

PROPOSED REEF RUNWAY 8-R/26-L

HONOLULU INTERNATIONAL AIRPORT

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FINAL ENVIRONMENTAL IMPACT STATEMENT

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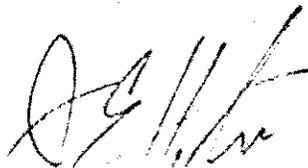
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With the Compliments of
SPARK MATSUO, GA
Representative to Congress

HONOLULU INTERNATIONAL AIRPORT

HONOLULU, HAWAII

APPROVE



Assistant Secretary for Environment and
Urban Systems, DOT

Date



DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION

PACIFIC REGION
P. O. BOX 4009
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Department of Transportation
Federal Aviation Administration
Environmental Impact Statement
Pursuant to Section 102(2)(c), P.L. 91-190

Statement of Findings
Honolulu International Airport
Honolulu, Hawaii
Proposed Reef Runway 8R/26L Project

After careful and thorough consideration of the facts contained herein and following consideration of the views of those Federal agencies having jurisdiction by law and special expertise with respect to involved environmental impacts, it is the finding of the undersigned that pursuit of the requested Federal action is consistent with existing national environmental policies and objectives as set forth in Section 101(a) of the National Environmental Policy Act of 1969 (P.L. 91-190); that there is no feasible and prudent alternative to the requested action which has not been considered; and further, that accomplishment of the proposed action contemplates all feasible and prudent planning leading to minimized adverse effects upon the human environment. Accordingly, it is recommended that the proposed Federal action be approved by the Assistant Secretary for Environment and Urban Affairs, Department of Transportation.

PHILLIP M. SWATEK

Director

Date: 21 JAN 1972

Approved: _____

Disapproved: _____

Assistant Secretary for Environment and Urban Affairs
Department of Transportation

Date: _____

FINAL
ENVIRONMENTAL IMPACT STATEMENT
REEF RUNWAY PROJECT
HONOLULU INTERNATIONAL AIRPORT
HONOLULU, HAWAII

JANUARY 1972

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6. This statement was made available to CEQ and the public on _____.

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DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION
FINAL ENVIRONMENTAL IMPACT STATEMENT

I. INTRODUCTION

Hawaii is the only island state within the United States. Due to its great distance from the continental United States (approximately 2,400 miles), over 99 percent of all passengers travel to and from Hawaii by aircraft. During periods of ship or dock stoppages, the airplane is the only means of shipping cargo to Hawaii. Honolulu International Airport is also the third largest point for international arrivals in the United States. Thus, Honolulu International Airport on the island of Oahu, the population and industrial center of Hawaii, is the principal gateway to the State of Hawaii.

In 1961, the number of aircraft operations at Honolulu International Airport was 257,000 (arrivals and departures). This number grew to 305,600 operations by 1967. In 1970, the number of operations increased to 325,305 according to the FAA Terminal Air Traffic Relationships, Fiscal Year 1970. Present forecasts indicate that the number of aircraft operations will be 382,000 by 1975, and 493,100 by 1985 (Reference 1). In recent years, tourism has become one of the major industries in Hawaii, replacing the raising and marketing of pineapple and sugar cane. It is the tourist industry that is having the major effect on Honolulu International Airport. In 1970, a total of 1,780,000 tourists visited Hawaii. The Airport Planning Computer Model of the Advanced Transportation Planning Office of the State Department of Transportation indicates the following tourist projections for the State of Hawaii:

<u>Year</u>	<u>Number of Tourists</u>
1975	2,633,000
1980	4,157,000
1985	6,880,000
1990	11,386,000

Recognizing this era of unprecedented growth and its effects on the existing runways and terminal buildings, the State of Hawaii had a master plan developed in 1968 to guide the long-range development of Honolulu International Airport through 1985. As a part of this long-range program, the State Department of Transportation initiated the first phase of the development program in mid-1968. This phase, which is scheduled for completion in 1972, involved significant additions to the terminal facilities and extension to, and improvement of, the existing runway/taxiway system. Future development beyond the first phase program includes the construction of a new runway (called the Reef Runway) in Keehi Lagoon south of the existing runway 8L-26R.

Studies in 1966 by the Honolulu International Airport Task Force, were also made as to location of the major air access to the Hawaiian Islands. (Reference 1). These studies determined the existing Honolulu International Airport was the most desirable and that it should be expanded to meet these increasing demands. An Airport Layout Plan reflecting these plans was approved by the Federal Aviation Administration on January 10, 1972. It is planned within the Federal Aviation Administration, Pacific Region, that Honolulu International Airport, Honolulu, Hawaii, will remain as the major air access to the State for the foreseeable future.

The State of Hawaii, Department of Transportation, has submitted a request to the Federal Aviation Administration for federal financial assistance to develop the new Reef Runway for Honolulu International Airport. The request for assistance was made under the Airport Development Aid Program (ADAP) of 1970, as authorized by the Airport and Airway Development Act of 1970. The first request for Federal Aviation Administration aid is dated September 28, 1971 and includes the items described herein for Increment I, Stage 1 construction. Increment I, Stage 2 construction and Increment II construction will be completed under subsequent projects, with a request for aid made under the Airport Development Aid Program. Details of the work to be included in each increment of the runway development are defined herein. This Final Environmental Impact Statement includes both Increment I and Increment II construction. Once construction is started, the pattern for the overall impact on the environment will be established.

II. DESCRIPTION AND PURPOSE OF PROPOSED DEVELOPMENT

A. GENERAL

The new runway proposed for Honolulu International Airport will be located south of the existing airport runway system, on the fringing coral reef, seaward of Keehi Lagoon in Mamala Bay, which extends from Barbers Point to Diamond Head. A plan of the existing airport and the area to be occupied by the Reef Runway is shown on Attachment 8, Area Map. The new Reef Runway will be 6,700 feet south of existing Runway 8L-26R. A runway protective structure will be constructed approximately 1,000 feet south of the Reef Runway centerline. General details of the new runway and associated construction are shown on Attachment 1, Reef Runway Layout.

B. DESCRIPTION

The development of the new Reef Runway (Runway 8R-26L) in Keehi Lagoon will occupy State of Hawaii land set aside for airport use, plus land that will be acquired from the Federal Government; privately owned land will not have to be acquired. All land to be acquired is under military control. Federally-owned land that will have to be acquired, as identified on Attachment 7, Reef Runway Land Requirements, is as follows:

<u>AREA</u>	<u>OWNER</u>	<u>APPROX. ACRES</u>
1	USAF	18
2	USAF	10
3	USAF	4
4	USA	1
5	USA	20
6	USA	95
7	USN	344
8	USN	178
9	USN	32
10	State of Hawaii	137
TOTAL		839 acres

The proposed project will include the construction of a new paved and lighted runway, 200 feet wide by 12,000 feet long, approximately nine feet above mean sea level, together with a connecting and parallel taxiway system. A runway protective structure will be constructed to protect the offshore construction against wave action. The complete construction will be accomplished in two increments. Items included in each increment of construction are as follows:

INCREMENT I

Stage 1 (Request For Aid, Dated September 28, 1971)

- Runway protective structure and service road
- Embankment for Reef Runway, including safety area
- Embankment for Taxiways RC, RF, RT, C, RB, portion of RA; circulation culverts; confining embankment
- Glide slope area
- Relocation of Navy Recreation Facility
- Relocation of Wildlife Habitat
- Dredging of Circulation Channels A and B

Stage 2

- Runway paving and lighting
- Paving and lighting Taxiways RC, RF, RT, C, RB, portion of RA
- Underpass under Taxiway RB
- Replace sewer outfall with connection to City & County Sewage System
- Fire station
- Facility to process fuel spills and aircraft wash water at existing main terminal and maintenance area (Fiscal Year 1974)

INCREMENT II

- Embankment for areas between runway/taxiways and between runway/runway protective structure
- Embankment for Taxiways RM, RL, RK, RE, RS, RG, RH, portion of RA
- Pave and light Increment II taxiways
- Deepening of Kalihi Channel

C. PURPOSE

The present capacity of Honolulu International Airport is between 76 and 82 peak-hour operations and the annual capacity is between

341,000 and 364,000 operations, (Reference 1). According to the FAA Terminal Area Air Traffic Relationships, Fiscal Year 1970, the actual peak-hour operations in Fiscal Year 1970 were 78 and the total annual operations were 325,305. Forecasts of demand have recently been revised and 382,000 Honolulu International Airport operations are predicted for 1975, with an increase to 493,100 operations in 1985 (Reference 1). The existing airport is operating at its hourly capacity at the present time on the average of at least two hours per day. Based upon current forecasts, the demand will exceed both hourly and annual capacity by 1975.

Heavy four-engine turbojet aircraft operations now comprise 35 percent of the total operations. The percentage forecast for 1975 and 1985 are 38 percent and 43 percent, respectively. Military aircraft constitutes 25 percent of current traffic. It is estimated that military traffic will remain on this level for the foreseeable future. The addition of the Reef Runway will increase the hourly capacity of Honolulu International Airport to between 112 and 119 peak-hour operations. It will also increase the annual capacity to between 503,000 and 533,000 operations, thus providing capacity to meet the forecast demand through 1985.

The new Reef Runway 8R-26L will provide an additional arrival and departure runway for heavy four-engine turbojet aircraft, thus reducing the breakaway and sideline noise levels experienced during operations from existing Runways 8L-26R, 4R-22L and 4L-22R, as these operations will be moved approximately 6,700 feet seaward. As a result, there will be a subsequent reduction in noise levels over metropolitan Honolulu, thus alleviating an adverse impact to the human environment.

The new runway will increase airfield flexibility by providing an inter-continental category jet runway when 8L-26R is shut down for maintenance. This will preclude use of Runway 4R-22L by large aircraft for departures during trade wind conditions.

The safety of inhabitants in the heavily populated Kalihi-Palama community northeast of the airport and in downtown Honolulu will be improved as heavy four-engine turbojet operations will be moved to the new Reef Runway 8R-26L, thereby reducing the possibility of accidents/incidents in the area. Approximately 90 percent of all airport operations are in a trade wind (northeast) direction, even though trade winds blow only two-thirds of the time. Only ten percent of the time, when the Kona (south) winds are strong enough, are airport operations directed to the south.

D. BACKGROUND

Prior to World War II, Keehi Lagoon was a tideland lagoon located on mudflats and the fringing coral reef that stretches from Barbers Point to Diamond Head on the south side of the island of Oahu. A plan of the existing condition of Keehi Lagoon,

Honolulu International Airport and the surrounding area, is shown on Attachment 8, Area Map. At high tide the depth of the water in the lagoon over the fringing reef varied from a few inches to several feet, with little navigable water between the reef and the shoreline; the depth of water between Ahua Point and the reef was approximately one foot. At low tide, the bottom of the lagoon was exposed. Keehi Lagoon at that time, though defined as a navigable water, had one usable channel, Kalihi Channel. As late as 1941, Kalihi Channel was an irregular stream, 10,000 feet in length, varying from 250 feet wide and 35 feet deep at the seaward edge of the reef to five feet deep at the land edge.

During World War II, the U. S. Navy began dredging operations to create seaplane runways. Seaplane Runways A, B and D were dredged to approximately 13 feet below mean sea level, were 1,000 feet wide, and were 10,000 feet, 15,000 feet and 16,000 feet long, respectively. Later, dredging was also conducted west of the former seaplane runways to obtain fill material for new construction. This created a small boat channel just south of the Fort Kamehameha Military Reservation that runs from the west end of the seaplane runways to what is now called Hickam Harbor. The approximate limits of the seaplane runways and this small boat channel are shown on Attachment 8, Area Map. Attachment 8 also indicates the approximate limits of a dredging operation conducted by the U. S. Navy in the boat channel in 1968. For the development of the Reef Runway and this environmental impact statement, Keehi Lagoon is to include the area within the following limits: Hickam Harbor on the west to Sand Island on the east, and from the shoreline on the north to the fringing coral reef on the south.

As a result of the dredging, Keehi Lagoon has become a recreational area for boating, fishing, sailing, swimming and water-skiing. When dredging Kalihi Channel, the seaplane runways and the small boat channel leading to Hickam Harbor, little attention was given to the mass transport of water and the circulation patterns within Keehi Lagoon. As a result, inadequate and ineffective circulation patterns created a trap for organic and inorganic pollutants (plants, vegetation cuttings, domestic sewage and silt), that contributed in part to the present polluted condition. The lagoon has been further degraded by the introduction of industrial wastes along the shores and from the streams emptying into the lagoon (References 2 and 3).

