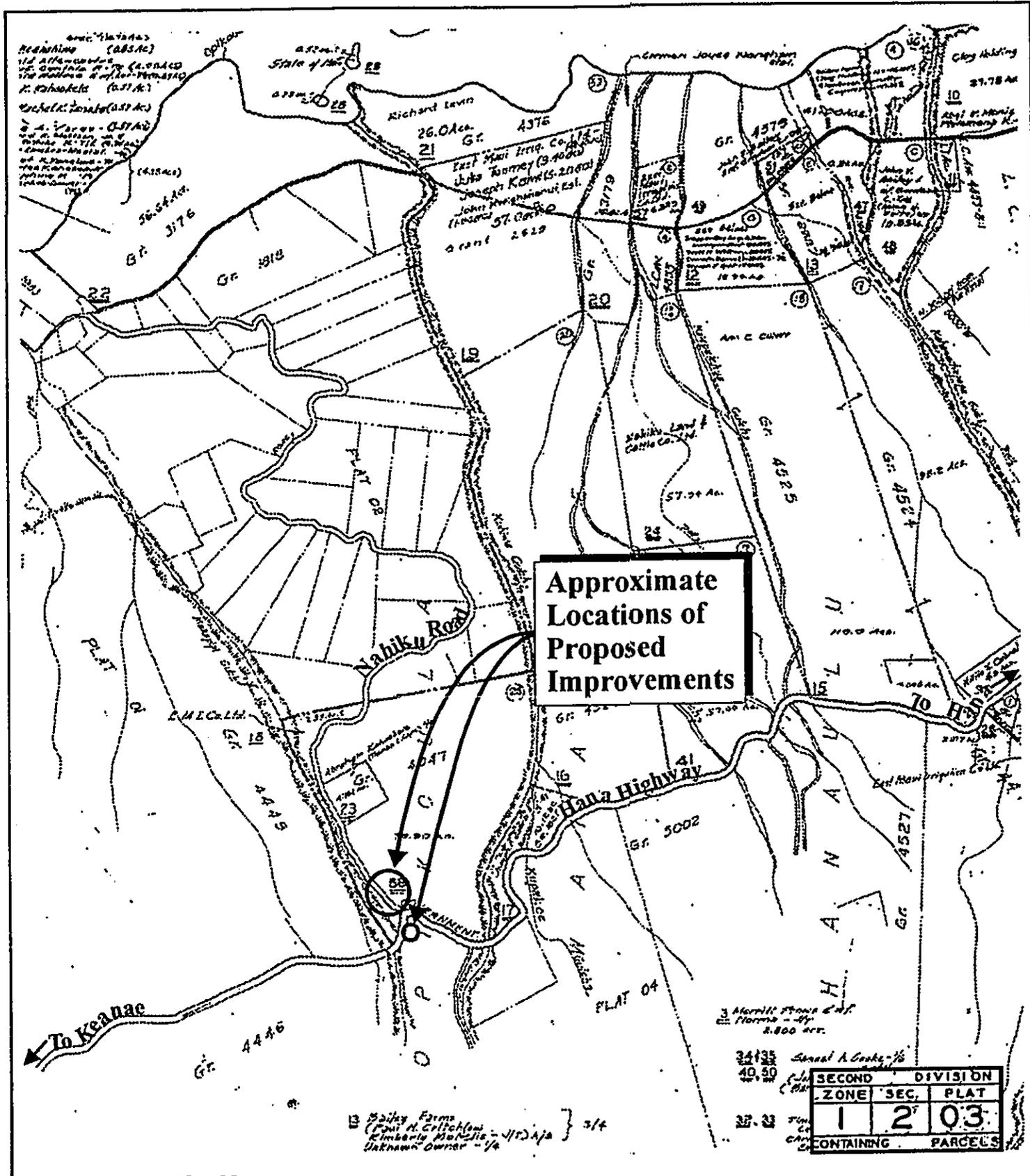
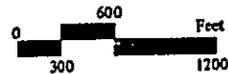


Figure 2 Proposed Improvements to Nahiku Road Tax Map Key

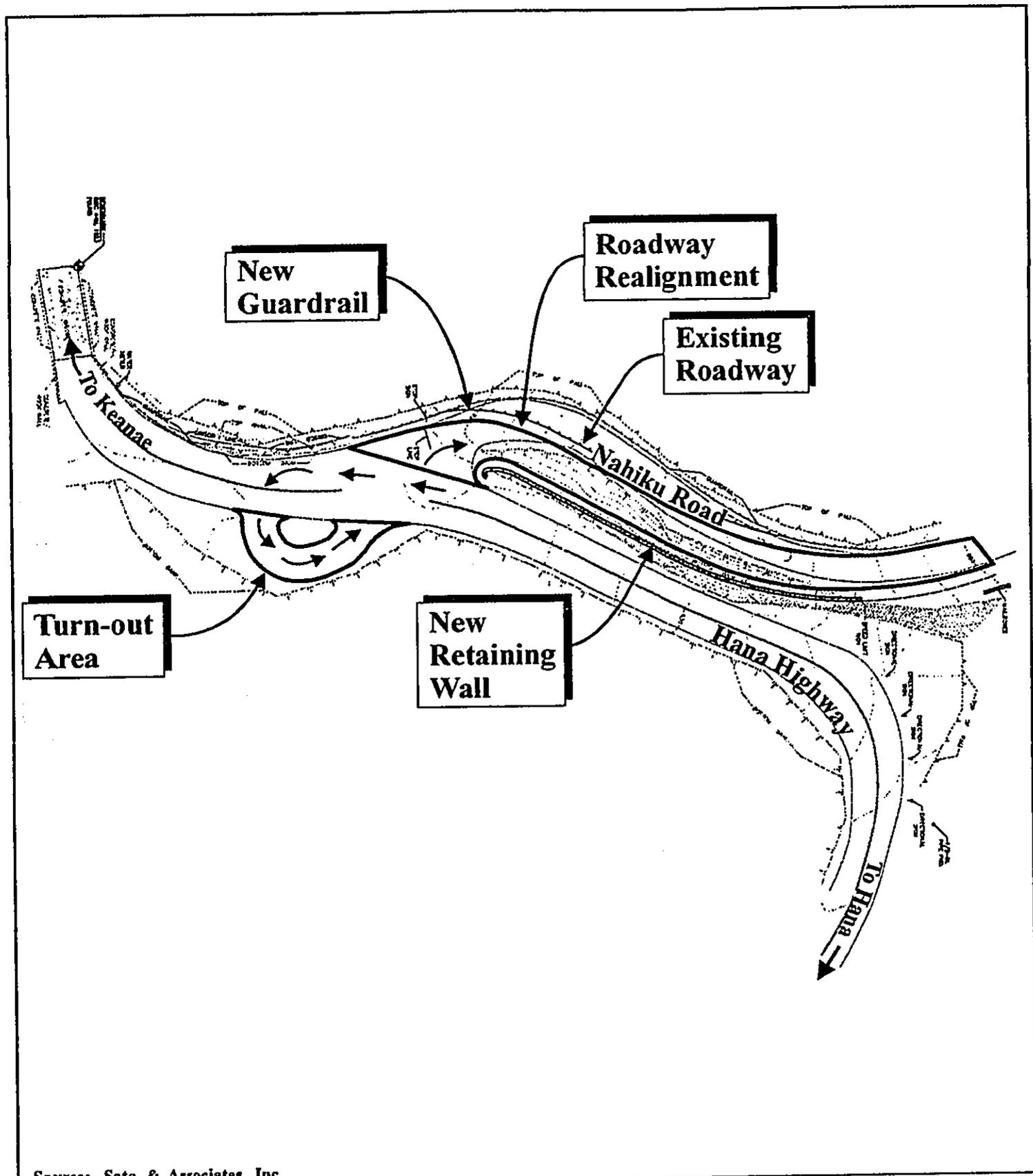


Prepared for: County of Maui, Dept. of Public Works and Environmental Management



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SECOND DIVISION	
ZONE	SEC. PLAT
1	2 03
CONTAINING PARCELS	



Source: Sato & Associates, Inc.

Figure 3 Proposed Improvements to Nahiku Road NOT TO SCALE
 Site Plan



Prepared for: County of Maui, Department of Public Works and Environmental Management

MUNEKIYO & HIRAGA, INC.

on the mauka side. The existing utilities which follow the roadway will also need to be realigned. The roadway will be repaved from its intersection with Hana Highway to the makai extent of the realignment.

The proposed project also includes the development of a "jug handle" turn-off on Hana Highway, directly opposite to its intersection with Nahiku Road. This turn-off will allow westbound traffic on Hana Highway to access Nahiku Road more safely than a direct, right-hand turn onto Nahiku Road would permit. Refer to Figure 3.

The estimated cost of the project is \$400,000.00. Construction is anticipated to begin in the first quarter of 2007. A construction duration of four (4) months is projected.

C. PROJECT NEED

The current alignment has become unviable due to previous landslide conditions which caused portions of the road shoulder to fall away into the adjacent Makapipi Gulch. See Figure 4. The proposed realignment will move the road away from the cliff falloff. The turn-out area is necessary to allow westbound traffic to access Nahiku Road safely. The current intersection configuration is such that westbound traffic has to make a dangerously sharp turn, in excess of 45 degrees, from Hana Highway onto Nahiku Road.

The proposed action, in total, is designed to provide greater safety to automotive traffic using Nahiku Road.

Since the project involves the use of State and County lands and proposes the use of County monies, this Environmental Assessment has been prepared in accordance with Chapter 343, Hawaii Revised Statutes,



Source: Munekiyo & Hiraga, Inc.

Figure 4

Proposed Improvements to
Nahiku Road

NOT TO SCALE



Existing Conditions at Roadway Segments
Affected by Landslides

Prepared for: County of Maui, Department of Public
Works and Environmental Management

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and the National Environmental Policy Act.

In addition, Nahiku Road falls within the County of Maui's Special Management Area (SMA), requiring a SMA permit review and action by the Hana Advisory Committee and the Maui Planning Commission.

Chapter II

***Affected Environment,
Potential Impacts and
Mitigation Measures***

II. AFFECTED ENVIRONMENT, POTENTIAL IMPACTS AND MITIGATION MEASURES

A. LAND USE

1. Existing Conditions

The project site is located at and near to the intersection of Nahiku Road and Hana Highway. Nahiku is a small community on Maui's northeast side, approximately 2.5 miles west of Hana Town. This entire region is primarily rural in character, without any substantial urban development. The area of Nahiku located along Nahiku Road is a small, rural community consisting mostly of single-family residences. Nahiku Road terminates at Nahiku Landing, a County boat ramp without facilities.

2. Impacts and Mitigation Measures

The proposed action is not anticipated to result in any adverse impact to surrounding land uses. The realigned roadway segment is directly adjacent to the existing alignment. Right-of-way acquisition will be required from a sliver of TMK (2) 1-2-003:058, but is not expected to affect the spatial utility of the parcel. The turn-out area is within the Hana Highway right-of-way and is currently used as an unofficial parking area and turn-out area.

B. CLIMATE, TOPOGRAPHY AND SOILS

1. Existing Conditions

Because of their near-tropical latitude, the Hawaiian Islands do not experience seasonal variation as the mainland does. Instead, there are two (2) weather variations each year: a warm season and a cooler season. The native Hawaiian named the warm season *kau*. This is the period when the sun is almost directly overhead. The second period, *ho'oilo*, is a time of more variable winds and

greater precipitation, with the sun hanging lower in the sky.

The climate in the Hana region of Maui is characteristically mild and wetter than the rest of the island. Temperatures run from an average high in the low 90's in September to an average low in the high 70's in February. Hana averages 80.62 inches of rain a year, with an average of 269 days of the year experiencing some precipitation (Maui County Data Book, 2003).

The portion of Nahiku Road with which the project is concerned runs along a moderate slope of approximately 8 percent, with elevations descending from the Haleakala to the shoreline. The Hana Highway right-of-way, including the proposed turn-out area, is graded and flat.

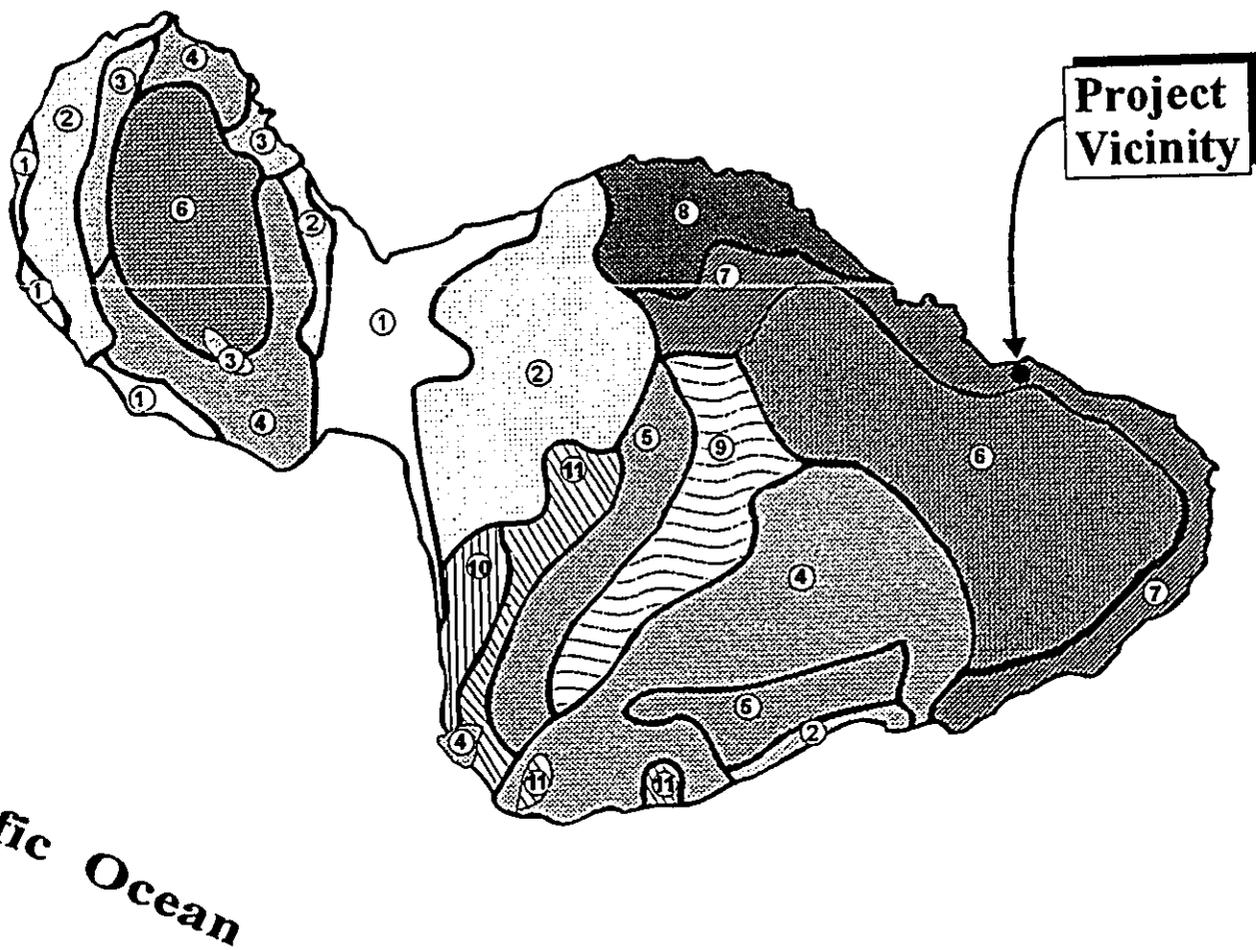
The project site is located within the Hana-Makaalae-Kailua soil association. See Figure 5. Honomanu silty clay (rHOD) underlies the subject property. See Figure 6. This soil type is found on the wettest parts of Haleakala on its northeastern side. Slopes range from 5 to 25 percent. This soil is characterized by moderately rapid permeability and slow runoff, with slight erosion hazard. Typical uses on this soil type include water supply and wildlife habitat (USDA, 1972).

2. Impacts and Mitigation Measures

The proposed action is not anticipated to result in any substantial, adverse impact to topography or soils. By moving the roadway portion further mauka, some cut and grading of the adjacent slope will be required. The slope of the roadway would be largely retained in the realignment segment. The turn-out area will require

LEGEND

- | | |
|---|---|
| <p>① Pulehu-Ewa-Jaucas association</p> <p>② Waiakoa-Keahua-Molokai association</p> <p>③ Honohua-Olelo association</p> <p>④ Rock land-Rough mountainous land association</p> <p>⑤ Puu Pa-Kula-Pane association</p> <p>⑥ Hydrandepts-Tropaquods association</p> | <p>⑦ Hana-Makaalae-Kailua association</p> <p>⑧ Pauwela-Haiku association</p> <p>⑨ Laumain-Kaipoi-Olinda association</p> <p>⑩ Keawakapu-Makena association</p> <p>⑪ Kamaole-Oanapuka association</p> |
|---|---|



Map Source: USDA Soil Conservation Service

Figure 5

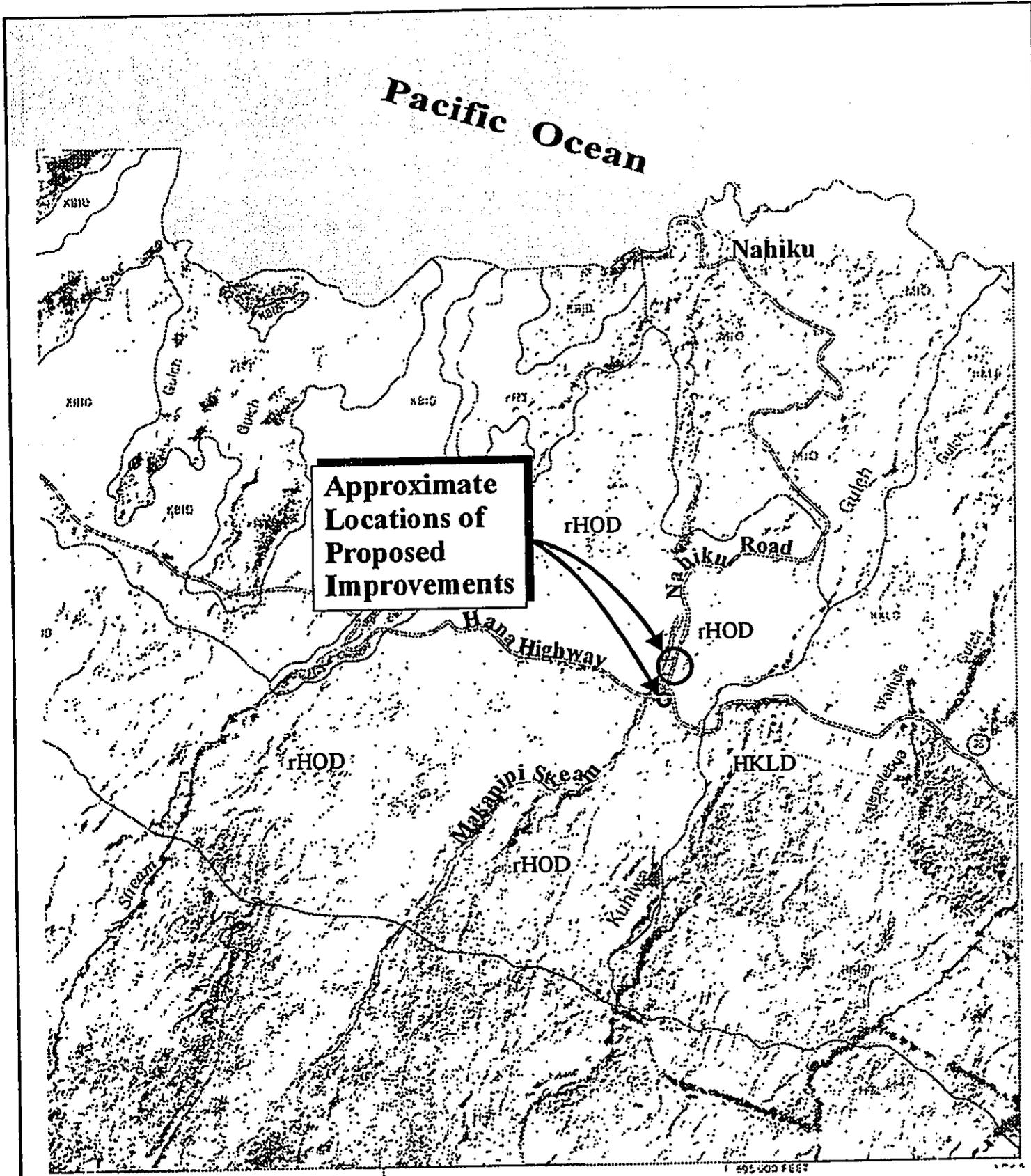
Proposed Improvements to
Nahiku Road
Soil Association Map

NOT TO SCALE



Prepared for: County of Maui, Department of Public Works and Environmental Management


 MUNEKIYO & HIRAGA, INC.



Map Source: USDA, Soil Conservation Service

Figure 6

Proposed Improvements to
Nahiku Road
Soil Classification Map

NOT TO SCALE



Prepared for: County of Maui, Department of Public Works and Environmental Management

MUNEKIYO & HIRAGA, INC.

minimal grading.

C. FLOOD AND TSUNAMI HAZARDS

1. Existing Conditions

The Flood Insurance Rate Map locates the project site in Flood Zone C, an area of minimal flooding, with no development restrictions. Nahiku Road and Hana Highway are located beyond the drainageway for the Makapipi Gulch. See Figure 7.

2. Impacts and Mitigative Measures

No adverse impacts to the roadway and turn-out area are anticipated from flood or tsunami hazards. The project site is located well-above sea level and away from the coast.

D. FLORA AND FAUNA

1. Existing Conditions

A Biological Resources Survey was prepared for the proposed project. See Appendix "A". Plant and animal life in the vicinity of the project site is typical of this side of Maui, with its more tropical climate. Species of flora include introduced grasses (California grass) and trees (rose apples and guava), as well as ferns (uluhe and pakahakaha). The only avian species encountered was the mynah, although a single Pacific Golden Plover was the site adjacent to the project site. The Plover is a protected, migratory species, otherwise, there are no known rare, threatened, or endangered species of flora or fauna within the project area, nor significant habitants of the same.

2. Impacts and Mitigative Measures

The proposed action is not anticipated to result in any substantial,

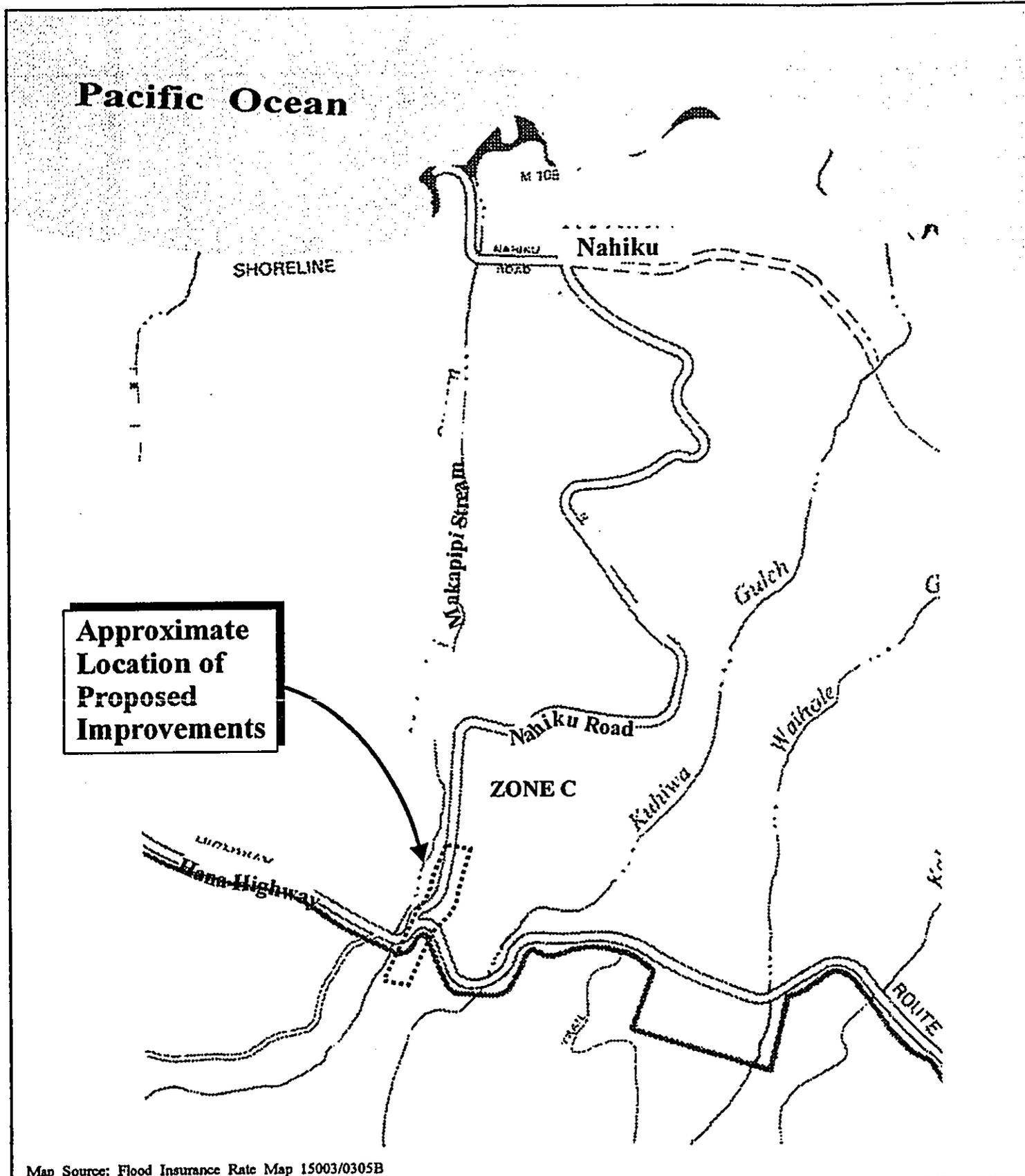


Figure 7 Proposed Improvements to Nahiku Road Flood Insurance Rate Map NOT TO SCALE



Prepared for: County of Maui, Department of Public Works and Environmental Management

MUNEKIYO & HIRAGA, INC.

adverse impact to flora or fauna.

E. AIR AND NOISE CHARACTERISTICS

1. Existing Conditions

The Hana region has generally good air and noise quality, owing to its rural character and the absence of any significant, point-sources of emissions. Airborne pollutants and background noises can be largely attributed to vehicular exhaust from Hana Highway.

2. Impacts and Mitigative Measures

The proposed action is not anticipated to result in any substantial, adverse impact to air or noise quality. The project will not result in any increase in vehicular traffic or increase in roadway infrastructure.

F. HISTORIC AND ARCHAEOLOGICAL RESOURCES

1. Existing Conditions

An archaeological field inspection was carried out at the proposed project. See Appendix "B". The site has been substantially impacted by road maintenance activities. There is no evidence for or indication of cultural or historical deposits in the project area. The nearby Makapipi Bridge is a historic structure, but is not part of the project area.

2. Impacts and Mitigative Measures

No impacts to archaeological resources are anticipated to result from the proposed roadway improvements. No work is proposed which might affect the historic Makapipi Bridge. Should any significant deposits be encountered during construction-related activities, all work in the area will cease and the appropriate

authorities contacted.

G. CULTURAL IMPACT ASSESSMENT

1. Existing Conditions

a. Historical Context

The subject property is located within the *moku* or district of Hana, which extends from Ko'olau to Kaupo. The Hana *moku* was noted for bountiful production of upland taro, bananas, yams, wakue, olana and 'awa (Handy, 1940). The Hana district is also distinguished by its rich cultural history. Hana's closeness to the island of Hawaii permitted frequent interaction between the two (2) islands in times of war and peace. In pre-contact times, Hana was a desirable district to reside in due to its abundant agricultural resources and numerous coastal fishponds. The Hana district was also noted for its fine surfing, excellent supply of natural woods (used for crafting scaffolds and ladders) and having the best round, smooth stones used in slingshots.

Hana was also called "*a land beloved by chiefs because of the fortress of Ka'uiki and the ease of living in that place*". Ka'uiki, a *pu'u* located on the southern edge of Hana Bay, had a summit at a height of approximately 400 feet and was covered with a natural vegetative mat that provided the chiefs and chiefesses with a comfortable sleeping environment. Fishponds immediately below Ka'uiki provided unlimited fish supplies, with large quantities of awa root also available.

Notable figures of old Hawaii were known to have resided at

Ka'uiki, including Kaahumanu, who was born and raised in the Kawaipapa ahupua'a. Pi'ilani and his brother Kihapi'ilani, resided at Ka'uiki. Kihapi'ilani stayed at Ka'uiki with Pi'ilani until differences drew them apart. With the aid of a fleet of canoes sent by Umi from the island of Hawaii, Kihapi'ilani defeated Pi'ilani and later extended his rule throughout the island of Maui (Handy, 1940).

As chief of Maui, Kihapi'ilani built the "Long Road", or Alaloa around the island of Maui, around 1516 (Handy, 1940). The trail was paved with flat hard beach stones, bordered in the open country by large boulders sunk into the ground. Maui ali'i organized human chains to pass shoreline stones from the coast to the trail areas. The trail was useful during times of war, with runners carrying messages along the trails for the ali'i. The trail was also used during the Makahiki by tax collectors (Handy, Handy and Pukui, 1972). Eventually, the Maui trail would come to be known as the King's Trail, the only island trail in Hawaii to traverse the whole island.

Nahiku itself was once known as one of the premiere canoe-building centers on the island (County of Maui, 1994).

b. Informant Interviews

To obtain a wider array of cultural perspectives, an interview was conducted with Mr. James Kaho'okele and Ms. Cynthia Waipuilani Allencastre, individuals knowledgeable about and familiar with the area of the proposed improvements and its history. A summary of their interviews is presented below.

(1) James Kaho'okele

Mr. Kaho'okele was born in Nahiku in 1934. He still lives on the same plot of land, in a house next to that which his father built. The older house is currently occupied by his niece. All of his other family have since left Maui, including a brother who has lived in Texas since 1976. Mr. Kaho'okele grew up in Nahiku and attended Nahiku School. Mr. Kaho'okele noted that his grandfather had donated the land on which Nahiku School was sited and which was supposed to have reverted to the family when the school was closed down around 1955. His father, David K. Kaho'okele, Senior, was well-known in the area, serving as a legislator in the House of Representatives and respected as a canoe-builder. One of the elder Kaho'okele's canoes was sent to the Bishop Museum, although Mr. Kaho'okele was unsure whether or not it was still in existence. He did recall, that his father used to journey up into the mountain to select the proper trees for his canoes, float them down a river, and finally drag them with a mule down to the shore for construction.

Because of his Hawaiian ancestry, Mr. Kaho'okele was able to attend the Kamehameha School, from which he graduated in 1953. He recalls having classmates there such as Diana La'i. After high school, Mr. Kaho'okele joined the U. S. Marine Corps. He was sent to Korea soon after the armistice was signed and served there for 13 months. Thereafter, he served in Japan, California, and back in Hawaii at Pearl Harbor. Mr. Kaho'okele described his military role as being "a jack of all trades"; he served as a Military Policeman (MP), in Motor Transport, and with the First Air Wing (Marine).

After his discharge from the military in 1964, Mr. Kaho'okele returned to Maui and worked for Maui Dry Goods, before going into the construction industry. He again left the island, but finally returned in 1975. He continued construction work before retiring from Fletcher Pacific Construction in 1993.

Mr. Kaho'okele noted that the Nahiku area has

suffered from an influx of tourists and unofficial residents. The Nahiku Landing, the boat ramp at the bottom of Nahiku Road, for example, has no facilities such as restrooms or trash receptacles and the visitors leave their garbage when they visit. Furthermore, Mr. Kaho'okele suggests that although there are only approximately 60 official residents along the road, he estimates that there are over 100 people living there in total, many of those illegally camping or squatting. This puts a strain on the limited resources of the community.

Mr. Kaho'okele attempts to discourage the campers and litterers and lead efforts to clean up the Landing, but noted that this is very difficult to do without some official status. He and other *kupuna* (elders) in the community have attempted to turn the abandoned Nahiku School into a Community Center, but without success so far. There is some organizational structure to the community, however, through the Nahiku Congregational Church, to which most of the official residents belong and which his family had helped build.

Mr. Kaho'okele stated that there were no traditional or cultural practices taking place in or associated with the project vicinity. All cultural festivals, such as the taro festival, had moved to Hana some time ago. Lu'aus were still held in Nahiku for important occasions, but these were private, family occasions and not public events. As far as he was aware of, no one in Nahiku engaged in any traditional, religious practices as the residents are all members of the Congregational Church. Mr. Kaho'okele recalled that his father had engaged in some practices concerned with canoe-building and poi-throwing events, but that this had been unusual even in those days and had virtually disappeared now, although he believed that his niece might participate in some *hauloa* (taro) practices.

Finally, Mr. Kaho'okele suggested, pursuant to the proposed project, that the roadway should be moved as far mauka as possible and cut into the mountain; otherwise, the same land instability issues will recur.

He also believed that the project should take into account trees falling onto the Hana Highway in the intersection area.

(2) Cynthia Waipuilani Allencastre

Ms. Allencastre was born in Nahiku in 1935 and lived there for most of her childhood. When the United States entered World War II, her parents, Kela and Taua Plunkett, went to Honolulu to find better employment opportunities, as did many other Nahiku residents. Ms. Allencastre remained in Nahiku with one (1) other sibling, living with her grandparents, while the four (4) youngest siblings went with her parents.

Ms. Allencastre lived with her grandparents, Joseph and Pawehe Ko'omoa, until 1947. She recalled that her grandfather had been injured during military service, probably in World War I, and, as a result, was unable to do more than moderate labor. The entire family lived off of his military pension. Her grandmother was thus forced to work very hard to provide not only for Ms. Allencastre and her sister, but for their three (3) sons as well. The interviewee particularly recalled her grandmother's fishing expeditions and how she would bring home *opi'i*, *opai*, and the fresh-water *opi'i* called *hihiwai*. Ms. Allencastre also recalled how her grandfather, because of his injuries, took over some of the duties more usually associated with women at the time, such as cooking and pounding *poi*. He was also able to maintain the yard, which she recalled was done by hand with a sickle in those days.

