GEORGE R. ARIYOSHI
GOVERNOR

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
869 PUNCHBOWL STREET
HONOLULU, HAWAII 96813

RYOKICHI HIGASHIONNA, Ph.D.
DIRECTOR

DEPUTY DIRECTORS
WAYNE J. YAMASAKI
JAMES R. CARRAS
JAMES B. McCORMICK
JONATHAN K. SHIMADA, Ph.D.

IN REPLY REFER TO:

May 3, 1982

HAR-EP 3569

Ms. Joan Kodani
Executive Secretary
Environmental Quality Commission
550 Halekauwila Street, Room 301
Honolulu, Hawaii 96813

Dear Ms. Kodani:

Negative Declaration: Kaulana Bay Boat Launching Ramp Facility, South Point, Hawaii
Job H. C. 6109

In accordance with Chapter 343, H.R.S., we are notifying you that an Environmental Impact Statement will not be required for the subject action. Attached is a Negative Declaration for the proposal.

If you have any questions, please contact Mr. Dan Tanaka of our Harbors Division at 548-2505.

Very truly yours,

Ryokichi Higashionna

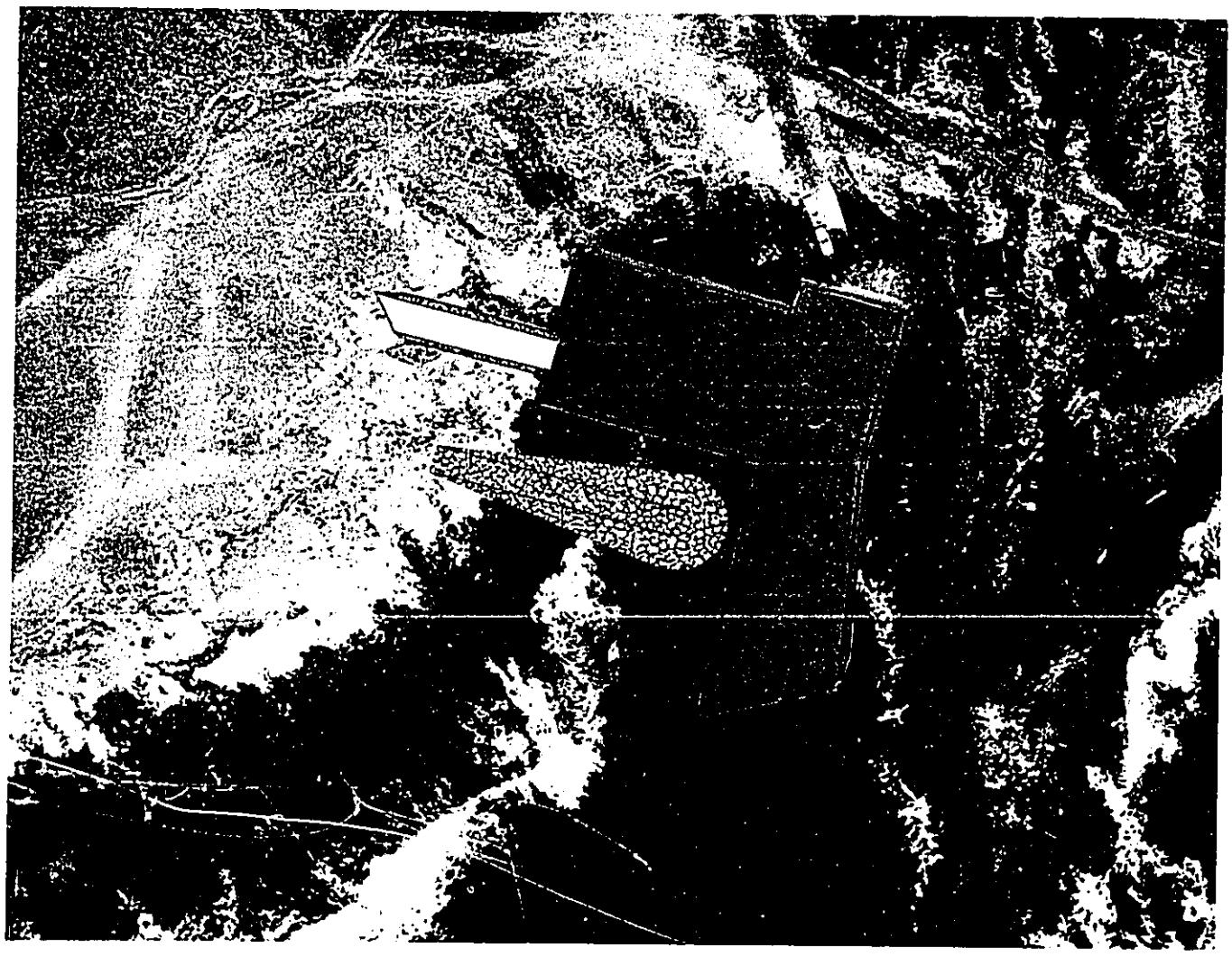
Ryokichi Higashionna
Director of Transportation

Attachment

FINAL Detailed Project Report and Environmental Statement

KAULANA BAY Navigation Improvements

South Point, Island of Hawaii



US Army Corps of Engineers
Honolulu District

September 1981

FINAL

DETAILED PROJECT REPORT

AND

ENVIRONMENTAL STATEMENT

KAULANA BAY
NAVIGATION IMPROVEMENTS

SOUTH POINT, ISLAND OF HAWAII, STATE OF HAWAII

US Army Engineer District
Honolulu

Building 230
Fort Shafter, Hawaii 96858

SEPTEMBER 1981

KAULANA BAY NAVIGATION IMPROVEMENTS

FINAL

DETAILED PROJECT REPORT
AND
ENVIRONMENTAL STATEMENT
SOUTH POINT, ISLAND OF HAWAII, STATE OF HAWAII

TABLE OF CONTENTS

TABLE OF CONTENTS (contd)

APPENDICES

LIST OF FIGURES

LIST OF TABLES

LIST OF PHOTOGRAPHS

KAULANA BAY

NAVIGATION IMPROVEMENTS

SOUTH POINT, ISLAND OF HAWAII

MAIN REPORT

I. INTRODUCTION

1. PURPOSE

The purposes of this study were to determine the need for and feasibility of providing light-draft navigational improvements on the Island of Hawaii.

2. STUDY AUTHORITY

This study and report were accomplished under the authority provided by Section 107 of the River and Harbor Act of 1960 (Public Law 84-645), as amended. Pertinent paragraphs of the authority are included in Appendix A.

The Kaulana Bay Navigation Improvements Study was initiated following a written request from the State of Hawaii, dated 23 August 1979. Based upon this request, a reconnaissance report was completed by the US Army Corps of Engineers, Honolulu District on 8 January 1980 and approved for detailed project studies by the Chief of Engineers in June 1980.

3. STUDY AREA

The Island of Hawaii (Figure 1), the largest of the Hawaiian Islands, encompasses 4038 square miles of land area and 305 miles of coastline. This island has two main population centers, Kailua-Kona on the west coast and Hilo on the east coast. The town of Hilo is the economic and political center of the island and the main port.

The Ka'u Judicial District (study area) encompasses most of the south-southeast portion of the island. The surrounding lands consist of treeless plains covered by grass and low shrubs, and volcanic basalt partially overlain by sand dunes. The shoreline in the area is rough and rugged, characterized by historic lava flows, and offering little natural protection or safe mooring.

The boating facility at Kaulana Bay, consisting of a 20-foot wide, single-lane concrete ramp is the only facility in the Ka'u District constructed and administered by the State Department of Transportation. The ramp was built in 1963 and improved in 1972.

4. SCOPE OF THE STUDY

This study identified and evaluated the problems and needs associated with providing light-draft navigational improvements along the Ka'u Coast of Hawaii and the impacts upon the overall environmental, economic, social, cultural, and recreational resources of the area. The development of alternative sites and design layouts, and the costs and benefits associated with implementing these measures were evaluated.

Studies conducted included site investigations, archaeological-cultural studies, hydrographic and topographic surveys, geologic, foundations and materials investigations, fish and wildlife studies, oceanographic and meteorological studies, engineering designs, economic evaluations and environmental assessment.

The objective of this study is to provide a planning process based on increasingly specific stages of investigation. At the conclusion of each

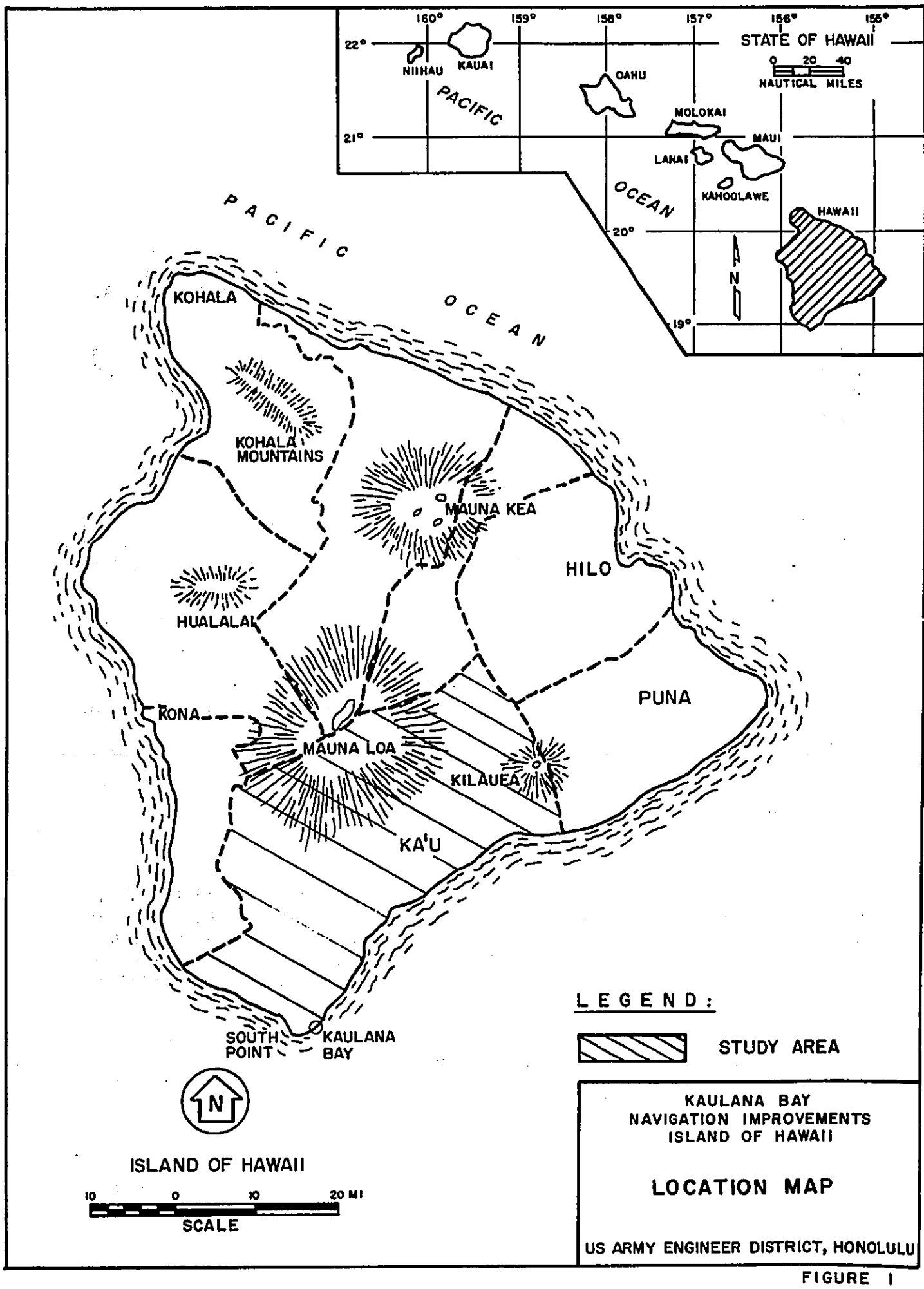

160°
159°
158°
157°
156°
155°
22°
21°
20°
19°
STATE OF HAWAII
0 20 40
NAUTICAL MILES
NIIHAU
KAUAI
OAHU
MOLOKAI
MAUI
LANAI
KAHOOLAWE
HAWAII
PACIFIC
OCEAN
N
PACIFIC
OCEAN
KOHALA
KOHALA MOUNTAINS
MAUNA KEA
HILO
HUALALAI
PUNA
KONA
MAUNA LOA
KILAUEA
KA'U
SOUTH POINT
KAULANA BAY
N
ISLAND OF HAWAII
10 0 10 20 MI
SCALE
LEGEND:
STUDY AREA
KAULANA BAY
NAVIGATION IMPROVEMENTS
ISLAND OF HAWAII
LOCATION MAP
US ARMY ENGINEER DISTRICT, HONOLULU

FIGURE 1

stage, the range of possible alternatives was assessed and evaluated. Elimination of infeasible or undesirable measures narrowed the field of potential alternatives until an acceptable plan was developed.

The Detailed Project Report (DPR) constitutes the authorizing document for construction for the US Army Corps of Engineers small projects or continuing authorities program. Construction plans and specifications can be initiated after subsequent approval of the DPR by the Chief of Engineers and receipt of local assurances from the State of Hawaii.

5. STUDY PARTICIPANTS AND COORDINATION

The US Army Corps of Engineers, Honolulu District, was responsible for conducting and coordinating the overall study and preparing the study report. Studies and investigations were performed with the assistance of governmental agencies (Federal, State, and local). Community groups and private interests were contacted during the study to help identify study concerns, to obtain pertinent study information, and to develop and evaluate alternative plans. A list of those contacted and the Public Involvement program are presented in Appendix B.

6. REPORT PREPARATION

This document consists of a main report and a series of appendices. The main report is a self-contained document which describes the planning process and includes the environmental impact statement. The appendices contain technical and detailed information and background data to support the information contained in the main report.

Appendix A, Plan Formulation Criteria and Compliance Reports, contains specific information regarding the study authority, legislative requirements, planning criteria and constraints, and local cooperation requirements that contribute to the plan formulation process of the study. Also included in this appendix are the evaluation reports required by Executive Order 11988, Section 404 of the Clean Water Act, and the Coastal Zone Management Act.

Appendix B, Public Involvement Program, describes the public involvement program and contains pertinent correspondence received during the study and evaluation period.

Appendix C, Engineering Investigations and Design Analysis, contains the engineering analyses and data relevant to the design of the proposed general navigation improvements. This appendix also provides information concerning geology, foundations and materials investigations and cost estimates.

Appendix D, Cultural and Social Resources, contains information on the cultural-archaeological and social resources within the affected study area.

Appendix E, Natural Resources and Fish and Wildlife Coordination, contains information on natural resources within the study area and the US Fish and Wildlife Service report prepared in accordance with the Fish and Wildlife Coordination Act of 1958 (Public Law 85-624).

Appendix F, Economic Analysis, contains the economic background, data, and analyses for determining the benefits and costs associated with each alternative plan.

7. PRIOR STUDIES

a. The US Army Corps of Engineers, Honolulu District completed a Reconnaissance Report on possible light-draft navigation improvements for the Island of Hawaii on 8 January 1980. This report established Federal interest in providing possible navigational improvements in Hawaii under Section 107 of the River and Harbor Act of 1960, as amended.

b. The County of Hawaii completed a General Plan through an urban planning grant from the Department of Housing and Urban Development, under the provision of Section 701 of the Housing Act of 1954, as amended, and the State of Hawaii. The General Plan revision program, completed in April 1978 outlines general guidelines concerning socioeconomic, physical, and institutional planning. This plan also outlined desired navigational improvements for Hawaii.

II. PROBLEM IDENTIFICATION

1. PURPOSE

The purpose of this section is to define the study area and the problems to be addressed in the study. This includes describing the base conditions, identifying public concerns, establishing planning criteria, and analyzing the problems. Public concerns which relate to water and related land resource problems are identified and then refined, based on national and local policies.

National planning policies are prescribed by the Water Resources Council's Principles and Standards (18 CFR Part 711 et seq), the National Environmental Policy Act of 1969 (PL 91-190), Section 122 of the River and Harbor and Flood Control Act of 1970 (PL 91-611), the Water Resources Development Act of 1974 (PL 93-251), the Clean Water Act of 1977 (PL 95-217), and the Corps of Engineers' policy guidelines (ER's).

To help determine the resource management[1/] problems, the base condition of the study area is initially defined. The base condition is the existing economic, social, and environmental characteristics of the area. Future conditions are then projected and analyzed to determine the "most probable future"[2/] which would prevail over the area without any changes to existing resource management plans. This analysis describes the "without condition" criterion. Planning objectives[3/] are then formulated based on the problems and needs of the area related to the "without condition" criterion.

1/ "Resource management" involves the development, conservation, enhancement, preservation and maintenance of water and related land resources to achieve the goals of society expressed nationally and locally.

2/ "Most probable future" is the projection of basic demographic, economic, social, and environmental parameters, which is used as the basis for defining the "without condition" and the planning objectives for a particular study.

3/ "Planning objectives" are the national, state, and local water and related land resource management needs (opportunities and problems) specific to a given study area that can be addressed to enhance National Economic Development or Environmental Quality.

2. NATIONAL OBJECTIVES

The Water Resources Council Principles and Standards (P&S) for planning water and related land resources define the national objectives of national economic development and environmental quality. National objectives are a means of measuring the effectiveness of possible solutions. The national economic development (NED) objective is achieved by increasing the value of the nation's output of goods and services and improving national economic efficiency. The environmental quality (EQ) objective provides for the management, conservation, preservation, creation, restoration, or improvement of the quality of certain natural and cultural resources and ecological systems in the study area.

During the formulation of alternative plans, the NED and EQ contributions are evaluated on an equal basis. For any plan to be considered for implementation, the total beneficial contributions accruing from the project must exceed the total adverse impacts of the project. The P&S also require that the impacts of a proposed action be measured in terms of Regional Development (RD) and Social Well Being (SWB). Contributions to the RD account are determined by establishing a proposal's effects on a region's income, employment, population, economic base, environment, and social development. Contributions to the SWB account are determined by establishing a proposal's effects on real income, security of life, health and safety, education, cultural and recreational opportunities, and emergency preparedness.

3. PROFILE OF EXISTING BASE CONDITIONS

The cultural, physical, environmental, and economic characteristics of Kaulana are briefly described. The appendices contain more detailed descriptions relevant to the planning and design of general navigation improvements.

a. History and Culture. Prior to Kamehameha's rule in the late 18th century, the Ka'u District on the Island of Hawaii was historically a relatively independent Kingdom isolated from the rest of the island. Historical and archaeological records have revealed that Polynesian voyagers who settled in the Hawaiian Islands may have first landed and settled at Ka Lae, South Point, Hawaii. As the population expanded, other parts of the island became inhabited. Most of the early settlements consisted of small fishing villages.

In 1791, Kamehameha became ruler of the entire island by gaining the Ka'u District when its chief Keoua was killed at the dedication of Pu'ukohola Heiau at Kawaihae. The Ka'u area later became a stopping point for seagoing travelers on their way to Hilo. In the 1860's, Mark Twain lived in Waiohinu and wrote extensively about his experience in the islands.

b. Physical and Environmental Setting.

(1) Physical features. Being of volcanic origin, the dominant topographic feature on the southeastern portion of the island (Ka'u District) are the large expanses of lava fields. Two of the island's most active volcanoes, Mauna Loa (13,677 MSL) and Kilauea are located in this area. Mauna Loa (Big Mountain), the largest single mountain on earth, provides a dramatic backdrop for the Kaulana Bay area. The Ka'u landscape is characterized by historic as well as young lava flows, moderate slopes with little or no established surface drainage, and a rugged coastline consisting of low and extremely steep sea cliffs.

(2) Climate. The Island of Hawaii has a semi-tropical climate, but has wide variations across the island in temperature and rainfall. Temperatures range from 58 to 90 degrees (minimum-maximum) along the coastal plain to sub-freezing minimums in the mountains. Mauna Kea and Mauna Loa often have a mantle of snow during the winter months. Rainfall in the southwestern region of the Ka'u District which includes the South Point area varies from less than 20 inches at South Point to 75 inches at the 5,000-foot elevation. Relatively uniform tradewinds prevail offshore, but disruption by the high land masses make inland winds very complex.

(3) Astronomical tides. The nearest tidal benchmark to Kaulana Bay is at Honuapo, approximately 15 miles to the northeast. Tidal measurements taken at this location by the US Coast and Geodetic Survey in 1929 are:

	Feet
Highest tide (estimated)	4.00
Mean higher high water	2.50
Mean high water	2.00
Half tide level	1.15
Mean low water	0.30
Mean lower low water	0.00
Lowest tide (estimated)	-1.50

All elevations in this report are referenced to mean lower low water (MLLW) datum.

(4) Terrestrial biota. The coastal area of the Ka'u District is characterized by sparse vegetation consisting primarily of indigenous strand plants such as ilima, Pa'u-o-Hiiaka and beach morning glory with patches of Bermuda grass occurring in backshore areas.

Terrestrial fauna in the Ka'u District are also limited in abundance and diversity. Shorebirds, including the golden plover, wandering tattler and ruddy turnstone probably utilize the available shallow feeding habitat in the area. Passerine birds, field mice, rats, mongoose, pueo, and feral goats are also found in this area.

(5) Marine biota. The substratum throughout most of Ka'u coastline consists of hard lava rock covered in places by accumulation of silt and coral rubble. A number of bays along this coastline contain scattered massive heads of Porites coral. Coral growth elsewhere in these bays are limited to scattered Pocillopora colonies, possibly a consequence of the constant wave action occurring in these areas. A variety of common reef fish and marine benthic invertebrates, including gastropod mollusks, sea urchins, sea cucumbers and crabs, are present along the coastline. Green sea turtles are occasionally observed offshore often feeding, but no known nesting beaches are located in the Ka'u area. The endangered humpback whale has also been observed along the Ka'u coast in transit to or from the shallow shoals that comprise their preferred wintering habitat, primarily Penguin Banks and the area between Maui, Lanai and Molokai.

(6) Geology. The Island of Hawaii is the youngest of the Hawaiian island archipelago and is the result of the coalescence of the lava flows of five volcanoes. The volcanoes Mauna Loa and Kilauea are still very active. The base rock in the area is massive basalt. This is overlain by soil consisting of volcanic ash. The soils are very shallow, covering rough lava flows that are extremely permeable.

(7) Seismicity. The Island of Hawaii is situated within a seismically active zone and is classified as seismic zone 3. Many earthquakes of low and moderate magnitudes occur throughout the year. Most earthquakes that do occur are related to the volcanic activity of Kilauea and Mauna Loa.

c. Economic Characteristics.

(1) Development and economy. The State of Hawaii is prosperous with a growing population and economy. Between 1958 and 1980, the total resident population increased from 611,800 to 963,617 (preliminary census). During the period 1958 to 1977, the gross State product more than quintupled, from $1.4 billion to $8.0 billion. The three largest contributors to the State economy are tourism, defense expenditures, and agriculture, the bulk of the last activity being in the production of sugar and pineapple. The most rapid growth during the last several years has been in the tourist industry. Tourists' arrivals totaled 171,500 in 1958 and 3,960,000 in 1979. Tourist expenditures were $83 million in 1958. The expenditures were $440 million in 1968 and $2.6 billion in 1979, an increase of 495 percent. This compares to an increase of 175 percent for defense spending. It is expected that the growth trend in tourism will continue although at a slower pace together with the State economy in general.

Sugar and tourism dominate the economy of the Island of Hawaii. There are 469 sugarcane farms in Hawaii County cultivating 92,829 acres of caneland. Production of raw sugar was 3.9 million tons, 42.5 percent of the State's total in 1978 with a value of $68.6 million.

The visitor industry on the Island of Hawaii grew rapidly in the past 15 years. Hotel construction increased so fast during this period that capacity exceeded the need for rooms. The increase in hotel units has been greatest along the Kona coast. Of the 6,093 units on the island in 1979, there were 3,637 units in Kona area, 1,954 units in Hilo and 502 units in other areas of the county. Total visitor expenditure on the island in 1978 was $158 million. Two-thirds of the State's beef and one-half of the diversified agriculture crops are produced on the Island of Hawaii. Commercially caught fish previously sold only to local markets or shipped to Honolulu are now being shipped freshly iced to the mainland.

Ka'u, South Kona, and the North Kona Districts would be serviced by Kaulana Bay. The major economy in the area includes livestock, sugar, coffee farming, and the visitor industry. The visitor industry is the fastest growing industry and will have the greatest influence in the future. According to the 1979 County of Hawaii Data Book, an additional 2,150 hotel units are planned for the Kona area (excluding South Kohala District) within the next several years.

Commercial fishing has always been popular in the Kaulana area. Available records indicate over 588,000 pounds of fish caught in 1980. This is expected to grow since Kaulana fronts one of the best fishing grounds in the islands.

(2) Population and labor force. Hawaii County's population decreased between 1930 and 1960. The 1970 census marked the first time since 1930 that the population had shown an increase over the previous decade. The population has continued to increase at a steady rate up through 1980.

Mechanization led to the decline in sugar employment and out-migration of the population. With the advent of tourism in the 1960's, the population began to increase. Hawaii County population increased 3 percent from 61,332 in 1960 to 63,468 in 1970 and then 45 percent the next decade to 92,206 in 1980. For the same decades, the Ka'u and Kona districts had increases of 1 percent to 1970 and 91 percent to 1980. The Ka'u District by itself had increases of 0.9 percent to 1970 and 8.9 percent to 1980.

TABLE 1. HISTORICAL POPULATION OF HAWAII COUNTY AND KA'U, SOUTH KONA, NORTH KONA

	Hawaii County		Ka'u, South Kona, North Kona		Ka'u	
Year	Population	Percent Growth	Population	Percent Growth	Population	Percent Growth
1910	55,382					
1920	64,895	1.6	11,440			
1930	73,325	1.2	14,156	23.7		
1940	73,276	-.1	13,529	-4.4		
1950	68,350	-.7	11,633	-14.0	4,303	
1960	61,332	-1.1	12,111	4.1	3,368	-21.7
1970	63,468	3.5	12,234	1.0	3,398	0.9
1980	92,206	45.3	23,411	91.3	3,699	8.9

Despite the rapid population growth in recent years, the county remains relatively uncrowded with a density of 23 person per square mile, as compared with over 1,000 person per square mile on Oahu.

The civilian labor force within the county increased 25 percent from 28,300 in 1970 to 35,400 in 1980. The greatest increase was hotel employment, followed by retail trade. The largest decrease was in the sugar industry where labor needs in harvesting and processing were reduced by mechanization. A slump in the tourist trade during the late 1970's in conjunction with the rising population, caused unemployment to rise to its highest levels in the past two decades. The median family income among Ka'u, South Kona and North Kona District residents was $8,478 in 1970 compared with $9,750 for Hawaii County and $11,554 for the State. The most recent income figures available show a household income of $10,293 in Puna-Kona and $12,165 for Kona in 1975.

4. "WITHOUT" CONDITION PROFILE

If no Federal action is taken to provide navigation improvements, the lack of an adequate boating facility will continue to constrain full use of the ocean's resources in the study area for commercial fishing. In addition, the lack of an adequate facility may stifle economic growth in the area through reduced boating related commercial enterprise and employment opportunities. Ka'u fishermen and other Big Island residents will continue to utilize the Kaulana Bay launch ramp, the only publicly owned and operated ramp in the entire Ka'u District.

The resident population and small business activity will continue to grow in the study area. With the ever-increasing number of commercial fishermen, greater demands are being placed for an additional or improved boating facility. In recent years, the export of fresh fish to local and mainland markets have been making increasing contributions to the gross economic output of the area. Commercial fishing is fast becoming an important economic mainstay of the Ka'u District.

5. NAVIGATION PROBLEMS AND NEEDS

The existing Kaulana boat ramp is directly exposed to deepwater swells from the east clockwise to the southwest. Two large mountains, Mauna Loa and Mauna Kea, cause the prevailing tradewinds and waves in the Kaulana area to be easterly. These waves refract and diffract into the unprotected launch ramp resulting in considerable danger and difficulty during launching and recovery operations. During Kona winds, the ramp is not usable at all. Because of these difficulties, launch and recovery operations take 3-4 persons, and the local boaters estimate that boats or trailers are damaged about 20 percent of the time the ramp is used. Based on available data and discussions with local boaters, it is estimated that launch and recovery at the existing ramp is only possible about 60 percent of the time.

Under current conditions, fishermen caught in sudden storms cannot safely land and recover their boats. This is a serious hazard for fishermen, when very profitable bottom fishing is done. If the winds and seas start to build, the boater must wait until safe conditions prevail at the ramp. In addition, if sufficient people are not available to help, the boat is often damaged during the recovery operation.

The current practice for Ka'u fishermen is to launch their boat at Kaulana and to moor it on the lee of the cliffs on the west coast of South Point when hazardous bay conditions prevent returning to the ramp. At the mooring area, they unload their catch and load fuel and ice, wind and seas permitting. Fish and supplies are transported over the cliff face by rope and pulley. During the year when the fishing is exceptionally good, the boats are often moored overnight to reduce the number of hazardous launch and recovery operations. However, this practice is very risky also, particularly during the winter months when the wind and seas often change direction quickly. One boater stated he lost 7 boats in the last 20 years because he could not get his boat out when wind and seas increased unexpectedly. A protected basin would permit fishermen to return to the ramp, safely unload their catch and return to the fishing grounds.

The relatively small, 18 to 27-foot fishing boats have no refrigeration or space for large amounts of ice. This limits the catch to what can be kept chilled, and often requires frequent trips to shore to unload the catch. Several of the boaters have stated that they would purchase larger craft to increase their fishing capability if safer launch and recovery facilities were available.

In spite of the hazardous conditions, the fishermen will continue to use the Kaulana ramp because of its proximity to excellent fishing grounds. The other nearby State-operated public launch ramps are located at Pohoiki Bay on the east coast and Honaunau on the west coast, approximately 58 and 40 nautical miles away, respectively. These ramps are too distant for the Ka'u boaters to safely reach their fishing grounds and return. Consequently, Kaulana Bay, as well as other potential sites along the Ka'u coast, were investigated for

possible navigation improvements or construction of a new facility in a more sheltered location.

6. RELATED PROBLEMS AND NEEDS

a. Environmental Resources. Maintaining the district's natural environmental quality is important to the Ka'u community, as well as to visitors to the Ka'u coast. Any navigation improvements should be designed to complement existing uses of the area's natural resource, and should have as little adverse effect on the coastal and marine environment as possible. Marine life is relatively diverse and abundant along this coastline.

The Ka'u coast is rich in Hawaiian historical and cultural resources. Local residents have indicated an awareness and concern for protecting these resources and the need to coordinate improvements in the Ka'u area so as to not adversely impact on important cultural and historic resources as well as local lifestyles. The South Point area of the Ka'u District is on the register of National Historic Landmarks.

b. Human Resources.

(1) The Ka'u coastline provides recreational opportunities for southeast Hawaii residents and is actively used by swimmers, fishermen, and surfers as well as mainland visitors attracted simply for its scenic beauty. The effect of navigation improvements on these activities and the possible secondary effects on the use of adjacent land areas must be assessed and evaluated. If future shoreside facilities are provided, major utilities including electricity and water must be made available.

7. DESIRED IMPROVEMENTS

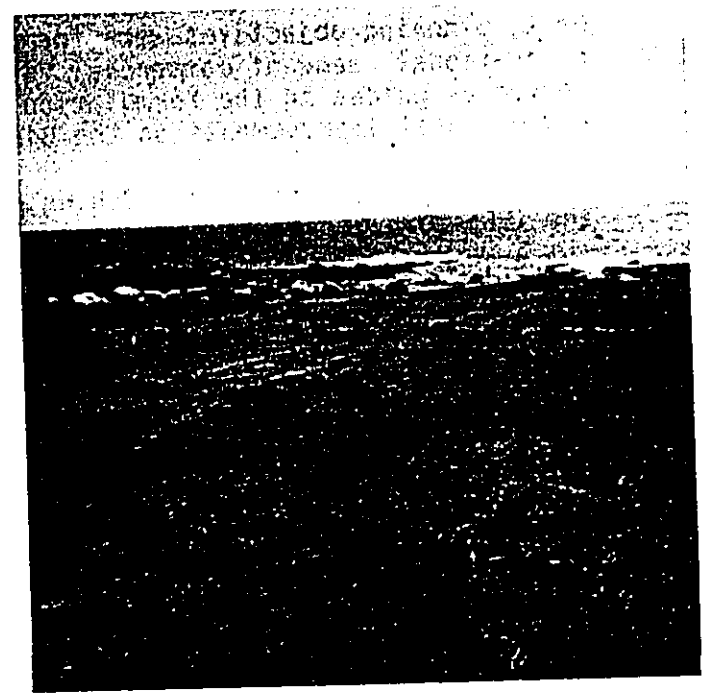
The State of Hawaii, Department of Transportation, has requested Corps of Engineers assistance with navigation improvements at Kaulana Bay, including the construction of a breakwater and protected basin. This request was based on the expressed desires of the Ka'u Fishermen Association to improve the usability and safety of the launch facilities used by the South Point commercial fishermen.

At the public workshop held on 9 July 1980 on the Island of Hawaii, the consensus of those attending (local governmental agencies, residents, and fishermen) favored Kaulana Bay as the site for navigation improvements. However, the possibility of improving existing facilities at other sites or the construction of new facilities in a more sheltered location were also considered. The alternative sites discussed at the public workshop were Punaluu, Honuapo Bay, Kaalualu Bay, Kaulana Bay, and Pohue Bay.

8. PLANNING OBJECTIVES

The formulation of planning objectives for the study was completed in two stages. First, preliminary analyses of social, economic, and environmental resources were performed in conjunction with the identification of the problems and needs related to light-draft navigation. Based on the analyses and the stated views of the County, the most immediate navigation needs are focused on commercial fishing.

PHOTOGRAPH NO. 1

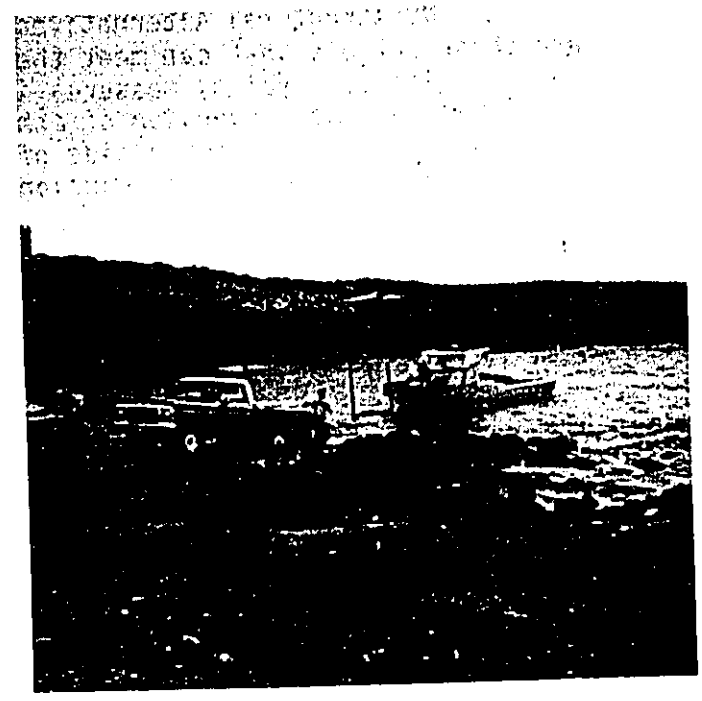


Kaulana Bay Area

PHOTOGRAPH NO. 2

Kaulana Bay Launch Ramp

PHOTOGRAPH NO. 3



Retrieval Operation

Next, planning objectives were formulated to satisfy the specific light-draft navigational needs of commercial fishing. The following planning objectives served as guides in the formulation and evaluation of alternative plans for navigational improvements on the Big Island.

a. Improve commercial fishing opportunities in the Ka'u District during the 1985-2035 period of analysis.

b. Improve the socioeconomic opportunities for the people of the Ka'u District.

III. FORMULATION OF PRELIMINARY PLANS

1. RATIONALE

This section of the report is directed towards the development and evaluation of alternative measures to resolve the problems and needs of the study area and to fulfill the planning objectives defined in the previous section. Possible measures need not necessarily be within the Corps of Engineers' authority or capabilities. If favorable or superior measures are available outside the Corps of Engineers authorities, the final recommendations will also indicate these alternative measures. The initial step in the formulation process is the identification of broad measures (nonstructural or structural) available to resolve the problems. If structural measures are considered to be the best solution to meet the planning objectives, the second step is to identify and evaluate potential sites where structural solutions can be constructed with minimal adverse impacts. After the selection of a suitable project site or sites, specific design layouts can be formulated and evaluated. Those plans that meet the planning objectives and local desires can then be identified.

2. PRELIMINARY SCREENING OF ALTERNATIVE MEASURES

a. Nonstructural Alternatives. Nonstructural alternatives or measures are those actions that can meet the planning objectives without constructing new facilities. Typical measures include improving the efficiency of existing facilities or the conversion of other existing facilities. Utilization of a hoist system on the leeward side of the Ka'u District near South Point is considered a nonstructural solution.

b. The general lack of any public waterfront, harbor or protected boating facility in the Ka'u area makes it difficult to apply nonstructural alternatives as a management option. There are only two boating facilities along the entire Ka'u coastline both of which are launch ramps. Neither facility, can meet the planning objectives without extensive modifications.

Although not intended to provide all-weather navigation protection, improving the navigation conditions for fair through marginal weather would greatly enhance fishing opportunities by increasing the percentage of time a vessel can use the launch facility. To meet the needs of these vessels, a protected basin to launch and retrieve boats is considered necessary for the safety and well-being of Ka'u fishermen.

c. Structural Alternative. The State of Hawaii Department of Transportation has identified specific criteria they feel would minimally meet the needs of Ka'u fishermen. Because little is known about the specific life requirements for many reef and marine organisms, precaution must also be exercised in evaluating possible disruption or destruction of these ecosystems by any structural proposal. Consequently, certain planning concepts should also be applied in evaluting these ecosystems and in selecting possible sites and/or designs for structural alternatives. Planning criteria for the formulation of preliminary plans would include at this stage:

(1) Providing a protected basin that can accommodate a typical fishing vessel of 27-foot length, 7-foot beam width and 2.5-foot draft.

(2) Minimizing conflicts with local land-use policy and physical community disruption.

(3) Enhancing, preserving, or minimizing adverse effects on marine and terrestrial flora and fauna resources and water quality.

(4) Preserve archaeological and historical resources.

(5) Maximization of net benefits.

3. IDENTIFICATION OF POTENTIAL SITES

a. This section of the report is directed towards the development and evaluation of alternative sites for light-draft navigation improvements. As expressed in the problems and needs section of this study, the construction of a protected basin was considered essential to commercial fishermen. A protected basin would permit safe passage of fishing boats during sudden storm conditions and provide safe launch and recovery operations. With improved conditions, increased fishing capabilities of existing boaters are anticipated. The initial step is to identify potential sites. The number of potential sites can then be reduced by eliminating areas that would not meet our preliminary environmental, economic and land-use concerns. The alternative of no development was considered but rejected because it would not meet the expressed desire for improvement which is the basic objective of this study.

b. Potential sites were restricted to the Ka'u District coastline of the Big Island. Areas along the remaining coastline were considered too far from prime fishing grounds in the south and southeast coastal waters.

Five sites were initially considered as possible areas for light-draft navigation improvements (see Figure 2). The major considerations in selecting a possible site were: (1) sea conditions, (2) access, (3) distance to best fishing grounds, (4) land availability, (5) historical sites, (6) endangered species, (7) utilities, and (8) existing and proposed land use and zoning. No other location was identified by Hawaii County agencies or by the general public at a 9 July 1980 public workshop held on the Island of Hawaii. The possible alternative sites for navigation improvements include:

(1) Punaluu.

(2) Honuapo Bay.

(3) Kaalualu Bay.

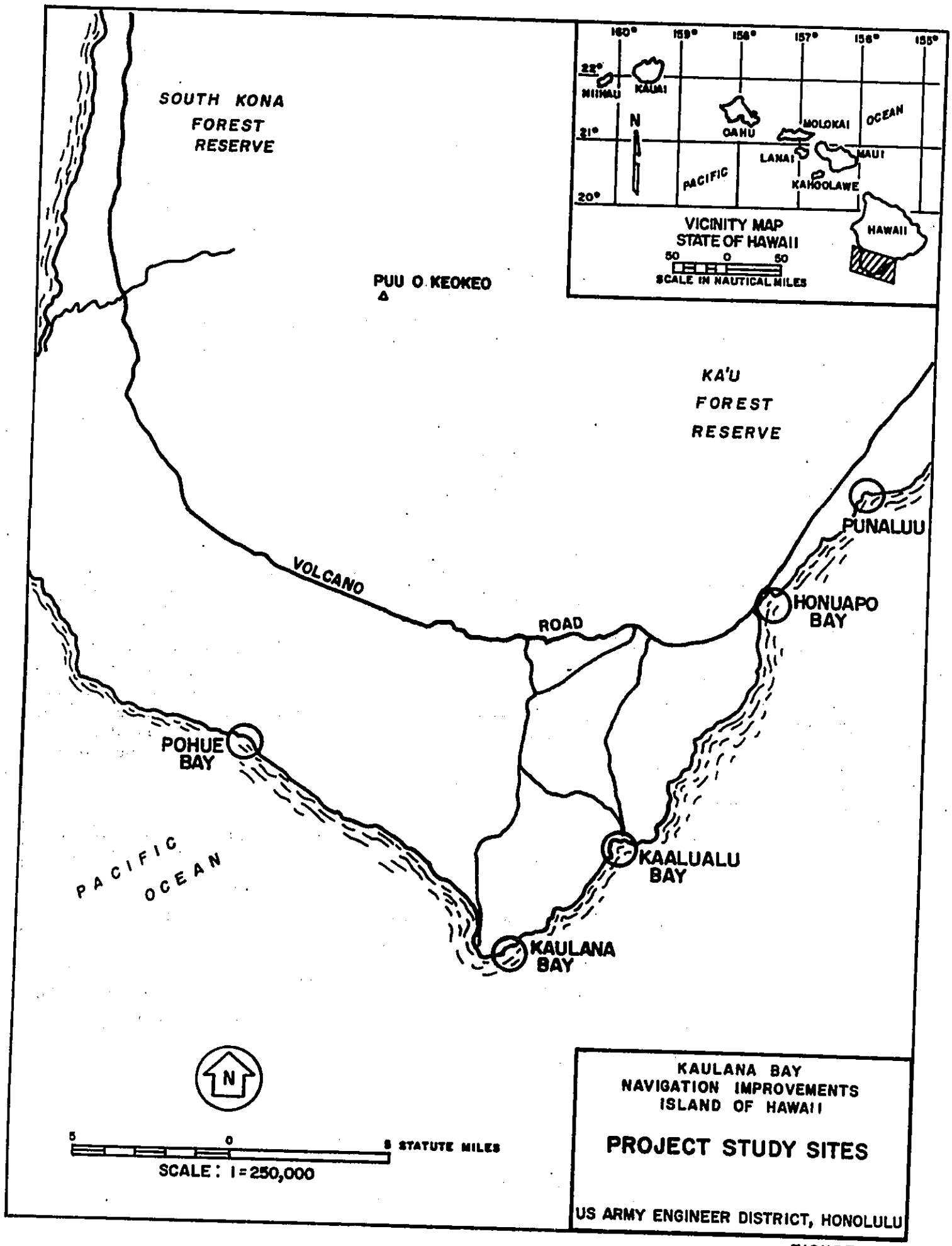

SOUTH KONA
FOREST
RESERVE
PUU O KEOKEO
KA'U
FOREST
RESERVE
VOLCANO
ROAD
PUNALUU
HONUAPO
BAY
POHUE
BAY
KAALUALU
BAY
KAULANA
BAY
PACIFIC
OCEAN
160°
159°
158°
157°
156°
155°
22°
21°
20°
N
NIIHAU
KAUAI
OAHU
MOLOKAI
OCEAN
LANAI
MAUI
PACIFIC
KAHOOLAWE
HAWAII
VICINITY MAP
STATE OF HAWAII
50 0 50
SCALE IN NAUTICAL MILES
N
5 0 5 STATUTE MILES
SCALE : 1=250,000
KAULANA BAY
NAVIGATION IMPROVEMENTS
ISLAND OF HAWAII
PROJECT STUDY SITES
US ARMY ENGINEER DISTRICT, HONOLULU

FIGURE 2

(4) Kaulana Bay.

(5) Pohue Bay.

c. Punaluu.

(1) Land use. Land adjacent to the existing boat ramp and access road is privately owned by C. Brewer and Company. In recent years, the Punaluu Beach area has been developing into a tourist destination point. The C. Brewer Company maintains a condominium development, golf course, meeting center, and restaurant near the Punaluu Beach Park.

(2) Site condition. The existing launch ramp at Punaluu is very steep and in poor condition. It is aligned perpendicular to the incoming waves which creates hazardous conditions during launching and recovery operations. Although only a few boats utilize the ramp, fishermen claim that the ramp area offers good refuge during sudden storm conditions. The water depth at this site is shallow ranging from 1 to 3 feet in the vicinity of the ramp. The bottom surface is covered with a heterogeneous mixture of black sand, silt, coral rubble, exposed pahoehoe rock, basalt, boulders, concrete slabs from the old landing and metal debris.

The existing ramp lies on a point of lava previously used as a boat landing for sugar companies. An old concrete landing and adjacent buildings have been destroyed by waves and neglect. The access road to the ramp is a single lane converted railroad bed.

(3) Environmental considerations. An anchialine pond is situated behind the Punaluu Black Sand Beach and adjacent to the existing boat ramp. A description of this pond and its fauna appears in Elliott and Hall's "Wetlands and Wetland Vegetation of Hawaii." Vegetation at the site is a mixture of indigenous and exotic species. No rare or unique plants were observed. The vegetation was dominated by Christmas berry trees (Schinus terebinthe folius), haole koa (Leucaena leucocephala), beach heliotrope (Messerschmidia argentea), beach morning glory (Ipomoea spp.), and passion fruit vine (Pasiflora sp.).

Water clarity at Punaluu is excellent with visibility greater than 80 feet. A lens of freshwater, approximately 2-3 feet thick is visible on the surface within the bay near the ramp. Salinities of surface waters range from 19-29 ppt and water temperature is near 22 degrees C. The underlying salt water is substantially warmer at 25 to 27 degrees C. State water quality records obtained for Punaluu Black Sand Beach revealed that coliform levels do not exceed established limits. Very little coral growth is evident. However, there appears to be a diversity of marine life at this site. No unique or endangered species were observed during a recent field investigation. However, Punaluu is known to be an important feeding habitat for the threatened green sea turtle.

(4) Archaeological considerations. The remains of prehistoric Hawaiian structures can be found at Punaluu. The access road to the existing Punaluu ramp and the foundations of the sugar dock may be eligible for listing on the Hawaii and National Register of Historic Places. The Kane'ele'ele Heiau is situated on a hill immediately east of the existing boat ramp.

(5) Summary. The Punaluu area has been developed in recent years as a tourist destination point. Based on existing and future development in the

area, availability of land for potential sites for a harbor and shoreside facilities are limited. Several sites within the Punaluu area may be eligible for listing on the Hawaii and National Register of Historic Places (access road to ramp and old sugar dock). Because of problems associated with the acquisition of private shoreline land for navigational improvements, provisions for public vehicular access, archaeological considerations and encroachment into threatened species habitat, this site was consequently eliminated in favor of a more desirable location. Also, a master plan for statewide boat launching facilities completed in 1972 for the State of Hawaii Department of Transportation recommended no further consideration for this site prior to 1990 because of the cost to protect the ramp.

d. Honuapo Bay.

(1) Land use. A county park (Whittington Beach Park) with access for vehicular traffic is situated along Honuapo Bay. In 1975, a tsunami severely damaged an old sugar dock and beach park facilities. Park facilities including three small pavilions and a restroom facility, have recently been built by the County. Future plans for this area call for a resort development by C. Brewer Company consisting of a 200-unit hotel and golf course.

(2) Site condition. Honuapo Bay is a shallow crescent shaped embayment situated about 5 miles southwest of Punaluu Harbor. A prominent feature of the coastline are the high cliffs along the southern coastal area. The offshore areas consist of a series of exposed pahoehoe domes as well as a fringing basalt shelf along the seaward edge of the inner bay. The Honuapo site is directly exposed to tradewind conditions, resulting in waves in excess of 2 feet nearly 100 percent of the time. Waves in excess of 6 feet occur on an average of 80 days per year. The configuration of the bay offers limited natural protection from wave attack, resulting in generally poor navigation conditions.

(3) Environmental considerations. A small coastal wetland can be found along the northern shoreline of Honuapo Bay. During a recent field trip, approximately 8 sea turtles (Chelonia mydas), a threatened species, were observed feeding nearshore. The largest of these turtles had an estimated carapace length of 36 inches or more.

(4) Archaeological considerations. The Honuapo Landing site, located just south of Whittington Park, was recommended by the Ka'u Historical Society as a reserve because of its historical relationship to Ka'u and its economic history and to inter-island shipping generally. Archaeological sites of importance in this area include house sites, platforms, walled structures (east of Laeokamilo Point), and the Honuapo Ponds.

(5) Summary. Whittington Beach Park, located along the shoreline of Honuapo Bay, provides shoreline recreational opportunities for the people of Hawaii County. The construction of navigational improvements for commercial fishing at this site is not considered to be compatible. Although this site is easily accessible from the main highway, the entire area is privately owned and launching is very difficult because of the shallow reef and wave exposure. A master plan for state boat launching facilities, completed in 1972, recommended no further consideration of this site because of the expense involved.

e. Kaalualu Bay.

(1) Land use. The County of Hawaii Recreation Plan (1974) is proposing to develop a regional beach park at Kaalualu Bay. C. Brewer's long-range plan for this area consists of several resorts and multiple family dwellings and single family residences, the majority of which are along the shoreline.

(2) Site condition. The configuration of adjacent land features affords good shelter for small craft during tradewind weather, but is exposed during Kona weather. Kaalualu Bay is very shallow and extensive dredging of hard bottom substrate would be required to provide a channel. Most of the bottom surface is composed of firmly attached basaltic material although loose boulders are also present. Access to this site is impossible without a four wheel drive vehicle.

(3) Environmental considerations. With the possible exception of the endemic sponges, the dominant and conspicuous macrofauna and macroflora of the bay are not unusual. Differences in depth and salinity from the head of the bay to its seaward extreme has made it possible to detect differences in the fish and invertebrates fauna indicative of the physical changes. Considerable seepage of brackish water occurs at the head of the bay, resulting in lowered temperatures in this region.

Approximately 80 percent of the vegetation at the site are non-native consisting mostly of weedy species. The vegetation around the bay may be divided into four communities: (a) Scaevola Thicket, (b) Prosopis Forest, (c) Sesuvium Marsh and (d) Lantana Bushland. No endangered or threatened species exist at this site.

(4) Archaeological considerations. An archaeological reconnaissance of the surrounding area completed in 1972 discovered 91 archaeological sites. The sites discovered in the bay area represent prehistoric Hawaiian utilization of the area--the most significant sites are the clusters of bait cups which are situated along the eastern edge of the bay. Other prehistoric sites include the Kapenako Waterhole which is adjacent to the east side of the bay and scattered house sites around nearby Paiahaa Bay.

(5) Summary. A regional beach park being proposed for Kaalualu Bay would provide shoreline recreational opportunities. Long range plans by C. Brewer include a resort/subdivision development. Based on these plans, construction of a harbor for commercial fishing is not considered to be compatible with the context of this theme. On a recent field trip, a species of endemic sponges was identified at this site. In addition, an archaeological reconnaissance conducted in 1972 revealed a total of 91 archaeological sites. Because of the environmental and archaeological considerations and land-use plans associated with this site, this location was no longer considered.

This site was selected for navigation improvements and funds were appropriated by the 1971 State Legislature, however, because of subsequent environmental conflicts this site was no longer considered.

f. Pohue Bay.

(1) Land use. Additional development of the existing subdivision directly northeast of Pohue Bay is not anticipated based on recent discussion with

County planning department officials. This site is located on private land. The 1971 General Plan for the County of Hawaii proposes to establish the Pohue Bay area as a shoreline reserve.

(2) Site condition. A small sandy beach, one of only two along the South Kona coast, characterizes the edge of the central portion of the bay. Since the area is sheltered from tradewind conditions, Pohue Bay has considerable natural protection. Waves in excess of 2 feet approach the area 200 days a year while waves over 6 feet are estimated to occur only about 5 days per year. Access into this area is restricted over a private road system. A portion of the road leading to the Pohue Bay area is unimproved.

(3) Environmental considerations. The Hawaiian hoary bat sited in this area is listed on the endangered species list.

(4) Archaeological considerations. Directly across the shoreline are a number of archaeological sites which include the Kanonone Waterhole, house sites, petroglyphs, konani boards, and burials. Many other existing sites were not surveyed at the time of this reconnaissance.

(5) Summary. An existing subdivision is located northeast of Pohue Bay, however, no additional plans for urbanization are anticipated. A number of archaeological sites have been identified within the project area and along and adjacent to the shoreline area are a number of archaeological sites which have not yet been evaluated by the State Archaeologist. Because of environmental and archaeological considerations and limited access, this site was eliminated in favor of a more desireable location.

g. Kaulana Bay.

(1) Land use. Land is available adjacent to the bay, however it is under the jurisdiction of the Hawaiian Homes Commission. An arrangement would have to be made with Hawaiian Home Lands for access and shoreside space. The 1971 County of Hawaii General Plan proposes to establish the Kaulana Bay area as a shoreline reserve.

(2) Site condition. The shoreline of Kaulana Bay is scattered with rocks, cobbles and boulders with some sand and terrestrial sediments. The bottom of the bay is primarily solid rock substrate overlain with sand and rock up to about 1-foot in diameter. Depths vary from about 1-foot near the ramp area to about 6-8 feet in the bay. Wave energy within Kaulana Bay is usually generated by the northeast trades; however, when Kona storm conditions are present, southerly waves are focused directly into the bay causing hazardous conditions.

A paved and dirt road branching from the main highway provides access into this area.

(3) Environmental considerations. A recent study of coastal vegetation did not reveal the possible presence of Portulaca hawaiiensis (a rare species proposed for listing as endangered in 1976) or Sesbania tomentosa plants (ohai). Vegetation consisted principally of indigenous strand plants such as ilima (Sida fallax), Pa'u-o-Hiiiaka (Jacquemontia sandivicensis) and beach morning glory (Ipomoea pes-caprae). Open spaces at Kaulana are covered with Bermuda grass (Cynodon dactylon).

Water clarity at Kaulana is approximately 50 to 75 feet. Wave wash over a sand shoal is responsible for some localized turbidity. Surface salinities, ranging from 33.5 ppt to 32.5 ppt, suggested the presence of some fresh-water seepage. Scattered massive coral heads are found along the western portion of the bay. Presumably, because the bay is subjected to substantial wave action, there is little other hard coral growth. No unique or endangered marine species were observed during a recent field trip.

(4) Archaeological Considerations. Kaulana Bay is within the South Point National Historic District and is designated a National Landmark. A survey conducted in 1969 by the National Park Service identified Kaulana Bay point on the east side of the bay as a kapu area having numerous archaeological sites.

(5) Summary. Kaulana Bay is the nearest site to prime fishing grounds off the Ka'u coast of the Big Island. The Department of Hawaiian Home Lands acknowledged that they foresee no major problems in the State obtaining the necessary permits for navigation and shoreside improvements.

Except for occasional feeding by the green sea turtle, endangered or threatened species or species eligible for listing do not utilize the Kaulana Bay area. However, Kaulana Bay is located within the National Historic Landmark District and archaeological sites are known to exist on the east side of the existing boat launching ramp. Navigational improvements at this location would require minimal channel dredging because existing depths are adequate for small craft navigation. Water clarity would be temporarily reduced because of dredging activities.

The loss of surface substrate is not expected to eliminate the habitat or fish resources of the area. Breakwaters have the potential of enhancing marine resources by providing habitat diversity and possibly increasing species diversity and abundance. Advantages arising from this site include minimal environmental and archaeological damage in comparison with the other potential sites. Consequently, further detailed studies were conducted for this site.

A master plan of statewide boat launching facilities, completed in 1972 for the State of Hawaii Department of Transportation, recommended that the ideal solution at Kaulana Bay appeared to be the relocation of the existing ramp to the Kona side of the cove and to construct a small stub breakwater to reduce both shoaling and wave action. The use of the site at that time was not considered extensive enough to justify such an expense, however, within recent years the Kaulana ramp has been heavily used by commercial fishermen from all parts of the island.

h. Summary of Potential Sites. Tables 2 and 3 give an overview of the various items considered in the selection of a site for possible navigation improvements. An inventory of existing facilities and resources within each alternative site was considered as well as various land-use designations within the Conservation District. Major concerns and impacts resulting from existing and future conditions and developments were considered in the selection process. Based on the overall comparison of sites as depicted in Tables 2 and 3 and the desires of State and local concerns, Kaulana Bay was selected for further detailed studies.

TABLE 2. SUMMARY OF POTENTIAL SITES

Site	Existing Facilities and Resources	Proposed[1] Developments	Hawaii County Conservation[2] District Inventory	Major Concerns and Planning Conflicts or Determination of Impacts
Punaluu	-Condominium development (multifamily units) -Golf course, meeting center, restaurant -Punaluu Beach Park -Launch ramp -Limited parking area -Existing depths of -1 to -3 feet MLLW -Prehistoric Hawaiian structures	-"Longhouse" pavilion to hold approximately 500 people -Hiking trail: Punaluu to Kawaa -Resort development -Improvements to parking area -Additional restroom facilities -Landscaping and additional smaller pavilions -Beach park acquisition and expansion	Hazard -Tsunami inundation, floodplain, volcanic Recreation - Wild shoreline, board surfing, county park, archaeological site Conservation District Vegetation -Scrubland, grassland Fish and Wildlife -Game bird range Land Use -Other urban Private Land	-Limited land area for harbor and shoreside facilities -Potential historic significance of access road and foundations of sugar dock -No public land -Possible disturbance of wetland area (anchialine pond) -Important feeding habitat for threatened Green sea turtle.
Honuapo Bay	-Pavilions rest room facility -Whittington Beach Park -Existing natural channel 100 feet wide at -28 feet MLLW -Sea turtles (Chelonia mydas) observed -Honuapo Landing site (historical)	-Expansion of park/facilities -Clearing and additional landscaping -Resort development -Golf course -Reserve as a natural, scenic, preservation area through legislation	Hazard -Tsunami Inundation, floodplain Recreation -Wild shoreline, board surfing, county park Conservation District Vegetation -Grassland Fish and Wildlife -Game bird range Private Land/State -Land (County park) Water Resources -Irrigation water system and well	-Theme of county park for recreation/conservation in conflict with commercial fishing and ancillary facilities -Possible adverse affect on sea turtles (threatened species) -Possible disturbance of coastal wetland area
Kaalualu Bay	-Very shallow bay -Numerous archaeological sites -Endemic sponges	-Regional beach park -Investigation of access and land acquisition -Resort area -Multifamily/single family dwellings	Recreation -Wild shoreline Conservation District Fish and Wildlife -Game mammal range State Land	-Theme of proposed park for recreation/conservation in conflict with commercial fishing and ancillary facilities -Extensive dredging because of shallow bay -Potential loss of endemic sponges -Potential circulation problem because of seepage of brackish water into bay -Protect numerous archaeological sites (91) -Poor access road
Pohue Bay	-Subdivision -Good sand beach -Hawaiian bat -Numerous archaeological sites	-Provide public access and establish as shoreline reserve -Investigate feasibility of acquisition and/or alternative means of open space preservation -Evaluate historical significance	Recreation -Wild shoreline Conservation District Fish and Wildlife -Game mammal range Private Land	-Private land -Protect numerous archaeological sites -Protect bat (endangered species) -No public access.
Kaulana Bay	-Launch ramp -Existing depths of -1 to -(6-8) feet MLLW -Scattered coral growth -Unlimited parking area -Scattered archaeological sites. National Register of Historic Places and National Landmark	-Provide public access and establish as shoreline reserve -Investigate feasibility of acquisition and/or alternative means of open space preservation -Evaluate historical significance	Hazard -Volcanic Conservation District Vegetation -Grassland Fish and Wildlife -Game mammal range Private Land Water Resources -Domestic water system nearby (2-1/2 miles)	-Land under jurisdiction of Hawaiian Homes Commission -Protect archaeological sites adjacent to existing ramp area; historic coordination required -No readily available utilities if needed

1/ Source: 1974 County of Hawaii Recreation Plan
2/ Source: Conservation district inventory maps, State of Hawaii, Department of Land and Natural Resources, July 1977.