The 1985 development plan for the Honolulu International Airport was completed by Leigh Fisher & Associates in 1968 (Reference 1). Development of this plan was initiated in mid-1968, and the first phase with an expenditure of \$150 million, is scheduled for completion in 1972. The major elements of the Phase I expansion includes:

- A new inter-island terminal
- Seven B-747 passenger holding gates
- Ten B-747 parking and fueling positions
- An expanded domestic arrival baggage claim area
- A new overseas baggage check-in and claim terminal
- A new international arrival facility
- An intra-terminal passenger transfer system
- A 2,500-car parking structure
- Improved access road system 2,000 feet long
- Extension of Runway 4R

Development of the Reef Runway is a major item in the three-phase 1985 development plan.

E. ZONING

The Department of Transportation, State of Hawaii, adopted airport zoning regulations on March 20, 1970, which became effective on April 3, 1970, that prevented the creation, maintenance, establishment or continuance of airport hazards as determined by the criteria defined in Federal Aviation Regulations, Part 77. The Reef Runway project does not conflict with the general plan developed for the City and County of Honolulu, of Honolulu International Airport area. The State is also in the process of zoning to light industrial use, military land that is being acquired for the Reef Runway. It should be noted that military lands adjacent to the airport are not presently zoned.

III. PUBLIC HEARING

On March 22, 1971, a public hearing was held at Puuhale School Auditorium, Honolulu, Hawaii, to consider the economic, social and environmental effects of developing the Reef Runway. The Notice of Public Hearing announcing the meeting is shown on Exhibit A, Page 9. At the hearing, the State of Hawaii (Reference 4) presented testimony that the Reef Runway would:

- Reduce noise over Honolulu
- Reduce overflights over Honolulu
- Increase airfield capacity
- Provide an alternate runway during periods when the existing principal runway is under repair

During the oral testimony portion of the public hearing, organizations such as Life of the Land, Hawaii Audubon Society, Kalihi-Palama Community Council, Conservation Council, Air Transportation Association, Puuhale School PTA, Molokai International Developers, Inc., and the Linapuni Action Movement gave testimony. The Kalihi-Palama Community Council and the Puuhale School Parent Teachers Association expressed their continual complaint about aircraft noise and the associated loss of teaching time for children in schools adjacent to Honolulu International Airport. Accordingly, they are strongly in favor of constructing the Reef Runway as there will be a definite reduction in noise over the currently affected areas.

Since the public hearing, a petition has been received from the Kalihi-Palama and Salt Lake residents, workers and businessmen petitioning that construction begin immediately on the Reef Runway in an effort to reduce aircraft noise and overflights at an early date. A copy of their petition is included in the Appendix. The Legal Aid Society (Reference 5), on behalf of the Kalihi-Palama Model City Association, has subsequently evaluated the noise problems in the Kalihi-Palama area and has concluded that turbojet aircraft operations at Honolulu International Airport produce the highest ambient noise levels in the area.

Conservation groups at the hearing indicated a great concern for adequate replacement of wildlife habitat lost due to construction, and control of water quality during construction. Life of the Land expressed concern for the Hawaiian Stilt as a certain amount of wildlife habitat will be lost as a result of the construction. The Hawaiian Stilt is an endangered species of bird with a total population of 1,000 within the State of Hawaii. These numbers are almost equally divided between the islands of Oahu and Maui, with small numbers on the islands of Hawaii, Kauai, and Niihau.

The Department of Interior has recommended that positive action be taken to replace the lost habitat. The State of Hawaii has responded

EXHIBIT A

HONOLULU STAR-BULLETIN
Tuesday, February 23, 1971

NOTICE OF PUBLIC HEARING

Pursuant to the Provisions of Act 132, 1970 Session Laws of Hawaii, the "Airport and Airway Development Act of 1970," Public Law 91-258, and all other laws applicable thereto, a public hearing will be held by the Department of Transportation, Airports Division on the proposed development of the Reef Runway Project, including the revised Airport boundaries and layout plan for Honolulu International Airport, for the purpose of considering the economic, social and environmental effects of the foregoing development. The hearing will be held at 7:00 p.m., March 22, 1971, at Puuhale School Auditorium, 336 Mokauea Street, Honolulu. All interested persons are invited to submit data, views, comments, or arguments for the State's consideration of the project at the date, time and place specified above. Written statements will also be accepted by the Department until March 31, 1971.

Exhibits of the proposed development can be viewed from 8:00 a.m. to 4:00 p.m., Monday through Friday, from March 1 to March 22, at the Airports Division Engineering Office, 5th Floor, Administration Building, Honolulu International Airport.

FUJIO MATSUDA

Director

Department of Transportation

(S.B.: Feb. 23, 25; March 1, 3, & 5, 1971)

affirmatively and will provide, with the assistance of the U. S. Navy, adequate replacement habitat in the Pearl Harbor area as shown on Attachment 9, Wildlife and Recreational Facilities. The Hawaii Audubon Society also testified by taking no position for or against the Reef Runway project. They did recommend, however, that replacement bird habitats be considered for the Hawaiian Stilt.

The Conservation Council expressed concern over future circulation patterns of the water in Keehi Lagoon. As this point was well analyzed and covered through professional studies, they voiced no objection to the project, but will monitor progress at their discretion.

The representatives from the Molokai International Developers, Inc. and Linapuni Action Movement expressed viewpoints on aircraft operations at Honolulu International Airport and the associated noise levels. A suggestion that STOL and VTOL aircraft could replace the large four-engine turbojets in the near future was also expressed.

In reviewing the need for transportation services to the islands, particularly for passengers, a higher speed vehicle such as a conventional turbojet aircraft is desirable. At the present time, there are no long-range, high-capacity, high-speed VTOL/STOL aircraft on the market. A return to the slower VTOL/STOL aircraft in an effort to reduce runway lengths, such as recommended by the Linapuni Action Movement, is not considered an acceptable approach from a passenger comfort and handling viewpoint. New technology and the requirement for engine manufacturers to meet the design standards for the next generation of commercial aircraft as outlined in Federal Aviation Regulation 36, will bring about a reduction in noise levels associated with future heavy four-engine turbojet aircraft.

In response to this testimony, representatives of the State of Hawaii asserted that they plan to replace the wildlife habitat and maintain strict control over the construction area during and after construction of the Reef Runway. At the public hearing, it appeared the majority of the opinion as expressed was in favor of the Reef Runway.

IV. THE PROBABLE IMPACT OF THE PROJECT ON THE HUMAN AND NATURAL ENVIRONMENT

A. GENERAL

The Reef Runway will divide Keehi Lagoon and change the use of the offshore area. Since the western extension of Keehi Lagoon will be isolated from deep water, a new channel will be dredged to deep water to allow access of small boats to Hickam Harbor. The location of this channel, Channel A, is shown on Attachment 1, Reef Runway Layout. A second channel, Channel B, will be dredged around the east end of the runway protective structure to provide a deep channel for water to flow into and out of Keehi Lagoon. Channel B can also be used for a small boat access to and from the lagoon. Channels A and B will be used as a source of fill material for elevating the runway/taxiways above the ocean. Additional fill will be obtained from the borrow area indicated on the shallow reef just south of the east end of the runway. Kalihi Channel will be widened and deepened by dredging during Increment II to provide a source of fill material.

The Reef Runway will not require the use of any publicly owned land from a public park, recreation area, or wildlife and waterfowl refuge of national, State, or local significance as determined by the Federal, State, or local officials having jurisdiction thereof, or any land from an historic site of national, State, or local significance as so determined by such officials. Additionally, no communities will be divided as a result of this project. The 1,240 acres of offshore land that fall within the construction limits of the Reef Runway can be categorized as follows:

1.	Coral mudflat area, wildlife feeding and roosting area.....	186 acres
2.	Shallow coral reef area - 1' to 30' deep.....	450 acres
3.	Former seaplane runways mud/silt bottom.....	332 acres
4.	Navigable small boat channel and recreation area - mud/silt bottom.....	<u>272 acres</u>
	TOTAL	1,240 acres

Constructing the Reef Runway offshore will cause the use of the offshore area to be changed. After construction, the area offshore will be found as:

1.	Runway, taxiway, runway protective structure and other fill area.....	765 acres
2.	Circulation and small boat channels.....	235 acres
3.	Marine pond.....	<u>240 acres</u>
	TOTAL	1,240 acres

As indicated, the total loss of offshore land to the Reef Runway will be 765 acres. Apart from this loss, the human environment will receive benefits in many areas due to construction of the Reef Runway. Additionally, the construction will have a definite effect on the natural environment of Keehi Lagoon and its fringing reef. To assure that the maximum benefits are gained and degradation to the environment is minimized, the Governor of the State of Hawaii has certified to the Secretary of Transportation that the Reef Runway will be located, designed, constructed and operated so as to comply with all applicable air and water quality standards. A print of this letter is included in the Appendix.

Monitoring conducted during the past 17 months of aeronautical operations (and their resultant effects on the natural environment) at the Everglades Airport in Florida indicates that there is no change in quality of the water in the areas associated with the airport. Runoff from the pavement areas has also been monitored and there is no indication of derogation of water quality due to petro-chemical residue from these surfaces. Thus, aircraft operations on the new Reef Runway should not cause a degradation of water quality in Keehi Lagoon or the ponded areas adjacent to the runway.

B. IMPACT ON THE HUMAN ENVIRONMENT

1. Noise Abatement

A very significant reduction of the present high noise levels in metropolitan Honolulu caused by the operation of military and civilian aircraft will follow as a direct result of this project. The principal communities surrounding Honolulu International Airport that would benefit most are U. S. Navy Barbers Point, Ewa, Ewa Beach, Iroquois Point, Hickam Air Force Base Housing, Fort Kamehameha Army Housing, Pearl City, Aliamanu, Moanalua, Salt Lake, Kalihi, Kapalama (Kalihi-Palama Model City), Iwilei and Waikiki. The Reef Runway will also reduce overflights over metropolitan Honolulu by large commercial and military aircraft. Currently, over 13,000 school children in the Kalihi-Palama area are subjected to noise levels of 85 (calculated) decibels (db) and above for total periods up to one hour per school day (Reference 6). The Department of Planning and Economic Development (Reference 7) estimates that another 131,000 persons living in the area surrounding the airport are subjected to a noise level of 85 decibels and above. The

schools and metropolitan areas within the flight paths of existing Runway 8L-26R and the Reef Runway are noted on Attachments 2, 3 and 4. Metropolitan and residential areas that will receive relief are indicated on Attachments 5 and 6. The Department of Housing and Urban Development favors construction of the Reef Runway, over the alternatives outlined herein in Section VI. Use of the Reef Runway will result in lower noise levels over the highly populated areas of Kalihi-Palama and downtown Honolulu.

Attachment 2 indicates the flight path envelopes for arrivals and departures used during trade wind and light Kona wind conditions which occur approximately 90 percent of the year. Attachment 3 indicates similar data for ten percent of the year when strong Kona wind conditions exist. Attachments 4, 5 and 6 show the reduction in noise levels anticipated over metropolitan Honolulu during trade wind conditions by moving aircraft operations from existing Runway 8L-26R to the new Reef Runway. Through use of the Reef Runway, it has been calculated that all schools in the Kalihi-Palama area will be exposed to less than 85 decibel noise. Presently, the schools in this area can be subjected to noises of 105 decibels and higher. For reference, see Exhibit B, Page 14, for representative sound levels and associated human response to the sound.

The noise levels on Attachments 4, 5 and 6 are based on the operation of Boeing 707 aircraft, currently one of the aircraft most widely used by the airlines serving Hawaii and one that is considered typical of the heavy four-engine turbojets now using Honolulu International Airport runways. When the Reef Runway becomes operational, an immediate short-term impact on the environment will be the reduction of aircraft noise in the Honolulu area. Since the Reef Runway will function as the primary departure runway for heavy four-engine aircraft during trade wind conditions, the communities east of Honolulu International Airport will experience a significant reduction in noise (Attachment 4). Arrivals of heavy aircraft during trade wind conditions in the future will be restricted to Runways 4R and 4L; the present heavy turbojet landings on Runway 8L-26R are to be discontinued. This will result in a reduction in the noise now experienced by the communities of Ewa Beach, Iroquois Point, Barbers Point, Pearl City, Pearl Harbor and other residential areas north and west of Honolulu International Airport. During Kona (south) weather, the primary landing runway will be the Reef Runway.