Ms. Allencastre recalled some stories that her grandmother had told her about life in Nahiku in the old days, when ships used to put in at Nahiku Landing and donkeys were used to haul the goods across Makapipi Stream and along the old road. Nahiku was a mixed community of Chinese, Japanese, Filipino, and Hawaiian residents. The major landmark of Nahiku, the Nahiku Congregational Church, was built in 1867 and remains to this day. The major employer in the area was the East Maui

Irrigation Company (EMI) and the interviewee's paternal grandfather, John Plunkett, worked as a supervisor for EMI until his death in 1951. There was some attempt at making rubber tree cultivation a viable business in the area, but it was unsuccessful.

Ms. Allencastre attended Nahiku School until the 6th grade. When her mother returned to Maui with her stepfather, they settled in Wailuku, and Ms. Allencastre moved to live with them. She attended Kahului School and then Baldwin High, graduating in 1953. She married Arnold Allencastre in 1956. They lived in Kaupakalua, where he owned a slaughterhouse. In 1979, they leased the slaughterhouse and moved back to Nahiku. Her husband worked a bulldozer, clearing land and helping with the upkeep of George Harrison's approximately 60 acre estate there. Ms. Allencastre is currently the minister of the Nahiku Congregational Church, with a congregation of fifteen to twenty members.

The interviewee stated that Nahiku had not changed nearly as much as the rest of Maui during her lifetime. She noted that most of the houses that existed during her childhood were still there and one (1) house is at least one hundred years old. There are, however, a number of newer houses and at least one (1) of these has been assigned a street number, unlike the other houses in the community. She estimated that there are approximately forty homes in Nahiku at present and noted that many of the newer houses are hidden behind trees and shrubbery, unlike the older homes.

Ms. Allencastre discussed the lack of employment opportunities in Nahiku and the necessity of commuting for work. Most of the residents work in Hana, at the school or the Hana Ranch Store. She noted that some of the older children work for EMI, clearing ditches, but after high school, many of the boys join the military and leave Nahiku. People are interested in moving to Nahiku, but she sees the lack of jobs as restrictive to potential residents. Despite this, land prices have risen sharply over the years and Ms. Allencastre pointed out that the land which

she bought in the 1970's for approximately \$2,000.00 now costs one hundred times as much.

Many tourists, however, do come to enjoy the Landing. Ms. Allencastre estimates one hundred cars a day drive down to the Landing, to picnic, fish, or hike to Hanawi. Although she has no objections to this, Ms. Allencastre noted that some residents are less pleased by the tourist-influx: the sign on Hana Highway which indicated the turn-off for Nahiku was stolen four (4) times and has never been replaced. The lack of facilities at the Landing is a common source of complaint and problem for both tourists and residents wishing to keep the Landing clean.

Ms. Allencastre is unaware of any traditional or cultural practices associated with the project area, such as gathering or access rights.

2. **Impacts and Mitigative Measures**

The proposed action is not anticipated to result in any substantial, adverse cultural impacts. Nahiku, and the Hana District as a whole, are noted as being significant from a historical and cultural perspective. However, lands in the vicinity of the project site have been significantly altered through previous roadway construction. In addition, archaeological field work, historical research and local resident interviews indicate that there are no historic properties or significant cultural or religious activities which will be adversely impacted by the proposed improvements.

H. **SCENIC AND OPEN SPACE RESOURCES**

1. **Existing Conditions**

The project site is located along and adjacent to the Hana Highway, a popular scenic drive for tourists. The northern slopes of Haleakala are visible to the south of the project area, while the

steep descent of Nahiku Road gives way to views of the Pacific Ocean, with undeveloped lands in between.

2. **Impacts and Mitigation Measures**

The proposed action is not anticipated to result in any substantial, adverse impacts to scenic and open space resources. The realigned roadway will preserve the existing views.

I. **PUBLIC SERVICES**

1. **Existing Conditions**

The Maui Police Department is headquartered in Wailuku. Service is divided into the Wailuku, Lahaina, and Hana patrol districts, the last of which services Nahiku from its substation in Hana Town. Fire Service is similarly provided and the fire station in Hana is located in the same building as the police substation.

Maui Memorial Medical Center is currently the only major medical facility on the island. Acute, general, and emergency care services are provided by the approximately 196-bed facility. In Hana, the Hana Community Health Center provides general health care, dental, and mental health services to community residents, as well as 24-hour urgent care services. There are no major medical facilities in Nahiku.

There are two (2) public schools located in the region: Hana High and Elementary School, with an approximate enrollment of 300 students, and Keanae Elementary School, which serves grades K-3 and enrolls approximately six (6) students.

County solid waste collection is provided to residents of upper

Nahiku. Solid waste is transported to the Hana landfill, a 30-acre site maintained by the County of Maui.

Nahiku Landing, at the base of Nahiku Road, is a State-owned recreational facility. A number of other parks are located in Hana, including the County Hana Bay Beach Park, the State Waianapapa Park, and the National Oheo Gulch Recreation Area.

2. **Impacts and Mitigation Measures**

The proposed action is not anticipated to result in any substantial, adverse impacts to public services. The proposed action is not considered a population generator and the roadway improvements will not extend emergency service areas or the scope of such services.

J. **SOCIO-ECONOMIC ENVIRONMENT**

1. **Existing Conditions**

The Hana District includes Nahiku, as well as Hana Town and neighboring communities. The entire region has limited vehicular accessibility, with only the circuitous route of Hana Highway providing connection to the rest of the island. Hana Town is the major population center of the district. Population levels have remained fairly steady over the past two (2) decades. In 1980, the population of the Hana District was 1,423; this increased to 1,895 in 1990, and dipped slightly to 1,855 in 2000 (Maui County Data Book, 2003). This represents a significantly sparser population than is found in the island as a whole: the population density in 2000 was estimated at approximately 152 persons per square mile for the island of Maui, as compared to approximately 10 persons per square mile for the Hana District. It is noted that population

figures for Nahiku specifically are unavailable.

The economy of the region is primarily based on diversified agriculture, the visitor industry, government services, and subsistence activities. Diversified agricultural activities include ranching and the cultivation of crops such as taro and tropical flowers. Businesses, government services, and visitor accommodations are centered in Hana Town. Nahiku is primarily a rural residential in character. In 1990, there were approximately 680 jobs in the Hana region, while in 2000, there were approximately 840. As with the population, job growth is expected to remain stable over the next several years (SMS, 2002).

2. **Impacts and Mitigation Measures**

The proposed action is not anticipated to result in any substantial, adverse impacts to the socio-economic environment. The roadway improvements are not considered population generators nor will they impact the economic climate of the area.

K. **INFRASTRUCTURE**

1. **Existing Conditions**

Hana Highway (State Highway 360) is the only major arterial connection between the Hana region and the rest of the island of Maui. In this region, Hana Highway is a two-way, two-lane roadway, noted for its winding, circuitous route around the slopes of Haleakala, its scenic beauty, and its historic nature, which includes crossing some 59 historic bridges.

Nahiku Road is a two-way, two-lane, County roadway which begins at Hana Highway and descends for approximately two (2) miles

until it reaches Nahiku Landing at the shoreline. Traffic counts were performed at three (3) locations within the project area so that the new roadway would be adequately designed for the automobile traffic it bears. See Appendix "C".

The Hana region is served in part by the County of Maui, Department of Water Supply, which includes deep wells at Hamoa and Wakiu. A 2-inch waterline runs along the existing Nahiku Road alignment.

There are no County wastewater collection or treatment facilities in the Hana region and none located in the project area. There are also no drainage improvements. Stormwater runoff follows natural contours, sheet-flowing into the nearby Makapipi Stream and, subsequently, into the ocean.

2. **Impacts and Mitigation Measures**

The proposed action is not anticipated to result in any substantial, adverse impacts to infrastructure. The project will improve roadway operations by removing Nahiku Road from its dangerous overhang into the adjacent gulch and by allowing west-bound traffic on Hana Highway to access Nahiku Road without making a dangerously sharp turn. The Department of Public Works and Environmental Management will coordinate with the Department of Water Supply in realigning the existing waterline to conform to the improved Nahiku Road. No additional burdens will be placed on existing infrastructure. The proposed roadway improvements will not affect drainage patterns and will have minimal impact in runoff. See Appendix "D".

L. CUMULATIVE AND SECONDARY IMPACTS

Cumulative impacts are defined as the impact on the environment which results from the incremental impact of an action when added to other past, present, and reasonably foreseeable future actions, regardless of what agency or person undertakes such other actions.

The proposed project is not part of a larger action, nor would it occur within the context of such actions. There are no direct community growth impacts resulting from or occurring with the project. There are no other public works projects anticipated within the project context.

Secondary impacts are those which have the potential to occur later in time or farther in distance, but are still reasonably foreseeable. They can be viewed as actions of others that are taken because of the presence of the project. Secondary impacts from highway projects, for example, can occur because they can induce development by removing one of the impediments to growth-transportation access.

There are no foreseeable secondary impacts associated with the proposed project. It is not considered a generating component for population, nor will it place additional burden upon infrastructure or the environment.

Chapter III

**Relationship to Land Use
Plans, Policies and Controls**

III. RELATIONSHIP TO LAND USE PLANS, POLICIES AND CONTROLS

A. STATE LAND USE DISTRICTS

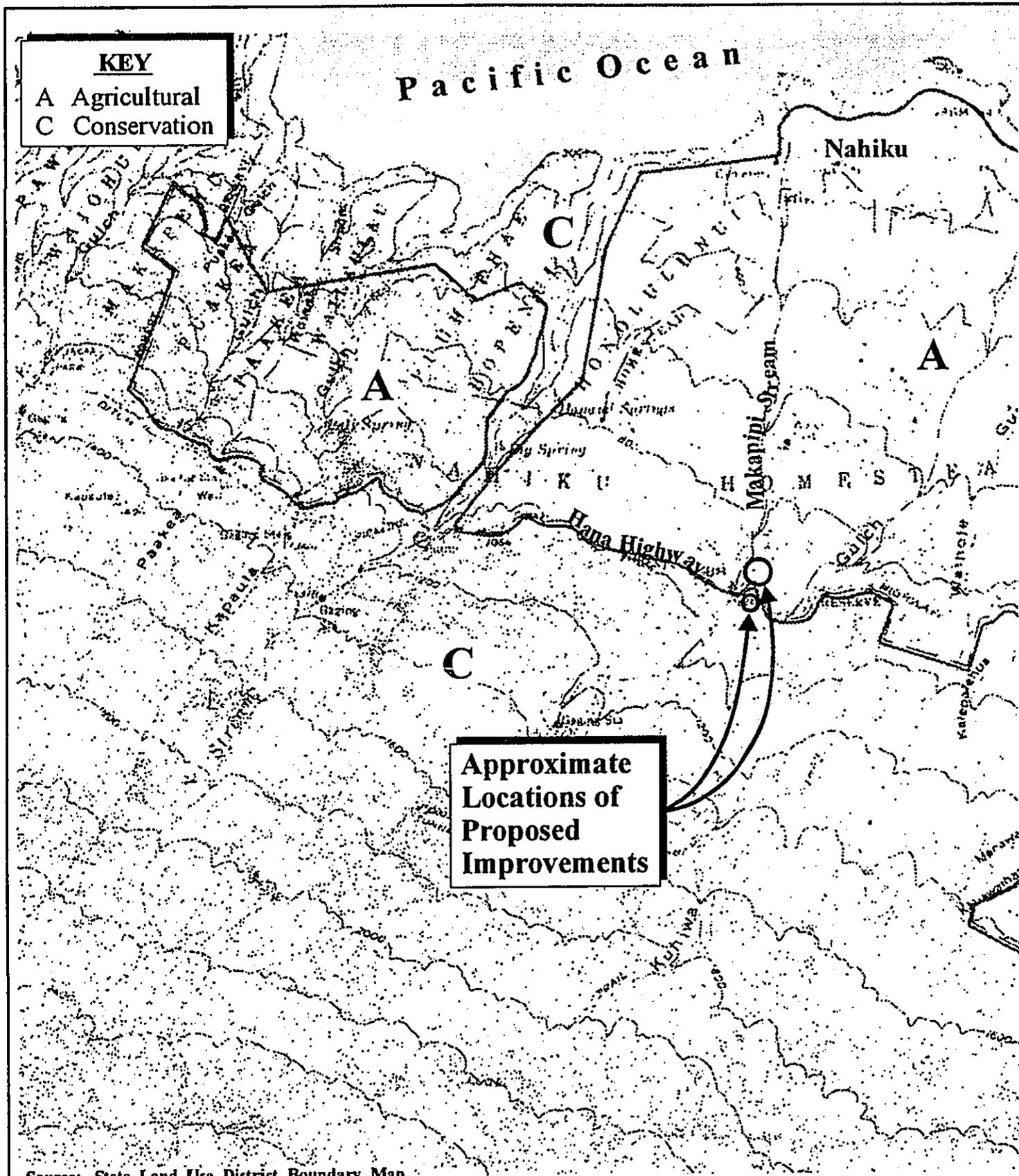
Chapter 205, Hawaii Revised Statutes, relating to the Land Use Commission, establishes four (4) major land use districts in which all lands in the State are placed. These districts are designated as "Urban", "Rural", "Agricultural", and "Conservation". The area for the realigned roadway is located within the "Agricultural" district, while the turn-out area is located within the Hana Highway right-of-way. See Figure 8.

B. MAUI COUNTY GENERAL PLAN

The Maui County General Plan (1990 Update) sets forth broad objectives and policies to help guide the long-range development of the County. As stated in the Maui County Charter:

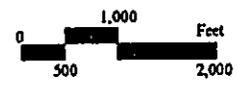
" . . . indicate desired population and physical development patterns for each island and region within the county; shall address the unique problems and needs of each island and region; shall explain the opportunities and the social, economic, and environmental consequences related to potential developments; and shall set forth the desired sequence, patterns, and characteristics of future developments. The general plan shall identify objectives to be achieved, and priorities, policies and implementing actions to be pursued with respect to population density, land use maps, land use regulations, transportation systems, public and community facility locations, water and sewage systems, visitor destinations, urban design, and other matters related to development."

The proposed action is in keeping with the following General Plan objectives and policies:



Source: State Land Use District Boundary Map

Figure 8 Proposed Improvements to Nahiku Road
State Land Use District Classifications



Prepared for: County of Maui, Dept. of Public Works and Environmental Management

MUNEKIYO & HIRAGA, INC.

LAND USE

Objective:

To use the land within the County for the social and economic benefit of all the County's residents.

Policy:

Mitigate environmental conflicts and enhance scenic amenities, without having a negative impact on natural resources.

ENVIRONMENT

Objectives:

- To preserve and protect the county's unique and fragile environmental resources.
- To use the County's land-based physical and ocean-related coastal resources in a manner consistent with sound environmental planning practice.

Policies:

- Preserve for present and future generations the opportunity to experience the natural beauty of the islands.
- Preserve, enhance and establish traditional and new environmentally sensitive access opportunities for mountain and ocean resources.
- Evaluate all land based development relative to its impact on the County's land and ocean ecological resources.

CULTURAL RESOURCES

Objective:

To preserve for present and future generations the opportunity to know and experience the arts, culture and history of Maui County.

Policy:

Identify and maintain an inventory of significant and unique cultural

resources for special protection.

C. **HANA COMMUNITY PLAN**

Within Maui County, there are nine (9) community plan regions. From a General Plan implementation standpoint, each region is governed by a community plan which sets forth desired land use patterns, as well as goals, objectives, policies, and implementing actions for a number of functional areas including infrastructure-related parameters. The area of the realigned roadway is located within the Hana Community Plan region and designated as "Conservation" land. The project is in keeping with the following goals, objectives, and policies.

ENVIRONMENT

Goal:

Protection and management of Hana's land, water and ocean resources to ensure that future generations can enjoy the region's exceptional environmental qualities.

Objective and Policy:

Protect, preserve and increase the Hana region's natural marine, coastal and inland resources, encouraging comprehensive resource management programs.

CULTURAL RESOURCES

Goal:

Identification, preservation, protection, and where appropriate, restoration of significant cultural resources and practices, that provide a sense of history and identity for the Hana region.

Objective and Policy:

Identify, preserve and protect historically, archaeologically and culturally significant areas, sites, and features within the Hana District.

URBAN DESIGN

Goal:

Harmony between the natural and man-made environments through building, infrastructure and landscaping design which ensures that the natural beauty and character of the Hana region is preserved.

Objectives and Policies:

- Encourage roadway, drainage, landscaping and other public improvement standards which are in harmony with an informal rural or natural environment.
- Preserve significant view corridors.

PHYSICAL INFRASTRUCTURE

Goal:

Timely and environmentally sensitive development and maintenance of infrastructure systems which protect and preserve the safety and health of the Hana region's residents and visitors, including the provision of domestic water, utility and waste disposal services, and effective transportation systems which meet the needs of residents and visitors while protecting the region's rural character.

Objective and Policy:

Ensure community participation, including resident Hawaiian, in all long-term infrastructure planning.

D. COUNTY ZONING

Permitted uses and performance standards are set forth by Title 19 of the Maui County Code relating to zoning. Parcel 58 is currently zoned "Agriculture" by the County. Infrastructure systems, including roadways, are permitted in each of the County zoning districts. The improvements proposed along Hana Highway to facilitate turning movements onto Nahiku Road are located within the existing Hana Highway right-of-way.

E. SPECIAL MANAGEMENT AREA OBJECTIVES AND POLICIES

The Nahiku Road realignment component of the project is located within the County of Maui's Special Management Area (SMA). Pursuant to Chapter 205A, Hawaii Revised Statutes, and the SMA Rules and Regulations for the Maui Planning Commission, actions proposed within the SMA are evaluated with respect to SMA objectives, policies, and guidelines. This section addresses the proposed action as related to applicable coastal zone management considerations, as set forth in Chapter 205A and the Rules and Regulations of the Maui Planning Commission.

1. Recreational Resources

Objective: Provide coastal recreational opportunities accessible to the public.

Policies:

- a. Improve coordination and funding of coastal recreation planning and management; and
- b. Provide adequate, accessible and diverse recreational opportunities in the coastal zone management area by:
 - i. Protecting coastal resources uniquely suited for recreational activities that cannot be provided in other areas;
 - ii. Requiring replacement of coastal resources having significant recreational value including, but not limited to surfing sites, fishponds, and sandy beaches, when such resources will be unavoidably damaged by development; or requiring reasonable monetary compensation to the State for recreation when replacement is not feasible or desirable;
 - iii. Providing and managing adequate public access, consistent with conservation of natural resources, to and along shorelines with recreational value;

-
- iv. Providing an adequate supply of shoreline parks and other recreational facilities suitable for public recreation;
 - v. Ensuring public recreational use of County, State, and federally owned or controlled shoreline lands and waters having recreational value consistent with public safety standards and conservation of natural resources;
 - vi. Adopting water quality standards and regulating point and non-point sources of pollution to protect and where feasible, restore the recreational value of coastal waters; and
 - vii. Developing new shoreline recreational opportunities, where appropriate, such as artificial beaches, and artificial reefs for surfing and fishing; and
 - viii. Encouraging reasonable dedication of shoreline areas with recreational value for public use as part of discretionary approvals or permits by the land use commission, board of land and natural resources, and county authorities; and crediting such dedication against the requirements of Section 46-6, HRS.

Response: The proposed improvements are located approximately 1.25 miles from the shoreline and are not anticipated to impact shoreline recreational resources or coastal access in any adverse way.

2. **Historic Resources**

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

Policies:

- a. Identify and analyze significant archaeological resources;

-
- b. Maximize information retention through preservation of remains and artifacts or salvage operations; and
 - c. Support State goals for protection, restoration, interpretation and display of historic resources.

Response: An archaeological assessment was performed for the project area. Refer to Appendix "B". There are no significant cultural or historic deposits which might be impacted by the proposed project identified in this survey. In the event that any subsurface archaeological resources are encountered during grading activities, all work will be halted in the immediate vicinity of the find and the State Historic Preservation Division will be contacted immediately to determine an appropriate mitigation strategy.

3. **Scenic and Open Space Resources**

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

Policies:

- a. Identify valued scenic resources in the coastal zone management area;
- b. Ensure that new developments are compatible with their visual environment by designing and locating such developments to minimize the alteration of natural land forms and existing public views to and along the shoreline;
- c. Preserve, maintain and, where desirable, improve and restore shoreline open space and scenic resources; and
- d. Encourage those developments that are not coastal dependent to locate in inland areas.

Response: The proposed improvements are located approximately 1.25 miles from the shoreline and are not anticipated

to impact coastal scenic or open space resources in any adverse way.

4. **Coastal Ecosystems**

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

Policies:

- a. Exercise an overall conservation ethic, and practice stewardship in the protection, use, and development of marine and coastal resources;
- b. Improve the technical basis for natural resource management;
- c. Preserve valuable coastal ecosystems, including reefs, of significant biological or economic importance;
- d. 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; and
- e. Promote water quantity and quality planning and management practices that reflect the tolerance of fresh water and marine ecosystems and maintain and enhance water quality through the development and implementation of point and nonpoint source water pollution control measures.

Response: During construction-related activities, appropriate BMP's will be utilized to ensure that there is no substantial, adverse impact to coastal ecosystems. It is noted again that the proposed roadway improvements are not located in proximity to shoreline areas.

5. **Economic Uses**

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

Policies:

- a. Concentrate coastal dependent development in appropriate areas;
- b. Ensure that coastal dependent development such as harbors and ports, and coastal related development such as visitor industry facilities and energy-generating facilities are located, designed, and constructed to minimize adverse social, visual and environmental impacts in the coastal zone management area; and
- c. Direct the location and expansion of coastal dependent developments to areas presently designated and used for such developments and permit reasonable long-term growth at such areas, and permit coastal dependent development outside of presently designated areas when:
 - i. Use of presently designated locations is not feasible;
 - ii. Adverse environmental effects are minimized; and
 - iii. The development is important to the State's economy.

Response: The proposed project is not a coastal dependant development nor is it anticipated to impact the economy.

6. **Coastal Hazards**

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

Policies:

- a. Develop and communicate adequate information about storm wave, tsunami, flood, erosion, subsidence, and point and nonpoint source pollution hazards;

-
- b. Control development in areas subject to storm wave, tsunami, flood, erosion, subsidence, and point and nonpoint source pollution hazards;
 - c. Ensure that developments comply with requirements of the Federal Flood Insurance Program; and
 - d. Prevent coastal flooding from inland projects.

Response: The proposed improvements are located in Flood Zone C, an area of minimal flood hazard. The project is not anticipated to increase the region's susceptibility to coastal hazards.

7. **Managing Development**

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

Policies:

- a. Use, implement, and enforce existing law effectively to the maximum extent possible in managing present and future coastal zone development;
- b. Facilitate timely processing of applications for development permits and resolve overlapping or conflicting permit requirements; and
- c. Communicate the potential short and long-term impacts of proposed significant coastal developments early in their life-cycle and in terms understandable to the general public to facilitate public participation in the planning and review process.

Response: In compliance with Chapter 343, Hawaii Revised Statutes, this Environmental Assessment has been prepared to facilitate public understanding and involvement with the proposed

project. Compliance with applicable regulatory requirements advances the objective and policies for Managing Development.

8. **Public Participation**

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

Policies:

- a. Promote public involvement in coastal zone management processes;
- 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 issues, developments, and government activities; and
- c. Organize workshops, policy dialogues, and site-specific mediations to respond to coastal issues and conflicts.

Response: As noted above, public awareness of the project is being made through the Environmental Assessment process. The proposed project is not contrary to the objectives of public awareness, education, and participation.

9. **Beach Protection**

Objective: Protect beaches for public use and recreation.

Policies:

- a. Locate new structures inland from the shoreline setback to conserve open space, minimize interference with natural shoreline processes, and minimize loss of improvements due to erosion;
- b. Prohibit construction of private erosion-protection structures

seaward of the shoreline, except when they result in improved aesthetic and engineering solutions to erosion at the sites and do not interfere with existing recreational and waterline activities; and

- c. Minimize the construction of public erosion-protection structures seaward of the shoreline.

Response: During construction-related activities, appropriate BMP's will be utilized to ensure that there is no substantial, adverse impact to coastal ecosystems. The proposed roadway improvements are not located in proximity to shoreline areas. Beach processes are not anticipated to be impacted by the proposed project.

10. Marine Resources

Objective: Promote the protection, use, and development of marine and coastal resources to assure their sustainability.

Policies:

- a. Ensure that the use and development of marine and coastal resources are ecologically and environmentally sound and economically beneficial;
- b. Coordinate the management of marine and coastal resources and activities to improve effectiveness and efficiency;
- c. Assert and articulate the interests of the State as a partner with federal agencies in the sound management of ocean resources within the United States exclusive economic zone;
- d. Promote research, study, and understanding of ocean processes, marine life, and other ocean resources in order to acquire and inventory information necessary to understand how ocean development activities relate to and impact upon ocean and coastal resources; and
- e. Encourage research and development of new, innovative

technologies for exploring, using, or protecting marine and coastal resources.

Response: The proposed improvements are not anticipated to adversely impact coastal marine resources. The project site is not located in proximity to shoreline areas.

Chapter IV

***Summary of Adverse
Environmental Effects
Which Cannot be Avoided***

IV. SUMMARY OF ADVERSE ENVIRONMENTAL EFFECTS WHICH CANNOT BE AVOIDED

The proposed roadway improvements will result in certain, unavoidable, construction-related impacts, including noise-generated impacts and air quality impacts associated with construction equipment and vehicles, such as dust and exhaust emissions. All construction-related impacts will be short-term and mitigated to the fullest extent practicable by the utilization of appropriate Best Management Practices.

The proposed action is not anticipated to result in any substantial, adverse impacts to the environment.

Chapter V

***Alternatives to the
Proposed Action***

V. ALTERNATIVES TO THE PROPOSED ACTION

A. PREFERRED ALTERNATIVE

The project design as presented in this document represents the preferred alternative. DPWEM regards this plan as the most efficient and practicable method of ensuring motorist safety on Nahiku Road and allowing safe vehicular access to Nahiku Road from Hana Highway.

B. NO ACTION ALTERNATIVE

The No Action Alternative would mean that motorists on Nahiku Road would continue to drive dangerously near to the drop-off into Makapipi Gulch; or even that the road itself would fall away. It would also mean the westbound vehicles accessing Nahiku Road from Hana Highway, including emergency vehicles, would continue to make a dangerously sharp turn. DPWEM does not regard the No Action Alternative as advisable.

C. DESIGN ALTERNATIVE

During the design phase of the project, consideration was given to the exact length of roadway to be realigned, as well as how far mauka the road should be moved. Other options considered included leaving Nahiku Road in its current alignment and bolstering the roadway (through structural retainage) on its makai side. Turning radii options were also considered in lieu of the "jug handle" design proposed at Hana Highway. In the end, the Preferred Alternative was deemed the most practicable and efficient design.

Chapter VI

***Irreversible and Irretrievable
Commitments of Resources***

VI. IRREVERSIBLE AND IRRETRIEVABLE COMMITMENTS OF RESOURCES

The proposed action will involve the irreversible and irretrievable commitment of lands for the realignment roadway segment, as well as for the turn-out area. The project will also require the commitment of fuel, labor, funding, and material resources. The irreversible and irretrievable expenditure of these resources is deemed appropriate to increase roadway safety.

Chapter VII

**Findings and
Conclusions**

VII. FINDINGS AND CONCLUSIONS

The "Significance Criteria", Section 12 of the Administrative Rules, Title 11, Chapter 200, "Environmental Impact Statement Rules", were reviewed and analyzed to determine whether the proposed project will have significant impacts to the environment. The following analysis is provided.

1. **No Irrevocable Commitment to Loss or Destruction of Any Natural or Cultural Resources Would Occur as a Result of the Proposed Project**

Based upon the archaeological report and cultural impact assessment completed for the project, there are no anticipated impacts to any historical or cultural resources from the proposed action. Similarly, there are no anticipated impacts to any threatened, endangered, or rare flora or fauna or habitants of such. Therefore, there is no commitment to a loss of any natural or cultural resources.

2. **The Proposed Action Would Not Curtail the Range of Beneficial Uses of the Environment**

The project involves work within and adjacent to existing roadway rights-of-way. The lands proposed for the realigned roadway segment lie between the existing roadway and Hana Highway and are used only as a buffer area. The proposed project will not curtail the range of beneficial uses of the environment.

3. **The Proposed Action Does Not Conflict with the State's Long-Term Environmental Policies or Goals or Guidelines as Expressed in Chapter 344, Hawaii Revised Statutes**

The State's Environmental Policy and Guidelines are set forth in Chapter 344, Hawaii Revised Statutes (HRS). The proposed action is in consonance with the policies and guidelines of Chapter 344, HRS.

4. **The Economic or Social Welfare of the Community or State Would Not Be Substantially Affected**

The proposed roadway improvements will have no substantial impacts to economic or social welfare.

5. **The Proposed Action Does Not Affect Public Health**

No adverse impacts to public health are anticipated to result from the proposed project. Public safety will be positively affected by the roadway realignment and the provision of a safe, turning area onto Nahiku Road.

6. **No Substantial Secondary Impacts, Such as Population Changes or Effects on Public Facilities are Anticipated**

The proposed action is not anticipated to result in any secondary impacts. The roadway improvements are not considered population generators. Neither are there anticipated effects upon public services.

7. **No Substantial Degradation of Environmental Quality is Anticipated**

The proposed action will have no substantial impact to environmental quality. During construction-related activities, appropriate BMP's will be utilized to ensure that potential adverse environmental effects are mitigated.

8. **The Proposed Project Does Not Involve a Commitment to Larger Actions, Nor Would Cumulative Impacts Result in Considerable Effects on the Environment**

The proposed action does not involve a commitment to larger actions nor be a component in cumulative actions which would have considerable impact on the environment.

9. **No Rare, Threatened, or Endangered Species or Their Habitats Would Be Adversely Affected by the Proposed Action**

A biological resources survey was prepared for the project. Refer to Appendix "A". There are no rare, endangered, or threatened species within the subject property and none are anticipated to be impacted by the action.

10. **Air Quality, Water Quality, or Ambient Noise Levels Would Not Be Detrimentially Affected by the Proposed Project**

Appropriate BMP's will be employed during construction-related activities to ensure that adverse environmental effects on air, water, and noise quality are mitigated as much as is feasible. In the long term, there are no significant impacts in these areas resulting from the project.

11. **The Proposed Project Would Not Affect Environmentally Sensitive Areas, Such as Flood Plains, Tsunami Zones, Erosion-prone Areas, Geologically Hazardous Lands, Estuaries, Fresh waters, or Coastal Waters.**

The proposed action is considered an appropriate mitigation to the slope instability conditions which caused the existing safety issues at Nahiku Road. The realigned roadway section would place the road on stable conditions ensuring the long-term structural integrity of the road. Appropriate BMP's will be employed during construction-related activities to ensure that impacts to the adjacent Makapipi Stream and downstream lands are minimized.

12. **The Proposed Action Would Not Substantially Affect Scenic Vistas and Viewplanes Identified in County or State Plans or Studies**

The proposed roadway improvements would have no impact on scenic vistas or viewplanes.

13. *The Proposed Action Would Not Require Substantial Energy Consumption*

The proposed project will involve the short-term commitment of fuel for equipment, vehicles, and machinery during construction-related activities. However, this short-term demand is not considered excessive or substantive within the context of the region's overall energy consumption. In the long term, the project is not anticipated to result in any substantial consumption of energy.

Based on the foregoing findings, the conclusion reached is that the proposed action is not anticipated to result in any significant impacts.

Chapter VIII

***List of Permits
and Approvals***

VIII. LIST OF PERMITS AND APPROVALS

The following permits and approvals will be required prior to implementation of the proposed project.

State of Hawaii

1. NPDES Permit, as applicable (Department of Health)
2. Community Noise Permit, as applicable (Department of Health)

County of Maui

1. Grading Permit
2. Special Management Area Permit

Chapter IX

**Agencies Consulted During the
Preparation of the Draft
Environmental Assessment;
Letters Received and Responses
to Substantive Comments**

IX. AGENCIES CONTACTED DURING THE PREPARATION OF THE DRAFT ENVIRONMENTAL ASSESSMENT; LETTERS RECEIVED AND RESPONSES TO SUBSTANTIVE COMMENTS

The following agencies were contacted prior to the preparation of the Draft Environmental Assessment. Letters received and responses to substantive comments are included in this section.