TABLE 3. SUMMARY OF POTENTIAL IMPACTS AND MAJOR CONCERNS

● - Major Concern
◒ - Moderate Concern
○ - Minimal or No Concern

Criteria	Punaluu	Honuapo Bay	Kaalualu Bay	Kaulana Bay	Pohue Bay
1. PHYSICAL CRITERIA					
a. Access of site by the design vessel	● Extensive dredging required	◒ Moderate dredging required	● Extensive dredging required	◒ Moderate dredging required	
b. Area to accommodate harbor	○ Adequate	○ Adequate	○ Adequate	○ Adequate	○ Adequate
c. Public land to accommodate harbor shoreside facilities	● No public land available; requires purchasing or leasing of private lands	◒ Public land available; however, used for County beach park	○ Adequate public land available	◒ No public land available; however, no major conflict anticipated with leasing of Hawaiian Homes land	● No public land available; requires purchasing or leasing of private land
d. Vehicular access to site	○ Adequate	○ Adequate	● Poor	◒ Fair	◒ Fair
2. LAND USE POLICY					
a. Compatible with local land use planning	◒ Site designation for other urban uses. (Recreational uses, coastal works, etc.)	◒ Possible conflict with County beach park	◒ Possible conflict with proposed County park	○ Site designated as public boat launching area	◒ Possible conflict with existing/proposed subdivision development
b. Possible community impacts	◒ Commercial/resort; recreational mix may be incompatible	◒ Commercial/recreational mix may be incompatible	◒ Commercial/recreational mix may be incompatible	○ No impacts anticipated	◒ Commercial/residential mix may be incompatible (Odor/traffic)
3. Environmental/significant adverse effects on terrestrial and/or marine resources	◒ Possible adverse impact on feeding habitat of Green sea turtle (Chelonia mydas)	◒ Possible adverse impact on turtle (Chelonia mydas), a threatened species.	◒ Possible adverse impact on endemic sponges	○ No significant impact anticipated	◒ Possible adverse impact on bat habitat(endangered species)
4. Archaeological/ historical resources	◒ Access road to the existing Punaluu ramp & foundation of sugar dock elegible for listings on the Hawaii & National Register of Historic Places	○ No significant archaeological/ historical sites	● Numerous archaeological sites in area	● Located within highly significant National Landmark	● Numerous archaeological sites in area

i. Public Workshop. A public workshop (see Appendix B) was held on 9 July 1980 at the Naalehu Youth Center on the Big Island to obtain information on the suitability of these sites as well as any other sites that may be recommended or identified by the public. Only one other site, Pohue Bay, was identified as a possible or desirable location for navigation improvements. Preference for protection of the existing ramp at Kaulana was expressed. Because of a lack of available public lands, an arrangement would have to be made with Hawaiian Homes Land for access and shoreside space.

j. Governmental Planning. The County of Hawaii indicated preference for navigational improvements to be located at Kaulana Bay. A launch ramp at Kaulana, built by the State of Hawaii Department of Transportation in 1963, is the only public boating facility along the entire Ka'u District coastline.

Basic public facilities, services and amenities are not available at Kaulana Bay. However, according to officials with the State of Hawaii Department of Transportation, a preliminary shoreside development plan will include water utilities and portable sanitary facilities.

4. DEVELOPMENT OF DETAILED PLANS

a. General. This section of the report is directed towards the development of design and evaluation criteria for analyzing specific harbor configuration plans at Kaulana Bay. The formulation of design plans were guided by the specific technical, economic and environmental criteria which are described in the following sections.

b. General Technical Criteria.

(1) The design of the protective structure allows for a minor overtopping criteria by a design wave which may be expected from a severe combination of meteorological and hydrological conditions that are reasonably characteristic of the area.

(2) The entrance channel is to be of adequate depth and width to safely accommodate one-way traffic by the design vessel and the turning basin is to provide a safe maneuvering area. The prevailing wind and wave approach directions are to be evaluated to determine safe channel alignments for navigation. To insure navigational safety, the severity of turns (dog legs) of the entrance channel should be minimized and the widening (flaring) of the channel at the turns are to be provided. The protected basin is to have a maximum wave amplitude of 3 feet to insure minimal damage to vessels.

(3) Navigation improvements shall be designed to accommodate a design vessel of 27-foot length, 7-foot beam, and a 2.5-foot draft. The proposed project is to provide safe navigation and protection during all weather and sea conditions except severe storms.

(4) Each alternative is to be evaluated for shoaling characteristics to determine its effects on the stability of a dredged channel.

(5) Structural and foundation criteria should be applicable for an earthquake zone 3 area.

c. General Economic Criteria.

(1) The benefits should exceed the costs and the net benefits, as far as practicable, should be maximized.

(2) The costs for alternative plans of improvement are to be based on the latest unit prices and assumptions based on the prevailing conditions. The benefits and costs are to be expressed in comparable quantitative economic terms to the fullest extent possible. Annual costs are to be based on a 50-year amortization period and a 7-3/8 percent interest rate[1/]. The annual charges include the expected annual maintenance cost.

d. General Environmental Criteria.

(1) Minimize the physical destruction of scattered coral heads and seagrass resources within Kaulana Bay during harbor construction.

(2) Minimize long-term disturbances to the physical environment (e.g., water circulation, water quality, and sediment transport) which may have secondary impacts on the living resources that inhabit the bay.

(3) Avoid during design and construction phase highly significant archaeological features located on the east bank of Kaulana Bay.

e. The following general concepts were also used to guide the formulation, assessment, and evaluation of alternative harbor plans:

(1) Both adverse and beneficial impacts of alternative plans are to be identified and measured, and the beneficial or adverse contributions of each plan evaluated.

(2) Alternative plans which maximize net economic benefits (National Economic Development--NED plan) and those which are likely to make positive contributions to preserving, maintaining, restoring, or enhancing cultural and natural resources (Environmental Quality--EQ plan) have been designated.

5. DESCRIPTION OF DETAILED PLANS

a. Kaulana Bay. Further investigations were conducted in order to better evaluate the existing conditions of the potential site and to prepare more detailed analysis and design.

(1) Hydrographic and topographic surveys were conducted at Kaulana Bay.

(2) Geotechnical investigations were completed by the Corps of Engineers for the Kaulana Bay area. Investigations were limited to the vicinity of the bay and adjacent land areas. Preliminary foundation criteria were based on visual underwater inspections and their limitations are recognized. It would not be justified at this time to obtain costly offshore borings of the Kaulana site. A conservative design can first be implemented based on the geotechnical data gathered from these investigations for the purposes of initial design and cost estimates. Reasonable ranges in design and cost reduction can be incorporated to determine if a less conservative design, which can later be substantiated by more detailed subsurface investigations, would reduce the overall costs (see Appendix C for the foundations investigation analysis and program). Detailed subsurface investigations will be conducted when a site and a general plan has been selected.

1/ As established by the US Water Resources Council.

(3) Archaeological/cultural reconnaissance. An archaeological reconnaissance was conducted to determine whether historic properties were situated near or within the project sites. Of particular importance was the determination of potential significance of historic properties known to be in the project area, if any, and whether actions to avoid or mitigate impacts to such properties were needed.

b. Alternative Design Plans at Kaulana Bay.

Based on the identified problems and needs, the planning objectives, and the formulation and evaluation concepts, three alternative design plans for Kaulana Bay were developed in detail and evaluated with respect to their contributions to navigation improvements, their beneficial and adverse impacts and their benefits and costs. Two of the alternative plans would involve constructing and providing protection for a new launch ramp while the other plan would provide protection for the existing ramp. A protected basin would provide adequate safety for launching and retrieval operations. Ample parking for car/trailer vehicles is available in areas adjacent to the existing and proposed ramp. All future shoreside or parking facilities would be developed by local interests.

(1) Plan 1. Plan 1 consists of dredging a 245-foot-long, 80-foot-wide, and 8.5-foot-deep entrance channel; a 220-foot-long by 100-foot-wide, and 6.5-foot-deep turning basin, and constructing a 160-foot-long main breakwater with a +11.5-foot crest elevation. The offshore breakwater would provide protection for the existing launch ramp. This plan utilizes the existing reef flat as the entrance channel and the single-lane launch ramp.

(2) Plan 2. Plan 2 consists of dredging a 135-foot-long, 100-foot to 80-foot-wide tapered, and 8.5-foot-deep entrance channel; a 200-foot-long by 100-foot-wide, and 6.5-foot-deep turning basin, and constructing a 135-foot-long main breakwater with a +8.0-foot crest elevation. The breakwater would provide protection for the new launch ramp. This plan utilizes the existing natural channel and a new single-lane launch ramp.

(3) Plan 3. Plan 3 consists of dredging a 135-foot-long, 80-foot to 60-foot-wide tapered, and 8.5-foot-deep entrance channel; a 200-foot-long by 100-foot-wide, and 6.5-foot-deep turning basin, and constructing a 155-foot-long main breakwater with a +11.5-foot crest elevation at the head and a +8.0-foot crest elevation at the trunk. The breakwater would provide protection for the new launch ramp. This plan utilizes the existing natural channel and a new single-lane launch ramp.

c. Other Planning Considerations.

(1) Aids to Navigation. The U.S. Coast Guard will provide the necessary aids to navigation for the selected site and plan. These aids are a Federal cost and are not included in the maximum Corps of Engineers monetary limitation under the authorizing authority.

(2) Disposal Areas. A potential disposal area has been designated for dredged spoil material. Land disposal is considered to be environmentally superior to ocean dumping. The disposal site is located just west of the project area (see Figure 9).

The estimated quantity of dredged material for each plan is 11,700 CY, 5,300 CY and 5,200 CY for plans 1, 2, and 3, respectively.

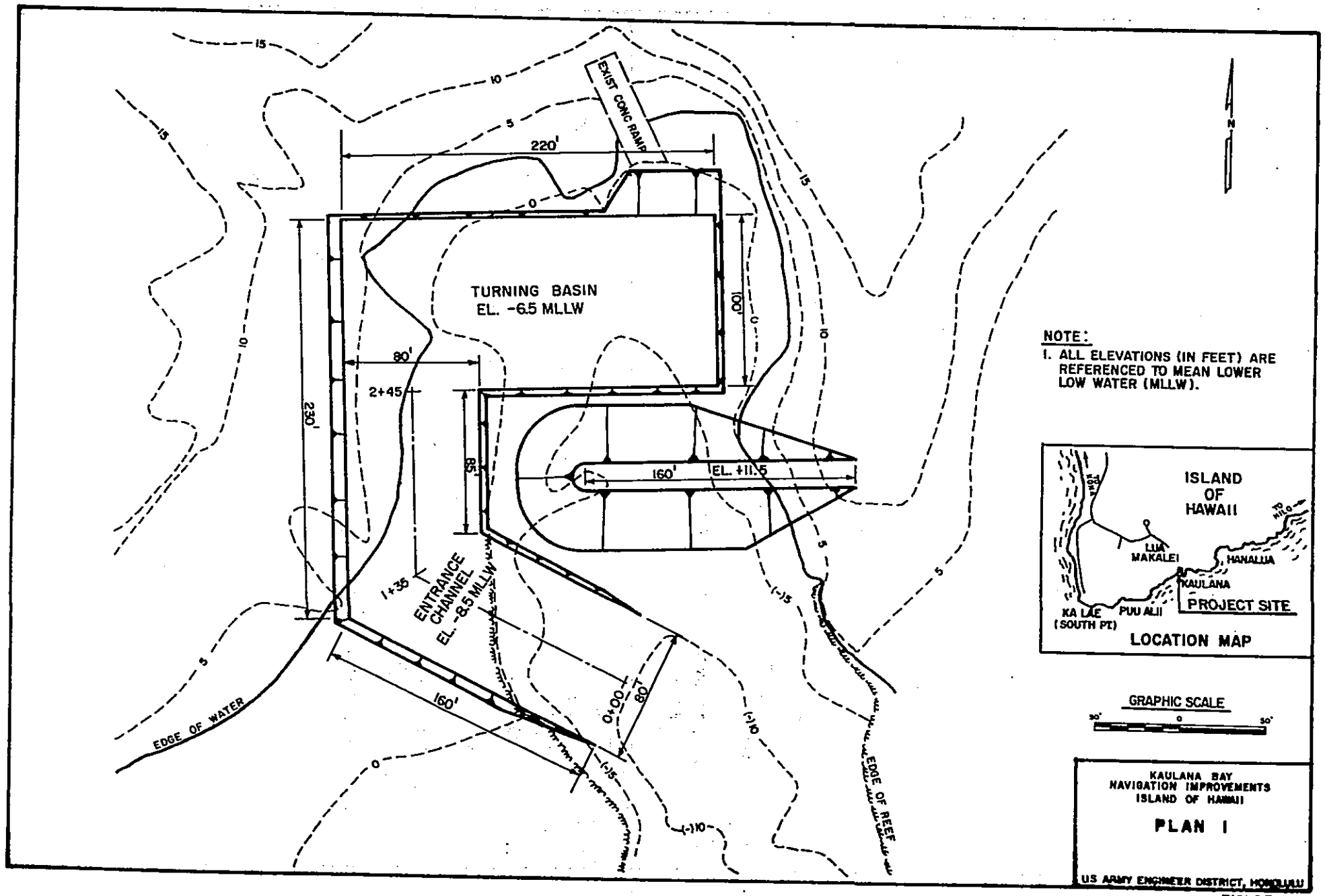

EXIST CONC RAMP
220'
TURNING BASIN
EL. -6.5 MLLW
100'
80'
2+45
230'
85'
160'
EL. +11.5
1+35
ENTRANCE CHANNEL
EL. -8.5 MLLW
160'
0+00
80'
EDGE OF WATER
EDGE OF REEF
15
10
5
0
(-)5
(-)10
(-)15
N
NOTE:
1. ALL ELEVATIONS (IN FEET) ARE REFERENCED TO MEAN LOWER LOW WATER (MLLW).
ISLAND OF HAWAII
HILO
LUA MAKALEI
HANALUA
KAULANA
PROJECT SITE
KA LAE (SOUTH PT)
PUU ALII
LOCATION MAP
GRAPHIC SCALE
50' 0 50'
KAULANA BAY
NAVIGATION IMPROVEMENTS
ISLAND OF HAWAII
PLAN I
US ARMY ENGINEER DISTRICT, HONOLULU

FIGURE 3

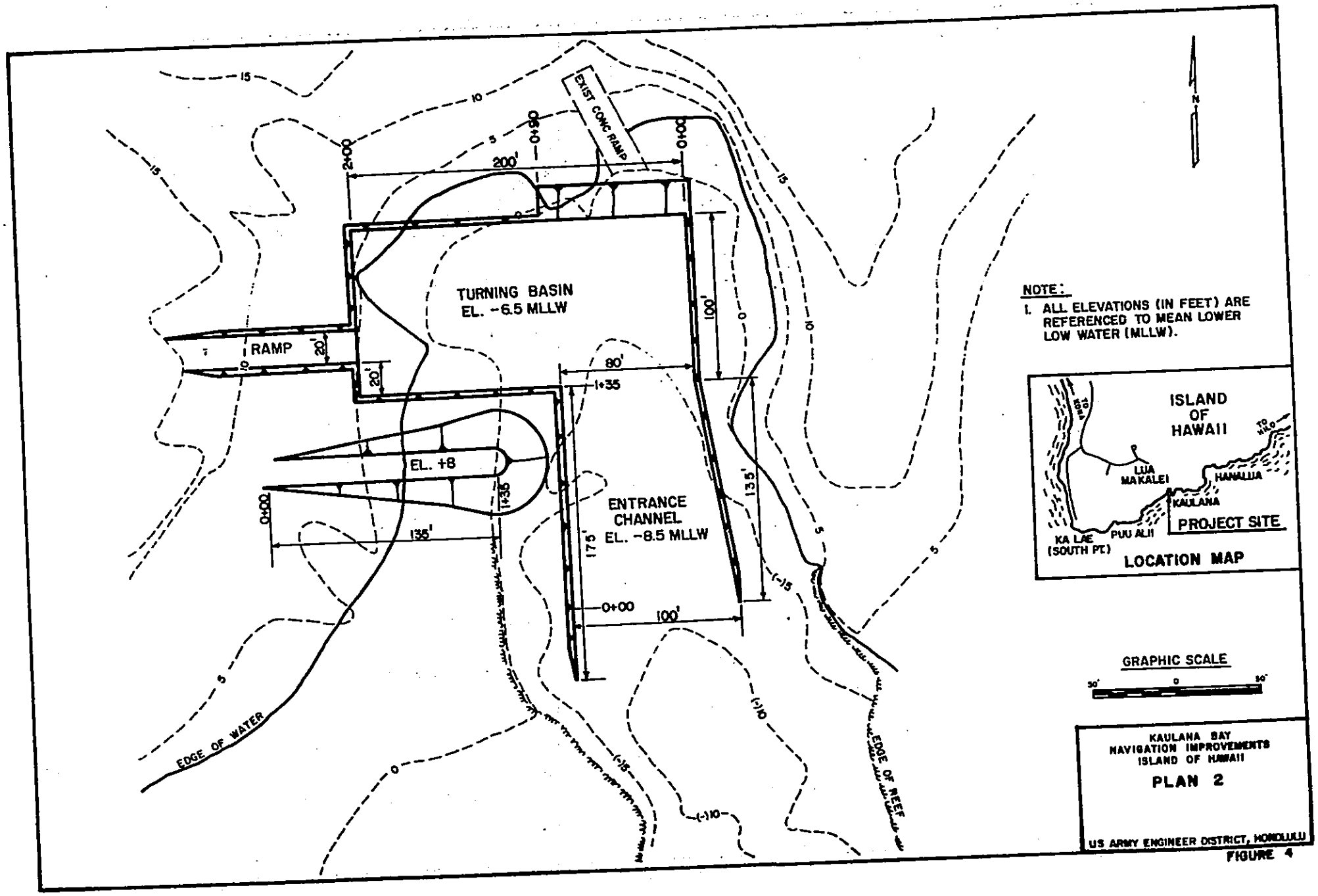

EXIST CONC RAMP
2+00
0+90
0+00
200'
TURNING BASIN
EL. -6.5 MLLW
100'
RAMP
20'
20'
80'
1+35
EL. +8
1+35
0+00
135'
ENTRANCE
CHANNEL
EL. -8.5 MLLW
175'
135'
0+00
100'
15
10
5
0
(-)15
(-)10
EDGE OF WATER
EDGE OF REEF
N
NOTE:
1. ALL ELEVATIONS (IN FEET) ARE REFERENCED TO MEAN LOWER LOW WATER (MLLW).
ISLAND OF HAWAII
HILO
LUA MAKALEI
HANALUA
KAULANA
PROJECT SITE
KA LAE (SOUTH PT.)
PUU ALII
LOCATION MAP
GRAPHIC SCALE
50'
0
50'
KAULANA BAY
NAVIGATION IMPROVEMENTS
ISLAND OF HAWAII
PLAN 2
US ARMY ENGINEER DISTRICT, HONOLULU

FIGURE 4

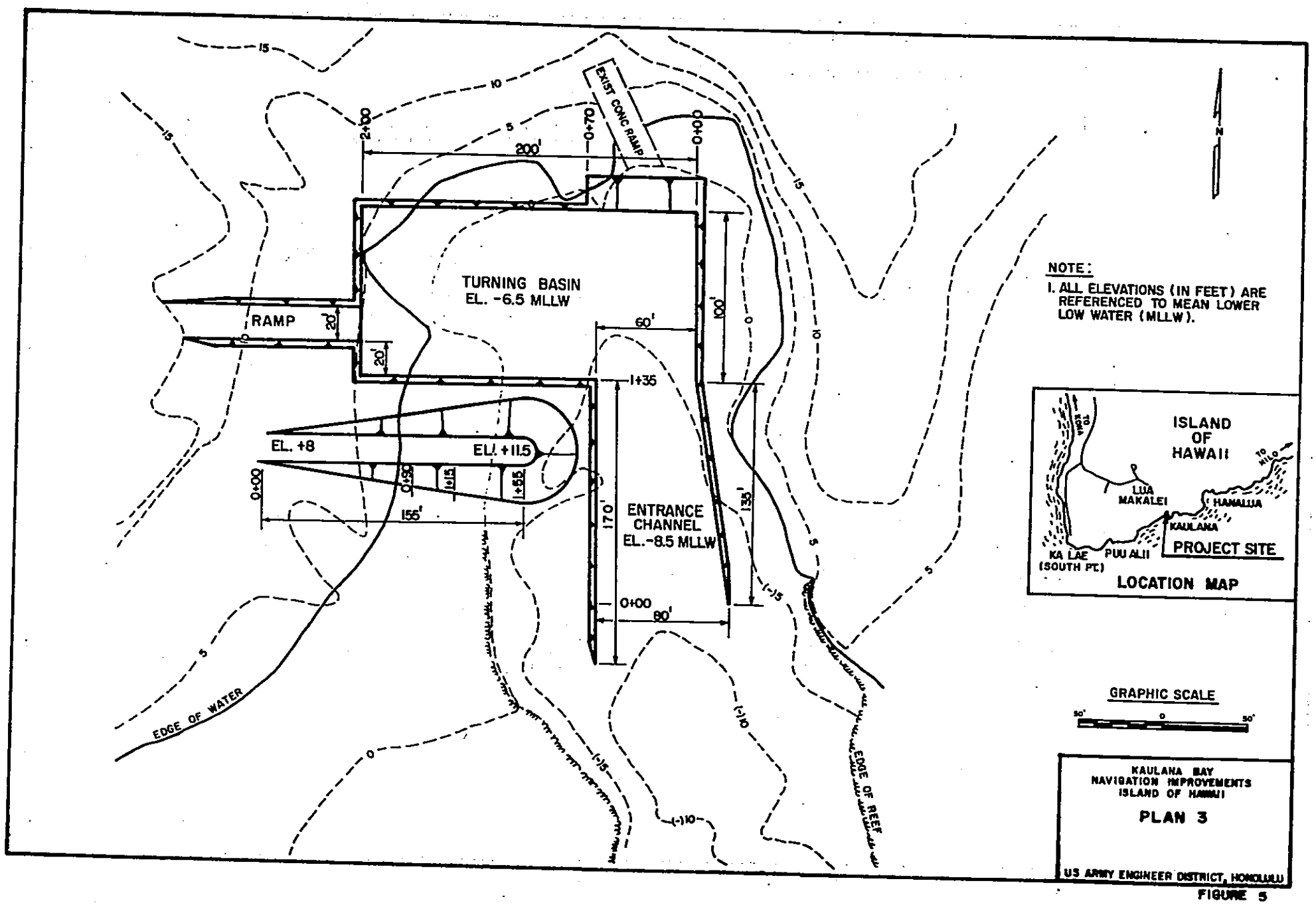
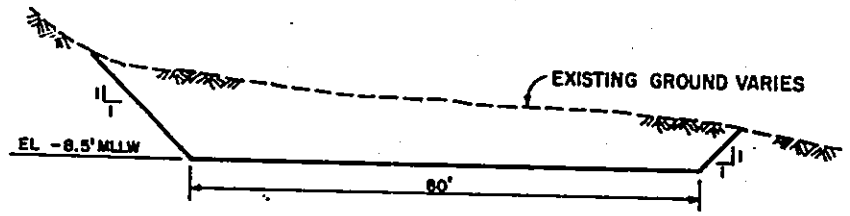
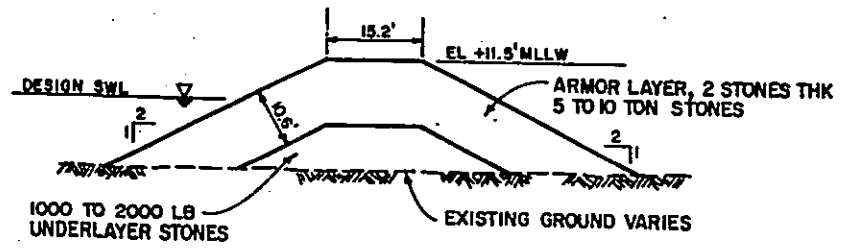

15
10
5
15
2+00
200'
0+00
EXIST CONC RAMP
0+20
TURNING BASIN
EL. -6.5 MLLW
RAMP
20'
20'
60'
100'
1+35
EL. +8
EL. +11.5
0+00
0+55
1+15
1+55
155'
ENTRANCE
CHANNEL
EL.-8.5 MLLW
170'
135'
0+00
80'
(-)15
(-)10
5
0
EDGE OF WATER
EDGE OF REEF
N
NOTE:
1. ALL ELEVATIONS (IN FEET) ARE REFERENCED TO MEAN LOWER LOW WATER (MLLW).
ISLAND OF HAWAII
HILO
LUA MAKALEI
HANALUA
KAULANA
PROJECT SITE
KA LAE (SOUTH PT.)
PUU ALII
LOCATION MAP
GRAPHIC SCALE
50'
0
50'
KAULANA BAY
NAVIGATION IMPROVEMENTS
ISLAND OF HAWAII
PLAN 3
US ARMY ENGINEER DISTRICT, HONOLULU

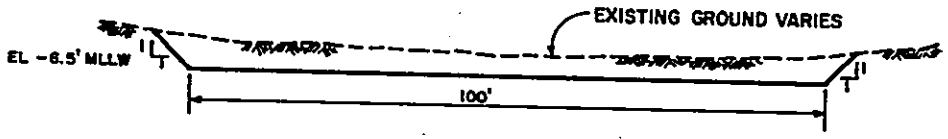
FIGURE 5



TYPICAL ENTRANCE CHANNEL



TYPICAL BREAKWATER SECTION



TYPICAL TURNING BASIN

NOTE :

THE CUT SLOPES IN THE AREA OF THE RAMP WILL BE FLATTENED TO CONFORM WITH THE STATE BOAT RAMP REQUIREMENTS.

GRAPHIC SCALE

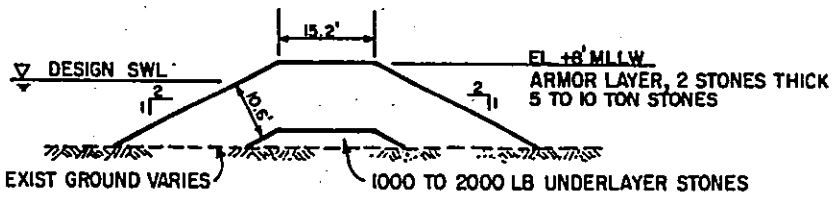
20' 15' 10' 5' 0 20' 40'

KAULANA BAY
NAVIGATION IMPROVEMENTS
ISLAND OF HAWAII

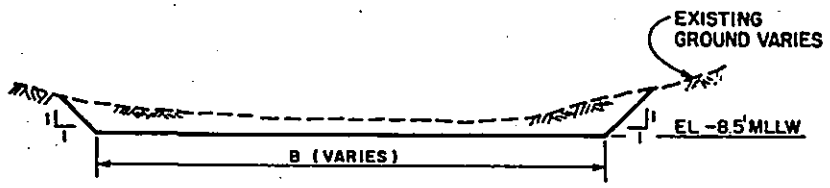
TYPICAL SECTIONS
PLAN I

US ARMY ENGINEER DISTRICT, HONOLULU

FIGURE 6

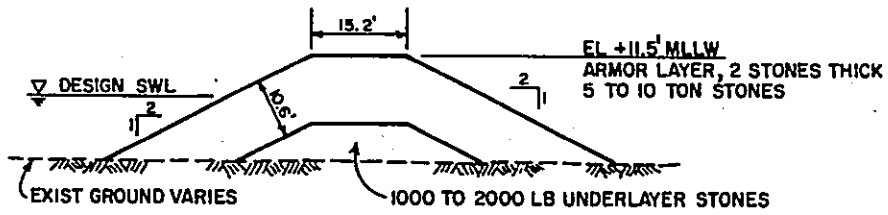


TYPICAL BREAKWATER SECTION, PLAN 2
TYPICAL TRUNK SECTION, PLAN 3
STA 0+00 TO STA 0+90

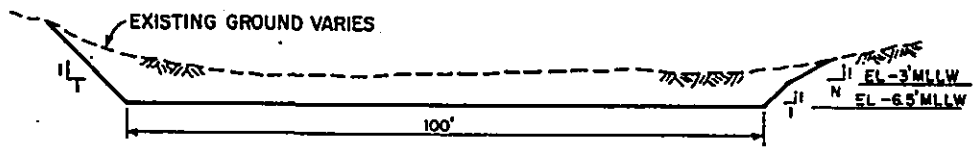


TYPICAL ENTRANCE CHANNEL

STATION	B (FT)	REMARK
PLAN 2		
STA 0+00 TO 1+35	100 – 80	TRANSITION
PLAN 3		
STA 0+00 TO 1+35	80 – 60	TRANSITION



TYPICAL HEAD SECTION, PLAN 3
STA 1+15 TO STA 1+55



TYPICAL TURNING BASIN

STATION	N
PLAN 2	
STA 0+00 TO 0+90	5
STA 0+90 TO 2+00	1
PLAN 3	
STA 0+00 TO 0+70	5
STA 0+70 TO 2+00	1

NOTE:
STA 0+90 TO STA 1+15 PLAN 3 BREAKWATER TRANSITION FROM CREST ELEV. +8 TO CREST ELEV. +11.5

GRAPHIC SCALE
20' 15' 10' 5' 0 20' 40'

KAULANA BAY
NAVIGATION IMPROVEMENTS
ISLAND OF HAWAII
TYPICAL SECTIONS
PLAN 2
PLAN 3

US ARMY ENGINEER DISTRICT, HONOLULU

FIGURE 7

(3) Construction Material Sources. Armor and underlayer stones are available at existing commercial quarry operations at Hilo or at the stockpile area at Honokahau Harbor. Armor stone sizes of 5 to 10 tons will be required.

6. ESTIMATED BENEFITS AND COSTS

a. Benefits. Benefits accruing from each plan were derived from navigation benefits and expected improvements in commercial fishing. Economic evaluations were conducted in accordance with procedures and standards prescribed by the Water Resources Council and Corps of Engineers' policy. Detailed analyses are presented in Appendix F.

b. Costs. Estimated project first costs were developed from projected September 1981 price levels and assumptions based on the prevailing physical conditions and construction methods suitable to the project area. The average annual cost for the purposes of the benefits to cost comparisons include interest (7-3/8%) and amortization (50 years) of the project first cost and the estimated annual maintenance costs associated with maintenance dredging, repairs to the breakwater structure, and maintenance for aids to navigation. Cost breakdowns and estimating assumptions are provided in Appendix C (Cost Estimation Section of the Engineering Investigations and Design Analysis Appendix).

c. Benefit to Cost Comparison. Table 4 presents a summary of the estimated average annual benefits to average annual costs associated with each plan. This comparison represents the degree of tangible economic justification for each plan.

TABLE 4. COST AND BENEFIT SUMMARY
(September 81 Price Levels)

Item	PLANS 1	2	3
Total Estimated First Cost 1/	$2,772,000	$1,120,000	$1,300,000
Estimated Average Annual Cost	218,000	85,000	101,000
Estimated Average Annual Benefit	291,000	291,000	291,000
Estimated Benefit to Cost Ratio	1.3	3.4	2.9

d. Apportionment of Costs. The apportionment of costs between Federal and non-Federal interests corresponds to Section 107 of the River and Harbor Act of 1960, as amended, which prescribes the cost of sharing. This law limits Federal participation to a monetary maximum of $2.0 million (excluding the cost of aids to navigation).

1/ The apportionment of costs does not include other non-Federal costs (self-liquidating) associated with the assurances of local cooperation as required in Section 221 of the River and Harbor Act of 1970. Provisions required in the local cooperation agreement are detailed on page 43. Cost estimates are detailed in Appendix C.

TABLE 5. APPORTIONMENT OF COSTS

Item	PLANS 1	2	3
Total Project First Cost	$ 2,772,000	$ 1,120,000	$1,300,000
Corps of Engineers First Cost Share 1/	2,000,000	996,000	1,176,000
US Coast Guard First Cost Share 2/	20,000	20,000	20,000
Non-Federal First Cost Share	752,000 3/	104,000 4/	104,000 4/

1/ All future maintenance dredging and breakwater repairs are a Federal cost.

2/ All future maintenance for aids to navigation is a Federal cost.

3/ Includes cost for lands, easements and rights-of-way.

4/ Includes cost for new ramp and lands, easements, and rights-of-way.

7. ASSESSMENT AND EVALUATION OF ALTERNATIVE PLANS

a. Comparison of Alternative Plans. The evaluation of the economic, social and environmental effects of each alternative plan is displayed in Table 6 (Comparison of Alternative Plans and System of Accounts). This table displays the significant contributions, the beneficial and adverse effects, and the extent to which various planning objectives and evluation criteria are met by each plan.

b. Compliance Requirements.

(1) In accordance with the Council on Environmental Quality Regulations and Procedures, a minimum comment period of forty-five (45) days from the date of the notice of availability for the draft environmental statement published in the Federal Register was provided. Copies of the report were circulated to Federal, State and County of Hawaii agencies and interested groups and individuals. Copies were also made available to the residents of Ka'u, Island of Hawaii. The mailing list is provided in Appendix B. No administrative action was taken regarding the proposed action for ninety (90) days.

(2) As part of the public involvement program, a public meeting was held on 14 July 1981 at the Naalehu Youth Center in Naalehu, Island of Hawaii. Public notices were distributed to the general public and media as well as to Federal, State, and County elected officials and government agencies. The meeting gave the public the opportunity to express their views concerning the proposed alternatives as well as on the effects of "discharge of fill material in the navigable waters of the US" and the "development of Federal activities

TABLE 6. COMPARISON OF ALTERNATIVE PLANS AND SYSTEMS OF ACCOUNTS

	NO IMPROVEMENT 'WITHOUT CONDITION'	PLAN 1	PLAN 2	PLAN 3
A. PLAN DESCRIPTION	Use of existing facility at Kaulana Bay. Closest publicly owned and operated facility is at Pohoiki Bay, approximately 58 miles to the northeast.	Construction of a 160-foot breakwater, dredging of a 245-foot long entrance channel and turning basin.	Construction of a 135-foot breakwater and a new single lane launch ramp, dredging of a 135-foot long entrance channel and turning basin.	Construction of a 155-foot breakwater and a new single lane launch ramp, dredging of a 135-foot long entrance channel and turning basin.
B. SIGNIFICANT IMPACTS				
1. Economic				
Local Government Finance*	None.	Requires approximately $752,000 local contribution not including costs for local assurances and cooperation.	Requires approximately $104,000 local contribution not including costs for local assurances and cooperation.	Requires approximately $104,000 local contribution not including costs for local assurances and cooperation.
Land Use	Land utilized in coastal area. Grazing on Hawaiian Homes Land inland by short-term lease.	No change to local land use policy, surrounding area is barren except for a few temporary shelters.	Same as Plan 1.	Same as Plan 1.
Public Facilities and Services	Existing Ramp. No shoreside facilities or major utilities.	Would provide for safe navigation and launch/recovery of boats and could promote the growth of related public facilities and services.	Same as Plan 1.	Same as Plan 1.
Regional Growth*	No significant impact. Stable growth will occur with or without navigation improvements.	No significant impact. Stable growth will occur with or without navigation improvements.	Same as Plan 1.	Same as Plan 1.
Employment*	Existing condition.	Would increase employment opportunities in commercial and general boating related services.	Same as Plan 1.	Same as Plan 1.
Damages to Boats and Related Equipment	Numerous damages during launch and recovery operations. Sixty percent use factor.	Marked decrease in damages during launch and recovery operations.	Same as Plan 1.	Same as Plan 1.
Increased Fish Catch for Commercial Fishermen	Current catch: 465,000 pounds per year.	203,000 pound increase per year.	Same as Plan 1.	Same as Plan 1.
Commitment of Economic Resources	Not applicable.	Commitment of 9,400 tons of stone and fill, time, man-power and energy resources.	Commitment of 1,800 tons of stone and fill, time, man-power, and energy resources.	Commitment of 3,000 tons of stone and fill, time, man-power and energy resources.

	NO IMPROVEMENT 'WITHOUT' CONDITION	PLAN 1	PLAN 2	PLAN 3
2. Environmental				
a. General				
Marine Environment	No change.	1.16 acres dredged or covered. (1, 6, 9)	0.85 acres dredged or covered. (1, 6, 9)	0.91 acres dredged or covered. (1, 6, 9)
Terrestrial Environment	No change.	0.24 acres modified. (1, 5, 9)	0.19 acres modified. (1, 5, 9)	0.22 acres modified. (1, 5, 9)
Fish and Wildlife	No change to existing conditions. Scattered coral growth within Kaulana Bay.	Loss of some coral and sessile organisms. Temporary displacement of motile organisms during construction. Rapid recovery anticipated. (1, 6, 9)	Same as Plan 1.	Same as Plan 1.
Water Quality*				
Temporary Increase in Water Turbidity Anticipated During Construction; Grossly Estimated by Length of Construction Time and Quantity of Material Removed	Not applicable.	12 months 11,700 Cubic Yards (1, 6, 9)	6 months 5,300 Cubic Yards (1, 6, 9)	6 months 5,200 Cubic Yards (1, 6, 9)
Long-Term Alterations to Water Quality	Not applicable.	No significant long-term effect except for impacts associated with boat operation. (1, 6, 9)	Same as Plan 1.	Same as Plan 1.
Circulation & Flushing				
Increase in Water Residence Time	No	Yes (1, 6, 9)	Yes (1, 6, 9)	Yes (1, 6, 9)
Air Quality*				
Dust Nuisance Estimated by Length of Construction Period	Not applicable.	12 months	6 months	6 months
Natural Resources*	Natural, unaltered shoreline except for existing ramp and natural bay area.	Would commit approximately 1.16 acres of natural marine environment to navigation improvements and 9,400 tons of quarried stone for protective structure. (1, 6, 9)	Would commit approximately 0.85 acres of natural marine environment to navigation improvements and 1,800 tons of quarried stone for protective structure. (1, 6, 9)	Would commit approximately 0.91 acres of natural marine environment to navigation improvements and 3,000 tons of quarried stone for protective structure. (1, 6, 9)
Man-Made Resources*	Continued demand for safe boating facility.	Completes boating facility for safe navigation. (1, 6, 9)	Same as Plan 1.	Same as Plan 1.

	NO IMPROVEMENT 'WITHOUT' CONDITION	PLAN 1	PLAN 2	PLAN 3
b. Environmental Quality Destroyed				
Marine Environment				
Amount of Bay Area Disturbed	Approximately 1.5 acres available.	1.16 acres. (1, 6, 9)	0.85 acres. (1, 6, 9)	0.91 acres. (1, 6, 9)
Amount of Live Coral Lost	None.	Minimal loss. (1, 6, 9)	Same as Plan 1.	Same as Plan 1.
c. Environmental Quality Enhanced				
Amount of New Intertidal and Rocky Interstitial Marine Habitat Created	None.	0.09 acres. (1, 2, 6, 9)	0.05 acres. (1, 2, 6, 9)	0.06 acres. (1, 2, 6, 9)
Species Diversity	None.	Localized Increase. (2, 6, 9)	Localized Increase. (2, 6, 9)	Localized Increase. (2, 6, 9)
3. Social				
Noise*	No change from existing condition.	Temporary increase during construction - 12 months; no long-term change. (1, 2, 5, 10)	Temporary increase during construction - 6 months; no long-term change. (1, 2, 5, 10)	Same as Plan 2.
Population*	No impact.	No significant effect on population growth and no displacement of people. (1, 2, 6, 9)	Same as Plan 1.	Same as Plan 1.
Aesthetic Values*	No change.	Visual intrusion from breakwater. (1, 6, 9)	Same as Plan 1.	Same as Plan 1.
Historic, Cultural, and Archaeological Resources	National Landmark District.	Probable destruction of two prehistoric features on east side of bay during construction. (1, 4, 9)	Possible effect on prehistoric features on east side of bay. (1, 5, 10)	Same as Plan 2.
Recreational Opportunities	No change.	Increase access for sports fishing. (1, 5, 10)	Same as Plan 1.	Same as Plan 1.
Health, Safety, and Community Well-Being	Hazardous navigation conditions at Kaulana Bay.	Would enhance health, safety and community well-being by providing a protective basin for boating operations. Also decreased accidents at sea. (2, 6, 8, 10)	Same as Plan 1.	Same as Plan 1.
Community Growth and Cohesion*	No change.	No significant change.	Same as Plan 1.	Same as Plan 1.

	NO IMPROVEMENT 'WITHOUT' CONDITION	PLAN 1	PLAN 2	PLAN 3
C. PLAN EVALUATION				
1. Contributions to the Planning Objectives				
Improve Commercial Fishing Opportunities on the Big Island for the Period 1985-2035	Restricts commercial fishing opportunities.	Provides protected basin for operation of trailer boats, contributes to development of commercial fishing, increases efficency and opportunities for existing fishing operations, provides a social and economic commitment on the importance of fishing.	Same as Plan 1.	Same as Plan 1.
Improve the Socio-Economic Opportunities for the People of the Ka'u District	Contributes to socio-economic opportunities.	Provides employment opportunities, provides diversity of Big Island's tax revenue base, provides stability of fish supply and prices.	Same as Plan 1.	Same as Plan 1.
Minimize Alteration to Historical and Cultural Resources of the Area	No modifications.	Minimal impact.	No modifications.	No modifications.
Minimize Alteration to Bay Marine Environment	No modifications.	1.16 acres modified.	0.85 acres modified.	0.91 acres modified.
2. Response to Specified Criteria				
Providing a Protected Basin That can Accommodate a Typical Fishing Bessel of 27-Foot Length, 7-Foot Beam Width and 2.5-Foot Draft.	No	Yes	Yes	Yes
Providing Ancillary Land Area that can Accommodate Parking	Yes	Yes	Yes	Yes
Minimize Conflicts with Local Land-Use Policy and Physical Community Disruption	Unchanged.	Yes	Yes	Yes
Enhancing, Preserving, or Minimizing Effects on Marine and Terrestrial Flora and Fauna Resources	Unchanged.	Minimal effects.	Minimal effects.	Minimal effects.
Preserving Archaeological and Historical Resources	Unchanged.	Significant adverse effects.	Possible adverse effects which can be avoided.	Same as Plan 2.

	NO IMPROVEMENT 'WITHOUT' CONDITION	PLAN 1	PLAN 2	PLAN 3
3. Relationship to National Accounts				
National Economic Development (NED)				
Average Annual Benefits	N/A	$291,000	$291,000	$291,000
Average Annual Costs	N/A	218,000	85,000	101,000
Net Annual Benefits	N/A	73,000	206,000	190,000
Benefit-to-Cost Ratio (B/C)	N/A	1.3	3.4	2.9
Environmental Quality	SEE ITEM B.2 ON THIS TABLE.			
Social Well-Being	SEE ITEM B.3 ON THIS TABLE.			
Regional Development	SEE ITEM B.1 ON THIS TABLE.			
4. Response to Associated Evaluation Criteria				
Acceptability	Not acceptable.	Low	Low	High
Completeness	Not applicable.	COMPLETE AS DESCRIBED, EXCEPT FOR PERIODIC MAINTENANCE DREDGING.		
Effectiveness	Not applicable.	Marginally effective.	Effective.	Highly effective.
Efficiency	Not applicable.	Marginally efficient.	Highly efficient.	Efficient.
Reversibility	Not applicable.	Irreversible commitment of resources.	Same as Plan 1.	Same as Plan 1.
Stability	Not applicable.	Medium	High	High
D. IMPLEMENTATION RESPONSIBILITIES				
1. Corps of Engineers	Not applicable.	Provide estimated project first cost share of $2 mil.; design and construction of the breakwater, entrance channel and turning basin.	Provide estimated project first cost share of $996,000 design and construction of the breakwater, entrance channel and turning basin.	Provide estimated project first cost share of $1.2 mil., design and construction of the breakwater, entrance channel and turning basin.
2. State of Hawaii	Not applicable.	Provide estimated local first cost share of $752,000 provide local assurances and cooperation.	Provide estimated local first cost share of$104,000 provide local assurances and cooperation.	Provide estimated local first cost share of $104,000 provide local assurances and cooperation.
3. US Coast Guard	Not applicable.	Provide navigational aids.	Provide navigational aids.	Provide navigational aids.

(*) Item specifically required in Section 122, Public Law 91-611 and ER 1105-2-240.

INDEX OF FOOTNOTES

TIMING
1. Impact is expected to occur prior to or during implementation of the plan.
2. Impact is expected within 15 years following plan implementation.
3. Impact is expected in a longer time frame (15 or more years following implementation).

UNCERTAINTY
4. The uncertainty associated with impact is 50% or more.
5. The uncertainty is between 10% and 50%.
6. The uncertainty is less than 10%.

EXCLUSIVITY
7. Overlapping entry: Fully monetized in NED account.
8. Overlapping entry: Not fully monetized in NED account.

ACTUALITY
9. Impact will occur with implementation.
10. Impact will occur only when specific additional actions are carried out during implementation.
11. Impact will not occur because necessary additional actions are lacking.

within the base floodplain" under Section 404 of the Clean Water Act of 1977 and Executive Order 11988 (Flood Plain Management, dated 24 May 1977), respectively. Additional evaluation reports required by these acts are provided in the final report. A transcript of the public meeting is provided in Appendix B.

(3) In accordance with the Fish and Wildlife Coordination Act of 1958, as amended, the US Fish and Wildlife Service provided a Section 2(b) report. A copy of this report is provided in Appendix E.

(4) In accordance with Section 7 of the Endangered Species Act of 1973, formal consultation was initiated between the National Marine Fisheries Service and the US Fish and Wildlife Service.

(5) The Draft Environmental Impact Statement (DEIS) was filed with the US Environmental Protection Agency. The EPA classified the DEIS as "LO-1" indicating lack of objections. Their classification and the date of the EPA's comments were published in the Federal Register. A copy of their findings is provided in Appendix B.

(6) The State of Hawaii Historic Preservation Officer, the Interagency Archaeological Service of the Heritage Conservation and Recreation Service, US Department of the Interior and the US Advisory Council on Historic Preservation were afforded the opportunity to review the adequacy of our cultural resources study and findings under the National Historic Preservation Act of 1966 and the Archaeological Recovery Act of 1960 as amended.

c. List of Letters and Responses. Section V of the Public Involvement Appendix B list all pertinent correspondence received regarding the Draft Detailed Project Report and Environmental Statement. Actual letters received are documented in the Public Involvement Appendix under Pertinent Correspondence. Response to agency and individual letters are also reproduced in this section.

IV. THE SELECTED PLAN

1. RATIONALE FOR SELECTION

Plan 3 at Kaulana Bay is considered the most suitable small craft facility layout for commercial fishermen. Plan 2 represents the least costly alternative. Although Plan 2 is designated as the National Economic Development (NED) plan based on a maximization of net benefits, Plan 3 is being recommended based on public input and review comments and on the greater navigational safety afforded to small-craft vessels within Kaulana Bay. Plan 2 was also considered to be the least environmentally damaging plan, however since Plans 2 and 3 have almost identical layouts, the discharge and environmental effects would be similar.

Plan 3, which involves relocating the existing ramp and utilizing the existing natural channel, would meet the planning objectives and would:

a. have minimal detrimental effects on the marine ecology,

b. have comparatively little impact on water quality and circulation,

c. have minimal adverse environmental effects.

2. PLAN DESCRIPTION

a. General Plan. The selected plan (Plan 3) provides for dredging of an entrance channel and turning basin, relocating the existing ramp, and a breakwater structure. The protected basin will provide for the safe launching and recovery of boats. Specific elements of the plan are shown on Figure 5 in the main report.

b. Shoreside Facilities. The State of Hawaii is responsible for providing all shoreside facilities including parking areas and an access road for this project. Land adjacent to Kaulana Bay will be leased from Hawaiian Home Lands and used for development of these facilities. At the present time, the Department of Transportation is developing shoreside plans for the Kaulana Bay area. Parking areas, dry storage facility, a wash area, and fresh water are included in shoreside plans to accommodate the anticipated trailer-vehicle traffic. Approximately 40-50 spaces for trailer-vehicles are planned for the parking area. A preliminary shoreside development plan is shown on Figure 8.

c. Dredge Disposal. Based upon coordination with the Department of Transportation, the dredged material (5,200 cubic yards) would be spread over a 6.4-acre site adjacent to the new launch ramp (see Figure 9). An archaeological survey, conducted by Dr. Paul H. Rosendahl (Archaeologist) in April 1981, indicates that there are no known archaeological features on the west side of Kaulana Bay. However, since the proposed disposal site is located in a National Historic Landmark and extends beyond the limits of the recent survey, the possibility exists that there may be subsurface or surface archaeological sites. An additional survey would be required prior to dredging to determine if any historic properties at the site would be adversely impacted by the dredge disposal. The results of the survey would be submitted to and coordinated with the State Historic Preservation Officer.

d. Aids to Navigation. The proposed plan at the Kaulana Bay launch facility site was coordinated with the US Coast Guard. They recommended that a day marker be installed at this location. The initial cost is estimated at $20,000 with an annual maintenance cost of approximately $1,500.

e. Drainage Modifications. With implementation of Plan 3, the State of Hawaii Department of Transportation will be responsible for possible drainage modifications (i.e., rerouting of runoff). Site conditions indicate surface drainage through naturally formed erosion gullies and eventually into Kaulana Bay.

f. Apportionment of Costs. Based on September 1981 price levels, the apportioned costs for the selected plan is shown below:

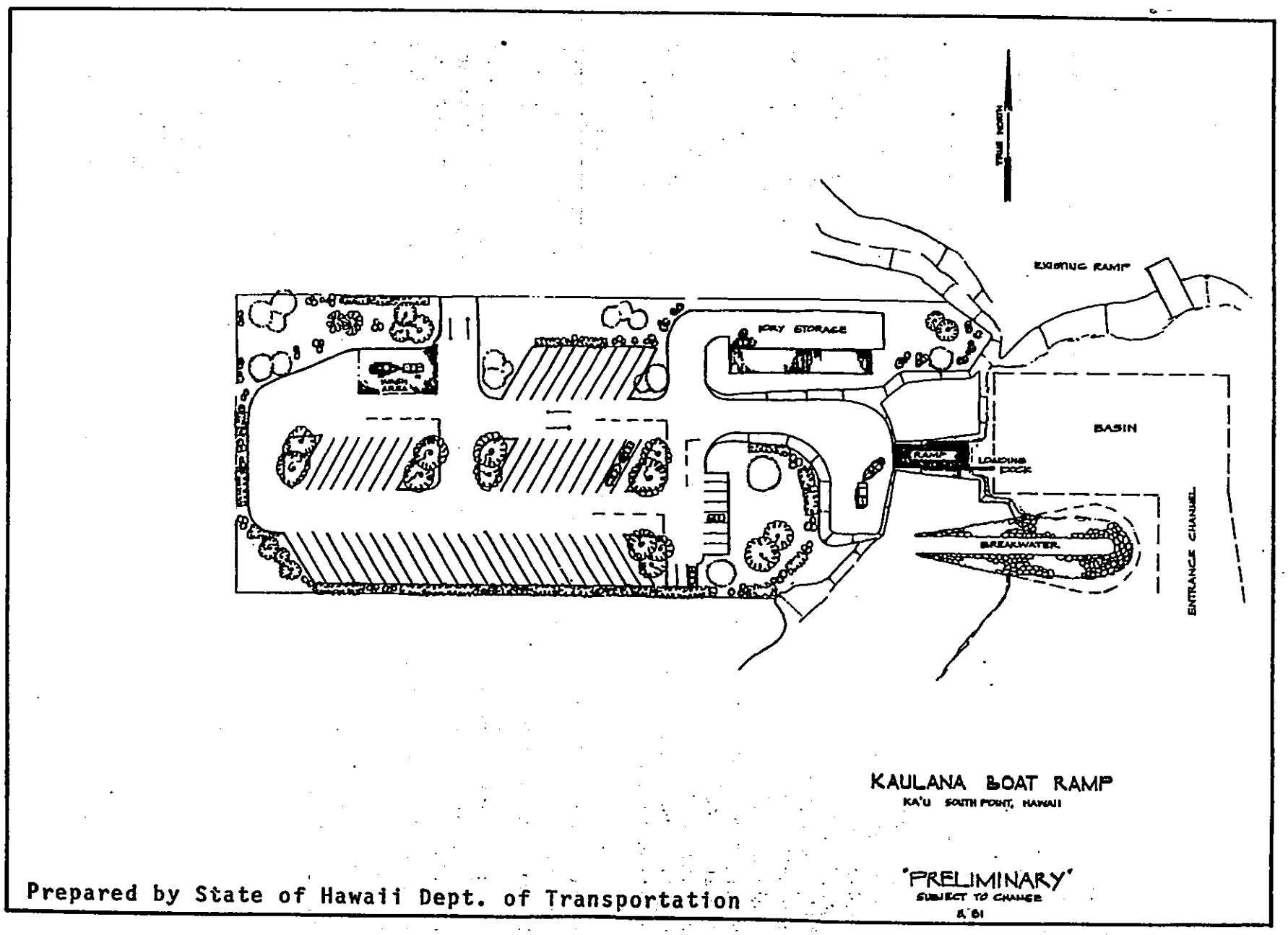
Apportionment of Costs for the Selected Plan
(September 1981 Price Levels)

Total Project First Cost	$1,300,000
Corps of Engineers First Cost Share 1/	1,176,000
US Coast Guard First Cost Share 2/	20,000
Non-Federal First Cost Share 3/	104,000

1/ All future maintenance dredging and breakwater repairs are Federal costs.

2/ All future maintenance for aids to navigation is a Federal cost.

3/ Includes cost for new ramp and lands, easements, and rights-of-way.



SHORESIDE DEVELOPMENT PLAN - FIGURE 8

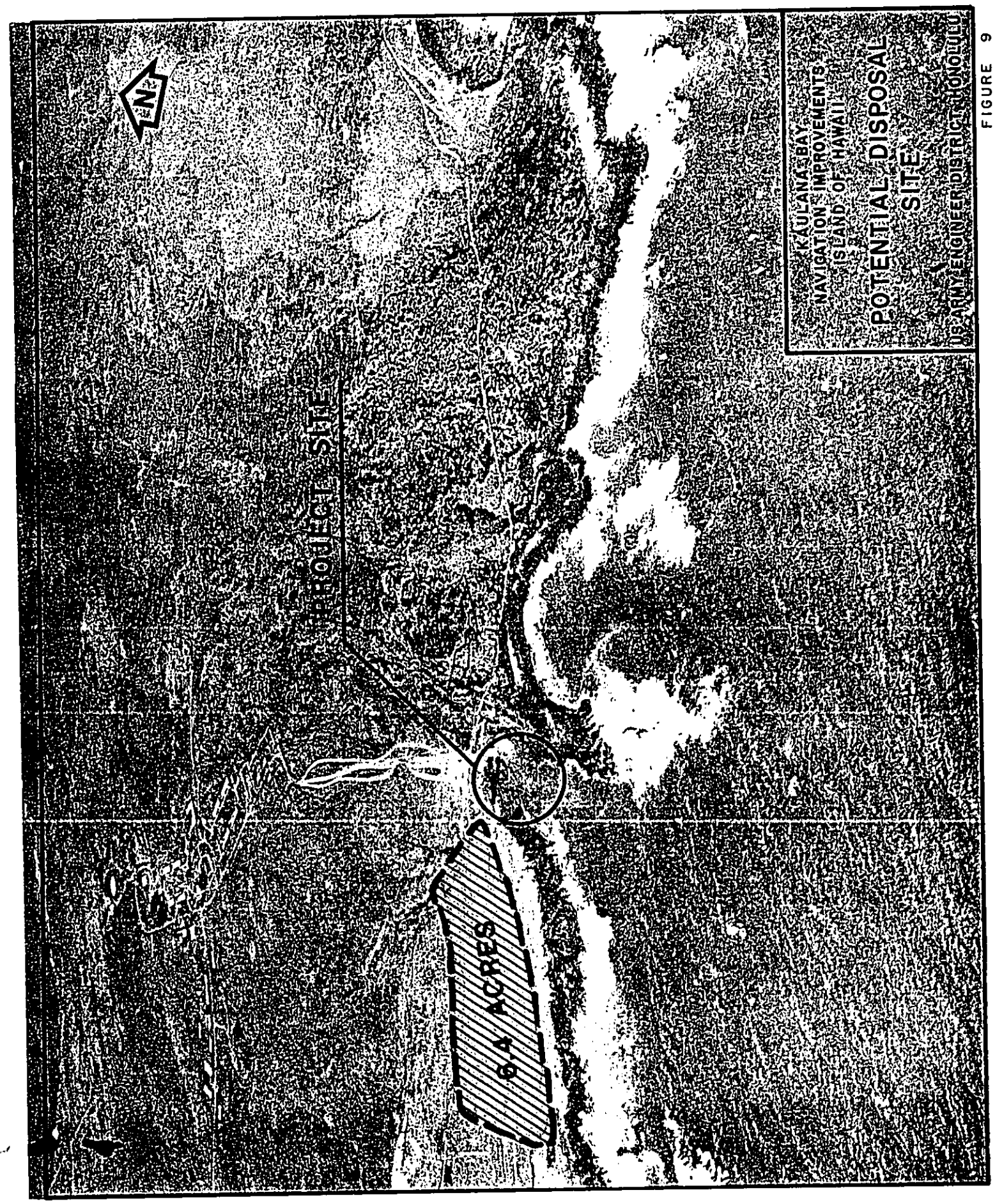


FIGURE 9

g. Plans and Specifications. Prior to initiation of construction, plans and specifications will be prepared. During this stage the following will be incorporated:

(1) additional subsurface (borings) investigations

(2) updated site bathymetric and topographic surveys

(3) final design and coordination

(4) construction drawings and plans

(5) real estate permits and rights-of-way

(6) local assurances in accordance with Section 211 of the River and Harbor Act of 1970

(7) compliance documents and certificates as necessary

(8) suitable dredged material disposal site.

3. PLAN IMPLEMENTION

a. Construction Schedule. The work schedule for preparation of plans and specifications is approximately 6 months. Construction would be accomplished by contract and will require approximately 6 months to complete.

b. Operation and Maintenance. Construction and maintenance of the general navigation features which include the entrance channel, turning basin, breakwater and aids to navigation will be accomplished by the Federal government at Federal expense. The average annual Federal maintenance cost, including for aids to navigation, is estimated to be $9,500. The State of Hawaii Department of Transportation will operate the launch facility and maintain all appurtenant facilities.

c. Local Assurances. The State of Hawaii must execute a formal local cooperation agreement prior to the initiation of the plans and specifications stage (in accordance with Section 221 of the River and Harbor Act of 1970). A testimony supporting the Kaulana Bay Navigation Improvement Study has been received from the Department of Transportation and is included in Appendix B, Section IV.

d. Compliance Documents and Certificates. All necessary Federal and local certifications for consistency and conformance to environmental (water quality, discharge, etc.) and land use regulations must be completed prior to any construction.

d. Federal Funding. The preparation of plans and specifications and the initiation of construction must be approved and authorized by the Chief of Engineers. The US Army Corps of Engineers priority for funding of construction under the Small Projects authority is based on the needs and merit of similar projects nation-wide and the availability of funds.