The Reef Runway will also be the primary departure runway for Heavy aircraft during Kona (south) weather. (Attachment 3). Some small aircraft during Kona wind conditions will use Runway 4R-22L. The net result during Kona wind conditions will be a reduction in the noise levels now experienced through use of existing Runway 8L-26R. The anticipated reduction in noise levels through use of the Reef Runway is indicated on Attachments 5 and 6.

EXHIBIT B

WEIGHTED SOUND LEVELS AND HUMAN RESPONSE

<u>SOUND SOURCE</u>	<u>db (A)*</u>	<u>RESPONSE CRITERIA</u>
Carrier Deck Jet Operation	140	Painfully Loud Limited Amplified Speech
Jet Takeoff (200 feet) Discotheque Auto Horn (3 feet)	120	Maximum Vocal Effort
Riveting Machine	110	
Jet Takeoff (2,000 ft.)		
Shout (0.5 feet)	100	
N. Y. Subway Station		Very Annoying
Heavy Truck (50 feet)	90	Hearing Damage (8 hours)
Pneumatic Drill (50 feet)	80	Annoying
Freight Train (50 feet)		
Freeway Traffic (50 feet)	70	Telephone Use Difficult Intrusive
Air Conditioning Unit (20 ft.)	60	
Light Auto Traffic (50 ft.)	50	Quiet
Living Room		
Bedroom	40	
Library		
Soft Whisper (15 feet)	30	Very Quiet
Broadcasting Studio	20	
	10	Just Audible
	0	Threshold of Hearing

* Typical A - Weighted sound levels taken with a sound-level meter and expressed as decibels on the scale. The "A" scale approximates the frequency response of the human ear.

Source: Environmental Quality - The First Annual Report of the Council on Environmental Quality. Council on Environmental Quality, Transmitted to Congress, August 1970.

An Instrument Landing System (ILS) is to be installed on Runways 4R, 8R, and 26L. The installation on Runway 4R is scheduled for Fiscal Year 1973 and will improve the acceptability of this runway for arrivals during instrument weather conditions. The ILS installation for Runways 8R and 26L is included in future facility and equipment plans of the Federal Aviation Administration. It is believed these installations will provide glide slope guidance to assist in noise abatement procedures for the new runway by keeping approaches as high as practical.

With the introduction of large wide-body turbojet aircraft (B-747, DC-10 and L-1011) and quieter engines, the existing noise levels associated with the present day aircraft (B-707 and DC-8) that comprise the majority of overseas commercial operations at Honolulu International Airport will be further reduced. This noise reduction can be expected, even though Honolulu International Airport will experience future increase in aircraft operations, as present day aircraft are retired from service and are replaced by aircraft powered by quieter engines. An example of this is the new 747's which are 25 to 40 percent quieter than the original models of the 747 produced before December 12, 1971. With development of the Reef Runway, even though the total operations will increase, the long-term effect will be a decrease in aircraft noise.

2. Land Use

As indicated on Attachment 7, Reef Runway Land Requirements, the Reef Runway will be developed on State-owned or leased Federal Government land, thus the project will not require privately-owned property or displace any persons. However, approximately 3,000 to 4,500 feet from the east end of the runway there are three islands (Mokuoeo Island, Kahakaaulana Island and Mokauea Island), on which squatters shacks have been built (Attachment 8, Area Map). Although the proposed development will not affect these islands, they are within the existing Honolulu International Airport boundaries and are posted with State Department of Transportation "Keep Out - No Trespassing" signs, which are in good condition, well maintained and in view of all individuals.

In the past when State authorities encountered individuals on these islands, they have been repeatedly told that they are only visiting the islands for the day. Efforts were initiated by the State in December 1971 to remove these shacks and squatters. Since the noise of aircraft operations caused by the use of the Reef Runway will, in effect, make living on these islands undesirable, the Attorney General of Hawaii was requested to render a legal opinion as to the qualification of the individuals under the State's Relocation Act. Accordingly, it is the position of the State

Attorney General that these squatters would not legally qualify under the State Relocation Act as displaced persons.

The U. S. Navy presently operates a recreational boating and beach facility on Ahua Point that is not open to the public (Attachment 8, Area Map). Since the property occupied by the recreational facility falls within the construction area required for the Reef Runway, the present facility must be relocated. The State of Hawaii has accordingly agreed to assist the U. S. Navy with the relocation of these facilities. It is presently planned that the existing marina and boating facilities be relocated in Aiea Bay, Pearl Harbor, under a joint development by the State of Hawaii and the U. S. Navy.

~~and swimming facilities will be relocated to Barbers Point Naval Air Station. Attachment 9, Wildlife and Recreation Facilities, shows the proposed locations for these recreational facilities.~~
The swimming and bathing facilities will be relocated to Barbers Point Naval Air Station. Attachment 9, Wildlife and Recreation Facilities, shows the proposed locations for these recreational facilities.

No publicly-owned land from an existing public park, recreation area, or wildlife and waterfowl refuge of national, state or local significance will be acquired for airport purposes as a part of this project; therefore, review under Section 4(f) of the Department of Transportation Act is not required.

3. Recreational

Due to the polluted nature of Keehi Lagoon, the majority of water activities are those requiring only a minimum of contact with the water. Restoration of Keehi Lagoon from its polluted condition will require stringent control over the discharge of industrial waste and sewage effluent into the water in this area. Flushing action alone will not remedy the situation in Keehi Lagoon; however, with an improved flushing action and a corresponding reduction of pollution and turbidity, the recreational value of Keehi Lagoon will be enhanced. It presently appears that the present polluted nature of Keehi Lagoon has limited the development of its full recreational potential (Reference 8).

Keehi Lagoon Park, located at the northerly apex of Keehi Lagoon (Attachment 8), is the only public park in the immediate vicinity of Honolulu International Airport. Through use of the Reef Runway by heavy four-engine turbojet aircraft, the park will experience a reduction of aircraft noise.

Boat access to and from Hickam Harbor will be greatly enhanced through the use of Channel A. After construction

of the Reef Runway, small boats will have direct access to the ocean, instead of having to traverse a distance of four miles through the former seaplane runway complex and Kalihi Channel to the ocean. Hickam Harbor, however, will be made somewhat smaller by construction of the Reef Runway through loss of the small boat channel and recreational area. The water quality in Hickam Harbor will be improved by the increased circulation through Channel A.

On the seaward side of the proposed runway, a number of potential surfing sites, based on a 1965-1968 survey, were identified by the Hawaii Surfing Association (Save Our Surf) (Reference 9). The surfing sites, ten in number, due to their distance and lack of accessibility from shore, have not been used enough to determine their exact location and the amount of interference that would result due to construction of the Reef Runway. These remote surfing and fishing areas, however, will be made more accessible to the public from the runway protective structure.

During the Clearinghouse Review, as required by Circular No. A-95 (Reference 10), the State Department of Health voiced concern over the possible degradation of the water quality in Keehi Lagoon, and the effect of aircraft operational noise on future parks planned for Sand Island. Accordingly, the State of Hawaii contracted Harvey & Palmer to complete an additional study on the water quality in Keehi Lagoon (Reference 2). The results of this study determined that the new circulation channels would increase the flushing action of the lagoon. The Department of Health was satisfied with the results of this study and withdrew their objection after the State of Hawaii draft of the Environmental Impact Statement for the Reef Runway was coordinated by the Governor's Office for Environmental Quality Control. The State of Hawaii, Department of Planning and Economic Development, is currently master-planning Sand Island for recreational and light industrial use. One of the parameters for recreational use of Sand Island will be the noise pattern which the Reef Runway will generate. It should be noted that no park exists on Sand Island at the present time (December 1971).

C. IMPACT ON THE NATURAL ENVIRONMENT

1. Water Quality

When the seaplane runways and Kalihi Channel were dredged, little attention was given to the flow of water into, out of, and within Keehi Lagoon. Untreated sewage is discharged into Mamala Bay from Sand Island. Presently, the circulation pattern within the lagoon is inadequate and the lagoon is a trap for organic and inorganic pollutants. The trade winds cause some of the floatable pollutants to move toward

Hickam Harbor and out into the ocean. When the Kona winds blow, untreated sewage from the Sand Island discharge line is blown into Keehi Lagoon, contributing greatly to air pollution as well.

Nearly all sanitary sewage originating in the airport facilities is now pumped into the City and County Sewage System and discharged through the Sand Island outfall into the Pacific Ocean without treatment. Some untreated sewage is also discharged through an outfall outside of Keehi Lagoon in the area beyond that of the Reef Runway. Over 55 million gallons of raw sewage are discharged into Mamala Bay by the City and County of Honolulu. The ocean outfall is approximately three miles from the east end of the runway. An advanced primary sewage treatment plant is currently under design for Sand Island and it is expected to be operational in 1974. The remaining sewage from Honolulu International Airport is discharged into the ocean through a line just west of Ahua Point that ends slightly south of the proposed location for the runway protective structure.

In the development of the Reef Runway, the sewer outfall past Ahua Point is to be abandoned. The sanitary sewage that is now discharged through this outfall will be pumped north to a new collector line being built by the City and County of Honolulu. Sewage from the terminal area will also discharge into this line, which is to connect to the proposed Sand Island treatment plant. When the connector line and the treatment plant are operational, a present source of untreated sewage in Mamala Bay will be eliminated.

The dredging of Circulation Channels A and B will be one of the first operations undertaken in Increment I construction. These channels will result in improved circulation patterns in Keehi Lagoon to help flush out the pollutants. Together with the elimination of untreated sewage, the improved circulation patterns that will be established will help to maintain the dissolved oxygen rate at the present level or higher, resulting in an improvement of the water quality in Keehi Lagoon.

The construction of the Reef Runway will split Keehi Lagoon into two parts (east and west). Presently, the major flushing action in Keehi Lagoon at the east end of the proposed runway is due to the flow of water in Kalihi Channel and the seaplane runways. The Reef Runway, when it is built, will fill in the west ends of former Seaplane Runways A and B and prevent them from being used for flushing channels. To provide an equal or better flushing action, Channel B has been provided as a replacement to the existing channels. While the seaplane runways are only 12 to 13 feet deep, Circulation Channel B will be 50 feet deep and 300 feet wide to allow a large flow of water into and out of Keehi

Lagoon. Kalihi Channel will also be deepened to aid the flushing action and to enhance the water quality. Design grades within these referenced channels will be such that no stagnant or "dead" waters will be formed. Littoral deposition is expected to be minor, based on experience with shoaling in the Kalihi Channel.

The runway protective structure and Taxiway RB will split the Hickam Harbor area from Keehi Lagoon proper. In so doing, they will eliminate the natural flow of water in the lagoon and eliminate any flushing benefits that would result due to the trade winds, which blow two-thirds of the time. Due to offshore construction, however, the turbidity and surface debris that is carried into Hickam Harbor by the trade wind-driven currents will be eliminated. To prevent the Hickam Harbor area from becoming stagnant, as well as to provide small boat access to the ocean, Channel A will be dredged at the west end of the Reef Runway. This channel will be 20 feet deep and 300 feet wide to allow for a large flow of water into and out of the harbor.

The protective structure itself will have an inner core and the height will average approximately 12 feet above mean sea level. A model to simulate the proposed Reef Runway development and its effect on lagoon circulation patterns was constructed. This model produced data which assisted in arriving at the above conclusions (Reference 15). In Increment I, Stage 2 of the construction sequence, facilities for treating water draining from the fuel storage area, the overseas, inter-island, main terminal area and the maintenance areas will be constructed to comply with appropriate Federal, State, City and County water quality standards. This treatment facility will also handle fuel spills in these areas. Through elimination of these potential sources of pollution in Manuwal Canal, an improvement in water quality will result in Keehi Lagoon and the proposed Marine Pond.

During the construction of the Reef Runway, all dredging will be accomplished by a hydraulic suction dredge. Fill material will be placed within impounded areas to control the flow of silt fines. Harvey, in Reference 8, points out that conditions inside the lagoon are so severe now that only resistant organisms can live there. Further, they would be little damaged, except in a localized area, by the construction activity. It is inevitable, even with a hydraulic suction dredge, that there will be an increase in organic material in the water. However, with the impoundment of the fill areas, it is expected that algae blooms would occur only within the specific settling basins used for confining the fill operation. Since the impoundment dike will act as a filter to silt fines, the water quality will be maintained. It also can be expected that the Biochemical Oxygen Demand (BOD) will increase temporarily during construction.