1. Ranae Ganske-Cerizo, Acting
District Conservationist
Natural Resources Conservation
Service
U.S. Department of Agriculture
210 Imi Kala Street, Suite 209
Wailuku, Hawaii 96793-2100
2. George Young, P.E.
U.S. Department of the Army
U.S. Army Engineer District,
Honolulu
Building 230
Fort Shafter, Hawaii 96858-5440
3. Robert P. Smith
Pacific Islands Manager
U. S. Fish and Wildlife Service
300 Ala Moana Blvd.
Rm. 3-122, Box 50088
Honolulu, Hawaii 96813
4. Mary Lou Kobayashi,
Planning Program Administrator
State of Hawaii
Office of Planning
P. O. Box 2359
Honolulu, Hawaii 96804
5. Denis Lau, Chief
Clean Water Branch
State of Hawaii
Department of Health
919 Ala Moana Blvd., Room 300
Honolulu, Hawaii 96814
6. Herbert Matsubayashi
District Environmental Health
State of Hawaii
Department of Health
54 High Street
Wailuku, Hawaii 96793
7. Peter Young
State of Hawaii
Department of Land and Natural
Resources
P. O. Box 621
Honolulu, Hawaii 96809
8. Melanie Chinen, Administrator
State of Hawaii
Department of Land and Natural
Resources
State Historic Preservation
Division
601 Kamokila Blvd., Room 555
Kapolei, Hawaii 96707
9. Rodney Haraga, Director
State of Hawaii
Department of Transportation
869 Punchbowl Street
Honolulu, Hawaii 96813
10. Clyde Namu'o, Administrator
Office of Hawaiian Affairs
711 Kapiolani Boulevard, Suite 500
Honolulu, Hawaii 96813

-
11. Carl Kaupalolo, Chief
County of Maui
**Department of Fire and Public
Safety**
200 Dairy Road
Kahului, Hawaii 96732
 12. Alice Lee, Director
County of Maui
**Department of Housing and
Human Concerns**
200 South High Street
Wailuku, Hawaii 96793
 13. Michael W. Foley, Director
County of Maui
Department of Planning
250 South High Street
Wailuku, Hawaii 96793
 14. Glenn Correa, Director
County of Maui
**Department of Parks and
Recreation**
700 Hali'a Nako Street, Unit 2
Wailuku, Hawaii 96793
 15. Thomas Phillips, Chief
County of Maui
Police Department
55 Mahalani Street
Wailuku, Hawaii 96793
 16. George Tengan, Director
County of Maui
Department of Water Supply
200 South High Street
Wailuku, Hawaii 96793
 17. Maui Electric Company, Ltd.
P. O. Box 398
Kahului, Hawaii 96732
 18. Hana Community Association
P. O. Box 298
Hana, Hawaii 96713

JAN 28 2005



REPLY TO
ATTENTION OF

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

January 27, 2005

Regulatory Branch

Matthew Slepín, Planner
Munekiyo & Hiraga, Inc.
305 High Street, Suite 104
Wailuku, Hawaii 96793

Subject: Early consultation for proposed improvements to Nahiku Road at its intersection with Hana Highway, Hana, Maui (portion of TMK: (2) 1-2-003:018).

Dear Mr. Slepín:

This office has reviewed the materials you submitted on January 19, 2005 requesting comments as part of the early consultation process for an Environmental Assessment for the above-referenced project. The information you submitted was reviewed pursuant to Section 404 of the Clean Water Act, which requires that a Department of the Army (DA) permit be obtained prior to the placement or discharge of dredged and/or fill material into waters of the U.S., including wetlands (33 U.S.C. 1344).

Based on the project description and a review of the United States Geological Service's topographic maps (Nahiku quadrangle), Makapipi Stream is a water of the U.S. located near the proposed project. Any discharge of dredged and/or fill material below the ordinary high water mark (OHWM) of the Makapipi Stream would require a DA permit from the Corps. The site plan (Figure 2) submitted does not indicate the location of the stream relative to the proposed roadway improvements. In order to make a final determination of Corps jurisdiction, the site plans would need to be revised to show the location of the work, particularly any placement of fill materials or re-grading (such as the retaining wall or the realigned road bed and bank) in relation to the OHWM of the stream.

Thank you for your cooperation with our regulatory program. If you have any further questions, please contact Ms. Connie Ramsey by telephone at 808-438-2039, by facsimile at 808-438-4060 or by electronic mail at Connie.L.Ramsey@usace.army.mil. Please refer to file number POH-2005-62.

Sincerely,

A handwritten signature in black ink, appearing to read "George P. Young".

George P. Young, P.E.
Chief, Regulatory Branch



MICHAEL T. MUNEKIYO
GWEN OHASHI HIRAGA
MITSURU "MICH" HIRANO

July 25, 2005

George Young, Chief
Department of the Army
Regulatory Branch
U. S. Army Engineer District, Honolulu
Building 230
Ft. Shafter, Hawaii 96858

SUBJECT: Proposed Improvements to Nahiku Road,
Hana, Maui, Hawaii, TMK (2) 1-2-003:058 (por.)

Dear Chief Young:

Thank you for your letter of January 27, 2005, responding to our request for early consultation comments for the proposed improvements to Nahiku Road in Nahiku, Maui. In response to your comments, we note the following:

1. We confirm that the project site is located in near proximity to Makapipi Stream, which is a water of the U.S. and that any discharge below the ordinary high water mark will require a permit from the Corps.
2. A site plan which clearly delineates the location of the Makapipi Stream in relation to the proposed roadway improvements is attached to this letter as Exhibit "A".

Thank you again for providing your input to the proposed action. A copy of the Draft Environmental Assessment will be provided to your office for review and comment.

Very truly yours,

Matthew M. Slep, Planner

MMS:yp

cc: Joe Krueger, Department of Public Works and Environmental Management
Kevin Ho, Sato & Associates, Inc.

sato@nahiku.army.res

environment
planning.

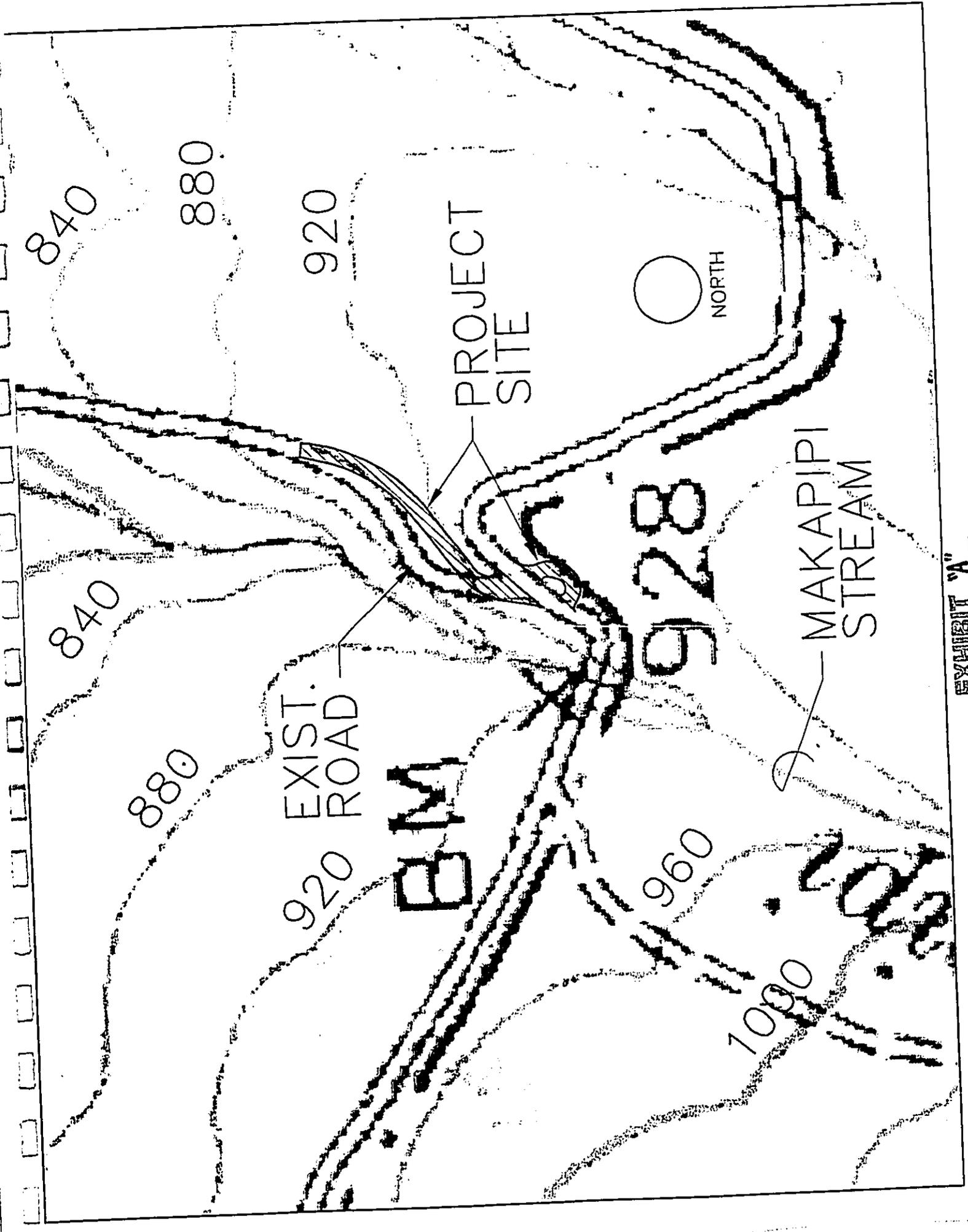


EXHIBIT 'A'

JAN 28 2005

LINDA LINGLE
GOVERNOR OF HAWAII



CHIYOME L. FUKINO, M.D.
DIRECTOR OF HEALTH

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

In reply, please refer to:
EMD/CWB

01052PKP.05

January 26, 2005

Mr. Matthew Slepín
Planner
Muneiyo & Hiraga, Inc.
305 High Street, Suite 104
Wailuku, Hawaii 96793

Dear Mr. Slepín:

**Subject: Early Consultation Request for Proposed Improvements to Nahiku Road,
Hana, Maui, Hawaii TMK: 1-2-003:018**

The Department of Health, Clean Water Branch (CWB), has reviewed the subject document and offers the following comments:

1. The Army Corps of Engineers should be contacted at (808) 438-9258 to identify whether a Federal license or permit (including a Department of Army permit) is required for this project. Pursuant to Section 401(a)(1) of the Federal Water Pollution Control Act (commonly known as the "Clean Water Act"), a Section 401 Water Quality Certification is required for "[a]ny applicant for Federal license or permit to conduct any activity including, but not limited to, the construction or operation of facilities, which may result in any discharge into the navigable waters..."
2. A National Pollutant Discharge Elimination System (NPDES) general permit coverage is required for the following activities:
 - a. Storm water associated with industrial activities, as defined in Title 40, Code of Federal Regulations, Sections 122.26(b)(14)(i) through 122.26(b)(14)(ix) and 122.26(b)(14)(xi).
 - b. Construction activities, including clearing, grading, and excavation, that result in the disturbance of equal to or greater than one (1) acre of total land area. The total land area includes a contiguous area where multiple separate and distinct construction activities may be taking place at different times on different schedules under a larger common plan of development or sale. An NPDES permit is required before the commencement of the construction activities.
 - c. Discharges of treated effluent from leaking underground storage tank remedial activities.
 - d. Discharges of once through cooling water less than one (1) million gallons per day.

Mr. Matthew Slepín
January 26, 2005
Page 2

- e. Discharges of hydrotesting water.
- f. Discharges of construction dewatering effluent.

- g. Discharges of treated effluent from petroleum bulk stations and terminals.
- h. Discharges of treated effluent from well drilling activities.
- i. Discharges of treated effluent from recycled water distribution systems.
- j. Discharges of storm water from a small municipal separate storm sewer system.
- k. Discharges of circulation water from decorative ponds or tanks.

The CWB requires that a Notice of Intent (NOI) to be covered by an NPDES general permit for any of the above activities be submitted at least 30 days before the commencement of the respective activities. The NOI forms may be picked up at our office or downloaded from our website at:
<http://www.hawaii.gov/health/environmental/water/cleanwater/index.html>

- 3. The applicant may be required to apply for an individual NPDES permit if there is any type of activity in which wastewater is discharged from the project into State waters and/or coverage of the discharge(s) under the NPDES general permit(s) is not permissible (i.e. NPDES general permits do not cover discharges into Class 1 or Class AA State waters). An application for the NPDES permit is to be submitted at least 180 days before the commencement of the respective activities. The NPDES application forms may also be picked up at our office or downloaded from our website at:
<http://www.hawaii.gov/health/environmental/water/cleanwater/index.html>
- 4. Hawaii Administrative Rules, Section 11-55-38, also requires the applicant to either submit a copy of the new NOI or NPDES permit application to the State Department of Land and Natural Resources, State Historic Preservation Division (SHPD), or demonstrate to the satisfaction of the DOH that the project, activity, or site covered by the NOI or application has been or is being reviewed by SHPD.

If you have any questions, please contact Ms. Kris Poentis of the Engineering Section, CWB, at (808) 586-4309.

Sincerely,



DENIS R. LAU, P.E., CHIEF
Clean Water Branch

KP:bt



MICHAEL T. MUNEKIYO
GWEN OHASHI HIRAGA
MITSURU "MICH" HIRAGA

July 25, 2005

Dennis Lau, Chief
Department of Health
Clean Water Branch
P. O. Box 3378
Honolulu, Hawaii 96801

SUBJECT: Proposed Improvements to Nahiku Road,
Hana, Maui, Hawaii, TMK (2) 1-2-003:058 (por.)

Dear Mr. Lau:

Thank you for your letter of January 26, 2005, responding to our request for early consultation comments for the proposed improvements to Nahiku Road in Nahiku, Maui. In response to your comments, we note the following:

1. The Department of the Army has been contacted through the early consultation process. We will continue to coordinate with them to determine what permitting, if any, is required for the proposed project.
2. We acknowledge your comments regarding general and individual National Pollutant Discharge Elimination System (NPDES) permit coverage. The Department of Public Works and Environmental Management will be seeking an appropriate NPDES permit for this project.
3. We also acknowledge the need for notification of the State Historic Preservation Division in regard to the NPDES permit. We will coordinate with that office to ensure that the proper procedures are followed.

environment
planning

Dennis Lau, Chief
July 25, 2005
Page 2

Thank you again for providing your input to the proposed action. A copy of the Draft Environmental Assessment will be provided to your office for review and comment.

Very truly yours,



Matthew M. Slepina, Planner

MMS:yp

cc: Joe Krueger, Department of Public Works and Environmental Management
Kevin Ho, Sato & Associates, Inc.

sato\ahiku\dohecw6.res

FEB 16 2005

LINDA LINGLE
GOVERNOR OF HAWAII



PETER T. YOUNG
CHAIRPERSON
BOARD OF LAND AND NATURAL RESOURCES
COMMISSION ON WATER RESOURCE MANAGEMENT

YVONNE Y. IZU
DEPUTY DIRECTOR - WATER

AQUATIC RESOURCES
BOATING AND OCEAN RECREATION
BUREAU OF CONVEYANCES
COMMISSION ON WATER RESOURCE MANAGEMENT
CONSERVATION AND COASTAL LANDS
CONSERVATION AND RESOURCES ENFORCEMENT
ENGINEERING
FORESTRY AND WILDLIFE
HISTORIC PRESERVATION
KAHOOLAWE ISLAND RESERVE COMMISSION
LAND
STATE PARKS



STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
LAND DIVISION

POST OFFICE BOX 621
HONOLULU, HAWAII 96809

February 14, 2005
LD-NAV

NAHIKUROADHIRAGA.RCM

Munekiyo and Hiraga, Inc.
Matthew Slepín
305 High Street, Suite 104
Wailuku, Hawaii 96793

Dear Mr. Slepín:

Subject: Pre-Assessment Consultation for Preparation of a Draft Environmental Assessment for the Improvements to Nahiku Road, Hana, Island of Maui, Hawaii – TMK: 2nd/ 1-2-003: 018 (portion)

Thank you for the opportunity to review and comment on the subject matter.

The Department of Land and Natural Resources' (DLNR) Land Division distributed a copy of your letter and maps dated January 19, 2005 pertaining to the subject matter to the following DLNR Divisions for their review and comment:

- Division of Forestry and Wildlife
- Engineering Division
- Commission on Water Resource Management
- Office of Conservation and Coastal Lands
- Land-Maui District Land Office
- Land-Planning and Development

Enclosed please find a copy of the Commission on Water Resource Management and Engineering Division comments.

Based on the attached responses the Department of Land and Natural Resources has no other comment to offer on the subject matter. If you have any questions, please feel free to contact Nicholas A. Vaccaro of the Land Division Support Services Branch at 1-808-587-0384.

Very truly yours,

A handwritten signature in black ink, appearing to read "Warren F. Wegesend Jr.".

WARREN F. WEGESEND JR
Administrator

LINDA LINGLE
GOVERNOR OF HAWAII



PETER T. YOUNG
CHAIRPERSON
BOARD OF LAND AND NATURAL RESOURCES
COMMISSION ON WATER RESOURCE MANAGEMENT

YVONNE Y. IZU
DEPUTY DIRECTOR - WATER

AQUATIC RESOURCES
BOATING AND OCEAN RECREATION
BUREAU OF CONVEYANCES
COMMISSION ON WATER RESOURCE MANAGEMENT
CONSERVATION AND COASTAL LANDS
CONSERVATION AND RESOURCES ENFORCEMENT
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JAN 27 3:50

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
LAND DIVISION

POST OFFICE BOX 621
HONOLULU, HAWAII 96809

January 25, 2005
LD/NAV
MUNEKIYO&HIRAGA

NAHIKUROAD.CMT
Suspense Date: 2/2/05

MEMORANDUM:

TO: XXX Division of Forestry and Wildlife
✓XXX Engineering Division
XXX Land-Maui District Land Office
XXX Land-Planning and Development
XXX Office of Conservation and Coastal Lands
XXX Commission on Water Resource Management

FROM: Dierdre S. Mamiya, Administrator
Land Division

SUBJECT: Pre-Assessment Consultation for Draft Environmental
Assessment for Proposed Improvements to Nahiku Road,
Hana, Maui, Hawaii - TMK: 2nd/ 1-2-003: 018 (portion)

Please review the attached letter dated January 19, 2005
(general overview of project) and maps pertaining to the subject
matter and submit your comment (if any) on Division letterhead
signed and dated by the suspense date.

Should you have any questions, please contact Nicholas A.
Vaccaro at 587-0384. If this office does not receive your comments
by the suspense date, we will assume there are no comments.

() We have no comments.

Division: Engineering

Date: 1/27/05

Comments attached.

Signed: Eric T. Hirano

Print Name: Eric T. Hirano ENGINEER

ERIC T. HIRANO, CHIEF ENGINEER

05 JAN 26 AM 11:23 ENGINEERING

DEPARTMENT OF LAND AND NATURAL RESOURCES
ENGINEERING DIVISION

REF.: NAHIKUROAD.CMT
Maui.391

COMMENTS

- () We confirm that the project site, according to the Flood Insurance Rate Map (FIRM), is located in Zone ____.
- (X) Please take note that the project site, according to the Flood Insurance Rate Map (FIRM), is located in Zone C. The Flood Insurance Program does not have any regulations for development within Zone C.
- () Please note that the correct Flood Zone Designation for the project site according to the Flood Insurance Rate Map (FIRM) is ____.
- () Please note that the project must comply with the rules and regulations of the National Flood Insurance Program (NFIP) presented in Title 44 of the Code of Federal Regulations (44CFR), whenever development within a Special Flood Hazard Area is undertaken. If there are any questions, please contact the State NFIP Coordinator, Ms. Carol Tyau-Beam, of the Department of Land and Natural Resources, Engineering Division at (808) 587-0267.

Please be advised that 44CFR indicates the minimum standards set forth by the NFIP. Your Community's local flood ordinance may prove to be more restrictive and thus take precedence over the minimum NFIP standards. If there are questions regarding the local flood ordinances, please contact the applicable County NFIP Coordinators below:

- () Mr. Robert Sumimoto at (808) 523-4254 or Mr. Mario Siu Li at (808) 523-4247 of the City and County of Honolulu, Department of Planning and Permitting.
 - () Mr. Kelly Gomes at (808) 961-8327 (Hilo) or Mr. Kiran Emler at (808) 327-3530 (Kona) of the County of Hawaii, Department of Public Works.
 - () Mr. Francis Cerizo at (808) 270-7771 of the County of Maui, Department of Planning.
 - () Mr. Mario Antonio at (808) 241-6620 of the County of Kauai, Department of Public Works.
- () The applicant should include project water demands and infrastructure required to meet water demands. Please note that the implementation of any State-sponsored projects requiring water service from the Honolulu Board of Water Supply system must first obtain water allocation credits from the Engineering Division before it can receive a building permit and/or water meter.
 - () The applicant should provide the water demands and calculations to the Engineering Division so it can be included in the State Water Projects Plan Update.

() Additional Comments: _____

() Other: _____

Should you have any questions, please call Mr. Andrew Monden of the Planning Branch at 587-0229.

Signed: Eric T. Hirano
For ERIC T. HIRANO, CHIEF ENGINEER

Date: 1/27/05

LINDA LINGLE
GOVERNOR OF HAWAII



PETER T. YOUNG
CHAIRPERSON
BOARD OF LAND AND NATURAL RESOURCES
COMMISSION ON WATER RESOURCE MANAGEMENT

YVONNE Y. IZU
DEPUTY DIRECTOR - WATER



STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
LAND DIVISION

POST OFFICE BOX 621.
HONOLULU, HAWAII 96809

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LAND DIVISION

2005 JAN 25 P 3:44

AQUATIC RESOURCES
BOATING AND OCEAN RECREATION
BUREAU OF CONVEYANCES
COMMISSION ON WATER RESOURCE MANAGEMENT
CONSERVATION AND COASTAL LANDS
CONSERVATION AND RESOURCES ENFORCEMENT
ENGINEERING
FORESTRY AND WILDLIFE
HISTORIC PRESERVATION
KAHOOLAWE ISLAND RESERVE COMMISSION
LAND
STATE PARKS

January 25, 2005
LD/NAV
MUNEKIYO&HIRAGA

NAHIKUROAD.CMT
Suspense Date: 2/2/05

MEMORANDUM:

TO: XXX Division of Forestry and Wildlife
XXX Engineering Division
✓XXX Land-Maui District Land Office
XXX Land-Planning and Development
XXX Office of Conservation and Coastal Lands
XXX Commission on Water Resource Management

FROM: Dierdre S. Mamiya, Administrator
Land Division

SUBJECT: Pre-Assessment Consultation for Draft Environmental
Assessment for Proposed Improvements to Nahiku Road,
Hana, Maui, Hawaii - TMK: 2nd/ 1-2-003: 018 (portion)

Please review the attached letter dated January 19, 2005
(general overview of project) and maps pertaining to the subject
matter and submit your comment (if any) on Division letterhead
signed and dated by the suspense date.

Should you have any questions, please contact Nicholas A.
Vaccaro at 587-0384. If this office does not receive your comments
by the suspense date, we will assume there are no comments.

We have no comments.

Comments attached.

Division: Land

Signed: _____

Date: 1/25/05

Print Name: _____

Charles S. Mamiya

LINDA LINGLE
GOVERNOR OF HAWAII



RECEIVED



2005 FEB -1 A 10:10

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
LAND DIVISION

POST OFFICE BOX 621
HONOLULU, HAWAII 96809

PETER T. YOUNG
CHAIRPERSON
BOARD OF LAND AND NATURAL RESOURCES
COMMISSION ON WATER RESOURCE MANAGEMENT

YVONNE Y. IZU
DEPUTY DIRECTOR - WATER

AQUATIC RESOURCES
BOATING AND OCEAN RECREATION
BUREAU OF CONVEYANCES
COMMISSION ON WATER RESOURCE MANAGEMENT
CONSERVATION AND COASTAL LANDS
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KAHOOLAWE ISLAND RESERVE COMMISSION
LAND
STATE PARKS

January 25, 2005
LD/NAV
MUNEKIYO&HIRAGA

NAHIKUROAD.CMT
Suspense Date: 2/2/05

MEMORANDUM:

TO: XXX Division of Forestry and Wildlife
XXX Engineering Division
XXX Land-Maui District Land Office
XXX Land-Planning and Development
XXX Office of Conservation and Coastal Lands
XXX Commission on Water Resource Management

FROM: Dierdre S. Mamiya, Administrator
Land Division

SUBJECT: Pre-Assessment Consultation for Draft Environmental
Assessment for Proposed Improvements to Nahiku Road,
Hana, Maui, Hawaii - TMK: 2nd/ 1-2-003: 018 (portion)

Please review the attached letter dated January 19, 2005
(general overview of project) and maps pertaining to the subject
matter and submit your comment (if any) on Division letterhead
signed and dated by the suspense date.

Should you have any questions, please contact Nicholas A.
Vaccaro at 587-0384. If this office does not receive your comments
by the suspense date, we will assume there are no comments.

We have no comments.

Comments attached.

Division: _____

Signed: Paul J. Conry

Date: JAN 26 2005

Print Name: PAUL J. CONRY, ADMINISTRATOR
DIVISION OF FORESTRY AND WILDLIFE

LINDA LINGLE
GOVERNOR OF HAWAII



PETER T. YOUNG
CHAIRPERSON
BOARD OF LAND AND NATURAL RESOURCES
COMMISSION ON WATER RESOURCE MANAGEMENT



RECEIVED
2005 FEB - 1 P 3:17
STATE OF HAWAII 26 A 8:16
DEPARTMENT OF LAND AND NATURAL RESOURCES
LAND DIVISION

YVONNE Y. IZU
DEPUTY DIRECTOR - WATER

AQUATIC RESOURCES
BOATING AND OCEAN RECREATION
BUREAU OF CONVEYANCES
COMMISSION ON WATER RESOURCE MANAGEMENT
CONSERVATION AND COASTAL LANDS
CONSERVATION AND RESOURCES ENFORCEMENT
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KAHOOLAWE ISLAND RESERVE COMMISSION
LAND
STATE PARKS

POST OFFICE BOX 621
HONOLULU, HAWAII, 96809

January 25, 2005
LD/NAV
MUNEKIYO&HIRAGA

NAHIKUROAD.CMT
Suspense Date: 2/2/05

MEMORANDUM:

- TO: XXX Division of Forestry and Wildlife
 XXX Engineering Division
 XXX Land-Maui District Land Office
 XXX Land-Planning and Development
 XXX Office of Conservation and Coastal Lands
 ✓ XXX Commission on Water Resource Management

FROM: Dierdre S. Mamiya, Administrator
Land Division

SUBJECT: Pre-Assessment Consultation for Draft Environmental Assessment for Proposed Improvements to Nahiku Road, Hana, Maui, Hawaii - TMK: 2nd/ 1-2-003: 018 (portion)

Please review the attached letter dated January 19, 2005 (general overview of project) and maps pertaining to the subject matter and submit your comment (if any) on Division letterhead signed and dated by the suspense date.

Should you have any questions, please contact Nicholas A. Vaccaro at 587-0384. If this office does not receive your comments by the suspense date, we will assume there are no comments.

() We have no comments.

(✓) Comments attached.

Division: _____

Signed: Yvonne Y. Izu

Date: _____

Print Name: YVONNE Y. IZU

2-22-05: 9:41AM:

LINDA LINGLE
GOVERNOR OF HAWAII



STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
COMMISSION ON WATER RESOURCE MANAGEMENT
P.O. BOX 621
HONOLULU, HAWAII 96809

FEB - 1 2005

PETER T. YOUNG
CHAIRPERSON

MEREDITH J. CHING
CLAYTON W. DELA CRUZ
JAMES A. FRAZIER
CHRISTOPHER L. FURUKO, M.D.
LAWRENCE H. NIKE, M.D., J.D.
STEPHANIE A. WHALEN

YVONNE Y. IZU
DEPUTY DIRECTOR

TO: Mr. Warren Wegehend, Administrator
Land Division

FROM: Yvonne Y. Izu, Deputy Director
Commission on Water Resource Management (CWRM)

SUBJECT: Pre-Assessment consultation for Draft Environmental Assessment for Proposed Improvements to Nahiku Road,
Hana, Maui, Hawaii (2) 1-2-003:018.

FILE NO.: NAHIKUROAD.CMT

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 recommend coordination with the Land Division of the State Department of Land and Natural Resources to incorporate this project into the State Water Projects 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/or a Pump Installation Permit from the Commission 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 Commission would be required prior to use of this source.
- Groundwater withdrawals from this project may affect streamflows, which may require an instream flow standard amendment.
- We are concerned about the potential for degradation of instream uses from development on highly erodible slopes adjacent to streams within or near the project. We recommend that approvals for this project be conditioned upon a review by the corresponding county's Building Department and the developer's acceptance of any resulting requirements related to erosion control.
- If the proposed project includes construction of a stream diversion, the project may require a stream diversion works permit and amend the instream flow standard for the affected stream(s).
- If the proposed project alters the bed and banks of a stream channel, the project may require a stream channel alteration permit.
- OTHER:

If there are any questions, please contact David Higa 587-0249.



MICHAEL T. MUNEKIYO
GWEN OHASHI HIRAGA
MITSURU "MICH" HIRANO

July 25, 2005

Warren Wegesend Jr., Administrator
State of Hawaii
Department of Land and Natural Resources
Post Office Box 621
Honolulu, Hawaii 96809

SUBJECT: Proposed Improvements to Nahiku Road,
Hana, Maui, Hawaii, TMK (2) 1-2-003:058 (por.)

Dear Mr. Wegesend:

Thank you for your letter of February 14, 2005, responding to our request for early consultation comments for the proposed improvements to Nahiku Road in Nahiku, Maui. In response to your comments, we note the following:

1. We acknowledge your confirmation that the project site is located in Flood Zone C, an area without development regulations.
2. The current plans for the roadway improvements do not include any stream channel alterations. We acknowledge that should the project require such actions, a stream channel alteration permit may be required.

Thank you again for providing your input to the proposed action. A copy of the Draft Environmental Assessment will be provided to your office for review and comment.

Very truly yours,

Matthew M. Slepik, Planner

MMS:yp

cc: Joe Krueger, Department of Public Works and Environmental Management
Kevin Ho, Sato & Associates, Inc.
sato@nahiku.dnr.res

planning environment

LINDA LINGLE
GOVERNOR OF HAWAII



STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
STATE HISTORIC PRESERVATION DIVISION
601 KAMOKILA BOULEVARD, ROOM 555
KAPOLEI, HAWAII 96707

HAWAII HISTORIC PRESERVATION
DIVISION REVIEW

Log No.: 2005 1203
Doc No.: 0506CD18

Applicant/Agency: Matthew Slepín
Address: Munekiyo and Hiraga, Inc.
305 High Street, Suite 104
Wailuku, Hawaii 96793

SUBJECT: **REVISED:** Chapter 6E-8 Historic Preservation Review – Early Consultation
for Proposed Improvements to Nahiku Road
Ahupua`a: Nahiku
District, Island: Hana District, Island of Maui
TMK: (2) 1-2-003:018 (por)

1. We believe there are no historic properties present, because:

- a) intensive cultivation has altered the land
- b) residential development/urbanization has altered the land
- c) previous grubbing/grading has altered the land
- d) an acceptable archaeological assessment or inventory survey found no historic properties
(Xamanek 2005)
- e) other:

2. This project has already gone through the historic preservation review process, and mitigation has been completed ____.

Thus, we believe that "no historic properties will be affected" by this undertaking

In the event that historic sites (human skeletal remains, etc.) are identified during the construction activities, all work needs to cease in the immediate vicinity of the find, the find needs to be protected from additional disturbance, and the State Historic Preservation Office needs to be contacted immediately at 243-5169, on Maui, or at (808) 692-8023, on O`ahu.

Staff: Cathleen A. Dagher Date: June 9 2005
Cathleen A. Dagher, Assistant Maui/Lana`i Island Archaeologist, (808) 692-8023

JUN 10 2005

PETER T. YOUNG
CHAIRPERSON
BOARD OF LAND AND NATURAL RESOURCES
COMMISSION ON WATER RESOURCE MANAGEMENT

ROBERT K. MASUDA
DEPUTY DIRECTOR - LAND

DEAN NAKANO
ACTING DEPUTY DIRECTOR - WATER

AQUATIC RESOURCES
BOATING AND OCEAN RECREATION
BUREAU OF CONVEYANCES
COMMISSION ON WATER RESOURCE MANAGEMENT
CONSERVATION AND COASTAL LANDS
CONSERVATION AND RESOURCES ENFORCEMENT
ENGINEERING
FORESTRY AND WILDLIFE
HISTORIC PRESERVATION
KAHOOLAWE ISLAND RESERVE COMMISSION
LAND
STATE PARKS

LINDA LINGLE
GOVERNOR

HIGHWAY DESIGN BRANCH, ROOM 688A
BRIDGE DESIGN SECTION, ROOM 611
CADASTRAL DESIGN SECTION, ROOM 600
HIGHWAY DESIGN SECTION, ROOM 809
HYDRAULIC DESIGN SECTION, ROOM 836
TECHNICAL DESIGN SERVICE, 688

RIGHT-OF-WAY BRANCH, ROOM 691

TRAFFIC BRANCH, ROOM 602

MOTOR VEHICLE SAFETY OFFICE, ROOM 511



STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION AT KAPOLEI
601 KAMOKILA BOULEVARD
KAPOLEI, HAWAII 96707

APR 24 2006

MAY 02 2006

RODNEY K. HARAGA
DIRECTOR

Deputy Directors
BRUCE Y. MATSUI
BARRY FUKUNAGA
BRENNON T. MORIOKA
BRIAN H. SEKIGUCHI

IN REPLY REFER TO

HWY-TO
2.7505

Mr. Matthew Slepín, Planner
Munekiyo & Hiraga, Inc.
305 High Street, Suite 104
Wailuku, Hawaii 96793

Dear Mr. Slepín:

Subject: Proposed Improvements to Nahiku Road, Hana, Maui, Hawaii
TMK: (2) 1-2-003:018 (por)
Environmental Assessment Early Consultation Request

Thank you for your letter of January 19, 2005, requesting our early review and comment on the subject project.

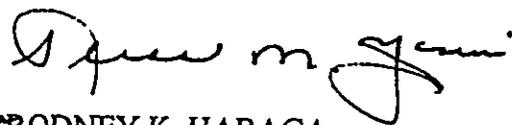
Please provide intersection turning movement counts, types of vehicles turning right from Hana Highway onto Nahiku Road, and other background information which necessitates the improvement. Similarly, discuss other alternatives other than a "jug handle" that have been investigated to mitigate the condition.

Should the "jug handle" be the preferred alternative, we have the following comments:

1. Guardrail should be provided on Hana Highway between the Nahiku Road intersection and Makapipi Bridge. Vehicles using the proposed "jug handle" will be directed towards this area.
2. Adequate sight distance should be provided for motorists executing the "jug handle" maneuver.

We appreciate the opportunity to comment on the proposed project.

Very truly yours,


RODNEY K. HARAGA
Director of Transportation



MICHAEL T. MUNEKIYO
GWEN DHASHI HIRAGA
MITSURU "MICH" HIRANO

July 25, 2005

Rodney Haraga, Director
State of Hawaii
Department of Transportation
869 Punchbowl Street
Honolulu, Hawaii 96813

SUBJECT: Proposed Improvements to Nahiku Road, Hana, Maui, Hawaii, TMK
(2) 1-2-003:017 (por.)