V. CONCLUSIONS AND RECOMMENDATIONS

Conclusions

The purpose of this report was to identify light-draft navigational users, problems, and needs. Considering the problems and needs of the Ka'u area, local financial constraints and economic priorities of the State of Hawaii, it was felt that the relocation of the existing ramp with a breakwater structure would satisfy the immediate socio-economic needs of commercial fishermen. After discussions with State and County agencies, it was determined that the new protective launch ramp would best satisfy their needs, priorities and constraints.

Recommendations

The District Engineer recommends that Plan 3 for Kaulana Bay at South Point be approved subject to the condition that local interests provide the following assurances:

a. Provide without cost to the United States all lands, easements, and rights-of-way required for construction of the project.

b. Provide without cost to the United States an area suitable to the Chief of Engineers for the disposal of spoils and if necessary, retaining dikes, bulkheads, and embankments or the cost of such work.

c. Provide and maintain without cost to the United States the necessary launch ramp facility, as well as all appropriate onshore structures, access roadways and parking areas to insure a complete and adequate project. These facilities must be open to all on equal terms.

d. Establish regulations prohibiting the discharge of pollutants into the waters of the channel and basin by users thereof, which regulations shall be in accordance with applicable laws or regulations of Federal and local authorities responsible for pollution prevention and control.

e. Hold and save the United States free from claims for damages due to the construction work and subsequent maintenance of the project, excluding damages due to fault or negligence of the United States or its contractor.

f. Assume all project costs (excluding costs for aids to navigation) in excess of the $2 million statutory Federal limitation under Section 107 of the River and Harbor Act of 1960, as amended. Formal assurances in accordance with Section 221 of the River and Harbor Act of 1970 will have to be executed prior to commencement of construction.

The recommended plan provides for a 135-foot-long, 80-foot to 60-foot-wide tapered, and 8.5-foot-deep entrance channel; a 200-foot-long by 100-foot-wide, and 6.5-foot-deep turning basin; a 155-foot-long main breakwater with a +11.5-foot crest elevation at the head and a +8.0-foot crest elevation at the trunk, and a new single-lane launch ramp.

VI. ENVIRONMENTAL STATEMENT

FINAL ENVIRONMENTAL STATEMENT
KAULANA BAY NAVIGATION IMPROVEMENTS
SOUTH POINT, ISLAND OF HAWAII

The responsible lead agency is the U.S. Army Corps of Engineers, Honolulu District. The responsible cooperating agencies are the U.S. Fish and Wildlife Service, Pacific Islands Office and the National Marine Fisheries Service, Western Pacific Program Office.

Abstract:

Kaulana Bay is located in the Ka'u District of the Island of Hawaii approximately 80 road miles southwest of Hilo. The bay is situated about a mile east of South Point within land administered by the Hawaiian Homes Commission. The Honolulu District, U.S. Army Corps of Engineers, has investigated public concerns and needs associated with providing light draft navigation improvements for this region of the island, and impacts upon the environmental, social, cultural, recreational and economic resources of the area. Five sites were initially evaluated; the Kaulana Bay site was selected for further detailed studies. Three plans of improvement have been developed for the Kaulana site to meet navigation needs and design criteria. Plan 1 would require extensive dredging along the western side of the bay, creating a new entrance channel. A protective rock structure would also be constructed across the eastern portion of the bay. Plans 2 and 3 differ only in the width of the entrance channel. Plan 2, with the wider channel, would require additional dredging. Both plans require construction of a protective rock structure on the western side of the bay and new launch ramp and dredging of a turning basin. None of the plans would have significant adverse effects on important environmental or social resources, but all three plans could adversely affect significant archaeological (cultural) resources. The recommended Plan 3 will avoid all adverse effects.

Further technical information concerning the statement may be obtained from:

Dr. James E. Maragos
U.S. Army Engineer District, Honolulu
Building 230
Fort Shafter, Hawaii 96858
Telephone (808) 438-2263/64

Note: Information, displays, maps, etc., discussed in the main report are incorporated by reference in the EIS.

FINAL

ENVIRONMENTAL IMPACT STATEMENT

TABLE OF CONTENTS

LIST OF TABLES

THE FOLLOWING PEOPLE WERE PRIMARILY RESPONSIBLE FOR PREPAIRNG THIS ENVIRONMENTAL IMPACT STATEMENT:

LIST OF PREPARERS

NAME	DISCIPLINE/EXPERTISE	EXPERIENCE	ROLE IN PREPARING EIS
Timothy Young	Hydraulic Engineer/Civil Engineering and Water Resource Planning	BS, Civil Engineering 4 years Civil/Hydraulic Engineering with the US Army Corps of Engineers	Study Manager
James E. Maragos	Supervisory Environmental Biologist/Marine Ecology	BS, Zoology, Ph D, Oceanography 2 years Post-Doctoral Research 9 years Environmental Consultant 6 years EIS studies with the US Army Corps of Engineers	EIS Coordinator
Robert Moncrief	Ecologist/Marine Biology	BA, Zoology 7 years Biologist with the US National Marine Fisheries Service 4 years Biologist with the US Navy 3 years EIS studies with the US Army Corps of Engineers	EIS Preparer
David G. Sox	Social Environmental Specialist/ Historical and Cultural Geography	BA, MA, Geography 6 years research 6 years EIS studies with the US Army Corps of Engineers	Social and Cultural Resource Assessment
William Lennan	Fish and Wildlife Biologist	BA, Zoology BS, Political Science 2 years Post Graduate Studies in Zoology 2 years Biologist with the US Fish and Wildlife Service	Fish and Wildlife Assessment

1. SUMMARY

a. Major Conclusion and Findings. The alternative plans are described in detail in Section III of the Detailed Project Report. All three plans meet the primary objectives of improving commercial fishing opportunities on the Island of Hawaii and improving socioeconomic opportunities for the people of the Ka'u District. Based on a maximization of net benefits, Plan 2 was designated as the National Economic Development (NED) plan. None of the plans result in net positive contributions to the environmental resources of the study area which is the criteria for designation of an Environmental Quality (EQ) Plan. Plan 2 is considered to be the least environmentally damaging plan because it involves the least modification of the bay's marine environment. It also would minimize alteration to historical and cultural resources of the area. An evaluation of the discharge of fill material under Section 404 of the Clean Water Act of 1977 indicates that the site and fill material are suitable for this purpose. No threatened or endangered species or their critical habitat would be affected by any of the proposed alternative plans. The project area is located within the South Point National Historic District which is listed on the National Register of Historic Places and is also designated a National Landmark. Archaeological sites within the South Point complex are located on the east side of Kaulana Bay. Construction of all three plans could have adverse effects on archeological sites east of the bay, but construction of Plans 2 and 3 can be planned to avoid any impact.

Plan 3 at Kaulana Bay was considered the most suitable small craft facility layout for commercial fishermen. Plan 2 represents the least costly alternative. Although Plan 2 is designated as the National Economic Development (NED) plan based on a maximization of net benefits, Plan 3 is being recommended based on public input and review comments and on the greater navigational safety afforded to small craft vessels within Kaulana Bay. Plan 2 was also considered to be the least environmentally damaging plan, however since Plans 2 and 3 have almost identical layouts, the discharge and environmental effects would be similar. The recommended Plan 3 will have no adverse effects on historic sites.

b. Areas of Controversy. None.

c. Unresolved Issues. None.

d. Relationship to Environmental Requirements.

The relationship of alternative plans to Federal and state environmental requirements is presented in Table 1.

Table 1
Relationship of Plans to Environmental Requirements

Federal Statutes	
National Environmental Policy Act (NEPA)	In full compliance
Prime Agricultural Lands	Not applicable
Preservation of Historic and Archaeological Data Act	In full compliance
National Historic Preservation Act	In full compliance.

Table 1 (Continued)
Relationship of Plans to Environmental Requirements

National Landmarks	In full compliance.
Fish and Wildlife Coordination Act of 1958	In full compliance.
Estuary Protection Act	Not applicable
Endangered Species Act of 1973, as amended	In partial compliance - Endangered species consultation with NMFS in progress.
Migratory Bird Treaty Act of 1918	Not applicable
Marine Mammal Protection Act of 1972	Not applicable
Marine Protection, Research and Sanctuaries Act	Not applicable
Federal Water Project Recreation Act of 1965	Not applicable
Land and Water Conservation Fund Act	In full compliance
Coastal Zone Management Act	In full compliance
Watershed Protection and Flood Prevention Act	Not applicable
Scenic and Wild River Act	Not applicable
Water Resources Planning Act	In full compliance
Rivers and Harbors Act of 1899	Not applicable
Clean Water Act	Partial compliance
Clean Air Act	In full compliance
<u>Executive Orders, Memoranda, Etc.</u>	
E.O. 11593 - Protection and Enhancement of of the Cultural Environment	In full compliance
E.O. 11990 - Protection of Wetlands	Not applicable
E.O. 11987 - Exotic Organisms	Not applicable
E.O. 11988 - Flood Plain Management	Not applicable
<u>State and Local Laws</u>	
Chapter 343, HRS: State EIS Law, State CZMA	In full compliance

Rev. 26 Sep 80

2. NEED FOR AND OBJECTIVES OF THE ACTION

a. Study Authority. The study and report were performed under the authority of Section 107 of the River and Harbor Act of 1960, as amended (Public Law 84-645). The authority permits Federal participation in the construction of small boat harbors on a cost sharing basis up to $2,000,000. The local government must provide lands, easements, right-of-way and monies for non-federal costs.

b. Public Concerns. The Kaulana Bay Navigation Improvements Study was initiated following a written request from the State of Hawaii in August 1979. The request was based on the expressed desires of the local Ka'u Fishermen Association to improve the usability and safety of boating facilities used by the South Point commercial fishermen. The existing Kaulana boat ramp is the only publicly owned and operated boating facility along the Ka'u coastline, providing ready access to rich fishing grounds off South Point less than a mile away. The launch ramp is unprotected and directly exposed to deep water swell and trade wind generated waves from the east through southwest direction. This makes launching operations difficult and dangerous, requiring at least 3-4 persons to accomplish. Local boaters estimate that boats and trailers are damaged about 20 percent of the time the ramp is in use. Presently, launch and recovery operations are possible an estimated 60 percent of the time. The occurrence of sudden storms preventing fishermen from safely landing and recovering their boats is another serious problem at Kaulana. Such events occur frequently in the winter and are especially hazardous at night when fishermen are engaged in bottom fishing or moor their boats overnight in the lee of the cliffs on the west coast of South Point. A protected basin, allowing fishermen to launch, recover, off-load their catch and return to the fishing grounds would greatly decrease the damages to boats and equipment and risk of bodily injury and contribute to the increased productivity of the local fishing industry which has been expanding in size and economic importance in recent years.

c. Planning Objectives and Criteria. The planning objectives and criteria which guided the formulation and evaluation of alternative navigation improvement plans are provided below:

(1) Planning Objectives.

(a) Improve commercial fishing opportunities on the Big Island during the 1985-2035 period of analysis.
(b) Improve the socioeconomic opportunities for the people of Ka'u district.

(2) Planning Criteria.

(a) Providing a protected basin that can accommodate a typical fishing vessel of 27-foot length, 7-foot beam and 2.5 foot draft.
(b) Minimizing conflicts with local land-use policy and physical community disruption.
(c) Enhancing, preserving or minimizing adverse effects on marine and terrestrial flora and fauna resources and water quality.
(d) Preserve archaeological and historical resources.
(e) Maximization of net benefits.

3. ALTERNATIVES INCLUDING THE PROPOSED ACTION

a. Plans Eliminated From Further Study.

(1) Non-structural Alternatives. Non-structural alternatives or measures are those actions that can meet the planning objectives without constructing new facilities. Typical measures include improving the efficiency of existing facilities or the conversion of other existing facilities. Utilization of a hoist system on the leeward side of the Ka'u District near South Point is considered a non-structural solution.

The lack of waterfront harbor or protected boating facilities in the Ka'u region made it infeasible to apply non-structural alternatives as a management option. The two boating facilities that do exist here, both launch ramps, cannot meet the planning objectives without extensive modification. Although not intended to provide all-weather navigation protection, a harbor project improving the navigation conditions for fair to marginal conditions would greatly enhance fishing opportunities by increasing the percentage of time in which launch and recovery operations can be conducted at Kaulana ramp. To meet the needs of the local fishing fleet and contribute to the overall economic development of the Ka'u area, protection of the existing ramp is considered essential.

(2) Alternative Project Sites. Potential harbor sites were limited to the Ka'u District coastline. Areas outside of the Ka'u District were not considered due to their distance from prime fishing grounds in the south and southeast coastal waters. Five sites were initially considered as possible locations for light-draft navigation improvements. These were Punaluu, Honuapo Bay, Kaalualu Bay, Kaulana Bay and Pohue Bay (Figure 2). The major considerations in selecting a possible site were: (1) sea conditions (2) access (3) distance to prime fishing grounds (4) land availability (5) historic sites (6) endangered species (7) utilities and (8) existing and proposed land use and zoning (Tables 2 & 3). Based on the above criteria the following alternative sites were dropped from further consideration:

(a) Punaluu. Land adjacent to the existing boat ramp and access road at Punaluu is privately owned by C. Brewer and Company. The Punaluu area has been developed by Brewer in recent years as a tourist destination point. Based on existing and future development in the area, availability of land for potential sites for a harbor and shoreside facilities are limited. Several sites within the Punaluu area may be eligible for listing on the Hawaii and National Register of Historic Places (access road to ramp and old sugar dock). Punaluu is also known to be an important feeding habitat for the threatened green sea turtle. Because of problems associated with the acquisition of private shoreline land for navigational improvements, provisions for public vehicular access, archeological considerations and encroachment into threatened species habitat, this site was consequently eliminated in favor of a more desirable location.

(b) Honuapo Bay. Hanuapo Bay is a shallow crescent-shaped embayment located about 5 miles southwest of Punaluu Harbor. The offshore area consists of a series of exposed pahoehoe domes and a fringing basalt shelf along the seaward edge of the inner bay. The bay is directly exposed to trade winds, resulting in waves in excess of 2 feet almost continuously. Waves in excess of 6 feet occur on an average of 80 days per year.

Whittington Beach Park (County), located along the shoreline of Honuapo Bay, provides shoreline recreational opportunities for the people of Hawaii County. The construction of navigational improvements for commercial fishing at this site is not considered to be compatible with this use.

Although this site is easily accessible from the main highway, the entire area is privately owned and launching is very difficult because of the shallow reef and wave exposure.

(c) Kaalualu Bay. Kaalualu Bay is located approximately 5 miles northeast of South Point. The bay affords good shelter for small craft during trade wind weather but is exposed during Kona weather. The bay is very shallow and would require extensive dredging of hard bottom material to provide a channel and turning basin. Vehicular access to the site is impossible without a four wheel drive.

A regional beach park is proposed for Kaalaulu Bay which would provide shoreline recreational opportunities. Long range plans by C. Brewer include a resort/subdivision development. Construction of a harbor for commercial fishing is not considered to be compatible with these plans.

On a recent field trip, a species of endemic sponge was identified at this site. In addition, an archeological reconnaissance conducted in 1972 revealed a total of 91 archeological sites. Because of environmental and archeological issues and land-use plans associated with this site, this location was no longer considered.

(d) Pohue Bay. Pohue Bay is located on the southwest coast of the island approximately ten miles from South Point. A small sandy beach characterizes the edge of the central portion of the bay. Because the area is sheltered from trade wind conditions, Pohue Bay has considerable natural protection. Waves in excess of 2 feet approach the area 200 days a year while waves over 6 feet are estimated to occur only about 5 days per year. Access into this area is restricted over a private road system. A portion of the road leading to Pohue Bay is unimproved.

Additional development of the existing subdivision directly northeast of Pohue Bay is not anticipated based on recent discussion with County planning department officials. The County General Plan proposes to establish this area as a shoreline reserve. Directly across the shoreline area are a number of archeological sites which have not yet been evaluated by the State Archeologist. Because of environmental and archeological considerations and limited access no further studies were conducted.

b. Without Condition (No Action). Without Federal implementation of planned navigation improvements at Kaulana Bay, boat launching and recovery operations will continue to be hazardous and difficult during strong trade winds and not possible during Kona wind conditions. Boats and trailers will be subject to damage as is presently the case. Fishing will be restricted by sea conditions rendering the ramp inoperable approximately 40 percent of the time. The developing local yellow fin tuna fishery will be restricted by adverse weather conditions affecting boat launching and recovery at Kaulana. Without an improved or additional boating facility, fishery related economic growth in the Ka'u District will be limited. There are no plans at this time for navigation improvements by local interests at Kaulana Bay or other alternative sites along the Ka'u coast.

c. Plans Considered in Detail. Based on the identified problems and needs, the planning objectives, and the formulation and evaluation concepts, three alternative design plans for Kaulana Bay were developed in detail and evaluated with respect to their contributions to navigation improvements, their beneficial and adverse impacts, and their benefits and costs. Two of the alternative plans would involve constructing and providing protection for a new launch ramp while the other plan would provide protection for the existing ramp. All of the plans incorporate space for a single-lane launch ramp. Because of the confined nature of the bay, no mooring areas for small-craft vessels were designated. Adequate parking for car/trailer vehicles is available in areas adjacent to the existing ramp. Parking areas and harbor-related facilities would be developed by local interests.

(1) Plan 1. Plan 1 consists of dredging a 245-foot-long, 80-foot-wide, and 8.5-foot-deep entrance channel; a 220-foot-long by 100-foot-wide, and 6.5-foot-deep turning basin, and constructing a 160-foot-long main breakwater with a +11.5-foot crest elevation. The offshore breakwater would provide protection for the existing launch ramp. This plan utilizes the existing reef flat as the entrance channel and the single-lane launch ramp. The breakwater will require approximately 9,400 tons of quarried rock covering 0.26 acres. The dredging of the entrance channel and turning basin will affect 1.1 acres generating about 11,700 cy of basalt material. When completed, the navigation improvement would inclose a total water area of about 1 acre. Total project first cost is $2,772,000 cost-shared at $2,020,000 in Federal funds and $752,000 in local funds.

(2) Plan 2. Plan 2 consists of dredging a 135-foot-long, 100-foot to 80-foot-wide tapered, and 8.5-foot-deep entrance channel; a 200-foot-long by 100-foot-wide, and 6.5-foot-deept turning basin, and constructing a 135-foot-long main breakwater with a +8.0-foot crest elevation. The breakwater would provide protection for the new launch ramp. This plan utilizes the existing natural channel and a new single-lane launch ramp. The breakwater will require approximately 1,800 tons of quarried rock covering 0.10 acres. The dredging of the entrance channel and turning basin will affect 0.82 acres generating about 5,300 cy of basalt material. When completed, the navigation improvement would inclose a total water area of about 1 acre. Plan 2 is considered the least environmentally damaging plan because it entails the least modification to the bay's marine environment. Total project first cost is $1,120,000 cost-shared at $1,016,000 is Federal funds and $104,000 in local funds. Based on a maximization of net benefits this plan was designated as the National Economic Development (NED) Plan.

(3) Plan 3. Plan 3 consists of dredging a 135-foot-long, 80-foot to 60-foot-wide tapered, and 8.5-foot-deep entrance channel; a 200-foot-long by 100-foot-wide, and 6.5-foot-deep turning basin, and constructing a 155-foot-long main breakwater with a +11.5-foot crest elevation. The breakwater would provide protection for a new single-lane launch ramp. The breakwater will require approximately 3,000 tons of quarried rock covering 0.12 acres. The dredging of the entrance channel and turning basin will affect 0.88 acres generating about 5,200 cy of basalt material. When completed, the navigation improvement would inclose a total water area of about 1 acre. Total project first cost is $1,300,000 cost-shared at $1,196,000 in Federal funds and $104,000 in local funds. Plan 3 is the recommended plan.

d. Comparative Impacts of Alternatives. Comparative impacts of the three alternative plans on significant resources are presented in Table 2. Additional comparison of alternate plans are contained in Table 3.

Table 2. Comparative Impacts of Alternatives on Significant Resources

Base Condition and Alternatives	South Point National Land Marks District	Threatened or Endangered Species	Coastal Water Quality	Plan Economics
Base Condition	Within the South Point complex of archeological sites, remains of the prehistoric and early historic Kapalaoa Village site are located inland and immediately east of the bay extending out to the end of Kaulana Point.	The shallow shelf on the eastern margin of the bay provides a substrate for attachment by benthic algae species that are preferred food for the green sea turtle. Turtles have been observed feeding on algae growing on this shallow reef.	Relatively pristine open coastal waters w/few pollutant sources.	Not applicable
Without Condition	No change anticipated.	No change anticiapted.	No change anticipated	Not applicable
Plan 1	Breakwater structure would have direct adverse effect on surface archaeological sites on east side of the bay, possibly concerning one or more of the rock structures located there. Related construction activities would further disturb and possibly destroy other sites and cultural material in the area.	Removal of approximately 300 square feet of shallow reef area suitable for algal attachment, by construction of a breakwater structure.	Temporary increase in water turbidity	Average Annual Cost: $218,000 Annual Benefit: $291,000 B:C Ratio: 1.3
Plan 2	No impacts provided that construction activities and equipment are confined to the central and western regions of the bay and shoreline. Construction activities related to dredging the entrance channel and turning basin, if conducted along the eastern side of the bay would damage or destroy surface archaeological sites and possibly subsurface cultural material. No anticipated adverse effects from disposal of dredged material.	Dredging of entrance channel to depth of -8.5 ft would remove approximately 300-500 square feet of shallow reef that serves as a green turtle foraging area.	During construction less than 1 year duration	Average Annual Cost: $85,000 Annual Benefit: $291,000 B:C Ratio: 3.4
Plan 3	Sames as Plan 2	Same as Plan 2.		Average Annual Cost: $101,000 Annual Benefit: $291,000 B:C Ratio: 2.9

4. AFFECTED ENVIRONMENT

a. Environmental Conditions.

(1) Physical features. The island of Hawaii is the largest of the Hawaiian islands consisting of about 4,038 square miles of land area and 305 miles of coastline. Being of volcanic origin, the dominant topographic feature on the southeastern portion of the island (Ka'u District) are the large expanses of lava fields. Two of the island's most active volcanoes, Mauna Loa (13,677 MSL) and Kilauea are located in this area. Mauna Loa (Big Mountain), the largest single mountain on earth, provides a dramatic backdrop for the Kaulana Bay area. The Ka'u landscape is characterized by historic as well as young lava flows, moderate slopes with little or no established surface drainage, and a rugged coastline consisting of low and extremely steep sea cliffs.

(2) Climate. The island of Hawaii has a semi-tropical climate, but has wide variations across the island in temperature and rainfall. Temperatures range from 58 to 90 degrees (minimum-maximum) along the coastal plain to sub-freezing minimums in the mountains. Mauna Kea and Mauna Loa often have a mantle of snow during the winter months. Rainfall in the southwestern region of the Ka'u District which includes the South Point area varies from less than 20 inches at South Point to 75 inches at the 5,000-foot elevation. Relatively uniform tradewinds prevail offshore, but disruption by the high land masses make inland winds very complex.

(3) Terrestrial biota. The coastal area of the Ka'u District is characterized by sparse vegetation consisting primarily of indigenous strand plants such as ilima, Pa'u-o-Hiiaka and beach morning glory with patches of Bermuda grass occurring in backshore areas. Terrestrial fauna in the Ka'u District are also limited in abundance and diversity. Shorebirds including the golden plover, wandering tattler and ruddy turnstone probably utilize available shallow feeding habitat in the area. Passerine birds, Hawaiian owl, field mice, rats, mongoose and goats are also found in this area.

(4) Marine biota. The substratum throughout most of Ka'u coastline consists of hard lava rock covered in places by accumulation of silt and coral rubble. A number of bays along this coastline contain scattered massive heads of Porites coral. Coral growth elsewhere in these bays are limited to scattered Pocillopora colonies possibly a consequence of the constant wave action occurring in these areas. A variety of common reef fish and marine benthic invertebrates including gastropod mollusks, sea urchins, sea cucumbers and crabs are present along the coastline. A table listing fish and invertebrate species observed in Kaulana Bay is provided in Appendix E of the Detailed Project Report. Green sea turtles are occasionally observed offshore feeding on algae growing on the shallow shelf on the east side of the bay. The shallow inshore areas of the Ka'u coast are considered important green sea turtle foraging grounds, however no known nesting beaches are located in the Ka'u area. Small concentrations (3-12 individuals) of endangered humpback whales have been observed over a shallow bank extending off South Point during annual National Marine Fisheries Service (NMFS) whale census cruises conducted in 1976-1979. It has not been determined whether these whales are a resident group, remaining in the area during the humpback season, or in transit to or from other shallow shoals that comprise their preferred wintering habitat, primarily Penguin Banks and the area between Maui, Lanai and Molokai.

(5) Geology. The island of Hawaii is the youngest of the Hawaiian island archipelago and is the result of the coalescence of the lava flows of five volcanoes. The volcanoes, Mauna Loa and Kilauea, are still very active. The base rock in the area is massive basalt. This is overlain by soil consisting of weathered base rock. The soils are very shallow, covering rough lava flows that are extremely permeable.

(6) Development and economy. The State of Hawaii is prosperous with a growing population and economy. Between 1958 and 1980, the total resident population increased from 611,800 to 963,617 (preliminary census). During the period 1958 to 1977, the gross State product more than quintupled, from $1.4 billion to $8.0 billion. The three largest contributors to the State economy are tourism, defense expenditures, and agriculture, the bulk of the last activity being in the production of sugar and pineapple. The most rapid growth during the last several years has been in the tourist industry. Tourists arrivals totaled 171,500 in 1958 and 3,960,000 in 1979. Tourist expenditures were $83 million in 1958. The expenditures were $440 million in 1968 and $2.6 billion in 1979, an increase of 495 percent. This compares to an increase of 175 percent for defense spending. It is expected that the growth trend in tourism will continue although at a slower pace together with the State economy in general.

Sugar and tourism dominate the economy of the island of Hawaii. There are 469 sugarcane farms in Hawaii County cultivating 92,829 acres in caneland. Production of raw sugar was 3.9 million tons, 42.5 percent of the States total in 1978 with a value of $68.6 million.

The visitor industry on the island of Hawaii grew rapidly in the past 15 years. Hotel construction increased so fast during this period that capacity exceeded the need for rooms. The increase in hotel units has been greatest along the Kona coast. Of the 6,093 units on the island in 1979, there were 3,637 units in Kona area, 1,954 units in Hilo and 502 units in other areas of the county. Total visitor expenditure on the island in 1978 was $158 million. Two-thirds of the State's beef and one-half of the diversified agriculture crops are produced on the island of Hawaii. Commercially caught fish previously sold only to local markets or shipped to Honolulu are now being shipped fresh-iced to the mainland.

Ka'u, South Kona, and North Kona Districts would be serviced by Kaulana Bay. The major economy in the area includes sugar, livestock, coffee farming, and visitor industry. The visitor industry is the fastest growing industry and will have the greatest influence in the future. According to the 1979 County of Hawaii Data Book, an additional 2,150 hotel units are planned for Kona area (excludes South Kohala District) within the next several years.

Commercial fishing has always been popular in the Kaulana area. Available records indicate over 588,000 pounds of fish were caught in 1980. This is expected to grow since Kaulana fronts one of the best fishing grounds in the islands.

b. Significant Resources.

(1) SOUTH POINT NATIONAL HISTORIC DISTRICT. Kaulana Bay is located within the South Point National Historic District which is listed on the National Register of Historic Places and is also designated a National Landmark. Originally, the South Point complex of sites was believed to have been the first area occupied by Hawaiians in 124 B.C. ± 60 A.D. and continuously occupied until about 1730. The national significance of the complex lay in the belief that "this area contains a group of sites which document the largest and most complete record of human occupation in the Hawaiian Islands." More recent radiocarbon dating studies show however that South Point fishermen established their living areas no earlier than 1,000 A.D. and continually occupied the region to about 1250 A.D. None of the individual archeological features which made up the original district nomination in 1962 as a National Landmark were found near Kaulana Bay, but subsequent investigations in 1969 identified the remains of the prehistoric and nearly historic Kapalaoa Village site upland and immediately east of the bay. This survey quoted a local Hawaiian informant as saying that Kaulana Point (east of the bay) as a kapu or forbidden area based on a number of rock structures found there (see map in Appendix D). A recent survey conducted in 1981 by Paul Rosendahl found additional structures out to the end of the point. An undisturbed subsurface cultural site with remains of hearths and fire pits was revealed in the compacted sand embankment immediately adjacent to and east of the boat launch ramp. No cultural materials were found in the area west of the present boat ramp.

(2) ENDANGERED SPECIES. The green sea turtle, Chelonia mydas, a listed threatened species and humpback whale, Megaptera novaeangliae, an endangered species both occur in the coastal waters of the Ka'u coast adjacent to the project area.

(3) COASTAL WATER QUALITY. Coastal waters within and adjacent to Kaulana Bay are considered perennially dry open coastal waters receiving very little influence from terrestrial sources and are characteristic of the oceanic water mass surrounding the island. However, during trade wind and Kona storm conditions, near shore waters within Kaulana Bay and adjacent coastal areas are generally turbid, resulting from suspended particulate matter. Periodic operation of boat motors at the launch ramp and infrequent sheet flow runoff constitute the major sources of pollution.

(4) RESOURCES AND VALUES IDENTIFIED IN SECTION 122 OF HARBOR AND RIVER ACT OF 1970, PUBLIC LAW 91-611. The following resources and environmental values have been fully considered with respect to possible adverse economic social and environmental effects resulting from implementation of the proposed project (Table 6 of the DPR and Section 5 and Table 3 of the FEIS):

(a) Air, Noise and Water Pollution.

(b) Man-made or natural resources, esthetic values, community cohesion and availability of public facilities and services.

(c) Employment effects and tax and property value.

(d) Displacement of people, businesses and farms.

5. ENVIRONMENTAL EFFECTS

a. South Point National Historic District. Construction of the breakwater in Plan 1 would have direct adverse effects upon the surface archaeological sites on the east side of the bay, possibly covering one or more of the rock structures located there. Related construction activities such as the movement of heavy equipment through the area containing archeological sites could cause additional damage to surface and subsurface cultural materials. Plans 2 and 3 will not affect the archeological sites provided construction activities related to dredging the entrance channel and turning basin are confined to the western and central regions of the bay and shoreline. The recommended Plan 3 with all construction to be conducted from the west bank will not adversely affect any archaeological materials. The significant areas east of the existing launch ramp may be cordoned off during construction. Disposal of dredged material for subsequent construction of a parking facility with comfort station should have no adverse effect on subsurface cultural materials. This determination of effect and adverse effect as required by 36 CFR 800.4 is augmented by Paragraphs 3 to 7 and 20 to 21, Appendix E, and serves as a request for comments from the Advisory Council in Historic Preservation in accordance with 36 CFR 800.4(d)(1).

b. Endangered Species.

(1) The recommended plan, requiring dredging of the entrance channel to a depth of -8.5 feet MLLW, would remove approximately 300-500 feet of shallow shelf that serves as substrate for benthic algae upon which green turtles forage. However, the breakwater structure would contribute approximately 200 square feet of hard substrate suitable for colonization by similar benthic algae. The net loss of potential green turtle foraging area resulting from project implementation would be approximately 100-300 square feet. The entire Ka'u coastline (approximately 45 miles long) has been identified as an important green turtle foraging area. The removal of 100-300 square feet of feeding habitat within this extensive feeding area would have minimal impact on the green turtle population residing along the Ka'u coast.

(2) Construction of the proposed harbor improvements would require blasting of the turning basin and part of the entrance channel. To avoid potential adverse effects resulting from noise generated by underwater blasting, all blasting activity would be prohibited during the months of December-May when humpback whales are present in Hawaiian waters.

(3) Kaulana Bay is presently used heavily by Big Island commercial fishermen as a boat launch and recovery facility. When yellowfin tuna are abundant in the grounds off South Point, fishermen from as far as Kailua, Kona and Hilo launch and recover at Kaulana. This pattern is expected to continue after completion of the proposed harbor improvements. No significant increase in the number of boats using Kaulana as a result of project implementation is anticipated. However, a gradual increase in boats fishing the South Point grounds is expected, as the Hawaii yellowfin tuna fishery continues to expand. Recent observations by cetacean biologists indicate that fishing vessels in Hawaii do not adversely affect humpback whales. It is, therefore, highly unlikely that proposed navigation improvements at Kaulana Bay would have an adverse impact on the small group of humpback whales that concentrate in the vicinity of the 100F banks off of South Point in the winter months.

c. Coastal Water Quality. A temporary increase in water turbidity during construction is anticipated. The dredged basin and protective structure will result in a slight increase in water residence time within the bay. Projected increased boat usage will contribute to impacts associated with boat operations. The impacts within the bay are expected to be minimal as the facility does not provide for mooring of boats. No significant long-term effects on coastal water quality are anticipated.

d. Resources and Values Identified in Section 122 of Public Law 91-611: Project related impacts on the environmental resources and values identified in Section 122 of P.L. 91-611 have been fully considered (see Table 3). Potential adverse impacts upon these resources resulting from project implementation are not significant:

(1) Air, Noise and Water Pollution. Adverse impacts related to air, noise and water would be temporary impacts during construction of harbor improvements. Minimization of these impacts would be affected by employment of construction methods that do not cause excessive or unnecessary turbidity, dust, hydrocarbon emission or noise.

(2) Man-made or natural resources, esthetic values, community cohesion and availability of public facilities and service: destruction or disruption of the above resources as a result of project implementation would be minimal and are not considered significant. Adverse impacts to nearshore marine communities attributed to dredging and placement of rock for protective structures will occur. Loss or damage to habitat will vary between 0.9 and 1.3 acres depending on the plan. Some beneficial effects are expected when marine life colonize and occupy protective structures.

(3) Employment effects and tax and property value: adverse employment effects and/or tax and property value losses would not result from project implementation.

(4) Displacement of people, businesses and farms: no injurious displacement of people, businesses and farms would result from project implementation.

6. PUBLIC INVOLVEMENT

a. Public Involvement Program. Government officials and agencies were notified by letter in June 1980 of the initiation of detailed studies for possible light-draft navigational improvements. A notice of intent to prepare a Draft Environmental Impact Statement (DEIS) for the Kaulana Bay Harbor was published in the Federal Register to notify those interested in contributing to the preparation of the DEIS.

TABLE 3. ANALYSIS OF IMPACTS ON RESOURCES AND VALUES IDENTIFIED IN SECTION 122 OF PUBLIC LAW 91-611 AND OTHER RESOURCES IN THE PROJECT AREA

	NO IMPROVEMENT 'WITHOUT CONDITION'	PLAN 1	PLAN 2	PLAN 3
A. PLAN DESCRIPTION	Use of existing facility at Kaulana Bay. Closest publicly-owned and operated facility is at Pohoiki Bay, approximately 58 miles to the northeast.	Construction of a 160-foot breakwater, dredging of a 245-foot long entrance channel and turning basin.	Construction of a 135-foot breakwater and a new single lane launch ramp, dredging of a 135-foot long entrance channel and turning basin.	Construction of a 155-foot breakwater and a new single lane launch ramp, dredging of a 135-foot long entrance channel and turning basin.
B. PROJECT IMPACTS				
1. Economic				
Local Government Finance*	None.	Requires approximately $752,000 local contribution not including costs for local assurances and cooperation.	Requires approximately $104,000 local contribution not including costs for local assurances and cooperation.	Requires approximately $104,000 local contribution not including costs for local assurances and cooperation.
Land Use	Land utilized in coastal area. Grazing on Hawaiian Homes Land inland by short-term lease.	No change to local land use policy; surrounding area is barren except for a few temporary shelters.	Same as Plan 1.	Same as Plan 1.
Public Facilities and Services	Existing Ramp. No shoreside facilities or major utilities.	Would provide for safe navigation and launch/recovery of boats and would promote the growth of related public facilities and services.	Same as Plan 1.	Same as Plan 1.
Regional Growth*	No significant impact. Stable growth will occur with or without navigation improvements.	No significant impact. Stable growth will occur with or without navigation improvements.	Same as Plan 1.	Same as Plan 1.
Employment*	Existing condition.	Would increase employment opportunities in commercial and general boating related services.	Same as Plan 1.	Same as Plan 1.

	NO IMPROVEMENT 'WITHOUT CONDITION'	PLAN 1	PLAN 2	PLAN 3
1. Economic (continued)				
Damages to Boats and Related Equipment	Numerous damages during launch and recovery operations. Sixty percent use factor.	Marked decrease in damages during launch and recovery operations.	Same as Plan 1.	Same as Plan 1.
Increased Fish Catch for Commercial Fishermen	Current catch: 465,000 pounds per year.	203,000 pound increase per year.	Same as Plan 1.	Same as Plan 1.
Commitment of Economic Resources	Not applicable.	Commitment of 9,400 tons of stone and fill, time, manpower and energy resources.	Commitment of 1,800 tons of stone and fill, time, manpower, and energy resources.	Commitment of 3,000 tons of stone and fill, time, manpower and energy resources.
2. Environmental				
Marine Environment	No change.	1.16 acres dredged or covered.	0.85 acres dredged or covered.	0.91 acres dredged or covered.
Terrestrial Environment	No change.	0.24 acres modified.	0.19 acres modified.	0.22 acres modified.
Fish and Wildlife*	No change to existing conditions. Scattered coral growth within Kaulana Bay.	Loss of some coral and sessile organisms. Temporary displacement of motile organisms during construction. Rapid recovery anticipated. Possible long term increase in species diversity and numbers.	Same as Plan 1.	Same as Plan 1.
Water Quality* Temporary increase in water turbidity anticipated during construction; grossly estimated by length of construction, time and quantity of material removed.	Not applicable.	12 months 11,700 Cubic Yards	6 months 5,300 Cubic Yards	6 months 5,200 Cubic Yards

	NO IMPROVEMENT 'WITHOUT CONDITION'	PLAN 1	PLAN 2	PLAN 3
2. Environmental (continued)				
Water Quality*				
Long-Term Alterations to water quality.	Not applicable.	No significant long-term effect except for impacts associated with increased boat operation.	Same as Plan 1.	Same as Plan 1.
Circulation & Flushing				
Increase in Water Residence Time.	No	Slight increase anticipated. Will not result in degradation of water quality.	Same as Plan 1.	Same as Plan 1.
Air Quality*				
Temporary dust nuisance estimated by length of construction period.	Not applicable.	12 months	6 months	6 months
Natural Resources*	Natural, unaltered shoreline except for existing ramp and natural bay area.	Would commit approximately 1.16 acres of natural marine environment to navigation improvements and 9,400 tons of quarried stone for protective structure.	Would commit approximately 0.85 acres of natural marine environment to navigation improvements and 1,800 tons of quarried stone for protective structure.	Would commit approximately 0.91 acres of natural marine environment to navigation improvements and 3,000 tons of quarried stone for protective structure.
Man-Made Resources*	Continued demand for safe boating facility.	Completes boating facility for safe navigation.	Same as Plan 1.	Same as Plan 1.
3. Social				
Noise*	No change from existing condition.	Temporary increase during construction - 12 months; no long-term change.	Temporary increase during construction - 6 months; no long-term change.	Same as Plan 2.
Population*	No impact.	No significant effect on population growth and no displacement of people.	Same as Plan 1.	Same as Plan 1.

	NO IMPROVEMENT 'WITHOUT CONDITION'	PLAN 1	PLAN 2	PLAN 3
3. Social (continued)				
Aesthetic Values*	No change.	Breakwater structure would create unusual impact. Stone breakwater not out of character with adjacent rocky coastline.	Same as Plan 1.	Same as Plan 1.
Historic, Cultural, and Archaeological Resources.	National Landmark District.	Probable destruction of two prehistoric features on east side of bay during construction.	Possible effect on prehistoric features on east side of bay. May be avoided by suitable construction methods.	Same as Plan 2.
Recreational Opportunities	No change	Increase access for sports fishing.	Same as Plan 1.	Same as Plan 1.
Health, Safety, and Community Well-being.	Hazardous navigation	Would enhance health, safety and community well-being by providing a protective basin for boating operations. Also decreased accidents at sea.	Same as Plan 1	Same as Plan 1.
Community Growth and Cohesion*	No change	No significant change	Same as Plan 1.	Same as Plan 1.

* Resources and values identified in Section 122 of Public Law 91-611.

An informal workshop was conducted on 9 July 1980 in the South Point area of the Big Island to obtain public input on the desires and needs of providing possible light-draft navigational improvements. Details of this workshop are provided in Appendix B of the Detailed Project Report.

After the draft report and EIS were circulated to Federal and local governmental agencies and interested citizens, a public meeting was held to obtain the public's view on the alternative plans. Public views and concerns expressed at that meeting were a major factor in the final selected plan. All public comments are documented in Appendix B of the final report.

The draft report and EIS was filed with the US Environmental Protection Agency and a notice of availability was published in the Federal Register in accordance with current environmental quality policy and procedure guidelines (44 FR 127). A 45-day comment period from the date of publication in the Federal Register was provided for public review and comment. Comments received during the review period are provided in Section IV (Pertinent Correspondence).

b. Required Coordination

(1) Coordination was initiated with the U.S. Fish and Wildlife Service at the inception of the study to fulfill the requirements of the Fish and Wildlife Coordination Act. A preliminary report was submitted by FWS on 29 January 1981 describing fish and wildlife resources in the project area, and was utilized as a planning aid during the study. The final FWCA report was submitted to the Corps on 4 September 1981 (Appendix E). Report recommendations are as follows:

(a) Extreme care will be taken to insure that no debris, petroleum products, or other deleterious materials be allowed to fall, flow, leach or otherwise enter the water.

(b) All construction activities within and adjacent to the water will be conducted so as to minimize turbidity and control erosion.

(c) If a bucket dredge is used, there shall be no stockpiling of materials in the water to obtain full buckets.

(d) On land, spoil disposal will be conducted behind maintained berms above the influence of the tide. Only clean runoff water from the spoil disposal area will be allowed to re-enter the waterway.

(e) Spoil disposal areas will be protected against erosion by vegetative cover or other suitable means.

(f) Prior to the start of construction, detailed surveys be conducted to determine if individuals of two rare plant species (Sesbania hawaiiensis) and (Portulaca hawaiiensis) are in the area to be utilized by construction equipment and the area designated by the State of Hawaii or the dredged material disposal site.

Recommendations 1-5 will be incorporated in the environmental protection guidelines of the construction specifications. Recommendation 6 has been accomplished. A detailed survey of the construction and disposal areas was conducted on 30 August 1981 by Lani Stemmermann, University of Hawaii Botany Department. Neither species of rare plant were identified during the survey.

(2) Endangered species coordination with the FWS Endangered Species Office was completed on 20 January 1981. Formal consultation has been initiated with the National Marine Fisheries Service (NMFS) to assess potential project effects on the threatened green sea turtle and endangered humpback whale. Preliminary indications from NMFS anticipate a no jeopardy opinion for both species. Completion of endangered species consultation is anticipated in October 1981.

(3) Coordination with the State Historic Preservation Officer (SHPO) has been initiated. A cultural reconnaissance survey was conducted and a Determination of Effect based on survey findings was forwarded to SHPO for review and concurrence. A letter concurring with the determination of effect was received from SHPO 20 July 1981.

(4) A coastal zone consistency determination report is provided in Appendix A of the Detailed Project Report for review by the State Coastal Zone Management Office. The consistency evaluation summarizes the project's conformance with the policies of the Hawaii State Coastal Zone Management Program.

(5) The U.S. Environmental Protection Agency and the State Department of Health have had the opportunity to review and comment on the Detailed Project Report and Draft Environmental Impact Statement (DEIS) to evaluate the effects of the project on water, air and noise quality. Neither agency anticipate any adverse impacts to water, air or noise quality resulting from the proposed project. The State Department of Health will be requested to provide a water quality certification in accordance with Section 404(r) of the Clean Water Act of 1977.

c. Statement Recipients. A list of agencies, groups and individuals have received copies of the combined Draft Environmental Impact Statement and Detailed Project Report for review is provided in Appendix B of the report.

d. Public Views and Responses. The State of Hawaii, Department of Transportation, has requested Corps of Engineers assistance with navigation improvements at Kaulana Bay, including the construction of a breakwater and protected basin. This request was based on the expressed desires of the local Ka'u Fishermen Association to improve the usability and safety of the launch facilities used by the South Point commercial fishermen.

At a public workshop (9 July 1980) held on the Big Island the consensus of those attending (local government agencies, residents and fishermen) favored Kaulana Bay as the site for navigation improvements. A public meeting was held on 14 July 1981 at the Naalehu Youth Center, Naalehu, Hawaii to obtain the public's views on the alternative plans. Views and concerns expressed at that meeting were a major factor in the final selected plan.

TABLE 4
INDEX, REFERENCES AND APPENDICES
KAULANA BAY HARBOR
SOUTH POINT, ISLAND OF HAWAII

Subject	Environmental Statement	Main Report & Appendices
Affected Environment	pp. EIS-12-13	pp. 5-9
Alternatives	pp. EIS-8-10	pp. 13
Areas of Controversy	pp. EIS-5	--
Comparative Impacts of Alternatives	pp. EIS-10-11	pp. 32-37
Cover Sheet	pp. EIS-1	Not applicable
Environmental Conditions	pp. EIS-12-13	pp. 5-9
Environmental Effects	pp. EIS-15-16	pp. 33-34
List of Preparers	pp. EIS-4	Not applicable
Major Conclusions and Findings	pp. EIS-5	pp. 43
Need for and Objectives of the Action	pp. EIS-7	pp. 9-10
Planning Objectives and Criteria	pp. EIS-7	pp. 12-13
Plans Considered in Detail	pp. EIS-10	pp. 24-30
Plans Eliminated From Further Study	pp. EIS-8-9	--
Public Concerns	pp. EIS-7	pp. 9-11
Public Involvement	pp. EIS-16	Appendix B
Public Involvement Program	pp. EIS-16	Appendix B
Public Views and Responses	pp. EIS-22	Appendix B
Relationship to Environmental Requirements	pp. EIS-5	--
Required Coordination	pp. EIS-21	pp. 3

Subject	Environmental Statement	Main Report & Appendices
Significant Resources	pp. EIS-14	--
South Point National Historic District	pp. EIS-14	pp. 10, 19
Statement Recipients	pp. EIS-22	Appendix B
Study Authority	pp. EIS-7	pp. 1
Table of Contents	pp. EIS-2	TC-1
Unresolved Issues	pp. EIS-5	--
Without Conditions (No Action)	pp. EIS-9	pp. 8

REFERENCES

1. Devaney, Dennis M. and Arthur Whistler, Preliminary Biological Survey of Kaalualu Bay, Hawaii, April 1972, for the US Army Corps of Engineers, Honolulu District.

2. Elliott, Margaret E. and Erin Hall, Wetlands and Wetland Vegetation of Hawaii, September 1977, for the US Army Corps of Engineers, Honolulu District.

3. Hansen, Violet and Marion Kelly, Cultural and Historical Survey of Kaalualu District of Kau, Island of Hawaii, September 1972, Bishop Museum, for the US Army Corps of Engineers, Honolulu District.

4. Herbst, Derral, Ph.D., Endangered Species Office, US Fish and Wildlife Service, Personal Communication, December 1979.

5. Handy, ES Craighill and Elizabeth Handy, Native Planters in Old Hawaii, Their Life, Lore and Environment, 1972, Bernice P. Bishop Museum Bulletin 233.

6. Johnson, G.F., and L. deWit, Ecological Effects of an Artificial Island, Rincon Island, Punta Gorda, California, September 1978, Coastal Engineering Research Center Miscellaneous Paper No. 78-3.

7. Ladd, Edmund J., An Archaeological Survey and Mapping at South Point, Island of Hawaii, October 1969.

8. Maciolek, John A., and Richard E. Brock, Aquatic Survey of the Kona Coast Ponds Hawaii, April 1974, UNIHI-SEAGRANT-AR-74-04.

9. National Register of Historic Sites - Nomination Form in Inventory of Restricted and Sensitive Marine Areas Within the State of Hawaii for the Mooring Study, Environment Impact Study Corp., October 1978.

10. Shallenberger, Edward W., The Status of Hawaiian Cetaceans, February 1979.

KAULANA BAY

NAVIGATION IMPROVEMENTS

SOUTH POINT, ISLAND OF HAWAII

PLAN FORMULATION CRITERIA

AND

COMPLIANCE REPORTS

APPENDIX A

APPENDIX A

PLAN FORMULATION CRITERIA AND COMPLIANCE REPORTS

TABLE OF CONTENTS

I. STUDY AUTHORITY

SMALL NAVIGATION PROJECT AUTHORITY

Legislative Authority. Section 107 of the River and Harbor Act of 1960, as amended by Section 310 of the River and Harbor Act of 1965, Section 112 of the River and Harbor Act of 1970, and Section 133(a) of the Water Resources Development Act, approved 22 October 1976, states:

> (a) The Secretary of the Army is authorized to allot from any appropriations hereafter made for rivers and harbors not to exceed $25,000,000 for any one fiscal year for the construction of small river and harbor improvement projects not specifically authorized by Congress which will result in substantial benefits to navigation and which can be operated consistently with appropriate and economic use of the waters of the nation for other purposes, when in the opinion of the Chief of Engineers such work is advisable, if benefits are in excess of the costs.
>
> (b) Not more than $2,000,000 shall be allotted for the construction of a project under this section at any single locality and the amount allotted shall be sufficient to complete the Federal participation in the project under this section.
>
> (c) Local interests shall provide without cost to the United States all necessary lands, easements, and rights-of-way for all projects to be constructed under the authority of this section. In addition, local interests may be required to hold and save the United States free from damages that may result from the construction and maintenance of the project, and may be required to provide such additional local cooperation as the Chief of Engineers deems appropriate. A state, county, municipality or other responsible local entity shall give assurance satisfactory to the Chief of Engineers that such conditions of cooperation as are required will be accomplished.
>
> (d) Non-federal interests may be required to share in the cost of the project to the extent that the Chief of Engineers deems that such cost should not be borne by the Federal Government in view of the recreational or otherwise special or local nature of the project benefits.
>
> (e) Each project for which money is allotted under this section shall be complete in itself and not commit the United States to any additional improvement to insure its successful operation other than routine maintenance, and except as may result from the normal procedure applying to projects authorized after submission of survey reports and projects constructed under the authority of this section shall be considered as authorized projects.

II. PLANNING CRITERIA AND CONSTRAINTS

Institutional Policies. Several institutional policies of the Federal Government affect the design and decisions for local and Federal participation. Executive policies are issued through the Office of Management and Budget (OMB), the Water Resources Council (WRC) and the Council of Environmental Quality (CEQ). Legislative policies are expressed by various legislative enactments of Congress which has developed a body of laws establishing national concerns regarding the nation's natural resources.

Design/Benefit Criteria. In developing justification for Federal participation, technical and economic evaluation policies, standards, principles, and procedures are established in determining a benefit to cost comparison. All projects must have a benefit to cost comparison. Projects must usually have a benefit to cost comparison of one or greater to be eligible for Federal participation.

Regulatory/Environmental Requirements. A number of statutory and regulatory requirements of the Federal Government must be complied with during the planning process. These requirements largely relate to the assessment and evaluation of possible impacts on the environment resources of the project area.

Archaeological and Historic Preservation Act of 1974 (Public Law 93-291), as amended. This act, also known as the Reservoir Salvage Act, provides for the preservation of historical and archaeological data which might be otherwise destroyed by flooding or other alteration of the terrain and authorizes up to one percent of the total amount authorized for appropriation for the project to be spent on recovery, protection and preservation of data. This act will be utilized only for sites eligible for or listed on the National Register of Historic Places. Applicability of this act to the project is assessed in Appendix D and the EIS.

Clean Air Act, as amended (42 USC 7401 et seq.). As it applies to Corps studies and construction projects, this act requires that all Federal projects must conform to EPA-approved or promulgated state implementation plans. Compliance with this act is addressed in the EIS.

Estuary Protection Act (Public Law 90-454). The act requires that Federal agencies, in planning for use or development of water and land resources, give consideration to estuaries and their natural resources and that if estuaries may be affected, the Secretary of the Interior shall be given an opportunity to evaluate the effects of the project on the estuary. There are no estuaries in the study area.

Federal Water Project Recreation Act (Public Law 89-72, as amended). This act requires that full consideration be given to project opportunities for outdoor recreation and fish and wildlife enhancement; that planning based on coordination for use with existing and planned Federal and local public recreation developments and that the views of governmental agencies concerned with recreation and wildlife, including the USFWS and Heritage Conservation and Recreation Service (HCRS), be included in the report.

Land Water Conservation Fund Act of 1965 (16 USC 4601-4 et seq). As it applies to Corps studies and project, this act requires that Corps recreation planning be coordinated with the State plan developed pursuant to the Act. Moreover, the non-Federal cost for the project may not be paid out of LWCFA funds.

Rivers and Harbors Appropriation Act of 1899, as amended (33 USC 401 et seq.). This statute, which established Corps' regulatory responsibilities and generally prohibited a wide range of actions which might obstruct navigable waters of the United States, does not impose any requirements on projects that are affirmatively authorized by Congress.

Watershed Protection and Flood Prevention Act, as amended (16 USC 1101 et seq.). This statute, which authorized the Soil Conservation Service to construct dams and other works in upstream watersheds, imposes no requirements on Corps projects.

National Environmental Policy Act of 1969 (Public Law 91-190). The National Environmental Policy Act (NEPA) requires an environmental statement in every recommendation or report on proposals for legislation and other major Federal actions significantly affecting the quality of the human environment.

Clean Water Act of 1977 (Public Law 95-217). (Formerly the Federal Water Pollution Control Act Amendments of 1972.) The requirement for Corps projects is to evaluate discharge effects of dredged or fill materials into waters of the United States and to comply.

Coastal Zone Management Act of 1972 (Public Law 92-583). This act requires that Corps projects comply with the objectives of Federal law as well as be consistent with the Coastal Management Program for the State of Hawaii.

Endangered Species Act of 1973 (Public Law 93-205). The implementing agency shall coordinate with the appropriate Federal wildlife agency to determine the presence of listed endangered or threatened species or their critical habitat which may be present in the area of proposed action. The results of the assessment shall be contained in the EIS.

Fish and Wildlife Coordination Act of 1958 (Public Law 85-624). This act requires any Federal agency proposing a water-resource project to consult with the Department of Interior, US Fish and Wildlife Service (USFWS) and the head of the state or territorial agency exercising control over fish and wildlife resources, concerning the impacts of such action. The USFWS shall recommend, in a 2(b) report, methods to mitigate impacts of the proposed action and to conserve fish and wildlife resources.

Marine Protection, Research, and Sanctuaries Act of 1972 (Public Law 92-532). This act requires the evaluation of the need and transportation of dredged material for the purpose of dumping in ocean waters. In the case of this project, there is no specific need to provide an ocean dump site for excess construction materials.

National Historic Preservation Act of 1966 (Public Law 89-635). This act requires that Federal agencies, when it proposes a construction project, to

take into account the effect of the undertaking on any property included in, or eligible for inclusion in the National Register and shall afford the Advisory Council on Historic Preservation a reasonable opportunity to comment with regard to such undertaking. Coordination is also required with the SHPO.

Executive Order on Flood Plain Management (EO 11988). This order requires that agencies avoid occupancy and modification of the base flood plain unless it is the only practicable alternative. For potential action in the flood plain, an evaluation of effects on flood plain values, a description of other practicable alternative actions outside the flood plain, and adequate dissemination of the action to the public must be undertaken.

Executive Order on Protection of Wetland, (EO 11990). This order requires the agency to analyze potential impacts of a project to existing wetlands and associated values and to give the public opportunity to comment.

Wild and Scenic Rivers Act of 1968 (Public Law 90-542). This act requires agencies to identify potential impacts to designated wild and scenic rivers and to coordinate action and obtain concurrence with the US Department of the Interior. There are no such designated rivers in the Ka'u District.

III. PRESIDENTIAL EXECUTIVE ORDER 11988 ON FLOOD PLAIN MANAGEMENT EVALUATION REPORT

The objective of Executive Order 11988, Flood Plain Management, dated 24 May 1977, is to avoid to the maximum extent possible the long and short term adverse impacts associated with the occupancy and modification of flood plains and to avoid direct and indirect support of flood plain development wherever there is a practicable alternative. The Order requires Federal agencies to:

a. Avoid the base flood plain unless it is the only practicable alternative;

b. Reduce the hazard and risk of flood loss;

c. Minimize the impact of floods on human safety, health, and welfare; and

d. Restore and preserve the natural and beneficial flood plain values.

Since the proposed action at Kaulana Bay is not located within or near any base flood plain, the recommended plan will be in compliance with all requirements set by Executive Order 11988.

IV. EVALUATION OF THE EFFECTS OF THE DISCHARGE OF DREDGED OR FILL MATERIAL INTO WATERS OF THE U.S. USING U.S. ENVIRONMENTAL PROTECTION AGENCY (EPA) SECTION 404(b) GUIDELINES

1. Project Description.

a. Description of the material proposed discharge.	
(1) General Characteristics of the Material.	Quarried basalt ranging in size from spall to 2-10 ton boulders.
(2) Quantity of Material to be Discharged.	Plan 1 - 9,400 tons Plan 2 - 1,800 tons Plan 3 - 3,000 tons
(3) Source of the Material.	Existing quarry at Hilo, Hawaii.
b. Description of the proposed discharge site.	
(1) Location.	Kaulana Bay.
(2) Type of discharge site.	Nearshore bay site.
(3) Method of discharge.	Material will be used to construct protective structure at the discharge site. The material will be placed by cranes and bulldozers to form the breakwater.
(4) Date and length of time when discharge will occur.	The project will be implemented within 2 years. Plan 1 will take approximately 12 months to construct while Plans 2 and 3 will take 6 months.
(5) Life of the discharge site.	All harbor plans have an economic life of 50 years.
(6) Bathymetry (if open water discharge site is used).	Water depths range from: 0 feet MLLW to -10 feet MLLW.

2. Physical Effects.

a. Potential Destruction of Wetlands.	Site is not a wetland.
b. Other Physical Effects.	
(1) Area of bottom covered by discharge.	Plan 1 - 0.31 acres Plan 2 - 0.15 acres Plan 3 - 0.18 acres

IV. EVALUATION OF THE EFFECTS OF THE
DISCHARGE OF DREDGED OR FILL MATERIAL INTO
WATERS OF THE U.S. USING U.S. ENVIRONMENTAL PROTECTION AGENCY (EPA)
SECTION 404(b) GUIDELINES

2. Physical Effects. (Cont)

(2) Changes in bottom geometry and substrate composition.	The bottom substrate consists mainly of basalt material. The discharged material will raise the bottom elevation from approximately -5.0 feet MLLW to +8.0 to +11.5 feet MLLW.
(3) Water circulation and flushing.	The protective structure will reduce wave influence on water mixing and possibly increase water residence time within the protected basin. At Kaulana Bay wind and tides will continue to dominate the surface current regime.
(4) Salinity distribution and gradients.	No alterations are anticipated because discharge does not involve releases of high or low salinity waters or materials.
(5) Natural drainage characteristics, and flood and stormwater storage.	Kaulana Bay site involves no drainage basin modifications; site has no flood or stormwater storage capability.
(6) Groundwater levels and recharge.	The site is not known as a groundwater recharge area, and the discharge is not expected to alter groundwater levels.

3. Chemical-Biological Interactive Effects.

a. The material proposed for discharge meets EPA exclusion criteria and no bioassay testing is required. The material to be discharged is larger than silt size, similar in composition to the substrate at the project site, and is obtained from sources removed from pollution point-sources.

b. Impacts on the Water Column.