The Reef Runway thresholds were located to provide a maximum approach slope clearance over both the Pearl Harbor Channel to the west and the Kalihi Channel to the east (Attachment 1). Large vessels whose masts exceed the appropriate approach slope criteria as defined by the current Federal Aviation Regulation, Part 77, will require a coordination of effort between the respective Harbor Master, Ships' Pilot and the Airport Control Tower of the Federal Aviation Administration.

The current procedures now used for large vessels using the Pearl Harbor Channel which must cross the extended runway centerline and subsequent approach area for existing Runway 8L will be used as guidelines. No formal agreement has been prepared, but due to an expected very limited number of conflicts, no problem is anticipated in this respect. There should be no other impact on the Pearl Harbor Channel entrance as a result of the construction of the Reef Runway and associated protective structure.

2. Visual and Air Pollution

Development of the Reef Runway will not derogate the aesthetic and visual effects in the offshore area of Honolulu International Airport. In fact, the reduction of turbidity in Keehi Lagoon by the new circulation channel will improve the visual appearance of Keehi Lagoon.

The visual air pollution now experienced from heavy turbojet aircraft arrivals and departures will be moved from Honolulu and out to sea approximately 6,700 feet. Presently, the engines of B-727, B-737 and DC-9 aircraft are in the process of being retrofitted to decrease visual pollutants. When this program is completed, a significant decrease in visual pollution due to operations of the Inter-Island air carriers will result.

The new wide-bodied four-engine turbojet airplanes such as the B-747, L-1011 and the DC-10 already have engines which reduce significantly the visual pollution. As the wide-bodied four-engine turbojet aircraft replace the predominant B-707 and DC-8 aircraft fleet, which contribute to the majority of visual pollution at Honolulu International Airport, in the coming years the visual pollution, noticeable now at Honolulu International Airport, will be reduced.

3. The Land

Nine military controlled parcels of land will have to be obtained from the Federal Government and one parcel from the State of Hawaii for construction of the Reef Runway. The locations of these parcels (areas) and the approximate size is shown on Attachment 7. The total acreage included

in the ten areas is approximately 839 acres. Attachment 1 indicates Hickam Air Force Base as being contiguous to Honolulu International Airport. A Joint Use Agreement between the United States Air Force and the State of Hawaii permits joint use of the landing area facilities at Hickam Air Force Base and Honolulu International Airport by both military and civilian aircraft. The operating airspace for this airport includes both Hickam Air Force Base and Honolulu International Airport. The environmental impact, if any, of each area to be obtained is indicated in the following paragraphs.

Area One

This parcel is currently under the control of the United States Air Force and is approximately 18 acres in size. It is located south of the west threshold of Runway 8L and is within the runway/taxiway system of Hickam Air Force Base. The land includes existing taxiways and is covered with coral and Kiawe (Prosopis pallida) trees, scrub brush, and grasses. There will be no impact to the environment due to the transfer and subsequent use of this area. It is located within the existing airport runway/taxiway system. Taxiway RB will be constructed across it, with only that area needed for the taxiway disturbed.

Area Two

This parcel is currently under the control of United States Air Force, approximately ten acres in size and is located north of the west threshold Runway 8L. It is within the runway/taxiway system of Hickam Air Force Base. The land is bare and predominantly graded coral fill material. There will be no impact to the environment due to the transfer and subsequent use by the State of Hawaii, with only that area needed for Taxiway RB disturbed.

Area Three

This parcel is currently under control of the United States Air Force and is approximately four acres in size. It is located south of Runway 8L-26R on the shoreline of Keehi Lagoon. The area is presently a coral fill stockpile with little vegetation. There will be no impact on the environment due to the transfer and subsequent use of this land. Only that area needed for Taxiway RB will be disturbed. Removal of the coral stockpile and construction of the taxiway will improve the visual aesthetics of this area.

Area Four

This parcel is under the control of the United States Army and is less than one acre in size. It is located

south of Runway 8L-26R. It is a semi-grass, coral, gravel area. This area is required to meet the safety area and obstacle clearance requirements for Taxiway RB. No construction work will be accomplished on this area. Its status will remain as is; accordingly, there will be no impact to the environment.

Area Five

This parcel is under the control of the United States Army and is approximately 20 acres in size. The area is south of Runway 8L-26R and north of the shoreline of Keehi Lagoon. The area is covered with Kiawe (Prosopis pallida) trees, a coral stockpile and is bisected by Worcester Road. There will be no impact on the environment due to the transfer and subsequent use of the land. An underpass will be constructed under Taxiway RB to maintain access to the Hickam Golf Course via Worcester Road. There will be no effect or impact on the environment due to the construction of Taxiway RB and the Worcester Road underpass.

Area Six

This parcel is currently under the control of the United States Army and is approximately 95 acres in size. It is located within the Honolulu International Airport airfield complex at the end of Runway 4R. This area includes Runway 4R, Lagoon Drive, and runway clear zone/safety areas which are presently covered with graded coral fill and low vegetation. There will be no environmental impact due to the transfer and subsequent use of this land. Taxiway C, RT and RS ultimately will be built in this area. There will be an increase in surface runoff due to construction of the paved surface. Lagoon Drive will be closed; however, an airport maintenance road will be provided for servicing vehicles. The area to be transferred is now under agreement for use of the State of Hawaii for airport purposes.

Runways 4R and 4L are presently the primary runways used for landing heavy four-engine turbojet aircraft at Honolulu International Airport. Runway 4R-22L was extended by the State of Hawaii from 7,000' to 9,000' during the summer of 1970. The noise-abatement program now used at this airport has been very effective as a result of the runway extension and its ability to accept the large four-engine aircraft. The area to be transferred to State ownership also includes a portion of the clear zones for Runways 4R and 4L. As noted on Attachment 7, the State of Hawaii requested transfer of this area under Section 16/23 on July 29, 1968. There will be no change in land use as a result of this land transfer.

Area Seven

This parcel is currently under the control of the United States Navy and is approximately 344 acres in size. It is in Keehi Lagoon and is considered to be tideland area, composed of fringing coral reef and a coral borrow pit. A part of the reef runway/taxiways, the runway protective structure and the associated filled areas will be constructed thereon.

This area was previously dredged for use as a seaplane runway. When the State of Hawaii acquired the former seaplane runway easterly of the existing airport, the U. S. Navy retained this tract should future military seaplane operations need such a facility. It should be noted it was retained for aeronautical use (i.e., takeoff and landing of aircraft). Its present use is mainly for sail boating, water-skiing, power boating, fishing, swimming, etc. Although the transfer of the land will have no impact, the use proposed for the area and construction activities thereon will. It is believed the specific impact and mitigation of this impact is adequately covered under Section IV, A, page 11; Section IV, B(3), page 16; Section IV, C(1), pages 17 through 20; Section IV, C(5), pages 27 through 30; Section IV, C(6), pages 30 through 32 of the impact statement; transfer of this tract must be made to allow for construction of the Reef Runway. The benefit and improvement to the human environment through reduced noise levels over metropolitan Honolulu warrants the transfer of the property to the State of Hawaii for airport purposes. It should be noted that neither the Department of Interior representatives nor any other agency (State of Federal) has objected to the transfer and subsequent construction of the runway/taxiway and protective structure thereon should adequate measures be taken to mitigate the marine losses. It is believed this will be done within the capabilities of the State of Hawaii. Application by the State of Hawaii for the transfer was made on June 17, 1968. The transfer of this parcel of Federal real estate should be made so the construction of the Reef Runway may proceed with a minimum of delay, thus providing a very significant improvement to the human environment adjacent to Honolulu International Airport thorough noise reduction over those areas now affected.

Area Eight

This parcel is currently under the control of the United States Navy and is approximately 178 acres in size. It is located on the south side of Honolulu International Airport within the airport runway system. The area includes parts of Runways 4L, 4R, and 32, Taxiway C, the

runway safety areas, and airplane ramp areas, in addition to four warehouses, five T-hangars, the former Lockheed maintenance hangar, two private general aviation hangars, various small buildings and Lagoon Drive. There will be no immediate impact on the environment due to the transfer of land.

The State of Hawaii presently performs the maintenance and supervises the operation of all facilities on this tract. The existing land use will not change. Transfer of this area will place a major land area now used for airport purposes under State control, thus assuring development in accordance with Federal Aviation Administration airport planning guidelines which essentially require conformance with the National Environmental Policy Act of 1969. Application for transfer was made by the State on June 17, 1968.

Area Nine

This parcel is currently under the control of the United States Navy and is approximately 32 acres in size; in addition to Ahua Point, this area includes the U. S. Navy Keehi Lagoon Recreational Facility, graded automobile parking areas and rough-graded open areas. The surface cover on the facility proper is graded coral, limited number of Kiawe trees (Prosopis pallida), Coconut trees (Cocos nucifera), Hau trees (Hibiscus tiliaceus), and other scrub vegetation. The construction of Taxiways C, RS and RT and the taxiway safety area requires relocation of the facility. The beach facilities will be relocated to Barbers Point and the sailing and marina facilities will be relocated to Aiea Bay, Pearl Harbor. Construction of the Reef Runway will have a significant impact on the environment of this parcel.

Initially, it was planned to design the taxiway system in this area, which will connect the Reef Runway and the airport complex, to bypass the referenced property. An evaluation of Federal Aviation Administration taxiway location criteria indicated certain connecting taxiways would pass through the area if the system were designed to provide maximum runway capacity and a compatible aircraft taxiway system. Additionally, it was necessary to place Taxiway "RS" so that there would be no encroachment by taxiing aircraft into the approach surfaces for Runway 4R. It should also be noted that the recreation facility is located in an area which experiences very high noise levels as a result of the use of Runway 4 for landing of heavy four-engine turbojet aircraft. This is the primary arrival runway for this category of aircraft due to the approach being over water. As a result of this project, the military recreational facilities will

be relocated, ~~and a portion of the area~~
~~It will change~~ It will change
an existing land use from recreational to airport purposes.
Of the area to be transferred, only seven acres of the
total 32 are presently being used for recreation. Adequate
and comparable replacement facilities are being provided as
a part of the Reef Runway development. In view of this,
we are of the opinion the loss of this recreation facility
to the military has been mitigated. The military services
on the island of Oahu have not objected to the proposed
relocation. The U. S. Navy has been very cooperative
and is to assist, subject to reimbursement by the State
of Hawaii, in the relocation. An improvement of the
recreational environment through relocation to areas
where there will be no noise levels associated with the
aircraft operations at Honolulu International Airport is
being accomplished. Transfer of the property for air-
port purposes under State control will assure compatible
land use in accordance with Federal Aviation Administra-
tion airport planning guidelines.

Area Ten

This parcel is currently under the control of the Department
of Land and Natural Resources, State of Hawaii, and is
approximately 137 acres in size. This area is composed
of fringing coral reef and varies in depth from one foot
to 50 feet. The present use is for fishing only. Although
the transfer of this land will have no environmental
impact, the use proposed for the area and construction
activities thereon will. It is believed the specific
impact and mitigation of this impact is adequately covered
under Section IV, A, page 11; Section IV, B(3), page 16;
Section IV, C(1) pages 17 through 20; Section IV, (c)(5)
pages 27 through 30; Section IV, C(6), pages 30 through
32 of the impact statement; transfer of this tract must
be made to allow for construction of the Reef Runway.

Circulation Channel A (also a small boat channel), and a
part of the runway protective structure will be constructed
in this parcel. The Circulation Channel A will be dredged
to 20 feet in depth and approximately 300 feet in width.
This channel will allow small boats moored in Hickam
Harbor direct access to the ocean. The west end of the
runway protective structure will be constructed across
a portion of this area. The area between the runway
protective structure and the runway shoulder will be
filled in Increment II. The clear zone for 26L will also
cover this area. Additionally, the Instrument Landing
System (ILS), in part, will be located in this area.

4. Wildlife

The use of approximately 186 acres of silted coral mudflats for wildlife roosting and resting areas will be lost in the immediate construction area of the Reef Runway. The locations of these areas are shown on Attachment 8. These areas are used mainly by the following migratory birds:

Golden Plover (Pluvialis dominica fulva)
Ruddy Turnstone (Arenaria interpes)
Sanderling (Crocethia alba)

The Hawaiian Stilt or Ae'o (Himantopus himantopus knudseni), a rare and endangered species uses this area as a seasonal feeding and roosting ground from June to January. Berger, in Reference 11, recommends that those Stilt roosting islets in Keehi Lagoon that are to be disturbed by construction, be replaced with a new islet in Keehi Lagoon, to be located outside the approach and departure flight paths to minimize bird/aircraft conflict. The one islet that is immediately endangered by construction will be relocated during Increment I, Stage 1, construction so that the wildlife will have a ready available alternate habitat when the existing one is disturbed.