Dear Mr. Haraga:

Thank you for your letter of April 28, 2005, responding to our request for early consultation comments for the proposed improvements to Nahiku Road in Nahiku, Maui. In response to your comments, we note the following:

1. As you request, the County of Maui, Department of Public Works and Environmental Maintenance will be performing intersection movement counts to provide adequate background information for the proposed improvements. Due to scheduling constraints, this information will not be available in time to be included in the Draft Environmental Assessment (EA), but will be provided to your office for review and then included in the Final EA.

It should be noted, however, that the principal need for the project is due to the unsafe conditions on Nahiku Road which do not relate to traffic volumes or turning movements.

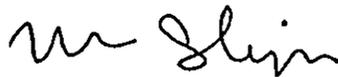
2. The Draft EA will discuss project design alternatives.
3. The proposed project now includes the provision of a guardrail between the intersection and Makapipi Bridge. The Draft Environmental Assessment will discuss this safety feature.
4. Adequate sight distance will be provided to motorists using the "jug handle" turn out area to access Nahiku Road.

environment
planning

Rodney Haraga, Director
July 25, 2005
Page 2

Thank you again for providing your input to the proposed action. A copy of the Draft Environmental Assessment will be provided to your office for review and comment.

Very truly yours,



Matthew Slepik, Planner

MS:yp

cc: Joe Krueger, Department of Public Works and Environmental Management
Kevin Ho, Sato & Associates, Inc.

F:\DATA\SATO\Nahko\Ref\dot.res.wpd

LINDA LINGLE
GOVERNOR OF HAWAII



STATE OF HAWAII
DEPARTMENT OF HEALTH
MAUI DISTRICT HEALTH OFFICE
54 HIGH STREET
WAILUKU, MAUI, HAWAII 96793-2102

January 25, 2005

JAN 27 2005

CHIYOME L. FUKINO, M. D.
DIRECTOR OF HEALTH

LORRIN W. PANG, M. D., M. P.
DISTRICT HEALTH OFFICER

Mr. Matthew Slepín, Planner
Munekiyo & Hiraga, Inc.
305 High Street, Suite 104
Wailuku, Hawai'i 96793

Dear Mr. Slepín:

Subject: Proposed Improvements to Nahiku Road
TMK: (2) 1-2-003:018 (por.)

Thank you for the opportunity to participate in the early consultation process for the environmental assessment. The following comments are offered:

National Pollutant Discharge Elimination System (NPDES) permit coverage is required for this project. The Clean Water Branch should be contacted at 808 586-4309.

The noise created during the construction phase of the project may exceed the maximum allowable levels as set forth in Hawaii Administrative Rules, Chapter 11-46, "Community Noise Control". A noise permit may be required and should be obtained before the commencement of work.

Should you have any questions, please call me at 984-8230.

Sincerely,

A handwritten signature in black ink, appearing to read "H. Matsubayashi".

Herbert S. Matsubayashi
District Environmental Health Program Chief



MICHAEL T. HINEKIYO
GWEN OHASHI HIRAGA
MITSURU "MICH" HIRANO

July 25, 2005

Herbert Matsubayashi, Program Chief
State of Hawaii
Department of Health
Maui District Health Office
54 High Street
Wailuku, Hawaii 96793

SUBJECT: Proposed Improvements to Nahiku Road, Hana, Maui, Hawaii,
TMK (2) 1-2-003:058 (por.)

Dear Mr. Matsubayashi:

Thank you for your letter of January 25, 2005, responding to our request for early consultation comments for the proposed improvements to Nahiku Road in Nahiku, Maui. In response to your comments, we note the following:

1. The proposing agency, the Department of Public Works and Environmental Management (DPWEM), will determine if a noise permit is necessary and will obtain one, as required, if it is advisable to do so.
2. The DPWEM will be seeking an NPDES permit for this project.

Thank you again for providing your input to the proposed action. A copy of the Draft Environmental Assessment will be provided to your office for review and comment.

Very truly yours,

Matthew M. Slepina, Planner

MMS:yp

cc: Joe Krueger, Department of Public Works and Environmental Management
Kevin Ho, Sato & Associates, Inc.

sato/nahiku/d/m/mauidoh.res

planning environment

FEB 08 2005

ALAN M. ARAKAWA
MAYOR



GEORGE Y. TENGAN
DIRECTOR
JEFFREY T. PEARSON,
P.E.

DEPARTMENT OF WATER SUPPLY
COUNTY OF MAUI
P.O. BOX 1109
WAILUKU, MAUI, HAWAII 96793-7109
Telephone (808) 270-7816 • Fax (808) 270-7833

January 27, 2005

Mr. Matthew Slepín, Planner
Munekiyó & Hiraga, Inc.
305 High Street Suite 104
Wailuku HI 96793

Subject: Early Consultation Request for the Preparation of an Draft Environmental Assessment for Improvements to Nahiku Road, Hana, Maui, Hawaii TMK: 1-2-03:018

Dear Mr. Slepín:

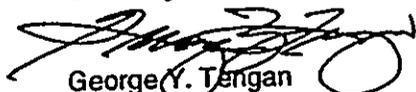
Thank you for the opportunity to provide comments on the preparation of a Environmental Assessment (EA) for this project.

The Department 2-inch galvanized water line runs along the West boundary of this section of Nahiku Road. It is currently situated on an asphalt berm at the site of the road collapse. The Department of Public Works and Environmental Management should contact our engineering division at 270-7835 to discuss possible realignment of the water line and coordinate construction plans. A section of the fire protection map is enclosed for your reference.

The project overlies the Keanae aquifer and is within 100 ft of Makapipi Stream. The Department of Water Supply strives to protect the integrity of surface and groundwater resources by encouraging the applicant to adopt best management practices (BMPs) designed to minimize infiltration and runoff from all construction and vehicle operations. We have attached sample BMPs for principle operations for reference. Additional information can be obtained from the State Department of Health.

Should you have any questions, please contact our Water Resources and Planning Division at 270-7199.

Sincerely,


George Y. Tengan
Director
emb

c: engineering division
applicant, with attachments:

Section of Fire Protection Map
Selected BMP's from "Guidance Specifying Management Measures for Sources of Nonpoint Pollution in Coastal Waters"-EPA

C:\WPdocs\EAs EISs\Nahiku Road Improvements DEA early consult.wpd

United States
Environmental Protection
Agency

Office of Water
Washington, DC 20460

840-B-92-002
January 1993



Guidance Specifying Management Measures For Sources Of Nonpoint Pollution In Coastal Waters

Issued Under the Authority of
Section 6217(g) of the Coastal Zone Act
Reauthorization Amendments of 1990

VII. ROADS, HIGHWAYS, AND BRIDGES

NOTE: Management Measures II.A and II.B of this chapter also apply to planning, siting, and developing roads and highways.⁶

A. Management Measure for Planning, Siting, and Developing Roads and Highways

Plan, site, and develop roads and highways to:

- (1) Protect areas that provide important water quality benefits or are particularly susceptible to erosion or sediment loss;
- (2) Limit land disturbance such as clearing and grading and cut and fill to reduce erosion and sediment loss; and
- (3) Limit disturbance of natural drainage features and vegetation.

1. Applicability

This measure is intended to be applied by States to site development and land disturbing activities for new, relocated, and reconstructed (widened) roads (including residential streets) and highways in order to reduce the generation of nonpoint source pollutants and to mitigate the impacts of urban runoff and associated pollutants from such activities. Under the Coastal Zone Act Reauthorization Amendments of 1990, States are subject to a number of requirements as they develop coastal NPS programs in conformity with this management measure and will have some flexibility in doing so. The application of management measures by States is described more fully in *Coastal Nonpoint Pollution Control Program: Program Development and Approval Guidance*, published jointly by the U.S. Environmental Protection Agency (EPA) and the National Oceanic and Atmospheric Administration (NOAA) of the U.S. Department of Commerce.

2. Description

The best time to address control of NPS pollution from roads and highways is during the initial planning and design phase. New roads and highways should be located with consideration of natural drainage patterns and planned to avoid encroachment on surface waters and wet areas. Where this is not possible, appropriate controls will be needed to minimize the impacts of NPS runoff on surface waters.

This management measure emphasizes the importance of planning to identify potential NPS problems early in the design process. This process involves a detailed analysis of environmental features most associated with NPS pollution, erosion and sediment problems such as topography, drainage patterns, soils, climate, existing land use, estimated traffic volume, and sensitive land areas. Highway locations selected, planned, and designed with consideration of these features will greatly minimize erosion and sedimentation and prevent NPS pollutants from entering watercourses during and after construction. An important consideration in planning is the distance between

⁶ Management measure II.A applies only to runoff that emanates from the road, highway, and bridge right-of-way. This management measure does not apply to runoff and total suspended solid loadings from upland areas outside the road, highway, or bridge project.

a highway and a watercourse that is needed to buffer the runoff flow and prevent potential contaminants from entering surface waters. Other design elements such as project alignment, gradient, cross section, and the number of stream crossings also must be taken into account to achieve successful control of erosion and nonpoint sources of pollution. (Refer to Chapter 3 of this guidance for details on road designs for different terrains.)

The following case study illustrates some of the problems and associated costs that may occur due to poor road construction and design. These issues should be addressed in the planning and design phase.

CASE STUDY - ANNAPOLIS, MARYLAND

Poor road siting and design resulted in concentrated runoff flows and heavy erosion that threatened several house foundations adjacent to the road. Sediment-laden runoff was also discharged into Herring Bay. To protect the Chesapeake Bay and the nearby houses, the county corrected the problem by installing diversions, a curb-and-drain urban runoff conveyance, and a rock wall filtration system, at a total cost of \$100,000 (Munsey, 1992).

3. Management Measure Selection

This management measure was selected because it follows the approach to highway development recommended by the American Association of State Highway and Transportation Officials (AASHTO), Federal Highway Administration (FHWA) guidance, and highway location and design guidelines used by the States of Virginia, Maryland, Washington, and others.

Additionally, AASHTO has location and design guidelines (AASHTO, 1990, 1991) available for State highway agency use that describe the considerations necessary to control erosion and highway-related pollutants. Federal Highway Administration policy (FHWA, 1991) requires that Federal-aid highway projects and highways constructed under direct supervision of the FHWA be located, designed, constructed, and operated according to standards that will minimize erosion and sediment damage to the highway and adjacent properties and abate pollution of surface water and ground-water resources.

4. Practices

As discussed more fully at the beginning of this chapter and in Chapter 1, the following practices are described for illustrative purposes only. State programs need not require implementation of these practices. However, as a practical matter, EPA anticipates that the management measure set forth above generally will be implemented by applying one or more management practices appropriate to the source, location, and climate. The practices set forth below have been found by EPA to be representative of the types of practices that can be applied successfully to achieve the management measure described above.

- a. Consider type and location of permanent erosion and sediment controls (e.g., vegetated filter strips, grassed swales, pond systems, infiltration systems, constructed urban runoff wetlands, and energy dissipators and velocity controls) during the planning phase of roads, highway, and bridges. (AASHTO, 1991; Hartigan et al., 1989)
- b. All wetlands that are within the highway corridor and that cannot be avoided should be mitigated. These actions will be subject to Federal Clean Water Act section 404 requirements and State regulations.

- c. *Assess and establish adequate setback distances near wetlands, waterbodies, and riparian areas to ensure protection from encroachment in the vicinity of these areas.*

Setback distances should be determined on a site-specific basis since several variables may be involved such as topography, soils, floodplains, cut-and-fill slopes, and design geometry. In level or gently sloping terrain, a general rule of thumb is to establish a setback of 50 to 100 feet from the edge of the wetland or riparian area and the right-of-way. In areas of steeply sloping terrain (20 percent or greater), setbacks of 100 feet or more are recommended. Right-of-way setbacks from major waterbodies (oceans, lakes, estuaries, rivers) should be in excess of 100 to 1000 feet.

- d. *Avoid locations requiring excessive cut and fill. (AASHTO, 1991)*
- e. *Avoid locations subject to subsidence, sink holes, landslides, rock outcroppings, and highly erodible soils. (AASHTO, 1991; TRB, Campbell, 1988)*
- f. *Size rights-of-way to include space for siting runoff pollution control structures as appropriate. (AASHTO, 1991; Hartigan, et al., 1989)*

Erosion and sediment control structures (extended detention dry ponds, permanent sediment traps, catchment basins, etc.) should be planned and located during the design phase and included as part of the design specifications to ensure that such structures, where needed, are provided within the highway right-of-way.

- g. *Plan residential roads and streets in accordance with local subdivision regulations, zoning ordinances, and other local site planning requirements (International City Managers Association, Model Zoning/Subdivision Codes). Residential road and street pavements should be designed with minimum widths.*

Local roads and streets should have right-of-way widths of 36 to 50 feet, with lane widths of 10 to 12 feet. Minimum pavement widths for residential streets where street parking is permitted range from 24 to 28 feet between curbs. In large-lot subdivisions (1 acre or more), grassed drainage swales can be used in lieu of curbs and gutters and the width of paved road surface can be between 18 and 20 feet.

- h. *Select the most economic and environmentally sound route location. (FHWA, 1991)*
- i. *Use appropriate computer models and methods to determine urban runoff impacts with all proposed route corridors. (Driscoll, 1990)*

Computer models to determine urban runoff from streets and highways include TR-55 (Soil Conservation Service model for controlling peak runoff); the P-8 model to determine storage capacity (Palmstrom and Walker); the FHWA highway runoff model (Driscoll et al., 1990); and others (e.g., SWMM, EPA's stormwater management model; HSP continuous simulation model by Hydrocomp, Inc.).

- j. *Comply with National Environmental Policy Act requirements including other State and local requirements. (FHWA, T6640.8A)*
- k. *Coordinate the design of pollution controls with appropriate State and Federal environmental agencies. (Maryland DOE, 1983)*

■ I. *Develop local official mapping to show location of proposed highway corridors.*

Official mapping can be used to reserve land areas needed for public facilities such as roads, highways, bridges, and urban runoff treatment devices. Areas that require protection, such as those which are sensitive to disturbance or development-related nonpoint source pollution, can be reserved by planning and mapping necessary infrastructure for location in suitable areas.

5. Effectiveness Information and Cost Information

The most economical time to consider the type and location of erosion, sediment, and NPS pollution control is early in the planning and design phase of roads and highways. It is much more costly to correct polluted runoff problems after a road or highway has already been built. The most effective and often the most economical control is to design roads and highways as close to existing grade as possible to minimize the area that must be cut or filled and to avoid locations that encroach upon adjacent watercourses and wet areas. However, some portions of roads and highways cannot always be located where NPS pollution does not pose a threat to surface waters. In these cases, the impact from potential pollutant loadings should be mitigated. Interactive computer models designed to run on a PC are available (e.g., FHWA's model, Driscoll et al., 1990) and can be used to examine and project the runoff impacts of a proposed road or highway design on surface waters. Where controls are determined to be needed, several cost-effective management practices, such as vegetated filter strips, grassed swales, and pond systems, can be considered and used to treat the polluted runoff. These mitigating practices are described in detail in the discussion on urban developments (Management Measure IV.A).

B. Management Measure for Bridges

Site, design, and maintain bridge structures so that sensitive and valuable aquatic ecosystems and areas providing important water quality benefits are protected from adverse effects.

1. Applicability

This management measure is intended to be applied by States to new, relocated, and rehabilitated bridge structures in order to control erosion, streambed scouring, and surface runoff from such activities. Under the Coastal Zone Act Reauthorization Amendments of 1990, States are subject to a number of requirements as they develop coastal NPS programs in conformity with this management measure and will have some flexibility in doing so. The application of management measures by States is described more fully in *Coastal Nonpoint Pollution Control Program: Program Development and Approval Guidance*, published jointly by the U.S. Environmental Protection Agency (EPA) and the National Oceanic and Atmospheric Administration (NOAA) of the U.S. Department of Commerce.

2. Description

This measure requires that NPS runoff impacts on surface waters from bridge decks be assessed and that appropriate management and treatment be employed to protect critical habitats, wetlands, fisheries, shellfish beds, and domestic water supplies. The siting of bridges should be a coordinated effort among the States, the FHWA, the U.S. Coast Guard, and the Army Corps of Engineers. Locating bridges in coastal areas can cause significant erosion and sedimentation, resulting in the loss of wetlands and riparian areas. Additionally, since bridge pavements are extensions of the connecting highway, runoff waters from bridge decks also deliver loadings of heavy metals, hydrocarbons, toxic substances, and deicing chemicals to surface waters as a result of discharge through scupper drains with no overland buffering. Bridge maintenance can also contribute heavy loads of lead, rust particles, paint, abrasive, solvents, and cleaners into surface waters. Protection against possible pollutant overloads can be afforded by minimizing the use of scuppers on bridges traversing very sensitive waters and conveying deck drainage to land for treatment. Whenever practical, bridge structures should be located to avoid crossing over sensitive fisheries and shellfish-harvesting areas to prevent washing polluted runoff through scuppers into the waters below. Also, bridge design should account for potential scour and erosion, which may affect shellfish beds and bottom sediments.

3. Management Measure Selection

This management measure was selected because of its documented effectiveness and to protect against potential pollution impacts from siting bridges over sensitive waters and tributaries in the coastal zone. There are several examples of siting bridges to protect sensitive areas. The Isle of Palms Bridge near Charleston, South Carolina, was designed without scupper drains to protect a local fishery from polluted runoff by preventing direct discharge into the waters below. In another example, the Louisiana Department of Transportation and Development specified stringent requirements before allowing the construction of a bridge to protect destruction of fragile wetlands near New Orleans. A similar requirement was specified for bridge construction in the Tampa Bay area in Florida (ENR, 1991).

4. Practices

As discussed more fully at the beginning of this chapter and in Chapter 1, the following practices are described for illustrative purposes only. State programs need not require implementation of these practices. However, as a practical matter, EPA anticipates that the management measure set forth above generally will be implemented by applying one or more management practices appropriate to the source, location, and climate. The practices set forth below have been found by EPA to be representative of the types of practices that can be applied successfully to achieve the management measure described above.

Additional erosion and sediment control management practices are listed in the construction section for urban sources of pollution (Management Measure IV.A).

- a. *Coordinate design with FHWA, USCG, COE, and other State and Federal agencies as appropriate.*
- b. *Review National Environmental Policy Act requirements to ensure that environmental concerns are met (FHWA, T6640.8A and 23 CFR 771).*
- c. *Avoid highway locations requiring numerous river crossings. (AASHTO, 1991)*
- d. *Direct pollutant loadings away from bridge decks by diverting runoff waters to land for treatment.*

Bridge decks should be designed to keep runoff velocities low and control pollutant loadings. Runoff waters should be conveyed away from contact with the watercourse and directed to a stable storm drainage, wetland, or detention pond. Conveyance systems should be designed to withstand the velocities of projected peak discharge.

- e. *Restrict the use of scupper drains on bridges less than 400 feet in length and on bridges crossing very sensitive ecosystems.*

Scupper drains allow direct discharge of runoff into surface waters below the bridge deck. Such discharges can be of concern where the waterbody is highly susceptible to degradation or is an outstanding resource such as a spawning area or shellfish bed. Other sensitive waters include water supply sources, recreational waters, and irrigation systems. Care should be taken to protect these areas from contaminated runoff.

- f. *Site and design new bridges to avoid sensitive ecosystems.*

Pristine waters and sensitive ecosystems should be protected from degradation as much as possible. Bridge structures should be located in alternative areas where only minimal environmental damage would result.

- g. *On bridges with scupper drains, provide equivalent urban runoff treatment in terms of pollutant load reduction elsewhere on the project to compensate for the loading discharged off the bridge.*

5. Effectiveness Information and Cost Information

Effectively controlling NPS pollutants such as road contaminants, fugitive dirt, and debris and preventing accidental spills from entering surface waters via bridge decks are necessary to protect wetlands and other sensitive ecosystems. Therefore, management practices such as minimizing the use of scupper drains and diverting runoff waters to land for treatment in detention ponds and infiltration systems are known to be effective in mitigating pollutant loadings. Tables 4-7 and 4-8 in Section II provide cost and effectiveness data for ponds, constructed wetlands, and filtration devices.

C. Management Measure for Construction Projects

- (1) Reduce erosion and, to the extent practicable, retain sediment onsite during and after construction and
- (2) Prior to land disturbance, prepare and implement an approved erosion control plan or similar administrative document that contains erosion and sediment control provisions.

1. Applicability

This management measure is intended to be applied by States to new, replaced, restored, and rehabilitated road, highway, and bridge construction projects in order to control erosion and offsite movement of sediment from such project sites. Under the Coastal Zone Act Reauthorization Amendments of 1990, States are subject to a number of requirements as they develop coastal NPS programs in conformity with this management measure and will have some flexibility in doing so. The application of management measures by States is described more fully in *Coastal Nonpoint Pollution Control Program: Program Development and Approval Guidance*, published jointly by the U.S. Environmental Protection Agency (EPA) and the National Oceanic and Atmospheric Administration (NOAA) of the U.S. Department of Commerce.

2. Description

Erosion and sedimentation from construction of roads, highways, and bridges, and from unstabilized cut-and-fill areas, can significantly impact surface waters and wetlands with silt and other pollutants including heavy metals, hydrocarbons, and toxic substances. Erosion and sediment control plans are effective in describing procedures for mitigating erosion problems at construction sites before any land-disturbing activity begins. Additional relevant practices are described in Management Measures III.A and III.B of this chapter.

Bridge construction projects include grade separations (bridges over roads) and waterbody crossings. Erosion problems at grade separations result from water running off the bridge deck and runoff waters flowing onto the bridge deck during construction. Controlling this runoff can prevent erosion of slope fills and the undermining failure of the concrete slab at the bridge approach. Bridge construction over waterbodies requires careful planning to limit the disturbance of streambanks. Soil materials excavated for footings in or near the water should be removed and relocated to prevent the material from being washed back into the waterbody. Protective berms, diversion ditches, and silt fences parallel to the waterway can be effective in preventing sediment from reaching the waterbody.

Wetland areas will need special consideration if affected by highway construction, particularly in areas where construction involves adding fill, dredging, or installing pilings. Highway development is most disruptive in wetlands since it may cause increased sediment loss, alteration of surface drainage patterns, changes in the subsurface water table, and loss of wetland habitat. Highway structures should not restrict tidal flows into salt marshes and other coastal wetland areas because this might allow the intrusion of freshwater plants and reduce the growth of salt-tolerant species. To safeguard these fragile areas, the best practice is to locate roads and highways with sufficient setback distances between the highway right-of-way and any wetlands or riparian areas. Bridge construction also can impact water circulation and quality in wetland areas, making special techniques necessary to accommodate construction. The following case study provides an example of a construction project where special considerations were given to wetlands.

CASE STUDY - BRIDGING WETLANDS IN LOUISIANA

To provide protection for an environmentally critical wetland outside New Orleans, the Louisiana Department of Transportation and Development (DOTD) required a special construction technique to build almost 2 miles of twin elevated structures for the Interstate 310 link between I-10 and U.S. Route 90. A technique known as "end-on" construction was devised to work from the decks of the structures, building each section of the bridge from the top of the last completed section and using heavy cranes to push each section forward one bay at a time. The cranes were also used to position steel platforms, drive in support pilings, and lay deck slabs, alternating this procedure between each bay. Without this technique, the Louisiana DOTD would not have been permitted to build this structure. The twin 9,200-foot bridges took 485 days to complete at a cost of \$25.3 million (*Engineering News Record*, 1991).

3. Management Measure Selection

This management measure was selected because it supports FHWA's erosion and sediment control policy for all highway and bridge construction projects and is the administrative policy of several State highway departments and local governmental agencies involved in land development activity. Examples of erosion and sediment controls and NPS pollutant control practices are described in AASHTO guidelines and in several State erosion control manuals (AASHTO, 1991; North Carolina DOT, 1991; Washington State DOT, 1988). A detailed discussion of cost-effective management practices is available in the urban development section (Section II) of this chapter. These example practices are also effective for highway construction projects.

4. Practices

As discussed more fully at the beginning of this chapter and in Chapter 1, the following practices are described for illustrative purposes only. State programs need not require implementation of these practices. However, as a practical matter, EPA anticipates that the management measure set forth above generally will be implemented by applying one or more management practices appropriate to the source, location, and climate. The practices set forth below have been found by EPA to be representative of the types of practices that can be applied successfully to achieve the management measure described above.

Additional erosion and sediment control management practices are listed in the construction section (Section III) of this chapter.

- a. *Write erosion and sediment control requirements into plans, specifications, and estimates for Federal aid construction projects for highways and bridges (FHWA, 1991) and develop erosion control plans for earth-disturbing activities.*

Erosion and sediment control decisions made during the planning and location phase should be written into the contract, plans, specifications, and special provisions provided to the construction contractor. This approach can establish contractor responsibility to carry out the explicit contract plan recommendations for the project and the erosion control practices needed.

- b. *Coordinate erosion and sediment controls with FHWA, AASHTO, and State guidelines.*

Coordination and scheduling of the project work with State and local authorities are major considerations in controlling anticipated erosion and sediment problems. In addition, the contractor should submit a general work schedule and plan that indicates planned implementation of temporary and permanent erosion control practices, including shutdown procedures for winter and other work interruptions. The plan also should include proposed methods of control on restoring borrow pits and the disposal of waste and hazardous materials.

- c. *Install permanent erosion and sediment control structures at the earliest practicable time in the construction phase.*

Permanent or temporary soil stabilization practices should be applied to cleared areas within 15 days after final grade is reached on any portion of the site. Soil stabilization should also be applied within 15 days to denuded areas that may not be at final grade but will remain exposed to rain for 30 days or more. Soil stabilization practices protect soil from the erosive forces of raindrop impact and flowing water. Temporary erosion control practices usually include seeding, mulching, establishing general vegetation, and early application of a gravel base on areas to be paved. Permanent soil stabilization practices include vegetation, filter strips, and structural devices.

Sediment basins and traps, perimeter dikes, sediment barriers, and other practices intended to trap sediment on site should be constructed as a first step in grading and should be functional before upslope land disturbance takes place. Structural practices such as earthen dams, dikes, and diversions should be seeded and mulched within 15 days of installation.

- d. *Coordinate temporary erosion and sediment control structures with permanent practices.*

All temporary erosion and sediment controls should be removed and disposed of within 30 days after final site stabilization is achieved or after the temporary practices are no longer needed. Trapped sediment and other disturbed soil areas resulting from the disposition of temporary controls should be permanently stabilized to prevent further erosion and sedimentation (AASHTO, 1991).

- e. *Wash all vehicles prior to leaving the construction site to remove mud and other deposits. Vehicles entering or leaving the site with trash or other loose materials should be covered to prevent transport of dust, dirt, and debris. Install and maintain mud and silt traps.*

- f. *Mitigate wetland areas destroyed during construction.*

Marshes and some types of wetlands can often be developed in areas where fill material was extracted or in ponds designed for sediment control during construction. Vegetated strips of native marsh grasses established along highway embankments near wetlands or riparian areas can be effective to protect these areas from erosion and sedimentation (FHWA, 1991).

- g. *Minimize the area that is cleared for construction.*

- h. *Construct cut-and-fill slopes in a manner that will minimize erosion.*

Cut-and-fill slopes should be constructed in a manner that will minimize erosion by taking into consideration the length and steepness of slopes, soil types, upslope drainage areas, and ground-water conditions. Suggested recommendations are as follows: reduce the length of long steep slopes by adding diversions or terraces; prevent concentrated runoff from flowing down cut-and-fill slopes by containing these flows within flumes or slope drain structures; and create roughened soil surfaces on cut-and-fill slopes to slow runoff flows. Wherever a slope face crosses a water seepage plane, thereby endangering the stability of the slope, adequate subsurface drainage should be provided.

- i. *Minimize runoff entering and leaving the site through perimeter and onsite sediment controls.*

- j. *Inspect and maintain erosion and sediment control practices (both on-site and perimeter) until disturbed areas are permanently stabilized.*

- k. *Divert and convey offsite runoff around disturbed soils and steep slopes to stable areas in order to prevent transport of pollutants off site.*
- l. *After construction, remove temporary control structures and restore the affected area. Dispose of sediments in accordance with State and Federal regulations.*
- m. *All storm drain inlets that are made operable during construction should be protected so that sediment-laden water will not enter the conveyance system without first being filtered or otherwise treated to remove sediment.*

5. Effectiveness Information and Cost Information

The detailed cost and effectiveness information presented under the construction measure for urban development is also applicable to road, highway, and bridge construction. See Tables 4-15 and 4-16 in Section III.

D. Management Measure for Construction Site Chemical Control

- (1) Limit the application, generation, and migration of toxic substances;
- (2) Ensure the proper storage and disposal of toxic materials; and
- (3) Apply nutrients at rates necessary to establish and maintain vegetation without causing significant nutrient runoff to surface water.

1. Applicability

This management measure is intended to be applied by States to new, resurfaced, restored, and rehabilitated road, highway, and bridge construction projects in order to reduce toxic and nutrient loadings from such project sites. Under the Coastal Zone Act Reauthorization Amendments of 1990, States are subject to a number of requirements as they develop coastal NPS programs in conformity with this management measure and will have some flexibility in doing so. The application of management measures by States is described more fully in *Coastal Nonpoint Pollution Control Program: Program Development and Approval Guidance*, published jointly by the U.S. Environmental Protection Agency (EPA) and the National Oceanic and Atmospheric Administration (NOAA) of the U.S. Department of Commerce.

2. Description

The objective of this measure is to guard against toxic spills and hazardous loadings at construction sites from equipment and fuel storage sites. Toxic substances tend to bind to fine soil particles; however, by controlling sediment mobilization, it is possible to limit the loadings of these pollutants. Also, some substances such as fuels and solvents are hazardous and excess applications or spills during construction can pose significant environmental impacts. Proper management and control of toxic substances and hazardous materials should be the adopted procedure for all construction projects and should be established by erosion and sediment control plans. Additional relevant practices are described in Management Measure III.B of this chapter.

3. Management Measure Selection

This management measure was selected because of existing practices that have been shown to be effective in mitigating construction-generated NPS pollution at highway project sites and equipment storage yards. In addition, maintenance areas containing road salt storage, fertilizers and pesticides, snowplows and trucks, and tractor mowers have the potential to contribute NPS pollutants to adjacent watercourses if not properly managed (AASHTO, 1988, 1991a). This measure is intended to safeguard surface waters and ground water from toxic and hazardous pollutants generated at construction sites. Examples of effective implementation of this measure are presented in the section on construction in urban areas. Several State environmental agencies are using this approach to regulate toxic and hazardous pollutants (Florida DER, 1988; Puget Sound Basin, 1991).

4. Practices

As discussed more fully at the beginning of this chapter and in Chapter 1, the following practices are described for illustrative purposes only. State programs need not require implementation of these practices. However, as a practical matter, EPA anticipates that the management measure set forth above generally will be implemented by applying one or more management practices appropriate to the source, location, and climate. The practices set forth below have been found by EPA to be representative of the types of practices that can be applied successfully to achieve the management measure described above.

The practices that are applicable to this management measure are described in Section III.B.

5. Effectiveness Information and Cost Information

The detailed cost and effectiveness data presented in the Section III.A of this chapter describing NPS controls for construction projects in urban development areas are also applicable to highway construction projects.

E. Management Measure for Operation and Maintenance

Incorporate pollution prevention procedures into the operation and maintenance of roads, highways, and bridges to reduce pollutant loadings to surface waters.

1. Applicability

This management measure is intended to be applied by States to existing, restored, and rehabilitated roads, highways, and bridges. Under the Coastal Zone Act Reauthorization Amendments of 1990, States are subject to a number of requirements as they develop coastal NPS programs in conformity with this management measures and will have some flexibility in doing so. The application of measures by States is described more fully in *Coastal Nonpoint Pollution Control Program: Program Development and Approval Guidance*, published jointly by the U.S. Environmental Protection Agency (EPA) and the National Oceanic and Atmospheric Administration (NOAA) of the U.S. Department of Commerce.

2. Description

Substantial amounts of eroded material and other pollutants can be generated by operation and maintenance procedures for roads, highways, and bridges, and from sparsely vegetated areas, cracked pavements, potholes, and poorly operating urban runoff control structures. This measure is intended to ensure that pollutant loadings from roads, highways, and bridges are minimized by the development and implementation of a program and associated practices to ensure that sediment and toxic substance loadings from operation and maintenance activities do not impair coastal surface waters. The program to be developed, using the practices described in this management measure, should consist of and identify standard operating procedures for nutrient and pesticide management, road salt use minimization, and maintenance guidelines (e.g., capture and contain paint chips and other particulates from bridge maintenance operations, resurfacing, and pothole repairs).

3. Management Measure Selection

This management measure for operation and maintenance was selected because (1) it is recommended by FHWA as a cost-effective practice (FHWA, 1991); (2) it is protective of the human environment (Puget Sound Water Quality Authority, 1989); (3) it is effective in controlling erosion by revegetating bare slopes (AASHTO, 1991b); (4) it is helpful in minimizing polluted runoff from road pavements (Transportation Research Board, 1991); and (5) both Federal (Richardson, 1974) and State highway agencies (Minnesota Pollution Control Agency, 1989; Pitt, 1973) advocate highway maintenance as an effective practice for minimizing pollutant loadings.

Maintenance of erosion and sediment control practices is of critical importance. Both temporary and permanent controls require frequent and periodic cleanout of accumulated sediment. Any trapping or filtering device, such as silt fences, sediment basins, buffers, inlets, and check dams, should be checked and cleaned out when approximately 50 percent of their capacity is reached, as determined by the erodible nature of the soil, flow velocity, and quantity of runoff. Seasonal and climatic differences may require more frequent cleanout of these structures. The sediments removed from these control devices should be deposited in permanently stabilized areas to prevent further erosion and sediment from reaching drainages and receiving streams. After periods of use, control devices may require replacement of deteriorated materials such as straw bales and silt fence fabrics, or restoration and reconstruction of sediment basins and riprap installations.

Permanent erosion controls such as vegetated filter strips, grassed swales, and velocity dissipators should be inspected periodically to determine their integrity and continued effectiveness. Continual deterioration or damage to these controls may indicate a need for better design or construction.