(1) Reduction in light transmission.	Temporary increase in water turbidity is anticipated as dust may be washed from the quarried basalt by wave action.
(2) Degradation of water aesthetic values.	Only temporary effects and in area already turbid.

3. Chemical-Biological Interactive Effects. (Cont)

(3) Direct destructive effects on nektonic and planktonic populations.	Temporary disturbance and displacement during construction. Minor permanent loss of existing water column habitat.
(4) Are contaminants found in the material?	None anticipated.
(5) Concentration of contaminants released from sediment to the water column. (Results of elutriate testing).	Material exempt from chemical and bioassay testing.
(6) Comparison of constituent concentrations with applicable water quality standards.	Not applicable.
(7) Size of mixing zone.	Not applicable.
c. Impacts on Benthos.	
(1) Area of benthic community covered by material.	Plan 1 - 0.26 acres Plan 2 - 0.10 acres Plan 3 - 0.12 acres
(2) Changes in community structure and function.	Protective structure will raise bottom elevation creating terrestrial, intertidal, and rocky interstitial marine habitat. Changes in community structure and function are localized and involve replacement of habitat.
(3) Effects of chemical constituents on benthos.	None anticipated.

4. Impacts of the Discharge at the Discharge Site.

a. Need for the proposed action.	The discharge is needed to construct a protective structure for the development of the Kaulana navigation facility.
b. Availability of alternate discharge sites and alternate methods of discharge.	None.

IV. EVALUATION OF THE EFFECTS OF THE
DISCHARGE OF DREDGED OR FILL MATERIAL INTO
WATERS OF THE U.S. USING U.S. ENVIRONMENTAL PROTECTION AGENCY (EPA)
SECTION 404(b) GUIDELINES

4. Impacts of the Discharge at the Discharge Site. (Cont)

c. Evaluation of Impacts.

(1) Chemical, physical and biological integrity of the aquatic ecosystem.	Discharge is localized in effect, and will not affect availability of biological resources. The basalt material will not alter the chemical integrity and the aquatic ecosystem. An increased water residence time is anticipated within the protected basin. Also increased habitat diversity will be created by the rocky substrate.
(2) Food chain and tropic level.	No effect anticipated.
(3) Diversity of plant and animal species.	A localized increase in habitat and species diversity is anticipated.
(4) Obstruction of movement into and out of feeding, spawning, breeding and nursery areas.	None anticipated.
(5) Wetlands having significant functions of water quality maintenance.	Not applicable.
(6) Natural highwater or flood water storage.	Not applicable.
(7) Degradation of Water Quality.	Temporary increase in water turbidity anticipated during construction.
d. Methods to minimize turbidity.	None.
e. Methods to minimize degradation of aesthetic, recreational and economic value.	Not applicable. No significant impacts anticipated.
f. Methods investigated to minimize possible harmful effects.	Not applicable. No impacts anticipated.

IV. EVALUATION OF THE EFFECTS OF THE DISCHARGE OF DREDGED OR FILL MATERIAL INTO WATERS OF THE U.S. USING U.S. ENVIRONMENTAL PROTECTION AGENCY (EPA) SECTION 404(b) GUIDELINES

g. Impacts on water uses.

(1)	Municipal water supply intakes.	None.
(2)	Shellfish	None.
(3)	Fisheries	None.
(4)	Wildlife	None.
(5)	Recreation Values	Improves recreational values and commercial fishing and idle time diversion.
(6)	Threatened and endangered species.	None.

		Plan 1	Plan 2 (In Acres)	Plan 3
(7)	Benthic life.			
	benthic area covered	0.26	0.10	0.12
	intertidal, rocky interstitial habitat	0.09	0.05	0.06

(8)	Wetlands.	None affected.
(9)	Submerged vegetation.	None affected.
(10)	Size of disposal site.	Approx 6.4 acres

V. FEDERAL COASTAL ZONE MANAGEMENT (CZM) CONSISTENCY EVALUATION REPORT

1. Purpose

The Coastal Zone Management (CZM) Act of 1972 (Public Law 92-583) and the regulations on Federal consistency with approved Coastal Zone Management programs (15 CFR 930) provide that all Federal activities must be consistent to the maximum extent practicable with the Hawaii State Coastal Zone Management Program.

2. The Kaulana Bay Navigation Improvements Project, located at South Point on the Island of Hawaii, will involve construction within the CZM area. The recommended plan (Plan 3) involves construction of a 155-foot long main breakwater, the widening and deepening of an 80-foot to 60-foot wide tapered and 8.5-foot deep entrance channel, and a 200-foot long by 100-foot wide and 6.5-foot deep turning basin. The improvements were requested by the State of Hawaii. The following consistency determination summarizes the projects conformance with policies of the Hawaii State Coastal Zone Management Program.

3. The recommended plan meets the objectives and policies of the CZM program as follows:

SECTION 205A-(b)(1), RECREATIONAL RESOURCES

Objective: Provide coastal recreational opportunities accessible to the public.

Policies:

a. Improve coordination and funding of coastal recreation planning and management.

The project document and subsequent authorization have resulted in the coordination and funding of harbor planning.

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

(1) Protecting coastal resources uniquely suited for recreational activities that cannot be provided in other areas.

(2) Requiring replacement of coastal resources having significant recreational value, including but not limited to, surfing sites 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.

(3) Providing an adequate supply of shoreline parks and other recreational facilities suitable for public recreation.

(4) Encouraging expanded public recreational use of County, State, and Federally owned or controlled shoreline lands and waters having recreational value.

(5) 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.

(6) Developing new shoreline recreational opportunities, where appropriate, such as artificial reefs for surfing and fishing.

(7) 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, county planning commissions; and crediting such dedication against the requirements of Section 46-6.

Development of a protected basin and safe entrance channel will provide for adequate and accessible recreational boating opportunity in the Ka'u District.

SECTION 205A-2(b)(2), HISTORIC RESOURCES

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

Policies:

a. Identify and analyze significant archaeological resources.

Archaeological resources were identified during project planning. Construction specifications will detail procedures for dealing with these archaeological resources and any others discovered during project construction.

b. Maximize information retention through preservation of remains and artifacts or salvage operations.

Construction specifications will detail methods of maximizing preservation of any remains or artifacts identified during project planning or discovered during construction activities.

c. Support State goals for protection, restoration, interpretation, and display of historic resources.

State goals regarding historic resources will be supported via active coordination throughout the planning and construction phases of the project with the State Historic Preservation Officer.

SECTION 205A-2(b)(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 CZM area.

No scenic resources will be affected by navigation improvements.

b. Insure 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.

The project modifies an existing facility and therefore is compatible with the existing visual environment. Minimal alterations to natural land forms along the shoreline will occur during project construction.

c. Preserve, maintain and, where desirable, improve and restore shoreline open space and scenic resources.

The project has only minimal effects on shoreline open space and does not affect any scenic resources.

d. Encourage those developments which are not coastal dependent to locate in inland areas.

The navigation improvement project is coastal dependent.

SECTION 205A-2(b)(4), COASTAL ECOSYSTEMS

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

Policies:

a. Improve the technical basis for natural resource management.

Geo-technical investigations conducted during project planning will improve technical knowledge of the offshore area in the vicinity of the harbor and will aid in the management of that resource.

b. Preserve valuable coastal ecosystems of significant biological or economic importance.

Although project construction may temporarily disturb the nearby ecosystems, those ecosystems will be enhanced after project completion due to the additional marine habitat created by the project.

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

Coastal waters will be temporarily degraded during dredging activities, but this degradation will be minimized by the enforcement of specified standards during construction.

d. Promote water quantity and quality planning and management practices which reflect the tolerance of fresh water and marine ecosystems and prohibit land and water uses which violate State water quality standards.

Construction specifications and State and local laws will promote planning and management practices which reflect the tolerances of marine ecosystems and prohibit uses which violate State water quality standards. A water quality certification will be obtained from the State Department of Health prior to the start of construction.

SECTION 205A-2(b)(5), ECONOMIC USES

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

Policies:

a. Concentrate in appropriate areas the location of coastal dependent development necessary to the State's economy.

The project modifies an existing State-owned facility. The project will enhance commercial fishing opportunities which aids the State's economy.

b. Insure that coastal dependent development such as harbors and ports, visitor industry facilities, and energy generating facilities are located, designed, and constructed to minimize adverse social, visual, and environmental impacts in the CZM area.

The project will add to an existing facility and thus will minimize the social, visual, and environmental impacts in the coastal zone. Only a small portion of shoreline area will be affected by the navigational improvements.

c. Direct the location and expansion of coastal dependent developments to areas presently designated and used for such development and permit reasonable long-term growth at such areas, and permit coastal dependent development outside of presently designated areas when:

(1) Utilization of presently designated locations is not feasible.

(2) Adverse environmental effects are minimized.

(3) Important to the State's economy.

The project is confined to an area already committed to boating activities.

SECTION 205A-2(b)(6), COASTAL HAZARDS

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

Policies:

a. Develop and communicate adequate information on storm wave, tsunami, flood, erosion, and subsidence hazard.

The project report develops and communicates detailed information on storm waves, the risk of coastal flooding due to tsunami, and subsidence hazard.

b. Control development in areas subject to storm wave, tsunami, flood, erosion, and subsidence hazard.

This navigation improvement project may encourage related development, however, such development is subject to coastal zone requirements. The improved boating facility will offer storm wave protection for areas within the basin.

c. Ensure that developments comply with requirements of the Federal Flood Insurance Program.

Not applicable to the project.

d. Prevent coastal flooding from inland projects.

Not applicable to the project.

SECTION 205A-2(b)(7), MANAGING DEVELOPMENT

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

Policies:

a. Effectively utilize and implement existing law to the maximum extent possible in managing present and future coastal zone development.

The project planning process utilizes and implements existing Federal, State, and County laws and ordinances as well as existing Federal and US Army Corps of Engineers regulations.

b. Facilitate timely processing of application for development permits and resolve conflicting permit requirements.

The implementation of project planning facilitates timely processing of permit applications to the maximum extent practicable.

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.

The project report thoroughly discusses all aspects of short- and long-term impacts relative to the project. Significant impacts will be discussed at a public meeting held prior to commencement of actual project construction.

KAULANA BAY

NAVIGATION IMPROVEMENTS

SOUTH POINT, ISLAND OF HAWAII

PUBLIC INVOLVEMENT PROGRAM

APPENDIX B

APPENDIX B

PUBLIC INVOLVEMENT PROGRAM

TABLE OF CONTENTS

I. PUBLIC INVOLVEMENT PROGRAM

OBJECTIVES

To insure that the desires and needs of the public were identified and considered, a public involvement program was developed. The public, as broadly interpreted by the US Army Corps of Engineers, is any affected or interested non-Corps of Engineers entity; other Federal and territorial government entities and officials; public and private organizations, and individuals. The public participation program is directed to maintaining information flow, achieving a mutual understanding and acceptance of the problems and opportunities, and attainment of interest level for proper decision making.

The objectives of the public participation program are:

a. To inform citizens of the current Corps of Engineers planning process and direction.

b. To surface key planning issues and concerns so that they are given full consideration.

c. To help formulate and review potential plans and improvement.

d. To offer technical, historical, and localized information pertinent to the study.

e. To provide a communicative forum between the Corps, local agencies, advocacy groups, and interested citizens on the subject plan and problems.

TECHNIQUES

The types of public participation forum in this study was a public workshop held on 9 July 1980 and a public meeting held on 14 July 1981.

a. Workshops: These meetings are informal exchange sessions open to the general public and usually numbering from 10 to 50 persons. The purpose is to promote the full airing of various views in recognition of current Corps' planning efforts. Public information notices and fact sheets are issued to all interested parties prior to the meeting.

b. Public Meeting: A formal public meeting will be held at a key point in the study effort. The purpose is to notify all interested parties of the planning effort to date and to obtain specific views on various items of the agenda. The meeting, presided by the District Engineer, will include a summary of findings to date, an informal question and answer period, a presentation of formal statements by others, and tentative conclusions. A public notice of the meeting is issued to the media and the general public invited. All information and statements are documented as part of the planning record.

ACTIVITIES CONDUCTED

Government officials and agencies were notified by letter in June 1980 of the initiation of detailed studies for possible light-draft navigational improvements. A notice of intent to prepare a Draft Environmental Impact Statement (DEIS) for the Kaulana Bay Harbor was published in the Federal Register to notify those interested in contributing to the preparation of the DEIS.

An informal workshop was conducted on 9 July 1980 in the South Point area of the Big Island to obtain public input on the desires and needs of providing possible light-draft navigational improvements. Details of this workshop is provided in Section II of this appendix.

A Draft Detailed Project Report and Enviromental Statement was circulated in June 1981 to Federal, State and county governmental agencies, elected officials and interested groups and individuals for their review and comments. A public meeting was held on 14 July 1981 at Naalehu on the Island of Hawaii. The transcript of this meeting is provided in Section III.

The Draft Environmental Statement was filed with the U.S. Environmental Protection Agency and a notice of availability was published in the Federal Register. A forty-five (45) day comment period from the date of publication in the Federal Register was made available to those who wished to review and comment on the Draft Environmental Statement. No administrative action on the report was taken for at least ninety (90) days. Comments received during this review period are provided in Section IV (pertinent correpondence).

FUTURE COORDINATION

The Final Detailed Project Report and Environmental Statement will be distributed for public review after approval by the Office of Chief of Engineers (OCE). OCE will file the Final Environmental Statement with EPA who in turn will publish a Notice of Availability of the Final EIS in the Federal Register. After a thirty-day review period a "record of decision" will be documented by OCE.

II. PUBLIC WORKSHOP

An information workshop was held on 9 July 1980 at the Naalehu Youth Center, Island of Hawaii. Public notices were sent to the local residents of the Ka'u area as well as to Federal and local governmental agencies.

ATTENDANCE AT THE PUBLIC WORKSHOP, 9 JULY 1980

Federal, Corps of Engineers

Mr. Scott Sullivan
Mr. John Ford
Ms. Lynn Martin

State of Hawaii

Mr. Dan Tanaka	-- Department of Transportation (Planning Department, Harbors Division)
Mr. Dennis Ruthrauff	-- Department of Transportation (Harbors Division)
Mrs. Kats Yamada	-- State representative

County of Hawaii

Ms. Violet Hansen -- Big Island Resource Conservation and Dev. Historic Sites Commission
Mr. George Yokoyama -- Director, Hawaii County Economic Opportunity Council (HCEOC)
Ms. Lily Kong -- HCEOC (Kona)
Ms. Mary Evangelista -- HCEOC (Ka'u-Puna)

Ka'u Kamaaina Fishing Association

Mr. Robert Makuakane -- President
Mr. John Makuakane
Mr. Scott Makuakane
Mr. Steve Oyama
Mr. Kenneth Enitan
Mr. Ralph Louis
Mr. Robert Beck
Mr. Eddie Kuahiwinui, Jr.
Mr. Danny Cambia
Mr. S. Cambia
Mr. Zachary Cambia
Mr. Arnold Howard

Individuals

Mr. Edward Medeiros
Mr. John Hansen
Ms. Julia K. Kaupor
Mr. Dean Palua
Ms. Lanna Cariage
Ms. Jeannette Howard

SUMMARY

The Corps of Engineers reviewed and briefed the participants on the status of the study, Corps planning policy, and study concerns. The floor was then opened to discuss specific topics geared to providing facts and information necessary for project planning. Among the items gathered from workshop participants included:

a. Boat type and value.

b. Number of fishermen (Ka'u area).

c. Average catch of fish.

d. Damages incurred during launch and recovery operations.

e. Average operating cost.

There was also considerable discussion on the pros and cons of alternative sites. County officials and those present at the workshop favored Kaulana Bay as a good site for navigation improvements, however, an arrangement would have to be made with Hawaiian Homes Land for access and shoreside space.

Certain problems were identified. Among those voiced were:

a. Launch basins are too shallow and sand has shoaled in existing launch areas.

b. Lack of a safe and protected boating facility.

c. Offshore protective structures could solve these problems.

III. PUBLIC MEETING

A public meeting presided by the District Engineer was held on 14 July 1981 at the Naalehu Youth Center, Naalehu, Island of Hawaii. Public notices were mailed to the general public, governmental agencies, the media and interested parties and individuals.

ATTENDANCE AT THE PUBLIC MEETING
14 July 1981

Federal, Corps of Engineers
- COL Alfred J. Thiede, District Engineer
- Mr. Timothy Young
- Ms. Sueno Kim
- Ms. Elsie Smith

Federal - Others
- Mr. Mike Tulang - Department of Agriculture
- Mr. W. B. Lennan II, Fish and Wildlife Service
- Mr. Larry Soenen, Soil Conservation Service
- Mr. John Quinn, U.S. Coast Guard
- Mr. G. A. Phipps, U.S. Coast Guard
- Mr. Bill Hamberg, U.S. Coast Guard

State of Hawaii
- Mr. Dan Tanaka, Department of Transportation
- Mr. David Parsons, Department of Transportation
- Mr. Donald Lee, Department of Transportation
- Mr. Ed Kanahele, Department of Hawaiian Home Lands
- Mr. Bryce Taylor, Department of Hawaiian Home Lands

County of Hawaii
- Ms. Violet Hansen, Big Island
- Mr. George Yokoyama, Hawaii County Economic Opportunity Council
- Mr. Bruce Tajiri, Fish and Wildlife Committee
- Ms. L. Anna Cariaga, Hawaii County Economic Opportunity Council
- Mr. Robert Makuakane, Ka'u Kamaaina Fishing Association

Individuals
- Mr. Roy Koi
- Ms. Mary T. Aranguena
- Mr. Prodincio Fuerte
- Ms. F. Fuerte
- Ms. Mary Evangelista

Individuals Cont'd

Mr. John Santangelo
Mr. Don Sakata
Ms. Lilly A Ahia
Mr. Steven Kuahuia
Ms. Kamla Kuahuia
Ms. Julia Kaupu
Mr. & Mrs. Katsuyoshi Hamada
Mr. John Wailani Jr
Mr. Wm. B. Albrecht
Ms. Anne Albrecht
Mr. John Hansen
Mr. Masato Teramoto
Mr. William Glover
Ms. Gay W. Glover
Mr. Calvin Hamada
Mr. Roy Funai
Mrs. Charlotte Hamada
Ms. B. A. Koi
Mr. Thomas T. Sasaki
Ms. Joanna Gaspar
Mr. Mitchell Gaspar
Mr. Harry K. Kamaka Jr.
Ms. Myra M. Kamaka
Mr. Delfredo J. Llanes
Mr. Francis P. Halena
Ms. Mabel K. Forcum
Mr. Roberto Martines
Ms. Mary Martines
Mr. Ralph B. Louis
Mr. David Kuahiwinui
Mr. Peter Kahele
Mr. Samuel Kaluna Jr.
Mr. Alvin Enos
Mr. Eddie Kuahiwinui Jr.

KAULANA BAY MEETING
14 July 1981

COL Thiede: Good evening. I'm Colonel Al Thiede from the Corps of Engineers in Honolulu; I'm the Honolulu District Engineer. I am delighted to see such a huge crowd here tonight; we've obviously got a winner. I hope everybody is here for the same reason. If anybody is here to shoot pool or to play ping pong, this is the wrong place. What we are here for tonight, folks, in case anybody is wondering, is to discuss the Kaulana Bay Navigation Improvement project that we've been working on for about a year or so. Basically what we'd like to do tonight is to tell you where we are coming from, present our game plan for helping out the community, and then getting your feedback--getting your vibes, some input from you as to what you think about our plan, some comments, criticism or suggestions for improvement. Then we can drive on and finalize the thing and hope that we can get something built for you in the not too distant future; and that's basically what we're here for tonight.

First of all, before we get started, if you haven't filled out one of these blue cards, we'd appreciate you doing that because we would like to have an accurate head count of everyone that's here and some background on everyone that's here so that we can analyze the participation. Then we have some handouts back there on Pacific Ocean Division activities in general; then we've got some pencils and paper that you might need. We also have some pre-addressed envelopes. If you think of something after the meeting is over or late in the meeting and you don't want to get up and speak, incidently, everyone will have an oppotunity to speak--everyone who wants to will have that opportunity--or will have the opportunity to submit information in writing. If you don't want to get up and speak for one reason or another, you can take one of those self-addressed envelopes which will come to me in Honolulu. The only thing I ask is that you mail it by the end of this month because we have got input coming from all types of interested parties including various Federal and State agencies and we're asking them to input early in August so we'd like to get your input at the same time. Then we'll take all the information, what we gather here this evening from this public meeting, what we've already gotten in the past in talking to folks on the spot and through a workshop we had about a year ago, plus the latest input from all interested agencies, Federal, State and local, then we'll look at it all and put it all together and come up with some final recommendations as to what should be done.

I brought along some other folks from the Honolulu District to help me out this evening. One of them you are already familiar with, Elsie Smith. She's our Acting Public Affairs Officer; you met her when you came in. Also sitting up here at the head table is Sue Kim who is recording everything that is being said. She's taking essentially verbatim testimony of everything that is said here this evening so we can have a permanent record or at least keep the records as long as we need to for the life of the project so everybody knows up front what took place and what everyone's input and desires were. And then, of course, a really important individual in our team is Tim Young who is the project manager on this study. Later on this evening when we get through with the introduction, I'll turn the meeting over to him, and he'll get down into the real meat and potatoes of our proposal. He will give you a quick overview of all the areas that we looked at for possible development from a navigational standpoint, then zero in on the Kaulana area which we selected based largely on your desires, as the primary development, and then talk specifically about three plans that we have for developing the Kaulana area. Before we get into the regular program, I'd like to recognize a number of governmental officials that are with us here this evening.

First off, a regular at our meetings, Mr. Bill Lennan from the U.S. Fish and Wildlife Service; he's here from Honolulu, also. He follows us around wherever we go--keeps us straight. Also, Mr. Larry Soenen from the Soil Conservation Service. I'm sure all of you know Larry; he's working here in the local area, and I've already had the opportunity to see some of the good work that Soil Conservation Service has done for you in my travels around here this afternoon. Then we also have John Quinn, U.S. Coast Guard, and he brought along a couple of helpers. John, welcome, it's good to see a few other uniformed folks here. From the State, we've got Mr. Bruce Taylor from the Department of Hawaiian Home Lands; he came in from Honolulu about 5 p.m. this afternoon, and, of course, he was guided down here by Mr. Ed Kanahele. Ed, good to see you again; had a good session with you this morning. And, last but not least, boy am I glad to see these fellows--the most important actors, some of the most important actors--couple of representatives from the Department of Transportation, Harbors Division, Mr. Dan Tanaka and the boating manager from the Harbors Division, Mr. Dave Parsons. Good to see you again.

Now that we've got those formalities out of the way, let me one more time reiterate how this thing is going to work. We're here primarily to briefly present our program and then to spend most of the evening getting your reaction to that program. As I indicated earlier, everyone who wants to say something can say something. Before you get an opportunity to say something, we're going to give Tim Young, the project engineer, an opportunity to explain basically what is contained in this comprehensive report. He's going to basically summarize what is in that report and give you the pros and cons and the reason why we came up with the three specific plans that we have for possible development of Kaulana Bay. After he gets done with that, and fields any questions that may come up regarding the specifics of his presentation, then I'll take the floor again and give those folks who have indicated that they wish to speak, an opportunity to speak. By that time, what's transpired during the meeting may trigger some of you other folks who previously decided not to say anything to get up and say something. You'll all have the opportunity. All you have to do is either in the meantime go back and see Elsie Smith and tell her you changed your mind or just raise your hand later on in the evening when there is a moment of silence or a break in the action, and I'll recognize you and give you an opportunity to say your piece. We'll continue back and forth that way exchanging information primarily getting from you your desires, your comments, your criticisms, and we'll stay here as long as anybody wants to talk. Anybody have any questions on what we are going to do tonight? Fine, OK Tim, it's all yours.

Tim Young: Thank you, Colonel Thiede. My name is Tim Young; I'm the study manager for the Kaulana Bay Navigation Improvement study. The purpose of this meeting as mentioned by Colonel Thiede is to get your reactions and feedback on the three alternative plans that we've developed. I'm with the Planning Branch of the Corps of Engineers, and we have come up with three alternative plans that I'll be discussing tonight.

I'm sure most of you have already seen the three plans. Before I go into a detailed discussion, I'd like to give you some background information on the study. The study was initiated in August 1979 with a request from the State Department of Transportation (DOT). At that time, DOT requested the Corps to look into assisting them in providing navigation improvements for the Kaulana Bay area, specifically. Under our Section 107 authority of the River and

Harbor Act of 1960, the Corps can study and participate in constructing small boat harbors. However, under this authority, our limitation goes up to $2 million. A public workshop was held at Naalehu in July 1980 to discuss a number of planning and design considerations and alternate sites. Of those who attended the workshop, the concensus felt that Kaulana Bay was the most advantageous location for navigation improvements. Some of the other areas discussed during the workshop were the Punaluu area, Honuapu Bay, Kaalualu Bay, Pohue Bay, and of course, Kaulana Bay. Based on the workshop and subsequent agency responses, we developed three alternative plans. Because of the limited area in the Kaulana Bay area, plans were limited.

Two of the plans will utilize the existing natural channel while the remaining plan, will be through extensive lava flats on the west side of the Bay. I'll go through a description of these plans later in my presentation. Some of the studies that were conducted during the course of this detailed project investigation were Fish and Wildlife studies, an archaeological reconnaissance survey, and an engineering and oceanographic survey and investigation. Based on these studies, agency responses, and input we receive tonight, we will be coming up with a final recommended plan. The Final Detailed Project Report will be completed sometime in September and we will be recommending one of the alternative plans. The primary objective of this study, of course, was to provide protection for trailer and boat launch and recovery operations. After talking to the Ka'u fishermen who represented most of the people at the workshop, there were indications that considerable difficulty is encountered during launch and recovery operations. The improvements that were designed in the Kaulana area were to be effective only during those periods when boats would reasonably be expected to utilize the ramp. In other words, during severe storm conditions, small boats are not expected to utilize the area. The design vessel that we used for designing all of our turning basins and entrance channels was a 27-foot boat with a 7-foot beam and a 2-1/2-foot draft. Based on our wave study investigations, navigation improvements would provide approximately an 85 percent usage factor compared to the existing 60 percent usage.

At this time, I'd like to go through some slides of the area and layout of the alternative plans.

Shown here is an aerial photograph of the Kaulana Bay area. The existing ramp is located in this area. Plan 1 will protect the existing ramp and have an entrance channel through these lava flats. The channel here will have a depth of about 8-1/2 feet, and the turning basin will be 6.5 feet in depth.

Plans 2 and 3 will relocate the existing ramp to the west side of the bay with an adjacent protective breakwater, approximately in this location. In these two plans we will be utilizing the existing natural channel, and we will have a turning basin in this area.

This is just another aerial shot of the Kaulana Bay area. During our archaeological reconnaissance investigations, it was determined that most significant archaeological sites are found in this area. Significant archaeological features, mapped during the survey, will be avoided during the constuction phase of the project. The survey indicated that there are no significant archaeological sites on this side of the Bay.

Just to give you a description of Plan 1, Plan 1 will consist of a 160-foot breakwater across the existing natural channel. An 8-1/2-foot deep entrance channel will be provided with a 6-1/2-foot deep turning basin. The channel entrance in this Plan is 80 feet wide. Plan 2 consists of a breakwater which is 135 feet long; an entrance channel which is 100 feet wide at the mouth and tapers down to 80 feet adjacent to the turning basin. The turning basin and channel entrance depths are identical to Plan 1. In Plans 2 and 3, a new ramp will be provided in this location adjacent to a protective breakwater. I might add that our investigations indicated that a 50 percent reduction in wave height at the existing ramp for Plan 1 can be expected.

For Plans 2 and 3, a 70 percent reduction in wave height can be expected at the ramp in this area. The only difference in Plan 3 versus Plan 2 is in the width of the entrance channel. In this case, the mouth of the entrance channel is 80 feet wide and tapers down to 60 feet versus a 100-foot channel tapering down to 80 feet in Plan 2.

The breakwater in this case is 155 feet long.

Shown here are the costs for the three different plans. Plan 1 in this case was estimated to be approximately 2.65 million dollars; Plans 2 and 3 are approximately $1.1 million on the average. The reason for Plan 1 being so high was the extensive dredging required. An entrance channel is planned through this shallow basalt area requiring a lot of blasting and dredging.

The average annual benefits are based strictly on commercial fishing; average annual costs as you can see varies from a high of $208,000 per year for Plan 1 and goes all the way down to $81,000 on an average annual basis for Plan 2. The benefit cost ratio which is a measure of economic feasibility shows a 1.4 B/C for Plan 1, 3.6 for Plan 2 and a 3.0 for Plan 3. A Benefit-Cost Ratio greater than 1 is an indication of an economical feasible project. The reason for such a high B/C Ratio in Plans 2 and 3, is that the benefits, based on commercial fishing, are much higher than the average annual cost.

Shown on this slide is the apportionment of cost between the Corps of Engineers, the U.S. Coast Guard, and the non-Federal first cost share which is the State portion. This is just an estimate. As you can see here in Plan 1, the Corps of Engineers first cost share is $2 million; this is our maximum limitation under the Small Projects authority. In Plans 2 and 3, the project first cost is just $1 million. The Corps first cost share in this case would be approximately $1 million. The Corps first cost share in this case would be aproximately $1 million. The Coast Guard share for aids to navigation was estimated at $10,000. The non-Federal share in Plan 1 is $644,000 which includes costs for lands, easements and rights-of-ways. Because the project is over $2 million, the State in this case would pick up the balance of the project first cost. In Plans 2 and 3, because we are relocating the ramp in another location in the Bay, the cost for relocation will be a non-Federal cost. The cost in Plans 2 and 3 includes the cost of the ramp and lands, easements, and rights-of-way.

Before I close, I might add that the ramp area is located on Hawaiian Homes land, and local assurances from the Hawaiian Homes people to the Department of Transportation, the local sponsor, will have to be made. The 50-year lease will have to be provided because of the fact that benefits for this project are based on a 50-year project life.

That concludes my presentation.

At this point, I'll turn the meeting over to COL Thiede.

COL Thiede: Before we give the people who indicated they'd like an opportunity to speak, I'd like to recognize Mr. Mike Tulang, U.S. Department of Agriculture, Resource Conservation and Development Office, Hilo, HI. Mike? Welcome aboard.

We have three people so far who indicated that they would like to formally speak. I would like to ask those folks to come up and stand behind the microphone and give your name loudly and clearly and also indicate if you are representing a fishermen's association or a surfer's association, let us know. The first speaker is Mr. Robert Makuakani. Robert?

Mr. Makuakani: First of all, I am President of the Ka'u Kamaaina Fishermen's Association which is fishermen in the Ka'u area. I would like to first thank COL Schlapak and the Corps of Engineers for a wonderful job in this draft which they have compiled. I think they did a good job and I think they did a job in favor of the fishermen. There's a few questions I would like to bring up on these three proposed plans. Number 1, we held a meeting on the 9th of this month with the fishermen of the Ka'u area. At that time we had agreed that we would go along with Plan 2 because of these reasons. Number 1, we wouldn't be in conflict with the environmental people, the historical site people, and the national economic development committee. The cost factor of Plan 2, the least amount for the government to spend, that's the federal government, because Plans 2 and 3, the State government will have to appropriate the same amount of money which is $101,000. But after meeting tonight, the reason why we kind of holding back on Plan 2 is the fact that we feel that the 20 feet of extension on the breakwater would create a greater wave action inside the ramp area. If we could modify Plan 2 to leave it at the height of 8.5 feet. In Plan 2, some of the fishermen went down into the area, and we find out that the breakwater extends in the water, the actual water area. This area is actually all Paahoe (???) so even with this breakwater here, we still going to have wave action because it's all Paahoe (???) out here. If we could extend Plan 2 20 feet like Plan 3 eliminating this height on Plan 3 than we would have an elevation of 8.5 to 11.5 feet- Plan 2 you have 8.5, 8.5 all the way out. If that would be making problems with our environmental people and whoever else, we don't want that. We want to construct something that would be in line with everybody else. The only objection we have to Plan 2 is the fact that it's too short; if we can bring it out 20 more feet here. If we can take Plan 2 and modify it here 20 feet--this is 155 and Plan 2 is 135 on the breakwater, but the elevation on the breakwater on Plan 3 is 8.5 to 11.5 feet.

Mr. Young: I might add that the reason for the breakwater being 11.5 feet at the head of the breakwater in Plan 3 is because of the slightly greater depth at that end. A greater wave height can be expected in the deeper water. Since the breakwater in Plan 2 is set back in shallower water, the wave height wouldn't be as great as in Plan 3. Therefore, the breakwater in extending out a little more in Plan 3 offers better protection in the turning basin.

Mr. Makuakani: This is the reason why, at our meeting, we agreed to Plan 2, because of the cost factor. Because of the President's cut-back on all these kinds of things we have going on, you know they are not going to give you money if you gonna spend this much money in comparison to that.

Mr. Young: I might add that between Plans 2 and 3, they basically have the same project first cost. Plan 3 offers added protection which may override the extra cost in this case.

Mr. Makuakani: Your B/C ratio shows 3.3 compared to 3.0 is because of this cost factor.

Mr. Young: What I'm saying is that because the cost is quite similar in both plans, the greater navigational safety afforded by Plan 3 may override the slight increase in cost. So extending the breakwater in Plan 2 would really be Plan 3. If you extend it out, that would cut down the width of the entrance channel.

Mr. Makuakani: Cut down the width of the entrance channel and cut down on the cost, because you don't need that much; you going only three feet.

Mr. Young: Since you're coming out you will have to build it a little higher. You're going into deeper water and the wave height that we calculated is going to be a little higher. so, what I'm saying is, your idea of extending Plan 2 is really Plan 3.

Mr. Makuakani: So right now, we are in favor of Plan 3 because of the cost factor.

COL Theide: You are in favor of Plan 2 because of the cost factor, but you'd rather have Plan 3.

Mr. Makuakani: Right. We've been working on this project with the help of Hawaii County Economic Opportunity Council for almost two years and we're trying to find something that we would have least problems with the various departments and the various agencies. And like I said, because of the cost factor on Plan 2, we said, OK. If we're not going to have any problems with Plan 2, we'll go along. But after talking tonight, we feel that the best benefit for fishermen would be Plan 3 and we would like to say that we are in favor of Plan 3. Thank you very much.

COL Thiede: OK, thanks a lot, Robert. Next speaker is Julia Kauuku (??).

Ms. Kauuku: My name is Julia Kauuku, and I've worked with the Ka'u fishermen from the very beginning of time. I can tell you after listening to Robert, you are going to have some fortitude in you to kind of stand their changing and their reasoning to choosing plans, but I am here to speak on behalf of the Kona fishermen who are here tonight, and in quite a full force. We live right around the corner from you down in Milolii. We will support the Ka'u fishermen in their choice of Plan 3. I guess we'll have to do it for the same reason; we like Plan 2 because it's cheaper but it's Plan 3 that they really want. I thought you were going to let us ask questions before we came here to speak, but evidently you changed your mind. Anyhow, I would like to know from you, you based most of the ratio on the annual cost factor in relation to the

benefit from the annual income, right--after the improvement--but before that you mentioned that with the new facilities, the existing facilities, they can only use 60% of the year. Right? And you said that with the new ramp, that they would be able to use it 85% of the year. Is that what you meant? When you used both figures, what did you mean by using 60% and 85% usage?

Mr. Young: The 60% usage, was based on interviews with fishermen in the area. At the present time it is estimated that the existing ramp is being used 60% of the year. With the new navigation improvements, with Plans 1, 2 or 3, usage is expected to increase to 85%.

Ms. Kauuku: Threfore, because of that advantage, is this how you based your---

Mr. Young: That's really based on wave height, wave studies in the area during the year. We figured that a wave of approximately 7 feet or less would allow fishermen to get in and out of the channel with minimal problem. Anything over that was considered the so-called storm condition. Therefore, based on this wave height, we've come out with a figure of 85%.

Ms. Kauuku: Ok, would you explain to me what is known as wave period in your diagram?

Mr. Young: The wave period was given as 15 seconds in terms of seconds--what it is is that one wave period--OK, if this a point in the ocean, one cycle of the wave passes here starting at time zero, then 15 seconds later another peak arrives at this same location, that 15 seconds is considered as one wave period.

Ms. Kauuku: All that was done just at the entrance of the ramp?

Mr. Young: Well, actually, that was done for the entire basin and the entrance channel. Those wave studies were studied for all three plans. Based on these studies we came out with a wave diffraction diagram which indicates the wave height at certain locations within the turning basin based on a design wave height of 11 feet.

Ms. Kauuku: You said that part of our cost would be in acquiring the land which is State function. When you introduced the people, you said that Hawaiian Homes was being represented here. I know that the people would need a 50-year lease on the property. Did you not say that?

Mr. Young: The reason being that the benefits or justification for this navigation project is based on a project life of 50 years.

Ms. Kauuku: All I'm going to say is that I hope we will hear from the representative of the Hawaiian Homes Commission as to whether there is a possibility of a 50-year lease and just exactly how much it will cost, or maybe the Hawaiian Homes Commission can give an in kind to the fishermen. Thank you.

COL Thiede: The next speaker we have this evening is Violet Hansen. Violet?

Ms. Hansen: My name is Violet Hansen and I am representing the Big Island Resource Conservation and Development, RC&D Historic Site Committee. I would like to state the following comments. First of all, we will be mailing in our

complete comments. At this time, I would like to pose three comments. I would like to know the disposal area. This is referred to on page 23, should be specified because of the district's great number of historic sites in close proximity to the Kalai Point National Historic Landmark. This is very important because we are just as interested in knowing where you are going to put the debris. The second--Environmental Impact Statement. Again, we would like to stress, with particular reference to page EIS-19, that the suitable construction methods be specified. We feel there should be consultation at the project site before actual construction work to provide temporary fencing along the east side of the bay. The other is also a request that a correction on page B-3 be made for my name. It should be Big Island Resource Conservation and Development Historic Sites Commission. Respectfully yours. We will be sending in a written reply.

Mr. Young: To answer Ms. Hansen's comment on a disposal site, we are coordinating with the Department of Transportation and the Department of Transportation in turn is working with the Hawaiian Home Lands as to a disposal site for the dredged material. In the draft report that we published, I do mention that the disposal site will be within 5 miles of the site, the reason being that a preferable site for this disposal is right in the project area. Right now the Planning Department for DOT has indicated to me that they are working very closely with the Hawaiian Homes people as to whether or not the disposal site near the Kaulana Bay area can be used. My own idea is to put the dredged material in depressed areas within the new launch location area. A disposal site is being worked out between the DOT and the Hawaiian Homes people, and it will be preferably be put on Hawaiian Homes land near the site area. The second question you had on construction. The cost estimates we worked up for Plans 1, 2 and 3 took into consideration the numerous archaeological sites that were present on the east side of the bay. Our construction methods for Plan 1 which is having a breakwater from the east portion of the bay--what we considered was building a mole from the opposite end of the bay and just working across in that area. From our archaeological reconnaisance we found that the narrow area along the east side of the bay was not adequate for construction equipment to bring in without disturbing the archaeological sites.

Ms. Hansen: Well I can say that we are in favor of Plan 1 or Plans 2 or 3.

Mr. Young: Well for Plans 2 and 3, the breakwater extends from the west side of the bay.

Ms. Hansen: Yes, right. Knowing construction workers, that if you don't have a barrier, and some of that site, the bank on the east side is very rich in cultural material, they are apt to, and they don't mean to do it, but the bulldozer will go right through it.

Mr. Young: I acknowledge your concern for that area and in our plans and specs, when we get to plans and specs, the specs will at that point acknowledge the fact that there are numerous archaeological sites on that portion and some kind of mitigative measures will be taken to protect that area whether it be a physical barrier or some kind of quality control inspector being out there during the period of construction.

COL Thiede: Thanks a lot. We've heard from all the speakers who indicated initially that they were interested in speaking. Is there anyone else out here based on what's already been said that would like to speak? If so, just raise your hand, and I will acknowledge you.

Mr. Yokoyama: My name is George Yokoyama. First of all, I want to speak in behalf of Congressman Daniel Akaka. He called me today and told me to be sure that I represented him and to support the majority of the Ka'u and Milolii fishermen on the plan that they preferred. I guess it's Plan 3 that he supports. Dan Akaka as here last year with COL Schlapak in the workshop and he's been really interested in this project from inception of planning. I just want to add his support to this planning.

Now, I represent Hawaii County Economic Opportunity Council; this is separate now. We had a workshop not only in Ka'u; we had two here last year I think it was, and one or two in Pahala. At that time, we invited the Hawaiian Homes Commission director, Georginia Padeken (???) and at that time, she agreed to talk to the Regulatory Agency in the Department of Transportation for them to get together and to lease the Hawaiian Homes land in the Kaulana Bay area to the Department of Transportation. And to this day, we didn't receive any response. Maybe the Hawaiian Homes Commission representative can give us some explanation on that.

I have two questions. One deals with non-federal cash, State cash. How do we go about getting it or is that a promise by the State for this project? Once you get the Federal cash, and is the Federal cash really coming down? This is what I want to know.

Mr. Young: After we submit our final Detailed Project Report with our recommendations, we will send it to our Office of Chief of Engineers in Washington D.C. What they will do is review the report and if there are no major comments, we will distribute the final report to all public, State, County and other interested individuals. Once that is completed, and there are no other comments from these other people, we will send it back to Washington D.C. and they in turn will put it on a so-called list of small projects. Then we will have to wait in line as to when we will get whatever we need--$2 million or $1 million or $900,000--for this project. When we get our money from the Chief of Engineers in Washington D.C., we can initiate our plans and specs. During the plans and specs stage, we'll have a 221 agreement which is an agreement with the State that they will provide certain assurances of funds indicated in the final draft report. Once the State signs that agreement, it is a binding agreement that they will support the project and they do have the money set aside for the project.

Mr. Yokoyama: When will your final draft be ready?

Mr. Young: The final draft is scheduled for completion in September and once we send that out, the review period by the people in Washington D.C. is approximately three months. If we get favorable comments--if they approve the project, there is a 30-45 day review period by all other agencies. Once we send the report back to Washington D.C., shortly thereafter we should be getting money from them for start of plans and specs. The time for the plans and specs is usually in the order of, I would say for this project, maybe four to five months.

Mr. Yokoyama: When we started this project, the State had appropriated $60,000 for this project. Do you still have the $60,000. If you didn't use it, you should have the $60,000, right?

Mr. Young: I can't answer that question.

COL Thiede: We didn't; we never use any of the State money.

Mr. Young: I'm not sure whether the State has money set aside for this project.

Mr. Parsons: It depends on exactly when the money was set aside because as you may know, during the last constitutional convention, they said they would put a time limit on any monies that was appropriated and monies not appropriated would revert back to the general funds. So I don't know if that money was appropriated; some residual money may be there, but in any event, what we will have to do, is once we get the word from the Corps of Engineers that the project will be approved and funded by Congress, then it is incumbent upon us that the money is put in the CIP budget to be sure that we have sufficient money. We coordinate very closely with the Corps on our joint projects and try to make sure that we both get the money at about the same time.

COL Thiede: To reiterate now, based on all the input we are getting here tonight, and from all the other agencies, we are going to finalize the report in September, send it up to the Chief of Engineers. Now the Chief of Engineers has got a pot of money for these types of projects. We don't need to go to Congress; Congress already gave the money. He's got approximately $30 million for this type of nationwide every year, so its'up to us jointly to convince him that our project is more important than some of the others. If we do that then we get this project on the road and be building in perhaps a year. That's assuming that we get the money and the State puts up their share.

Mr. Parsons: I would like to read the State's comments on this project. My name is David Parsons; I am the State Boating Manager with the State Harbors Division, and I'm representing the Director of the Department of Transportation, Dr. Higashionna tonight. The Harbors Division has long recognized the need for navigational improvements of the Kaulana Boat Ramp. There are currently no protective launching facilities in the Ka'u district, the closest behing Pohoiki to the east and Keahou to the north. Consequently this study to improve the hazardous condition found at the ramp site is appreciated. We reviewed the preliminary draft report and found that the navigational improvements being considered will greatly enhance the usability of the site for a boat ramp operation. The preliminary concepts also envisions a small but very important feature - the creation of a refuge area for distressed boaters. The rugged coastline characterized by the lack of naturally protected embayments and the many boaters who frequent the South Point fishing grounds dramatize the need for a harbor of refuge in this location, especially during emergency situations. It is noted that the coastline between Hilo and Kealekekua Bay represents the longest stretch of coastline in the United States without a suitable protected harbor to provide refuge from hazardous sea and weather conditions.

Close coordination is also being carried on between the Harbors Division and the Department of Hawaiian Home Lands, administrators of the surrounding Kaulana Bay property. Perpetual maintenance and access easements along with a license for the backup facilities must still be obtained from DHHL before any improvements can be instituted. This is to insure that the launching ramp facility will remain operational for the life of the project (50 years), a Corps requirement.

In comparing the three plans, we are concerned with the relatively higher economical and environmental impacts which Plan 1 will generate. Plans 2 and 3, on the other hand, appear to be good concepts for the development of a safe and unsable boat launching facility. We will, however, withhold our support for any particular plan until we have had an opportunity to evaluate the results of tonight's public meeting.

We appreciate the Corps' efforts to date and will continue to work closely with them in an attempt to provide the necessary improvements at Kaulana Bay for the benefit of the many Big Island boaters.

Mr. Bill Obrech: My name is Bill Obrech; I'm a resident of Ka'u in Pahala. I want to back up Mr. Makuakani's statements and his position of going to Plan 3 instead of Plan 2. Looking at the figures I come up with the same cost for the two. You got a lot less dredging on Plan 3 and adding this breakwater, extending the breakwater this small distance, the two should about cancel off and help this reduction of dredged material will also reduce the amount of material we're going to have to get rid of later. So, I'll go for Plan 3 and I'm sure the cost will be the same.

_____: I represent Ka'u Soil and Water Conservation District. Our basic concern is the approach area from the end of the paved road to the ramp. That's very erosive soil area and the increased use is going to increase the soil erosion. Mr. Young's idea that may fill could be used to pave that road--that is our main concern. Thank you.

Mr. Young: I didn't really say in the report what would happen in the back areas of the ramp. However, my idea when working up this project, the ideal situation would be to utilize that dredged material that we've gotten and kind of fill in depressed portions of the back-up area right behind the ramp. As far as other depressed spots, probably some grading would have to be done to afford better back-up parking areas for the anticipated increase in trailer and car vehicles.

Audience: Well, we'd like to see a black-top.

Mr. Young: As far as that is concerned, that would be a State funded portion of the project. We only put in the protective structures and that is the limit of our authority.

Mr. Taylor: I am Bruce Taylor and I am land agent for the Department of Hawaiian Home Lands. The Department of Transportation has been talking to us; we have had meetings and we have looked at their proposals and we are working with them. We do have some concerns, Violet, some of the same concerns that you have. We also have concerns about sanitation, about the access road, about security, and these things we've got to sit down with the Department of Transportation and come to some meeting ground on this. These are some very

definite concerns. We are the land owners and we are responsible to the people that we hold the land in trust for. Restrooms, security, maintenance, all these things are expensive and the Department simply does not have the money to make those kind of capital improvements, so we're going to have to sit down with the DOT and work these problems out. These were not brought out tonight; these are definite concerns to us. Boat ramp, as far as discussing it within our Department, sounds like a whale of a good idea. It sounds like I'm being terribly negative and I'm not. I think you've done a whole lot of work and we'd like to work with you, but the Department has its concerns which we have to address too. Originally, the Department of Transportation came to us and asked us for 50-year license. Now, we are prohibited by law for giving a 50-year license. The law says that all we can do is give a 21-year license; however, there is a possibility we're allowed to give a lease for that period of time so we've got some common ground to work with. We've got some problems and we're going to work them out, but we are discussing them, we are looking at them, we don't know at this point--Violet, one of my main concerns is the fill material. How much of it is there of it and where do they want to put it and what's it going to look like after it gets there? Now these are questions that are going to have to be answered and we're going to have to sit down and work up the rules on it. It sounds like a darn good thing and I think with the DOT and the Dept of Hawaiian Homes working together, I think we can do it. I'm glad that you brought up the historic sites and I'm glad that you brought up the road. These are two of the concerns, and put in security. I don't want a lot of bikers down there on weekends running wild and I've got nothing against motorcycles, but they are a problem down there. And sanitation--I haven't been down there in awhile but I saw some pictures and sanitation down there is a little less than adequate. Thank you. Does anybody have any questions of me?

Audience: These were concerns of the fishermen, but they couldn't act because they had no definite answer from anybody. We have worked with Hawaiian Homes for a length of time now and I hate to say this but there wasn't any communication coming down from Hawaiian Homes to our office, which Mr. Yokoyama represents. So far as the fishermen are concerned, they really don't know what has happened or what is happening ever since that meeting that was held at Pahala. We had DOT, we had Hawaiian Homes, local officials and State officials but no feedback. Everything came up at the very first meeting.

Mr. Taylor: You had an open channel through the Department of Transportation working with us in solving the problems and seeing what we can do. Use that channel. If you feel that it's absolutely necessary to call me and say that you are not getting anywhere, I'm in the book; you can call me. I am the land agent and I'll probably end up doing the paperwork on the thing, but I can't give you a whole lot of answers to a whole lot of questions. There are problems and we simply have to sit down and work them out.

Audience: One more question. Does the picture look good in having Hawaiian Homes grant the lease for 50 years?

Mr. Taylor: Well, I don't think that the DOT and the Corps of Engineers would have planned this whole thing here. We own the land; we hold the land in trust for the people and we have the responsibility. You don't just go build a house on somebody else's property. No, there are problems; there are concerns and there are things we will have to work out. But you are all responsible organizations. Let's look at the problems honestly and work on them.

Audience: Did I hear you mention restrooms?

Mr. Taylor: I'll reword that, I'll say sanitary facilities; I don't know what that will entail.

Audience: Wouldn't that include restrooms?

Mr. Taylor: I would imagine, yes.

Audience: You would have to lease a portion of this land out?

Mr. Taylor: Dept of Hawaiian Home Lands is the owner of the land. We are ochibited by law from selling it and we're prohibited by law from licensing it for more than 21 years and the present time. We're trying to get the licensing thing changed but I don't know whether it's going to work in a timeframe with the DOT or not. Possibly a lease is the answer and I don't know--it's something we've got to look at and work out.

Audience: Isn't it being leased right now and will it be a problem?

Mr. Taylor: At the present time--I would have to check back and see exactly what the situation is, but no, as we work it out there will be no problem, because even if it is leased to a private individual, and I'm not saying that it is, I don't thnk it is, but even if it is, we have a withdrawal clause for public purposes so no problem.

Audience: We understand that there was a 30-day clause.

Mr. Taylor: In our leases and in our permits, in our licenses, it's all the same thing; we have the right to withdraw.

Audience: How much land are you talking about leasing. Most of that is within the high water mark.

Mr. Taylor: Well, you're talking about access in there; you're talking about parking area.

Audience: There's no problem with the area in the water. There's no sense building a beautiful facility in the water if you can't get to it.

Mr. Taylor: We're talking about access roads and we're talking about parking area, we're talking about maintenance, sanitation and security.

Audience: So you are speaking about 2 or 3 acres basically?

Mr. Taylor: I don't know, I havn't seen the figures from DOT. When they get theirs finalized and then come to us and then say, here's our package, then we can sit down and go with it.

COL Thiede: Basically as far as the federal government is concerned, it's a dispute between State agencies; it's a State matter for resolution at the State.

Mr. Taylor: It's not even a dispute.

COL Thiede: But it needs to be resolved between State agencies. Tim mentioned earlier that the 221 agreement that's negotiated between us and the State before we undertake a federal project, really follows a-b-c rules. The State has to obtain all real estate and rights-of-way and that's really step one and that's the hold up right now. We can't go to Governor Ariyoshi and say, Governor, can you guarantee us that we've got the real estate free and clear including tne rights-of-way. We can't do that because his staff hasn't resolved all the problems.

Mr. Young: Just to give you an idea how much dreging will be done, it's given in the draft report under the cost estimation section. For Plan 1, we'll be dredging approximately 12,000 cubic yards, and in Plans 2 and 3, we estimate approximately 5,200 cubic yards of material.

Ms. Hansen: How much land area does this take in. I'm not talking about your roads or your access for the project because your archaeological work went up only 200 ft. Now everything you are talking about is within that 200 feet--is that correct? I'm talking about the land area now--I'm not talking about the dredging.

Mr. Young: The land area that will be created from this dredged material will depend on the height of our stockpile.

Ms Hansen: No, for the project.

COL Thiede: Now, this dredging all takes place in the water.

Ms. Hansen: Then, your maneuverability around it.

Mr. Young: Oh, I see, you mean as far as construction area is concerned.

Ms. Hansen: Yes, I naven't seen any figures on it.

COL Thiede: You mean during the construction period?

Ms. Hansen: Yes. The parking of your cars and trailers.

COL Thiede: You mean how much real estate would we fence off for the construction site. We always designate that for any job regardless of where it is, regardless if the real estate is historically significant or culturally important or not. We always specify to a contractor the area within which he's got to work.

Ms. Hansen: Do you know at this time?

Mr. Young: We are working with DOT as to exactly how much parking area will be needed for this project. That will be based, of course, on anticipated increase in trailer and vehicle traffic.

COL Thiede: Yes, but I think Violet is talking about the actual construction period.

Ms. Hansen: I'm talking about the area that is going to be involved--the land area involved in this project.

Mr. Young: Right now, we don't have an exact acreage amount for areas sectioned off, but that really comes during the plans and specs stage when we actually get down to drawing up the plans, getting the lands, easements and rights-of-way, and setting up certain areas as parking.

Ms. Hansen: But you have already set up a boundary for your archaeological work.

Mr. Young: Well we've pretty much studied the area for the archaeological reconnaissance.

William Glover: I'm William Glover and I'm speaking for myself. My boat draws 3 feet. Will I be able to launch it or not?

Mr. Young: How big is the boat?

Mr. Glover: It's a 21-foot slew (?) trailer boat.

Mr. Young: Well, our turning basin is 6-1/2 feet and the entrance channel is 8-1/2 feet.

Mr. Glover: The draft will go down 6 feet.

Mr. Young: Yes.

Mr Tanaka: Well, you normally design it for minus 3 feet.

COL Thiede: Does anyone else have any comments?

Mr. Parsons: I know there have been a lot of concern about back-up support facilities. Normally that is the responsibility of the State. When we go in for monies for this type of a project, we try to assess the needs for other ammenities, so it may be that we would be going in for more than the exact amount that's needed as matching funds for this. For instance, for every launching ramp, you should have a loading dock to go with it and there should be possibly some minimal treatment of the parking and vehicular back-up area whether it's just graded or covered with crushed gravel. That would all be State cost and I'm sure that with the communication already set up with this community, we can come back and get your ideas on such things as how big a parking area would be needed or what is the smallest one that would be acceptable, but we can work on this in the future. I know for one thing, I don't think we could justify asking for money to build a new road down there.

Mr. Young: At the present time, is there a master plan for the Kaulana Bay area.

Mr. Parson: No.

COL Thiede: When you say a new road, are you talking about a new road for the whole 12 miles?

Mr. Parson: Yes. But we'll see what we can work out. Normally the normal course of these projects we always ask for what we think is enough money for the project but when the bids get back in, they are always higher than what we had budgeted for, so we have what we call deductive items that would cut out some of the frills but at least we have enough basic money there for the basic project. So, I'll be glad to answer any questions after the meeting.

Ms. Kauuku: After listening to Tim, I wondered if we had enough money for State funds to cover whatever he wanted to plan. As I listen to the fellows from the Department of Transportation, I wonder some more being how hard money is in the State agencies. But I would like to suggest on half of all the fishermen that whatever plan can expedite that plan should be used. If you have got to deduct the frills, then deduct them. But the fishermen already have their hopes going up and you just crushed it, and you, and you, and I'm saying that whatever would expedite plans, I think is what your agency should be talking about.

Mr. Parsons: Right. I hope I came across that way. We are definitely in favor of this and in defense of Hawaiian Homes Land, they are under certain legal constraints on how they can dispose of their property and it's a matter of us getting together and seeing how we can achieve a mutually desireable answer.

Ms. Kauuku: Just so you can meet up with their timetable. You make sure that whatever you have got to discuss will end up with their timetable. I don't want you to take another 6 months after they took their 4 months--it will be another whole year again.

Mr. Parsons: As soon as we find out that we're getting some money, we'll let you know and you can talk to your local representatives and senators. As far as boating projects go, launching ramps project seem to receive a little more favor than other type of boating projects.

COL Thiede: Thanks again, Dave.

Does anyone else have anything else to say? Any more questions, any more comments, any more discussion?

Thank you everyone for coming and taking your valuable time to visit with us. We've gotten a great deal of important input. The turn out obviously was tremendous and your cooperation was terrific. We'll hope to get something on the road for you as quickly as we can.

IV. PERTINENT CORRESPONDENCE

1. LIST OF LETTERS AND RESPONSES:

1. LIST OF LETTERS AND RESPONSES (Contd)

Date	Subject	Initiating Agency	Page No.
20 July 1981	Comments on Draft DPR	State of Hawaii Dept of Land & Natural Resources	B-26
24 July 1981	Comments on Coastal Zone Management (CZM) consistency evaluation report	State of Hawaii Dept of Planning and Economic Development	B-27
14 August 1981	Response to Dept of Planning and Economic Development	US Army Corps of Engineers	B-28
24 July 1981	Comments on Draft DPR	State of Hawaii Office of Environmental Quality Control	B-29
5 August 1981	Response to Office of Environmental Quality Control	US Army Corps of Engineers	B-31
27 July 1981	Comments on Draft EIS	Dept of the Air Force	B-32
27 July 1981	Comments on Draft DPR	Dept of the Army - DEH	B-32
31 July 1981	Comments on Draft EIS	Dept of Housing and Urban Development	B-33
31 July 1981	Comments on Draft DPR	State of Hawaii Department of Agriculture	B-33
31 July 1981	Comments on Draft Environmental Statement	Advisory Council on Historic Preservation	B-34
1 August 1981	Public Involvement	Hawaii Audubon Society	B-35
19 August 1981	Response to Audubon Society	US Army Corps of Engineers	B-35
4 August 1981	Comments on Draft DPR	Environmental Center - University of Hawaii (Manoa)	B-36
31 August 1981	Response to Environmental Center	US Army Corps of Engineers	B-37
4 August 1981	Comments on Draft DPR	Planning Dept - County of Hawaii	B-38

1. LIST OF LETTERS AND RESPONSES (Contd)

Date	Subject	Initiating Agency	Page No.
14 August 1981	Response to Planning Dept	US Army Corps of Engineers	B-39
5 August 1981	Comments on Draft DPR	US Dept of Commerce - Nat'l Marine Fisheries Service	B-40
19 August 1981	Response to Nat'l Marine Fisheries Service	US Army Corps of Engineers	B-41
6 August 1981	Comments on Draft DPR	Marine Advisory Council - Univ. of Hawaii (Manoa)	B-43
17 August 1981	Response to Marine Advisory Council	US Army Corps of Engineers	B-44
6 August 1981	Comments on Draft DPR	Big Island Resource Conservation & Development	B-45
25 August 1981	Response to Big Island Resource Conservation & Development	US Army Corps of Engineers	B-45
7 August 1981	Comments on Draft DPR and Environmental Statement	US Environmental Protection Agency	B-46
7 August 1981	Comments on Draft DPR and Environmental Statement	US Dept of the Interior	B-47
11 September 1981	Response to US Dept of the Interior	US Army Corps of Engineers	B-48
17 August 1981	Comments on Draft Environmental Statement	US Dept of Commerce - NOAA	B-49
18 August 1981	Comments on Draft Environmental Statement	State of Hawaii - DLNR	B-49
25 August 1981	Draft Environmental Statement	General Counsel of the US Dept of Commerce	B-50
10 September 1981	Biological Assessment	Natl Marine Fisheries Service	B-50
18 September 1981	CZM Compliance	State of Hawaii DLNR	B-51
22 September 1981	Letter of Support	State Dept of Trans	B-52
24 September 1981	Response to F&WS Regarding Botanical Survey	US Army Corps of Engineers	B-53
28 September 1981	Aids to Navigation	US Coast Guard	B-53

DEPARTMENT OF THE ARMY
U. S. ARMY ENGINEER DISTRICT, HONOLULU
BUILDING 230
FT. SHAFTER, HAWAII 96858

PODED-PJ

1 0 JUN 1980

Dear Sir:

The US Army Engineer District, Honolulu, has initiated a study for possible navigation improvements in the area of South Point on the island of Hawaii. The study is in response to a request from the State of Hawaii, Department of Transportation.