A joint program for replacement of wildlife habitat lost due to the Reef Runway construction has been developed with the cooperation of the U. S. Navy, the U. S. Bureau of Sport, Fisheries and Wildlife, the State Division of Fish and Game, and the State Airports Division. The program consists of developing two wildlife areas in the U. S. Naval Station, Pearl Harbor. It is believed that a more desirable bird habitat will be established in the Pearl Harbor area as a result of this project and ultimately a majority, if not all, of the bird life will move from Keehi Lagoon. Attachment 9 shows the location of the wildlife habitats at Honouliuli and on the Pearl City Peninsula. Both of these refuges are within areas already committed by the U. S. Navy for conservation use. The site for Honouliuli bird refuge is approximately 25 acres in area and consists of old abandoned salt ponds. It is to be provided with a source of fresh water and is to serve as a feeding area. A number of small islands are also to be built to afford areas for breeding and roosting. The Pearl City Peninsula site is approximately 10 acres in size and is presently used for bird feeding during the wet months; the site dries up during the summer. This area is to be made into a permanent refuge for year around feeding, breeding and roosting. While it has not yet been determined whether these areas are of comparative productivity to the sites lost, biologists are of the opinion that when properly developed and maintained, such areas may be of equal or perhaps greater value to Stilts and other wildlife.

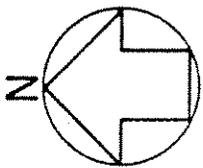
5. Marine Life

An ecological survey of Keehi Lagoon was carried out by Oceanic Institute from June 1970 to September 1970 (Reference 8) to determine the ecology of Keehi Lagoon and the effect the development of the Reef Runway would have on the flora and fauna of Keehi Lagoon. During the study, a primary purpose was to examine the invertebrates that were collected in the area. As an indicator, the molluscan population was selected for study since they are an especially good indicative organism. They require considerable time to grow to full size, and their growth can be correlated with sediments that exist in the area.

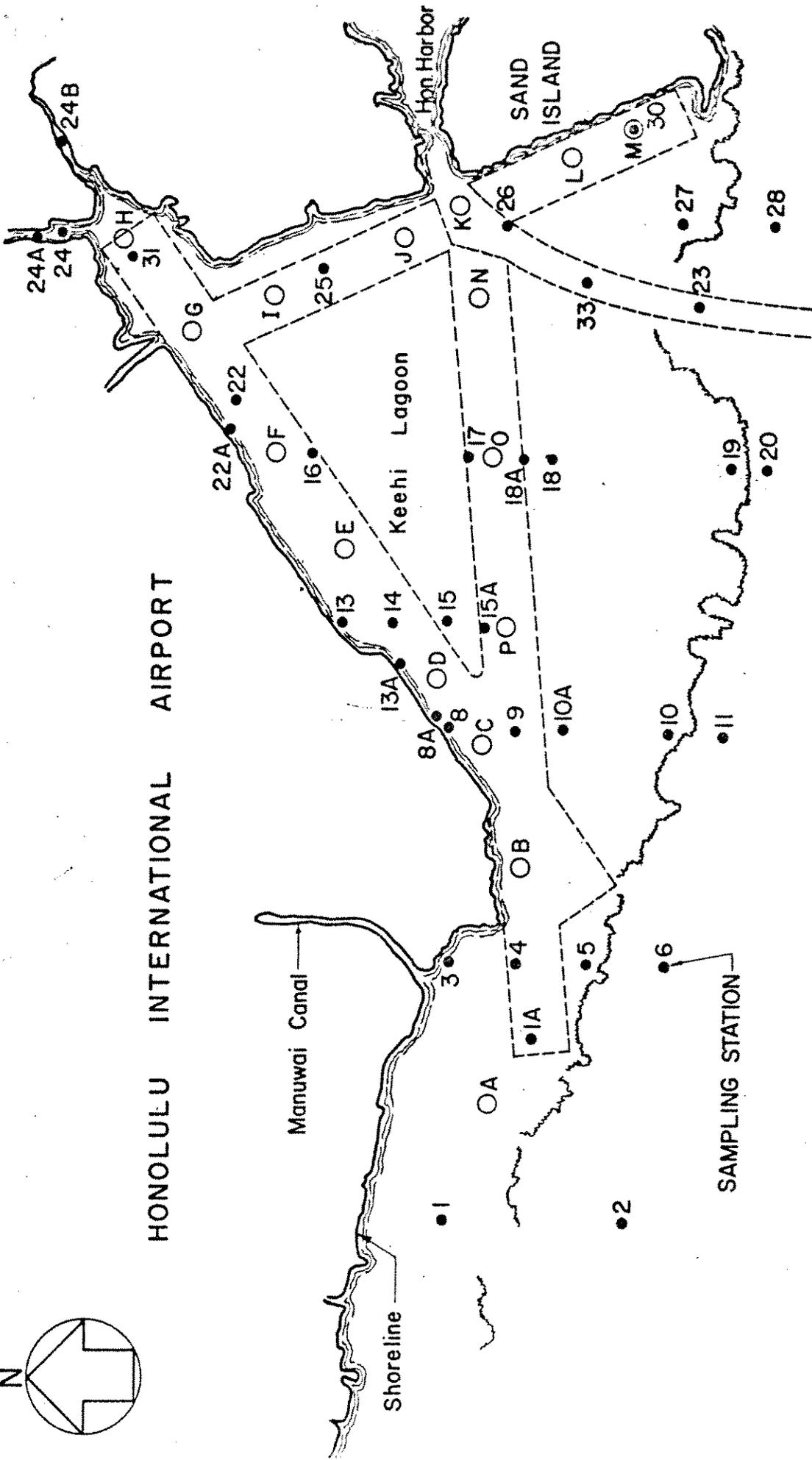
Seventy-six species, comprising approximately 500 specimens of marine mollusks, are represented in the 25 samples of dredged material taken from the waters of Keehi Lagoon. The locations of the sampling stations are shown on Exhibit C (Page 28). Twenty-seven species are represented by dead shells only. With few exceptions, the species are characteristic of most Hawaiian intertidal, weedy, fringing reefs. The mid-reef area with nine common species is characterized principally by the ubiquitous, euryhaline Bittium parcum, Risoella sp., Crucibulum, Crepidula and Diodora, the latter three probably introduced by ship transport. The reef edge has ten common species with large, active carnivores predominating. The stations offshore or outside the reef, with 23 common species, have both a more diverse and abundant molluscan fauna than either mid-reef or outer reef, which fauna includes a variety of both epifaunal and infaunal species.

Compared with other reef areas in Hawaii, the mid-reef and reef edge at Keehi Lagoon are poor by comparison in terms of both species diversity and abundance of specimens. The number of dead shells and the eroded, discolored shells of species such as Peristernia, Conus, and Morula indicate that the present conditions of the reef environment are extreme, with perhaps low salinities and silt predominating in their effects on the mollusks. It would appear that the offshore regions of the reef are somewhat more in balance than are those on the reef itself, but the presence of a rich bivalve and infauna suggests water with a high nutrient content.

Although the mollusks are the best organisms for indicating conditions over the whole lagoon area, the reef corals are the most important invertebrates with respect to the coastal conditions on the island of Oahu. The number of species of living corals and their abundance can be negatively correlated with detritus and turbidity and positively correlated with light intensity, oxygen content and water circulation as a result of correlations. Keehi Lagoon can be biologically classified as a very poor area. Species, including corals,



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- 7
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- 32

SAMPLING STATION LOCATION PLAN

that require clean sea water are absent inside the reef where the turbidity and organic loading is high. The animals characteristic of this region, in addition to the micro-mollusks, are worms of various kinds (living in the channel mud) and tubeworms (living on dead coral). These were found in profusion. Green, blue-green and some brown algae were also found on the dead coral within the reef in typical association with the worms and mollusks.

Generally, filter-feeding fauna commonly found in turbid calm water were observed on the rocks along the shoreline boundary of Keehi Lagoon. On the inner side of the reef, large numbers of Sabellid tube worms and tunicates were observed on the top side of coral rubble. Sponges and bryozoans were found to occupy the underside of loose pieces of coral rubble.

Sampling Station 7 appeared to be the cleanest of those included in the survey. Here there were five species of coral (Porites lobata, P. evermanni, Porites sp., Zoanthus sp., and Pavona varians), three species of starfish, a sea urchin, a tunicate, coralline algae, a serpulid worm, a barnacle (Balanus amphitrite), a crab (Xanthus sp.), and encrusting bryozoans. These organisms are typical of the community and were present in significant quantities. Many other species of animals were encountered at this station, as well as plants, but time did not permit their study. Fewer species were encountered east of Station 7.

At Station 12 the old coral and sand bottom were important factors. Here there were few fish, much Ulva and a population of holothurians (Holothuria atra). At Station 21 there were two abundant species of sea urchin (Echinothrix sp.) and two species of coral (Porites lobata, which was scarce, and Coelastrea tenuis, which was abundant). At Station 29 the bottom was composed of hard coral rubble and loose sand. There were many barnacles on the rubble, with scattered Ulva. No living coral was found. A red sea urchin and Conus leopardus was observed in the area of Station 29.

The seaward side of the reef area is rich in number of corals and invertebrates. The reef tops were encrusted with zoanthis, a type of soft coral common in areas of high surge. Hard corals of the genus Pocillopoia, Porites, Leotastrea, and Cyphastrea were observed in numbers that appear to be equivalent to those found in similar habitats elsewhere on the island of Oahu.

The benthic algae found in abundance in Keehi Lagoon are generally forms that tolerate or require fairly high levels of inorganic nutrients, principally nitrate and phosphate. Consequently, when present in abundance they indicate high organic loading followed by some degree of mineralization by

microorganisms. Some of the species like Acanthophora spicifera and Spyridia filamentosa also tolerate stagnant water. These forms are competitors with many of the reef-building coralline algae, such as Porolithon sp. Many of the algae are highly epiphytized, indicating old populations and polluted conditions. The inner stations are dominated by pollution-tolerant green forms (e.g., Ulva sp.) and red forms such as Acanthopora sp. Deeper waters have generally more blue-green algae (e.g., Symploca sp.), which are also pollution-tolerant.

The only collections which could be characterized as representing fairly clean conditions were made at Sampling Station 12 in fairly deep water outside the reef margin. It is to be noted that at the station which appeared to be the cleanest, Station 7, there were very few algae.

6. Fish

A number of species of fish, in addition to the commercial bait fish (the Nehu), have been observed in Keehi Lagoon. These can be classified as to habitat location as follows:

	Keehi Lagoon			
	<u>Shoreline</u>	<u>Inner Lagoon</u>	<u>Mid-Reef</u>	<u>Outer Reef</u>
Surgeon Fish				
<u>Acanthurus sandvicensis</u>		x		x
<u>A. Achilles</u>		x		x
Puffer Fish				
<u>Arothron hispidus</u>			x	
Eleotrids				
<u>Asterropteryx semipunctatus</u>			x	
Butterfly Fish				
<u>Chaetodon fremblii</u>		x		
<u>C. Miliaris</u>		x		
<u>C. sp.</u>				x
Mullet				
<u>Mugil cephalus</u>		x		
Trigger Fish				
<u>Rhinecanthus aculeatus</u>				x
<u>R. rectangulus</u>				x
<u>R. sp.</u>				x
Hammerhead Shark				
<u>Sphyrna Lewini</u>	x			

Additionally, the following fish have been observed on the seaward side of the reef: Wrasses, (family Labridae), Parrot Fish (family Scaridae), Goat Fish (family Mullidae), and Damsel Fish (family Pomacentridae).

Harvey, in Reference 8, concluded in the ecological survey of Keehi Lagoon that the lagoon and most of the reef must be considered as being in poor to very poor condition when compared to other biologically healthy areas. Also, the conditions inside the lagoon are so severe now that only resistant organisms can live there and these would be little damaged, except in localized areas, by the construction activity. The Reef Runway should result in improved ecological conditions in the lagoon and adjoining reef areas if circulation can be improved, especially if the quantity of sewage now entering the lagoon can be reduced by treatment.