4. Practices

As discussed more fully at the beginning of this chapter and in Chapter 1, the following practices are described for illustrative purposes only. State programs need not require implementation of these practices. However, as a practical matter, EPA anticipates that the management measure set forth above generally will be implemented by applying one or more management practices appropriate to the source, location, and climate. The practices set forth below have been found by EPA to be representative of the types of practices that can be applied successfully apply to achieve the management measure described above.

■ a. *Seed and fertilize, seed and mulch, and/or sod damaged vegetated areas and slopes.*

■ b. *Establish pesticide/herbicide use and nutrient management programs.*

Refer to the Management Measure for Construction Site Chemical Control in this chapter.

■ c. *Restrict herbicide and pesticide use in highway rights-of-way to applicators certified under the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) to ensure safe and effective application.*

■ d. *The use of chemicals such as soil stabilizers, dust palliatives, sterilants, and growth inhibitors should be limited to the best estimate of optimum application rates. All feasible measures should be taken to avoid excess application and consequent intrusion of such chemicals into surface runoff.*

■ e. *Sweep, vacuum, and wash residential/urban streets and parking lots.*

■ f. *Collect and remove road debris.*

■ g. *Cover salt storage piles and other deicing materials to reduce contamination of surface waters. Locate them outside the 100-year floodplain.*

■ h. *Regulate the application of deicing salts to prevent oversalting of pavement.*

■ i. *Use specially equipped salt application trucks.*

■ j. *Use alternative deicing materials, such as sand or salt substitutes, where sensitive ecosystems should be protected.*

■ k. *Prevent dumping of accumulated snow into surface waters.*

■ l. *Maintain retaining walls and pavements to minimize cracks and leakage.*

■ m. *Repair potholes.*

■ n. *Encourage litter and debris control management.*

- o. *Develop an inspection program to ensure that general maintenance is performed on urban runoff and NPS pollution control facilities.*

To be effective, erosion and sediment control devices and practices must receive thorough and periodic inspection checks. The following is a suggested checklist for the inspection of erosion and sediment controls (AASHTO Operating Subcommittee on Design, 1990):

- Clean out sediment basins and traps; ensure that structures are stable.
 - Inspect silt fences and replace deteriorated fabrics and wire connections; properly dispose of deteriorated materials.
 - Renew riprapped areas and reapply supplemental rock as necessary.
 - Repair/replace check dams and brush barriers; replace or stabilize straw bales as needed.
 - Regrade and shape berms and drainage ditches to ensure that runoff is properly channeled.
 - Apply seed and mulch where bare spots appear, and replace matting material if deteriorated.
 - Ensure that culverts and inlets are protected from siltation.
 - Inspect all permanent erosion and sediment controls on a scheduled, programmed basis.
- p. *Ensure that energy dissipators and velocity controls to minimize runoff velocity and erosion are maintained.*
 - q. *Dispose of accumulated sediment collected from urban runoff management and pollution control facilities, and any wastes generated during maintenance operations, in accordance with appropriate local, State, and Federal regulations.*
 - r. *Use techniques such as suspended tarps, vacuums, or booms to reduce, to the extent practicable, the delivery to surface waters of pollutants used or generated during bridge maintenance (e.g., paint, solvents, scrapings).*
 - s. *Develop education programs to promote the practices listed above.*

5. Effectiveness Information and Cost Information

Preventive maintenance is a time-proven, cost-effective management approach. Operation schedules and maintenance procedures to restore vegetation, proper management of salt and fertilizer application, regular cleaning of urban runoff structures, and frequent sweeping and vacuuming of urban streets have effective results in pollution control. Litter control, clean-up, and fix-up practices are a low-cost means for eliminating causes of pollution, as is the proper handling of fertilizers, pesticides, and other toxic materials including deicing salts and abrasives. Table 4-30 presents summary information on the cost and effectiveness of operation and maintenance practices for roads, highways, and bridges. Many States and communities are already implementing several of these practices within their budget limitations. As shown in Table 4-30, the use of road salt alternatives such as calcium magnesium acetate (CMA) can be very costly. Some researchers have indicated, however, that reductions in corrosion of infrastructure, damage to roadside vegetation, and the quantity of material that needs to be applied may offset the higher cost of CMA. Use of road salt minimization practices such as salt storage protection and special salt spreading equipment reduces the amount of salt that a State or community must purchase. Consequently, implementation of these practices can pay for itself through savings in salt purchasing costs. Similar programs such as nutrient and pesticide management can also lead to decreased expenditures for materials.

CMA Eligible for Matching Funds

Calcium magnesium acetate (CMA) is now eligible for Federal matching funds under the Bridge Program of the Intermodal Surface Transportation Efficiency Act (ISTEA) of 1991. The Act provides 80 percent funding for use of CMA on salt-sensitive bridges in order to protect against corrosion and to extend their useful life. CMA can also be used to protect vegetation from salt damage in environmentally sensitive areas.

Table 4-30. Effectiveness and Cost Summary for Roads, Highways, and Bridges Operation and Maintenance Management Practices

Management Practice	% Removal							Cost
	TSS	TP	TN	COD	Pb	Zn		
MAINTAIN VEGETATION For Sediment Control								
Average:	90	NA	NA	NA	NA	NA	Natural succession allowed to occur - Avg: \$100/ac/year	
Reported Range:	50-100	NA	NA	NA	NA	NA	Reported Range: \$50-\$200/ac/year	
Probable Range:	80-100	-	-	-	-	-		
For Pollutant Removal								
Average:	60	40	40	50	50	50	Natural succession not allowed to occur - Avg: \$800/ac/year	
Reported Range:	0-100	0-100	0-70	20-80	0-100	50-60	Reported Range: \$700-\$900/ac/year	
Probable Range:	0-100	0-100	0-100	0-100	0-100	0-100		
PESTICIDE/HERBICIDE USE MANAGEMENT								
Average:	NA						Generally accepted as an economical program to control excessive use	
Reported Range:	NA							
Probable Range:	NA							
STREET SWEEPING								
Smooth Street, Frequent Cleaning (One or More Passes Per Week)							Avg: \$20/curb mile	
Average:	20	NA	NA	5	25	NA	Reported Range: \$10-\$30/curb mile	
Reported Range:	20	NA	NA	0-10	5-35	NA		
Probable Range:	20-50	-	-	0-10	20-50	10-30		
Infrequent Cleaning (One Pass Per Month or Less)								
Average:	NA	NA	NA	NA	5	NA		
Reported Range:	NA	NA	NA	NA	0-10	NA		
Probable Range:	0-20	-	-	-	0-20	0-10		
LITTER CONTROL								
Average:	NA						Generally accepted as an economical approach to control excessive use	
Reported Range:	NA							
Probable Range:	NA							

Table 4-30. (Continued)

Management Practice	% Removal						Cost
	TSS	TP	TN	COD	Pb	Zn	
GENERAL MAINTENANCE (e.g., pothole and roadside repairs)							Generally accepted as an economical preventive maintenance program by local and State agencies
Average:	NA						
Reported Range:	NA						
Probable Range:							
PROTECTION OF SALT PILES							For salt storage building - Ave: \$30/ton salt Reported Range: \$10-\$70/ton salt
Average:	NA						
Reported Range:	NA						
Probable Range:	90-100 ^a						
MINIMIZATION OF APPLICATION OF DEICING SALTS							Generally accepted as an economical preventive maintenance program by local and State agencies
Average:	NA						
Reported Range:	NA						
Probable Range:	Deicing salts that are not applied to roads will not enter runoff ^a						
SPECIALLY EQUIPPED SALT APPLICATION TRUCKS							For spread rate control on truck - Ave: \$6,000/truck Reported Range: \$6,000/truck
Average:	NA						
Reported Range:	NA						
Probable Range:	Deicing salts that are not applied to roads will not enter runoff ^a						
USE OF ALTERNATIVE DEICING MATERIALS							CMA - Ave: \$650/ton Reported Range: \$650/ton (note: cost of salt \$30/ton)
Average:	NA						
Reported Range:	NA						
Probable Range:	Deicing salts that are not applied to roads will not enter runoff ^a						
CONTAIN POLLUTANTS GENERATED DURING BRIDGE MAINTENANCE							Varies with method of containment use
Average:	NA						
Reported Range:	NA						
Probable Range:	50-100 ^b						

NA = Not applicable.
^aMeasured as reduction in salt.
^bMeasured as reduction of all pollutants.

F. Management Measure for Road, Highway, and Bridge Runoff Systems

Develop and implement runoff management systems for existing roads, highways, and bridges to reduce runoff pollutant concentrations and volumes entering surface waters.

- (1) Identify priority and watershed pollutant reduction opportunities (e.g., improvements to existing urban runoff control structures; and
- (2) Establish schedules for implementing appropriate controls.

1. Applicability

This management measure is intended to be applied by States to existing, resurfaced, restored, and rehabilitated roads, highways, and bridges that contribute to adverse effects in surface waters. Under the Coastal Zone Act Reauthorization Amendments of 1990, States are subject to a number of requirements as they develop coastal NPS programs in conformity with this management measure and will have some flexibility in doing so. The application of management measures by States is described more fully in *Coastal Nonpoint Pollution Control Program: Program Development and Approval Guidance*, published jointly by the U.S. Environmental Protection Agency (EPA) and the National Oceanic and Atmospheric Administration (NOAA) of the U.S. Department of Commerce.

2. Description

This measure requires that operation and maintenance systems include the development of retrofit projects, where needed, to collect NPS pollutant loadings from existing, reconstructed, and rehabilitated roads, highways, and bridges. Poorly designed or maintained roads and bridges can generate significant erosion and pollution loads containing heavy metals, hydrocarbons, sediment, and debris that run off into and threaten the quality of surface waters and their tributaries. In areas where such adverse impacts to surface waters can be attributed to adjacent roads or bridges, retrofit management projects to protect these waters may be needed (e.g., installation of structural or nonstructural pollution controls). Retrofit projects can be located in existing rights-of-way, within interchange loops, or on adjacent land areas. Areas with severe erosion and pollution runoff problems may require relocation or reconstruction to mitigate these impacts.

Runoff management systems are a combination of nonstructural and structural practices selected to reduce nonpoint source loadings from roads, highways, and bridges. These systems are expected to include structural improvements to existing runoff control structures for water quality purposes; construction of new runoff control devices, where necessary to protect water quality; and scheduled operation and maintenance activities for these runoff control practices. Typical runoff controls for roads, highways, and bridges include vegetated filter strips, grassed swales, detention basins, constructed wetlands, and infiltration trenches.

3. Management Measure Selection

This management measure was selected because of the demonstrated effectiveness of retrofit systems for existing roads and highways that were constructed with inadequate nonpoint source pollution controls or without such controls. Structural practices for mitigating polluted runoff from existing highways are described in the literature (Silverman, 1988).

4. Practices

As discussed more fully at the beginning of this chapter and in Chapter 1, the following practices are described for illustrative purposes only. State programs need not require implementation of these practices. However, as a practical matter, EPA anticipates that the management measure set forth above generally will be implemented by applying one or more management practices appropriate to the source, location, and climate. The practices set forth below have been found by EPA to be representative of the types of practices that can be applied successfully to achieve the management measure described above.

- a. *Locate runoff treatment facilities within existing rights-of-way or in medians and interchange loops.*
- b. *Develop multiple-use treatment facilities on adjacent lands (e.g., parks and golf courses).*
- c. *Acquire additional land for locating treatment facilities.*
- d. *Use underground storage where no alternative is available.*
- e. *Maximize the length and width of vegetated filter strips to slow the travel time of sheet flow and increase the infiltration rate of urban runoff.*

5. Effectiveness Information and Cost Information

Cost and effectiveness data for structural urban runoff management and pollution control facilities are outlined in Tables 4-15 and 4-16 in Section III and discussed in Section IV of this chapter and are applicable to determine the cost and effectiveness of retrofit projects. Retrofit projects can often be more costly to construct because of the need to locate the required structures within existing space or the need to locate the structures within adjacent property that requires purchase. However, the use of multiple-use facilities on adjacent lands, such as diverting runoff waters to parkland or golf courses, can offset this cost. Nonstructural practices described in the urban section also can be effective in achieving source control. As with other sections of this document, the costs of loss of habitat, fisheries, and recreational areas must be weighed against the cost of retrofitting control structures within existing rights-of-way.

6. Pollutants of Concern

Table 4-31 lists the pollutants commonly found in urban runoff from roads, highways, and bridges and their sources. The disposition and subsequent magnitude of pollutants found in highway runoff are site-specific and are affected by traffic volume, road or highway design, surrounding land use, climate, and accidental spills.

The FHWA conducted an extensive field monitoring and laboratory analysis program to determine the pollutant concentration in highway runoff from 31 sites in 11 States (Driscoll et al., 1990). The event mean concentrations (EMCs) developed in the study for a number of pollutants are presented in Table 4-32. The study also indicated that for highways discharging into lakes, the pollutants of major concern are phosphorus and heavy metals. For highways discharging into streams, the pollutants of major concern are heavy metals—cadmium, copper, lead, and zinc.

Table 4-31. Highway Runoff Constituents and Their Primary Sources

Constituents	Primary Sources
Particulates	Pavement wear, vehicles, atmosphere, maintenance
Nitrogen, Phosphorus	Atmosphere, roadside fertilizer application
Lead	Leaded gasoline (auto exhaust), tire wear (lead oxide filler material, lubricating oil and grease, bearing wear)
Zinc	Tire wear (filler material), motor oil (stabilizing additive), grease
Iron	Auto body rust, steel highway structures (guard rails, bridges, etc.), moving engine parts
Copper	Metal plating, bearing and bushing wear, moving engine parts, brake lining wear, fungicides and insecticides
Cadmium	Tire wear (filler material), insecticide application
Chromium	Metal plating, moving engine parts, brake lining wear
Nickel	Diesel fuel and gasoline (exhaust), lubricating oil, metal plating, bushing wear, brake lining wear, asphalt paving
Manganese	Moving engine parts
Cyanide	Anticake compound (ferric ferrocyanide, sodium ferrocyanide, yellow prussiate of soda) used to keep deicing salt granular
Sodium, Calcium, Chloride	Deicing salts
Sulphate	Roadway beds, fuel, deicing salts
Petroleum	Spills, leaks or blow-by of motor lubricants, antifreeze and hydraulic fluids, asphalt surface leachate

In colder regions where deicing agents are used, deicing chemicals and abrasives are the largest source of pollutants during winter months. Deicing salt (primarily sodium chloride, NaCl) is the most commonly used deicing agent. Potential pollutants from deicing salt include sodium chloride, ferric ferrocyanide (used to keep the salt in granular form), and sulfates such as gypsum. Table 4-33 summarizes potential environmental impacts caused by road salt. Other chemicals used as a salt substitute include calcium magnesium acetate (CMA) and, less frequently, urea and glycol compounds. Researchers have differing opinions on the environmental impacts of CMA compared to those of road salt (Chevron Chemical Company, 1991; Salt Institute, undated; Transportation Research Board, 1991).

Table 4-32. Pollutant Concentrations in Highway Runoff (Driscoll et al., 1990)

Pollutant	Event Mean Concentration for Highways With Fewer Than 30,000 Vehicles/Day ^a (mg/L)	Event Mean Concentration for Highways With More Than 30,000 Vehicles/Day ^a (mg/L)
Total Suspended Solids	41	142
Volatile Suspended Solids	12	39
Total Organic Carbon	8	25
Chemical Oxygen Demand	49	114
Nitrite and Nitrate	0.46	0.76
Total Kjeldahl Nitrogen	0.87	1.83
Phosphate Phosphorus	0.16	0.40
Copper	0.022	0.054
Lead	0.080	0.400
Zinc	0.080	0.329

^aEvent mean concentrations are for the 50% median site.

Table 4-33. Potential Environmental Impacts of Road Salts

Environmental Resource	Potential Environmental Impact of Road Salt (NaCl)
Soils	May accumulate in soil. Breaks down soil structure, increases erosion. Causes soil compaction that results in decreased permeability.
Vegetation	Osmotic stress and soil compaction harm root systems. Spray causes foliage dehydration damage. Many plant species are salt-sensitive.
Ground Water	Mobile Na and Cl ions readily reach ground water. Increases NaCl concentration in well water, as well as alkalinity and hardness.
Surface Water	Causes density stratification in ponds and lakes that can prevent reoxygenation. Increases runoff of heavy metals and nutrients through increased erosion.
Aquatic Life	Monovalent Na and Cl ions stress osmotic balances. Toxic levels: Na - 500 ppm for stickleback; Cl - 400 ppm for trout.
Human/Mammalian	Sodium is linked to heart disease and hypertension. Chlorine causes unpleasant taste in drinking water. Mild skin and eye irritant. Acute oral LD ₅₀ in rats is approximately 3,000 mg/kg (slightly toxic).



MICHAEL T. MUNEKIYO
GWEN OHASHI TORRES
MITSURU "MICK" HIRAGA

July 25, 2005

George Tengan, Director
County of Maui
Department of Water Supply
200 South High Street
Wailuku, Hawaii 96793

SUBJECT: Proposed Improvements to Nahiku Road, Hana, Maui, Hawaii,
TMK (2) 1-2-003:058 (por.)

Dear Mr. Tengan:

Thank you for your letter of January 27, 2005, responding to our request for early consultation comments for the proposed improvements to Nahiku Road in Nahiku, Maui. In response to your comments, we note the following:

1. The Department of Public Works and Environmental Management (DPWEM) will coordinate with your Department to discuss the possible realignment of the water line running along the existing Nahiku Road. We appreciate the enclosed section of the fire protection map.
2. We acknowledge receipt of the sample Best Management Practices. DPWEM will utilize such BMP's as are practicable to minimize construction-related impacts and will bear in mind the proximity of the project site to Makapipi Stream.

planning environment

George Tengan, Director
July 25, 2005
Page 2

Thank you again for providing your input to the proposed action. A copy of the Draft Environmental Assessment will be provided to your office for review and comment.

Very truly yours,



Matthew M. Slepik, Planner

MMS:yp

cc: Joe Krueger, Department of Public Works and Environmental Management
Kevin Ho, Sato & Associates, Inc.

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FAX (808) 244-6411

February 8, 2004

FEB 14 2005



THOMAS M. PHILLIPS
CHIEF OF POLICE

KEKUHAUPIO R. AKANA
DEPUTY CHIEF OF POLICE

Mr. Matthew Slepín
Planner
Munekiyo & Hiraga, Inc.
305 High Street, Suite 104
Wailuku, HI 96793

Dear Mr. Slepín:

SUBJECT: Early Consultation Request for Proposed Improvements to Nahiku Road, Hana, Maui TMK (2) 1-2-003:018 (por)

Thank you for your letter of January 19, 2005, requesting comments on the above subject.

We have reviewed the information submitted for this project and have enclosed a copy of our comments. As always, thank you for giving us the opportunity to comment on this project.

Very truly yours,


Assistant Chief Sydney Kikuchi
for: Thomas M. Phillips
Chief of Police

c: Michael Foley, Planning Department

Enclosure

COPY

TO : THOMAS PHILLIPS, CHIEF OF POLICE, MAUI POLICE DEPARTMENT

VIA : CHANNELS *2/2/05*

FROM : MIKE CROWE, POLICE OFFICER II, HANA PATROL DISTRICT

SUBJECT : PROPOSED IMPROVEMENTS HANA HIGHWAY/L. NAHIKU ROAD

Sir,

I received an assignment by Sergeant William JUAN of the Hana Patrol District to review and submit comments regarding the proposed improvements to the intersection of Hana Highway and Lower Nahiku Road, submitted by the State Department of Transportation and their consulting firm of MUNEKIYO & HIRAGA, INC., being that I am the assigned liaison from the district to the Community of Nahiku.

Review of Plans:

I reviewed the plans and understood the need to make changes to the intersection, being that it is difficult for vehicles heading West on Hana Highway to negotiate a right hand turn onto Lower Nahiku Road without first crossing over the center line to oncoming traffic. Since the proposed changes will widen that portion of Lower Nahiku Road as it intersects with Hana Highway this will alleviate one of those long standing problems with the old design of the roadway.

Upon total review of the proposed changes there are no other concerns or issues regarding the changes from a law enforcement perspective.

The proposed changes will greatly enhance and possibly eliminate unnecessary accidents from occurring at that intersection.

Submitted for your perusal.

g. concur,
302

*NO ISSUES WITH
PROJECT. IT WILL
ENHANCE ROADWAY AND
MAKE IT SAFER.*

A. M. K. K.
2/3/05

Respectfully Submitted,
[Signature]
Ofc. M. CROWE E12558
Hana Patrol District
01/30/2005 @1100 hours



MICHAEL T. MUNEKIYO
GWEN CHASHI HIRAGA
MITSURU "MICH" HIRANO

July 25, 2005

Thomas Phillips, Chief
County of Maui
Police Department
55 Mahalani Street
Wailuku, Hawaii 96793

SUBJECT: Proposed Improvements to Nahiku Road, Hana, Maui, Hawaii,
TMK (2) 1-2-003:058 (por.)

Dear Chief Phillips:

Thank you for your letter of February 8, 2005, responding to our request for early consultation comments for the proposed improvements to Nahiku Road in Nahiku, Maui. We appreciate your expression of support and confirmation of the need for the proposed project. We do wish to clarify, however, that Nahiku Road will not be widened to provide better access for west bound traffic. Rather, the turn-out area adjacent to Hana Highway will be used to provide a type of round-about to facilitate access to Nahiku Road.

Thank you again for providing your input to the proposed action. A copy of the Draft Environmental Assessment will be provided to your office for review and comment.

Very truly yours,

Matthew M. Stepin, Planner

MMS:yp

cc: Joe Krueger, Department of Public Works and Environmental Management
Kevin Ho, Sato & Associates, Inc.

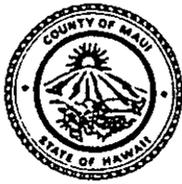
sato@nahikurdmpd.res

environment
planning

ALAN M. ARAKAWA
Mayor

MICHAEL W. FOLEY
Director

WAYNE A. BOTEILHO
Deputy Director



COUNTY OF MAUI
DEPARTMENT OF PLANNING

February 11, 2005

Mr. Matt Slepín
Munekiyo & Hiraga, Inc.
305 High Street, Suite 104
Wailuku, Hawaii 96793

Dear Mr. Slepín;

RE: Preconsultation - Draft Environmental Assessment for the Proposed Improvements to Nahiku Road located at TMK: 1-2-003: 018 (portion), Nahiku, Island of Maui, Hawaii (LTR 2005/0185)

The Maui Planning Department (Department) received your request for preconsultation comments in preparation of an Environmental Assessment (EA) as required by Chapter 343, HRS. The Department's comments are as follows:

1. Land Use Designation:
 - a. State - Agricultural District
 - b. Hana Community Plan - Agriculture
 - c. Zoning, Title 19, Maui County Code (MCC) - Agriculture
2. Include a discussion of potential impacts to the nearby stream and mitigative measures

Thank you for the opportunity to comment. Please include the Department on the Draft EA distribution list. Should you require additional clarification, please contact Ms. Kivette A. Caigoy, Environmental Planner, at 270-7735.

Sincerely,

A handwritten signature in black ink, appearing to read "M. W. Foley", with a stylized flourish at the end.

MICHAEL W. FOLEY
Planning Director

MWF:KAC:dm

c: Wayne A. Boteilho, Deputy Planning Director
Clayton I. Yoshida, AICP, Planning Program Administrator
Kivette Caigoy, Environmental Planner
DPEM
General File
K:\WP_DOCS\PLANNING\EA\PreConComments\2005\0185_NahikuRoadImprvmt.wpd



MICHAEL T. MUNEKIYO
GWEN OHASHI HIRAGA
MITSURU "MISHI" HIRAGA

July 25, 2005

Michael Foley, Director
County of Maui
Department of Planning
250 South High Street
Wailuku, Hawaii 96793

SUBJECT: Proposed Improvements to Nahiku Road, Hana, Maui, Hawaii,
TMK (2) 1-2-003:058 (por.)

Dear Mr. Foley:

Thank you for your letter of February 11, 2005, responding to our request for early consultation comments for the proposed improvements to Nahiku Road in Nahiku, Maui. In response to your comments, we note the following:

1. We acknowledge the land use designations which you have provided.
2. The Draft Environmental Assessment will discuss the potential impacts and mitigation measures for the project, including those associated with the nearby stream.

Thank you again for providing your input to the proposed action. A copy of the Draft Environmental Assessment will be provided to your office for review and comment.

Very truly yours,

Matthew M. Slepina, Planner

MMS:yp

cc: Joe Krueger, Department of Public Works and Environmental Management
Kevin Ho, Sato & Associates, Inc.

alohinahiku@planning.res

planning environment



MICHAEL T. MUNEKIYO
GWEN GRASHI HIRAGA
MITSURU "MIGHT" HIRANO

July 25, 2005

Valeriano Martin, Captain
County of Maui
Department of Fire
and Public Safety
200 Dairy Road
Kahului, Hawaii 96732

SUBJECT: Proposed Improvements to Nahiku Road, Hana, Maui, Hawaii,
TMK (2) 1-2-003:058 (por.)

Dear Captain Martin:

Thank you for your telephone call of January 24, 2005, and subsequent conversation responding to our request for early consultation comments for the proposed improvements to Nahiku Road in Nahiku, Maui. In response to your comments, we note the following:

1. The proposed turn-off area on Hana Highway is currently an undeveloped, dirt area which is unofficially used for both turning and parking. The improvement proposed under this project is solely intended to safely allow west-bound traffic to turn onto Nahiku Road. No parking will be permitted in this area.
2. We acknowledge your confirmation that a turn-off area such as that proposed will be required to allow west-bound fire trucks (coming from Hana) to turn safely onto Nahiku Road.

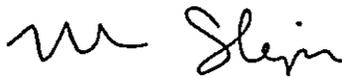
We note that due to topographic and engineering constraints, the proposed turn-off area will not be of sufficient radius to permit free-flop use by large fire emergency vehicles. Thus, the existing limitations on roadway geometrics which currently makes difficult fire truck access from Hana Highway onto Nahiku Road will not substantially be improved. At this time, the primary project objective is to address the unstable conditions along Nahiku Road.

environment
planning

Valeriano Martin, Captain
July 25, 2005
Page 2

Thank you again for providing your input to the proposed action. A copy of the Draft Environmental Assessment will be provided to your office for review and comment.

Very truly yours,



Matthew M. Slepik, Planner

MMS:yp

cc: Joe Krueger, Department of Public Works and Environmental Management
Kevin Ho, Sato & Associates, Inc.

sato\mahikurd@fire.res

Chapter X

**Letters Received During the Draft
Environmental Assessment Public
Comment Period and Responses
to Substantive Comments**

X. LETTERS RECEIVED DURING THE DRAFT ENVIRONMENTAL ASSESSMENT PUBLIC COMMENT PERIOD AND RESPONSES TO SUBSTANTIVE COMMENTS

A Draft Environmental Assessment for the subject project was filed and published in the Office of Environmental Quality Control's The Environmental Notice on August 8, 2005. During the 30-day public comment period, agencies were provided the opportunity to comment on the proposed action. This section incorporates the comments received during the 30-day comment period between August 8 and September 7, 2005. Responses to the substantive comments are also incorporated herein.

AUG 26 2005



REPLY TO
ATTENTION OF

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

August 24, 2005

Regulatory Branch

Joe Krueger, Project Manager
Department of Public Works
and Environmental Management
200 South High Street
Wailuku, HI 96793

Subject: Comments on draft Environmental Assessment (EA) for proposed improvements to Nahiku Road at its intersection with Hana Highway, Hana, Maui (por. TMK: (2) 1-2-003:018).

Dear Mr. Krueger:

File No. POH-2005-62

This office has reviewed the draft EA submitted on August 5, 2005 for the above-referenced project. The information submitted by the project consultant, Munekiyo & Hiraga, Inc., was reviewed pursuant to Section 404 of the Clean Water Act, which requires that a Department of the Army (DA) permit be obtained prior to the placement or discharge of dredged and/or fill material into waters of the U.S., including wetlands (33 U.S.C. 1344).

On July 25, 2005, the project consultant provided a copy of the United States Geological Service topographic map (Nahiku quadrangle) with the project footprint overlain. The map indicates that the proposed road improvements will not directly impact Makapipi Stream, which is located at the base of the shoulder drop-off along Nahiku Road. Based on the information provided in the draft EA and the July 25th correspondence, the Corps believes that no discharge of dredged or fill material will occur below the Ordinary High Water Mark (OHWM) of Makapipi Stream. Best Management Practices (BMP's) should be employed to ensure no dredged and/or fill material, or other potential pollutants such as construction debris or petroleum-based materials from heavy machinery, are discharged into Makapipi Stream.

Included in the draft EA was the Biological Resources Survey dated April 2005 by Xamanek Researches, LLC, which lists several hydrophytic plant species as present within the project area, including a "wayside" area dominated by California grass (*Brachiaria mutica*). *Ludwigia octovalis*, *L. palustris* and *Commelina diffusa*, to name a few, were also listed in Table 1 of the report. Additional information, including color site photographs and identification of the precise location of these hydrophytic plants (or plant communities) in relation to the project area (including the location of temporary access fills, stockpile areas, and contractor work and storage areas, if applicable), will be necessary in order to make a final determination of DA jurisdiction. The Corps recommends you or your consultant also provide Corps wetland delineation data sheets for the project area. Please note that this general area supports many springs that may provide hydrology to support a perched wetland community with downstream connections to other waters of the U.S.

If you have any further questions, please contact Ms. Connie Ramsey by telephone at 808-438-2039, by facsimile at 808-438-4060 or by electronic mail at Connie.L.Ramsey@usace.army.mil . Please refer to the above-referenced file number for future inquiries. Thank you for your cooperation with our regulatory program.

Sincerely,



George P. Young, P.E.
Chief, Regulatory Branch

Copy furnished:
Matthew Slepín, Munekiyo & Hiraga, Inc., 305 High Street, Suite 104, Wailuku, HI 96793

NOV 04 2005



REPLY TO
ATTENTION OF

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

November 3, 2005

Regulatory Branch

File No. POH-2005-62

Matthew Slepín, Planner
Munekiyo & Hiraga, Inc.
305 High Street, Suite 104
Wailuku, Hawaii 96793

Subject: Determination of Department of the Army (DA) jurisdiction for proposed improvements to Nahiku Road at its intersection with Hana Highway, Hana, Maui TMK (2) 1-2-003: portion of 18

Dear Mr. Slepín:

This office has reviewed the materials submitted by Xamanek Researches, LLC on October 24, 2005 in support of a request for a final determination of DA jurisdiction for the above-referenced project. The information was reviewed pursuant to Section 404 of the Clean Water Act, which requires that a Department of the Army (DA) permit be obtained prior to the placement or discharge of dredged and/or fill material into waters of the U.S., including wetlands (33 U.S.C. 1344). Based on the information provided, a DA permit will not be required. Best Management Practices (BMP's) should be employed to ensure no dredged and/or fill material, or other potential pollutants such as construction debris or petroleum-based materials from heavy machinery, are discharged into Makapipi Stream.

In general, the Corps' Regulatory staff is not able to inspect all proposed project sites in each County. In the future, detailed color site photographs and maps should be provided to the Corps in order to assist us in providing a final jurisdictional determination in a timely fashion, particularly in cases such as this when the state of the current roadway is becoming a safety concern. Maps should, at a minimum, depict the location of the proposed work, as well as any temporary access fills, stockpile areas, and contractor work and storage areas, in relation to any potential waters of the U.S., including wetlands.

If you have any further questions, please contact Ms. Connie Ramsey by phone at 808-438-2039, by facsimile at 808-438-4060 or by e-mail at Connie.L.Ramsey@usace.army.mil. Please refer to file number above regarding this project.

Sincerely,

A handwritten signature in black ink, appearing to read "George P. Young".

George P. Young, P.E.
Chief, Regulatory Branch



MICHAEL T. MUNEKIYO
GWEN OHASHI HIRAGA
MITSURU "MICH" HIRANO

November 11, 2005

George Young, Chief
Department of the Army
Regulatory Branch
U.S. Army Engineer District, Honolulu
Ft. Shafter, Hawaii 96858

**SUBJECT: Proposed Improvements to Nahiku Road, Hana, Maui, Hawaii, TMK
(2) 1-2-003:058 (por.)**

Dear Mr. Young:

Thank you for your letters of August 24 and November 3, 2005, providing comments on the Draft Environmental Assessment for the proposed improvements to Nahiku Road in Nahiku, Maui. We note your determination that a Department of the Army permit will not be required for the project. We further note that Best Management Practices (BMPs) will be utilized as practicable to mitigate impacts to the Makapipi Stream.

Thank you again for providing your input to the proposed action. Please feel free to contact me at (808)244-2015 with any further comments or questions.

Very truly yours,

A handwritten signature in black ink, appearing to read "M. Slepina", written in a cursive style.

Matthew M. Slepina, Planner

cc: Joe Krueger, Department of Public Works and Environmental Management
Kevin Ho, Sato & Associates

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LINDA LINGLE
GOVERNOR OF HAWAII



STATE OF HAWAII
DEPARTMENT OF HEALTH
MAUI DISTRICT HEALTH OFFICE
54 HIGH STREET
WAILUKU, MAUI, HAWAII 96793-2102

August 25, 2005

Mr. Matt Slep
Munekiyo & Hiraga, Inc.
305 High Street, Suite 104
Wailuku, Hawai'i 96793

Dear Mr. Slep:

Subject: **Draft Environmental Assessment, Special Management Area
Application, Proposed Improvements to Nahiku Road
TMK: (2) 1-2-003:058 (por.)**

We have no comments other than the comments provided during the early consultation process. The comments were adequately addressed by Munekiyo and Hiraga, Inc. Copies of both can be found in the Draft Environmental Assessment.

Should you have any questions, please call me at 808 984-8230.

Sincerely,

A handwritten signature in black ink, appearing to read "H. Matsubayashi".