The study will determine the feasibility of navigation improvements and the extent, if any, to which the Federal Government should participate. The first step will focus on the problems and needs of boaters and fishermen, areas of particular concern, and possible alternatives. As the study progresses, a full range of alternative solutions will be developed and evaluated and the final result of the study will be a report on the possible improvements including an environmental statement assessing the impacts of the proposed solution.

To aid us in this study we will maintain close coordination between all interested federal, state, and county agencies as well as the general public. We will continue to keep you informed of the study progress and welcome your comments or suggestions on any aspect of the project.

Sincerely,

B. R. Schlapak
B. R. SCHLAPAK
Colonel, Corps of Engineers
District Engineer

DANIEL K. INOUYE
HAWAII

United States Senate
ROOM 1__, RUSSELL SENATE BUILDING
WASHINGTON, D.C. 20510

June 16, 1980

Colonel B. R. Schlapak
District Engineer
Corps of Engineers
Department of the Army
Building 230
Ft. Shafter, Hawaii 96858

Dear Colonel Schlapak:

I wish to acknowledge receipt of your recent communication advising me that the U.S. Army Corps of Engineers has initiated a study for possible navigational improvements in the area of South Point on the Island of Hawaii, pursuant to a request from the State Department of Transportation.

Your thoughtfulness in sharing the abovementioned information with me is most appreciated. Please continue to keep me apprised of the progress of this study.

Aloha,

DANIEL K. INOUYE
United States Senator

DKI:jmpl

United States Department of the Interior

NATIONAL PARK SERVICE

HAWAII STATE OFFICE
300 ALA MOANA BLVD., SUITE 6305
BOX 50165
HONOLULU, HAWAII 96850

IN REPLY REFER TO:

H32
XL6

June 19, 1980

Colonel B. R. Schlapak
District Engineer, Corps of Engineers
U. S. Army Engineer District
Building 230
Fort Shafter, Hawaii 96858

Dear Colonel Schlapak:

In reply to your letter of June 10, 1980 concerning the study for possible navigation improvements at South Point, Hawaii Island, this is to remind the planners that South Point is a National Historic Landmark, a property listed in the National Register of Historic Places. The procedures of the Advisory Council on Historic Preservation apply.

B-18

Sincerely yours,

Thomas S. Ogi
Acting State Director

DEPARTMENT OF THE ARMY
U. S. ARMY ENGINEER DISTRICT, HONOLULU
BUILDING 230
FT. SHAFTER, HAWAII 96858

PODED-PJ

20 June 1980

Dear Boater:

The US Army Corps of Engineers has initiated studies for possible harbor improvements in the area of South Point on the Island of Hawaii. An informal public workshop meeting to assist in gathering information concerning problems, needs, and community desires will be held on:

WEDNESDAY, JULY 9

AT 6:00 P.M.

IN THE NAALEHU YOUTH CENTER

Information of particular importance to the study includes problems and damages associated with launch and recovery of trailered boats at the existing Kaulana Bay ramp; the increased fishing that would occur if the ramp was improved; considerations such as historic sites or special environmental conditions; and possible alternative small harbor sites that should be considered. Inclosed is a short questionnaire which I would appreciate your filling out and mailing back. Simply fold it so that the Corps of Engineers' address shows and drop it in the mail. Better yet, bring it to the workshop meeting with you. Some of you may have already received the questionnaire as it was recently used to obtain information on state-wide boating needs. If so, I would appreciate your completing it again so that boating problems and needs specifically in the South Point area may be determined. Thank you very much for your cooperation.

Sincerely,

B. R. SCHLAPAK
Colonel, Corps of Engineers
District Engineer

1 Incl
As stated

POMED-PV

13 January 1981

Mr. Dale Coggeshall
Pacific Islands Administrator
US Fish and Wildlife Service
US Department of the Interior
300 Ala Moana Boulevard, PO Box 50167
Honolulu, HI 96850

Dear Mr. Coggeshall:

Pursuant to the 1978 Amendments of the Endangered Species Act of 1973, we are requesting information on any listed or proposed endangered or threatened species that may be present in the Kaulana Small Boat Harbor project area, Ka'u, Hawaii (Incl 1). The US Army Corps of Engineers initiated general fish and wildlife coordination with the US Fish and Wildlife Service, Division of Ecological Services in Honolulu in January 1980.

We will appreciate any additional information provided by the Office of Endangered Species. If you have any questions, please contact Mr. Robert Honcrief, Environmental Resources Section, at (808) 438-2264.

Sincerely,

1 Incl
As stated

KISUK CHEUNG
Chief, Engineering Division

CF:
Mr. R. Kahler Martinson, Regional Director
Fish and Wildlife Service
US Department of the Interior
Lloyd 500 Building, Suite 1692
500 N.E. Multnomah Street
Portland, OR 96232

H-19

JAN

United States Department of the Interior

FISH AND WILDLIFE SERVICE
300 ALA MOANA BOULEVARD
P.O. BOX 50167
HONOLULU, HAWAII 96850

IN REPLY REFER TO:
1-2-81-SP-208

JAN 2 ? 1981

Mr. Kisuk Cheung
Chief, Engineering Division
U.S. Army Engineering District, Honolulu
Ft. Shafter, Hawaii 96858

Dear Mr. Cheung:

This is in reply to your letter of January 13, 1981, requesting a list of listed and proposed endangered and threatened species that may occur within the area of your proposed Kaulana Small Boat Harbor project. Your request and this response are made pursuant to Section 7(c) of the Endangered Species Act of 1973 as amended (PL 95-632).

We have reviewed the most recent information and, to the best of our knowledge, the endangered Hawaiian hoary bat (Lasiurus cinereus semotus) is the only listed species which may occur in the project area; no proposed species occur at the site. However, two plants in the vicinity of the project are candidates for listing: Portulaca hawaiiensis and Sesbania hawaiiensis. It is not known if these plants are found within the boundaries of the proposed project, but they have been noted in the general Ka'u area. As candidates, these species are presently being reviewed by this Service for consideration to propose and list as endangered or threatened. It should be noted that the candidate species have no protection under the Endangered Species Act and are included for your consideration as it is possible the candidates could become formal proposals and be listed during your construction period.

We appreciate your concern for endangered species and look forward to continued coordination. If you have further question, please contact Lucian Kramer, Environmental Services, at 546-7530.

Sincerely yours,

ACTING Pacific Islands Administrator

CONSERVE AMERICA'S ENERGY

Save Energy and You Serve America!

GEORGE R. ARIYOSHI
GOVERNOR OF HAWAII

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

July 7, 1981

GEORGE A. L. YUEN
DIRECTOR OF HEALTH

JOHN F. CHALMERS, M.D.
DEPUTY DIRECTOR OF HEALTH

HENRY N. THOMPSON, M.A.
DEPUTY DIRECTOR OF HEALTH

MELVIN K. KOIZUMI
DEPUTY DIRECTOR OF HEALTH

ABELINA MADRID SHAW, M.A., J.D.
DEPUTY DIRECTOR OF HEALTH

In reply, please refer to:
File: EPHS-SS

Mr. Kisuk Cheung
Chief, Engineering Division
Army Engineer District, Honolulu
Department of the Army
Ft. Shafter, Hawaii 96858

Dear Mr. Cheung:

Subject: Environmental Impact Statement (EIS) for Kaulana Bay Navigation Improvements Study, South Point, Island of Hawaii

B-20

Thank you for allowing us to review and comment on the subject EIS. On the basis that the project will comply with all applicable Public Health Regulations, please be informed that we do not have any objections to this project.

We do not anticipate any adverse water quality impacts as the result of the proposed discharge of dredged or fill material into State waters for the subject project.

We realize that the statements are general in nature due to preliminary plans being the sole source of discussion. We, therefore, reserve the right to impose future environmental restrictions on the project at the time final plans are submitted to this office for review.

Sincerely,

for MELVIN K. KOIZUMI
Deputy Director for
Environmental Health

cc: OEQC

Ka'u Soil and Water Conservation District

Pahala, Hawaii 96777
July 1o, 1981

To: Dept. Of The Army
U.S. Army Engineering District, Honolulu
Ft. Shafter, Hawaii 96858

From: Ka'u Soil And Water Conservation District

Subject: Proposed Kaulana Bay Navigation Improvements

The Ka'u Soil And Water Coservation District has reviewed the three alternative plans proposed for the Kaulana Bay Navigation Improvements at South Point, Hawaii, and some of our Directors have visited and are aware of conditions at the site.

The District Board of Directors is concerned that none of the alternatives recognize the need for a hard surfaced approach road and parking facility to accommodate increased traffic in the area.

Rain and wind caused soil erosion is already a Problem in the area due to the highly erodable nature of the Pakini Series soils found here combined with the difficulty of maintaining a protective vegetative cover.

The Ka'u Soil And Water Conservation District does not support any navigation improvements at Kaulana that do not include more adaquate soil erosion control measures in the immediate vacinity of the proposed facility.

Ka'u Soil and Water Conservation District

Dale W. Anderson, Chairman

B-21

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

PODED-PJ

27 July 1981

Mr. Dale W. Anderson, Chairman
Ka'u Soil and Water Conservation
District
Pahala, Hawaii 96777

Dear Mr. Anderson:

Thank you for your 10 July 1981 comments on the proposed navigation improvements at Kaulana Bay, South Point, Island of Hawaii. In answer to your concerns, we are working closely with the Department of Transportation (DOT) and will address the problem of soil erosion in our Final Detailed Project Report. The Department of Transportation, as the responsible agency for shoreside development, will be conducting detailed investigations on mitigative measures to minimize soil erosion during the preconstruction planning stage. We will also discuss with the DOT the provisions for a hard-surfaced approach road and parking in the project area.

Your interest and concerns on this study are appreciated.

Sincerely,

KISUK CHEUNG
Chief, Engineering Division

JUL 15 1981

ARIZONA
CALIFORNIA
NEVADA
HAWAII
GUAM
AMERICAN SAMOA

U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION
REGION NINE
Hawaii Division
Box 50206
Honolulu, Hawaii 96850

July 13, 1981

IN REPLY REFER TO
HDA-HI

Mr. Kisuk Cheung, Chief
Engineering Division
U.S. Army Corps of Engineers
Pacific Ocean Division, Bldg. 230
Fort Shafter, Hawaii 96858

Dear Mr. Cheung:

Subject: Kaulana Bay Navigation Improvements Study

Thank you for the opportunity of reviewing the Draft Project Report and Environmental Statement for the Kaulana Bay Navigation Improvements Study.

Our review indicates that facilities on the Federal-aid Highway System are not affected by the proposed project at Kaulana Bay.

We have no other comment to offer.

Sincerely yours,

H. Kusumoto
Acting Division Administrator

GEORGE R. ARIYOSHI
GOVERNOR

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HARBORS DIVISION
[illegible]

RYOKICHI HIGASHIONNA, Ph.D
DIRECTOR

DEPUTY DIRECTORS
JACK K. SUWA
JAMES R. CARRAS
JAMES B. McCORMACK
JONATHAN K. SHIMADA, Ph.D.

IN REPLY REFER TO:

July 14, 1981

TESTIMONY OF THE
DEPARTMENT OF TRANSPORTATION
HARBORS DIVISION

KAULANA BAY NAVIGATIONAL IMPROVEMENTS
KAU, HAWAII

The Harbors Division has long recognized the need for navigational improvements at the Kaulana boat ramp. There are currently no protected launching facilities in the Kau District, the closest being Pohoiki to the east and Keauhou to the north. Consequently, this study to improve the hazardous conditions found at the ramp site is appreciated.

We reviewed the preliminary draft report and found that the navigational improvements being considered will greatly enhance the usability of the site for a boat ramp operation. The preliminary concepts also envisions a small but very important feature - the creation of a refuge area for distressed boaters. The rugged coastline characterized by the lack of naturally protected embayments and the many boaters who frequent the South Point fishing grounds dramatize the need for a harbor of refuge in this location, especially during emergency situations. It is noted that the coastline between Hilo and Kealekekua Bay represents the longest stretch of coastline in the United States without a suitable protected harbor to provide refuge from hazardous sea and weather conditions.

Close coordination is also being carried on between the Harbors Division and the Department of Hawaiian Home Lands, administrators of the surrounding Kaulana Bay property. Perpetual maintenance and access easements along with a license for the backup facilities must still be obtained from DHHL before any improvements can be instituted. This is to insure that the launching ramp facility will remain operational for the life of the project (50 years), a Corps requirement.

In comparing the three plans, we are concerned with the relatively higher economical and environmental impacts which Plan 1 will generate. Plans 2 and 3, on the other hand, appear to be good concepts for the development of a safe and usable boat launching facility. We will, however, withhold our support for any particular plan until we have had an opportunity to evaluate the results of tonight's public meeting.

We appreciate the Corps' efforts to date and will continue to work closely with them in an attempt to provide the necessary improvements at Kaulana Bay for the benefit of the many Big Island boaters.

July 15, 1981

Colonel Schlapak
District Engineer, Corps of Engineers
U. S. Army Corps of Engineers
Building 230
Fort Shafter, Hawaii 96858

Dear Colonel Schlapak:

I would like to take this opportunity to thank you and your Department, in be-half of the Ka'u Kamaaina Fishing Association, for a wonderful job which you and your Department have done on the Detailed Project Environmental Statement Draft report. I believe that the report gives a detailed study of the area and that it shows the benefits which the State, County and Fishermen will receive from it's improvements.

On July 14, 1981, at the Public Hearing, held at the Naalehu Youth Center. I spoke in be-half of the Ka'u Kamaaina Fishing Association, at which time, we unanimously endorsed "PLAN 3". We believe that PLAN-3 will best meet the needs of the Association and yet not be in conflict with any organization, whose concerns are to keep the terrestial and marine environments destructions to a minimal and that no destructions be made in the areas of the Historical sites.

Concerns, voiced by concerned citizens and persons representing various organizations, are also concerns of this Association. These concerns were brought up at earlier meetings, at which time it was made understood that this concerns will be met with,prior to the final report by your Department. These concerns are also being discussed by the Hawaiian Homes Department, State Transportation Department and our local, County Department.

I will be keeping in contact with you and your Department, as well as other agencies involved. We hope and pray that an agreeable solution can be reached, prior to September, so that this project can proceed and a completion date seen in the near future.

I would like to again, thank you and your Department for a job well done. Should there be any questions or any assistance which maybe needed by you or your Department, feel free to contact me.

Sincerely,

R Makuakane

Robert Makuakane, President
Ka'u Kamaaina Fishing Association
P. O. Box 183
Pahala, Ka'u, Hawaii 96777

JUL 20 1981

United States Department of Agriculture

Soil Conservation Service

P. O. Box 50004
Honolulu, Hawaii
96850

July 16, 1981

Mr. Kisuk Cheung
Chief, Engineering Division
U.S. Army Engineer District, Honolulu
Building 230
Ft. Shafter, HI 96858

Dear Mr. Cheung:

Subject: Kaulana Bay Navigation Improvements Study - Final Report and EIS

We have reviewed the above-mentioned document as you requested and offer the following comments for your consideration:

Page 6, Item (6) Geology - The overlying Pakini soil referred to is formed from volcanic ash rather than from weathered base rock. Although the soil is extremely permeable, the Pahoehoe lava is not.

Page EIS-5 and EIS-11 - Plan 2, the recommended alternative, proposes construction of the ramp on the west side of the bay. This would extend the ramp into the Pakini soils, which are highly erosive. Once disturbed by construction, they are very difficult to stabilize. The hot, dry, and windy conditions will also make it difficult to establish vegetation without irrigation. This problem will be compounded even more if the soil is disturbed into the subsoil. This general area has been found to have high salt concentrations in the soil, which also hinders vegetative establishment.

Page D-14, Item 24 - Because of the soils involved, we would expect problems from wind and water erosion along with deterioration of the access road as the plan indicates. In addition, it is difficult to drive on these bare soils when wet. We therefore recommend that the roads and parking lots be paved to prevent wind and water erosion problems.

Thank you for the opportunity to review this document.

Sincerely,

JACK P. KANALZ
State Conservationist

The Soil Conservation Service is an agency of the Department of Agriculture

SCS-AS-1
10-79

B-25

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

PODED-PJ

29 July 1981

Mr. Jack P. Kanalz
State Conservationist
Soil Conservation Service
US Department of Agriculture
PO Box 50004
Honolulu, HI 96850

Dear Mr. Kanalz:

In reference to your letter dated 16 July 1981 concerning the Draft Detailed Project Report and Environmental Statement for the Kaulana Bay Navigation Improvements Study, the following is furnished in response to your comments:

a. Page 6, Item (6), Geology. Paragraph will be revised as suggested.

b. EIS-5 and EIS-11. Plan 3 is considered the most suitable small craft facility layout for commercial fishermen. Although Plan 2 was designated as the National Economic Development (NED) plan, Plan 3 is being recommended based on public input and review comments and on the greater navigational safety afforded to small craft vessels within Kaulana Bay. The Department of Transportation, as the local agency responsible for the design and construction of the launch ramp, will be conducting detailed investigations on mitigative measures to minimize soil erosion during the preconstruction planning stage. Your stated concerns and possible solutions will be addressed in the Final Detailed Project Report.

GEORGE R. ARIYOSHI
GOVERNOR OF HAWAII

JUL 22 1981

SUSUMU ONO, CHAIRMAN
BOARD OF LAND & NATURAL RESOURCES

EDGAR A. HAMAMU
DEPUTY TO THE CHAIRMAN

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

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

Your: PODED-PJ

July 20, 1981

Mr. Kisuk Cheung
Chief, Engineering Division
U. S. Army Engineer District, Honolulu
Ft. Shafter, Hawaii 96858

Dear Mr. Cheung:

We appreciate the opportunity to comment on the project report and Environmental Impact Statement (EIS) for the Kaulana Bay small boat harbor.

The harbor is located substantially in State-owned waters zoned Conservation. Use of this area will require approval of the Board of Land and Natural Resources.

The harbor is essentially to serve boat owners living in the South Point area. It can also serve as one element in a State-wide chain of refuge harbors, although the harbor depth is a limiting factor.

The project is located in an area which is geologically active. Harbor structures are, however, minimal.

Kaulana is within an "important resident area" for green sea turtles (NOAA-TM-NMFS-SWF C-7). They feed on Pterocladia capillacea, which grows in shallow waters close to shore and in areas where fresh water emerges from underground springs. Harassment of green turtles by boating activity may cause the turtles to abandon that feeding area. All impacts of the project on the green sea turtle should be addressed by the final EIS.

Our records indicate that the proposed project lies within the South Point Complex (site #4140), a site listed on the National Register of Historic Places.

The "Archaeological Reconnaissance Survey of the Kaulana Bay Harbor Study Area (April 1981)" by Paul Rosendahl, consulting archaeologist, indicates that the six archaeological features of that complex would not be impacted if either Plan 2 or Plan 3 of the subject report were to be implemented.

Since the project report recommends the Plan 2 alternative, we concur.

We further concur with Dr. Rosendahl's concern for the continued post-construction period protection of the features, including the stabilization of Feature A to prevent future erosion.

In the event that any unanticipated sites or remains such as artifacts, shell, bone, or charcoal deposits; human burials; rock or coral alignments, pavings, or walls are encountered during construction, please inform the applicant to stop work and contact our historic sites office (Phone 548-7460) immediately.

Since federal funds and/or permit are necessary for this development, further evaluation of the effects of this project on possible cultural resources will be necessary in conformance with Section 106, 36 CFR 800.

Sincerely,

SUSUMU ONO, Chairman
Board of Land and Natural Resources
and
State Historic Preservation Officer

DEPARTMENT OF PLANNING AND ECONOMIC DEVELOPMENT

GEORGE R. ARIYOSHI
GOVERNOR
HIDETO KONO
DIRECTOR
FRANK SUEMATSU
DEPUTY DIRECTOR

KAMAMALU BUILDING 250 SOUTH KING ST HONOLULU HAWAII • MAILING ADDRESS P.O. BOX 2359 HONOLULU HAWAII 96804

JUL 29 1981

July 24, 1981

COPY

Ref. No. 3402

Mr. Harry Akagi
Acting Director
Office of Environmental
Quality Control
550 Halekauwila Street
Room 301
Honolulu, Hawaii 96813

Dear Mr. Akagi:

Subject: Kaulana Bay Navigation Improvements Draft Detailed Project Report and Environmental Statement, U.S. Army Corps of Engineers

B-27

We have reviewed the subject document and offer the following comments for your consideration.

1. We note that the pages of the Coastal Zone Management (CZM) consistency evaluation report, Appendix A, are not in correct order. Apparently, pages A-13 and A-15 have been reversed.

2. The tentatively selected plan (Plan 2) may adversely affect archaeological features within the South Point National Historic District. While the CZM assessment indicates that construction specifications will detail procedures for dealing with these resources, we recommend that prior determinations of resource significance, proposed salvage operations and mitigation measures be formally approved by the State Historic Preservation Officer. This will assist in assuring that the final project specifications are consistent with CZM policies to the maximum extent practicable.

3. In consideration of CZM policies regarding coastal hazards, the CZM evalution report should address the possibilities of subsidence affecting project structures and the general harbor area. It is unclear whether any subsidence activity has

affected the existing boat ramp and if design specificatons for the proposed new ramp will consider earth settlement impacts.

Thank you for the opportunity to comment on the matter.

Sincerely,

Hideto Kono

cc: Mr. Kisuk Cheung, Chief
Engineering Division
U.S. Army Engineer District, Honolulu

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

PODED-PJ

14 August 1981

Mr. Hideto Kono, Director
Department of Planning and
Economic Development
PO Box 2359
Honolulu, HI 96804

Dear Mr. Kono:

In reference to your letter to the Office of Environmental Quality Control dated 24 July 1981 concerning the draft Detailed Project Report (DPR) and Environmental Statement for the Kaulana Bay Navigation Improvements study, the following are furnished in response to your comments:

a. Comment 1. Pages A-13 and A-15 of the Coastal Zone Management (CZM) consistency evaluation report in Appendix A of the DPR were reversed and will be corrected in the final DPR.

b. Comment 2. The recommended plan for navigational improvements at Kaulana will be plan 3, which includes relocation of the existing ramp to the west side of the bay, construction of a protective breakwater and dredging of a turning basin and entrance channel. Recent communications received from the State Historic Preservation Officer and the Advisory Council on Historic Preservation concur with our archaeological reconnaissance survey that no adverse impacts on existing archaeological features are anticipated with implementation of plan 3. Construction specifications will detail methods of maximizing preservation of any archaeological resources discovered during project construction.

The State of Hawaii Department of Transportation is currently developing a shore-side facility plan and is fully supportive of plan 3. If development extends beyond the limits of the archaeological reconnaissance survey (April 1981) area, additional surveys will be required and subsequent planning will be coordinated with the State Historic Preservation Officer for consistency with CZM policies.

c. Comment 3. No major subsidence has occurred in recorded history in the South Point area (Kaulana Bay). Although the entire island is seismically active, based on past records we do not expect any major subsidence activity during the life of the project (50 years). Minor subsidence has probably occurred over the past years; however, no visible impact to the existing launch ramp is evident. Coastal hazards, regarding subsidence activity, will be addressed in the CZM evaluation report.

14 August 1981

PODED-PJ
Mr. Hideto Kono

Thank you for your comments on the draft Detailed Project Report and Environmental Statement. Your interest and concerns regarding this study are appreciated.

Sincerely,

KISUK CHEUNG
Chief, Engineering Division

GEORGE R. ARIYOSHI
GOVERNOR

STATE OF HAWAII
OFFICE OF ENVIRONMENTAL QUALITY CONTROL
550 HALEKAUWILA ST.
ROOM 301
HONOLULU, HAWAII 96813

JUL 29 1981

Melvin Koizumi
Deputy Director

TELEPHONE NO.
548-6915

July 24, 1981

Kisuk Cheung, Chief
Engineering Division
U.S. Army Engineer District, Honolulu
Building 230
Fort Shafter, Hawaii 96858

SUBJECT: Draft Detailed Project Report and Environmental Impact Statement for Kaulana Bay Navigavtion Improvements Study, Ka Lae, Hawaii

Dear Mr. Cheung:

We have reviewed the subject document and offer the following comments for your consideration:

DRAFT DETAILED PROJECT REPORT

CORRECTION (page 5, page EIS-12)

The DPR and the EIS indicate that Mauna Loa is 13,796 feet above sea level. Actually, Mauna Kea is 13,796 feet and Mauna Loa is 13,677 feet.

TERRESTRIAL BIOTA (page 6)

The document should indicate that terrestrial biota includes mongoose, pueo, and feral goats.

DOCUMENTATION (page 7, page EIS-13)

The document states, "An additional 2,150 hotel units are planned for the Kona area within the next several years." The reference for this figure should be given. In addition, the reference should indicate whether the figure includes South Kohala.

REFERENCE (page 9)

The DPR indicates that about 20 percent of the time boats and trailers are damaged due to the present conditions of the area. The statement should be documented to substantiate the statement through insurance

claims or claims against the state.

IDENTIFICATION OF POTENTIAL SITES (page 16, page EIS-9)

We question the criteria used for choosing feasible areas for the boat launching ramp. Because C. Brewer has long range plans for a resort/subdivision, construction of a harbor for commercial fishing was deemed infeasible. However, in choosing potential sites, objective criteria should be used and not based on the selection of proposed long range development plan of C. Brewer. If such criteria is used, then Kaulana Bay may not be an acceptable site because the Hawaiian Home Lands Commission may have future plans for this site. Thus, we recommend that the statement be deleted from the document.

KAULANA BAY (page 17)

We question the reference to Hawaiian Home lands that states, "Land availability is unlimited ..." It seems to be assumed in the document that Hawaiian Home lands are treated as public lands which is not the case. Given current public sentiment of Hawaiian Home lands, the cited statement should be qualified. Furthermore, we recommend that close coordination with the Department of Hawaiian Home Lands be established for use of their lands prior to any further action.

On page 18, the person in the Department of Hawaiian Home Lands which forsees no problem in using Hawaiian Home lands should be identified.

JUSTIFICATION OF THE PROJECT

The document does not indicate the need for the project by documenting and projecting the number of launchings which would necessitate such proposed improvements. According to the Statewide Boat Launching Facilities Master Plan, heavy surge is not a major problem for boaters using the site. The study states on pages VI-29 and VI-30,

> The ramp is also subject to heavy surge, but this is not a major problem for boaters currently using the site. Periodic dredging or clearing of the toe area would provide temporary relief. However, the area can be expected to shoal again during storm periods. The ideal solution appears to be to relocate the ramp to the Kona side of the cove and construct a small stub breakwater to reduce

both shoaling and wave action. However, use of the site is not considered extensive enough to justify such an expense. (Emphasis added)

Thus, the justification for proposing a project that presently has 80 boats with only 17 percent full-time commercial fishing boats and proposes to expend funds ranging from $2.64 million to $1.07 million should be given. Moreover, without data to support the heavy use of Kaulana ramp, we question the need for the proposed project.

ENVIRONMENTAL IMPACT STATEMENT

ALTERNATE ACTION (page EIS-5)

Although the EIS states Plan 2 is the least environmentally damaging alternate plan, the alternative of "no action" is the least environmentally damaging plan.

DOCUMENTATION (page EIS-7)

The EIS should document the launch and recovery operations which are possible about 60 percent of the time. Reference should be given to substantiate the claim including whether the Corps has conducted a study on this matter.

TERRESTRIAL FAUNA (page EIS-12)

Another species to be include in the document under this subject are goats which have been observed in this area by this Office.

LOCAL GOVERNMENT FINANCE (page EIS-16)

The EIS indicates that local government finances are as follows:

Plan 1	$637,000
Plan 2	$ 93,000
Plan 3	$ 93,000

However, on page 30 of the DPR, Table 5 indicates that local government finances are as follows:

Plan 1	$644,000
Plan 2	$101,000
Plan 3	$101,000

A discussion is recommended to clarify the discrepancy.

SHORESIDE FACILITIES

The EIS indicates that shoreside facilities will be added to the area. A description of the facilities and its impacts should be included in the EIS to fully analyze its impact on the environment.

JOINT ENVIRONMENTAL IMPACT STATEMENT

The proposed action involves both state funds and lands which initiates the state EIS law, Chapter 343, Hawaii Revised Statutes. According to the state EIS law and the National Environmental Policy Act of 1969, a joint environmental impact statement should have been prepared to reduce duplication, time, effort, and cost. With the federal EIS process initiated, the state portion will require a duplication of effort. Thus, a discussion on why a joint EIS was not prepared is warranted.

We thank you for the opportunity to review the subject EIS. We trust that these comments will be helpful to you in preparing the final EIS. We would like to request twenty-two copies of the final EIS for our distribution and files.

If you should have any questions regarding this matter, please do not hesitate to contact us.

Sincerely,

Melvin Kotsuma
Deputy Director

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

PODED-PJ

5 August 1981

Mr. Melvin Koizumi, Deputy Director
Office of Environmental Quality Control
State of Hawaii
550 Halekauwila Street, Room 301
Honolulu, HI 96813

Dear Mr. Koizumi:

In reference to your letter dated 24 July 1981 concerning the Draft Detailed Project Report (DPR) and Environmental Statement for the Kaulana Bay Navigation Improvement Study, the following are furnished in response to your comments:

a. Page 5 and EIS-12. Sentence will be revised as suggested.

b. Page 6. Paragraph will be revised as suggested.

c. Page 7 and EIS-13. The figure for hotel units in the Kona area was obtained from the 1979 County of Hawaii Data Book. This figure does not include the South Kohala District. Reference will be cited and information on South Kohala will be presented in the final DPR.

d. Page 9. Based on interviews with Ka'u fishermen and input received from last year's public workshop, a figure of 20 percent was estimated.

e. Page 16 and EIS-9. The site selection for navigational improvements was based on an array of objective criteria and not solely on long-range development plans. Other criteria used in considering a potential site included access, archaeological and environmental considerations, and sea conditions. Based on an overall evaluation of the potential sites and public and agency input from the recent public meeting, it was determined that plan 3 at Kaulana Bay is an acceptable and feasible site for navigational improvements. During the formulation of alternative plans, a coordination meeting was held between representatives of the Department of Transportation (DOT), Hawaiian Home Lands (HHL), and the US Army Corps of Engineers to discuss any conflicts with future land use plans and problems with acquiring available lands for the project.

f. Page 17. Statement has been rephrased to read "Land is available adjacent to the bay..." The DOT, as local sponsor for this project, is working closely with HHL in resolving potential conflicts with the leasing of adjacent lands.

g. Page 18. Instead of identifying the person making this statement, the sentence was revised to read "The Department of Hawaiian Home Lands acknowledged that they foresee no major problems..."

h. Justification of the Project. A major need expressed by fishermen in the Ka'u District was for the construction of a protective breakwater structure. Based on discussions conducted with local fisherman, predominant tradewind conditions cause considerable difficulty during launching and recovery operations. The Corps of Engineers is proposing to construct a breakwater to protect the new launch ramp and to dredge an entrance channel and turning basin. These navigational improvements are designed to provide safe navigation and protection during all weather and sea conditions except severe storms. The relocations of the new ramp, as proposed in plans 2 and 3, would be constructed with State funds.

Based on data collected from a recent 1980 survey at Kaulana and interviews with local fishermen, average annual benefits amounting to $290,600 were obtained. With plan 3 being recommended, we have a benefit/cost ratio of 3.0 indicating an economically feasible project. A detailed benefit analysis is presented in Appendix F of the DPR.

i. Page EIS-5. The least environmentally damaging plan is referred to one of the alternate plans proposed under the "with project condition".

j. Page EIS-7. Based on interviews with Ka'u fishermen and input received from last year's public workshop, an estimate of 60 percent was obtained.

k. Page EIS-12. Paragraph will be revised as suggested.

l. Page EIS-16. The figures shown on Table 5 (page 30) were updated prior to final printing of this report. Figures displayed on Table 3 (page EIS-16) should reflect the same local government finances.

m. Shoreside Facilities. When a shoreside development plan is adopted by the DOT, a separate EIS will be submitted by the State to fully assess its impact on the environment.

n. Joint Environmental Impact Statement. Since the budgeting and scheduling requirements of the State DOT (local sponsor) and Corps of Engineers do not coincide with each other, timely submission of a joint EIS was not possible for this project.

Thank you for your comments on the Draft Detailed Project Report and Environmental Statement. Your interest and concerns on this study are appreciated. Copies of the final EIS will be sent to you upon final printing of the report.

Sincerely,

CLARENCE S. FUJII
Acting Chief, Engineering Division

DEPARTMENT OF THE AIR FORCE
HEADQUARTERS 15TH AIR BASE WING (PACAF)
HICKAM AIR FORCE BASE, HAWAII 96853

REPLY TO ATTN OF: DEEV (Mr Shiroma, 449-1831)

27 JUL 1981

SUBJECT: Draft EIS, Kaulana Bay Navigation Improvements, South Point

TO: Office of Environmental Quality Control
550 Halekauwila Street, Room 301
Honolulu, HI 96813

1. This office has reviewed the subject EIS and has no comment to render relative to the proposed project.

2. We greatly appreciate your cooperative efforts in keeping the Air Force apprised of your project and thank you for the opportunity to review the document.

WILLIAM T. MORIOKA
Chief, Engrg & Envmtl Plng Div
Directorate of Civil Engineering

B-32

DEPARTMENT OF THE ARMY
HEADQUARTERS UNITED STATES ARMY SUPPORT COMMAND, HAWAII
FORT SHAFTER, HAWAII 96858

REPLY TO ATTENTION OF:

APZV-EHE-E

27 JUL 1981

Office of Environmental Quality Control
550 Halekauwila Street, Room 301
Honolulu, Hawaii 96813

Gentlemen:

The Draft Detailed Project Report and Environmental Statement for the Kaulana Bay Navigation Improvements, South Point, Island of Hawaii has been reviewed and we have no comments to offer. There are no Army installations or activities in the vicinity of the proposed project.

Sincerely,

RAY H. JYO
Acting Director of Engineering and Housing

DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT
HONOLULU AREA OFFICE
300 ALA MOANA BLVD., RM. 3318, P.O. BOX 50007
HONOLULU, HAWAII 96850

AUG 3 1981

REGION IX

July 31, 1981

IN REPLY REFER TO:
9.ISS (Johnson/
546-5554)

Mr. Kisuk Cheung
Chief, Engineering Division
Department of the Army
U.S. Army Engineer District, Honolulu
Fort Shafter, Hawaii 96858

Dear Mr. Cheung:

Subject: Draft Detailed Project Report and Environmental Impact Statement for the Kaulana Bay Navigation Improvements Study

Our office has reviewed the Draft EIS for the proposed improvements at Kaulana Bay that includes alternative sites for light-draft navigational improvements at the southern end of Hawaii. The proposed action will not impact any HUD programs or projects in the area.

We appreciate the opportunity to comment and look forward to receiving a copy of the Final EIS.

Sincerely,

Frank Johnson

Frank Johnson
Environmental Clearance Officer

GEORGE R. ARIYOSHI
GOVERNOR

JOHN FARIAS, JR.
CHAIRMAN, BOARD OF AGRICULTURE

AUG 11 1981

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

July 31, 1981

MEMORANDUM

To: Mr. Kisuk Cheung, Chief
Engineering Division
Department of the Army

Subject: Draft Detailed Project Report and Environmental Statement for the Kaulana Bay Navigation Improvements Study

The Department of Agriculture has reviewed the subject environmental statement and offers the following comments.

The Kaulana Bay and Kaalualu Bay areas do have lands adjacent which are classified as "Other Important Agricultural Land" while the Honuapo Bay area has "Prime" land on the northern side. These classifications are according to the Agricultural Lands of Importance to the State of Hawaii.

However, we do not foresee any adverse impacts on the surrounding agricultural lands for the alternate sites considered.

Thank you for the opportunity to comment.

JOHN FARIAS, JR.
Chairman, Board of Agriculture

Advisory Council On Historic Preservation

This response does not constitute Council comment pursuant to Section 106 of the National Historic Preservation Act, nor Section 2(b) of Executive Order 11593.

AUG 3 1981

1522 K Street, NW
Washington, DC 20005

Reply to:

Lake Plaza South, Suite 616
44 Union Boulevard
Lakewood, CO 80228

July 31, 1981

Mr. Kisuk Cheung
Chief, Engineering Division
Corps of Engineers, Honolulu District
Department of the Army
Ft. Shafter, HI 96858

Dear Mr. Cheung:

This is in response to your request of June 23, 1981, for comments on the draft environmental statement (DES) for the proposed Kaulana Bay Navigation Improvements, Hawaii. We have reviewed the DES and note that two of the three proposed alternatives will have an adverse effect on South Point Complex, a property listed in the National Register of Historic Places which is also a National Historic Landmark.

Pursuant to Section 106 of the National Historic Preservation Act of 1966 (16 U.S.C. Sec. 470f, as amended, 90 Stat. 1320) Federal agencies must, prior to the approval of the expenditure of any Federal funds or prior to the granting of any license, permit, or other approval of an undertaking, afford the Council an opportunity to comment on the effect of the undertaking upon properties included in or eligible for inclusion in the National Register. In this instance, because a National Historic Landmark will be affected, if Plans 1 and 2 are chosen, consultation with the Hawaii State Historic Preservation Officer and the Council must be undertaken with full consideration of Section 110(f) of the 1980 Amendments to the National Historic Preservation Act before inception of the undertaking.

Until the requirements of Section 106 are met, the Council considers the DES incomplete in its treatment of historical, archeological, architectural, and cultural properties. To remedy this deficiency, the Council will provide, in accordance with its regulations, "Protection of Historic and Cultural Properties" (36 CFR Part 800), substantive comments on the effect of the undertaking on these properties.

We look forward to working with you as your planning proceeds. If you have questions or require assistance, please call Mrs. Jane King at (303) 234-4946, an FTS number.

Sincerely,

for Louis S. Wall
Chief, Western Division
of Project Review

For the Protection of Hawaii's Native Wildlife

HAWAII AUDUBON SOCIETY

P.O. BOX 22832
HONOLULU, HAWAII 96822

August 1, 1981

Colonel Alfred J. Theide
U.S. Army Engineer District, Honolulu
Building 230
Fort Shafter, Hawaii 96858

Dear Colonel Theide:

The Hawaii Audubon Society has only recently become aware of your proposed harbor construction at Kaulana Bay on the Big Island, and the distressing fact that non-governmental conservation organizations were not included on the mailing list of the project's "Public Involvement Program". We are very concerned about this lack of involvement and would appreciate being informed of the reasons for such an absence.

As you may be aware, the Hawaii Audubon Society is Hawaii's largest state-wide conservation organization. The basic goal of our Society is to enhance the protection and appreciation of native Hawaiian biota and the ecosystems upon which they depend. Our chapter is legally affiliated with the National Audubon Society.

Please include the Hawaii Audubon Society on your mailing list for all notices and environmental documents relating to Corps projects and permits in the Hawaiian and Pacific Islands.

We look forward to receiving your response to this inquiry.

Sincerely,

Barbara J. Johnsen
Corresponding Secretary
on behalf of the Board of Directors

B-35

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

PODED-PJ

19 August 1981

Ms. Barbara J. Johnsen
Corresponding Secretary
Hawaii Audubon Society
PO Box 22832
Honolulu, HI 96822

Dear Ms. Johnsen:

We are replying to your letter dated 1 August 1981 regarding the Kaulana Bay Navigation study. In response to your concerns on the US Army Corps of Engineers' public involvement program, we will include your organization on future mailing lists involving all Corps projects and permits in the Hawaiian and Pacific Islands.

To avoid any oversights regarding public participation by private organizations or individuals in the public involvement program, our Public Affairs Office normally sends press releases to the media prior to any public workshops or meetings. Press releases were published for last year's public workshop and the recently conducted public meeting at Naalehu on the island of Hawaii. A public notice on the 14 July 1981 public meeting was published in the West Hawaii Today and the Hawaii Tribune Herald on 10 July and 13 July, respectively. All interested individuals and/or organizations were afforded the opportunity to express their views or comments on the Kaulana Bay Navigation Improvements project. In addition, the Draft Environmental Impact Statement was filed with the US Environmental Protection Agency and a Notice of Availability for public review was published in the Federal Register.

A copy of the Final Detailed Project Report and Environmental Statement will be forwarded to your office concurrently with release to the US Environmental Protection Agency. We hope our response meets your organizational needs.

Sincerely,

KISUK CHEUNG
Chief, Engineering Division

AUG 5 1981

University of Hawaii at Manoa

Environmental Center
Crawford 317 • 2550 Campus Road
Honolulu, Hawaii 96822
Telephone (808) 948-7361

Office of the Director

August 4, 1981

RE:0333

Mr. Kisuk Cheung
Chief, Engineering Division
U.S. Army Corps of Engineers
Building 230
Fort Shafter, Hawaii 96858

Dear Mr. Cheung:

Draft Detailed Report and Environmental Statement
Kaulana Bay Navigational Improvements
South Point, Hawaii

The Environmental Center review of the above cited Draft EIS has been prepared with the assistance of Theodore Lee, Ocean Engineering; Harold Loomis, Joint Institute for Marine and Atmospheric Research; Ed Laws, Oceanography; Jacquelin Miller and Garret Kawamura of the Environmental Center.

B-356

Dredged Material

There are some discrepancies in the draft report which need to be corrected before the cost analysis on the three alternative plans can be properly evaluated. On pages 23 and C-23, the quantity of dredged material using Plan 3 is listed as 3,200 CY and 5,200 CY respectively. If the former figure is correct, then the cost of Plan 3 (reduced by $130,000) would be only 4 percent greater than the cost of Plan 2. Given the fact that 60 percent more material would be dredged using Plan 2, one might argue that Plan 3 is preferable to Plan 2 based on an overall economic-environmental analysis. In addition to the discrepancy of volumes sited for Plan 3, the actual calculations of the volumes of material to be dredged in Plans 2 and 3 do not seem to be correct as calculated from the entrance channel dimensions provided. The Final EIS should clarify the calculations.

Tsunami Damage

Have the costs of repairing structural damage due to tsunamis been considered in the economic analysis of this project? Large tsunamis would likely result in the shifting of the breakwater armor stones. This would include tsunamis generated from the south as well as locally-generated tsunamis. The frequency of such events might be every 20 years, approximately. Is it possible to derive these cost figures and incorporate them into the Average Annual Maintenance costs?

Disposal of Dredged Material

Have the costs of transporting dredged material to an authorized disposal site been considered in the analysis of the five potential site's for navigational improvements? Why aren't these costs included in the economic analysis which appears in Section III, of Appendix C? This oversight leads to inflated benefit-cost ratios. Based on the information in the Final EIS for Hawaii Dredged Material Disposal sites (September 1980), the only ocean disposal site for the island of Hawaii is located at 154° 55' E, 19° 46° N, about 8.3 km (4.5 mi.) off the coast near Hilo.

Health, Safety Improvements

Judging by the conclusions reached in Appendix D it appears that neither electrical power, telephone service, potable water or sanitary services will be provided at the new launch site. In light of the safety hazards identified on page D-4 and the sites isolation from public emergency services, the draft design plan should consider emergency telephone services on shore. There is no guarantee that a CB radio will be available in times of crisis. In what way would a buried telephone line induce further development in Kaulana Bay area (p. D-15)? It is the government's responsibility to take all necessary steps toward providing emergency services to those who utilize the boat-launching facility.

Perhaps our most serious concern is that the navigational improvements being proposed may invite and encourage boaters and fishermen who are relatively unfamiliar with Hawaii's south coast to fish this coastal area and, therefore, significantly increasing the possibility of accidents.

Recommended and Final Plan

The Environmental Center would appreciate a copy of the Selected Plan, Conclusions and Recommendations (final report) referred to on page 37.

Thank you very much for the opportunity to comment on the Draft EIS for the Kaulana Bay Navigational Improvements.

Sincerely,

Diane C. Drigot

Diane C. Drigot, Ph.D.
Acting Director

KK

cc: OEQC
Theodore Lee
Harold Loomis
Ed Laws
Jacquelin Miller
Garret Kawamura

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

POED-PJ

31 August 1981

Diane C. Drigot, Ph. D.
Acting Director
Environmental Center
University of Hawaii at Manoa
Crawford 317, 2550 Campus Road
Honolulu, HI 96822

Dear Dr. Drigot:

We are replying to your letter dated 4 August 1981 concerning the Draft Detailed Project Report (DPR) and Environmental Statement for the Kaulana Bay Navigation Improvements Study. The following information is furnished in response to your comments.

a. Dredged Material. The correct quantity of dredged material for Plan 3 should be 5,200 cubic yards. The figure on page 23 of the main report has been corrected. Although Plan 2 was designated as the National Economic Development (NED) plan, Plan 3 is being recommended based on public input and review comments, minimal impacts to the environment, and on the greater navigational safety afforded to small craft vessels within Kaulana Bay.

b. Tsunami Damage. The average annual maintenance cost for the breakwater is based upon one percent of the initial cost of the armor stone (see page C-24). This figure accounts for repairs necessitated by wave damage generated by severe storms which can reasonably be expected to occur throughout the life of the structure. We do not account for tsunami damage in either our design or our annual maintenance costs, no do we include these costs in the economic analysis due to the low frequency of occurrence and usually high cost of repair. Additionally, there are separate means available to obtain federal funds for repair work necessitated by a catastrophic tsunami.

c. Disposal of Dredged Material. The costs of handling and transporting dredged material to the disposal site is included in the unit cost for dredging. In the draft DPR (page 23) and Environmental Statement, the disposal site was assumed to be within five miles of the project. Since a disposal site has been tentatively designated recently by the State Department of Transportation near the proposed boat ramp location in Plan 3, the costs of transporting dredged material to the disposal site included in the unit cost for dredging is considered more than adequate. The proposed site will be located on approximately 6.4 acres of fastland.

d. Health, Safety Improvements. The State Department of Transportation is currently developing a shoreside facility plan for the Kaulana Bay area. Because utility services are not readily available in the area, portable sanitary facilities are planned. The use of an old abandoned water tank near the site is being investigated as a source for freshwater, however, electrical power and emergency telephone services are not being planned by the Department of Transportation. The inclusion of emergency services as a part of the shoreside facility plan has been discussed with the Department of Transportation. In response to your question on buried phone lines, we do not believe it will induce further development in the Kaulana area; however, the statement made on page D-15 refers to general utilities development such as potable water sewage, electricity and telephone service.

Navigation improvements being proposed at Kaulana Bay are expected to benefit fishermen of the Ka'u as well as other Big Island districts. Although an increase in usage of the ramp is anticipated, we feel because of the navigation improvements, boating-related accidents will decrease. The launch and recovery area, traditionally the area causing the most problems and accidents, will be dredged to a depth of 6.5 feet and protected by a 155-foot long breakwater.

Thank you for your comments on the Draft Detailed Project Report and Environmental Statement. Your interest and concerns on this study are appreciated. A copy of the final report will be forwarded to your office.

Sincerely,

KISUK CHEUNG
Chief, Engineering Division

COUNTY OF HAWAII

PLANNING DEPARTMENT

25 AUPUNI STREET • HILO, HAWAII 96720

HERBERT T. MATAYOSHI
Mayor

SIDNEY M. FUKE
Director

DUANE KANUHA
Deputy Director

AUG 1981

August 4, 1981

Mr. Kisuk Cheung, Chief
Engineering Division
Department of the Army
U. S. Army Engineer District, Honolulu
Ft. Shafter, Hawaii 96858

Attn: Tim Young

Dear Mr. Cheung:

Kaulana Bay Navigation Improvements
Draft Detailed Project Report and
Environmental Statement
South Point, Hawaii

Thank you for the opportunity to review and comment on the above cited document. These comments will also confirm the concerns and issues raised at your meeting with the various County Agencies and the Department of Hawaiian Homes Land on July 14, 1981.

In general, we have no objections to the proposed Navigation Improvements at Kaulana Bay.

However, the draft Detailed Project Report and Environmental Statement deals primarily with the off-shore impacts of the proposed improvements while the on-shore impacts, are not addressed in detail, if at all, by the report.

More specifically, the report does not address and or propose on-shore ancillary facilities such as toilets and shower building, parking and turn-around area for boat trailers and trucks, water source/infrastructure for boat washdowns, rubbish containers and periodic removal of same, and improvements to existing roads.

Without these support facilities, experience has shown that a general deterioration and unsightliness can be expected. As such, we feel that the need for ancillary facilities and improvements should be addressed as part of the Final Report.

Should you have any questions on the above, please feel free to contact William Moore or Virginia Goldstein of this department.

Sincerely,

SIDNEY FUKE
Planning Director

WLM:lgv

cc: Department of Public Works
Parks and Recreation

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

PODED-PJ

14 August 1981

Mr. Sidney M. Fuke, Director
Planning Department
County of Hawaii
25 Aupuni Street
Hilo, HI 96720

Dear Mr. Fuke:

We are replying to your letter dated 4 August 1981, regarding the Kaulana Bay Navigation Improvements Study. A coordination meeting was recently held on 6 August 1981 with the State of Hawaii Department of Transportation (DOT), Hawaiian Home Lands (HHL) and the Corps of Engineers. Specific items discussed included the status of the project, dredged disposal site, and development of a shoreside facility plan. At the present time, the DOT has no shoreside development plan for the Kaulana Bay area, however, HHL has requested that such a plan be completed prior to any formal agreement concerning leasing of required back-up areas. The DOT has initiated development of a plan for on-shore ancillary facilities. Information on these facilities as well as other major improvements and on-shore impacts as developed by DOT will be provided in the Final Detailed Project Report and Environmental Statement. However, detailed information on location, type and design of shoreside facilities is beyond the scope of the Federal project and report requirements.

Thank you for your comments on the Draft Detailed Project Report and Environmental Statement. Your interest and concern on this study is appreciated.

Sincerely,

KISUK CHEUNG
Chief, Engineering Division

U.S. DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
Southwest Region
Western Pacific Program Office
P. O. Box 3830
Honolulu, Hawaii 96812

August 5, 1981 F/SWR1:JJN

Colonel Alfred J. Thiede
U. S. Army Engineer District,
Honolulu
Building 230
Fort Shafter, Hawaii 96858

Dear Colonel Thiede:

The National Marine Fisheries Service (NMFS) has received and reviewed the draft environmental impact statement (DEIS) for Kaulana Bay Navigation Improvements, South Point, Island of Hawaii.

In order to provide as timely a response to your request for comments as possible, we are submitting this report to you directly in parallel with its transmittal to the Department of Commerce (DOC) for incorporation in the Departmental response. These comments represent the views of NMFS. The formal consolidated views of the Department should reach you shortly.

A two-week extension of the comment period was requested and granted via telephone on July 31, 1981. This was necessary in order to provide my staff the opportunity to conduct site inspections at Kaulana and the alternative project sites along the Ka'u District coastline. The DOC response should follow within two weeks of the new deadline.

B-40

General Comments

Site inspections of the potential harbor sites in Ka'u by NMFS biologists and our review of the combined DEIS and Draft Detailed Project Report (DPR), have prompted this agency to concur with the selection of Kaulana Bay as the site for the proposed project. The Kaulana site is the closest to the productive waters off South Point, as well as being immediately east of the protective cliffs of the point which offer an excellent lee during the predominate trade wind conditions. An adequate boat launch and recovery site is essential to develop the commercial fishing industry in the South Point area of the Island of Hawaii.

An underwater site survey of Kaulana Bay revealed that the bottom is primarily composed of coral rubble interspaced with sand patches. Several large live heads of Porites lobata coral are located on the west side of the bay. However, these corals could be relocated intact prior to construction. As indicated in the DEIS, other marine biota at Kaulana is similar to that found along the entire windward Ka'u District coastline. A large school of weke a'a (Mulloidichthys flavolineatus) and a smaller school of baitfish, the iao (Pranesus insularum), were sighted within the bay in the immediate vicinity of the existing boat ramp.

NMFS did not receive a request from the Corps of Engineers for endangered species coordination in the Kaulana Bay area, as was conducted between the Corps and the U.S. Fish and Wildlife Service. Consequently, the DEIS is deficient in its discussion of threatened and endangered species under NMFS jurisdiction.

The statement is made in the subject document that "there are no endangered species or species eligible for listing in the Kaulana Bay area." During a site inspection, NMFS biologist sighted three juvenile green turtles, Chelonia mydas, feeding on a red algae (probably Pterocladia capillacea) growing on a shallow shelf on the east side of Kaulana Bay well within the project area. The importance of the Ka'u coastline as a green turtle foraging area is documented in Synopsis of Biological Data on the Green Turtle in the Hawaiian Islands, George H. Balazs, Hawaii Institute of Marine Biology, September 1979.

The endangered humpback whale, Megaptera novaeangliae, is consistently sighted over the small bank extending off South Point, Hawaii. During four consecutive humpback whale census cruises conducted by NMFS every February from 1976 through 1979 whales were found concentrated on the South Point Bank (1976 = 7, 1977 = 3, 1978 = 12, 1979 = 6). Although the bank (water less than 100 fathoms) extends off the point and to the east as far as Kaalualu Bay, the whales appear to concentrate in those waters nearest the point itself. The consistent small concentration of whales at South Point is particularly interesting in comparison with the lack of sightings on the Kona side, between Kailua-Kona and South Point, and on the Hilo side, between Hilo Bay and South Point. Whether the South Point group of whales is a resident group throughout the humpback season has yet to be determined.

In light of the above, we recommend you initiate formal consultation with NMFS under Section 7 of the Endangered Species Act of 1973, at your earliest convenience. We do not at this time anticipate any delays in the project due to the Section 7 consultation process.

The combined DEIS and DPR should expand the discussion on projected increase of vessel usage and traffic from the improved Kaulana facility once the proposed project has been completed. Discussions with commercial fishermen in both Hilo and Kona indicate that usage at the Kaulana facility would not be restricted to only Ka'u District fishermen. With improved facilities more fishermen from other Big Island districts would launch at Kaulana, particularly when large yellowfin tuna move into the South Point grounds and/or when seasonal demands for bottomfish occur.

As stated earlier, NMFS concurs with the selection of Kaulana Bay as the site for the proposed project. Of the three plans proposed for Kaulana Bay we recommend the implementation of either Plan 2 or 3.

Sincerely yours,

Doyle E. Gates
Administrator

cc: F/SWR3
Office of Habitat Protection, F/HP
(4 copies)

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

PODED-PJ

19 August 1981

Mr. Doyle E. Gates, Administrator
National Marine Fisheries Service
US Department of Commerce
PO Box 3830
Honolulu, HI 96812

Dear Mr. Gates:

We are replying to your letter dated 5 August 1981 concerning the Kaulana Bay Navigation Improvements study. The US Army Corps of Engineers concurs in your assessment of the need to the formal consultation process under Section 7 of the 1973 Endangered Species Act. We have initiated the formal consultation process and have recently completed a biological assessment on the effects of the proposed project on the endangered humpback whale and threatened green turtle. We have forwarded the documentation to your regional offices. A copy of the assessment is attached for your information (Incl 1).

According to local residents, the existing ramp at Kaulana Bay is already heavily used by commercial fishermen from all parts of the Big Island especially Hilo, Kona, and the Ka'u areas. The existing traffic pattern and usage is expected to continue after completion of the proposed navigation improvements.

Sincerely,

1 Incl
As stated

KISUK CHEUNG
Chief, Engineering Division

B-41

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

PODED-PV

13 August 1981

Mr. Gerald V. Howard
Regional Director, SW Region
National Marine Fisheries Service, NOAA
300 South Ferry Street
Terminal Island, California 96731

Dear Mr. Howard:

This letter forwards the US Army Corps of Engineers Biological Assessment on the effects of the proposed Kaulana Bay Navigation Improvements project on the endangered humpback whale and threatened green turtle. The assessment fulfills the requirements of Section 7(c) of the Endangered Species Act of 1973, as amended in 1978. Based on our biological assessment (Incl 1) we find that the proposed navigation improvement project at Kaulana Bay, Hawaii will neither jeopardize the continued existence of the humpback whale or green turtle nor result in the destruction or adverse modification of their respective habitat.

We request that your office provide us a response to the biological assessment by 1 September in order that we may meet our schedule for completion of the study.

If you have any questions, please contact Mr. Robert Moncrief, Environmental Resources Section at (808) 438-2264.

Sincerely,

1 Incl
Biological Assessment

KISUK CHEUNG
Chief, Engineering Division

CF: w/incl
Mr. R. Kahler Martinson
Regional Director
Fish and Wildlife Service
US Department of the Interior
Lloyd 500 Building, Suite 1692
500 NE Multnomah Street
Portland, Oregon 96232

Endangered Species Biological Assessment for Kaulana Bay Navigation Improvements

1. Background Information

a. Project Description

The recommended navigation improvement plan at Kaulana Bay, Hawaii, consists of dredging a 135-foot-long, 80-foot to 60-foot-wide tapered, and 8.5-foot-deep entrance channel; a 200-foot-long by 100-foot-wide, and 6.5-foot-deep turning basin, and constructing a 155-foot-long main breakwater with a +11.5-foot crest elevation. The breakwater would provide protection for a new single-lane launch ramp. The breakwater will require approximately 3,000 tons of quarried rock covering 0.12 acres. The dredging of the entrance channel and turning basin will affect 0.88 acres generating about 5,200 cy of basalt material. When completed, the navigation improvement would inclose a total water area of about 1 acre.

b. Endangered Species

National Marine Fisheries Service personnel have recently reported the presence of two listed threatened or endangered species in the vicinity of the proposed project. During a site inspection three juvenile green turtles, Chelonia mydas, were observed feeding on algae on a shallow bench along the east-side of Kaulana Bay. The Ka'u coastline which includes Kaulana Bay, has been documented as an important green turtle foraging area in Synopsis of Biological Data on the Green Turtle in the Hawaiian Islands, George H. Balazs, Hawaii Institute of Marine Biology, September 1979.

The endangered humpback whale, Megaptera novaeangliae, is consistently sighted over the small bank extending off South Point, Hawaii. During four consecutive humpback whale census cruises conducted by NMFS every February from 1976 through 1979 whales were found concentrated on the South Point Bank (1976 = 7, 1977 = 3, 1978 = 12, 1979 = 6). Although the bank (water less than 100 fathoms) extends off the point and to the east as far as Kaalualu Bay, the whales appear to concentrate in those waters nearest the point itself.

2. Impact Assessment

Dredging of the entrance channel to a depth of -8.5 feet MLLW would remove approximately 300-500 square feet of shallow shelf that serves as substrate for bentnic algae upon which green turtles forage. However, the breakwater structure would contribute approximately 200 square feet of hard substrate suitable for colonization by similar benthic algae. The net loss of potential green turtle foraging area resulting from project implementation would be approximately 100-300 square feet. The entire Ka'u coastline (approximately 45 miles long) has been identified as an important green turtle foraging area. The removal of 100-300 square feet of feeding habitat within this extensive feeding area would have minimal impact on the green turtle population residing along the Ka'u coast.

Construction of the proposed harbor improvements would require blasting of the turning basin and part of the entrance channel. To avoid potential adverse effects resulting from noise generated by underwater blasting, all blasting activity would be prohibited during the months of December-May when humpback whales are present in Hawaiian waters.