Records indicate that 12.5 percent of the Hawaiian Tuna Fishery commercial bait taken in Hawaii was from Keehi Lagoon. Of this bait, Nehu (Stolephorus purpureus) comprise 9.3 percent and the Iao (Pranesus insularum) almost all the remainder (of the total 12.5 percent) (Reference 12). In Uchida's analysis of the operations of seven Hawaiian skipjack tuna fishing vessels from June 1967 to August 1967, less than one percent of the total bait caught in Keehi Lagoon was in the area of the Reef Runway. It has been the past experience of Hawaiian skipjack tuna fishermen that after an area has been newly dredged or redredged, the availability and abundance of Nehu often increases. It is the general opinion of the Tuna Boat Owners Association that the dredging will improve the fishing area for Nehu and thus compensate for the loss of Nehu habitat. The State Fish and Game Division concurs with this opinion. Channel A and Channel C can also be used for bait fishing. However, the effect of the loss of 765 acres of marine habitat for Nehu spawning and nursery ground cannot be ascertained at this time due to a lack of basic data on the life history of the Nehu.

A number of oceanographic engineering studies have also been completed for Keehi Lagoon. In one of the early engineering feasibility studies a preliminary circulation study was completed for the lagoon by Parsons, Reference 13. Since then, additional engineering feasibility studies (including a hydraulic scale model study and a detailed circulation study by the University of Hawaii) have been completed by Sunn, Low, Tom & Hara, Inc., Reference 14, and the University of Hawaii, Reference 15. As a result of these oceanographic engineering studies, it has been concluded by Harvey & Palmer (Reference 2) that the circulation patterns of Keehi Lagoon will be improved by the development of the Reef Runway. With the improved circulation patterns, the construction of the Reef

Runway will result in an improved ecological condition in the lagoon complex. This will aid in improving the fishing and food gathering in the lagoon. This decrease in pollution will be further aided upon completion of the sewage treatment plant planned for Sand Island.

V. PROBABLE ADVERSE ENVIRONMENTAL EFFECT WHICH CANNOT BE AVOIDED

The probable adverse environmental effects which cannot be avoided by constructing the Reef Runway are the loss of construction materials that will be required for construction and the loss of existing marine and wildlife habitat. The two predominant construction materials are coral fill and rock products. Fill material will be obtained in the offshore areas through the dredging of channels which will improve the circulation within Keehi Lagoon and provide a replacement access to Hickam Harbor. All fill material will be obtained within the ultimate boundary of the airport and from an offshore borrow area. Rock products, which will range from crushed rock to boulders weighing 10 to 20 tons, will be obtained from existing developed quarries on the island of Oahu. These rock products will more than likely be hauled to the construction site by truck.

Approximately 765 of the 1,240 acres of marine wildlife habitat within the construction area for the Reef Runway will be covered over by dredge fill or large rock required for construction of the runway and taxiways and the runway protective structure. The use of the remaining 475 acres of existing marine habitat will also be changed. The new circulation and small boat channels will occupy 235 acres; 240 acres will become a Marine Pond that is to be operated by the University of Hawaii for aquacultural purposes.

VI. ALTERNATIVES TO THE REEF RUNWAY PROJECT

The Reef Runway project is expected to meet the present and foreseeable operation requirements of the State of Hawaii. The configuration shown on Attachment 1, Reef Runway Layout, results from the consideration of a combination of operational, engineering, cost and environmental items. One of the prime advantages of the Reef Runway as configured is an improvement in the human environment by the reduction of noise. It is also a configuration that would impose the minimal disturbance to the natural environment.

A number of alternative designs were considered prior to electing to develop the Reef Runway. The three principal runway configurations considered, as shown on Attachment 10, Alternate Runway Configuration, are as follows:

- A runway oriented 10-28 (100° - 280°) was proposed by Austin, Smith & Associates and considered as an alternative to the Reef Runway (Reference 16). The runway orientation has never progressed beyond the planning stage since it would have a higher crosswind component than is operationally acceptable. Additionally, it would only increase aircraft operational capacity in easterly (trade wind) departure operations. Arrivals and departures to the northwest would move the present noise and overflight problem to the Pearl Harbor and adjacent residential areas. The effect of the noise on this area, where aeronautical operations did not previously exist, would not be acceptable to the human environment.
- A close-in parallel runway, 1,300 feet south of the existing Runway 8-26, was proposed by Leigh Fisher Associates, the Honolulu International Airport airport consultant, (Reference 1). While this scheme would increase airfield capacity, there would be little or no improvement in noise attenuation and little or no improvement in safety from overflights. For these reasons, the Honolulu International Airport Task Force, a group of airline governmental, business and community leaders, recommended that since the goal was to reduce aircraft noise levels over the populated areas on the southern coast of Oahu, and to minimize the incidence of aircraft flights over downtown Honolulu, this alternative was not acceptable.
- In 1969, the airlines that serve Honolulu International Airport engaged Stanford Research Institute (SRI) to perform a study of alternates to the Reef Runway. The SRI study report (Reference 17) recommended extending Runway 8L-26R 4,000 feet to the west and constructing an additional 6,500 foot reliever parallel runway, 1,300 feet south of the existing runway. With these improvements, SRI indicated that the Reef Runway would not be needed until 1980. In December 1969, the airlines recommended a 2,500 foot westerly extension of Runway 8L-26R. The USAF objected to this extension due to

the high level of noise that would be experienced by Hickam Air Force Base and the adjacent military housing. The replacement cost to the military for facilities lost by the extension would have been \$37 million. Due to the anticipated high noise levels at the west end of the proposed runway extension together with little reduction of noise over residential areas west of the runway, this alternate was not accepted.

The Governor after due consideration of the many alternatives has approved the Honolulu International Airport Master Plan (Reference 1). This plan included development and construction of the Reef Runway. It is the opinion of the State that there is no alternative which will offer the social-environmental balance that the Reef Runway will provide. In Fiscal Years 1970 to 1973, under the State of Hawaii Capital Improvement Program, the Hawaii State Legislature approved \$29.52 million for construction of the Reef Runway.

Another alternative to the Reef Runway project would be to forego construction of the project. The consequences are that metropolitan Honolulu and adjacent communities would continue to be subjected to high aircraft arrival and departure noise levels (See Attachments 4, 5 and 6), in addition to being subjected to overflights by large subsonic aircraft and the SST when it becomes operational. Additionally, the use of Honolulu International Airport would be limited since it is now operating at maximum operational conditions at peak hours. This would, in turn, limit growth of the tourist industry, one of Hawaii's largest industries.

If the Reef Runway project was not undertaken, the present sources of pollution abated, and adequate channels through the reef dredged to insure flushing, the productivity of Keehi Lagoon would increase, as suggested by Harvey in Reference 8. However, the overall advantages of the Reef Runway to the human environment outweigh the increase in productivity of Keehi Lagoon through an improved water quality program.

Since its earliest conception, there has been a continual dialogue between Federal, State and community agencies, private groups and individuals regarding the Reef Runway project. It is the conclusion of the State of Hawaii that the Reef Runway project has the support of the community and a majority of federal regional agencies in Hawaii.

VII. THE RELATIONSHIP BETWEEN LOCAL SHORT-TERM USES OF THE ENVIRONMENT AND ENHANCEMENT OF LONG-TERM PRODUCTIVITY

The Reef Runway will be constructed in two increments. The work items included in each increment is listed herein and shown on Attachment 1. Increment I, Stage 1 construction is scheduled to begin in early summer 1972, with completion scheduled for late 1973. Increment I, Stage 2 construction is scheduled to begin in mid-1973, and should extend into early 1974. A starting date has not been scheduled for Increment II construction. When undertaken, Increment II construction is estimated to take 12 months to complete. It is believed that the total impact to the environment on both the short and long-term basis will be established once construction of the Reef Runway is started.

The first Increment I items scheduled for construction are the runway protective structure and concurrent dredging of Channel A and B, followed by dredge fill operation for the runway and taxiways (the offshore work). As mentioned previously, the replacement islets for the displaced bird-life will also be constructed early in the first stage of construction. Constructing the runway/taxiways and lighting will follow in subsequent order.

Work on the runway protective structure will begin at the east end of the runway in the shallow reef area and proceed to the west into deeper water. Initial efforts in the building of the runway protective structure will be the construction of the service road that connects the mainland with the shallow reef at the east end of the runway. This road will also be used as a construction road to allow subsequent construction operations to proceed. The outside slopes of this road will be composed of rock rubble or gravel. The absence of silt-sized fines in this coarse material will insure that there will be no muddying of the water in the construction area. The initial construction with the coarse material will only proceed until the top is above the water level. The final top elevation will be reached with finer material (probably coral) only after other dikes have been constructed to isolate each segment of the placing operation from the surrounding water in Keehi Lagoon. These initial coarse material dikes will be used throughout the construction period for the runway protective structure and dredge fill operation to limit the silt-fines.

All dredge operations will be conducted with hydraulic suction dredges. The dredging operations will be confined to Circulation Channels A and B, Kalihi Channel and the designated borrow area offshore at the east end of the runway. The suction dredge will disturb the water in the borrow areas less than any type of dredging equipment available. The increase in the turbidity of the water should be very minimal. The dredge fill will be piped directly from the dredge to the various confined ponds along the length of the runway. The flow of water out of these ponds will be controlled by weirs to control the flow of fines. If required, additional settling ponds with weirs will be constructed to further limit the fines to the impounded areas.

There is a possibility that the silt on the bottom of the seaplane runways will have to be removed prior to placing the fill for the runway and taxiways. This silt will be removed by the dredges prior to initiating the filling operations. All silt removal operations will be conducted within the confines of the dike system. Additionally, all dredged silt will be deposited in specified areas within the dikes outside the shoulders for the runway and taxiways. At the conclusion of the dredging operation, the silt-disposal areas will be filled over with clean fill material to eliminate any future chance for causing future turbidity within the lagoon.

Armor stone and other coarse material that would be required from a quarry for construction of the runway protective structure, will be supplied from existing quarries located on the island of Oahu. Attachment 11, Vicinity Map, shows the existing quarries and the principal highways leading to each quarry. Constructors hauling the armor stone and coarse material out of the quarries will be limited by the construction specifications to operations that will not pollute the highways and haul roads. Runway paving materials, including aggregate, will be made at local plants. Their production will meet local codes and standards. Specifications prepared in accordance with these standards will be required for hauling the armor stone and gravel. It is expected that there may be some localized pollution due to fines escaping in the construction area. This will be kept to a minimum by the use of a hydraulic suction dredge and impoundment of the construction areas. Pollution caused by construction will be temporary, reversible and will cause no permanent damage to the remaining portion of Keehi Lagoon. All construction will be in accordance with FAA Advisory Circular No. 150/5370-7, Airport Construction Controls to Prevent Air and Water Pollution (Reference 18).

When plans and specifications have been prepared for this project, they will be transmitted for review and comment by appropriate federal agencies. It is believed those agencies that will have a major interest are the Department of Interior (Bureau of Outdoor Recreation and Bureau of Sport Fisheries and Wildlife); Department of Commerce (National Oceanic and Atmospheric Administration); Department of Army, Corps of Engineers, Honolulu District; and the Environmental Protection Agency.

A small number of trees exist at the Navy Recreation Facility at Ahua Point that will have to be removed. Most of these will be replanted in other areas; those which are not replanted will be disposed of in accordance with applicable local regulations. The small amount of top soil at the Navy Recreation Facility that is to be removed will be reused for topsoil in other areas. Debris caused as a result of the construction will be very minimal and disposed of at an existing controlled landfill area. Building relocation will be a part of the project associated with the Navy Recreation Facility relocation.

The long-term effect of the Reef Runway development will be the reduction of the high aircraft noise level over metropolitan Honolulu, and the increased safety due to reduced overflights. Additionally, Honolulu International Airport will be able to meet the operational needs of the Hawaiian community through the year 2000.

Another long-term effect to the environment will be the loss of 765 acres of low coral reef in the lagoon area. An additional 235 acres will be small boat access and circulation channels. The 240 acres north of the runway will be retained as a Marine Pond (see Attachment 1). In order that this pond can be managed biologically, approximately a 20 percent turnover of sea water per day will be maintained by the use of two multiple culverts under Taxiway RB to Hickam Harbor and one culvert under Taxiway RA and Runway 8R-26L. Pumping of the sea water will be employed, if necessary, to maintain this turnover. The University of Hawaii Sea Grant Program has requested, and received permission, from the State to use this 240-acre marine pond for aquaculture research. The installation of facilities in the vicinity of the existing John Rodgers Terminal area and the existing aircraft maintenance areas to collect and treat aircraft washwater and fuel spills will eliminate the present source of pollution from entering Manuwai Canal and other drainage channels that empty into Keehi Lagoon and the new Marine Pond.