Herbert S. Matsubayashi
District Environmental Health Program Chief

c: Joe Krueger
Michael W. Foley
Genevieve Salmonson

AUG 26 2005

CHIYOME L. FUKINO, M. D.
DIRECTOR OF HEALTH

LORRIN W. PANG, M. D., M. P. H.
DISTRICT HEALTH OFFICER

SEP 07 2005

PHONE (808) 594-1888

FAX (808) 594-1865



STATE OF HAWAII
OFFICE OF HAWAIIAN AFFAIRS
711 KAPI'OLANI BOULEVARD, SUITE 500
HONOLULU, HAWAII 96813

HRD05/1713B

September 1, 2005

Matt Slepín
Munekiyo and Haraga, Inc.
305 High Street, Suite 104
Wailuku, Hawaii, 96793

RE: Proposed Improvements to Nahiku Road, Nahiku, Hana District, Maui, TMK (2) 1-2-003: 058 (por.).

Dear Mr. Slepín,

The Office of Hawaiian Affairs (OHA) is in receipt of your August 5, 2005 request for comment on the above listed proposed project, TMK (2) 1-2-003: 058 (por.). OHA offers the following comments:

OHA has no comment specific to the Draft Environmental Assessment (DEA) at this time. Please contact Thelma Shimaoka of OHA's Maui Office as she may be able to assist you in the consultation process for the DEA.

OHA further requests your assurances that if the project goes forward, should iwi or Native Hawaiian cultural or traditional deposits be found during ground disturbance, work will cease, and the appropriate agencies will be contacted pursuant to applicable law.

Thank you for the opportunity to comment. If you have further questions or concerns, please contact Jesse Yorck at (808) 594-0239 or jessey@oha.org.

'O wau iho nō,

A handwritten signature in black ink, appearing to read "Clyde W. Nāmu'o".

Clyde W. Nāmu'o
Administrator



MICHAEL T. MUNEKIYO
GWEN OHASHI HIRAGA
MITSURU "MICH" HIRANO

November 11, 2005

Clyde Namu'o, Administrator
State of Hawaii
Office of Hawaiian Affairs
711 Kapiolani Boulevard, Suite 500
Honolulu, Hawaii 96813

**SUBJECT: Proposed Improvements to Nahiku Road, Hana, Maui, Hawaii, TMK
(2) 1-2-003:058 (por.)**

Dear Mr. Namu'o:

Thank you for your letter of September 1, 2005, providing comments on the Draft Environmental Assessment for the proposed improvements to Nahiku Road in Nahiku, Maui. In response to your comment, we note that should any cultural or traditional deposits be uncovered during construction-related activities, all work will be halted and the appropriate agencies contacted.

Thank you again for providing your input to the proposed action. Please feel free to contact me at (808) 244-2015 with any further comments or questions.

Very truly yours,

Matthew M. Slep, Planner

MMS:yp

cc: Joe Krueger, Department of Public Works and Environmental Management
Kevin Ho, Sato & Associates, Inc.
Erik Fredricksen, Xamanek Researches, LLC

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LINDA LINGLE
GOVERNOR OF HAWAII



GENEVIEVE SALMONSON
DIRECTOR

STATE OF HAWAII
OFFICE OF ENVIRONMENTAL QUALITY CONTROL

235 SOUTH BERETANIA STREET
SUITE 702
HONOLULU, HAWAII 96813
TELEPHONE (808) 586-4185
FACSIMILE (808) 586-4186
E-mail: oocq@health.state.hi.us

August 8, 2005

Milton Arakawa
Department of Public Works & Environmental Management
200 South High Street
Wailuku, HI 96793

Attn: Joe Krueger

Dear Mr. Arawaka:

Subject: Draft Environmental Assessment (EA), Nahiku Road Improvements

Traffic management: If Hana Highway is a one-lane road in this area, then construction activities have the capacity to cause a huge bottleneck. During this phase, how will you manage traffic to keep it flowing smoothly, especially during peak hours?

We have no other comments at this time.

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

Sincerely,

A handwritten signature in cursive script that reads "Genevieve Salmonson".

GENEVIEVE SALMONSON
Director

c: Matt Slepik, Munekiyo & Hiraga



MICHAEL T. MUNEKIYO
GWEN OHASHI HIRAGA
MITSURU "MICH" HIRANO

November 11, 2005

Genevieve Salmonson, Director
State of Hawaii
Office of Environmental Quality Control
235 South Beretania Street, Suite 702
Honolulu, Hawaii 96813

SUBJECT: Proposed Improvements to Nahiku Road, Hana, Maui, Hawaii, TMK
(2) 1-2-003:058 (por.)

Dear Ms. Salmonson:

Thank you for your letter of August 8, 2005, providing comments on the Draft Environmental Assessment for the proposed improvements to Nahiku Road in Nahiku, Maui. In response to your comment, we note that there are no anticipated traffic delays on Hana Highway from the proposed project. Work on Hana Highway at the proposed "cup-handle" turning area, primarily affects an area outside of the existing two-way travel way. As required, traffic control flaggers will be posted to facilitate the safe movement of construction equipment and vehicles working on the turning area. Should land closures be needed for project construction, such closures are not expected to be of extended duration. Traffic on Nahiku Road will be impacted, although this is a very lightly traveled roadway. Traffic movement on Nahiku Road will be directed by a flagger during construction-related activities and there are minimal impacts anticipated.

Thank you again for providing your input to the proposed action. Please feel free to contact me at (808) 244-2015 with any further comments or questions.

Very truly yours,

A handwritten signature in dark ink, appearing to read "M. Slepina", is written over the typed name.

Matthew M. Slepina, Planner

MMS:yp

cc: Joe Krueger, Department of Public Works and Environmental Management
Kevin Ho, Sato & Associates, Inc.

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DEPARTMENT OF
HOUSING AND HUMAN CONCERNS
COUNTY OF MAUI

AUG 10 2005

ALAN M. ARAKAWA
Mayor

ALICE L. LEE
Director

HERMAN T. ANDAYA
Deputy Director

200 SOUTH HIGH STREET • WAILUKU, HAWAII 96793 • PHONE (808) 270-7805 • FAX (808) 270-7165

August 10, 2005

Mr. Matthew Slepín, Planner
Munekiyo & Hiraga, Inc.
305 High Street, Suite 104
Wailuku, Hawaii 96793

Dear Mr. Slepín:

SUBJECT: PROPOSED IMPROVEMENTS TO NAHIKU ROAD

In response to your August 5, 2005 letter, we have reviewed the Draft Environmental Assessment and the Special Management Area (SMA) Use Permit Application for the subject project and wish to inform you that we do not have any comment to offer.

Thank you for the opportunity to comment. We are returning the Draft Environmental Assessment for your use.

Very truly yours,

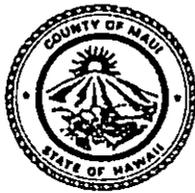
ALICE L. LEE
Director

ETO:hs

Enclosure

c: Mr. Joe Krueger
Mr. Michael Foley
Ms. Genevieve Salmonson
Mr. Edwin Okubo

ALAN M. ARAKAWA
Mayor



AUG 12 2005

GLENN T. CORREA
Director

JOHN L. BUCK III
Deputy Director

(808) 270-7230
Fax (808) 270-7934

DEPARTMENT OF PARKS & RECREATION

700 Hali'a Nako'a Street, Unit 2, Wailuku, Hawaii 96793

August 9, 2005

Mr. Matt Slepín, Planner
Munekiyo & Hiraga, Inc.
305 High Street, Suite 104
Wailuku, Hawaii 96793

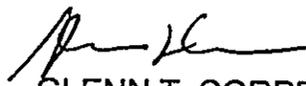
Dear Mr. Slepín:

SUBJECT: PROPOSED IMPROVEMENTS TO NAHIKU ROAD

We have reviewed the Draft Environmental Assessment for the subject project and have no comments or objections to the proposed action.

Thank you for the opportunity to review and comment. Should there be any questions, please contact Mr. Patrick Matsui, Chief of Parks Planning and Development, at 270-7387.

Sincerely,


GLENN T. CORREA
Director

c: Patrick Matsui, Chief of Parks Planning and Development
Joe Krueger, Department of Public Works & Environmental Management
Michael W. Foley, Director of Planning
Genevieve Salmonson, Director - OEQC

ALAN M. ARAKAWA
Mayor



DEPARTMENT OF WATER SUPPLY
COUNTY OF MAUI
200 SOUTH HIGH STREET
WAILUKU, MAUI, HAWAII 96793-2155
www.mauewater.org

SEP 09 2005

GEORGE Y. TENGAN
Director
ERIC H. YAMASHIGE, P.E., L.S.
Deputy Director

September 1, 2005

Mr. Joe Krueger, Project Manager
Department of Public Works and Environmental Management
200 South High Street
Wailuku, Hawaii 96793

Mr. Matt Slepín, Planner
Munekiyo & Hiraga, Inc.
305 High Street Suite 104
Wailuku HI 96793

Subject: Early Consultation Request for the Preparation of an Draft Environmental Assessment for Improvements to Nahiku Road, Hana, Maui, Hawaii TMK: 1-2-03:018

Dear Mr. Krueger and Mr. Slepín:

Thank you for the opportunity to provide comments on this Draft Environmental Assessment (EA) and application for Special management Area Use Permit. Our comment letter of January 27, 2005 is included in the EA. We have no further comments at this time.

Should you have any questions, please contact our Water Resources and Planning Division at 244-8550.

Sincerely,


George Y. Tengan, Director
emb

c: engineering division
Michael W. Foley, Department of Planning
Genevieve Salmonson, Office of Environmental Quality Control

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"By Water All Things Find Life"

Printed on recycled paper



ALAN M. ARAKAWA
Mayor

MICHAEL W. FOLEY
Director

WAYNE A. BOTEILHO
Deputy Director



COUNTY OF MAUI
DEPARTMENT OF PLANNING

September 6, 2005

SEP 08 2005

Mr. Matthew Slepín
Munekiyo & Hiraga
305 South High Street, Suite 104
Wailuku, Hawaii 96793

Dear Mr. Slepín:

RE: Draft Environmental Assessment for the Proposed Improvements to Nahiku Road located at TMK: 1-2-003:058, Hana Highway, Hana, Island of Maui, Hawaii

The Maui Planning Department (Department) has reviewed the Draft Environmental Assessment (EA) for the Proposed Improvements to Nahiku Road located at its intersection with Hana Highway.

The proposed action involves the realignment of a section of Nahiku Road and corollary improvements including grading, installation of new guardrail, construction of a retaining wall, relocating utilities, repaving small sections of roadway, and construction of a jug-handle turn-off.

The Department provides the following comments on the Draft EA document:

Section II. Affected Environment, Potential Impacts and Mitigation Measures

- a. **Climate, Topography and Soils:** Discussions should be included regarding:
 - i. How the existing erosion into Makapipi Stream will be alleviated.
 - ii. How impacts to water resources, especially Makapipi Stream, will be mitigated during the construction period.
 - iii. How impacts to air and water resources, particularly from dust, will be mitigated during construction.

Mr. Matthew Slepik
September 6, 2005
Page 2

- b. Flora and Fauna: A discussion should be included that addresses the type of vegetation that will be used to replant any disturbed areas. Native Hawaiian vegetation is recommended.
- c. Infrastructure: A discussion should be included that addresses how the proposal will be designed to alleviate erosion, especially regarding the cliff falloff undercutting the road that is occurring now.

Thank you for the opportunity to comment. Should you require further clarification, please contact Mr. Jeff Hunt, AICP, Staff Planner, at 270-6271.

Sincerely,



MICHAEL W. FOLEY
Planning Director

MWF:KAC:bsv

c: Wayne Boteilho, Deputy Planning Director
Paul Fasi, Staff Planner
Kivette Caigoy, Environmental Planner
Jeff Hunt, AICP, Staff Planner
DPWEM
OEQC
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MICHAEL T. MUNEKIYO
GWEN OHASHI HIRAGA
MITSURU "MICH" HIRANO

November 11, 2005

Michael Foley, Director
Department of Planning
County of Maui
250 South High Street
Wailuku, Hawaii 96793

**SUBJECT: Proposed Improvements to Nahiku Road, Hana, Maui, Hawaii, TMK
(2) 1-2-003:058 (por.)**

Dear Mr. Foley:

Thank you for your letter of September 6, 2005, providing comments on the proposed improvements to Nahiku Road in Nahiku, Maui. Our responses are numbered to correspond with your letter.

- a.i. The proposed improvements are being undertaken in response to an emerging situation of roadway hazard. The project scope and funding do not allow for the wider action of shoring up Makapipi Gulch. The project is limited to relocating Nahiku Road away from the area of erosion.
- a.ii. Through the use of appropriate Best Management Practices (BMPs), there are no anticipated impacts to area water resources, including Makapipi Stream. We note, in this regard, that the Department of the Army has indicated that no permits will be required from their office.
- a.iii. As No. 2 above, BMP's will be employed to mitigate environmental impacts. No substantive impacts are anticipated to result to air or water quality.
- b. The area proposed for the relocated roadway is currently variously populated by a variety of plants, most non-native, such as California grass. It is noted that a significant section of the project site lies within the County's "spray zone" and is not suitable for any significant landscaping.
- c. See No. a.i. above.

Michael Foley, Director
November 11, 2005
Page 2

Thank you again for providing your input to the proposed action. Please feel free to contact me at (808)244-2015 with any further comments or questions.

Very truly yours,



Matthew M. Slepina, Planner

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cc: Joe Krueger, Department of Public Works and Environmental Management
Kevin Ho, Sato & Associates

Maui Electric Company, Ltd. • 210 West Kamehameha Avenue • PO Box 398 • Kahului, Maui, HI 96733-6898 • (808) 871-8461

AUG 17 2005



August 15, 2005

Mr. Matt Slepín, Planner
Munekiyo & Hiraga, Inc.
305 High Street, Suite 104
Wailuku, HI 96793

Dear Mr. Slepín,

Subject: Proposed Improvements to Nahiku Road – Draft Environmental Assessment
(EA)
Nahiku, Hana District, Maui
Tax Map Key: (2) 1-2-003:058

Thank you for allowing us to comment on the subject project.

In reviewing our records and the information transmitted, Maui Electric Company (MECO) has no objections or comments to the proposed project at this time.

If you have any questions or concerns, please call Ray Okazaki at 871-2340.

Sincerely,

A handwritten signature in dark ink, appearing to read 'Neal Shinyama'. The signature is fluid and cursive, with the first name 'Neal' being more prominent.

Neal Shinyama
Manager, Engineering

NS/ro:lh

cc: Joe Krueger – Department of Public Works and Environmental Management
Michael W. Foley – Department of Planning
Genevieve Salmonson - Office of Environmental Quality Control

References

References

County of Maui, General Plan, 1990.

County of Maui, Hana Community Plan, 1994.

County of Maui, Office of Economic Development, Maui County Data Book 2003, September 2003.

Federal Emergency Management Agency, Flood Insurance Rate Map Community Panel Number 150003/0305B, June 1, 1981.

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Martin, Valeriano, Department of Fire and Public Safety, telephone conversation, January 24, 2005.

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U.S. Department of Agriculture, Soil Conservation Service, Soil Survey of the Islands of Kauai, Oahu, Maui, Molokai, and Lanai, State of Hawaii, U.S. Government Printing Office, 1972.

Appendices

Appendix A

***Flora and
Fauna Survey***

**BIOLOGICAL RESOURCES SURVEY
FOR THE PROPOSED
NAHIKU ROAD IMPROVEMENT PROJECT
NAHIKU *AHUPUA`A*, HANA DISTRICT,
MAUI, HAWAI'I
(TMK: (2) 1-2-003: 058 [portion])**

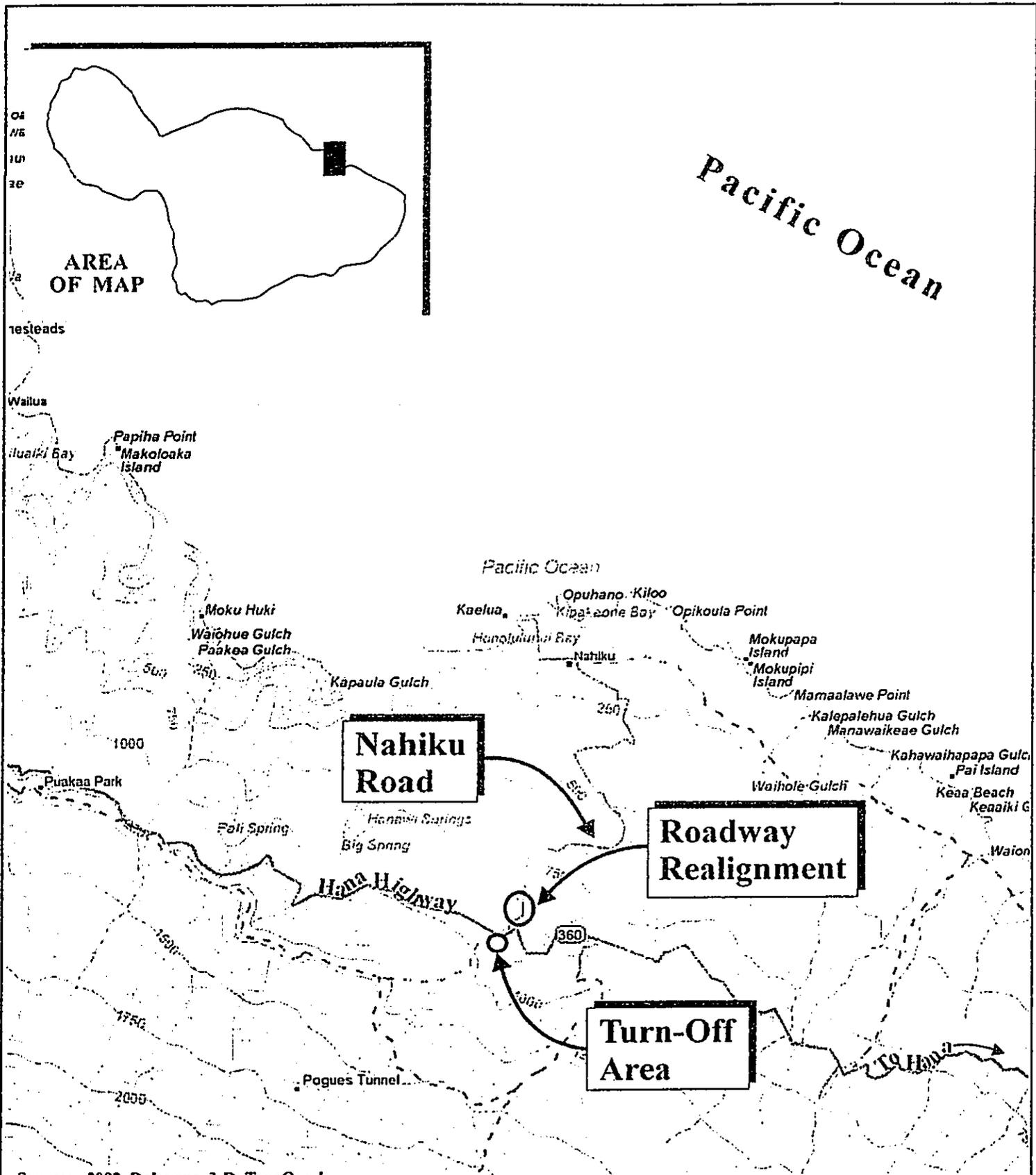
Prepared for:

**County of Maui
Department of Public Works and Environmental Management
Highways Division
Wailuku, Maui**

Prepared by:

**David Paul
Xamanek Researches, LLC
Pukalani, Maui**

April 2005



Source: 2002 DeLorme 3-D TopoQuads

Figure 1 Proposed Improvements to Nahiku Road NOT TO SCALE
Regional Location Map



Prepared for: County of Maui, Department of Public Works and Environmental Management

MUNEKIYO & HIRAGA, INC.

BIOLOGICAL RESOURCES SURVEY

SUMMARY:

Two vegetation types occur in the project area; a Wayside disturbance community and Lowland Wet Forest. No Listed Endangered or Threatened Species were found in the project area.

Critical Habitat for Endangered and Threatened Species is located along the coastline below the project area, and above the project area in the Ko'olau Forest Reserve.

The *kolea* or Pacific golden plover (*Pluvialis fulva*), a protected Migratory species, was found adjacent to the project area on Nahiku Road.

Makapipi Stream runs adjacent to the project area and may be subject to impacts due to the actions of the project.

INTRODUCTION:

On April the 9th, 2005, a Biological Resources Survey for the Nahiku Road Improvement Project in East Maui, Hawai'i, was conducted by David Paul and Erik Fredericksen of Xamanek Researches, LLC.

The survey provided information necessary to describe the vegetation and macrofauna in the area and determine if any species of vascular plant, animal, or specific habitat found there is protected under Federal or State Law, and would require consideration for planning in the actions of the project.

METHODS:

The survey was conducted by traversing the borders of the project area, and meandering through it. Every species of vascular plant and macrofauna encountered in the area were recorded. Each species of plant occurring there was placed into a Unique Biological Community. Identifying unique communities helps to locate areas that support legally protected species.

Each plant species was identified by using keys and descriptions from the *Manual of the Flowering Plants of Hawai'i* (Wagner, W.L., et al, 1990).

Each avian species was identified by using descriptions from *Hawaii's Birds* (Hawaii Audubon Society, 1993).

Unique Biological Communities were identified by using descriptions from *Vegetation* (Gagne & Cuddihy, 1990).

Plants which are given legal protection were reviewed from *Listed and Candidate Species, as Designated Under the U.S. Endangered Species Act: Hawaiian Islands Plants - Updated January 5, 2005* (USFWS, 2005).

Animals which are given legal protection were reviewed from *Listed and Candidate Species, as Designated Under the U.S. Endangered Species Act: Hawaiian Islands Animals - Updated December 23, 1997* (USFWS, 1997).

RESULTS:

The species of vascular plants which were encountered during the Biological Resources Survey are members of Unique Biological Communities. Those communities may contain species that have protection under Federal or State Law. Therefore, each species encountered during the survey were placed into a *List of Vascular Plants* (Table 1., *List of Avians* (Table 2.)), to represent each distinct form of life and show if any legally protected species occurs in the project area which would require consideration for planning. The following sections describe the vegetation and macrofauna of the project area in detail.

Unique Biological Communities:

Two vegetation types are located in the project area: a Wayside disturbance community, and Lowland Wet Forest.

The Wayside disturbance community occurs in the project area along the sides of Hana Highway and Nahiku Road. The community consists of a number of Alien species, which are routinely sprayed with glyphosate ("Round-Up"). In the project area, the Wayside community is dominated by California grass (*Brachiaria mutica*).

The Lowland Wet Forest community occurs in the project area right behind the Wayside community. It is dominated by a mixture of Alien trees, including: rose apple (*Syzygium jambos*), guava (*Psidium guajava*), paperbark (*Melaleuca quinquenervia*, tropical ash (*Fraxinus uhdei*), strawberry guava (*Psidium cattleianum*), Queensland maple (*Flindersia brayleyana*), silver oak (*Grevillea robusta*), and African tulip (*Spathodea campanulata*).

The Alien species dominated Wet Forest grades into an Endemic species dominated Wet Forest, *mauka* of the project area in the Ko'olau Forest Reserve.

There were no Endemic plant species found in the project area.

The only Indigenous species found in the project areas were ferns, and these were *uluhe* (*Dicranopteris linearis*) which was found between Hana Highway and Nahiku Road, *pakahakaha* (*Lepisorus thunbergianus*), and *puapuamoa* (*Ophioderma pendulum*) which were found as epiphytes on Alien tree species.

No Listed Endangered or Threatened plant species were found in the project area.

Avian Species Accounts:

The only avian species seen in the project area at the time of the survey was the mynah (*Acridotheres tristis*). This is due to the rain that persisted the entire time of the survey. Certainly there would be several more birds found in the project area during sunny weather.

A single *kolea* or Pacific Golden plover (*Pluvialis fulva*) was seen adjacent to the project area on Nahiku Road. The *kolea* is a protected Migratory species.

No Listed Endangered or Threatened avian species were found in the project area.

Stream Accounts:

Makapipi Stream runs adjacent to the project area and may be subject to impacts due to the actions of the project.

The dumping of construction materials into Makapipi Stream during the actions of the project may have an impact on the stream habitat. Therefore, the dumping of materials into the stream, during the actions of the project, should be avoided.

Lists of Plants and Animals:

The Lists of Plants and Animals are found at the end of this report. The List of Vascular Plants (Table 1.) reflects the vegetation found in the project area that is native or naturalized. The List of Avians (Table 2.) reflects the species that were present at the time of the survey. There will certainly be a greater number of bird species which visit the area throughout the year.

RECOMMENDATIONS:

There were no Listed Endangered or Threatened plant or animal species found in the project area at the time of the survey. As the project area lies within a repeatedly disturbed area, no Listed Endangered or Threatened plant or animal species are expected to establish in the area in the future.

The *kolea* or Pacific golden plover (*Pluvialis fulva*), a protected Migratory species, was seen adjacent to the project area on Nahiku Road. The actions of the project are not expected to disturb the *kolea*.

Makapipi Stream runs adjacent to the project area and is subject to impacts from the actions of the project.

To avoid any impacts to Makapipi Stream, the dumping of any material from the actions of the project, into the stream, should be avoided.

REFERENCES:

- Gagne, W.C., & Cuddihy, L.W. 1990. *Vegetation*. in Wagner, W.L., et al, Eds. 1990. *Manual of the Flowering Plants of Hawai'i*. University of Hawai'i Press. Honolulu, HI. Vol. 1 pp. 45-114.
- Hawaii Audubon Society. 1993. *Hawaii's Birds*. Hawaii Audubon Society. Honolulu, HI. 112p.
- USFWS. 1997. *Listed and Candidate Species, as Designated Under the U.S. Endangered Species Act: Hawaiian Islands Animals – Updated December 23, 1997*. USFWS, Pacific Islands Office. Honolulu, HI. 17p.
- USFWS. 2000. *Critical Habitat for 61 Plant Species from Maui and Kahoolawe*. USFWS, Pacific Islands Office. Honolulu, HI. 6p.
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- Wagner, W.L., Herbst, D.R., & Sohmer, S.H. 1990. *Manual of the Flowering Plants of Hawai'i*. University of Hawaii Press. Honolulu, HI. 2 vol. 1853p.

KEY TO SPECIES LISTS:

Genus / species - Binomial term given to a life form.

Common Name - Locally used term for a life form.

Distribution - Geographical origin of a species.

A = Alien; introduced to Hawai'i after 1778 AD.

P = Polynesian; introduced to Hawai'i prior to 1778 AD.

I = Indigenous; native to Hawai'i and elsewhere.

E = Endemic; unique to Hawai'i.

M = Migratory; referring to avian species.

Table 1. **List of Vascular Plant Species**

DICOTYLEDONS

FAMILY	<u>Genus / species</u>	<u>Common Name</u>	<u>Distribution</u>
ASTERACEAE		Sunflower Family	
	<u>Ageratum conyzoides</u> L.	<i>maile hohono</i>	A
	<u>Bidens pilosa</u> L.	<i>ki nehe</i>	A
	<u>Crepis capillaries</u> (L.) Wallr.	hawk's beard	A
	<u>Erectites valerianifolia</u> (Wolf) DC	fireweed	A
	<u>Synedrella nodiflora</u> (L.) Gaertn.	nodeweed	A
BALSAMINACEAE		Touch-Me-Not Family	
	<u>Impatiens walleriana</u> J.D. Hook	impatiens	A
BEGONIACEAE		Begonia Family	
	<u>Begonia hirtella</u> Link	fuzzy begonia	A

BIGNONIACEAE	Bignonia Family	
<u>Spathodea campanulata</u> P. Beauv.	African tulip	A
BRASSICACEAE	Mustard Family	
<u>Cardamine flexuosa</u> With.	Bittercress	A
CARYOPHYLLACEAE	Pink Family	
<u>Drymaria cordata</u>	<i>pipili</i>	A
(L.) Willd. ex Roem & Schult.		
CONVOLVULACEAE	Morning Glory Family	
<u>Ipomoea alba</u> L.	moon flower	A
EUPHORBIACEAE	Poinsettia Family	
<u>Phyllanthus tenellus</u> Roxb.	niruri	A
FABACEAE	Bean Family	
<u>Chamaecrista nictitans</u> (L.) Moench	partridge pea	A
<u>Mimosa pudica</u> L.	sleepy grass	A
LAURACEAE	Laurel Family	
<u>Persea americana</u> Mill.	avocado	A
LYTHRACEAE	Loosestrife Family	
<u>Cuphea carthagenensis</u> (Jacq.) Macbr.	tarweed	A
MALVACEAE	Hibiscus Family	
<u>Sida rhombifolia</u> L.	false 'ilima	A
MELASTOMATACEAE	Melastoma Family	
<u>Clidemia hirta</u> (L.) D. Don	Koster's curse	A
<u>Dissotis rotundifolia</u> (Sm.) Triana	dissotis	A
MYRTACEAE	Myrtle Family	
<u>Melaleuca quinquenervia</u> (Cav.) S.T. Blake	paperbark	A
<u>Psidium cattleianum</u> Sabine	strawberry guava	A
<u>Psidium guajava</u> L.	guava	A
<u>Syzygium jambos</u> (L.) Alston	roseapple	A
OLEACEAE	Olive Family	
<u>Fraxinus uhdei</u> (Wenzig) Lingelsh.	tropical ash	A
ONAGRACEAE	Evening Primrose Family	
<u>Ludwigia octovalis</u> (Jcq.) Raven	<i>kamole</i>	P
<u>Ludwigia palustris</u> (L.) Elliot	marsh purslane	A

OXALIDACEAE	Wood Sorrel Family	
<u>Oxalis corniculata</u> L.	<i>'ihi</i>	P
<u>Oxalis corymbosa</u> DC	pink wood sorrel	A
PLANTAGINACEAE	Plantain Family	
<u>Plantago major</u> L.	<i>laukahi</i>	A
POLYGALACEAE	Milkwort Family	
<u>Polygala paniculata</u> L.	miltwort	A
PROTEACEAE	Protea Family	
<u>Grevillea robusta</u> A. Cunn. ex R. Br.	silver oak	A
ROSACEAE	Rose Family	
<u>Rubus rosifolius</u> Sm.	thimbleberry	A
RUBIACEAE	Coffee Family	
<u>Coffea arabica</u> L.	coffee	A
RUTACEAE	Citrus Family	
<u>Flindersia brayleyana</u> F.v. Muell.	Queensland maple	A
SCROPHULARIACEAE	Snapdragon Family	
<u>Castilleja arvensis</u> Cham. & Schlectend.	Indian paintbrush	A
URTICACEAE	Nettle Family	
<u>Pilea microphylla</u> (L.) Liebm.	artillery plant	A
VERBENACEAE	Verbena Family	
<u>Stachytarpheta urticifolia</u> (Salisb.) Sims	nettle-leaved vervain	A

MONOCOTYLEDONS

ARACEAE	Taro Family	
<u>Epipremnum pinnatum</u> (L.) Engl.	taro vine	A
COMMELINACEAE	Spiderwort Family	
<u>Commelina diffusa</u> N.L. Burm.	<i>honohono</i>	A
CYPERACEAE	Sedge Family	
<u>Fimbristylus dichotoma</u> (L.) Vahl	-	I
<u>Kyllinga brevifolia</u> Rottb.	<i>kili'o'opu</i>	A
<u>Pycreus polystachyos</u> (Rottb.) P. Beauv.	nutgrass	I

<u>Rhynchospora caduca</u> Elliot	beak-rush	A
ORCHIDACEAE	Orchid Family	
<u>Spathoglottis plicata</u> Blume	Philippine ground orchid	A
POACEAE	Grass Family	
<u>Axonopus fissifolius</u> (Raddi) Kuhl	carpetgrass	A
<u>Brachiaria mutica</u> (Forssk.) Stapf	California grass	A
<u>Digitaria ciliaris</u> (Retz) Koeler	crabgrass	A
<u>Digitaria violescens</u> Link	violet crabgrass	A
<u>Oplismenus hirtellus</u> (L.) P. Beauv.	<i>honohono</i>	A
<u>Panicum maximum</u> Jacq.	Guinea grass	A
<u>Paspalum conjugatum</u> Bergius	Hilo grass	A
<u>Sacciolepis indica</u> (L.) Chase	Glenwood grass	A
<u>Setaria gracilis</u> Kunth	yellow foxtail	A
ZINGIBERACEAE	Ginger Family	
<u>Hedychium flavescens</u> N. Carey ex Roscoe	yellow ginger	
PTERIDOPHYTES		
BLECHNACEAE	Blechnum Fern Family	
<u>Blechnum appendiculatum</u> Willd.	blechnum	A
GLEICHENIACEAE	Wing-Fern Family	
<u>Dicranopteris linearis</u> (Burm. f.) Underw.	<i>uluhe</i>	I
NEPHROLEPIDACEAE	Sword Fern Family	
<u>Nephrolepis multiflora</u> (Roxb.) F.M. Jarrett ex C.V. Morton	sword fern	A
OPHIOGLOSSACEAE	Adder's Tongue Fern Family	
<u>Ophioderma pendulum</u> subsp. <u>pendulum</u> (L.) C. Presl	<i>puapuamoa</i>	I
POLYPODIACEAE	Common Fern Family	
<u>Lepisorus thunbergianus</u> (Kaulf.) Ching	<i>pakahakaha</i>	I
<u>Phlebodium aureum</u> (L.) J. Sm.	<i>laua'e haole</i>	A
THELYPTERIDACEAE	Wood Fern Family	
<u>Christella dentata</u> (Forssk.) Brownsey & Jermy	wood fern	A

Table 2.

List of Avian Species

<u>Genus / species</u>	<u>Common Name</u>	<u>Distribution</u>
<u>Pluvialis fulva</u>	<i>kolea</i> / Pacific golden plover	M
<u>Acridotheres tristis</u>	mynah bird	A

Appendix B

***Archaeological
Field Survey***

**XAMANЕК RESEARCHES, LLC
P.O. BOX 880131
PUKALANI, MAUI, HI 96788
Phone/Fax: 572-8900
Phone/Fax: 572-6118**

**State Historic Preservation Division Maui Office
Department of Land and Natural Resources Annex
Wailuku, Maui
Fax: 243-5838**

**Attn.: Dr. Melissa Kirkendall, SHPD Maui Office,
Ms. Cathleen Dagher, SHPD Kapolei Office**

26 April 2005

Subject: A letter report on the results of an archaeological field inspection for the proposed Nahiku Road Improvements Project, located in Nahiku *Ahupua`a*, Hana District, Maui (TMK: (2) 1-2-003: 058 [portion]). This field inspection has been undertaken per the direction of Mr. Matthew Slepın, planner with Munekiyo & Hiraga, Inc. (Reference SHPD DOC NO: 0504CD10).