Kaulana Bay is presently used heavily by Big Island commercial fishermen as a boat launch and recovery facility. When yellowfin tuna are abundant in the grounds off South Point, fishermen from as far as Kailua, Kona and Hilo launch and recover at Kaulana. This pattern is expected to continue after completion of the proposed harbor improvements. No significant increase in the number of boats using Kaulana as a result of project implementation is anticipated. However, a gradual increase in boats fishing the South Point grounds is expected, as the Hawaii yellowfin tuna fishery continues to expand. Recent observations by cetacean biologists indicate that fishing vessels in Hawaii do not adversely effect humpback whales. It is, therefore, highly unlikely that proposed navigation improvements at Kaulana Bay would have an adverse impact on the small group of humpback whales that concentrate in the vicinity of the 100F banks off of South Point in the winter months.

3. Conclusions

a. The Kaulana Bay Navigation Improvements project will not jeopardize the continued existence of endangered humpback whale or threatened green turtle.

b. The project will not result in the destruction or adverse modification of critical habitat of the humpback whale or green turtle.

AUG 7 1981

University of Hawaii at Manoa

A Sea Grant College
Spalding Hall 252 B • 2540 Maile Way
Telephone (808) 948-8191 • Honolulu, Hawaii 96822 / Cable Address: UNIHAW

Marine Advisory Program
2349 Kalanianaole Avenue
Hilo, Hawaii 96720
(808) 935-3830

August 6, 1981

Mr. Kisuk Cheung, Engineering Division Chief
US Army Corps of Engineers
Building 230, Fort Shafter
Honolulu, HI 96858

Dear Mr. Cheung:

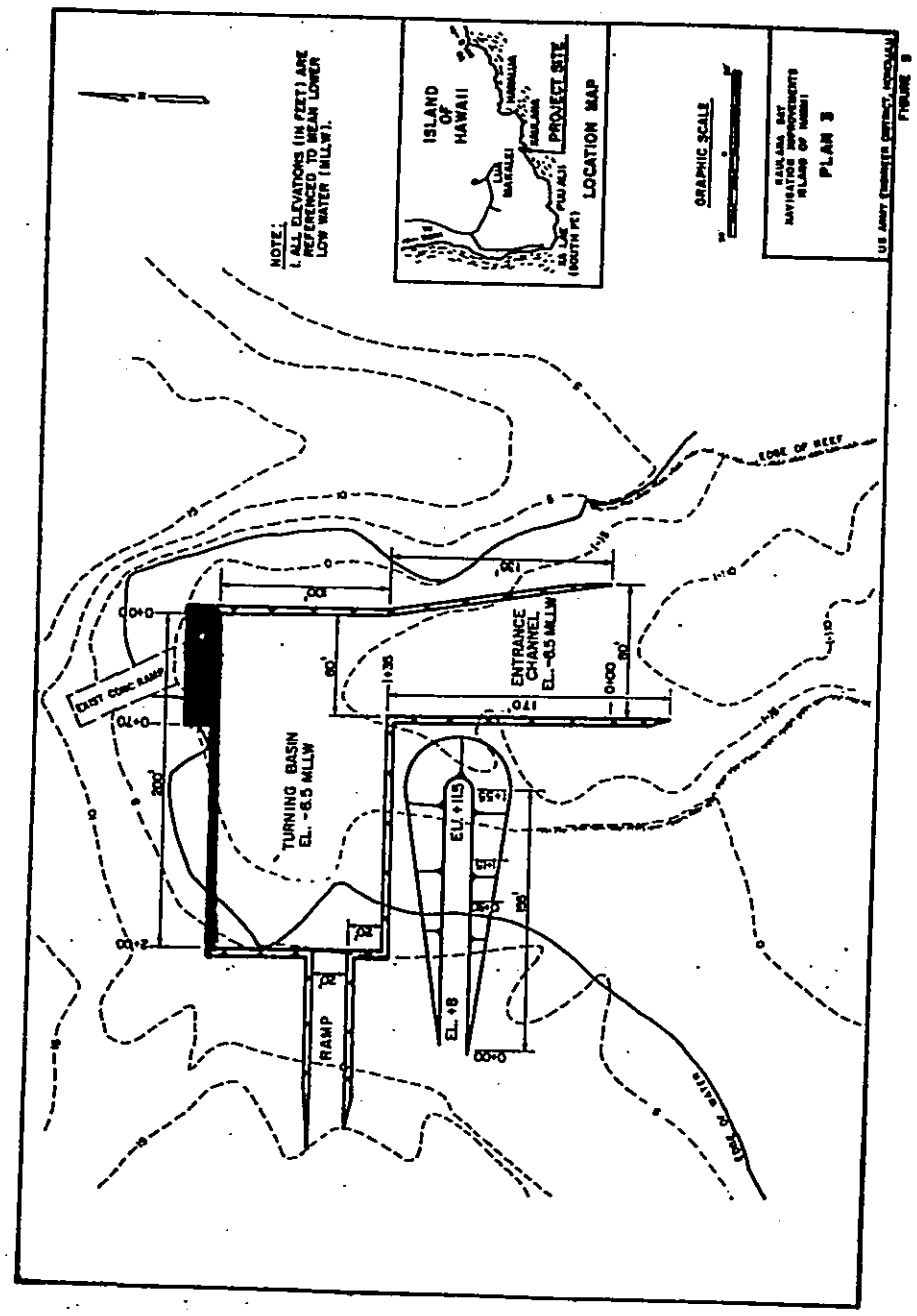
The East Hawaii Sea Grant Marine Advisory Council has reviewed the Draft Detailed Project Report and Environmental Statement for the Kaulana Bay Navigation Improvements study. We are in favor of alternative #3, however, we would like to suggest the placement of an energy adsorption structure along the interior shoreline, especially in the vicinity of the existing boat ramp. We feel this structure will minimize interior wave action within the protected confines of the proposed groin. We assume that the existing ramp will not be used. See attached figure for details.

We realize that our comments will not be received by the suggested deadline. However, we hope that our concerns will be addressed in the final document.

Thank you for your consideration.

Sincerely yours,

Michael C. Tulang
Chairman, Marine Advisory Council



AN EQUAL OPPORTUNITY EMPLOYER

B-43

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

PODED-PJ

17 August 1981

Mr. Michael C. Tulang, Chairman
Marine Advisory Council
2349 Kalanianaole Avenue
Hilo, HI 96720

Dear Mr. Tulang:

We are replying to your letter dated 6 August 1981 concerning the Kaulana Bay Navigation Improvements Study. A wave absorption structure, as suggested by the Marine Advisory Council, would minimize wave action within the turning basin. However, the additional cost that is required is not considered to be cost effective. The recommended plan (plan 3), as presented in the draft Detailed Project report, was designed to provide adequate protection and safety for small craft vessels during all but severe storm conditions. Although the existing ramp will be exposed to incoming waves, it would still be usable during normal weather conditions.

Thank you for your comments on the draft Detailed Project Report and Environmental Statement. Your interest and concern on the study is appreciated.

Sincerely,

KISUK CHEUNG
Chief, Engineering Division

AUG 1 1981

BIG ISLAND RESOURCE CONSERVATION AND DEVELOPMENT

WA KA MANA'O

August 6, 1981

Mr. Kisuk Cheung
Chief, Engineering Division
Department of the Army
U. S. Army Engineer District, Honolulu
Ft. Shafter, HI 96850

Dear Mr. Kisuk Cheung:

We have completed review of the Draft Detailed Project Report and Environmental Statement for Kaulana Bay. I presented testimony at the Naalehu meeting on July 14, 1981; however, I wanted to insure that our concerns were properly addressed.

1. We feel that the community is justified with its selection of Alternative Plan #3.

2. We are very concerned with the engineering specifications relating to the protection of rich cultural resources on the eastern side of Kaulana Bay. At the Naalehu meeting, we suggested a physical barrier, ie. portable fence.

3. The disposal area for the dredged material should also be specified, so as to preclude dumping on known cultural resources.

Overall, we thought that the project report and enviornmental statement was an excellent effort and was indicative of the Corps of Engineers' high quality production. Thank you for the opportunity to participate in the process.

Sincerely yours,

Violet Hansen

(Mrs.) Violet Hansen
Chairman
Historic Sites Committee

cc: Michael Tulang, RC&D Area Coordinator

B-45

P.O. BOX 915, HILO, HAWAII 96720 Phone (808) 935-1712

HAWAII

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

POED-PJ

25 August 1981

Ms. Violet Hansen, Chairman
Historic Sites Committee
Big Island Resource Conservation
and Development
PO Box 915
Hilo, HI 96720

Dear Ms. Hansen:

We are replying to your letter dated 6 August 1981 concerning the Draft Detailed Project Report and Environmental Statement for the Kaulana Bay Navigation Improvements Study. The following information is furnished in response to your comments:

a. Comment #1. We are recommending Plan 3 to our higher authority for implementation.

b. Comment #2. Prior to construction, plans and specifications will detail methods for preservation of any remains or artifacts identified during project planning or discovered during construction activities. To protect existing sites on the east side of Kaulana Bay, a physical barrier will be considered during pre-construction planning.

c. Comment #3. A four-acre site, located adjacent to the new launch ramp proposed in Plan 3 has been designated by the Department of Transportation as a potential disposal area. Prior to any disposal work, an investigation will be conducted for possible cultural resources within this area.

Thank you for your comments on the Draft Detailed Project Report and Environmental Statement. Your interest and concerns on this study are appreciated.

Sincerely,

CLARENCE S. FUJII
Acting Chief, Engineering Division

AUG 1 1981

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION IX
215 Fremont Street
San Francisco, Ca. 94105

Project #D-COE-K32029-HI

7 AUG 1981

Kisuk Cheung, Chief
Engineering Division
U.S. Army Engineer District, Honolulu
Ft. Shafter, HI 96858

Dear Mr. Cheung:

The Environmental Protection Agency (EPA) has received and reviewed the Draft Environmental Impact Statement (DEIS) titled KAULANA BAY NAVIGATION IMPROVEMENTS, SOUTH POINT, ISLAND OF HAWAII.

The EPA's comments on the DEIS have been classified as Category LO-1. Definitions of the categories are provided by the enclosure. The classification and the date of the EPA's comments will be published in the Federal Register in accordance with our responsibility to inform the public of our views on proposed Federal Actions under Section 309 of the Clean Air Act. Our procedure is to categorize our comments on both the environmental consequences of the proposed action and the adequacy of the environmental statement.

The EPA appreciates the opportunity to comment on this DEIS and requests five copies of the Final Environmental Impact Statement when available.

If you have any questions regarding our comments, please contact Susan Sakaki, EIS Review Coordinator, at (415) 556-7858.

Sincerely yours,

for Jake Mackenzie, Director
Surveillance and Analysis Division

Enclosure

B-46

EIS CATEGORY CODES

Environmental Impact of the Action

LO—Lack of Objections

EPA has no objection to the proposed action as described in the draft impact statement; or suggests only minor changes in the proposed action.

ER—Environmental Reservations

EPA has reservations concerning the environmental effects of certain aspects of the proposed action. EPA believes that further study of suggested alternatives or modifications is required and has asked the originating Federal agency to reassess these aspects.

EO—Environmentally Unsatisfactory

EPA believes that the proposed action is unsatisfactory because of its potentially harmful effect on the environment. Furthermore, the Agency believes that the potential safeguards which might be utilized may not adequately protect the environment from hazards arising from this action. The Agency recommends that alternatives to the action be analyzed further (including the possibility of no action at all).

Adequacy of the Impact Statement

Category 1—Adequate

The draft impact statement adequately sets forth the environmental impact of the proposed project or action as well as alternatives reasonably available to the project or action.

Category 2—Insufficient Information

EPA believes that the draft impact statement does not contain sufficient information to assess fully the environmental impact of the proposed project or action. However, from the information submitted, the Agency is able to make a preliminary determination of the impact on the environment. EPA has requested that the originator provide the information that was not included in the draft statement.

Category 3—Inadequate

EPA believes that the draft impact statement does not adequately assess the environmental impact of the proposed project or action, or that the statement inadequately analyzes reasonably available alternatives. The Agency has requested more information and analysis concerning the potential environmental hazards and has asked that substantial revision be made to the impact statement.

If a draft impact statement is assigned a Category 3, no rating will be made of the project or action, since a basis does not generally exist on which to make such a determination.

UNITED STATES
DEPARTMENT OF THE INTERIOR
OFFICE OF THE SECRETARY
PACIFIC SOUTHWEST REGION
BOX 36098 • 450 GOLDEN GATE AVENUE
SAN FRANCISCO, CALIFORNIA 94102
(415) 556-8200

ER 81/1264

August 7, 1981

cc: Director, OEPR w/copy incoming
Director, Fish and Wildlife Service
Director, National Park Service
Director, Geological Survey
Director, Bureau of Mines
Reg. Dr., FWS
Reg. Dr., NPS
Reg. Dr., GS
Reg. Dr., BM

Deputy Commander Alfred J. Thiede
District Engineer
Honolulu District, Corps of Engineers
Building 230
Fort Shafter, Hawaii 96858

Dear Deputy Commander Thiede:

The Department of the Interior has reviewed the draft Detailed Project Report and Draft Environmental Statement, Kaulana Bay Navigation Improvements, South Point, Island of Hawaii. The following comment is offered for your consideration.

B-47

The document does not address either spoil disposal sites or borrow sites for the breakwater construction. These aspects of the project must be defined in order to properly evaluate the environment impacts of the proposed project on the South Point National Historic (Landmark) District.

Once the project is fully defined, early consultation with the National Park Service, State Historic Preservation Officer, and the Advisory Council on Historic Preservation should be initiated to develop a viable avoidance or mitigation plan, per 33 CFR 305.9. Documentation of this consultation should be included in the final environmental impact statement.

Thank you for the opportunity to comment on this draft Detailed Project Report.

Sincerely,

Patricia Sanderson Port

Patricia Sanderson Port
Regional Environmental Officer

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

PODED-PJ

11 September 1981

Ms. Patricia Sanderson Port
Regional Environmental Officer
US Department of the Interior
450 Golden Gate Ave., Box 36098
San Francisco, CA 94102

Dear Ms. Port:

We are replying to your letter dated 7 August 1981, regarding the Kaulana Bay Navigation Improvements Study. Relative to your concerns on the spoil disposal, a 6.4-acre site has been selected and is located adjacent to and west of the project area. We will include a map of the spoil disposal site in the final report. The borrow site for breakwater construction would be the existing commercial quarry in Hilo, as noted on page C-21 of Appendix C.

Consultation with the National Park Service, State Historic Preservation Officer, and the Advisory Council on Historic Preservation has been completed. Recent communications received from the State Historic Preservation Officer and the Advisory Council on Historic Preservation concur with our archaeological reconnaissance survey that no adverse impacts on existing archaeological features are anticipated with implementation of Plan 3 (the selected plan).

Thank you for your comments on the Draft Detailed Project Report and Environmental Statement. Your interest and concerns on this study are appreciated.

Sincerely,

RICHARD M. CHUN
Acting Chief, Engineering Division

UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL OCEAN SURVEY
Rockville, Md. 20852

[illegible] 1981 OA/C52x6:JVZ

TO: PP/EC - Joyce M. Wood

FROM: OA/C5[illegible] - Robert B. Rollins

SUBJECT: DEIS #8107.24 - Kaulana Bay Navigation Improvements, South Point, Island of Hawaii

The subject statement has been reviewed within the areas of the National Ocean Survey's (NOS) responsibility and expertise, and in terms of the impact of the proposed action on NOS activities and projects.

The tide information on pages 6 and C6 are correct and referenced to the proper datum.

B-49

10TH ANNIVERSARY 1970-1980
National Oceanic and Atmospheric Administration
A young agency with a historic tradition of service to the Nation

GEORGE R. ARIYOSHI
GOVERNOR OF HAWAII

AUG 25 1981

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

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

August 18, 1981

Mr. Kisuk Cheung
Chief, Engineering Division
Dept. of the Army
U.S. Army Engineer District, Honolulu
Ft. Shafter, Hawaii 96858

Subject: Kaulana Bay Nagivation Improvements
Environmental Statement

Dear Mr. Cheung:

Thank you for the opportunity to review the subject document. We have no State Parks interests in this area.

Very truly yours,

ROY K. C. SUE
State Parks Administrator
Division of State Parks

GENERAL COUNSEL OF THE
UNITED STATES DEPARTMENT OF COMMERCE
Washington, D.C. 20230

AUG 2 5 1981

Colonel Alfred J. Thiede
U.S. Army Engineer District,
Honolulu
Building 230
Fort Shafter, Hawaii 96858

Dear Colonel Thiede:

This is in reference to the draft environmental impact statement entitled, "Kaulana Bay Navigation Improvements, South Point, Island of Hawaii." The enclosed comments from the National Oceanic and Atmospheric Administration are forwarded for your consideration. The comments from the National Marine Fisheries Service are the same as those transmitted directly to you from their Western Pacific Program Office.

Thank you for giving us an opportunity to provide these comments, which we hope will be of assistance to you. We would appreciate receiving four copies of the final environmental impact statement.

Sincerely,

Robert T. Miki
Director of Regulatory Policy

Enclosures Memo from: Doyle E. Gates
Administrator, Southwest Region
Western Pacific Program Office
National Marine Fisheries Service
National Oceanic and Atmospheric Administration

Robert B. Rollins
National Ocean Survey
National Oceanic and Atmospheric Administration

B-50

SEP 16

U.S. DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
Southwest Region
300 South Ferry Street
Terminal Island, California 90731

September 10, 1981 F/SWR1:ETN

Mr. Kisuk Cheung
Chief, Engineering Division
U. S. Army Corps of Engineers
Honolulu District
Building 230
Fort Shafter, Hawaii 96858

Dear Mr. Cheung:

We have reviewed the Biological Assessment for the Kaulana Bay Navigation Improvements project which was received on September 1, 1981.

The biological information regarding threatened and endangered species presented in the assessment is generally correct. However, in the conclusions, the correct evaluation by the Corps should have been that the proposed project "may affect" green turtles and humpback whales. A determination of "jeopardy" or "no jeopardy" will be made by the National Marine Fisheries Service (NMFS) after formal consultation under Section 7 of the Endangered Species Act. We therefore recommend that the Corps initiate formal consultation with NMFS for this project. The consultation request should be addressed to the Assistant Administrator for Fisheries, National Marine Fisheries Service, NOAA, Department of Commerce, Washington, D. C. 20235.

Should you or your staff have any questions or wish to provide any further information, please contact Mr. Eugene Nitta at our Western Pacific Program Office in Honolulu at 808-955-8831 or P. O. Box 3830, Honolulu, HI 96812. We do not anticipate any difficulties in conducting the consultation or preparation of the Biological Opinion and will make every effort to insure a timely conclusion for the consultation.

Sincerely yours,

for Alan W. Ford
Regional Director

cc: C. Karnella, F/MM
D. Gates, F/SWR1

SEP 1 1981

GEORGE R. ARIYOSHI
Governor

HIDETO KONO
Director

FRANK SKRIVANEK
Deputy Director

DEPARTMENT OF PLANNING
AND ECONOMIC DEVELOPMENT

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

September 18, 1981

Ref. No. 3653

Mr. Kisuk Cheung
Chief, Engineering Division
U.S. Army Engineer District, Honolulu
Building 230
Fort Shafter, Hawaii 96858

Dear Mr. Cheung:

Subject: Kaulana Bay Navigation Improvement Project

Thank you for your August 14, 1981, response to our coastal zone management comments on the subject project. Our previously expressed concerns have been adequately addressed in your response. Accordingly, we agree with your determination that the proposed project is consistent with Hawaii's Coastal Zone Management (CZM) Program to the maximum extent practicable.

Your cooperation in complying with the substantive and procedural requirements of the CZM Program is very much appreciated.

Sincerely,

Frank Skrivanek
for Hideto Kono

B-51

GEORGE R. ARIYOSHI
GOVERNOR

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION

RYOKICHI HIGASHIONNA, Ph.D
DIRECTOR

DEPUTY DIRECTORS
WAYNE J. YAMASAKI
JAMES R. CARRAS
JAMES B. McCORMACK
JONATHAN R. SHIMADA Ph.D.

IN REPLY REFER TO

HAR-EP 1029

September 22, 1981

Colonel Alfred J. Thiede
District Engineer
U. S. Army Engineer District, Honolulu
Building 230
Ft. Shafter, Hawaii 96858

Dear Colonel Thiede:

Kaulana Bay Navigational Improvements
South Point, Hawaii - Job. H. C. 6109

We understand the final report of the "Detailed Project Report and Environmental Statement, Kaulana Bay Navigational Improvements, South Point, Island of Hawaii" is nearing completion.

As you know, we are currently in the process of obtaining the necessary lands, easements, and rights-of-way from the Department of Hawaiian Home Lands (DHHL) to allow for the construction of the subject improvements. We do not expect to receive official reaction until possibly November, 1981, or beyond.

During the interim, we would like to provide the following required assurances subject to DHHL's favorable response to our requests:

A. Provide without cost to the United States all lands, easements, and rights-of-way required for the construction of the project.

B. Provide without cost to the United States an area suitable to the Chief of Engineers for the disposal of spoils and, if necessary, retaining dikes, bulkheads, and embankments or the cost of such work.

C. Provide and maintain without cost to the United States the necessary launch facility, as well as all appropriate onshore structures, access roadways, and parking areas to insure a complete and adequate project. These facilities must be open to all on equal terms.

D. Establish regulations prohibiting the discharge of pollutants into the waters of the channel and basin by users thereof, which regulations shall be in accordance with applicable laws or regulations of Federal and local authorities responsible for pollution prevention and control.

E. Hold and save the United States free from claims for damages due to the construction work and subsequent maintenance of the project, excluding damages due to fault or negligence of the United States or its contractor.

F. Assume all project costs (excluding cost for aids to navigation) in excess of the $2 million statutory Federal limitation under Section 107 of the River and Harbor Act of 1960, as amended. Formal assurances in accordance with Section 221 of the River and Harbor Act of 1970 will have to be executed prior to commencement of construction.

We will keep your office apprised of our progress with the DHHL.

Very truly yours,

Ryokichi Higashionna

Ryokichi Higashionna
Director of Transportation

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

PODED-PV

24 September 1981

Mr. Dale T. Coggeshall
Pacific Islands Administrator
Fish and Wildlife Service
US Department of the Interior
300 Ala Moana Blvd., PO Box 50167
Honolulu, HI 96850

Dear Mr. Coggeshall:

The Fish and Wildlife Coordination Act (FWCA) final report for Kaulana Bay Navigation Improvements project, submitted 4 September 1981, recommended that a detailed survey of the project area to be utilized by construction equipment, the dredged material disposal site and the quarry site be conducted prior to the start of construction to determine if two rare endemic plants are present. The quarry to be used for the project is located near Hilo, well outside the known range of the two rare plants. The dredged material deposition site, recently designated by the State Department of Transportation, is located adjacent to the western margin of the bay and extends west and slightly north of the bay on approximately six acres of Hawaiian Home Lands (see Incl 1). To insure that the two rare plants are not damaged by project implementation, a detailed survey of this area including the project staging and construction area was conducted on 30 August 1981 by Ms. Lani Stemmermann under contract to the US Army Corps of Engineers. No species of the two rare plants were found during the survey. We are including a report of survey findings for your information (Incl 2).

Sincerely,

2 Incl
As stated

KISUK CHEUNG
Chief, Engineering Division

B-53

SEP 29 1981

DEPARTMENT OF TRANSPORTATION
UNITED STATES COAST GUARD

COMMANDER (oan)
Fourteenth Coast Guard District
Prince Kalanianaole Federal Bld
300 Ala Moana Blvd.
Honolulu, Hawaii 96850
(808) 546 7130

16500
Serial 32157
SEP 28 1981

From: Commander, Fourteenth Coast Guard District
To: District Engineer, U. S. Army Engineer District Honolulu

Subj: Kaulana Bay Navigation Improvements

1. The Coast Guard intends to establish a set of lighted ranges to mark the channel centerline upon completion of the subject harbor.

2. Aids to navigation designs are currently under review. The positions of the ranges have not yet been determined. The estimated cost of establishing the ranges is $25,000.

3. Please provide us with the coordinates (latitude and longitude) of astronomical station "KALAE 2" used as the reference point for the Kaulana Bay survey by Park Engineering, Inc. in September 1980. This will enable us to determine positions for our aids.

J. W. DUENZL
By direction

V. MAILING LIST

STATE OF HAWAII

Honorable George R. Ariyoshi
Governor of Hawaii
Honolulu, HI 96813

Honorable Spark M. Matsunaga
United States Senate
362 Russell Senate Office Bldg
Washington, DC 20510

Honorable Spark Matsunaga
United States Senator
300 Ala Moana Blvd, Room 3104
Honolulu, HI 96850

Honorable Daniel K. Inouye
United States Senate
105 Russell Senate Office Bldg
Washington, DC 20510

Honorable Daniel K. Inouye
United States Senator
300 Ala Moana Blvd, Room 6104
Honolulu, HI 96850

Honorable Cec Heftel
House of Representatives
322 Cannon House Office Bldg
Washington, DC 20515

Honorable Cec Heftel
Representative in Congress
300 Ala Moana Blvd, Room 4104
Honolulu, HI 96850

Honorable Daniel K. Akaka
House of Representatives
415 Cannon House Office Bldg
Washington, DC 20515

Honorable Daniel K. Akaka
Representative in Congress
300 Ala Moana Blvd, Room 5104
Honolulu, HI 96850

Director
State Department of Transportation
869 Punchbowl St
Honolulu, HI 96813

Chief, Harbors Division
State Department of Transportation
79 S Nimitz Highway
Honolulu, HI 96813

Chief
Water Transportation Facilities Div
State Department of Transportation
79 S Nimitz Highway
Honolulu, HI 96813

Mr. Dan Tanaka
Harbors Division
79 S Nimitz Highway
Honolulu, HI 96813

Land Management Administrator
State Dept of Land & Natural Resources
P. O. Box 621
Honolulu, HI 96813

State Historic Preservation Officer
Department of Land & Natural Resources
1151 Punchbowl St
Honolulu HI 96813

Administrator, State Parks Outdoor
Recreation & Historic Sites Div
Department of Land & Natural Resources
1151 Punchbowl St
Honolulu, HI 96813

Director
State Dept of Planning & Economic Devel
250 S King St
Honolulu, HI 96813

Chairman
Land Use Commission
Pacific Trade Center, Suite 1795
Honolulu, HI 96813

STATE OF HAWAII (Contd)

Chairman
Board of Land & Natural Resources
P. O. Box 621
Honolulu, HI 96813

Program Planning Coordinator
State Planning Office
Dept of Land & Natural Resources
1151 Punchbowl St
Honolulu, HI 96813

Administrator
Division of Fish & Game
State Dept of Land & Nat Resources
1151 Punchbowl St
Honolulu, HI 96813

Chairman
Board of Agriculture
1428 S King Street
Honolulu, HI 96814

Marine Affairs Coordinator
Office of Marine Affairs
State of Hawaii
P. O. Box 2359
Honolulu, HI 96813

Director
State Ofc of Envrnmtl Quality Control
550 Halekauwila St
Honolulu, HI 96813

CZM Program Manager
State Dept of Planning & Economic Devel
P.O. Box 2359
Honolulu, HI 96804

Director
Environmental Center
University of Hawaii
10 Maile Way
Honolulu, HI 96822

Director
Department of Hawaiian Home Lands
550 Halekauwila Street
Honolulu, HI 96813

Hawaii State Library
ATTN: Documents Center
478 S King St
Honolulu, HI 96813

University of Hawaii Library
Serial Records
2550 The Mall
Honolulu, HI 96822

Director
Department of Health
State of Hawaii
1250 Punchbowl St
Honolulu, HI 96813

State Conservationist
SCS, US Dept of Agriculture
300 Ala Moana Blvd., Rm. 4316
Honolulu, HI 96850

Hawaii Institute of Marine Biology
P. O. Box 1346
Coconut Island, Kaneohe, HI 96744

FEDERAL

HQDA (DAEN-CWP-W)
WASH DC 20314

Department of Agriculture
Office of the Secretary
Coordinator, Environmental
Quality Activities
Washington, DC 20250

Staff Director
Council on Environmental Quality
722 Jackson Place, NW
Washington, DC 20006

Assistant Secretary, Program Policy
Ofc of Environmental Proj Review
U.S. Department of the Interior
Washington, DC 20240

Deputy Assistant Secretary
For Environmental Affairs
U.S. Department of Commerce
Washington, DC 20230

Regional Director, SW Region
National Marine Fisheries Svc, NOAA
300 S Ferry Street
Terminal Island, CA 97031

Office of Federal Activities, A-104
Environmental Protection Agency
ATTN: EIS Filing Section
Room 537 West Tower, Waterside Mall
401 M Street, SW
Washington, DC 20460

EIS Coordinator, Region IX
U.S. Environmental Protection Agency
215 Fremont Street
San Francisco, CA 94105

Director, Western Region
National Park Service
450 Golden Gate Ave, Box 36063
San Francisco, CA 94102

Manager, Pacific Islands Office
US Environmental Protection Agency
300 Ala Moana Blvd, Room 1302
Honolulu, HI 96850

Chief, Office of Archaeological &
Historic Preservation
National Park Service
US Department of the Interior
Washington, DC 20240

Chief, Interagency Archaeological Svc
National Park Service
450 Golden Gate Ave, Box 36065
San Francisco, CA 94102

Executive Director
Advisory Council on Historic Preservation
P. O. Box 25085
Denver, CO 80225

Regional Director
National Park Service
Box 36062, Room 1045, Fed Bldg
450 Golden Gate Ave
San Francisco, CA 94102

Executive Director
Advisory Council on Historic Preservation
1522 K Street, NW
Washington, DC 20005

Advisory Council on Historic Preservation
Lake Plaza South, Suite 616
44 Union Boulevard
Lakewood, CO 80228

Department of Transportation
Federal Highway Administration
450 Golden Gate Ave
San Francisco, CA 94102

FEDERAL (Contd)

Regional Director, Region IX
U.S. Fish & Wildlife Service
Lloyd 500 Bldg, Suite 1692
500 NE Multnomah Street
Portland, OR 97232

Administrator
Fish & Wildlife Service
U.S. Department of the Interior
300 Ala Moana Blvd, Room 5302
Honolulu, HI 96850

Field Supervisor, Ecological Svcs
Fish & Wildlife Service
U.S. Department of the Interior
300 Ala Moana Blvd, Room 5302
Honolulu, HI 96850

Administrator
Federal Highway Administration
P. O. Box 50206
Honolulu, HI 96850

District Chief
Water Resources Division
U.S. Geological Survey
300 Ala Moana Blvd, Room 6110
Honolulu, HI 96850

Director, Hawaii Office
National Park Service
U.S. Department of the Interior
300 Ala Moana Blvd, Room 6305
Honolulu, HI 96850

State Conservationist
Soil Conservation Service
U.S. Department of Agriculture
300 Ala Moana Blvd, Room 4316
Honolulu, HI 96850

Administrator, Southwest Region
National Marine Fisheries Svc
U.S. Department of Commerce
P. O. Box 3830
Honolulu, HI 96813

Director
National Weather Svc, Pacific Region
U.S. Department of Commerce
300 Ala Moana Blvd, Room 4110
Honolulu, HI 96850

District Conservationist
U.S. Department of Agriculture
Soil Conservation Service
P. O. Box 1361
Hilo, HI 96720

Pacific Regional Manager
NOAA, Office of Coastal Zone Management
U.S. Department of Commerce
3300 Whitehaven St, NW
Washington, DC 20235

Regional Administrator, Region IX
Dept of Housing & Urban Development
450 Golden Gate Ave, Box 36003
San Francisco, CA 94102

Commander
Naval Air Station
FPO San Francisco 96630

Commander
Fourteenth Coast Guard District
ATTN: Engr Div, Civil Branch
300 Ala Moana Blvd, 9th Floor
Honolulu, HI 96850

Commander
Fourteenth Coast Guard District
ATTN: Aids to Navigation
300 Ala Moana Blvd, 9th Floor
Honolulu, HI 96850

ISLAND OF HAWAII (COUNTY, STATE, & FEDERAL AGENCIES)

Honorable Herbert T. Matayoshi
Mayor of the County of Hawaii
Hilo, HI 96720

Director
Department of Parks & Recreation
County of Hawaii
25 Aupuni Street
Hilo, HI 96720

Director
Department of Planning
County of Hawaii
25 Aupuni Street
Hilo, HI 96720

Chief Engineer
Department of Public Works
County of Hawaii
25 Aupuni Street
Hilo, HI 96720

Mr. George Yokoyama
Hawaii County Economic Opportunity Council
34 Rainbow Drive
Hilo, HI 96720

Hawaii District Office
Harbors Division, State of Hawaii
Port of Hilo
Hilo, HI 96720

Hawaii District Land Agent
Land Management Division
DLNR, State of Hawaii
Hilo, HI 96720

District Administrator
Division of State Parks
DLNR, State of Hawaii
75 Aupuni Street
Hilo, HI 96720

District Administrator
Division of Water & Land Development
DLNR, State of Hawaii
75 Aupuni Street
Hilo, HI 96720

Chairman
Planning Commission
County of Hawaii
25 Aupuni Street
Hilo, HI 96720

Chairman
Hawaii County Council
25 Aupuni Street
Hilo, HI 96720

OTHER

Mr. Robert Makuakane, President
Ka'u Kamaaina Fishing Association
Pahala, HI 96777

Ms. Anna Cariaga
Pahala, HI 96777

Mr. Dennis O'Shea
Box 5263
Kona, HI 96740

Ms. Violet Hansen, Chairwoman
RC&D Recreation & Historic Sites Committee
P. O. Box 915
Hilo, HI 96720

U.S. Department of Agriculture
Soil Conservation Service
Big Islnd RC&D Area Office
P. O. Box 915
Hilo, Hawaii 96720.

Hawaii Audubon Society
ATTN: Barbara J. Johnsen
P. O. Box 22832
Honolulu, HI 96822

Mr. Richard Martyr
Vice President
National Audubon Society
Western Regional Office
555 Audubon Place
Sacramento, CA 95825

KAULANA BAY

NAVIGATION IMPROVEMENTS

SOUTH POINT, ISLAND OF HAWAII

ENGINEERING INVESTIGATIONS

AND

DESIGN ANALYSIS

APPENDIX C.

APPENDIX C

ENGINEERING INVESTIGATIONS AND DESIGN ANALYSIS

Table of Contents

APPENDIX C

SECTION I. DESIGN ANALYSIS SECTION

LIST OF TABLES

LIST OF FIGURES

I. DESIGN ANALYSIS

1. GENERAL

A navigation project design analysis requires the determination of the following elements:

a. DESIGN VESSEL.

(1) Dimensions.

(2) Maneuverability.

(3) Channel frequency of use.

b. WEATHER AND HYDRAULIC CONDITIONS.

(1) Wind.

(2) Waves.

(3) Tides.

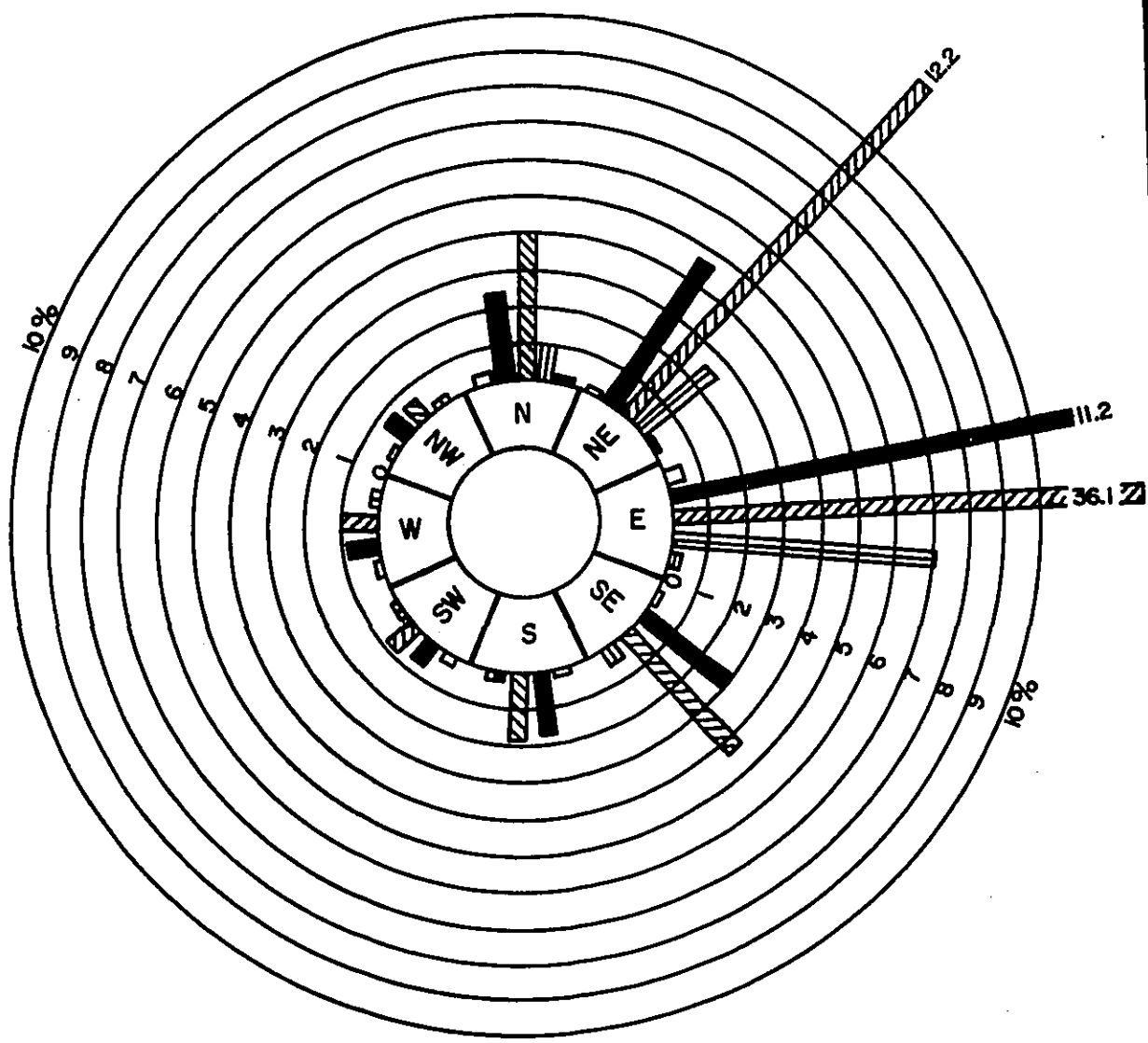
2. SITE LOCATION

Kaulana Bay is located on the southern coast of the Island of Hawaii, roughly 80 road miles southwest of Hilo Harbor at about 18° 55' north latitude and 155° 40' west longitude.

3. WIND CONDITIONS

a. PREDOMINANT WIND. No wind data are available for the immediate vicinity of Kaulana Bay. For this design analysis, it is assumed extrapolated statistical data on offshore winds contained in the U.S. Naval Weather Surface Command publication, "Summary of Synoptic Meteorological Observation," June 1971, is applicable to the site. The wind information is for the position 20.9° north latitude and 156.0° west longitude. Local variations due to land mass effects and temperature variations are expected. An offshore wind diagram shown on Figure C-1 indicates wind direction, speed, and frequency.

b. TROPICAL STORMS AND HURRICANES. Although extremely rare in the Hawaiian Islands, intense tropical storms and hurricanes have and do, from time-to-time, directly affect the islands. Tropical storms are defined as having sustained wind speeds between 34 and 63 knots, while hurricanes are defined as storms with sustained wind speeds equal to or greater than 64 knots. Based on information from the U.S. Department of Commerce, National Oceanic and Atmospheric Administration (NOAA), National Weather Service, from 1950 to 1980, at least 14 tropical storms or hurricanes have intruded within 500 miles of the State. So far, most of the threatening storms have weakened before reaching the islands and their effects have been minor in most cases. Hurricane effects in Hawaiian waters generally occur during the summer months.



TOTAL % OF THE YEAR
10 %

PERIOD OF RECORD
1963 TO 1970

STATION LOCATION
209 NORTH LATITUDE
156 WEST LONGITUDE

SOURCE
U.S. NAVAL WEATHER SERVICE COMMAND

LEGEND:

- 1-3 KTS
- 4-10 KTS
- 11-21 KTS
- 22-33 KTS
- 34-37 KTS

KAULANA BAY
NAVIGATION IMPROVEMENTS
ISLAND OF HAWAII

OFFSHORE WIND DIAGRAM

US ARMY ENGINEER DISTRICT, HONOLULU

FIGURE C-1

4. WAVE CONDITIONS

a. WAVE CLIMATE. Kaulana Bay faces south and generally is subject to a wave spectrum from the east clockwise to the southwest. Three primary wave types affect the area: (1) the local wind waves, (2) the southern swell generated in the Southern Hemisphere, and (3) the "kona" storm waves.

(1) LOCAL WIND WAVES. No wave gage stations are located in the area. Deepwater wave statistics for the study are contained in the "Summary of Synoptic Meteorological Observations (SSMO), Hawaii and Selected North Pacific Island Coastal Marine Areas, Volume I, Area 1, Hawaiian Windward, prepared by the National Climatic Center for the U.S. Weather Service Command." This data is obtained through direct synoptic observation by shipboard personnel in the Island of Hawaii area and represent data recorded during the 8-year period from 1963 to 1970. These statistics represent average conditions during the period of record. The data also shows that the majority of waves affecting Hawaii are easterly tradewind-generated waves. The tables show that deepwater wind wave heights are generally 2 to 10 feet with periods of 6 to 12 seconds (Table C-1 and C-2).

TABLE C-1

ANNUAL PERCENT OF OCCURRENCE OF WAVE HEIGHTS VERSUS DIRECTION

Wave Ht (Feet)	E	SE	S	SW	TOTAL
1	1.4	0.4	0.4	0.2	2.4
1-2	10.0	2.1	1.2	0.5	13.8
3-4	19.1	3.2	1.3	0.4	24.0
5-6	13.9	1.5	0.7	0.3	16.4
7	6.2	0 6	0.1	0.1	7.0
8-9	3.0	0.1	0.1	0.1	3.3
10-11	0.9	0.1	-	-	1.0
12	0.4	0.1	-	-	0.5
13-16	0.2	-	-	-	0.2
17-19	0.1	-	-	-	0.1
TOTAL	55.2	8.1	3.8	1.6	68.7

TABLE C-2

PERCENT FREQUENCY OF WAVE HEIGHT VERSUS WAVE PERIOD

Period (Sec)	Wave Height (Feet) 1	1-2	3-4	5-6	7	8-9	10-11	12	13-16	TOTAL
6	1.0	8.7	17.9	9.4	3.3	1.3	0.3	0.1	0.1	42.1
6-7	-	1.3	6.9	10.8	6.0	2.6	1.1	0.6	0.2	29.5
8-9	-	0.3	1.6	3.8	4.5	2.3	1.1	0.5	0.4	14.5
10-11	0.0	0.1	0.4	0.9	1.5	1.1	0.7	0.4	0.4	5.5
12-13	0.0	-	0.1	0.3	0.4	0.4	0.3	0.2	0.1	1.8
13	0.0	-	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.6
Indet	2.5	0.8	0.8	0.7	0.3	0.2	0.1	-	-	5.4
TOTAL PERCENT	3.5	11.3	27.6	26.0	16.2	8.1	3.6	1.8	1.3	99.4

(2) SOUTHERN SWELL. Southern swell is generated during the Antarctic winter months by strong winds blowing over long fetches of the southern Pacific and Indian Oceans. After traveling over thousands of miles of open ocean, these waves arrive at the southern shores of the Hawaiian Islands as long period swell. Periods typically range between 14 and 22 seconds with heights generally 1 to 4 feet. In an average year, southern swell arrives at Kaulana Bay about 10 percent of the time; usually during the summer months from April to October.

(3) "KONA" STORM WAVES. "Kona" storm waves are generated by local storms and fronts which generally cause winds and waves from the south through the west. These storms are neither frequent nor consistent, however, they may generate large destructive waves which can directly affect Kaulana Bay. Commonly, periods range from 8 to 10 seconds, with heights of 10 to 15 feet. In any year, Kona storms may occur several times or not at all. They occur most often during the winter months.

(4) TROPICAL STORM WAVES. In addition to the primary wave types discussed above, there are others which are less frequent, but which are significant. One of these is the large swell generated by tropical storms in the equatorial regions and southern hemisphere. Wave heights may be 8 to 15 feet with periods of 10 to 15 seconds. These waves generally approach the Hawaiian Islands from the southeast through the southwest and are most likely to occur in August and September.

(5) HURRICANES. Another infrequent source of large destructive waves are hurricanes. The most recent hurricanes passed through the Hawaiian chain in August 1959, December 1975, and again in July 1978. Theoretical calculations indicate that a significant deepwater wave height of 27 feet can be expected for a typical 50-year hurricane having the following parameters: (a) central pressure reduction of 1 inch of mercury, (b) radius of maximum winds of 20 nautical miles, (c) forward speed of 12 knots.

b. REFRACTION ANALYSIS. Wave refraction studies were conducted to aid in locating zones of high-energy concentration in the vicinity of the mouth of the bay, and to determine the probable approach alignment of the primary wave types affecting the site. Wave refraction diagrams were drawn for deepwater waves approaching each site. These directions were selected after evaluating the storm exposure regime. The deepwater wave height from the SSMO data for the directions affecting the site was analytically transformed considering refraction and shoaling to shallow wave heights at the harbor entrance. Based on Table C-2, Percent Frequency of Wave Height Versus Wave Period, 8- and 10-second waves were considered for refraction purposes as being representative of the local wind-wave period. Wave period of 15 seconds were considered characteristic of deepwater swells contributed by tropical storms and hurricanes. Refraction analyses were evaluated for waves from the east clockwise to the southwest. These waves were refracted to enter the bay as shown in Figure C-2.

5. TSUNAMI

During the past 31 years, eight tsunami have affected the Island of Hawaii. Four of the eight caused major damage throughout the State. These occurred on 1 April 1946, 4 November 1952, 9 March 1957, and 23 May 1960. The most recent tsunami, which occurred on 29 November 1975, was unique because it was generated locally by a large-scale land subsidence which occurred during an earthquake centered off the southeast coast of the Island of Hawaii. The earthquake was the largest in over a century--magnitude 7.2 on the Richter Scale. The tsunami caused runups of about 25 feet along certain areas of the southeastern coast of Hawaii. Ground subsidence, which occurred simultaneously with the earthquake, fell 10 feet in some areas. A discussion on seismicity in Hawaii is found on page C-18.

6. WATER LEVEL

a. TIDES. The nearest tidal benchmark to Kaulana Bay is at Honuapo, approximately 15 miles northeast from Kaulana Bay. The tidal data shown were obtained from the U.S. Coast and Geodetic Survey and are referenced to mean lower low water (MLLW). All elevations in this appendix is in feet and referenced to MLLW datum.

	Feet
Highest tide (observed)	*4.0
Mean higher high water	2.50
Mean high water	2.00
Half tide level	1.15
Mean low water	0.30
Mean lower low water	0.00
Lowest tide (observed)	*-1.50

*Estimated.

b. ASTRONOMICAL TIDE.

The astronomical tide is estimated to be equivalent to the Mean Higher High Water or 2.5 feet.

c. ATMOSPHERIC PRESSURE DROP.

The water level rise due to atmospheric pressure is calculated by:

$$S_{\Delta p} = 1.14\ (P_n - P_o)\ (1 - e^{-R/r})$$

Assuming parameters of hurricane Fico, 1978:

P_n = 29.92 inches

P_o = 28.20 inches

R = 25 nautical miles

r = 100 nautical miles

$S_{\Delta p}$ = 0.4 feet

d. STORM SURGE.

The water level rise due to storm surge is calculated by:

Storm surge = S_i, where S_i is the incremental rise in water level due to wind stress perpendicular to the bottom contour.

$$S_i = \frac{540K\ U_R^2\ \Delta X}{\overline{d}}$$

$K = 3.0 \times 10^{-6}$

U_R = 94 knots

ΔX = incremental distance in nautical miles

$\overline{d}$ = mean depth over increment (FT)

Storm surge in the study area is estimated to be 0.5 feet for the July 1978 hurricane Fico.

e. WAVE SETUP.

The water level rise due to wave setup (S_W) is estimated using Figure 3-45, Shore Protection Manual.

S_W = 1.4 feet

f. DESIGN STILLWATER LEVEL.

The design stillwater level (SWL) during hurricane conditions consists of (1) astronomical tide, (2) the rise due to atmospheric pressure drop, (3) the rise due to storm surge, and (4) the rise due to wave setup.

(1) Astronomical tide	+2.5 ft
(2) Atmospheric pressure drop	+0.4 ft
(3) Storm surge	+0.5 ft
(4) Wave setup	+1.4 ft
SWL	+4.8 ft

7. ENTRANCE CHANNEL AND TURNING BASIN DESIGN

The entrance channel and turning basin are designed to accommodate vessels up to a length of 27 feet, a beam of 7 feet, and a draft of 2.5 feet. This criteria represents the dimensions of a loaded fishing boat, which is the largest vessel anticipated to use this boating facility.

a. ENTRANCE CHANNEL.

The entrance channel width and depth were computed as follows:

(1) Minimum Width (based on one-way traffic).

Width = 5 x design vessel beam x 1.5 to allow for wave action within channel

= 5 x 7 x 1.5

= 52.5 feet

In consideration of currents in the entrance channel and the alignment of the channel, an 80-foot bottom width was chosen for Plans 1 and 2. A 60-foot bottom width was chosen for Plan 3, based on boater experience in the area. A 60-foot bottom width for the entrance channel will provide more protection at the ramp and more area for refuge during storms.

(2) Minimum Depth. The minimum depth was based on an acceptable wave height of 6 feet within the channel.

Depth = design vessel draft + wave allowance + *minimum* tide below MLLW + bottom clearance and squat

= 2.5 + 3 + 1 + 2

= 8.5 feet

Use: 8.5 feet

b. TURNING BASIN.

The minimum dimensions for the basin were computed as follows:

(1) Minimum Length and Width

Length and Width = 3 x design vessel length

= 3 x 27

= 81 feet

Use: 100 feet

(2) Minimum Depth. The minimum depth was based on an acceptable wave height of 3 feet within the basin.

Depth = design vessel draft + wave allowance + bottom clearance

= 2.5 + 2 + 2

= 6.5 feet

Use: 6.5 feet

8. BREAKWATER LAYOUT.

a. DESIGN WAVE HEIGHT. The design of the structural elements was based on the controlling depth criteria which determines the maximum wave height to which the structure might reasonably be subjected. The design wave height is based on the depth (d_s) at the structure toe, the wave period (T), and the slope (m) seaward of the structure. Using Figure 7-4, Shore Protection Manual, with values of:

d_s = 13.3 feet; T = 15 seconds; m = 0.01.

Design Wave Height = 11.4 feet

b. DIFFRACTION ANALYSIS. Theoretical wave diffraction analyses were conducted for each alternative plans. Incident wave direction was determined from the refraction analysis described previously. Wave periods were determined from Table C-2, Percent Frequency of Wave Height Versus Wave Period. A wave period of 10 seconds would be exceeded 10% of the time in a normal year and an 8-second wave would be exceeded 15% of the time. Figures C-3 to C-5 show the diffraction coefficient, K', for each wave period analyzed.

c. BREAKWATER ORIENTATION. The breakwater orientation was selected to provide a diffracted wave height of 2 feet at the ramp from an incident wave height of 6 feet.

9. BREAKWATER DESIGN.

a. ARMOR LAYER. Shore Protection Manual (SPM) design formulas were used to determine the weight of the stone and the thickness of the stone layer. (Typical sections shown in main report.)

(1) Weight.

Armor stone size: $$W = \frac{W_r H_b^3}{K_D (S_r - 1)^3 \cot \theta}$$

W_r = unit weight of stone = 165 pcf

H_b = design wave height = 11.4 feet

K_D = stability coefficient = 2.5 (2 stones thick)

S_r = specific gravity of armor unit relative to seawater = 2.58

$\cot \theta$ = cotangent of structure slope = 2.0

W = Armor Stone Size=12,400 lbs.=6 tons

Since the ramp is assumed to be used during non-storm conditions only, the breakwater is designed for overtopping conditions and the stone size is increased by 30%. To allow for variations in stone sizes, a range of 0.5 to 1.25 is allowed, giving a range in stone sizes of 5 to 10 tons. The lower range of 0.5 is used instead of 0.75 to help reduce wave transmission.

(2) Thickness

$$\text{Thickness} = nk \left(\frac{W}{W_r}\right)^{1/3}$$

n = layer thickness = 2

k = layer coefficient = 1.15

Thickness = 10.6 feet

b. CREST WIDTH. The crest width was calculated using the same formula for determining the armor layer thickness.

$n = 3$, $k = 1.10$

Crest Width = 15.2 feet

c. WAVE RUNUP. The wave runup was calculated using the Coastal Engineering Research Center's Technical Report No. 80-1 (TR-80-1).

$$\frac{R}{H} = \frac{a\,E}{1 + bE}$$

$$E = \frac{\tan \theta}{\sqrt{H/L_o}}$$

a = empirical coefficient = 0.775

b = empirical coefficient = 0.361

E = surf parameter

H = design wave height = 11.4 feet

$\tan\theta = 0.5$

L_o = deepwater wave length = 1152 feet

$\frac{R}{H} = 1.4$ = wave runup factor

d. CREST ELEVATION. The crest elevation was based on the wave that would break at the head of the structure causing the bay to be non-navigable. As discussed earlier, the breakwater is designed for overtopping therefore the design stillwater level is not used. The stillwater level used is the half-tide level. The use of this water level will allow minor overtopping during storm conditions and will keep the breakwater crest at an elevation that coincides with the natural ground. The crest elevation for the proposed plans are in Table C-3.

TABLE C-3. BREAKWATER CREST ELEVATION

Plan	(1) Wave Height (Feet)	(2) Runup Factor	(3) Half-Tide Level	Crest 1/ Elevation (Feet)
1	7.5	1.4	+1	+11.5
2	5	1.4	+1	+ 8.0
3	7.5	1.4	+1	+11.5

1/ Crest elevation = (1) x (2) + (3).

10. BASIN RESPONSE TO INCIDENT WAVE CRESTS.

With the proposed basin being rectangular in shape and the increased channel depth, a theoretical analysis was conducted to determine the wave periods that would increase resonant surging. The fundamental resonance period (T) is the time it takes a wave to travel from one end of the basin to the other end and back. Any multiple of this wave period may induce resonant surging. The fundamental resonance was computed as follows:

$$T = \frac{2b}{\sqrt{gd}}$$

b = basin length, 200 ft

g = acceleration due to gravity, 32.2 ft/sec2

d = basin depth, 8 ft

T = 25 seconds

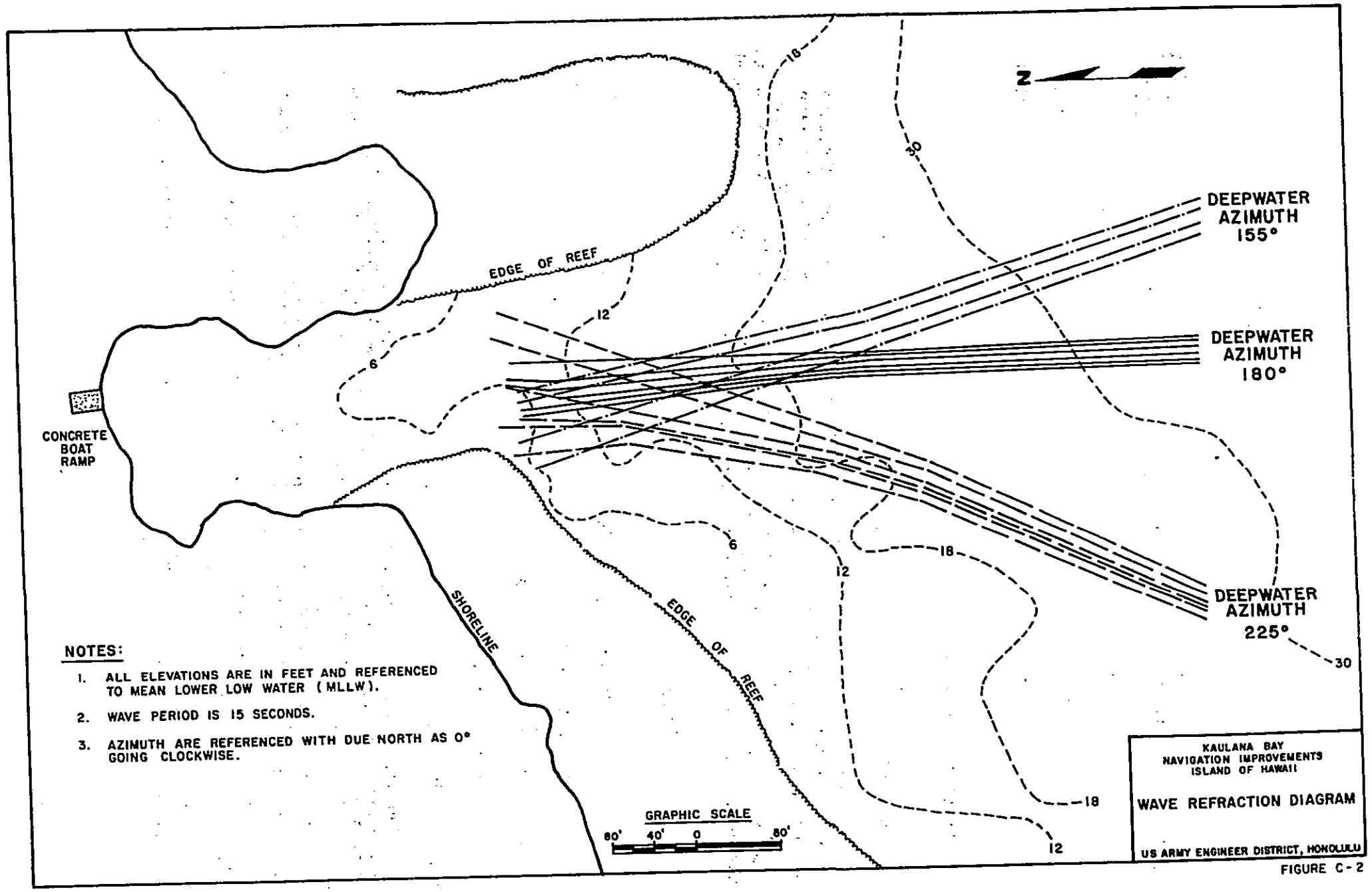
11. REFERENCES.

Dunham, James W. and Arnold A. Finn, Small-Craft Harbors: Design, Construction and Operations. Special Report No. 2 prepared for the US Army Coastal Engineering Research Center, Fort Belvoir, VA, Dec 1974.

US Army Coastal Engineering Research Center, Shore Protection Manual, Vols. I, II, III, Fort Belvoir, VA, 3d Edition, 1977.

US Army Coastal Engineering Research Center, Technical Report No. 4, Fort Belvoir, VA, 3d Edition, 1966.

US Army Coastal Engineering Research Center, Technical Report No. 80-1, Fort Belvoir, VA, 1980.



NOTES:

1. ALL ELEVATIONS ARE IN FEET AND REFERENCED TO MEAN LOWER LOW WATER (MLLW).
2. WAVE PERIOD IS 15 SECONDS.
3. AZIMUTH ARE REFERENCED WITH DUE NORTH AS 0° GOING CLOCKWISE.