VIII. IRREVERSIBLE AND IRRETRIEVABLE COMMITMENTS OF RESOURCES THAT WILL RESULT

The irreversible and irretrievable commitments of resources that would be involved in the development of the Reef Runway are the existing marine and wildlife habitats that will be used for the runway and taxiways, plus the labor and materials necessary for the construction. Approximately 765 acres of existing marine and wildlife habitat will be covered by the fill for the runway and taxiways and by the runway protective structure. An additional 475 acres of existing habitat will become circulation and small boat channels and a Marine Pond.

The predominant construction materials will be coral for fill, rock, plus smaller amounts of Portland cement or asphalt products, for construction of the runway/taxiway pavements. Coral fill will be dredged from circulation channels or borrow areas located as shown on Attachment 1. Rock, in both large size and crushed form, will be obtained from existing quarries on the island of Oahu. Construction of the Reef Runway will be classified as heavy construction. As such, a large amount of heavy equipment will be used to minimize the expenditure of labor for construction, both on-site and in the quarries.

IX. PROBLEMS AND/OR OBJECTIONS

The Air Transportation Association representing the scheduled airlines at the Public Hearing on March 22, 1971, agreed that the Reef Runway will provide environmental benefits to Hawaii. However, they feel that the financial burden on the airlines will be too great at that time. It is the position of the State of Hawaii that the environmental benefits of the Reef Runway outweigh these financial considerations. In fact, the airlines that serve Honolulu International Airport will bear only approximately 25-35 percent of the total Reef Runway cost. It is anticipated the remainder will be financed by non-airline concessionaires and matching federal funds. The airline representatives are also of the opinion the Reef Runway is a required addition to Honolulu International Airport, but one that is not needed until 1980.

The local conservation and wildlife groups at the Public Hearing (Reference 4) spoke on the need for adequate safeguards against adverse environmental effects of the project. At the hearing, recommendations were made that the loss of marine habitat be mitigated. The State recognized that the environmental consideration of construction of the runway will require an active program of environmental quality control during design and construction by an independent environment consultant. During the design phase for the Reef Runway, the firm of Sunn, Low, Tom & Hara Inc., Environmental Consultants, are providing the following consulting services:

- Task A. Develop criteria for circulation of water into and out of the Marine Pond north of Taxiway RA to comply with the Environmental Impact Statement.
- Task B. Provide pollution control guidelines for the designers associated with the design of the Reef Runway to include in their designs and construction specifications.
- Task C. Review the criteria established for the bird habitats and make appropriate comments and recommendations.

During construction, an active program of environmental and ecological quality control and monitoring will also be provided by an independent environmental consultant.

The State plans to mitigate the loss of wildlife habitat by a cooperative program with the U. S. Navy, the U. S. Bureau of Sport Fisheries and Wildlife, the State Division of Fish and Game, and the State Division of Airports. Basically, the program consists of developing two existing conservation areas to provide breeding, feeding and roosting sites for the Hawaiian Stilt and other birdlife.

The policy of the Federal Aviation Administration clearly states that before undertaking any major airport development action potentially involving federal financial aid, the agency, in consultation with appropriate federal, State and local agencies, assess in detail the action's potential environmental impact in order that adverse effects are avoided and environmental quality restored or enhanced to the

fullest extent possible. Actions covered under this policy statement also include the transfer of federal lands. It is also within the purview of the agency to require an environmental impact statement on any action affecting the development of an airport, particularly when the development is likely to be highly controversial on environmental grounds.

Section 101(b) of the National Environmental Policy Act of 1969 (P.L. 91-190) indicates the broad range of aspects of the environment to be surveyed in any assessment of significant effect. Section 102(2)(c) of the referenced Act implies that all actions and programs that affect the environment or have the potential for affecting the environment are considered to be major federal actions and require a full and complete review by the appropriate federal agency before any change, alteration, or construction may be initiated. The referenced Act provides adequate measures to prevent any change in the current status and uses of Keehi Lagoon. Pending preparation and acceptance of a satisfactory use plan, compatible with aeronautical operations at Honolulu International Airport, it appears that no change in the lagoon management is warranted.

The Department of Interior has indicated that the estuarine value of Keehi Lagoon is of considerable value to the human and natural environment of the State of Hawaii. They have made a strong recommendation that this area be made available for a multi-purpose recreational area, even though at the present time a plan for such a program has not been developed.

The State of Hawaii, through their Department of Transportation (Harbors Division) and the Department of Land and Natural Resources, has allocated funds to complete a study for development of Sand Island for park and recreational purposes. As Keehi Lagoon is adjacent to the proposed recreational area, and will definitely be influenced by any proposal for development of Sand Island, it is believed that no firm commitment as to the change in the current status of Keehi Lagoon is warranted at this time.

Keehi Lagoon, per se, is now used for numerous recreational purposes. These uses include sail and power boating, water-skiing, surfing, fishing, scuba-diving and swimming, particularly in the areas of the former seaplane runways. At the present time, there are no restrictions to this use, other than for safety reasons as administered by the Harbors Division of the State Department of Transportation.

It should be noted that under Hawaii Revised Statutes, Chapter 266, Section 266-1, the State Department of Transportation has jurisdiction over all ocean shores below mean highwater mark, shore waters and navigable streams, and all harbors and roadsteads. Further, all harbor and waterfront improvements belonging to, or controlled by the State, and all shipping within the harbors, roadsteads, water and streams shall be under the care and control of the Department of Transportation (Reference: Section 26-19, State Attorney General Op. 62-16). It is believed this referenced statute determines the legality of control as now exercised by the State Department of Transportation. The Harbors Division

and Airports Division are respective organizations under the Department of Transportation. Presently, the area under question is under the control of the Airports Division. It is questionable whether transfer of control from the Department of Transportation to another State agency (Land and Natural Resources) can be accomplished legally under the current statutes.

In line with the strong environmental considerations that Congress enacted in the Airport and Airways Development Act of 1970, the Federal Aviation Administration is very reluctant to consider release of such a prime area already located within the existing airport boundary where compatible use can now be assured. The agency has continually adopted programs to make good neighbors of our airports, and where new airports are being built, providing large tracts of land needed to insulate neighbors from airport operations. It is now recognized that some use patterns have grown like Topsy, but more and more public officials recognize the need for land use compatible with the operation of an airport. With this in mind, there appears to be no need to release this prime area for a proposed multi-purpose use when that use has not been thoroughly planned nor funded for implementation.

The short-range environmental impact of the proposed Reef Runway on the lagoon area, which has been proposed for a multi-purpose recreation area, will be negligible. In fact, heavy four-engine turbojet aircraft will be arriving and departing on the seaward Reef Runway, thereby reducing noise levels over a portion of the lagoon area. The State Department of Transportation has no plans within the foreseeable future to change the present status of recreational use for the lagoon. As mentioned previously the Department of Transportation is aware of the potential of the lagoon and is in process of having such a plan developed. The results of the plan (although not available until March 1972) will basically encompass a proposed development of Sand Island for recreational purposes.

The long-range environmental impact on Keehi Lagoon for airport development and expansion should be considered in conjunction with the overall development of Sand Island and other recreational areas on the island of Oahu. A plan should be developed with the concurrence of the interested federal agencies to ensure compatible land use near the Honolulu International Airport, and to provide for development of existing areas for multi-purpose recreational use, should this be the highest and best use for the area.

The State of Hawaii, through development of Interstate Highway H-1, will improve surface transportation access to Honolulu International Airport. This work is needed now, and is scheduled for construction to start in 1973. Development of Keehi Lagoon for a multi-purpose recreation use will increase the need for additional surface access to the area, particularly for Sand Island. This must be included in an overall plan, since the existing and currently planned system improvement should not be forced to accept the additional use for recreation only as a trade-off to allow for construction of additional runway facilities. The time spent between the air passengers' surface departure point to the

airport terminal is very critical. The Department of Interior representatives have expressed the viewpoint in meetings in Honolulu that they have no objection to the proposed construction, only that Keehi Lagoon should be released from airport control.

In view of the above that the short-range environmental impact on the lagoon as a result of the Reef Runway will not change, we do not feel that a change in airport control over the area in question, nor a change in airport boundary, is warranted. If a suitable plan can be developed that allows for a compatible use of the lagoon for recreational purposes, the Federal Aviation Administration would not object as long as the airport interests within the State retain control.

Three Honolulu Harbor Development Studies have included the development of Keehi Lagoon for other than airport multi-purpose use. Bartholomew (Reference 19) in Part One of The Honolulu Waterfront proposed that the triangle area of the lagoon be developed for industrial, maritime, recreation, fishing and marine uses. Tudor (Reference 20) in Part Two of The Honolulu Waterfront generally expanded in greater detail the proposed facilities recommended in Part One. Later in 1968, Wilson, Okamoto & Associates (Reference 21) revised The Honolulu Waterfront to indicate an integrated development plan for Keehi Lagoon, which included the Reef Runway project and other elements of the Honolulu International Airport Master Plan. In Hawaii's Shoreline Study, 1962 (Reference 22), it was proposed that Keehi Lagoon be filled and the 233 acres be used for light industrial, marina, commercial fishing, beach and recreational areas. It should be noted that a small boat harbor (see Attachment 8), Keehi Lagoon Marina, has been developed in Keehi Lagoon by the State Department of Transportation, Harbors Division, at a cost of over \$1 million. Continued use and additional development of this area for multi-purpose use will be permitted.

The possibility of a future SST noise problem was discussed at the public hearing. The discussion centered around development of an American SST, a program that has since been curtailed. However, it is the understanding of the State of Hawaii that Boeing has committed itself to the assurance that the ambient takeoff noise levels for the SST (should one be developed) will meet the levels established in Federal Aviation Regulation 36 for the latest subsonic jet aircraft. Should an SST be certified, the aircraft would be able to operate on the existing runways as well as on the Reef Runway. Through a preferential use program, the SST operations could be limited to the Reef Runway and thus have a greater effect from a noise abatement standpoint than use of existing Runway 8L-26R.

REFERENCES

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2. Harvey, George W., Palmer, R. Q., Walker, James R. and Kartha, T. D. Krishna Plan to Enhance Water Quality in Keehi Lagoon and Ponds Makai of Proposed Reef Runway 8R-26L, February 1971
3. Governor's Task Force on Keehi Lagoon Report on Keehi Lagoon and Waikiki Beach Water Quality, January 1971
4. Department of Transportation State of Hawaii Official Transcript - Reef Runway Public Hearing, March 22, 1971.
5. Legal Aid Society Personal Communication From Floyd Sumida, August 1, 1971.
6. Department of Education State of Hawaii Personal Communication, Honolulu District Office, July 29, 1971.
7. Department of Planning & Economic Development State of Hawaii The Population of Hawaii (Revised Final Report) - Statistical Report 79, January 8, 1971.
8. Harvey, George W. Keehi Lagoon Ecological Survey, June to September 1970, Oceanic Institute, 1970.
9. Hawaii Surfing Association Surfing Survey - Summary of Honolulu Quadrant 1968.
10. Executive Office of the President Bureau of the Budget Circular A-95 - Evaluation, Review and Coordination of Federal Assistance Programs & Projects, July 24, 1969
11. Berger, Andrew J. and Walker, R. T. Keehi Lagoon Bird Survey, July 12, 1971.
12. Uchida, R. N. & Sumida, R. E. Analysis of the Operations of Seven Hawaiian Skipjack Tuna Fishing Vessels, June - August 1967, Unpublished, Bureau of Commercial Fisheries, Biological Laboratory, Honolulu, Hawaii, March 1971
13. The Ralph M. Parsons Company Study Report - Proposed Reef Runway, Honolulu International Airport, Vol. I and II, State of Hawaii, December 1968.