Mr. Matthew Slepın, planner with Munekiyo & Hiraga, Inc., contacted Xamanek Researches, LLC and requested that we carry out an archaeological field inspection for the proposed Nahiku Road Improvements Project in Nahiku, Maui. The project area is located along Hana Highway and the upper c. 200 feet of Nahiku Road. This request was in response to verbal communication with the State Historic Preservation Division (SHPD) and an early consultation letter from the SHPD, which indicated that an archaeological field inspection was needed for this project (reference SHPD DOC NO: 0504CD10).¹ The results of our 8 April 2005 field inspection of the project corridor follow below.

The project area is located within a portion of the Hana Highway right-of-way, and includes the upper portion of Nahiku Road (Figures 1 and 2). The study area consists of a c. 100-meter long section of the County right-of-way along Hana Highway and the upper portion of Nahiku Road. Makapipi Gulch lies adjacent to and northwest of the study corridor. The approximate elevations of the study area range from a low of about 850 ft AMSL at the lower portion of Nahiku Road to a high of over 900 ft AMSL near Makapipi Bridge (Photographs 1-3).

The study corridor was vacant at the time of our inspection, but the roadside grass and other vegetation appeared to have been recently cut and portions sprayed with an herbicide such as Round Up. The study area has also been impacted by previous earthmoving activities associated with road maintenance, as well as some recent

¹ Erik Fredericksen previously contacted Dr. Melissa Kirkendall, SHPD Maui staff archaeologist, and she indicated that an archaeological field inspection would be required for the project.

rainwater erosion on a portion of Nahiku Road. Some relatively recently deposited refuse was noted along the roadside.

It was possible to walk the entire length of the project area and also inspect the ground surface within the right-of-way. Surface visibility was generally good, and the base of Makapipi Gulch could be seen from much of the extreme roadside edge of the corridor. It is estimated that this streambed lies c. 40-60 feet below the project area, with an essentially vertical drop-off from the road shoulder area.

Discussion

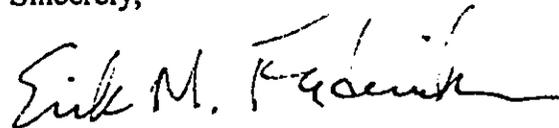
There were no significant material culture remains noted in the County right-of-way, such as Hawaiian habitation and/or agricultural features. Visibility was generally good and it was possible to inspect the area that will be impacted by the proposed road improvements.

Summary and Conclusion

As noted above, there was no sign of any remnant Hawaiian habitation or agricultural activities encountered during the field inspection of the corridor. Consequently, it does not appear that further archaeological investigation is warranted at this time. However, in the event that significant material culture remains are encountered during any future earthmoving activities on the project area, the State Historic Preservation Division will need to be immediately notified. Appropriate mitigation measures will then need to be carried out. It is our understanding at the writing of this report that the proposed road improvements will not affect the Makapipi Bridge, which qualifies for importance under multiple federal and state historic preservation criteria. In the event that road design plans change and this bridge will be impacted by this project, it is strongly recommended the SHPD Architectural Branch first be notified, prior to final design submittal.

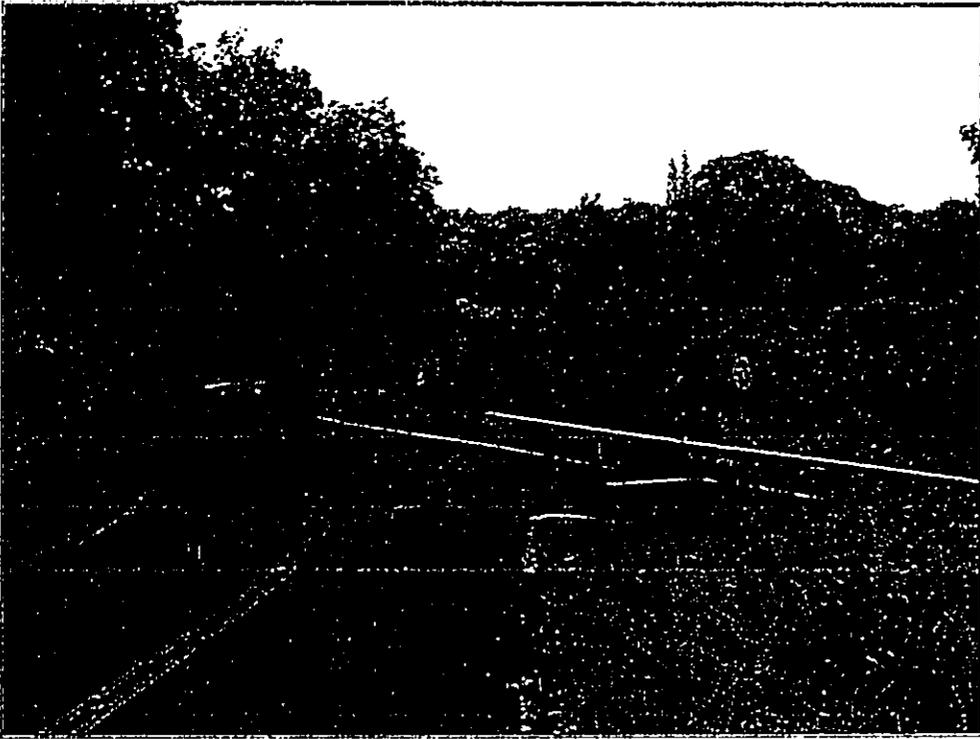
Please feel free to contact me @ 572-6118 should you have any questions or need additional information regarding this archaeological field inspection letter report for the proposed Nahiku Road Improvements Project in Nahiku, Maui.

Sincerely,



Erik M. Fredericksen

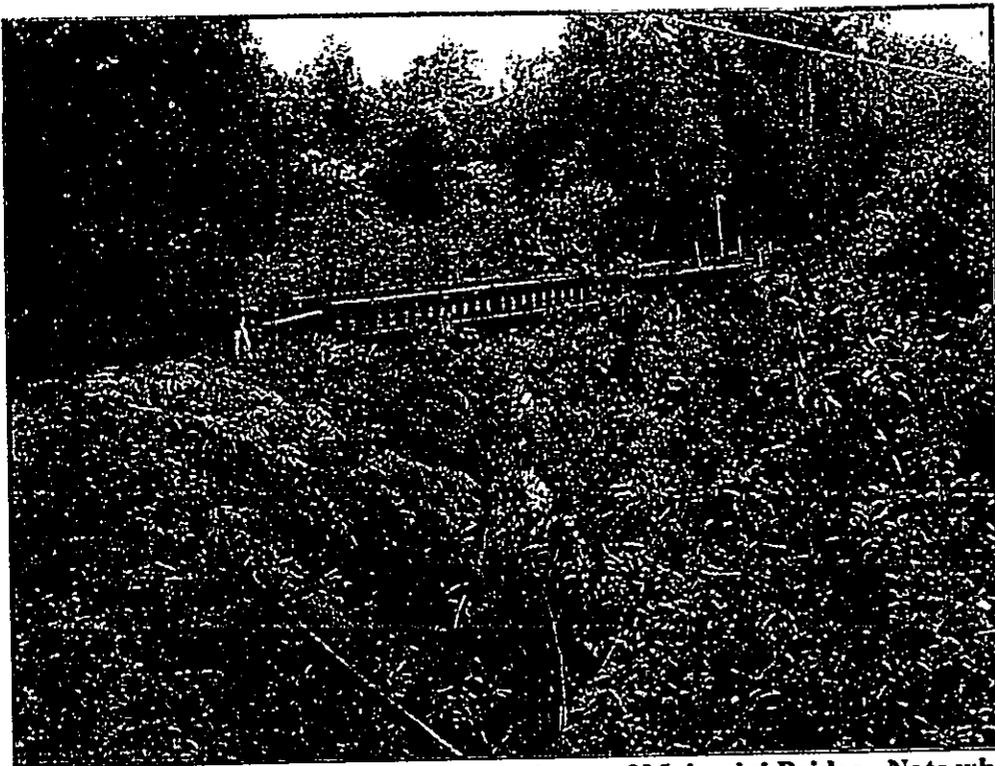
Photographs 1-3



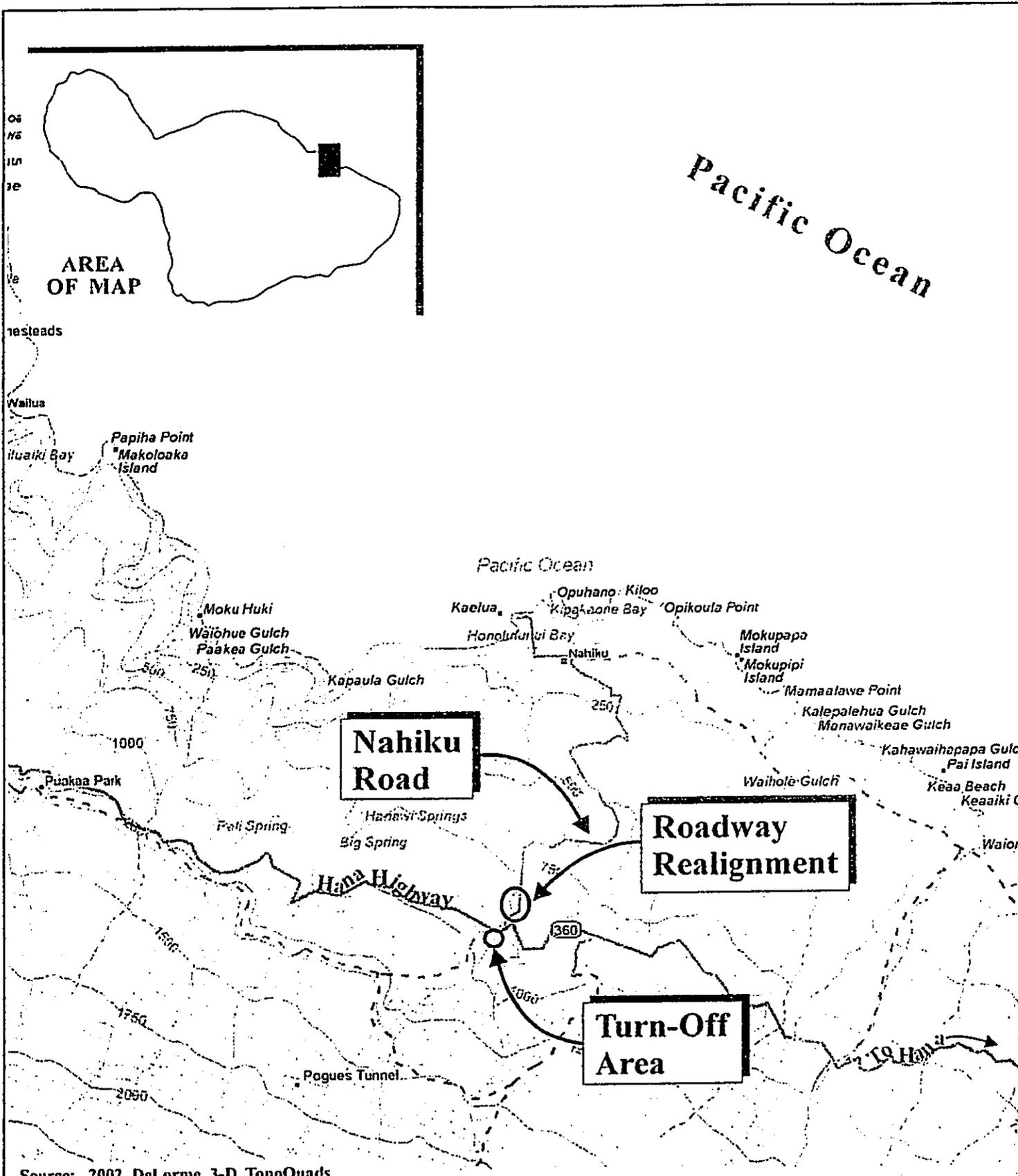
Photograph 1 – General view across southern portion of project area. Photograph taken for Hana Highway.



Photograph 2 – General view across the southeastern portion of the project area towards Hana Highway.



Photograph 3 – General view to the southeast of Makapipi Bridge. Note white water flow in the stream on the day of the survey.



Source: 2002 DeLorme 3-D TopoQuads

Figure 1

Proposed Improvements to
Nahiku Road
Regional Location Map

NOT TO SCALE



Prepared for: County of Maui, Department of Public
Works and Environmental Management

MUNEKIYO & HIRAGA, INC.

Appendix C

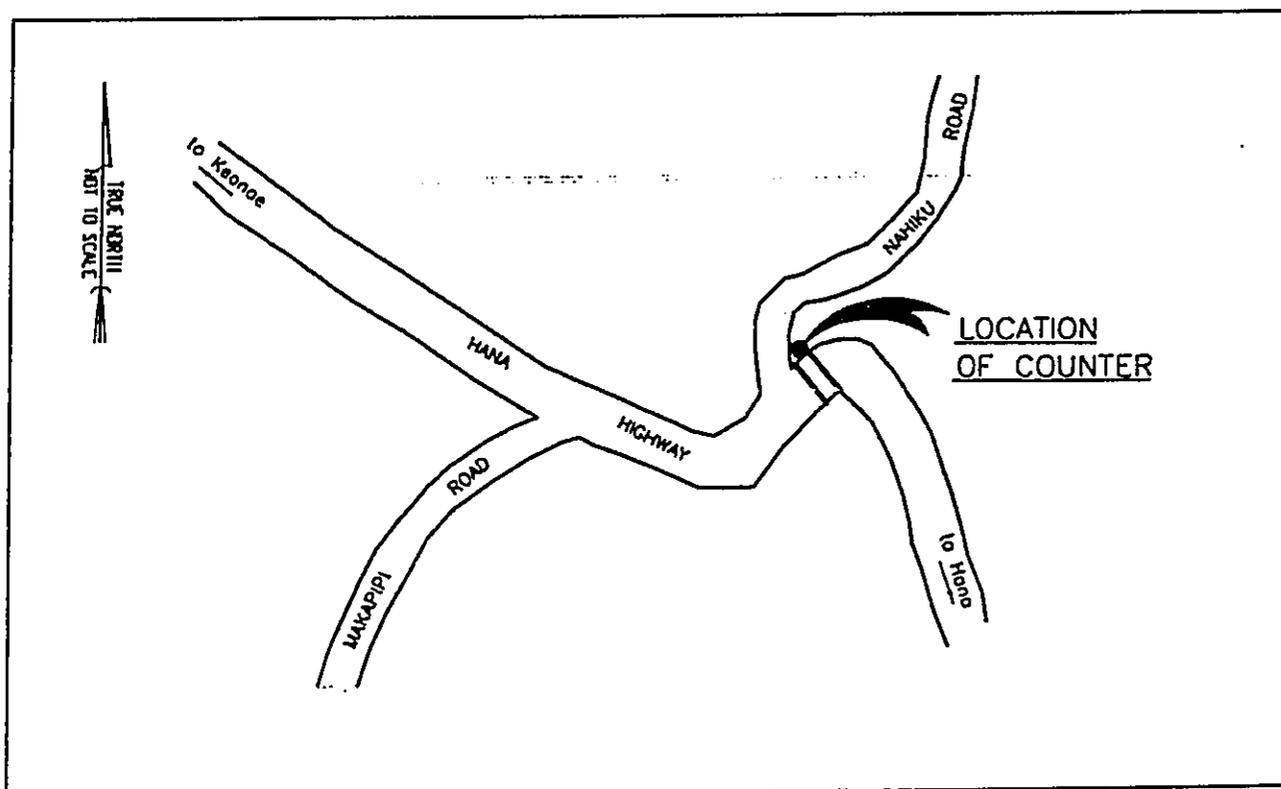
Traffic Counts

**COUNTY OF MAUI
DEPARTMENT OF PUBLIC WORKS AND ENVIRONMENTAL MANAGEMENT**

Location:	HANA HIGHWAY	Axle Count:	5,479
Area:	NAHIKU	Axles Not Used:	287
Start Date & Time:	September 22, 2005, 12:00 NOON	Percentage Utilized:	94.8%
End Date & Time:	September 23, 2005, 11:00 AM		

SPEED BIN SUMMARY

	September 22 Thursday Partial	September 23 Friday Partial
Number of Vehicles:	977	277
Average Speed:	17	18
50th Percentile Speed:	17.3	18.2
85th Percentile Speed:	21.2	22.1
Pace Speed (10 mph):	11-21	15-25
Number in Pace:	819	233
Percentage in Pace:	83.8%	84.1%



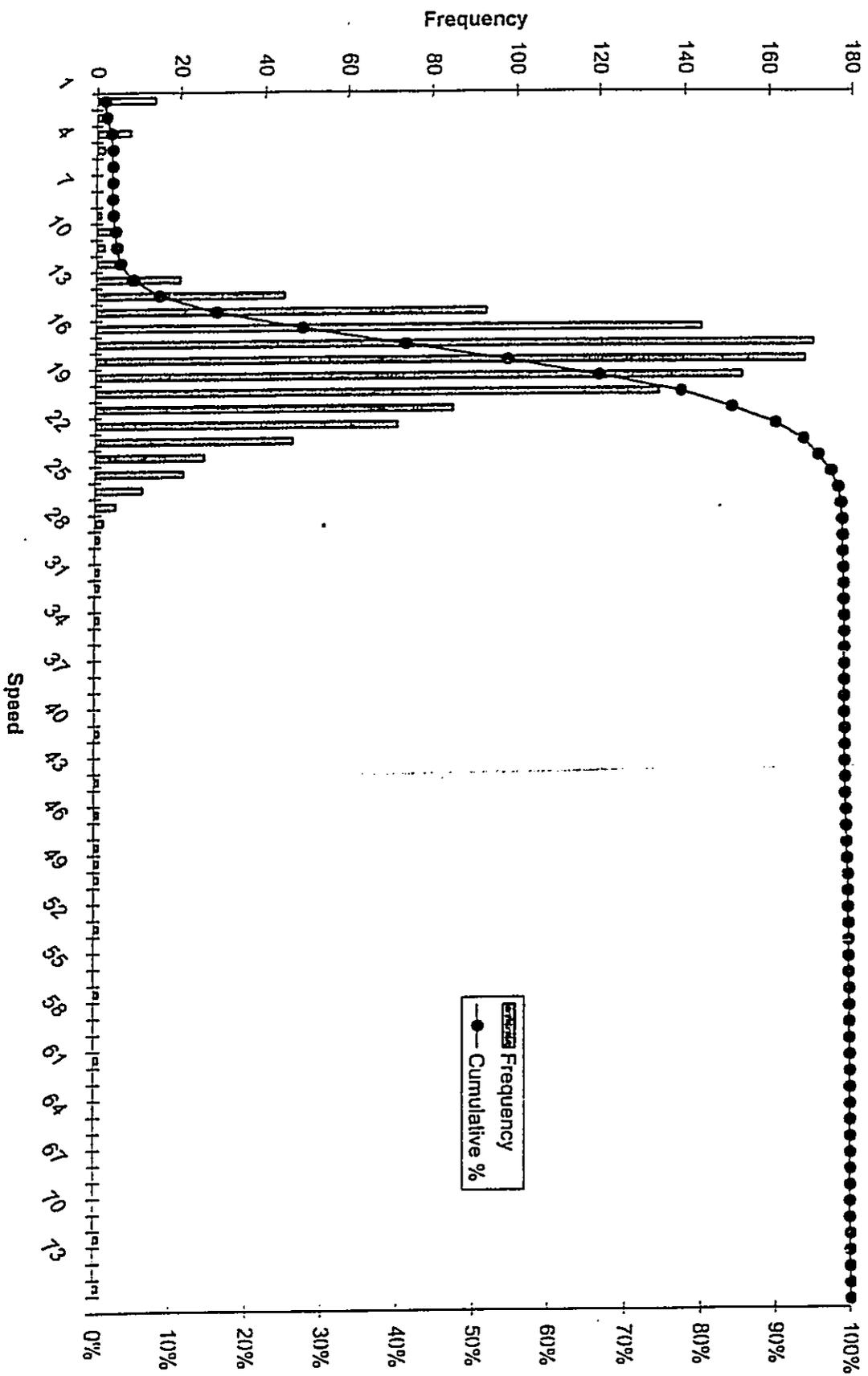
HANA HIGHWAY SPEED STUDY
Time Period: 9/22-23/2005

Speed	Frequency	Cumulative %	Speed	Frequency	Cumulative %
1	14	1.12%	38	0	99.12%
2	3	1.36%	39	0	99.12%
3	8	1.99%	40	1	99.20%
4	2	2.15%	41	0	99.20%
5	0	2.15%	42	0	99.20%
6	0	2.15%	43	1	99.28%
7	0	2.15%	44	0	99.28%
8	1	2.23%	45	1	99.36%
9	4	2.55%	46	0	99.36%
10	2	2.71%	47	1	99.44%
11	6	3.19%	48	1	99.52%
12	20	4.78%	49	1	99.60%
13	45	8.37%	50	0	99.60%
14	93	15.79%	51	0	99.60%
15	144	27.27%	52	1	99.68%
16	171	40.91%	53	0	99.68%
17	169	54.39%	54	0	99.68%
18	154	66.67%	55	0	99.68%
19	134	77.35%	56	1	99.76%
20	85	84.13%	57	0	99.76%
21	72	89.87%	58	0	99.76%
22	47	93.62%	59	0	99.76%
23	26	95.69%	60	1	99.84%
24	21	97.37%	61	0	99.84%
25	11	98.25%	62	0	99.84%
26	5	98.64%	63	0	99.84%
27	2	98.80%	64	0	99.84%
28	1	98.88%	65	0	99.84%
29	0	98.88%	66	0	99.84%
30	1	98.96%	67	0	99.84%
31	1	99.04%	68	0	99.84%
32	0	99.04%	69	0	99.84%
33	1	99.12%	70	0	99.84%
34	0	99.12%	71	1	99.92%
35	0	99.12%	72	0	99.92%
36	0	99.12%	73	0	99.92%
37	0	99.12%	74	1	100.00%
38	0	99.12%			
39	0	99.12%	Total	1,254	

Speed	
Mean	17.40
Standard Error	0.14
Median	17.15
Mode	17.30
Standard Deviation	5.11
Sample Variance	26.13
Kurtosis	34.06
Skewness	3.35
Range	73.60
Minimum	0.2
Maximum	74
Sum	21,822
Count	1,254
Confidence Level(95.0%)	0.28

Pace	
10 MPH Speed Increment	13-22
Number in Pace	1,114
Percentage in Pace	88.8%

HANA HIGHWAY SPEED STUDY
Time Period: 9/22-23, 2005



Vehicle Speed Summary

STREET : HANA HIGHWAY
 AREA : NAHIKU
 TMK : N/A

Site: D2
 Date: 09/22/05

Direction: WB +EB

Begin Time	Total	1-5 MPH	6-10 MPH	11-15 MPH	15-20 MPH	21-25 MPH	26-30 MPH	31-35 MPH	36-40 MPH	41-45 MPH	46-50 MPH	51-55 MPH	56-60 MPH	61-99 MPH	Avg
12:AM															
01:00															
02:00															
03:00															
04:00															
05:00															
06:00															
07:00															
08:00															
09:00															
10:00															
11:00															
12:PM	177	0	1	47	103	23	2	0	0	1	0	0	0	0	17
01:00	174	0	0	44	100	22	2	2	0	0	1	0	2	1	18
02:00	135	0	3	40	69	18	1	0	1	1	1	1	0	0	18
03:00	127	0	0	45	66	14	2	0	0	0	0	0	0	0	17
04:00	135	0	2	33	73	25	0	0	0	0	1	0	0	1	18
05:00	108	0	1	34	66	7	0	0	0	0	0	0	0	0	16
06:00	54	0	0	18	30	6	0	0	0	0	0	0	0	0	17
07:00	37	0	1	13	20	3	0	0	0	0	0	0	0	0	16
08:00	14	0	0	2	8	4	0	0	0	0	0	0	0	0	18
09:00	7	0	0	0	4	3	0	0	0	0	0	0	0	0	20
10:00	5	0	0	0	2	3	0	0	0	0	0	0	0	0	21
11:00	4	0	0	1	1	2	0	0	0	0	0	0	0	0	19
Daily Totals	977	0	8	277	542	130	7	2	1	2	3	1	2	2	17

Percent of Total	0.0	0.8	28.4	55.5	13.3	0.7	0.2	0.1	0.2	0.3	0.1	0.2	0.2
------------------	-----	-----	------	------	------	-----	-----	-----	-----	-----	-----	-----	-----

Percentile Speeds	<u>10%</u>	<u>15%</u>	<u>50%</u>	<u>85%</u>	<u>90%</u>
	12.6	13.5	17.3	21.2	23.0

10 MPH Pace Speed : 11 - 21
 Number in pace : 819
 % in pace : 83.8

Speed Exceeded : 35 MPH 45 MPH 55 MPH
 Percentage : 1.1 0.8 0.4
 Totals : 11 8 4

Vehicle Speed Summary

STREET : HANA HIGHWAY
 AREA : NAHIKU
 TMK : N/A

Site: D2
 Date: 09/23/05

Direction: WB +EB

Begin Time	Total	1-5 MPH	6-10 MPH	11-15 MPH	15-20 MPH	21-25 MPH	26-30 MPH	31-35 MPH	36-40 MPH	41-45 MPH	46-50 MPH	51-55 MPH	56-60 MPH	61-99 MPH	Avg
12:AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
01:00	2	0	0	0	1	1	0	0	0	0	0	0	0	0	20
02:00	1	0	0	0	0	1	0	0	0	0	0	0	0	0	23
03:00	2	0	0	0	0	2	0	0	0	0	0	0	0	0	23
04:00	2	0	0	0	1	1	0	0	0	0	0	0	0	0	20
05:00	11	0	0	0	8	2	0	0	0	0	1	0	0	0	21
06:00	30	0	0	6	21	3	0	0	0	0	0	0	0	0	17
07:00	31	0	0	8	13	10	0	0	0	0	0	0	0	0	18
08:00	44	0	0	6	28	9	1	0	0	0	0	0	0	0	18
09:00	50	0	0	8	34	7	1	0	0	0	0	0	0	0	18
10:00	104	0	0	13	78	13	0	0	0	0	0	0	0	0	18
11:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
12:PM	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
01:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
02:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
03:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
04:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
05:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
06:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
07:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
08:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
09:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
10:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
11:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Daily Totals	277	0	0	41	184	49	2	0	0	0	1	0	0	0	18
Percent of Total		0.0	0.0	14.8	66.4	17.7	0.7	0.0	0.0	0.0	0.4	0.0	0.0	0.0	

Percentile Speeds	10%	15%	50%	85%	90%
	14.4	15.0	18.2	22.1	23.6

MPH Pace Speed : 15 - 25
 Number in pace : 233
 % in pace : 84.1

Speed Exceeded	35 MPH	45 MPH	55 MPH
Percentage	0.4	0.4	0.0
Totals	1	1	0

Vehicle Count Summary

STREET : HANA HIGHWAY
 AREA : NAHIKU
 TMK : N/A

Site: D2
 Date: 09/22/05

Interval Begin	WB		EB		Combined		Day:
	AM	PM	AM	PM	AM	PM	
12:00	*	7 47	*	29 130	*	36 177	Thursday
12:15	*	5	*	42	*	47	
12:30	*	17	*	30	*	47	
12:45	*	18	*	29	*	47	
01:00	*	15 72	*	35 102	*	50 174	
01:15	*	22	*	18	*	40	
01:30	*	19	*	36	*	55	
01:45	*	16	*	13	*	29	
02:00	*	14 59	*	14 76	*	28 135	
02:15	*	12	*	25	*	37	
02:30	*	14	*	12	*	26	
02:45	*	19	*	25	*	44	
03:00	*	19 81	*	18 46	*	37 127	
03:15	*	20	*	9	*	29	
03:30	*	22	*	6	*	28	
03:45	*	20	*	13	*	33	
04:00	*	19 85	*	13 50	*	32 135	
04:15	*	25	*	13	*	38	
04:30	*	26	*	9	*	35	
04:45	*	15	*	15	*	30	
05:00	*	34 84	*	6 24	*	40 108	
05:15	*	16	*	6	*	22	
05:30	*	18	*	9	*	27	
05:45	*	16	*	3	*	19	
06:00	*	15 43	*	1 11	*	16 54	
06:15	*	12	*	1	*	13	
06:30	*	9	*	5	*	14	
06:45	*	7	*	4	*	11	
07:00	*	3 27	*	4 10	*	7 37	
07:15	*	7	*	2	*	9	
07:30	*	6	*	2	*	8	
07:45	*	11	*	2	*	13	
08:00	*	2 6	*	2 8	*	4 14	
08:15	*	3	*	2	*	5	
08:30	*	0	*	3	*	3	
08:45	*	1	*	1	*	2	
09:00	*	0 2	*	1 5	*	1 7	
09:15	*	2	*	0	*	2	
09:30	*	0	*	2	*	2	
09:45	*	0	*	2	*	2	
10:00	*	0 0	*	2 5	*	2 5	
10:15	*	0	*	0	*	0	
10:30	*	0	*	0	*	0	
10:45	*	0	*	3	*	3	
11:00	*	0 0	*	4 4	*	4 4	
11:15	*	0	*	0	*	0	
11:30	*	0	*	0	*	0	
11:45	*	0	*	0	*	0	
Totals	0	506	0	471	0	977	
Split%	*	51.8	*	48.2	*		
Day Totals		506		471		977	
Day Splits		51.8		48.2			
Peak Hour	*	04:15	*	12:15	*	12:45	
Volume	*	100	*	136	*	192	
Factor	*	0.74	*	0.81	*	0.87	

Vehicle Count Summary

STREET : HANA HIGHWAY
 AREA : NAHIKU
 MK : N/A

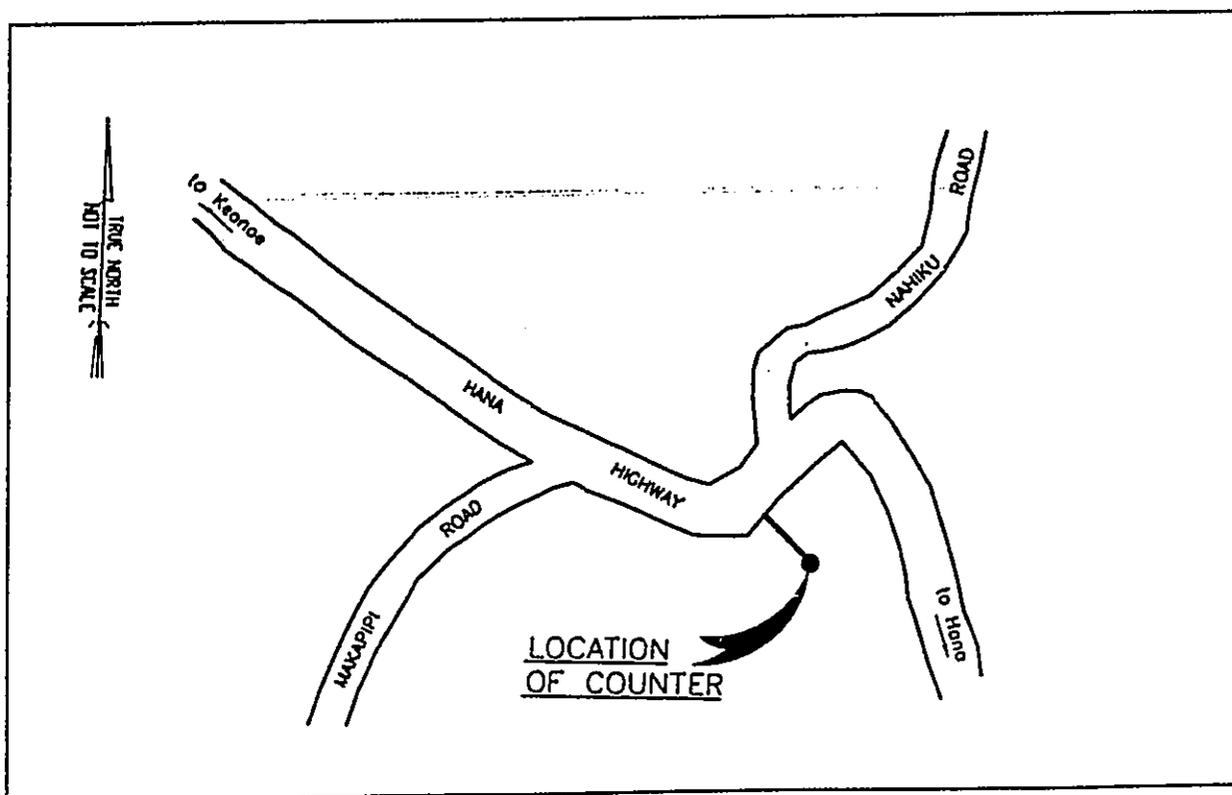
Site: D2
 Date: 09/23/05

Interval Begin	WB		EB			Combined		Day:	Friday
	AM	PM	AM	PM	AM	PM			
12:00	0	0	*	0	0	*	0	0	*
12:15	0		*	0		*	0		*
12:30	0		*	0		*	0		*
12:45	0		*	0		*	0		*
01:00	0	0	*	1	2	*	1	2	*
01:15	0		*	0		*	0		*
01:30	0		*	0		*	0		*
01:45	0		*	1		*	1		*
02:00	0	0	*	0	1	*	0	1	*
02:15	0		*	0		*	0		*
02:30	0		*	1		*	1		*
02:45	0		*	0		*	0		*
03:00	1	2	*	0	0	*	1	2	*
03:15	0		*	0		*	0		*
03:30	0		*	0		*	0		*
03:45	1		*	0		*	1		*
04:00	2	2	*	0	0	*	2	2	*
04:15	0		*	0		*	0		*
04:30	0		*	0		*	0		*
04:45	0		*	0		*	0		*
05:00	3	11	*	0	0	*	3	11	*
05:15	2		*	0		*	2		*
05:30	1		*	0		*	1		*
05:45	5		*	0		*	5		*
06:00	1	18	*	2	12	*	3	30	*
06:15	4		*	1		*	5		*
06:30	4		*	4		*	8		*
06:45	9		*	5		*	14		*
07:00	2	12	*	7	19	*	9	31	*
07:15	2		*	6		*	8		*
07:30	5		*	5		*	10		*
07:45	3		*	1		*	4		*
08:00	7	26	*	4	18	*	11	44	*
08:15	3		*	5		*	8		*
08:30	8		*	2		*	10		*
08:45	8		*	7		*	15		*
09:00	6	17	*	8	33	*	14	50	*
09:15	1		*	6		*	7		*
09:30	5		*	12		*	17		*
09:45	5		*	7		*	12		*
10:00	6	21	*	15	83	*	21	104	*
10:15	3		*	14		*	17		*
10:30	5		*	27		*	32		*
10:45	7		*	27		*	34		*
11:00	*		*	*		*	*		*
11:15	*		*	*		*	*		*
11:30	*		*	*		*	*		*
11:45	*		*	*		*	*		*
Totals	109	0	*	168	0	*	277	0	*
%	39.4		*	60.6		*			*
Day Totals	109			168			277		
Day Splits	39.4			60.6					
Hour	08:00		*	10:00		*	10:00		*
Time	26		*	83		*	104		*
Factor	0.81		*	0.77		*	0.76		*