KAULANA BAY
NAVIGATION IMPROVEMENTS
ISLAND OF HAWAII

WAVE REFRACTION DIAGRAM

US ARMY ENGINEER DISTRICT, HONOLULU

FIGURE C-2

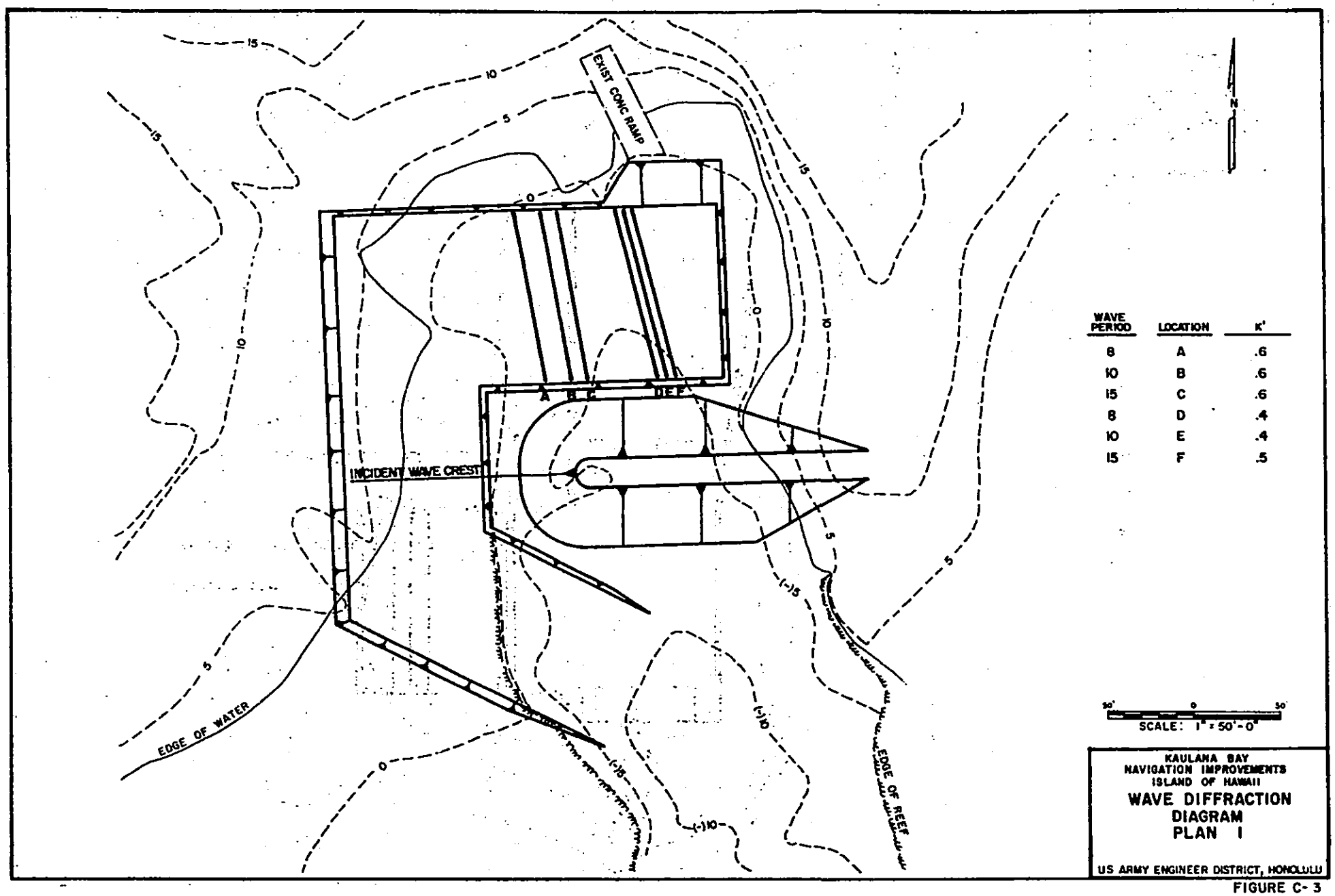

EXIST CONC RAMP
INCIDENT WAVE CREST
EDGE OF WATER
EDGE OF REEF
A B C D E F
15
10
5
0
(-)5
(-)10
(-)15
N
WAVE PERIOD | LOCATION | K'
8 | A | .6
10 | B | .6
15 | C | .6
8 | D | .4
10 | E | .4
15 | F | .5
50' 0 50'
SCALE: 1" = 50'-0"
KAULANA BAY
NAVIGATION IMPROVEMENTS
ISLAND OF HAWAII
WAVE DIFFRACTION
DIAGRAM
PLAN I
US ARMY ENGINEER DISTRICT, HONOLULU

FIGURE C- 3

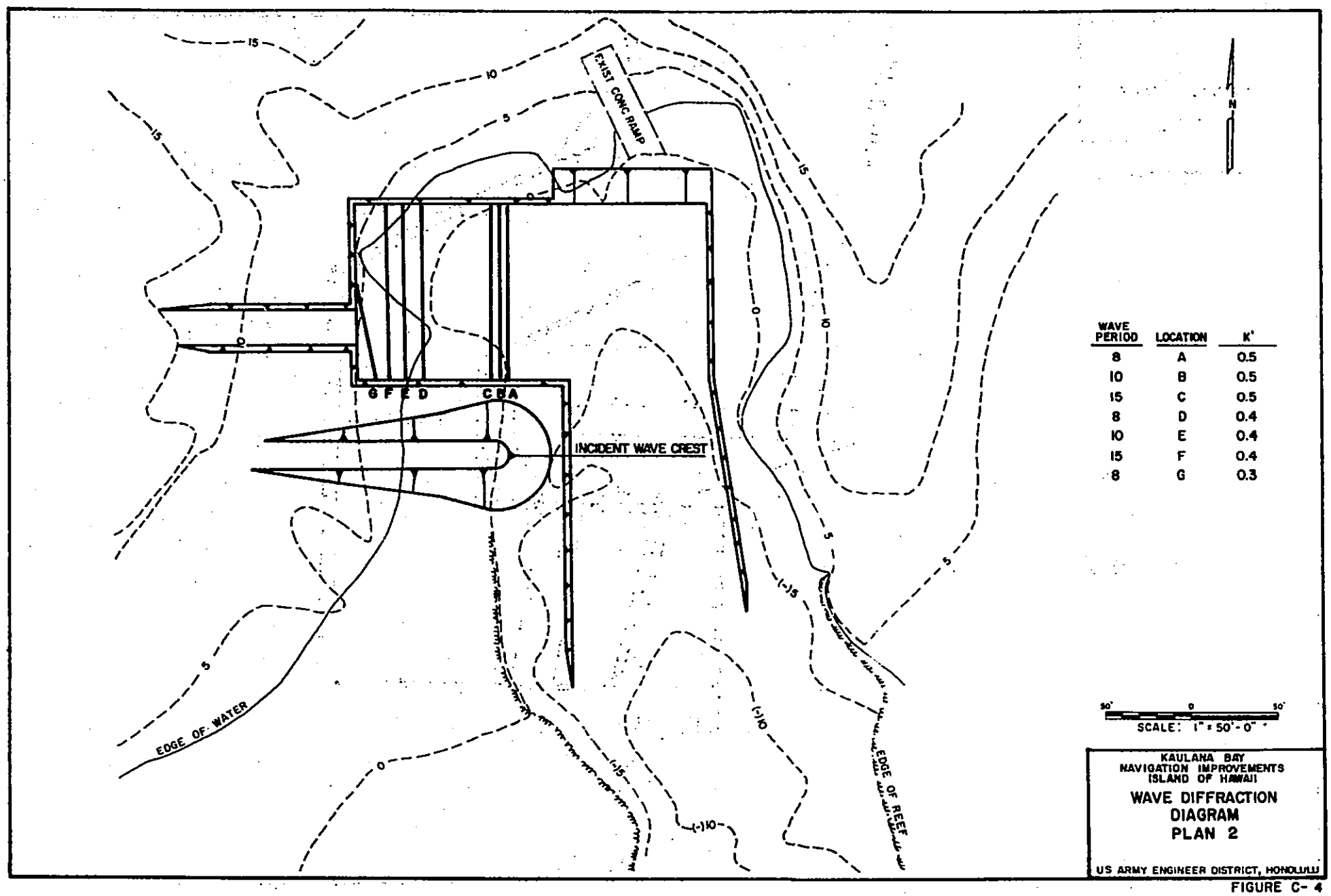
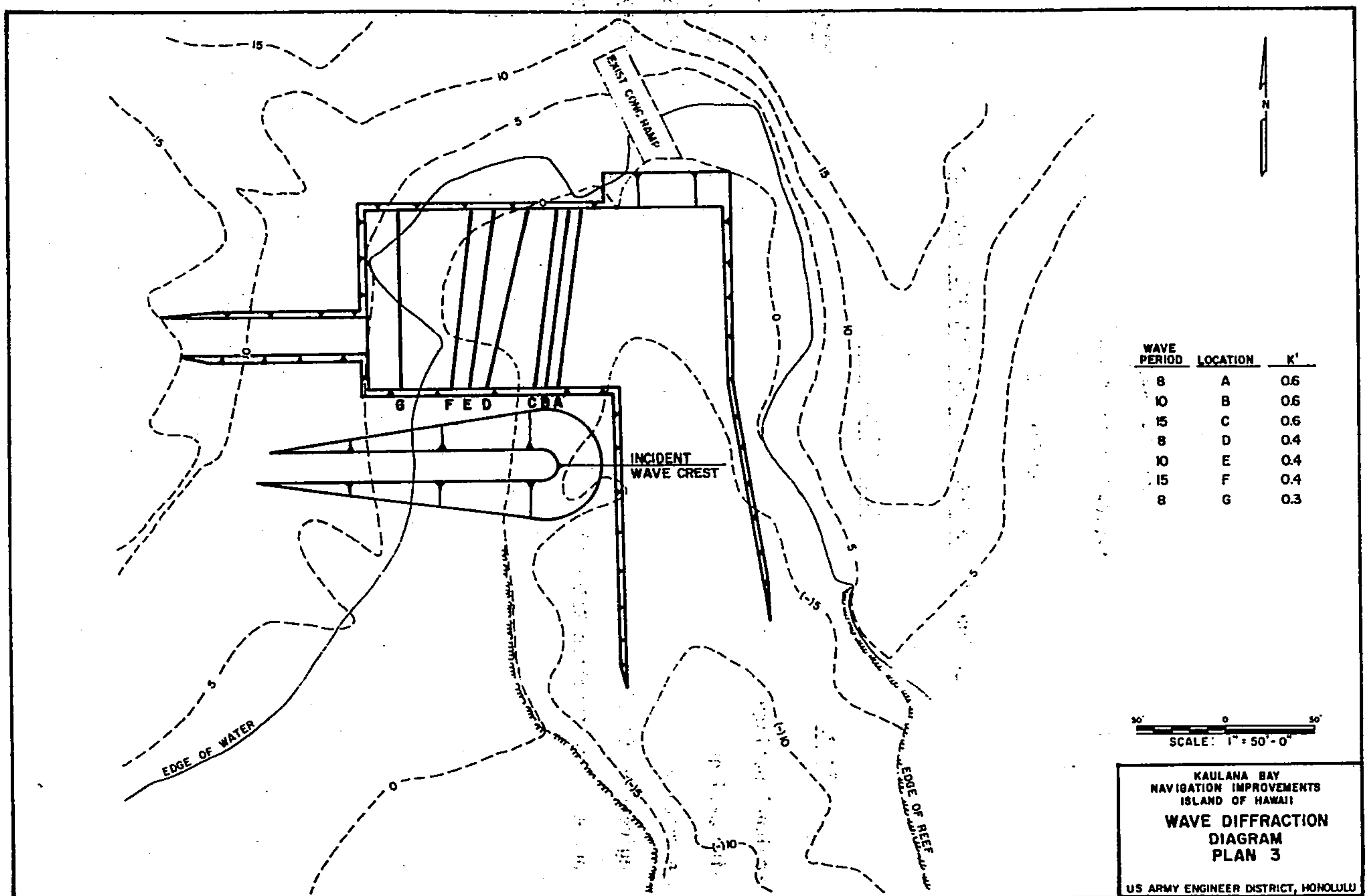

15
10
5
15
EXIST CONC RAMP
0
0
G F E D
C B A
INCIDENT WAVE CREST
15
0
5
5
5
(-)15
EDGE OF WATER
0
(-)15
(-)10
(-)10
EDGE OF REEF
N
WAVE PERIOD | LOCATION | K'
8 | A | 0.5
10 | B | 0.5
15 | C | 0.5
8 | D | 0.4
10 | E | 0.4
15 | F | 0.4
8 | G | 0.3
50' 0 50'
SCALE: 1" = 50'-0"
KAULANA BAY
NAVIGATION IMPROVEMENTS
ISLAND OF HAWAII
WAVE DIFFRACTION
DIAGRAM
PLAN 2
US ARMY ENGINEER DISTRICT, HONOLULU

FIGURE C- 4



WAVE PERIOD	LOCATION	K'
8	A	0.6
10	B	0.6
15	C	0.6
8	D	0.4
10	E	0.4
15	F	0.4
8	G	0.3

FIGURE C- 5

KAULANA BAY

NAVIGATION IMPROVEMENTS

APPENDIX C

SECTION II. GEOLOGY, FOUNDATIONS AND MATERIALS

TABLE OF CONTENTS

GEOLOGY, FOUNDATIONS & MATERIALS
KAULANA BAY NAVIGATION IMPROVEMENTS
KAULANA BAY, HAWAII

REGIONAL GEOLOGY

1. The Hawaiian Islands are a chain of broad, shield basalt domes built on a 1600 mile long fissure in the ocean floor. The Island of Hawaii is the largest, youngest and southernmost of the chain. It is the result of many thousands of thin lava flows from rift zones (zones of fractures) from five volcanoes.

2. Mauna Loa is the volcano responsible for the greater bulk of the island's southern half. Erupting as late as 1975, it is one of two active volcanoes in this area. The slopes of Mauna Loa are covered with finger-shaped recent flows of lava-basalts, tuffs and ash deposits of the Kau Volcanic Series. Small but frequent "Kipukas" (Hawaiian word referring to an area of older land surface surrounded by the lava of new flow) expose the Kahuku Volcanic Series. The Kahuku Volcanic Series consist of thin lava-basalt flows intercalated with ash and capped with yellow pyroclastic ash (Pahala Ash).

3. The Kahuku and Kau Volcanic Series occurred during the Middle Pleistocene (50,000 + years) and Late Pleistocene to Recent Epochs of geologic time, respectively. The young age of the Island of Hawaii is characterized by rough, irregular coast lines with cliffs, frequently exposed lava-basalt flows, steep offshore margins and lack of extensive coral reefs.

SITE GEOLOGY

4. Kaulana Bay is located south of Mauna Loa's southwest rift and several miles northeast of South Point (Kalae). The bay measures roughly two hundred (200) feet in width and runs inland for about four hundred (400) feet. The east and west sides of the bay are relatively straight and the north shore is symmetrically curved. The bay is open to the south and enclosed to the north by several thin flow-units extruded from the southwest rift of Mauna Loa.

5. The east shore of the bay is part of a finger or extension of the most recent and prominent lava flow, which rises twenty (20) feet above the bay and tapers gently towards the ocean. At the bay margin the east shore is considerably steeper from the top of the flow to the floor of the bay. Thin deposits of subanglar to subrounded basalt gravels to boulders (up to 18 inches in diameter) and clinkers are scattered over the east shore and flow surface.

6. On the west and north shores of the bay the lava flows (or flow) are considerably lower (7 feet maximum elevation) and older than the flow of the east shore. The north shore is nearly covered by a thin deposit of subangular to subrounded basalt gravel and cobbles which abruptly changes to a yellow pyroclastic ash (Pahala) thirty (30) feet north of the shoreline and extends beyond the limits of the study area. The lava flow of the west shore is almost level but is intensely fractured and jointed. A thin (approx. 2 foot thick) deposit of sand and fine gravel with occasional basalt cobbles covers

the lava flow forty (40) feet from the west shoreline. The sand-gravel deposit is thirty (30) feet wide and parallels the entire length of the west shore. It grades into a wave-cut section of the yellow pyroclastic ash (Pahala). The six (6) to eight (8) foot wave-cut scarp in the pyroclastic ash parallels the west shoreline at a distance of about one hundred (100) feet from the water's edge. Inland from the scarp, the gently undulating grass-covered terrace of yellow pyroclastic ash caps the lava-basalt flows. The thickness of the ash terrace is approximately thirteen (13) feet.

7. The floor of the bay is shallow (less than 10 feet) and irregular. The floor consists of an accumulation of recent lava-basalt flows on top of older flows. The floor surface is partly covered by thin deposits of subangular to subrounded basalt cobbles and boulders. One small sand-filled trough (30 feet to 100 feet) trends north-south near the middle of the bay. A small thin (less than a foot thick) sand deposit (75 feet in diameter) lies east of the boat launch ramp. All deposits consist of fine to medium grained coral sand. A few scattered coral formations (colonies) avarage three (3) feet in height and parallel the sand-filled trough. Beyond the mouth of the bay, the depth of the ocean floor increases rapidly.

SEISMICITY

8. Hawaii has the highest density of earthquakes (occurrence rate of magnitude two and greater earthquakes per unit area) in the United States. During the past 18 years, about 48,000 earthquakes in Hawaii have been located and their magnitude determined. Of these, more than 3,000 events were of magnitude 3.0 to 7.2; magnitude 3.0 is generally the threshold of felt earthquakes.

9. The strongest earthquake in historic time in the islands occurred on April 2, 1868 and was centered along the south coast of the Island of Hawaii. The earthquake had a Richter magnitude of about 7.5 and caused serious damage across the entire island, even stopping clocks as far away as Honolulu. Practically all earthquakes on the Island of Hawaii and Maui are associated with intermittent volcanic activity. However, potential earthquakes in the islands can also be caused by deep seated tectonic forces and not from the indirect action of volcanic activity. A Richter magnitude 7 earthquake on January 23, 1938 had an epicenter 25 mile north of Pauwela Point on the north shore of Haleakala, Maui. Recent explorations of geophysical methods show that faults and rift zones cut through the major islands and that these faults are branches of a gigantic fracture system known as the Molokai Fracture Zone.

10. The only major earthquake felt on Oahu since 1938 occured in April 26, 1973. The tremor registered 6.2 on the Richter scale and was centered offshore about twelve miles northeast of Hilo, Hawaii and about 35 miles deep.

11. The uniform building code and the Army Technical Manual 5-809-10, April 1973, assigned a zone three (3) seismic risk rating of the Island of Hawaii for design considerations. The draft Army Technical Manual 5-809-10 (April 1981), scheduled for publishing in the near future, increases the seismic risk rating from zone three (3) to zone four (4).

12. The magnitude of Hawaiian earthquakes was not routinely determined locally until 1958. Prior to that, magnitudes of large earthquakes were measured by seismograph stations on continental United States, usually by those at the California Institute of Technology, University of California at Berkeley and Columbia University.

ENGINEERING CONSIDERATIONS

13. Both pahoehoe and aa flows are common on the slopes of Mauna Loa with aa usually found at lower elevations. The terms pahoehoe and aa are Hawaiian and are used to classify surface appearances and structure of lava flows. At Kaulana Bay, lava basalt rocks are variable and unpredictable in physical and chemical properties. The loose scoriaceous surface layer (clinker) of aa is open, porous and very easy to excavate. Vesicular basalt underlies the clinker layer and generally requires ripping to excavate. Excavation of some of the harder layers will require drilling and blasting or comparable effort. Rough, irregular cutslopes are anticipated in all excavations regardless of excavation methods because of the varying rock properties. The designed excavation slope of 1 vertical to 1 horizontal is adequate for this project.

14. If the lava-basalt flows of the bay floor are two feet or more in thickness they will provide an adequate foundation for the breakwater, as designed herein. Removal of basalt cobbles and loose clinker material in the foundation will be required. Pot holes in the surface of lava flows around the bay are a result of waves eroding soft materials (possible ash pockets) and suggests a weak foundation which warrants subsurface investigations.

15. The yellow pyroclastic ash (Pahala Ash) covering the ground surface north and west of the bay is water sensitive, highly erosive, and should be removed within the limits of the breakwater foundation. Beneath smaller project features (i.e., boat launch ramp, approach roads, parking areas, etc.) where increased thickness of ash precludes deep excavation, superior base and pavement designs should be used. Roadways and parking areas should be paved and all cutslopes protected to prevent slope failure and erosion of the ash. Disturbing the pyroclastic ash subbase in roadways and parking areas should be avoided.

16. Surface drainage around and above Kaulana Bay is channeled through naturally-formed erosion gullies. The highly erodible ash covers the ground surface to the north and west of the bay can wash into the bay after heavy rains unless surface drainage is diverted around the project area.

SOURCES OF CONSTRUCTION MATERIALS

17. Construction materials produced in the South Point-Naalehu (Kau District) area are primarily fills and base course materials used for highway construction. The porous, vesicular nature of the lava rock produced in this area precludes usage as revetment as well as concrete and asphalt aggregates. Excavated rock from the bay will also be unsuitable for the breakwater revetment. Rock materials from Hilo quarries may be selectively used in the proposed breakwater. Basalt rock from the Honokohau Small Boat Harbor excavation is stockpiled adjacent to that harbor and consists of small rock pieces up to 10 tons and larger. The rock quality varies from dense, hard basalt to highly vesicular and scoriaceous clinker; however, more than enough quality (dense) rock exists in the spoil piles to construct the proposed breakwater at Kaulana Bay. The spoil is a result of random excavating and dumping which, if selected for use, will require re-excavating, grading, separating, handling and segregating before placing.

APPENDIX C

SECTION III. COST ESTIMATION SECTION

TABLE OF CONTENTS

III. COST ESTIMATION SECTION

1. COST ESTIMATING ASSUMPTIONS

a. The following assumptions were utilized in estimating construction costs:

(1) Big Island based contractor to perform work.

(2) All stone materials to come from existing commercial quarry in Hilo.

(3) Estimated quantities based on hydrographic survey map and typical plans and sections.

(4) Prices projected to September 1981 price levels.

(5) A 20% contingency cost allowance.

(6) 12 months construction period for Plan 1.
6 months construction period for Plans 2 and 3.

2. COST ESTIMATES

a. Plan 1

Total Project First Cost

Item	Unit	Quantity	$ Unit Cost	$ Total Cost
I. FEDERAL				
A. Construction Costs				
Mobilization and Demobilization	LS	1 Job	-	52,000
Dredging	CY	11,700	68.00	795,600
Main Breakwater				
Armor (5-10 Tons)	Tons	7,350	125.00	918,800
Underlayer (.5-1 Ton)	Tons	2,040	112.00	228,500
Subtotal				$1,995,000
Contingency (20%)				399,000
Total Direct Federal Constr Cost				$2,394,000
B. Engineering and Design				
Detailed Project Report (pre-authorized study costs)				100,000
Plans and Specifications				48,000
Engineering During Construction				19,000
Total Engineering and Design Costs				$167,000

Total Project First Cost

Item	Unit	Quantity	$ Unit Cost	$ Total Cost
C. Supervision and Administration (S&A)				$167,700
D. US Coast Guard Aids to Navigation				20,000
II. NON-FEDERAL				
A. Lands, Easements, & Rights-of-Way (Non-Federal)	LS			23,000
Total Project First Cost				$2,772,000

b. Plan 2

Total Project First Cost

Item	Unit	Quantity	$ Unit Cost	$ Total Cost
I. FEDERAL				
A. Construction Costs				
Mobilization and Demobilization	LS	1 Job	-	52,000
Dredging	CY	5,300	68.00	360,400
Main Breakwater Armor (5-10 Tons)	Tons	1,810	125.00	226,300
Subtotal				$638,700
Contingency (20%)				127,700
Total Direct Federal Construction Cost				$766,000
B. Engineering and Design				
Detailed Project Report (pre-authorized study costs)				100,000
Plans and Specifications				48,000
Engineering During Construction				19,000
Total Engineering and Design Costs				167,000
C. Supervision and Administration (S&A)				62,000
D. US Coast Guard Aids to Navigation				20,000
II. NON-FEDERAL				
A. Lands, Easements & Rights-of-Way (Non-Federal)	LS			23,000
B. Construction Costs				
20' x 93' Launch Ramp	1 Job			73,000
C. Indirect Costs				8,300
Total Project First Cost				$1,120,000

c. Plan 3

Total Project First Cost

Item	Unit	Quantity	$ Unit Cost	$ Total Cost
I. FEDERAL				
A. Construction Costs				
Mobilization and Demobilization	LS	1 Job	-	52,000
Dredging	CY	5,200	68.00	353,600
Main Breakwater Armor (5-10 Tons)	Tons	3,000	125.00	375,000
Subtotal				$781,000
Contingency (20%)				156,200
Total Direct Federal Construction Cost				$937,000
B. Engineering and Design				
Detailed Project Report (pre-authorized study costs)				100,000
Plans and Specifications				48,000
Engineering During Construction				19,000
Total Engineering and Design Costs				167,000
C. Supervision and Administration (S&A)				73,000
D. US Coast Guard Aids to Navigation				20,000
II. NON-FEDERAL				
A. Lands, Easements & Rights-of-Way (Non-Federal)	LS			23,000
B. Construction Costs				
20' x 93' Launch Ramp	1 Job			73,000
C. Indirect Costs				8,300
Total Project First Cost				$1,300,000

d. Non-Federal Costs. Non-federal costs are those costs that the State of Hawaii must provide in accordance with local cooperation agreements and assurances. Non-federal project first costs are anticipated for all alternative plans. The cost to lease and acquire lands, easements, and rights-of-ways from Hawaiian Homes Land will be a non-federal cost.

Other non-federal costs include a portion of the total project construction cost for the new single lane launch ramp in Plans 2 and 3 and associated indirect costs. The total cost of the launch ramp may be included into the overall federal construction contract using State of Hawaii Funds. The estimated cost of the ramp is $73,000.

3. ESTIMATED AVERAGE ANNUAL COST

a. The average annual cost is the equivalent annual charges which includes interest, amortization of the initial investment, cost of maintenance and operation, and replacement costs during the project life.

b. Interest rate used follows the U.S. Water Resources Council's rate of 7-3/8 percent. The project economic life is 50 years.

c. Annual replacement, operation and maintenance costs can be broken down into the following categories:

(1) Maintenance dredging due to shoaling.

(2) Periodic maintenance and repair for aids to navigation.

(3) Maintenance and repair costs for the breakwater structure.

Maintenance Dredging

Based on the sediment transport analysis conducted for the drainage basin at Kaulana Bay, the average annual sediment rate is .25 acre-feet per square mile or 28.2 cubic yards. The average siltation at Kaulana Bay was estimated at 1 foot every 10 years (includes siltation from storm runoff).

Maintenance dredging to maintain the Kaulana Bay launch facility is based on an estimated 2,500 cubic yards for each alternative plan every 50 years. The cost of maintaining the facility includes mobilization and demobilization of dredging equipment. Mobilization and demobilization cost is estimated at $156,000. Dredging cost is estimated at approximately $21.00 per cubic yard of material.

Aids to Navigation

Periodic maintenance and repair costs for aids to navigation is estimated at $1,500 per year.

Maintenance and Repair Costs for the Breakwater

Annual maintenance and repair costs of the breakwater for the economic life of the project is based on 1% of the initial cost of the armor stone.

Summary of Average Annual Maintenance Costs

	Plans 1	2	3
Maintenance Dredging	$4,200	$4,200	$4,200
Aids to Navigation	1,500	1,500	1,500
Protective Structure	9,200	2,300	3,800
Total Average Annual Maintenance Cost	$14,900	$8,000	$9,500

d. Summary of the average annual costs for determining the benefit to cost comparison is shown below:

	Plans 1	2	3
Total Project First Cost 1/	$2,672,000	$1,020,000	$1,200,000
Average Annual First Cost	202,800	77,400	91,100
Average Annual Maintenance Cost	14,900	8,000	9,500
Total Average Annual Cost	$218,000	$85,000	$101,000

1/ Excludes pre-authorized study costs for benefit and cost analysis.

4. APPORTIONMENT OF COSTS

In accordance with Section 107 of the River and Harbor Act of 1960, the apportionment of costs between Federal and non-Federal cost is specified below. The Federal share is a statutory limit of $2 million. All costs exceeding this amount must be borne by the State of Hawaii. The non-Federal share includes the cost for a new ramp, indirect costs, and lands, easements and rights-of-way.

Summary of Apportionment of First Cost

	Plans 1	2	3
Federal Share 1/			
Corps of Engineers	$2,000,000	$996,000	$1,176,000
U.S. Coast Guard	20,000	20,000	20,000
Non-Federal Share 2/	752,000	104,000	104,000
Total Project First Costs	$2,772,000	$1,120,000	$1,300,000

1/ All future costs associated with future maintenance dredging, repairs to the breakwater structure and maintenance for aids to navigation is Federal. These costs are not included in the project first costs but are considered in determining the average annual costs for developing the benefit to cost comparison.

2/ This share does not include the costs of local cooperation and assurances specified in Appendix A.

KAULANA BAY

NAVIGATION IMPROVEMENTS

SOUTH POINT, ISLAND OF HAWAII

CULTURAL AND SOCIAL RESOURCES

APPENDIX D

APPENDIX D

CULTURAL AND SOCIAL RESOURCES

Table of Contents

LIST OF TABLES

LIST OF FIGURES

APPENDIX D

CULTURAL AND SOCIAL RESOURCES

I. INTRODUCTION

1. Part I of Appendix D summarizes the findings of the Corps in identifying prehistoric sites, historic structures, or other cultural resources in the study area and assessing the effects of the alternatives on the sites or resources. Identification of historic sites is required by the Reservoir Salvage Act of 1960 as amended and Executive Order 11593 (1971). The Federal agency must evaluate the significance of the sites in order to determine possible eligibility for the National Register of Historic Places. If any sites in the project area were determined eligible for or already listed on the National Register, they would be protected by Federal law and regulation to the extent that the Federal agency must consult with the State Historic Preservation Officer and the US Advisory Council on Historic Preservation to determine the effect of the Federal project and to identify measures to either avoid or mitigate for any adverse effects.

2. Part II of the cultural and social resources appendix summarizes pertinent socioeconomic profile data on the study area and assesses the social well-being components of the four alternative plans. The other social effects component analysis derives from the Water Resources Council's "Principles and Standards for Planning Water and Related Land Resources--Level C" (P&S), 45 Federal Register 64366-64400, 29 September 1980. The other social effects components now required by P&S consist of (a) Urban and community impacts such as income distribution, employment distribution, population distribution and composition, the fiscal condition of the local government, and the quality of community life; (b) Life, health and safety; (c) Displacement including people, businesses, and farms; (d) Long-term productivity involving renewable resources such as fisheries; and (e) Energy requirements and energy conservation both during construction and operation of facilities. Part III of the appendix discusses the impacts of the three alternative plans on the cultural resources and the other social effects elements.

II. AFFECTED RESOURCES

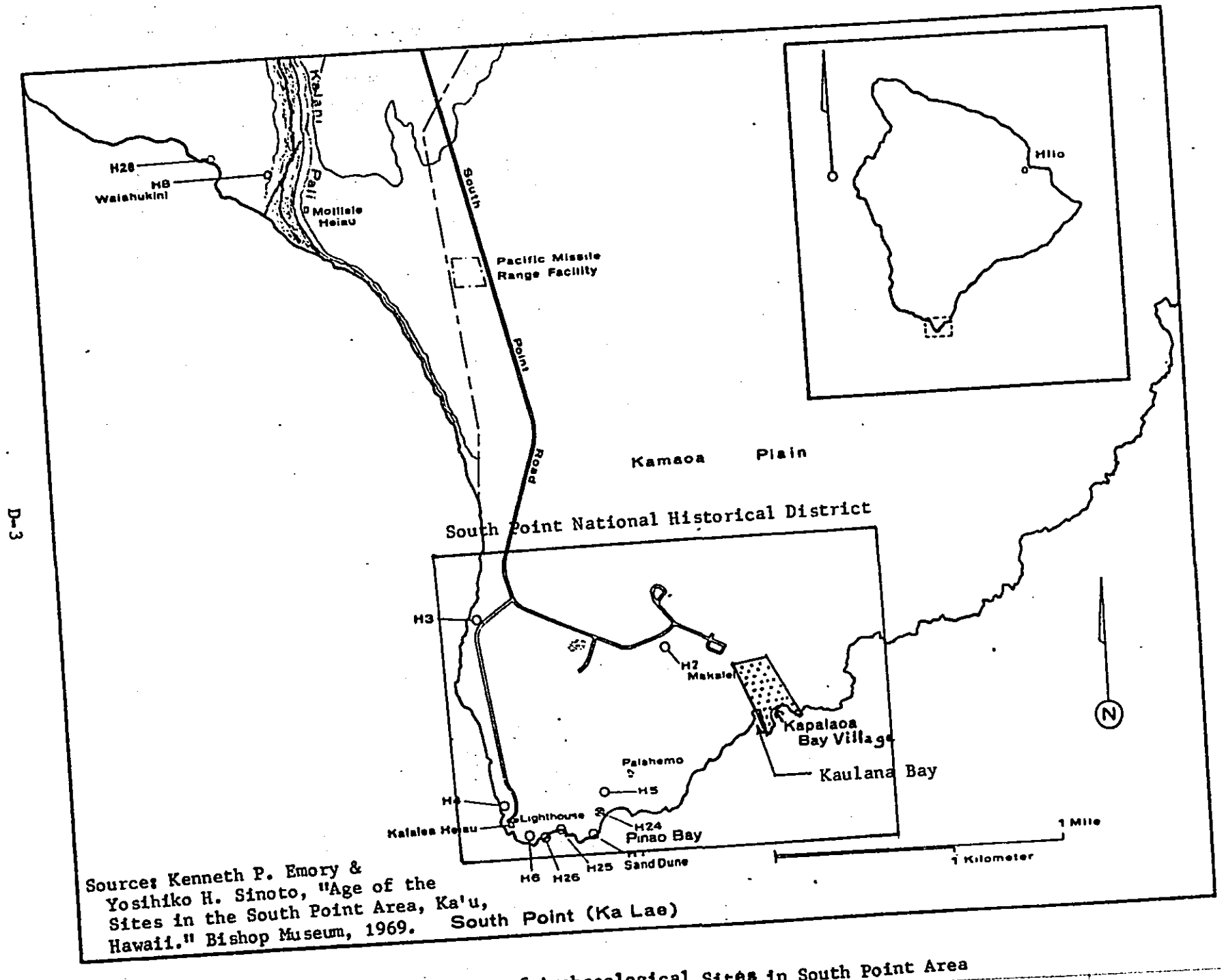
3. Historical Background. The South Point or Ka Lae area of Hawaii Island, believed at one time to be the earliest occupied site complex in the Hawaiian Islands, has been subject to a large number of intensive archaeological and historical studies conducted principally under the auspices of the Bernice P. Bishop Museum. A paper by Marion Kelly of the Museum on the "Historical Background of the South Point Area, Ka'u, Hawaii" presented as Pacific Anthropological Records No. 6 in 1969, summarizes the previous archaeological studies of the South Point area which began in 1953 and culminated in that period by a survey of a portion of Kapalaoa Bay Village, adjacent to Kaulana Bay, by Edmund J. Ladd and Ms. Kelly in October 1969 (Ms, 1969). No additional investigations have been performed on sites along the southeast coast of the South Point area except for a US Army Corps of Engineers' sponsored cultural and historical survey of the Ka'alu'alu Bay area by Ms. Kelly and Violet Hansen of Bishop Museum in 1972 and two studies performed in conjunction with the present study. Ms. Hansen prepared a brief cultural reconnaissance report in December 1979 on her own initiative representing the Big (Hawaii) Island Resource

Conservation and Development Council and Dr. Paul Rosendahl, Consulting Archaeologist, conducted a more intensive reconnaissance survey in 1981 under contract to the Corps. Detailed site maps and the Ladd manuscript with illustrations and the Hansen and the Rosendahl reconnaissance reports are provided under separate cover to historic site agencies and appropriate professionals in accordance with the Archaeological Resources Protection Act of 1979.

4. South Point National Historic (Landmark) District. The South Point Complex is a group of prehistoric and historic sites which was believed in 1969 to provide the longest and most complete record of human occupation in the Hawaiian islands according to K. Emory and Y. Sinoto, "Age of the Sites in the South Point Area, Ka'u, Hawaii," Pacific Anthropological Records, No. 8, Bishop Museum, 1969 (Figure D-1). The Puu Alii Sand Dune Site (Site No. 50-HA-B20-1 or H1) was a fisherman's habitation later covered by sand and used as a burial ground. It was originally dated by radiocarbon-dating methods to about 124 A.D. (National Park Service, 1962). A nearby inland site, Makaai Cave Shelter (Site No. 50-HA-B20-2 or H2), is believed to date to about 1750 A.D. Kalalaea Heiau, located adjacent to the modern lighthouse, is a fishermen's heiau of the small court variety which has been generated for years and is still maintained by the local fishermen. Other sites identified as formally within the National Landmark historic district are eighty or more canoe-mooring holes carved into the lava cliff overlooking the sea; numerous carved and natural salt pans at and near the heiau site; and Pohakuokeau "Stone of the Times" which is supposed to turn over when the traditional reign changed. According to Ladd (1969), not included in the site inventory of the South Point Historical District Landmark, but of utmost importance to the total interpretation of the prehistory and history of the area are the Kapalaoa Bay Village site (located adjacent to Kaulana Bay and within the historic district), Molilele heiau, perched on the edge of the spectacular Pali-(cliff)-o-Kalani, and the prehistoric shelter cave and village of Waiahukini (Sites 50-HA-B21-1 or H8 and 50-HA-B21-2 or H28). The latter three sites are outside the historic district.

5. Excavations and dating conducted in the late 1960's now indicate that the sand dune site (H1) was only occupied for a relatively short period from about 1250 to 1350 A.D. based on radiocarbon dating, stratigraphic analysis and an analysis of changing forms of fishhooks (Emory and Sinoto, 1969). They believe that the Waiahukini shelter (H8) was occupied from as early as 750 A.D. to no later than about 1850 A.D. No dating has been conducted at the Kapalaoa Village site near Kaulana Bay, but Ladd suggests that the prehistoric village as probably abandoned in the mid- and late-19th century (Figure D-2). At any one time during the peak occupation there may have been 35 to 40 people living within the eight house sites at Kapalaoa Village. The choice of the ancient Hawaiians to occupy this particular site was probably made because it provided protection from the winds and because it was adjacent to Kapalaoa and Kaulana Bays which provide suitable landing places for canoes. According to "Place Names of Hawaii" by Pukui, Elbert, and Mookini published in 1974, Kaulana literally means "(boat) landing." Ladd suspected that the inhabitants of this village saw Captain Cook's Resolution and Discovery passing offshore early in the year 1779 and possible visited the ships in canoes launched from Kaulana and Kapalaoa Bays.

6. Indeed, Cook's journal entry for January 5, 1779 reported that as his ship rounded the South Point of Hawaii Island:



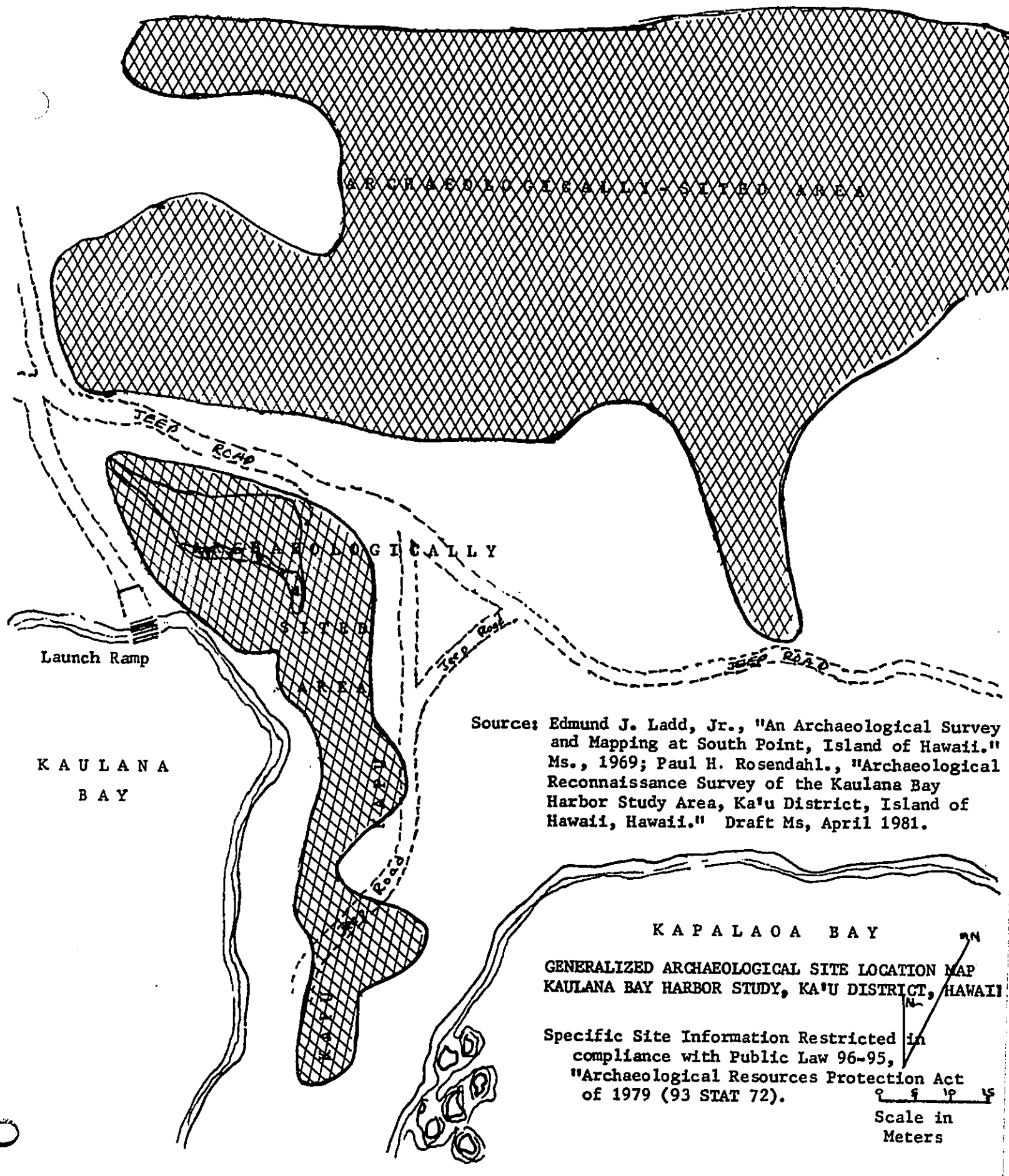
Source: Kenneth P. Emory & Yosihiko H. Sinoto, "Age of the Sites in the South Point Area, Ka'u, Hawaii." Bishop Museum, 1969.

South Point (Ka Lae)

Figure D-1. Location of Archaeological Sites in South Point Area

"On this point stands a pritty (sic) large village, the inhabitants of which thronged off to the ship with hogs and women" [in Kelly, 1969]. Later in 1789, a significant battle took place in the general area of Ka Lae and the Kamaoa Plain (Figure D-1) between Keoua, a high-ranking Chief of Ka'u and Kaiana, a lieutenant of the future King Kamehameha I. The Hawaiian historian Samuel Kamakau noted that "if word was brought that 'ahi (yellow fin) were plentiful at Ka Lae, off went the Chief to the 'ahi fishing, and he fished also at Kaulana, Ka'iliki'i, Pohue, Na-pu-u-o-Pele, Kapalilua, and other places along the coast" (in Kelly, 1969). No further mention is made of Kaulana in the historical record for the prominent villages along the coast were at Kailikii, Waiahukini and Kaalualu, and inland at Waiohinu. Observations by Reverend John D. Paris in 1841 and Samuel Clemens (Mark Twain) in 1866 of the situation at nearby Kaalualu imply a decline in local residents from "hundreds of natives" to none. This suggests that the decline in population of Kapalaoa Village occurred during that same period when diseases, onerous poll, land and labor taxes and natural disasters were taking their heavy price (Kelly, 1969). The volcanic disturbances of 1868 spared Kaulana the ravages of lava flows but hit it with a tsunami wave of perhaps twenty feet in height. One unnamed observer noted that between Kaalualu and South Point (about six miles distance), "The sea had been inland in some places, a hundred and fifty yards, and the whole coast was lined with house timbers, lumber, broken canoes, dead animals that had drifted ashore" (Brigham, 1909 in Kelly, 1969).

7. Kaulana Bay Archaeological Sites. The function that the Kaulana Bay boat ramp plays today is evidenced by an old photograph in Ladd and Kelly's manuscript of 1969 showing perhaps a Model-T and tent staked out at Kaulana Bay just as today auto campers belonging to fishermen's families dot that South Point area awaiting their men to come home from the sea. Figure D-2 shows the remnants of a fisherman's shack at Kaulana Bay which according to an Hawaiian informant for Ladd was the former residence of Kalai Moku Halii, who lived there in the 1920's. The shack was in periodic use until it was destroyed some time after 1969. According to Ladd, the archaeological remains in this point area are a poorly preserved (rock) platform, a (rock) platform with an adjoining house pavement, and a rather interesting composite of walls which form an open-ended enclosure and a mound that is probably a grave (Ladd, Ms, 1969). Ladd's informant said that one of these structures is a heiau and for that reason the area was kapu. The Hawaiian word kapu is a variation of the Polynesian tabu or taboo. Rosendahl's recent resurvey of Kaulana Bay in 1981 revealed that the sites described by Ladd were in poorer condition or that Ladd's map of the sites had described an ideal condition of the sites rather than a real condition. Additional sites were found southward or seaward of the previously sited area. Rosendahl found six (6) artifacts on the surface around and within the sites. He also confirmed the existence of undisturbed cultural features including hearths and fire-pits within a hard, volcanic soil embankment immediately adjacent to and east of the boat launch ramp. The cultural features appear along a discontinuous exposure near the present water line extending approximately 20 to 25 meters landward and to the north from the ramp area. Rosendahl does not believe the cultural deposits extend below the approach to the ramp. Scattered surface cultural material was observed at the "intersection" where the Jeep trail meets the dirt road going down to the launch ramp. No cultural materials were found west of the launch ramp for a distance of 250 to 300 feet from the bay. Rosendahl believes it unlikely that cultural materials would be found for another 250 feet west in the same zone. If any materials had existed there they have undoubtedly been eroded away. Rosendahl reported that there was no counter-indication that Kaulana Point was not a traditionally kapu area.



Source: Edmund J. Ladd, Jr., "An Archaeological Survey and Mapping at South Point, Island of Hawaii." Ms., 1969; Paul H. Rosendahl., "Archaeological Reconnaissance Survey of the Kaulana Bay Harbor Study Area, Ka'u District, Island of Hawaii, Hawaii." Draft Ms, April 1981.

GENERALIZED ARCHAEOLOGICAL SITE LOCATION MAP
KAULANA BAY HARBOR STUDY, KA'U DISTRICT, HAWAII

Specific Site Information Restricted in compliance with Public Law 96-95, "Archaeological Resources Protection Act of 1979 (93 STAT 72).

Figure D-2. Location of Archaeological Sites at Kaulana Bay

8. Urban and Community Characteristics: Ka Lae, the southernmost point in the Hawaiian Islands, is an open, windswept land covered with grass and used as a grazing area for cattle. It is largely controlled by the State Department of Hawaiian Home Lands except for a lighthouse operated by the US Coast Guard at the extreme tip of the land and the unimproved, County-controlled Kalae Boat Landing and Park (see Figure 1). Kaulana Bay is located over ten miles from the main highway and thirteen miles from the nearest village of Waiohinu. Access through the State-controlled property is over a narrow one to two lane paved road which is not well maintained. It is estimated that no more than one hundred people live in the expansive, grazing land south of the highway. All of the principal communities of Ka'u District, Waiohinu, Pahala and Naalehu, are close-knit, sugar plantation towns. Population levels and composition have not substantially changed in Ka'u District and its villages in the past decade, in marked comparison with other districts and communities in Hawaii County (see Table D-1). There are few economic opportunities or environmental incentives for permanent residents to settle in Ka'u District, except for the area's isolation and stark, volcanic landscape. The latter has encouraged one of the area's largest individual landowners, C. Brewer and Company, to develop its Seamountain Resort at Ninole Cove near Punaluu and other interests to develop residential areas called Oceanview and Discovery Harbor, northwest and north of Ka Lae, respectively. One resident of Oceanview optimistically suggests that Oceanview will be Ka'u's future population center with 10,000 residents by 1990 or later. Both Oceanview and Discovery Bay have remained largely undeveloped and have attracted very few residents. Discovery Bay has one of the three golf courses in Ka'u District. These two developments and an influx of artists and crafts-
men to Waiohinu are probably responsible for the increased proportion of Caucasians in the district population from 24.7 percent in 1970 to 27% in 1980 (see Table D-1). It is likely that the ethnic composition will continue to change in the future and that the rate of population increase will be greater than it has been in the last twenty years.

9. Unemployment levels in Hawaii County have usually been higher than the rest of the state due to an historic decline in agriculturally-related jobs and a widely-varying tourist industry. Unemployment levels in Ka'u were lower than the county as a whole in 1970, 2.1 percent compared to 2.7 percent, and it is likely that these trends prevail in the present time due to the generally constant employment in the District's sugar industry (see Table D-2). The OEO 1975 Census Update Survey prepared by Survey & Marketing Services, Inc., in September 1976 showed that of the 26,437 jobs in the farming, fishing and forestry sector in the County, fully 13.5 percent or 3,562 of the jobs occurred in Puna and Ka'u Districts. No reliable statistics are kept on numbers of fishermen, but estimates obtained at a public workshop at Naalehu in July 1980 indicated there were twenty full-time fishermen in Ka'u and fifty to sixty part-time fishermen. A small number of the full- and part-timers came from outside Ka'u District. An analysis of Tables D-1 and D-2 indicate that residents of Filipino origin are proportionally less unemployed than Hawaiians and part-Hawaiians. The Filipinos provide the primary workforce for the sugar industry in Ka'u. Due to the high dependence on agriculture for a livelihood, the median family income levels for Ka'u are lower than for the County and considerably more families in Ka'u have incomes below poverty than compared to the rest of the county.

TABLE D-1. POPULATION CHARACTERISTICS

Year	Hawaii County	Hilo Town	South Hilo	Kailua Town	North Kona	South Kona	Ka'u	Pahala Town	Naalehu Town	Other Ka'u Areas
	POPULATION									
1960[1]	61,332	25,966	31,558	499	4,451	4,292	3,368	1,392	952	1,024
Change (%)	3.5	1.5	7.5	-26.9	8.6	-6.7	0.9	8.3	6.5	-14.3
1970[1]	63,468	26.353	33,915	365	4,832	4,004	3,398	1,507	1,014	877
Change (%)	45.0	34.0	24.7	1,200	184.5	47.7	8.9	8.2	14.5	3.4
1980[2,3]	92,053	35,303	42,278	4,763	13,748	5,914	3,699	1,631	1,161	907
1990[4]	105,100	DATA NOT AVAILABLE				DATA NOT AVAILABLE				
2000	123,300	DATA NOT AVAILABLE				DATA NOT AVAILABLE				

Ethnic Composition	Hawaii County 1970[5]	Percentage	1980[6]	Percentage	Ka'u District 1970[5]	Percentage	1980[6]	Percentage
Caucasian	18,298	28.8	31,316	34.0	839	24.7	998	27.0
Japanese	23,817	37.5	N/A		881	25.9	N/A	
Filipino	10,454	16.5	N/A		1,096	32.3	N/A	
Hawaiian	7,809	12.3	N/A		452	13.3	N/A	
Total Asian and Pacific Islanders	44,251	69.7	57,063	62.0	2,528	74.4	2,547	68.9

[1]Hawaii Department of Planning and Economic Development (DPED, The Hawaii Urban Planning Information Center. "Community Profiles for Hawaii," February 1973.
[2]Hawaii DPED. "The State of Hawaii Data Bock 1980. A Statistical Abstract." Table 7.
[3]County of Hawaii Department of Research and Development. "Big Island Report" March 1981.
[4]Hawaii Data Book 1980, Table 10.
[5]Community Profiles for Hawaii, 1973
[6]Big Island Report, March 1981.

TABLE D-2. EMPLOYMENT AND INCOME CHARACTERISTICS

	State of Hawaii	Percentage	County of Hawaii	Percentage	District of Ka'u	Percentage
Civilian Labor Force[1] (March 1981)	405,000	100.0	36,000	8.9	est. 1,241	0.3
Male					N/A	N/A
Female	21,500	5.3	2,700	7.5		
Unemployed						
Unemployment by Ethnic Group[2] (Total 1975)			2,668	100.0	DATA NOT AVAILABLE	
Caucasian (incl Portugese)			824	30.9		
Japanese			675	25.3		
Filipino			151	5.7		
Hawaiian and Part Hawaiian			670	25.1		
Other			348	13.0		
Income Distribution				100.0		
No. of Families (1975)	201,000[3]	100.0	19,514[4]	100.0	Puna-Ka'u District	
Median Income per Family (1975)[4]	N/A		$11,354		$10,131	
No. Families below Poverty (1975)[5]	13,000	6.4	2,959	15.2		

[1] State Department of Labor and Industrial Relations, Research and Statistics Office, "Labor Area News," April 1981.

[2] Hawaii Data Book 1981, Table 211.

[3] Hawaii Data Book 1977, Table 190.

[4] County of Hawaii, Department of Research and Development, "County of Hawaii Data Book 1980, Table 162."

[5] Hawaii Data Book 1980, Table 249.

10. The fiscal conditions of the State of Hawaii and County of Hawaii are better than they have been in the past due to a new state constitutional amendment limiting expenditures and recent State tax revenues being higher than budgeted. In fiscal year 1979, State revenues totalled $1,577,866,000 of which $337,367 was in Federal grants-in-aid. Expenditures amounted to only $1,482,995,000 (Hawaii County Data Book, 1980). County of Hawaii revenues for the same period totalled $41,371,000 and expenditures were only $38,784,000.

11. Life, Health, and Safety. A discussion of tsunamis and earthquakes appears in paragraph 5, Appendix C. All of Ka'u is in the US Geological Survey Seismic Zone 3, the highest and most dangerous. On January 1, 1975, there was a major subsidence of the land centered off Punaluu estimated to be 5.6 on the Richter scale. The most dramatic tsunami occurred on April 2, 1868, accompanying a local earthquake, which resulted in what was believed to be a runup of more than 65 feet in the South Point-Punaluu region. See paragraph 6 above for a description of the destruction in the Kaulana Bay area. During the same period, a destructive lava flow inundated several prehistoric Hawaiian settlements below the pali (cliff), four miles northwest of Kaulana Bay. An ancient, undated aa lava flow itself forms the rocky point bordering the east side of Kaulana Bay while the western portion of the bay area consists of older, weathered flows.

12. As outlined in the Main Report, boat damage and health risk to boaters and fishermen is a major concern to the local fishermen of Ka'u who normally use the Kaulana Bay launch ramp. One long-time commercial fisherman noted at a workshop held in September 1979 at Naalehu that he damaged his boat one out of every five times he launched or recovered it using the Kaulana Bay ramp. Another full-timer fisherman remarked that he had lost seven boats in his first 20 years of fishing at South Point. Damage occurs not only during launch and recover, but also due to having to moor on the west side of South Point when recovery is impossible due to high waves. High waves also damaged parked trailers near the launch ramp. The Hawaii County Economic Opportunity Council estimated in July 1979 that during the previous four or five years, two lives had been lost due to conditions at Kaulana, sixteen boats and pieces of equipment had been damaged, two individuals had been injured and $30,000 worth of damage had been done to vehicles. (The monetary measurements of these damages have been factored into the National Economic Development Account). At the Corps-sponsored public workshop held on July 9, 1980 at Naalehu, the participants noted that the two lives had been lost in 1979 due to high surf and an inability to seek shelter along the South Point coast. In addition, one fisherman had suffered a heart attack at sea and was delayed in coming into shore at Kaulana by high seas.

13. There is also a complete lack of utilities and readily-available emergency services for those who utilized Kaulana Bay launch ramp. The nearest available water source is a county-owned tank about a few thousand feet north of the bay. The nearest US Coast Guard Patrol Boat is stationed at Hilo, approximately 80 nautical miles from South Point. There is a County police station at Naalehu, about 16 miles from Kaulana Bay and a County fire station at Pahala, about 30 miles from Kaulana. The nearest hospital is a State-operated facility at Pahala with a 15-bed capacity.

14. Long-Term Productivity and Displacement of People, Farms and Businesses. There are no temporary or permanent residences, farms or businesses in the immediate vicinity of Kaulana Bay. The nearest permanent residence is believed to be about eight road miles (or six direct miles) from Kaulana Bay

in the Kamaoa Homestead area. There are only a small number (less than ten) of farm residences located in Kamaoa Homestead. Nearly all the land in Kamaoa Homestead and the large surrounding parcels owned by B.P. Bishop Estate and the State Department of Hawaiian Home Lands are utilized solely for cattle grazing. This area, designated as Tax Map Key Zone 9, Section 3 of the Third Division comprises 28,562 acres, of which 25,762 acres (or 90 percent) is zoned Agriculture by the County of Hawaii (Hawaii County Data Book, 1980). The remaining acreage is zoned as Open. Existing land uses are similar to the zoned areas. In fact only 0.14 percent of all Ka'u District land is in non-agricultural or non-open uses. For a distance of five miles to the north and northwest, all land is owned by the Department of Hawaiian Home Lands. This area, which comprises most of the Kamaoa-Puueo ahupua'a (a traditional Hawaiian land unit), consists mainly of Eutrandept soils, a well-drained volcanic ash soil with high inherent fertility. The prehistoric aa lava flows located adjacent and to the northeast of Kaulana Bay are a comparatively small area containing too little soil to be considered a true soil group and have practically no agricultural potential. Water is the limiting factor. Rainfall averages between 10 and 30 inches per year south of the main highway and there are no large-scale developed groundwater sources in the Kamaoa-Puueo region, although potential sources do exist near Naalehu and eastward toward Punaluu (Hawaii Water Resources Regional Study, April 1975). If a plentiful supply of inexpensive water could be developed, the Big Island Resource Conservation and Development Council believes that Kamaoa-Puueo could be developed into a productive area for sugarcane, truck crops or orchard uses (1978). A more conservative attitude is reflected in the "Hawaiian Home Lands General Plan" adopted by the State of Hawaii in April 1976. That plan recommends that the best potential for its 10,366 acres lies in grazing, and forage crops if additional water can be obtained. Under the plan, the current policy is to convert the Kamaoa-Puueo holdings from general lease to pastoral lease for eligible Hawaiians who would be permitted to construct single-family farm residences on their leased parcels. Funds were appropriated for preparing a development plan for the Kamaoa-Puueo area, but they lapsed before the plan could be prepared. The Kawaihae Ranch currently holds a revocable, year-to-year permit to utilize 10,190 acres for grazing purposes. The cattle are not bound within fenced areas, thus they often wander down into the boat launch ramp area.

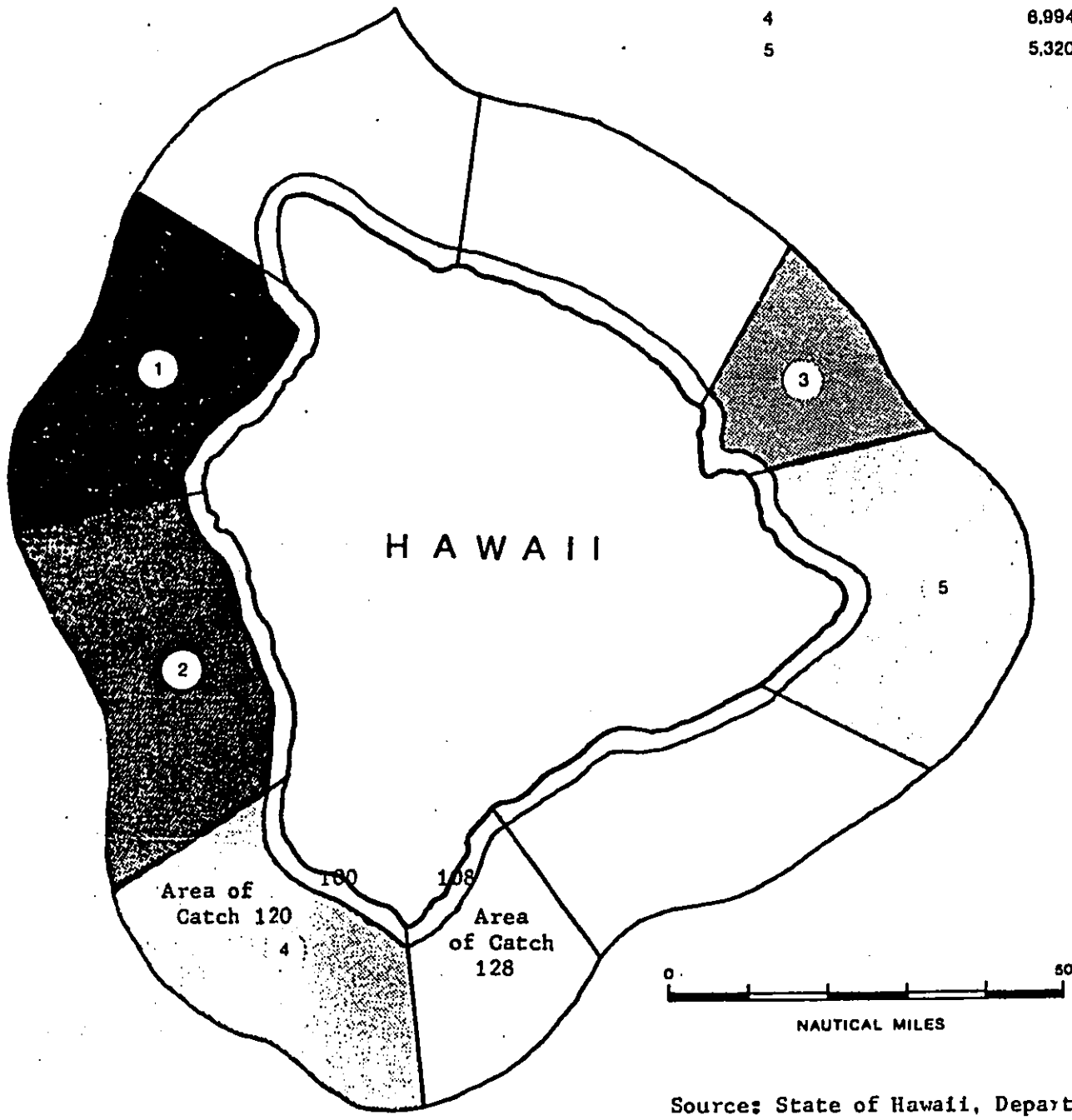
15. Approximately 1,000 feet west of Kaulana Bay lies an abandoned World War II airstrip and associated concrete pads that once anchored temporary buildings. This facility is now controlled by the Department of Hawaiian Home Lands, but could conceivably be developed into living quarters or a commercial base for the fishing and recreational activities that occur at Ka Lae.

16. No studies have been conducted to determine the long-range potential of the fisheries to the west and east of Ka Lae. The "Hawaii Coastal Zone Fisheries Management Study" produced by the State Division of Fish and Game in March 1980 reports that the waters west of Ka Lae ranked fourth in average annual catch of major bottom fishes from 1973-1977 (see Figure D-4). Table D-3 below indicates the top ranking species for the inshore and offshore area of catch to the west of Ka Lae (Areas 100 and 120, respectively) and the inshore and offshore areas of catch east of Ka Lae (Areas 108 and 128, respectively). Another fish not mentioned in the Fisheries Management Study is the ulua or jack crevalle which is supposed to be the most popular fish caught by shoreline fishermen, particularly those fishing off the cliffs on the west side of Ka Lae Lighthouse. The only statement that can be made about the long-term productivity of this area of converging currents is that it has been attracting native fishermen for over 1,200 years.

Figure D-3

AVERAGE ANNUAL CATCH OF MAJOR BOTTOM FISHES FROM 1973–1977

SEGMENT RANKING	CATCH (POUNDS)
1	24,398
2	12,631
3	7,629
4	6,994
5	5,320



Source: State of Hawaii, Department of Land and Natural Resources, Division of Fish and Game, "Hawaii Coastal Zone Fisheries Management Study," March 1980.

Table D-3. Top Ranking Fish by Total Pounds Caught in 1977, Island of Hawaii

Area	#1	#2	#3	#4	#5
100 (offshore)	opelu (Mackerel Scad)	ahi (Yellow Fin)	menpachi (squirrel fish)	aweoweo (red bigeye)	moana (goat fish)
108 (inshore)	opihi (limpet)	ahi	menpachi	opelu	ono (wahoo)
120 (offshore)	ahi	blue marlin	opakapaka (pink snapper)	opelu	kahala (amberjack)
128 (inshore)	ahi	ono	opakapaka	onaga (red snapper)	kahala

Source: State Department of Land and Natural Resources, Division of Fish and Game. "Hawaii Coastal Zone Fisheries Management Study," March 1980, Table 6.2.

17. Energy Requirements and Conservation. There are no electrical transmission lines leading into Kaulana Bay nor into the Ka Lae/South Point area in general. The nearest established power line leads into the former US Navy Pacific Missile Range Facility approximately 2 miles north of Ka Lae point.

18. Recreational Resources. In comparison with other districts in Hawaii County, there is greater overall demand for participation in inland-resource-based activities than for coastal-resource based activities (State Department of Land and Natural Resources (DLNR), "State Recreational Plan," September 1980). This reflects in part the attraction of Volcano National Park and the three public golf courses (the most of any district) located in Ka'u. Ka'u is the second-most popular destination area for visitors and the fourth most popular for residents, Kona being the most popular for both categories of participants. On the other hand, the greatest perceived need for facilities or perceived individual interest in Ka'u lies in fishing, swimming/sunbathing at a beach park, boating from slips and moorages, walking, jogging, and bicycling. DLNR surveys show a comparatively low demand for boating from launch ramps. There are currently two launch ramps in Ka'u. One is the State-owned facility at Kaulana Bay; the other is the privately-owned, but publicly accessible ramp at Punaluu. The State of Hawaii Department of Transportation holds no legal easement for public transit through Department of Hawaiian Home Lands to Ka Lae and Kaulana, but the Department of Hawaiian Home Lands has not made an issue of the lack of an easement. In South Kona District, there are also two launch ramps, one is a private one at Milolii and the other is a State-operated facility at Honaunau. At one time, the "Statewide Boat Launching Facilities Master Plan" prepared in 1972 for the State Department of Transportation by Koebig & Koebig recommended that a long-range plan be developed for a single-lane facility at Kaalualu Bay, about five miles northeast of Kaulana, to replace the ramp at Kaulana. The Department of Transportation no longer supports that recommendation. The Department currently supports the Master Plan recommendation to retain the Kaulana ramp to serve commercial fishermen, and to improve the access road to the site. There is also a remnant of a State pier within the State-owned, County-controlled parcel called Ka Lae Boat Landing and Park, but there are no plans to develop this area as a boat landing.

19. Other recreational resources in the Ka Lae-Kaulana Bay area include the unimproved Ka Lae Beach Reserve located along the western coast of Ka Lae (see above) and Mahana Bay (Green Sands) Beach, located two miles northeast of Kaulana Bay, which is only a potential resource. There are no present plans to develop either of these two beaches into formal recreational areas. Still, on most any week day, there may be ten or more auto campers scattered around Ka Lae, mostly families of shoreline and offshore fishermen. These numbers increase on weekends. The Ka Lae area is recognized as one of seven critical demand camping areas on Hawaii by the "County of Hawaii: Recreation Plan" prepared by Aotani & Associates in 1973. Some people also come to the Ka Lae area to see the ancient archaeological sites.

III. IMPACTS

20. South Point National Historical District. This discussion of the effects of the alternative plans on the National Register district serves as partial compliance with the Advisory Council on Historic Preservation's 36 CFR 800.9 and 800.13(b). Plans 1, 2, and 3 have been evaluated and found to have potentially adverse effects on archaeological features located on the rocky point bordering the eastern side of Kaulana Bay and perhaps the cultural features found in the embankment immediately adjacent to and east of the present ramp. These features are located within the South Point National Historical District which is listed on the National Register of Historic Places and is also designated as a National Landmark. The features on Kaulana Bay Point are probably associated with Kapalaoa Village which has been identified to be of precontact (1778) origin. There will be no change in or possibly even less probabililty of wave-induced erosion of feature A which abuts the existing launch ramp. If construction equipment such as trucks and cranes must maneuver along the eastern bank of Kaulana Bay to dredge the entrance channel and part of the turning basin for all three plans and to place stone to construct the breakwater for Plan 1, then there is a high probability of direct damage to or destruction of some of the archaeological features identified on Figure D-3. Since the point is also allegedly kapu or tabu, any major disturbance to the structures on the point may be culturally unacceptable to local residents. It is conceivable that the construction equipment may be able to maneuver within severely restricted paths and zones which would serve to isolate the equipment from the surface archaeological features, but placing such restrictions on a construction contractor may not be feasible. It is likely therefore the construction of Plan 1 would result in unavoidable damage to or destruction of some of the aforementioned archaeological features.

21. Construction of Plans 2 and 3 would be planned to avoid most, if not all, contact with any of the archaeological features by directing the contractor build temporary moles extending from the western edge of the bay. The dredging and rock laying equipment would then operate from these moles without having to maneuver directly on Kaulana Point. Further consideration will be given to temporarily fence off the sites adjacent to and east of the existing ramp to protect them from construction activities. For reasons discussed in the Main Report, no other sites in the study area were considered to satisfactorily achieve the planning objectives nor did they meet desires of the resident Ka'u fishermen. The construction of a breakwater does introduce a new visual element into the physical and cultural landscape of Kaulana Bay [36 CFR 800.3(b)], but it is reasoned that the function of the breakwater and improved navigational facilities at Kaulana Bay is in keeping with the prehistoric and

historic offshore fishing tradition at Ka Lae. Thus, the visual intrusion of the breakwater is not considered adverse.

22. The State Historic Preservation Officer and the Advisory Council on Historic Preservation concur with the recent archaeological reconnaissance survey that no adverse impacts on existing archaeological features are anticipated with the implementation of plan 3 (Recommended Plan). These agencies have also indicated informally that because cultural features are not likely to be found immediately west of the archaeologically surveyed area within 250 to 300 feet west of the Bay, the placement of dredged material there and the subsequent construction of a parking area by the State of Hawaii Department of Transportation are likewise not anticipated to have any effect on subsurface archaeological sites. If any surface or subsurface archaeological sites or materials are uncovered during construction, construction activities in the vicinity will be temporarily halted, the find left undisturbed and the State Historic Preservation Officer notified.

23. Urban and Community Impacts. Any navigational improvements to the Kaulana Bay boat launch ramp under either Plans 1, 2, or 3 are expected to have no direct measurable effect on population growth or composition in Ka'u District. The isolation of the launch ramp and the normal roughness of the offshore water is not expected to attract many new recreational boaters and fishermen, particularly those who would permanently relocate to the Ka'u District. Nevertheless, a gradual growth in some of the district's existing new residential developments at Ocean View Estates, Discovery Bay, and C. Brewer's resort at Punaluu and Ninole can be anticipated over the next twenty years and some of the new residents probably will utilize the improved boat launch ramp. Neither is the improved boat ramp expected to have greatly significant effects on increased employment and income levels in the fishing, boating and related industries in Ka'u. There will be some direct effect as discussed in the Evaluation Appendix F, but the effect will be relatively insignificant compared with the tourist and agricultural sectors or the Ka'u and Hawaii County economy as a whole. If a fishing industry can develop on the scale of Stan Shimizu's Fishery out of Honaunau, Kona, an example of a small entrepreneur made good, then the effects on local employment and income levels will be more pronounced. Full-time and part-time commercial fishing out of Kaulana Bay should remain an occupation confined primarily to local Japanese, Filipino and Hawaiians. The existing ramp at Kaulana Bay is already heavily used by commercial fishermen from all parts of the Big Island especially Hilo, Kona and the Ka'u areas. The existing traffic pattern and usage is expected to continue after completion of the proposed navigation improvements.

24. Life, Health, and Safety Impacts. Improved launching conditions should substantially reduce personal injuries and the likelihood of being unable to recover boats in severe conditions offshore. Personal risk and possibility of damage to boats moored on the western side of Ka Lae may not be substantially altered even with the improved conditions at Kaulana, depending on how long fishermen chose to remain near the good fishing spots there even when sea conditions begin to turn dangerous.

25. If electrical power and telephone service are provided at the new launch ramp site, the distance over which these utilities cover will probably involve the local sponsor spending a relatively large sum of money in addition to its

share of construction costs. Bringing utilities into the isolated South Point area could have adverse visual effects on the wild natural landscape. It would be preferable to minimize any shoreside development to maintain the natural landscape of the surrounding area. At the present time, shoreside plans developed by the Department of Transportation include bringing potable water into the Kaulana area from a nearby county-owned tank, placement of portable sanitary facilities, and the improvement of the parking area and access road to handle the anticipated increase in trailer-vehicle traffic. The 1972 "Statewide Boat Launching Facilities Master Plan" recommends that consideration be given by the State to improve portions of the access road. Since electric utilities could have an adverse visual effect on the wild, natural landscape of the area, navigational aids will be battery operated to avoid the necessity and cost of bringing power lines into Kaulana Bay and to conserve energy. A supply of potable water and the provisions for restroom facilities will be developed near the county-owned water tank, a few thousand feet from the existing ramp. Since the landscape in this area has already been modified, the placement of portable sanitary facilities and water pipes will have only minimal visual impacts on the adjacent natural surroundings. Emergency telephone service may also be deemed a necessity, but consideration should be given to providing a CB radio for emergency purposes to avoid the high cost in money and energy to bring telephone lines several miles from existing lines to Kaulana Bay.

26. Impacts on Long-Term Productivity and Displacements of People, Business and Farms. There will be no displacements of any people, businesses, or farms as a result of implementing any of the alternatives. There should be no direct or indirect effect on the long-term productivity of the surrounding agricultural lands since their future is controlled by the State Department of Hawaiian Home Lands. It is not known what effect there will be on the long-term productivity of the nearshore and offshore fishery at Ka Lae. Ka'u residents have shown some concerns about outsiders coming in to pick crab and opihi (limpets) off the strand should an improved boating facility be provided.

27. Energy Requirements and Conservation. Energy consumption for construction of the project can be estimated by the amount of fuel required to run construction equipment including trucking of concrete, stone and other supplies from Hilo, dredging the entrance channel and turning basin, and constructing the breakwater. The fuel estimates were based on the assumption that 50 percent of the project direct costs would be for equipment and that 15 percent of the equipment cost would be for diesel fuel and 5 percent for lubrication oil. The volume of fuel used under Plan 1 was calculated to about 141,000 gallons @ $.90/gallon. The volume of fuel used under Plans 2 and 3 amounted to about 50,000 gallons.

28. The indirect energy costs of bringing in electricity or telephone utilities five miles or more from their present extensions into the Kamaoa-Puueo plain would be extremely high. Other utilities such as potable water will have minimal costs since their location will be situated near the county-owned water tank. The provision of utilities to the remote Kaulana Bay area could induce further development which would be out of character with the nature of the National Historic District and the bleak, wind-swept cape. It is suggested that no major utilities be brought into the project site and that navigational aids be restricted to battery-operated units. Potable water and portable restroom facilities will be located near the county-owned tank where the surrounding landscape has already been modified.

KAULANA BAY

NAVIGATION IMPROVEMENTS

SOUTH POINT, ISLAND OF HAWAII

NATURAL RESOURCES

AND

FISH AND WILDLIFE COORDINATION

APPENDIX E

APPENDIX E

NATURAL RESOURCES AND FISH AND WILDLIFE COORDINATION APPENDIX

TABLE OF CONTENTS

a. Marine Resources

The substratum throughout most of Ka'u coastline consists of hard lava rock covered in places by accumulation of silt and coral rubble. A number of bays along this coastline contain scattered massive heads of Porites coral. Coral growth elsewhere in these bays are limited to scattered Pocillopora colonies possibly a consequence of the constant wave action occurring in these areas. A variety of common reef fish and marine benthic invertebrates including gastropod mollusks, sea urchins, sea cucumbers and crabs are present along the coastline. Table E-1 provides a list of marine fishes and invertebrates observed at two sites by Corps of Engineers biologists during a field trip in June 1980. Green sea turtles are occasionally observed offshore but no known nesting beaches are located in the Ka'u area. Near shore areas along the Ka'u coast comprise an important green turtle foraging area. The endangered humpback whale has also been observed along the Ka'u coast in transit to or from the shallow shoals that comprise their preferred wintering habitat, primarily Penguin Banks and the area between Maui, Lanai and Molokai.

b. Vegetation

The coastal area of the Ka'u District is characterized by sparse vegetation consisting primarily of indigenous strand plants such as ilima, *Pa'u-o-Hiiaka* and beach morning glory with patches of Bermuda grass occurring in backshore areas. A list of plant species observed at two locations along the Ka'u coast by Corps biologists is contained in Table E-1.

c. Wildlife

Wildlife species in the Ka'u District are also limited in abundance and diversity. Shorebirds including the golden plover, wandering tattler and ruddy turnstone probably utilize available shallow feeding habitat in the area. Passerine birds, field mice, and rats are also found in this area. Domestic cattle are raised on the extensive pasture lands of Southpoint. Other domestic animals may occasionally be found in the area.

d. Endangered Species

Both the threatened green sea turtle (Chelonia mydas) and endangered humpback whale (Megaptera novaeanglae) have been observed in coastal waters adjacent to the project area. The U.S. Fish and Wildlife Service Endangered Species Office has indicated that the endangered Hawaiian hoary bat may occur in the project area. If this is the case, it would be transiting the airspace above the bay while feeding off the Ka'u coast. The project area is barren and otherwise devoid of roosting habitat for the Hawaiian bat. Hence the proposed project would have no impact on this species. Two endemic plants occurring in the Ka'u region are candidates for listing on the Federal list. As candidates these species are presently being reviewed by the FWS for consideration to propose and list as endangered or threatened. Neither of these species were observed in the project area designated dredged material disposal area during a detailed survey conducted in August 1981, by Ms. Lani Stemmermann of the University of Hawaii Botany Department.

e. Air Quality

No air quality data are available from the Southpoint area. Because of its distance from the highway and other sources of particulate emissions, air quality in the study area is presumed to be good.

f. Coastal Water Quality

Water quality data are not available from the study area. The waters are considered perennially dry open coastal waters receiving very little influence from terrestrial sources. However, during trade wind and Kona storm conditions, water in Kaulana Bay and adjacent nearshore areas are generally turbid resulting from suspended particulate matter.

g. Marine Mammals

The bottlenose dolphin (Tursiops gilli) has been sighted in coastal waters adjacent to the study area. Two strandrings have been recorded in the area involving a killer whale (Orcinus orca) and a gooseneck whale (Ziphius cavirostris). Humpback whales (Megaptera novaeangliae) have also been observed off the Ka'u coast. No marine mammals are known to appear in the harbor project area.

h. Wildlife Refuges. No national or local wildlife refuges occur within the project area.

i. Marine Sanctuaries. No marine sanctuary has been designated in or adjacent to the project area.

j. Harvestable Shellfish Beds. No harvestable shellfish beds occur within or adjacent to the project area.

k. Migratory Birds. No migratory bird breeding or nesting areas are located in the project area.

l. Wetlands. No wetlands occur in or immediately adjacent to the project area. An anchialine pond is located approximately a mile from Kaulana Bay at Lua O Palahemo. The pond is the result of a flooded lava tube. Lua O Palahemo has been nominated for inclusion in the State Natural Area Reserve System.

TABLE E-1
FLORA AND FAUNA OBSERVED AT KAULANA AND PUNALUU BAYS

A. Vegetation

Family Genus species	KAULANA	PUNALUU
Anacardiaceae *Schinus terebinthefolius*		X
Boraginaceae *Heliotropium* spp. *Messerschmidia argentea*	X	X
Convolvulaceae *Impomoea pes-caprae* *Jacquemontia sandwicensis*	X X	X
Leguminosae *Seucaena leucocephala*		X
Malvaceae *Sida fallax*	X	
Palmae *Cocos nucifera*		X
Passifloraceae *Passiflora* spp.	X	X
Gramineae *Cynodon dactylon*		X

B. Marine Fishes

Family (Common name) Genus species	KAULANA	PUNALUU
Engraulidae (Nehu) *Stolephorus purpureus*	X	
Synodontidae (Lizardfish) *Saurida gracilis*	X	
Muraenidae (Moray eel) *Gymnomuraena zebra* *Gymnothorax undulatus*	X	X X
Holocentridae (Squirrelfish) *Myripristis* sp.		X
Mugilidae (Mullet) *Mugil cephalus*		X

TABLE E-1 Continued
FLORA AND FAUNA OBSERVED AT KAULANA AND PUNALUU BAYS

Kuhliidae (Aholehole)		
Kuhlia sandvicensis		X
Apogonidae (Cardinalfish)		
Apogon spp.	X	X
Mullidae (Goatfish)		
Mulloidichthys flaviolineatus	X	X
Parupeneus multifasciatus	X	X
Kyphosidae (Rudderfish)		
Kyphosus bigibbus		X
Chaetodontidae (Butterflyfish)		
Chaetodon miliaris		X
C. quadrimaculatus	X	X
C. auriga		X
C. lunula	X	
Cirrhitidae (Hawkfish)		
Paracirrhites forsteri	X	X
P. arcatus		X
Cirrhites pinnulatus	X	X
Pomacentridae (Damselfish)		
Plectroglyphidodon johnstonianus	X	X
Chromis sp.	X	X
Abudefduf abdominalis		X
Labridae (Wrasse)		
Labroides phthirophagus		X
Chelinus rhodochrous		X
Thalassoma fuscum	X	X
T. dupperrey	X	X
Coris gaimard		X
Stethojulis balteata	X	X
Gomphosus varius	X	

B. Marine Fishes (Cont'd)

Family (Common name) Genus species	KAULANA	PUNALUU
Scaridae (Parrotfish)		
Scarus dubius	X	X
S. perspicullatus	X	X
Zanclidae (Moorish idol)		
Zanclus cornutus		X

TABLE E-1 Continued
FLORA AND FAUNA OBSERVED AT KAULANA AND PUNALUU BAYS

Acanturidae (Surgeonfish)		
Acanthurus triostegus	X	X
A. nigrofuscus	X	X
A. dussumieri		X
Naso unicornis (skeletal remains only)	X	
Blenniidae (Blennys)		
Cirripectes variolosus		X
Plagiotremus goslini		X
Canthigasteridae (Sharpback puffer)		
Canthigaster jactator		X

C. Marine Invertebrates

Phylum Family (Common name) Genus species	KAULANA	PUNALUU
Porifera (Sponges)		
2 unknown species	1 species	1 species
Coelenterata		
Poritidae (Lobe coral)		
Porites lobata	X	X
Pocilloporidae (Finger coral)		
Pocillopora meandrina	X	X
Annelida		
Terebellidae (Spaghetti worm)		
Lanice sp.		X
Mollusca		
Neritidae (pipipi)		
Nerita picea	X	X
Littorinidae (Periwinkle)		
Littorina pintado	X	X
Thaididae (Drupe)		
Drupa ricina	X	
Morula sp.	X	
Conidae (Cone shell)		
Conus flavidus		X
Vermetidae (Tube worm)		
Serpulorbis variabilis	X	X
Crustacea		
Grapsidae (Rock crab)		
Metapograpsus messor		X
Grapsus grapsus	X	X

TABLE E-1 Continued
FLORA AND FAUNA OBSERVED AT KAULANA AND PUNALUU BAYS

Echinodermata		
Asteroidea (Sea star)		
Linckia multifora		X
Echinoidea (Sea urchin)		
Echinometra mathaei		X
E. oblongata		X
Diadema paucispinum	X	X
Echinothrix spp.		X
Colobocentrotus atratus	X	X
Heterocentrotus mammilatus		X
Tripneustes gratilla		X
Eucidaris metularia		X
Holothuroidea (Sea cucumbers)		
Holothuria atra	X	X
H. hilla	X	X
Actinopygia mauritiana	X	X
Ophiuroidea (Brittle star)		
2 unidentified species	2 species	2 species

II. FISH AND WILDLIFE COORDINATION

a. Fish and Wildlife Coordination Act of 1958.

In accordance with the Fish and Wildlife Coordination Act of 1958 (P.L. 85-624) the US Fish and Wildlilfe Service was officially consulted. Figure E-1 indicates the Fish and Wildlife coordination input requirements at the various stages of the study.

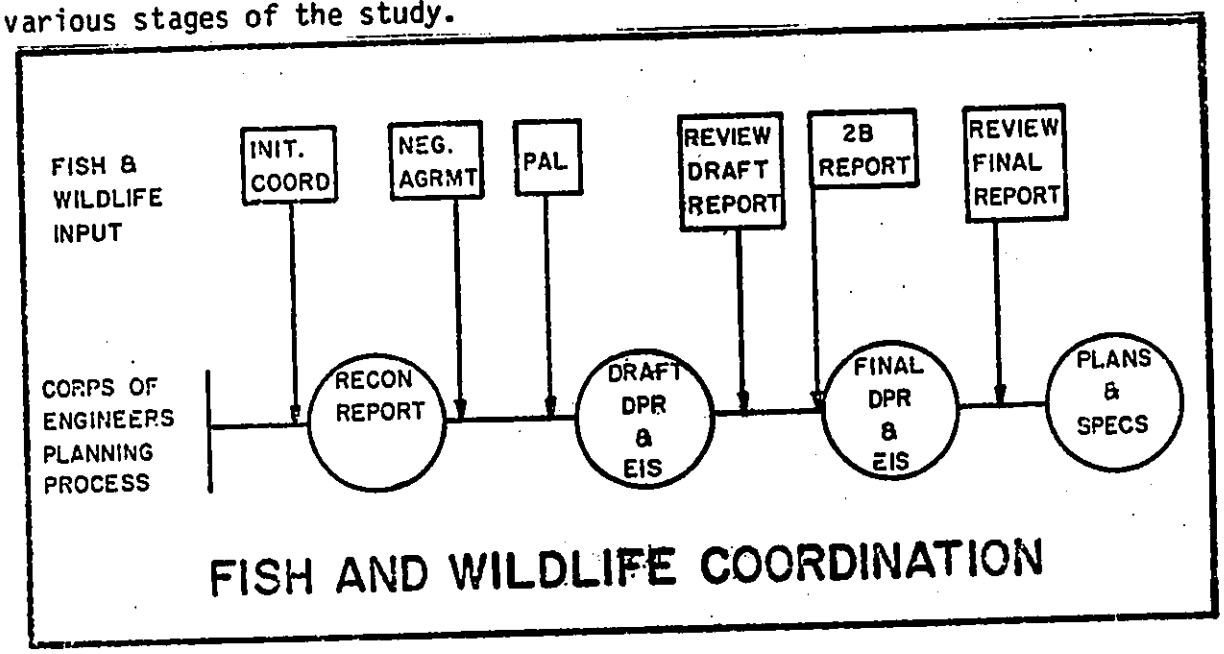


Figure E-1

A Planning Aid Letter (PAL) report was provided to the Corps of Engineers on 24 August 1979 and included in this appendix. This planning aid evaluated the construction of navigation improvements at Kaulana Bay. A Fish and Wildlife Coordination Act (FWCA) Report addressing effects of the selected plan on Fish and Wildlife Resources was submitted on 4 September 1981. The report recommends fish and wildlife conservation and development, mitigation and/or compensation for habitat and resource losses associated with our proposed plan. The FWCA report is included in Section C below.

b. Summary of Requirements.

FWL Input	Time Table
PAL	Completed January 1981
Review Draft Report and EIS	45 days after receipt of draft report
Section 2(b) Report (Fish and Wildlife Coordination Act Final Report)	30 days after notification of the selected plan.

c. Fish and Wildlife Coordination Act Final Report.

United States Department of the Interior

FISH AND WILDLIFE SERVICE
300 ALA MOANA BOULEVARD
P.O. BOX 50167
HONOLULU, HAWAII 96850

IN REPLY REFER TO:
ES
Room 6307

SEP 4 1981

Colonel Alfred J. Thiede
U.S. Army Engineer District Honolulu
Building 230
Fort Shafter, Hawaii 96858

Re: Kaulana Bay
Small Boat Harbor
County of Hawaii, Hawaii

Dear Colonel Thiede:

This is the U.S. Fish and Wildlife Service's Final Report regarding plans by the Honolulu District of the U.S. Army Corps of Engineers to construct a small boat harbor at Kaulana Bay, Island of Hawaii, Hawaii. This report has been prepared under the authority of and in accordance with the provisions of Section 2(b) of the Fish and Wildlife Coordination Act (48 Stat. 401, as amended; 16 U.S.C. 661 et seq.) and other authorities mandating Department of the Interior concern for environmental values. It is also consistent with the intent of the National Environmental Policy Act.

This study was authorized by Section 107 of the River and Harbor Act of 1960 (Public Law 84-645) as amended. It was restricted to a few primary alternatives, and has not yet been approved for construction. The goals of the Service in its study involvement were to: evaluate the impact each principal alternative would have on fish and wildlife resources, their habitat, and their utilization by the public; identify and evaluate the least environmentally damaging alternative; and recommend methods for preserving, compensating and enhancing these resources.

The Service's findings are based on project data furnished prior to August 31, 1981. The biological data was obtained in cooperation with the Fisheries Division of the State of Hawaii Department of Land and Natural Resources. Prior Service reports and Planning Aid Letters consist of a preliminary 2(b) report dated June 30, 1981 and a Planning Aid Letter dated January 27, 1981, and are superceded by this report.

This document has been prepared by William B. Lennan II using various reports provided by the Corps, a project site inspection by Service biologists and other relevant data concerning the project area.

CONSERVE AMERICA'S ENERGY

Save Energy and You Serve America!

DESCRIPTION OF THE PLANNING AREA

Kaulana Bay is a small indentation on the southern coast of the island of Hawaii, approximately 1 mile east of South Point (figure 1). It is approximately 200 feet wide and 265 feet long. A concrete boat ramp at the foot of the bay is used as a launching site for small fishing vessels.

The area is somewhat isolated and does not appear to receive much water-oriented recreational use except that which is boating related. The bay is a popular launch site for commerical fishermen.

On January 6, 1981, Service biologists conducted a snorkeling survey of the bay. Twenty-two species of fish were identified and several unidentified species were seen (Table 1). There were numerous small heads of coral (Porites lobata) and other common Hawaiian invertebrates (Table 1). The tide pools adjacent to the bay contained the common blennie Istiblennius zebra and various species of algae, the most prominent of which was Caulerpa racemosa. The submerged portion of the project area is not unique as similar habitat exists throughout the Kona coast.

No birds or other terrestrial vertebrates were seen during the survey and the vegetation consists of common native and exotic low plants, except for two rare species identified in the Service's Section 7 Consultation Report. The rare plants are grazed by cattle and consequently are somewhat difficult to identify. Their distribution is patchy, with large areas between colonies or isolated individuals.

PLAN DESCRIPTION

The final plan selected by the Corps of Engineers has been identified as Plan 3 in previous reports. It was concurred in by the public attending the public meeting on July 14, 1981. This plan consists of dredging a 135-foot-long, 80-foot to 60-foot-wide tapered, and 8.5-foot-deep entrance channel; a 200-foot-long by 100-foot-wide, and 6.5-foot-deep turning basin, and constructing a 155-foot-long main breakwater with a +11.5-foot crest elevation at the head and a +8.0-foot crest elevation at the trunk. The breakwater would provide protection for the new launch ramp. This plan utilizes the existing natural channel and a new single-lane launch ramp (figure 2).

BIOLOGICAL & SOCIOECONOMIC EVALUATIONS

FUTURE WITHOUT PROJECT

Aquatic and Terrestrial Biological Assessment

Without the project, there should be no change in the aquatic or terrestrial environment in the forseeable future.

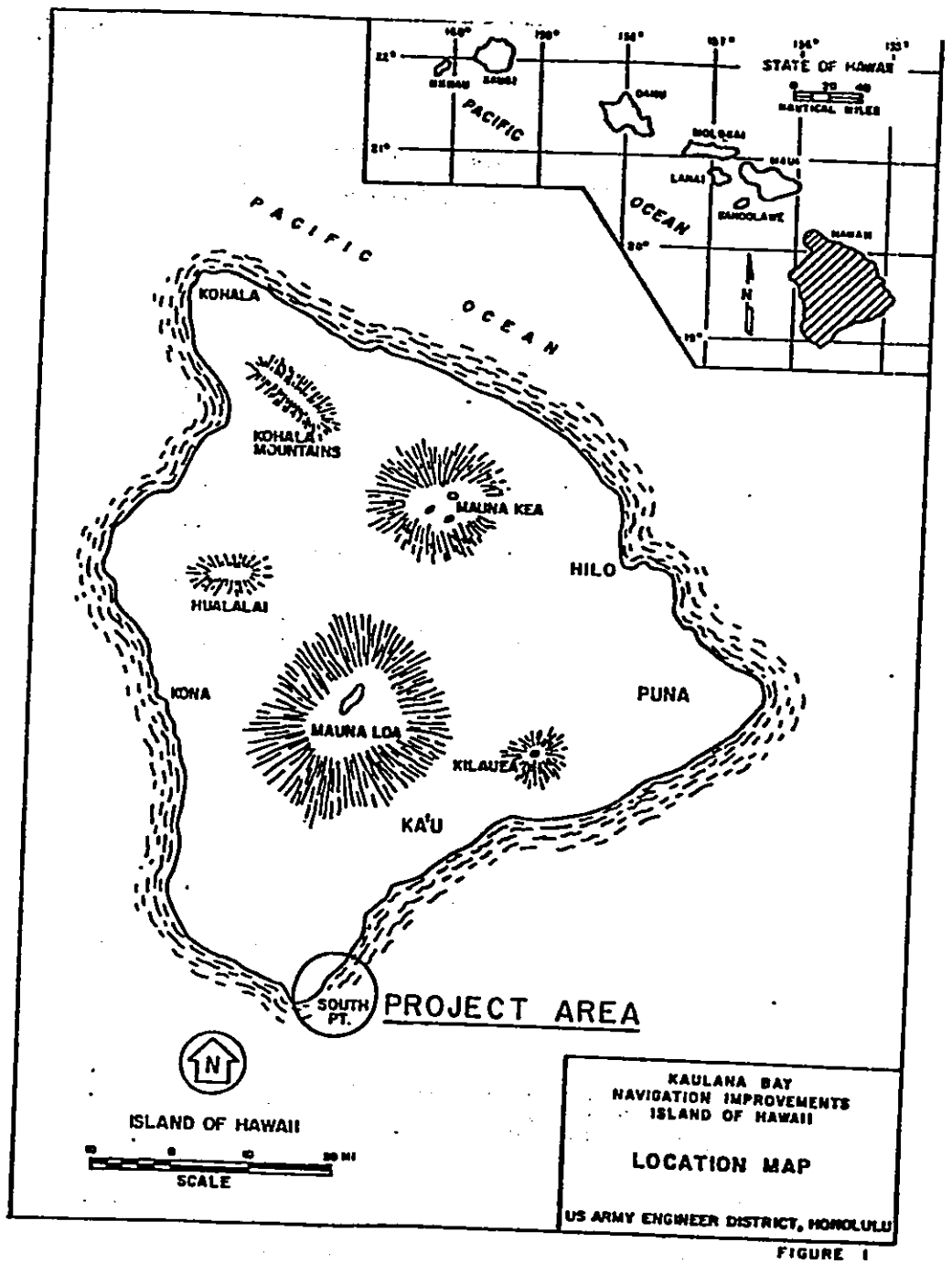


FIGURE 1

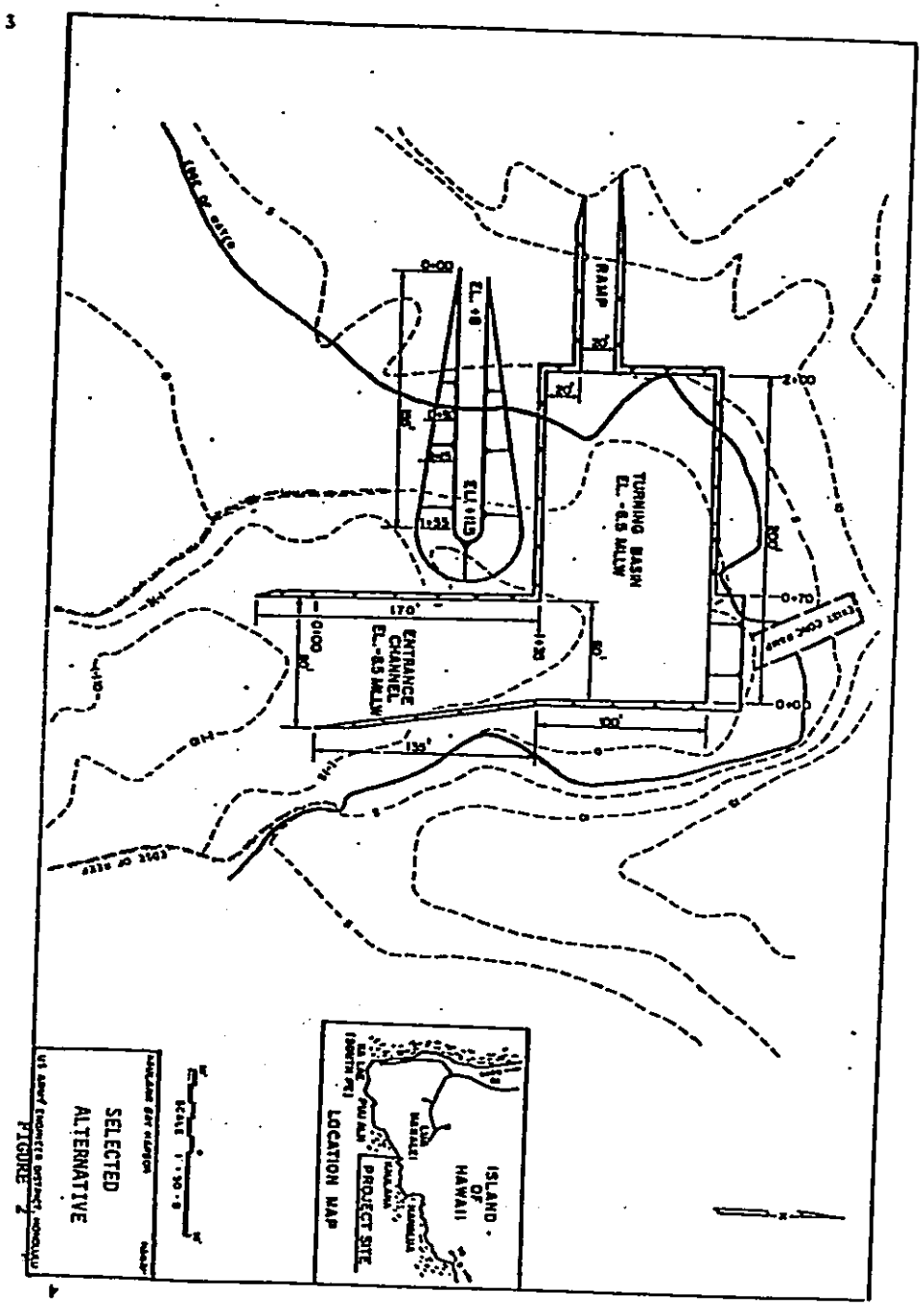


FIGURE 2

Table 1 Checklist of fishes and invertebrates observed during a survey January 6, 1981 of Kaulana Bay for the Kaulana Bay Navigation Improvement Project

FISHES

ACANTHURIDAE

Acanthurus dussumieri Cuvier & Valenciennes
Acanthurus nigrofuscus (Forsskal)
Acanthurus triostegus sandvicensis (Linnaeus)
Naso literatus (Bloch & Schneider)

BALISTIDAE

Rhinecanthus rectangulus (Bloch & Schneider)

BLENNIIDAE

Isteblennius zebra (Vaillant & Sauvage)

CHAETODONTIDAE

Chaetodon quadrimaculatus Gray
Chaetodon ornatissimus Cuvier & Valenciennses

GOBIIDAE

Unidentified Goby Sp. 1
Unidentified Goby Sp. 2

KYPHOSIDAE

Kyphosus cinerescens (Forsskal)

LABRIDAE

Coris gaimardi (Quoy & Gaimard)
Stethojulius balteata (Quoy & Gaimard)
Thalassoma duperrey (Quoy & Gaimard)
Thalassoma fuscum (Lacepede)
Unidentified Wrasse sp. 1
Unidentified Wrasse sp. 2

MULLIDAE

Mulloidichthys samoensis (Gunther)
Parupeneus multifasciatus (Quoy & Gaimard)
Parupeneus porphyreus (Jenkins)

Table 1 (Continued)

POMACENTRIDAE

Abudefduf abdominalis (Quoy & Gaimard)
Abudefduf imparipennis (Vaillent & Sauvage)
Abudefduf sordidus (Forskaal)
Pomacentrus jenkinsi Jordan & Everman
Unidentified Pomacentridae

SYNODONTIDAE

Saurida gracilis (Quoy & Gaimard)

ZANCLIDAE

Zanclus cornutus (Linnaeus)

INVERTEBRATES

CRUSTACEA

Unidentified Hermit Crabs
Unidentified Xanthid Crabs

MOLLUSCA

Drupa sp.
Nerita sp.

ECHINODERMATA

Actinopyga mauritiana (Quoy & Gaimard)
Holothuria atra Jaeger

Socioeconomic Assessment

Without the project, use by boaters will probably remain at the present level. The amount and kinds of fish landed (Table 2 and Table 3) will probably not change. The value of the catch may increase due to inflation.

FUTURE WITH THE PROJECT

Aquatic and Terrestrial Biological Assessment

The biological future with the project is not expected to be significantly different than without the project.

Socioeconomic Assessment

The project is expected to significantly increase the percentage of time Kaulana Bay can be used for launch and recovery of boats, especially fishing boats. This will result in an increased annual catch and increased income for the fisherman.

SUMMARY OF IMPACTS

Aquatic

The completed project is not expected to have a significant adverse impact on the area. Construction activities will destroy some corals and other benthic organisms and some fish will be displaced by loss of coral habitat. Because the area is not unique, and similar habitat and organisms exist throughout the Kona coast, this loss is not considered significant. In fact, the breakwater would provide additional interstitial habitat and could thereby increase the biological diversity of the bay. Benthic organisms will recolonize the bay after dredging, and most near-shore fishes will return.

Terrestrial

Heavy construction equipment and other vehicles will destroy many of the low plants in the immediate project area and dredge spoil disposal site. The possible presence of two rare plants (Sesbania hawaiiensis and Portulaca hawaiiensis) in the Kaulana Bay area has been noted in the project Reconnaissance Report dated January 8, 1980 and in the Section 7 Consultation Report provided by the Service on January 20, 1981.

RECOMMENDATIONS

Since the project will have minimally adverse impacts, the U.S. Fish and Wildlife Service does not recommend mitigation for the completed project. Our principal concern is to insure that the two rare plants are not damaged by project construction activities. The Service therefore recommends that prior to the start of construction, a detailed survey be conducted to determine if individuals of the two rare plant species are in the area to be

Table 2

Catch for Area Around South Point
May 1978 through August 1980

Species	Weight (lbs.)	Sale Price ($)
FISH		
Acanthuridae		
Acanthurus dussumieri *	342	185.58
Acanthurus nigroris	631	599.85
Acanthurus triostegus	949	1,817.72
Acanthurus xanthopterus	239	89.03
Ctenochaetus strigosus	527	368.41
Naso unicornis	291	111.63
Acanthuridae-species not indicated	320	271.72
Albulidae		
Albula vulpes	169	203.52
Apogonidae		
Apogon synderi	592	513.26
Balistidae-species not indicated	100	18.54
Bothidae		
Bothus spp.	2	4.50
Carangidae		
Decapterus pinnulatus	31,627	24,997.59
Elagatis bipinnulatus	867	522.33
Scomberoides sancti-petri	8	7.65
Seriola dumerilii	5,150	3,619.60

Species	Weight (lbs.)	Sale Price ($)
Trachurops crumenopthalmus	2,778	2,548.45
Carangidae-species not indicated	4,850	7,162.87
Chanidae		
Chanos chanos	11	9.50
Clupeidae		
Etrumeus micropus	2	1.00
Coryphaenidae		
Coryphaena hippurus	4,059	6,426.72
Elopidae		
Elops hawaiensis	3	.45
Empylidae		
Gempylus serpens	114	46.89
Gempylidae		
Ruvettus pretiosus	153	38.25
Holocentridae		
Myripristis chryseres	3	6.00
Myripristis spp.	12,270	20,854.83
Holocentridae-species not indicated	528	735.90
Istiophoridae		
Istiophorus orientalis	96	81.00
Makaira ampla	13,123	4,848.97
Makaira audax	786	601.15
Makaira indica	985	295.52
Tetrapterus angustirostris	210	154.18

Species	Weight (lbs.)	Sale Price ($)
Kyphosidae		
Kyphosus cinerascens	507	337.69
Kuhliidae		
Kuhlia sandvicensis	359	714.03
Labridae		
Bodianus bilunulatus	156	151.14
Initistius pavoninus	11	19.28
Labridae-species not indicated	13	19.72
Lutjanidae		
Aphareus rutilens	2,274	7,620.96
Aprion virescens	4,284	7,862.99
Etelis carbunculus	913	2,299.36
Etelis marshi	1,667	5,715.50
Lutjanus kasmira	1,715	1,517.15
Lutjanus vaigiensis	57	143.53
Pristipomoides microlepis	11,464	22,942.78
Pristipomoides sieboldii	974	1,907.05
Rooseveltia brighami	653	1,380.48
Mugilidae		
Mugil cephalus	11	22.00
Neomyxus chaptalii	135	262.40
Mullidae		
Mulloidichthys auriflamma	464	474.70
Mulloidichthys samoensis	35	54.58
Parupeneus multifasciatus	718	1,575.71

Species	Weight (lbs.)	Sale Price ($)
Parupeneus pleurostigma	1	1.50
Parupeneus porphyreus	887	2,747.18
Polynemidae		
Polydactylus sexfilis	142	348.19
Pomacentridae		
Abudefduf sordidus	53	32.45
Priacanthidai-species not indicated	800	934.32
Scaridae-species not indicated	2,135	1,770.88
Scombridae		
Acanthocybium solandri	33,768	51,487.09
Euthynnus yaito	696	565.34
Katsuwonus pelamis	2,972	2,074.89
Neothunnus macropterus	203,716	254,816.28
Thunnus alalunga	1,650	1,308.93
Thunnus orientalis	3,902	9,452.25
Scorpaenidae		
Scorpaenopsis spp.	438	587.95
Serranidae		
Epinephelus quernus	2,093	3,141.45
Sparidae		
Monotaxis grandoculis	9	10.50
Sphyraenidae		
Sphyraenidae	299	490.91
Sphyraena barracuda	1,093	1,112.61
Sphyraena helleri		

Species	Weight (lbs.)	Sale Price ($)
Xiphiidae		
Xiphias gladius	985	1,218.60
INVERTEBRATES		
CRUSTACEA		
Podopthalmus vigil	68	244.00
Panulirus spp.	8	29.75
MOLLUSCA		
Octopoda-species not indicated	37	36.00
Decapoda-species not indicated	859	581.52
Cellana exerata	456	961.00
MISCELLANEOUS		
Not classified by taxonomic division	1,154	1,318.01
Grand Total	366,416	466,895.28

Table 3

Catch of Aquarium Fishes By a Single Fisherman During Four Dives Around South Point Between November 1980 and Present

Species	Number Caught
Holocanthus arculatus	4
Centrotype potteri	32
Centrotype flammeus	3
Hemitaurichthys zoster	6
Forcipiger flavissimus	10
Forcipiger longirostris	39
Chaetodon fremblii	10
Chaetodon corallicola (Kleini)	5
Chaetodon unimaculatus	2
Chaetodon quadrimaculatus	19
Chaetodon multicinctus	2
Chaetodon tinkeri	45
Labroides phthirophagus	13
Thalassoma duperreyi	15
Anampses rubrocaudatus	6
Halichoeres ornatissimus	6
Acanthurus achilles	86
Naso lituratus	6
Ctenochaetus hawaiiensis	40
Zebrasoma flavescens	180
Xanthichthys ringens	14
Canthigaster jactator	7

Table 3 (Continued)

Ostracion lentiginosus	3
Zanclus cornutus	32

Total Value Approximately $3,500.00

utilized by construction equipment and a similar survey be conducted in the dredge spoil disposal site and quarry or borrow site. Upon request, a Service botanist can be provided to assist in the survey. Additionally, we recommend the following precautions be taken to protect water quality during construction:

1. Extreme care will be taken to insure that no debris, petroleum products, or other deleterious materials be allowed to fall, flow, leach or otherwise enter the water.

2. All construction activities within and adjacent to the water will be conducted so as to minimize turbidity and control erosion.

3. If a bucket dredge is used, there shall be no stockpiling of materials in the water to obtain full buckets.

4. On land, spoil disposal will be conducted behind maintained berms above the influence of the tide. Only clean runoff water from the spoil disposal area will be allowed to re-enter the waterway.

5. Spoil disposal areas will be protected against erosion by vegetative cover or other suitable means.

If due caution is exercised during construction, the project should have a minimal adverse impact on the biota of the area.

We appreciate this opportunity to comment.

Sincerely yours,

Pacific Islands Administrator

REFERENCES

Devaney, D.M., and Eldredge, L.G. 1977. Reef and Shore Fauna of Hawaii, Section I: Protozoa through Ctenophora. Bernice P. Bishop Museum Special Publication 64(1), Bishop Museum Press, Honolulu, Hawaii.

Edmundsen, C.H. 1946. Reef and Shore Fauna of Hawaii. Bernice P. Bishop Museum Special Publication 22. Bishop Museum Press, Honolulu, Hawaii.

Gosline, W.A. and Brock, V.E. 1960. Handbook of Hawaiian Fishes. University of Hawaii Press, Honolulu, Hawaii.

Hiatt, R.W. 1954. Hawaiian Marine Invertebrates. University of Hawaii, Honolulu, Hawaii.

Ludwig, G.M., et al. 1980. Summer Census of the Reef-fish Community of Waters Technical Report #32, Cooperative National Park Resources Studies Unit. University of Hawaii, Honolulu, Hawaii.

Magruder, W.H. and Hunt, J.W. 1979. Seaweeds of Hawaii. The Oriental Publishing Company, Honolulu, Hawaii.

Sanderson, S.L., et al. 1980. A comparison of two visual survey techniques for fish populations. Marine Affairs Coordinator, State of Hawaii, Honolulu, Hawaii.

Tinker, S.W. 1978. Fishes of Hawaii. Hawaiian Service, Inc., Honolulu, Hawaii.

KAULANA BAY

NAVIGATION IMPROVEMENTS

SOUTH POINT, ISLAND OF HAWAII

ECONOMIC ANALYSIS

APPENDIX F

APPENDIX F

ECONOMIC ANALYSIS

TABLE OF CONTENTS

LIST OF TABLES

APPENDIX F

ECONOMIC ANALYSIS

BENEFIT ANALYSIS

Benefits are estimated to accrue to the commercial fishing fleet using Kaulana navigation facility. These benefits basically result from the measured difference between conditions with and without the proposed plan of improvements. All of the proposed plans accomplish essentially the same physical results, and benefits attributable to the alternative plans do not differ measurably from each other. The existing fishing fleet of about 80 boats will experience benefits due to decreased damage, greater fish catch, and enhanced safety.

FISHING FLEET

The fishing fleet at Kaulana consist of about 80 boats, some full-time, some part-time, and come mainly from three districts. For congruency, all fishing boats at Kaulana are converted to equivalent full time fishing boats. Of the 66 boats from Ka'u-Kona District, 17 percent are full-time, and 83 percent are part-time averaging one trip per week. The 14 boats from Hilo average four months of the year fishing at Kaulana. The total equivalent full-time fishing boats equal 23 boats.

$$(66 \times 17\%) + (66 \times 83\% \times 52/365) + (14 \times 4/12) = 23 \text{ boats}$$

REDUCTION OF DAMAGES

Present users of the launch ramp experience destruction and damages to boats and launching equipment of about $74,700 per annum as detailed in Table F-1. All repairable damages are based on 23 equivalent full-time fishing boats and 55 percent of the fleet experiencing damages during a typical year.

It is difficult to accurately estimate the reduction in sustained damages with improved conditions. Damage reduction benefits are based on the assumption that damages incurred are proportional to the percent of time that conditions prohibit launching. Based on an engineering analysis of navigation at Kaulana, existing conditions preclude launching 40 percent of the time. With the proposed improvement, this is reduced to 15 percent of the time, resulting in average annual damages of $74,700 x 15/40 = $28,000 per year for a saving of $46,700 per year.

TABLE F-1. DAMAGES AT KAULANA RAMP

Description	Damage Estimated
Damage to propellers and housing. Average cost $160 to $250 each. Average three per boat per year [($160 + $250) (1/2) (3) (23) (55%)]	$ 7,800
Gimbal Housing. Average two break each month of total fleet at an average cost per break of $1,000 [(2) (12) ($1,000) (55%)]	13,200
Bent or broken trailer spindal (axle and housing) from bouncing with waves. Average three to four times per trailer per year. Average cost $150 per trailer damaged per year [(3 + 4) (1/2) ($150) ($23) (55%)]	6,600
Damage to truck pulling trailer while bobbing on ramp. Average $400 to $500 per damaged truck per four months. [(400 + 500) (1/2) (12/4) (23) (55%)]	17,100
Damaged bottom of boat from bouncing at ramp with waves. Repairs done by owner.	10,500
Sub Total (repairable damages)	$55,200
Twenty-eight boats destroyed within the past 15 years while moored along the coastline or while being delayed at the launch ramp due to wave action. Average boat value $12,700. Damages = (23 x $12,700 x 1/15)	19,500
Damages for a typical year	$74,700

INCREASED FISH CATCH

Using data from a most recent (1980) survey at Kaulana, the commercial fishing fleet operation from Kaulana currently averages 1,481 fishing trips per year with an average catch per trip of 361 pounds, an average value per pound of $1.20 and an average cost per trip of $56. The average net income computed per trip is $377 as shown on Table F-2. With the proposed project, an increase in the fish catch and hence increase in net income can be expected as a result of:

a. An increase in the average number of boats able to operate due to the decrease in damages resulting in less "downtime."

b. An increase in the number of trips due to improved conditions which would permit launching a greater percent of the time.

TABLE F-2. AVERAGE NET INCOME PER TRIP, KAULANA FISHING FLEET

Average Catch Per Trip	= 361 lbs
Average Value Per Pound	= $1.20
Average Revenue Per Trip	= 361 lbs x $1.20 = $433
Average Cost Per Trip	= $56
Average Net Income Per Trip	= $433 - 56 = $377

Although the fleet is comprised of 23 equivalent boats, the average equivalent number of boats operational at any time is less than 23, since damaged boats are inoperative during repair. A survey of fisherman using the ramp has reported that during the past years 55 percent of the boats received damages each year. This computes to an equivalent 12.6 boats (23 x 55% = 12.6) damaged per year. It took an average of 1/2 month for the repair of each boat damaged. With the proposed improvement this downtime will be reduced so that the effective size of the operational fleet will be greater, resulting in an increase in trips, fish catch, and net income.

The downtime experienced for the Kaulana fishing fleet is equal to one equivalent boat out of 23 boats being inoperative for 6.3 months per year. (23 x 55% x 1/2 mo = 6.3 mos.) With the project, this downtime factor will decrease by an estimated 5/40 (based on the assumption discussed in connection with damage reduction benefits). The effect on the equivalent size of the operational fleet is as follows:

a. Average equivalent boats operating per year without project [23 - (6.3/12)] = 22.47 boats.

b. Average equivalent boats operating per year with project [23 - (6.3/12 x 15/40)] = 22.80 boats.

An engineering analysis of Kaulana navigation conditions has shown that launching is now possible about 60 percent of the time, and that project protection would result in an icrease to 85 percent. If the number of trips made per year per boat were proportional to this factor, the indicated increase in trips per year would be about 42 percent (85/60 = 1.42). Contacts with fishermen using the launch ramp have indicated that conditions permit launching 50.4 percent of the year. With the project the ramp would be usable 85 percent of the time, indicating an increase in trips per year of about 69 percent (85/50.4 = 1.69).

Analysis of physical conditions at Kaulana suggest that an increase in boat trips per year of between 42 percent and 69 percent is possible and reasonable. The lower estimate of 42 percent, which relies on available climatological data is used in the benefit computations.

The benefits resulting from an increase in the number of trips per year due to improved navigability and launching conditions, and to the increase in the number of boats in operating condition is calculated below. This benefit is the increase in net income based on an increased fish catch.

Net income without project:

(1,481 trips/yr) ($377/trips) = $558,000 per year

Net income with project:

(1,481 trips/yr) (85%/60%) (22.80/22.47) ($377/trip) = $802,000 per year

Average annual increased fish catch benefit:

$802,000 - 558,000 = $244,000

Not included in the above downtime is time lost while waiting for wave conditions to improve to either launch or retrieve boats. A time-loss incident was recorded (Table F-3) when it required 1-hour and 10-minutes to launch one boat and retrieve four boats from sea. Assuming 2 to 5 minutes as an average time per movement on the ramp under ideal condition, the entire procedure could have been accomplished in 25 minutes (5 boats x 5 min = 25 min). Fishermen at Kaulana stated that an average waiting period of 1/2 to 1 hour outside the bay for wave action to subside so that channel conditions are safe to enter is a normal occurrence.

TABLE F-3. TIME LOSS INCIDENT

Period	Incident
12:55 p.m.	2 boats entered bay for retrieval. 2 boats arrived outside bay; waiting.
13:07 p.m.	1st boat brought on land.
13:09 p.m.	2d boat brought on land. 3d boat waiting outside came in bay.
13:40 p.m.	3d boat cannot land on ramp and returned to sea outside of bay; began waiting.
13:41 p.m.	4th boat came in to bay.
13:46 p.m.	4th boat brought on land. (A fortuitous minute.)
13:50 p.m.	One boat entering ramp to go into water, having a hard time going in the water.
13:53 p.m.	Boat off trailer and into water and out into ocean.
13:56 p.m.	3d boat returned to bay.
14:05 p.m.	3d boat brought on land.

ENHANCED SAFETY

In addition to the economic returns resulting from improved conditions as described above, unquantifiable benefits would result from a greater degree of safety. Numerous injuries have been incurred with use of the existing launching facility, as indicated below. Information was obtained from interviews covering a 12-month period.

a. Smashed toe from trailer bouncing on ramp from wave action.

b. Smashed finger and hand from boat bouncing on trailer during launch and retrieval of boat.

c. Cut hand and sprained muscle while holding guideline (rope) that stretch from ramp to channel entrance to keep boat from drifting into the rocky coast.

d. Cut feet and gash on head from fall due to rough wave action during retrieval.

As a direct result of incidents like these, expenses are incurred in the form of medical costs and potential income foregone because of a missed trip. Improved launching condition would largely eliminate such occurrences and could possibly prevent a fatal accident.

SUMMARY OF BENEFITS

The estimated average annual benefits which would result from the proposed plan of improvement are summarized in Table F-4.

TABLE F-4. SUMMARY OF AVERAGE ANNUAL BENEFITS

Reduction of damage	$ 46,600
Increased fish catch	244,000
Reduction of loss time and catch from waiting outside of bay	not computed
Enhanced safety	not quantified
TOTAL	$290,600