**COUNTY OF MAUI
DEPARTMENT OF PUBLIC WORKS AND ENVIRONMENTAL MANAGEMENT**

Location:	HANA HIGHWAY	Axle Count:	N/A
Area:	NAHIKU TURN OUT AREA	Axles Not Used:	N/A
Start Date & Time:	September 22, 2005, 11:30 AM	Percentage Utilized:	N/A
End Date & Time:	September 23, 2005, 11:30 AM		

SPEED BIN SUMMARY	September 22 Thursday Partial	September 23 Friday Partial
Number of Vehicles:	14	3
Average Speed:	N/A	N/A
50th Percentile Speed:	N/A	N/A
85th Percentile Speed:	N/A	N/A
Pace Speed (10 mph):	N/A	N/A
Number in Pace:	N/A	N/A
Percentage in Pace:	N/A	N/A



Vehicle Count Summary

STREET : HANA HIGHWAY
 AREA : TURN OUT AREA
 TMK : N/A

Site: D4
 Date: 09/22/05

Interval	AM - EB	PM - EB	Day:
Begin			Thursday
12:00	.	0	2
12:15	.	0	
12:30	.	1	
12:45	.	1	
1:00	.	1	2
1:15	.	1	
1:30	.	0	
1:45	.	0	
2:00	.	1	2
2:15	.	1	
2:30	.	0	
2:45	.	0	
3:00	.	1	1
3:15	.	0	
3:30	.	0	
3:45	.	0	
4:00	.	1	2
4:15	.	0	
4:30	.	1	
4:45	.	0	
5:00	.	0	0
5:15	.	0	
5:30	.	0	
5:45	.	0	
6:00	.	0	0
6:15	.	0	
6:30	.	0	
6:45	.	0	
7:00	.	0	0
7:15	.	0	
7:30	.	0	
7:45	.	0	
8:00	.	0	0
8:15	.	0	
8:30	.	0	
8:45	.	0	
9:00	.	0	0
9:15	.	0	
9:30	.	0	
9:45	.	0	0
10:00	.	0	
10:15	.	0	
10:30	.	0	
10:45	.	0	
11:00	.	1	1
11:15	.	0	
11:30	.	0	
11:45	.	0	
Totals	4	10	
Peak Hour		12:30	
Volume		4	
Factor		1.	
DayTotal	14		

Vehicle Count Summary

STREET : HANA HIGHWAY
 AREA : TURN OUT AREA
 TMK : N/A

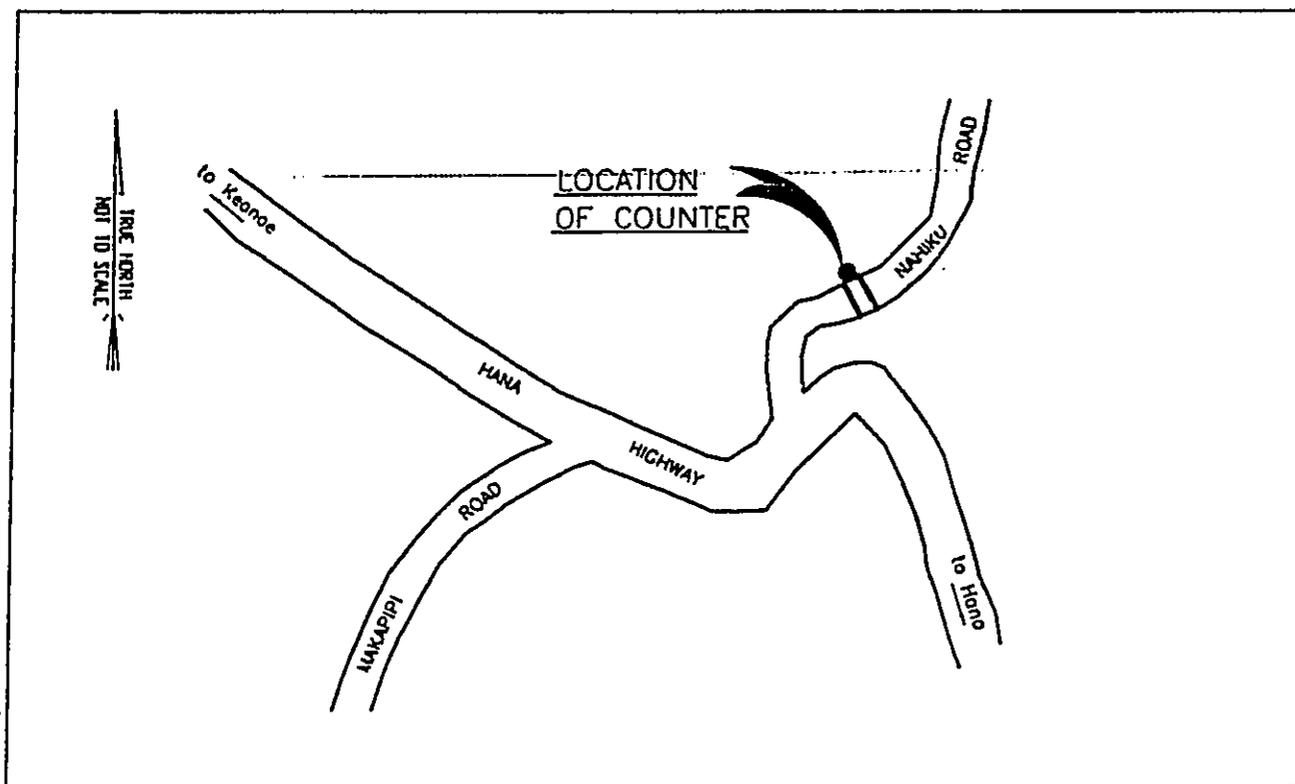
Site: D4
 Date: 09/23/05

Interval	Day: Friday	
Begin	AM - EB	PM - EB
12:00	0	0
12:15	0	0
12:30	0	0
12:45	0	0
1:00	0	0
1:15	0	0
1:30	0	0
1:45	0	0
2:00	0	0
2:15	0	0
2:30	0	0
2:45	0	0
3:00	0	0
3:15	0	0
3:30	0	0
3:45	0	0
4:00	0	0
4:15	0	0
4:30	0	0
4:45	0	0
5:00	0	0
5:15	0	0
5:30	0	0
5:45	0	0
6:00	0	0
6:15	0	0
6:30	0	0
6:45	0	0
7:00	0	0
7:15	0	0
7:30	0	0
7:45	0	0
8:00	0	0
8:15	0	0
8:30	0	0
8:45	0	0
9:00	0	1
9:15	0	0
9:30	1	0
9:45	0	2
10:00	1	0
10:15	0	0
10:30	0	0
10:45	1	0
11:00	0	0
11:15	0	0
11:30	0	0
11:45	0	0
Totals	3	0
Peak Hour	9:15	0
Volume	2	0
Factor	0.5	0
WayTotal	3	0

**COUNTY OF MAUI
DEPARTMENT OF PUBLIC WORKS AND ENVIRONMENTAL MANAGEMENT**

Location:	NAHIKU ROAD	Axle Count:	1,011
Area:	NAHIKU	Axles Not Used:	73
Start Date & Time:	September 22, 2005, 12:00 NOON	Percentage Utilized:	92.8%
End Date & Time:	September 23, 2005, 12:00 NOON		

SPEED BIN SUMMARY	September 22	September 23
	Thursday	Friday
Number of Vehicles:	<u>Partial</u> 156	<u>Partial</u> 76
Average Speed:	20	22
50th Percentile Speed:	21.4	22.2
85th Percentile Speed:	25.1	26.4
Pace Speed (10 mph):	15-25	15-25
Number in Pace:	137	62
Percentage in Pace:	87.8%	81.6%



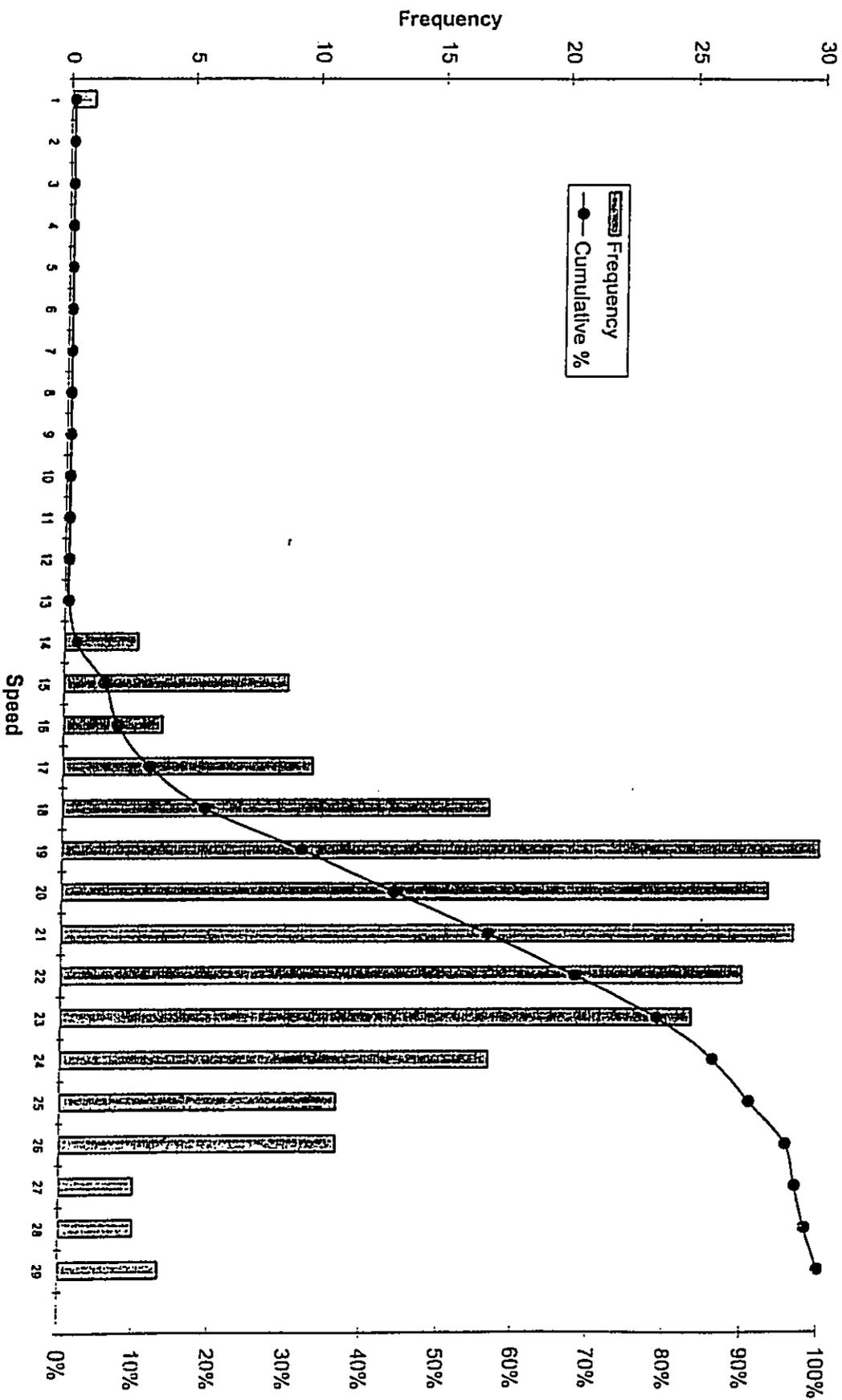
NAHIKU ROAD SPEED STUDY
Time Period: 9/22-23/2005

Speed	Frequency	Cumulative %
1	1	.43%
2	0	.43%
3	0	.43%
4	0	.43%
5	0	.43%
6	0	.43%
7	0	.43%
8	0	.43%
9	0	.43%
10	0	.43%
11	0	.43%
12	0	.43%
13	0	.43%
14	3	1.72%
15	9	5.60%
16	4	7.33%
17	10	11.64%
18	17	18.97%
19	30	31.90%
20	28	43.97%
21	29	56.47%
22	27	68.10%
23	25	78.88%
24	17	86.21%
25	11	90.95%
26	11	95.69%
27	3	96.98%
28	3	98.28%
29	4	100.00%
Total	232	100.00%

Speed	
Mean	21.00
Standard Error	0.22
Median	21.00
Mode	22.40
Standard Deviation	3.36
Sample Variance	11.28
Kurtosis	4.89
Skewness	-0.79
Range	28.60
Minimum	0.8
Maximum	29
Sum	4,872
Count	232
Confidence Level(95.0%)	0.43

Pace	
10 MPH Speed Increment	17-26
Number in Pace	205
Percentage in Pace	88.4%

NAHIKU ROAD SPEED STUDY
 Time Period: 9/22-23, 2005



Vehicle Speed Summary

STREET : NAHIKU ROAD
 AREA : NAHIKU
 TMK : N/A

Site: D5
 Date: 09/22/05

Direction: SB +NB

Begin Time	Total	1-5 MPH	6-10 MPH	11-15 MPH	15-20 MPH	21-25 MPH	26-30 MPH	31-35 MPH	36-40 MPH	41-45 MPH	46-50 MPH	51-55 MPH	56-60 MPH	61-99 MPH	Avg
12:AM															
01:00															
02:00															
03:00															
04:00															
05:00															
06:00															
07:00															
08:00															
09:00															
10:00															
11:00															
12:PM	35	0	0	2	15	17	1	0	0	0	0	0	0	0	20
01:00	28	0	0	1	19	8	0	0	0	0	0	0	0	0	19
02:00	20	0	0	1	6	13	0	0	0	0	0	0	0	0	21
03:00	16	0	0	1	7	7	1	0	0	0	0	0	0	0	20
04:00	18	0	0	1	10	6	1	0	0	0	0	0	0	0	20
05:00	18	0	0	2	2	11	3	0	0	0	0	0	0	0	22
06:00	6	0	0	2	0	3	1	0	0	0	0	0	0	0	20
07:00	5	0	0	0	0	4	1	0	0	0	0	0	0	0	24
08:00	7	0	0	0	2	4	1	0	0	0	0	0	0	0	22
09:00	1	0	0	0	1	0	0	0	0	0	0	0	0	0	18
10:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:00	2	0	0	0	0	2	0	0	0	0	0	0	0	0	0
Daily Totals	156	0	0	10	62	75	9	0	0	0	0	0	0	0	23
Percent of Total		0.0	0.0	6.4	39.7	48.1	5.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	

Percentile Speeds	10%	15%	50%	85%	90%
	15.6	16.4	21.4	25.1	25.6

10 MPH Pace Speed : 15 - 25
 Number in pace : 137
 % in pace : 87.8

Speed Exceeded	35 MPH	45 MPH	55 MPH
Percentage	0.0	0.0	0.0
Totals	0	0	0

Vehicle Speed Summary

STREET : NAHIKU ROAD
 AREA : NAHIKU
 TMK : N/A

Site: DS
 Date: 09/23/05

Direction: SB +NB

Begin Time	Total	1-5 MPH	6-10 MPH	11-15 MPH	15-20 MPH	21-25 MPH	26-30 MPH	31-35 MPH	36-40 MPH	41-45 MPH	46-50 MPH	51-55 MPH	56-60 MPH	61-99 MPH	Avg
12:AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
01:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
02:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
06:00	6	0	0	0	0	3	3	0	0	0	0	0	0	0	26
07:00	13	0	0	0	3	7	3	0	0	0	0	0	0	0	23
08:00	5	0	0	0	1	2	2	0	0	0	0	0	0	0	24
09:00	6	0	0	1	3	2	0	0	0	0	0	0	0	0	19
10:00	16	0	0	0	7	6	3	0	0	0	0	0	0	0	22
11:00	30	0	0	1	14	14	1	0	0	0	0	0	0	0	20
12:PM	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
01:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
02:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
03:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
04:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
05:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
06:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
07:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
08:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
09:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
10:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
11:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Daily Totals	76	0	0	2	28	34	12	0	0	0	0	0	0	0	22
Percent of Total		0.0	0.0	2.6	36.8	44.7	15.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	

Percentile Speeds	10%	15%	50%	85%	90%
	16.3	17.1	22.2	26.4	28.1

MPH Pace Speed : 15 - 25
 Number in pace : 62
 % in pace : 81.6

Speed Exceeded : 35 MPH 45 MPH 55 MPH
 Percentage : 0.0 0.0 0.0
 Totals : 0 0 0

Vehicle Count Summary

STREET : NAHIKU ROAD
 AREA : NAHIKU
 TMK : N/A

Site: D5
 Date: 09/22/05

Interval Begin	SB		NB		Combined		Day:	Thursday	
	AM	PM	AM	PM	AM	PM			
12:00	*	3	19	*	3	16	*	6	35
12:15	*	5		*	4		*	9	
12:30	*	6		*	5		*	11	
12:45	*	5		*	4		*	9	
01:00	*	6	18	*	6	10	*	12	28
01:15	*	6		*	1		*	7	
01:30	*	1		*	0		*	1	
01:45	*	5		*	3		*	8	
02:00	*	1	11	*	3	9	*	4	20
02:15	*	2		*	4		*	6	
02:30	*	4		*	0		*	4	
02:45	*	4		*	2		*	6	
03:00	*	3	8	*	2	8	*	5	16
03:15	*	2		*	1		*	3	
03:30	*	1		*	2		*	3	
03:45	*	2		*	3		*	5	
04:00	*	3	8	*	2	10	*	5	18
04:15	*	4		*	2		*	6	
04:30	*	0		*	3		*	3	
04:45	*	1		*	3		*	4	
05:00	*	4	8	*	2	10	*	6	18
05:15	*	1		*	4		*	5	
05:30	*	1		*	1		*	2	
05:45	*	2		*	3		*	5	
06:00	*	0	2	*	1	4	*	1	6
06:15	*	1		*	0		*	1	
06:30	*	0		*	1		*	1	
06:45	*	1		*	2		*	3	
07:00	*	0	0	*	2	5	*	2	5
07:15	*	0		*	1		*	1	
07:30	*	0		*	0		*	0	
07:45	*	0		*	2		*	2	
08:00	*	0	1	*	2	6	*	2	7
08:15	*	0		*	3		*	3	
08:30	*	0		*	1		*	1	
08:45	*	1		*	0		*	1	
09:00	*	0	0	*	0	1	*	0	1
09:15	*	0		*	0		*	0	
09:30	*	0		*	0		*	0	
09:45	*	0		*	1		*	1	
10:00	*	0	0	*	0	0	*	0	0
10:15	*	0		*	0		*	0	
10:30	*	0		*	0		*	0	
10:45	*	0		*	0		*	0	
11:00	*	1	1	*	0	1	*	1	2
11:15	*	0		*	1		*	1	
11:30	*	0		*	0		*	0	
11:45	*	0		*	0		*	0	
Totals	0	76		0	80		0	156	
Split%	*	48.7		*	51.3		*		
Day Totals		76			80			156	
Day Splits		48.7			51.3				
Peak Hour	*	12:30		*	12:15		*	12:15	
Volume	*	23		*	19		*	41	
Factor	*	0.96		*	0.79		*	0.85	

Vehicle Count Summary

STREET : NAHIKU ROAD
 AREA : NAHIKU
 MK : N/A

Site: D5
 Date: 09/23/05

Interval Begin	SB		NB		Combined		Day:	Friday
	AM	PM	AM	PM	AM	PM		
12:00	0	0	0	0	0	0		
12:15	0		0		0			
12:30	0		0		0			
12:45	0		0		0			
01:00	0	0	0	0	0	0		
01:15	0		0		0			
01:30	0		0		0			
01:45	0		0		0			
02:00	0	0	0	0	0	0		
02:15	0		0		0			
02:30	0		0		0			
02:45	0		0		0			
03:00	0	0	0	0	0	0		
03:15	0		0		0			
03:30	0		0		0			
03:45	0		0		0			
04:00	0	0	0	0	0	0		
04:15	0		0		0			
04:30	0		0		0			
04:45	0		0		0			
05:00	0	0	0	0	0	0		
05:15	0		0		0			
05:30	0		0		0			
05:45	0		0		0			
06:00	2	6	0	0	2	6		
06:15	1		0		1			
06:30	2		0		2			
06:45	1		0		1			
07:00	1	12	0	1	1	13		
07:15	2		0		2			
07:30	5		1		6			
07:45	4		0		4			
08:00	0	4	0	1	0	5		
08:15	1		0		1			
08:30	1		1		2			
08:45	2		0		2			
09:00	1	4	1	2	2	6		
09:15	2		1		3			
09:30	1		0		1			
09:45	0		0		0			
10:00	0	4	3	12	3	16		
10:15	3		3		6			
10:30	0		2		2			
10:45	1		4		5			
11:00	8	20	1	10	9	30		
11:15	3		4		7			
11:30	4		0		4			
11:45	5		5		10			
Totals	50	0	26	0	76	0		
Split%	65.8		34.2					
Totals by Splits		50		26		76		
Hourly Error	11:00		10:00		11:00			
Time	20		12		30			
Error	0.63		0.75		0.75			

Axle Classification Summary

STREET : NAHIKU ROAD
 AREA : NAHIKU
 TMK : N/A

Site: D5
 Date: 09/22/05

Direction: SB +NB

Begin Time	Total	1 Bikes	2 Cars & Trs	3 2 Axle Long	4 Buses	5 2 Axle 6 Tire	6 3 Axle Single	7 4 Axle Single	8 <5 Axl Double	9 5 Axle Double	10 >6 Axl Double	11 <6 Axl Multi	12 6 Axle Multi	13 >6 Axl Multi
12:AM														
01:00														
02:00														
03:00														
04:00														
05:00														
06:00														
07:00														
08:00														
09:00														
10:00														
11:00														
12:PM	35	0	4	31	0	0	0	0	0	0	0	0	0	0
01:00	28	0	1	25	0	2	0	0	0	0	0	0	0	0
02:00	20	0	3	14	0	3	0	0	0	0	0	0	0	0
03:00	16	0	3	9	2	2	0	0	0	0	0	0	0	0
04:00	18	0	2	13	0	3	0	0	0	0	0	0	0	0
05:00	18	0	3	11	0	4	0	0	0	0	0	0	0	0
06:00	6	0	0	5	0	1	0	0	0	0	0	0	0	0
07:00	5	0	0	5	0	0	0	0	0	0	0	0	0	0
08:00	7	0	1	5	0	1	0	0	0	0	0	0	0	0
09:00	1	0	0	1	0	0	0	0	0	0	0	0	0	0
10:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:00	2	0	0	2	0	0	0	0	0	0	0	0	0	0
Daily Totals	156	0	17	121	2	16	0	0	0	0	0	0	0	0
Percent of Total		0.0	10.9	77.6	1.3	10.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Axle Classification Summary

STREET : NAHIKU ROAD
 AREA : NAHIKU
 MK : N/A

Site: D5
 Date: 09/23/05

Direction: SB +NB

Begin Time	Total	1	2	3	4	5	6	7	8	9	10	11	12	13
		Bikes	Cars & Trs	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi
12:AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
01:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
02:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
06:00	6	0	0	5	0	1	0	0	0	0	0	0	0	0
07:00	13	0	0	9	0	4	0	0	0	0	0	0	0	0
08:00	5	0	1	1	0	3	0	0	0	0	0	0	0	0
09:00	6	0	1	3	0	2	0	0	0	0	0	0	0	0
10:00	16	0	1	13	0	1	0	0	1	0	0	0	0	0
11:00	30	0	2	25	0	3	0	0	0	0	0	0	0	0
12:PM	*	*	*	*	*	*	*	*	*	*	*	*	*	*
01:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*
02:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*
03:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*
04:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*
05:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*
06:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*
07:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*
08:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*
09:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*
10:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*
11:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Daily Totals	76	0	5	56	0	14	0	0	1	0	0	0	0	0
Percent of Total		0.0	6.6	73.7	0.0	18.4	0.0	0.0	1.3	0.0	0.0	0.0	0.0	0.0

Appendix D

Drainage Report



**DRAINAGE REPORT
FOR
PROPOSED IMPROVEMENTS
TO NAHIKU ROAD**

**NAHIKU, HANA, MAUI
TMK: (2)1-2-003:058 (por)**

Prepared for
**County of Maui
Department of Public Works and
Environmental Management
200 South High Street
Wailuku, Hawaii 96793**

Prepared by
**Sato & Associates, Inc.
2115 Wells Street
Wailuku, Hawaii 96793**

**This work was prepared by me
or under my supervision.
Expiration Date: 4/30/06**

June 2005

PROJECT LOCATION

The project site is Nahiku Road. Nahiku Road begins at Hana Highway and descends toward the coastline to terminate at Nahiku Landing. The project is on a portion of parcel identified as Tax Map Key (TMK) (2)1-2-003:058.

PROJECT DESCRIPTION

The proposed project consists of realignment of approximately 300 lineal feet of Nahiku Road. The proposed project also includes the development of a "jug handle" turn off on Hana Highway, directly opposite to its intersection with Nahiku Road. This turn-off will allow westbound traffic on Hana Highway to access Nahiku Road more safely than a direct, right hand turn onto Nahiku Road would permit.

EXISTING SITE CONDITIONS

The current alignment of Nahiku Road has become unviable due to previous landslide conditions which caused portions of the road should to fall away into adjacent Makapipi Gulch. The proposed alignment would move the road away from the cliff fallout.

EXISTING DRAINAGE CONDITIONS

The general storm water runoff pattern is from the South to the North. The runoff from Nahiku Road flows into Makapipi Stream which then flows to the ocean.

Flood Insurance Rate Maps (FIRM) published by the Federal Emergency Management Agency (FEMA) indicate that the project site is located within Zone C.

PROPOSED DRAINAGE CONDITIONS

There will be a minimal increase in runoff generated from the project. The proposed project will not alter the existing drainage pattern.

CONCLUSION

The minimal increase in runoff generated from the project will not adversely affect Makapipi Stream or surrounding properties.



END

CERTIFICATION

I HEREBY CERTIFY THAT THE MICROPHOTOGRAPH APPEARING IN THIS REEL OF
FILM ARE TRUE COPIES OF THE ORIGINAL DOCUMENTS.

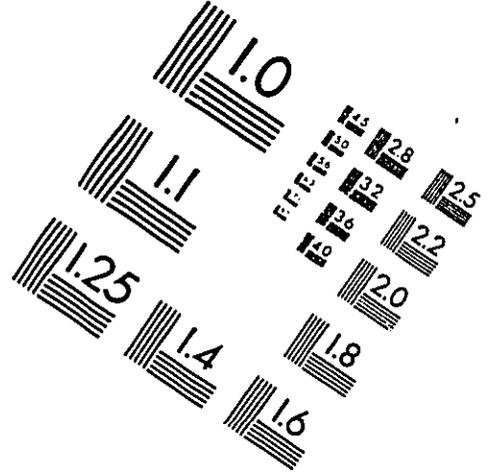
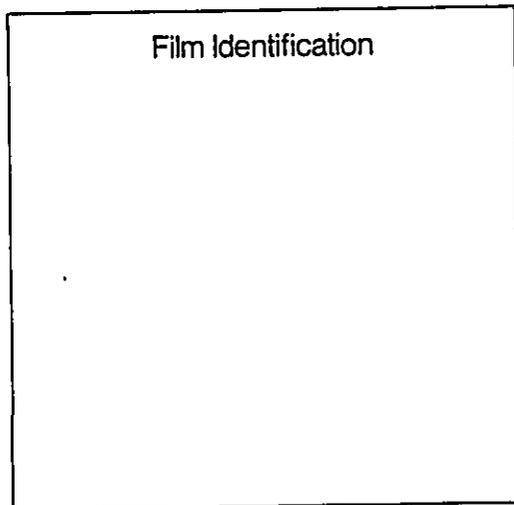
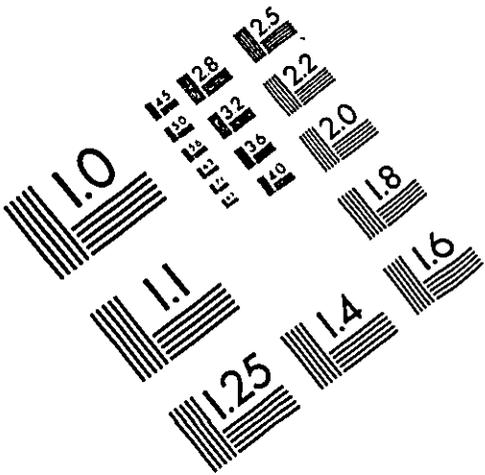
2005

DATE

Sonaine Collops-Burke

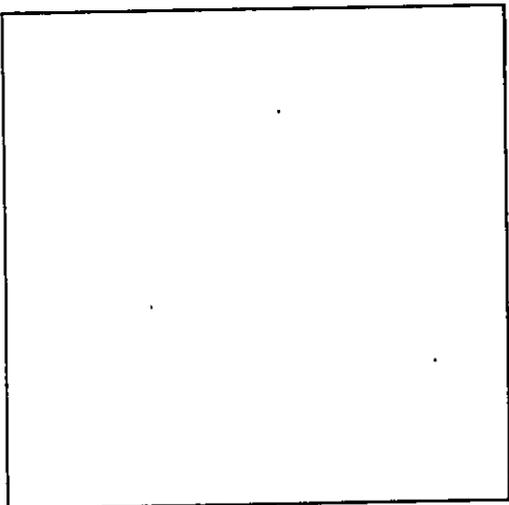
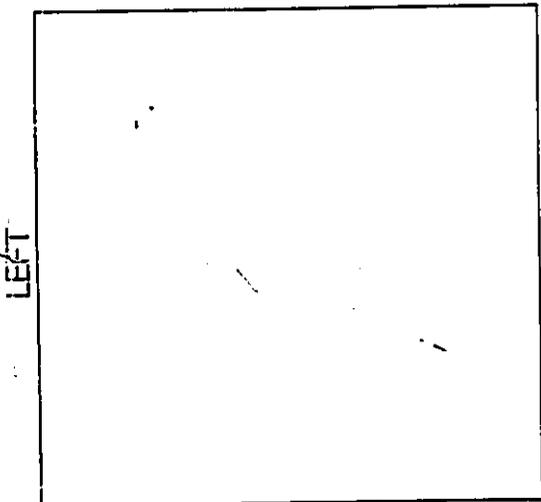
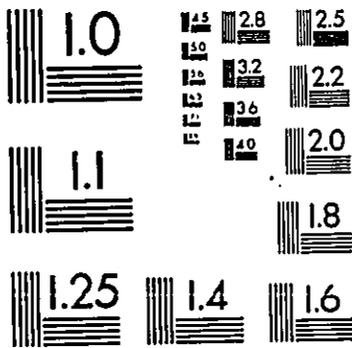
SIGNATURE OF OPERATOR

TOP



A & P International
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577 Locust Street • Prescott, WI 54021
Web Site <http://www.zimc.com/apintl>

PRECISIONSM RESOLUTION TARGETS

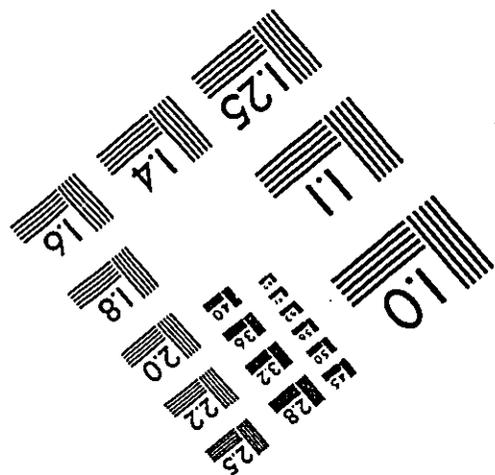
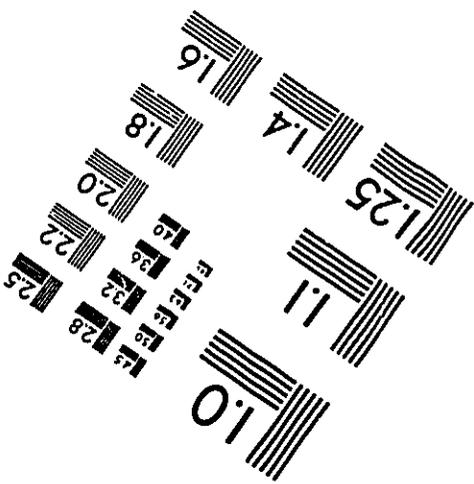


LEFT

RIGHT

150 MM

6"



PA-3 8½"x11" PAPER PRINTED GENERAL TARGET

DENSITY TARGET



ADVANCED MICRO-IMAGE SYSTEMS HAWAII