REFERENCES

14. Sunn, Low, Tom & Hara, Inc. Current Study in Connection With Proposed Reef Runway, University of Hawaii, December 1969.
15. University of Hawaii Hydraulic Model Study - Proposed Reef Runway, JFK Look Laboratory, Department of Ocean Engineering, 1970.
16. Austin, Smith & Associates, Inc. Report Covering the Preliminary Engineering of the Seaward Jet Runway 10-28, January 1963
17. Stanford Research Institute Runway Development Requirement at Honolulu International Airport, 1969.
18. Federal Aviation Administration Airport Construction Controls to Prevent Air and Water Pollution, Advisory Circular 150/5370-7, April 26, 1971
19. Harland Bartholomew & Assoc. The Honolulu Waterfront, Part One, A General Plan for the Honolulu Waterfront Area, March 2, 1961.
20. Tudor Engineering Company The Honolulu Waterfront, Part Two, Development Plan for Maritime Facilities, March 2, 1961.
21. Wilson, Okamoto & Assoc. Honolulu Harbor 1968, A Planning and Engineering Guide for the Development of the Honolulu Waterfront, October 21, 1968.
22. Department of Planning & Economic Development
State of Hawaii Hawaii's Shoreline, 1962.

APPENDIX

REFERENCED LETTERS

1. Mr. George S. Moriguchi to Mr. Owen Miyamoto
2. Mr. Oliver Kinney to Governor John A. Burns
3. Governor John A. Burns to Mr. Phillip M. Swatek
4. Dr. Richard E. Marland to Governor John A. Burns
5. Dr. Fujio Matsuda to Mr. Phillip M. Swatek
6. Miscellaneous letters on planning.

CITY AND COUNTY OF HONOLULU

629 POHUKAINA STREET
HONOLULU, HAWAII 96813

FRANK P. PASI
MAYOR



ROBERT R. WAY
PLANNING DIRECTOR

GEORGE S. MORIGUCHI
DEPUTY PLANNING DIRECTOR

April 1, 1971

P3/71-1254

MEMORANDUM

TO : MR. OWEN MIYAMOTO, CHIEF, AIRPORTS DIVISION
DEPARTMENT OF TRANSPORTATION, STATE OF HAWAII

FROM : GEORGE S. MORIGUCHI, ACTING PLANNING DIRECTOR
CITY AND COUNTY OF HONOLULU
METROPOLITAN CLEARINGHOUSE

SUBJECT : DRAFT OF THE ENVIRONMENTAL IMPACT STATEMENT FOR THE
REEF RUNWAY PROJECT

We have completed our review of the above draft and find that your draft appears consistent with the requirement of Section 102(2)(C) of the National Environmental Policy Act of 1969.

Handwritten signature of George S. Moriguchi in cursive script.
GEORGE S. MORIGUCHI
Acting Planning Director

GSM/JB:cag

cc: State Clearinghouse

RECEIVED APR 07 1971

Skylane Inn, Inc.

"Hawaii's Airport Hotel"
2628 WAIWAI LOOP

HONOLULU, HAWAII 96819

TELEPHONE: 841-4231

RECEIVED JUL 30 1971

April 30, 1971

The Honorable John A. Burns
Governor of Hawaii
Hawaii State Capitol
Honolulu, Hawaii 96813

Dear Governor Burns:

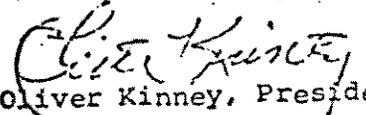
Re Seaward Runway Plans

The residents of the Kalihi-Kapalama and Salt Lake, as well as workers and business men of these areas named, and many others are vitally concerned with the development now in progress at the International Airport and wish by their petitions to the Department of Transportation to indicate their support to the State of Hawaii in its plans for immediate action in the present development of the Seaward Runway.

Copies of the petitions are enclosed for your information and file.

Respectfully yours,

SKYLANE INN, INC.


Oliver Kinney, President

OK:rl
Encls.



April 15, 1971

Mr. E. Alvey Wright, Deputy Director
Airports Division
Department of Transportation
Honolulu International Airport
Honolulu, Hawaii 96819

Dear Mr. Wright:

Re Seaward Runway Plans

It is noted through the press that "Views on the Seaward Runway Plans" have been sought by Army Engineers of interested parties to write concerning the State plans to build the 12,000 feet seaward runway in Keehi Lagoon.

We, the undersign residents of the Kalihi-Kapalama, and Salt Lake areas; workers employed in this area, and businessmen located in this section do hereby petition and urgently request of the government agencies concerned that the plan now being developed by the State of Hawaii be given high priority and put into operation at the earliest possible date, for the following reasons:

1. The safety and noise removal factors are important;
2. With the 747 Boeing Jet and larger planes now in actual operation the need for immediate action is urgent; and
3. The need to clean out the polluted condition now existing in Keehi Lagoon is a "must" and the dredging and removal of coral and sand as well as silt and other pollutants from the lagoon for fill material will serve a dual purpose.

We urge immediate action to carryout the State Plans for the Seaward Runway.

Name

Address

John J. [unclear]

2635 Waiwai Loop

F. J. [unclear]

2635 Waiwai Loop

Richard Duke

2635 Waiwai Loop

James W. [unclear]

2620 Waiwai Loop

John [unclear]

2620 - Waiwai Loop

John B. [unclear]

2370 Kaimali Ave.

Alvin [unclear]

2620 Waiwai Loop

James V. [unclear]

2620 Waiwai Loop

Robert [unclear]

2620 Waiwai Loop

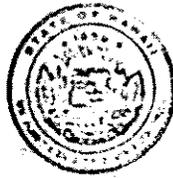
August J. [unclear]

2620 Waiwai Loop

Fred [unclear]

2620 Waiwai Loop

Name	Address
James S. Igawa	7070 Waiwai Loop
John W. Miller	2628 Waiwai Loop
Philip D. Gump	2620 Waiwai Loop
John W. Scherer	2620 Waiwai Loop
Jose R. Gutierrez Jr.	2678 Waiwai Loop
J. Edward Ho	2620 Waiwai Loop
James A. Brown	2620 Waiwai Loop
P. L. Kana	2620 Waiwai Loop
W. L. Chumley	5822 Lanikai St.
Kenneth H. Lee	4446 Waiwai Loop
Kenneth H. Hanlon	2620 Waiwai Loop
Michael H. McManis	2620 Waiwai Loop
Laurie M. Muth	2624 Waiwai Loop
James A. Brennan	2990 Kapaekapa
Daniel S. Hancock	50. Hana St. Waiwai
Reginald K. Kim	12th Ave
Vernon Adams	Ewa Beach
John M. Mace	6111 Iliwahi
Larry Ragan	1501 Waterhouse Dr
Peter S. Kim	37 Cantrell St
George Souza	1436 A Akoni St
Yvonne Kato	243 Anapala St
Alice K. Kitten	P.O. Box 33
Michael W. Benawa	1673 Palolo Ave
Robert L. Linton	Iliwahi Hill
Edward Johnson	U.S.S. Phoenix
Paul Smith	1440 Koko Head



EXECUTIVE CHAMBERS
HONOLULU

JOHN A. BURNS
GOVERNOR

May 19, 1971

Dear Mr. Swatek:

Subject: Reef Runway Project
Honolulu International Airport
State of Hawaii Project No. 0-93

The State of Hawaii is applying for Federal Grant Aid to the Federal Aviation Administration (FAA) for the proposed Reef Runway at Honolulu International Airport (HIA).

The State of Hawaii will locate, design, construct, and operate the Reef Runway in compliance with applicable air and water quality standards as required in Section 16-e 1 & 2 of the "Airport and Airway Development Act of 1970".

Sincerely,

John A. Burns

Mr. Phillip M. Swatek
Director, Pacific Region
Federal Aviation Administration
Department of Transportation
P. O. Box 4009
Honolulu, Hawaii 96813





1971 SEP 2 PM 4 00

EXECUTIVE CHAMBERS
HONOLULU

GOVERNOR'S OFFICE

September 2, 1971

JOHN A. BURNS
GOVERNOR

Office of Environmental
Quality Control

MEMORANDUM

To: Governor John A. Burns

From: Dr. Richard E. Marland (via Dr. Marvin Miura)

Subject: Revised draft, Environmental Impact Statement for proposed Reef Runway, pursuant to Section 102(2)(c), P.L. 91-190

The following evaluation of the revised draft environmental impact statement for the proposed Reef Runway project (Department of Transportation) is divided into two major categories: Positive benefits and Negative benefits. In addition, a Summary section is provided with our staff recommendations. Approval by you is required prior to forwarding of this document to the Federal Aviation Administration under the provisions of PL 91-190.

I Description of Project: The proposed Reef Runway will be located at the Honolulu International Airport, to be built on the fringing coral reef, seaward of Keehi Lagoon, in Mamala Bay. The proposed runway is to be 12,000' long and the primary purpose of the runway is to improve the existing

environment for the metropolitan community by reducing noise levels that are presently in 85-125db level. The realignment of the flight patterns will alleviate considerably the noise levels presently existing as direct overhead noise, to lesser sideline landing and takeoff pattern noise levels. In addition to the enhancement of the environment through noise abatement, the safety factors that will be obtained from the realignment flight patterns are of paramount importance.

II Positive Benefits: The single most important environmental benefit is to the human environment in the metropolitan core of downtown Honolulu, as well as the principal communities surrounding the Honolulu International Airport. These communities are: U. S. Navy Barbers Point, Ewa, Ewa Beach, Hickam Air Force Base Housing, Fort Kamehameha Army Housing, Pearl City, Aliamanu, Moanalua, Kalihi, Kapalama, (Kalihi Model City), Iwelei, and Waikiki. Public Hearings have been held on the subject of aircraft noise as specific problems to schools in the immediate vicinity, affecting the learning habits of over 13,000 school children. The Department of Planning and Economic Development estimates that there are another 13,000 persons living in the area that are affected by the noise levels.

In addition to the benefits derived by the human environment, the existing condition of the Keehi Lagoon area as a recreational facility are impaired by the sub-standard water quality due to the pollution levels of the Lagoon area. Despite the reduction in total area available for water contact sports such as boating, sailing, sport fishing, water skiing, and surfing, the construction of the reef runway will improve considerably the intrinsic water quality of the Lagoon proper by providing a badly needed flushing system by the construction of channels to the open ocean. These flushing patterns will reduce the turbidity currently caused by the silt and industrial discharge load coming downstream from the Kalihi and Moanalua Streams, thus enhancing the Lagoon for improved water contact recreational activities.

A third benefit that will be derived from the proposed project will be the improvement of the bait fish activities that in the past have accounted for 12.5% of the Hawaiian Tuna Commercial Fishery bait source. The dredging will in the opinion of the Tuna Boat Owners Association, improve the viability of the Nehu and Iao bait fish. The State Fish and Game Division concurs.

Finally, the project will meet all State and Federal water quality standards insofar as sewage disposal, aircraft wash water, and fuel spillage at the Honolulu International Airport is concerned. The current practice for sewage disposal is to conduct the sewage through the City and County Sand Island facility. The improved City and County facility will improve the present practice by providing additional treatment and transporting the effluent farther offshore via the extended outfall.

III Negative Impact: The loss of 1240 acres of maring habitat which cannot be avoided is the single most important consideration. However, the retention of 240 acres as a marine pond is considered to be a sincere effort to minimize the total loss of marine habitat area.

A second negative impact is the relocation of native and endangered species of wild birds who at the present time occupy 186 acres of silt-coral mudflats. These are the Golden Plover, Ruddy Turnstone, Sanderling, and the Hawaiian Stilt. These birds use the mudflats as a seasonal feeding and roosting ground. It has been recommended to the State that these locations be re-established in and around Keehi Lagoon, away from the intended flight patterns. The degree of success that will be enjoyed in this relocation effort must still be determined. In addition, the State is negotiating with the U. S. Navy for the establishment of bird refuges in the Pearl Harbor area. These habitats are expected to compensate for the loss of bird habitat in the Keehi Lagoon area that will be destroyed by the construction of the reef runway.

Finally, the Department of Transportation considered three other runway configurations as alternatives to the Reef Runway. All three were rejected for the following reasons:

1. Higher crosswind component than is operationally acceptable;
2. No improvement in heavy turbo-jet aircraft noise and overflight noise patterns;
3. Failure to provide basic requirement of noise abatement and increased airport capability.

In view of these three considerations being rejected, the proposed Reef Runway configuration is considered the most beneficial for the intended benefits to the human and natural environment.

The Governor and the State Legislature have approved the Honolulu International Airport Master Plan which includes the Reef Runway. In fiscal years 1970, 1971, and 1972, State of Hawaii Capital Improvements Budget, the Legislature has approved \$29.52 million for construction of the Reef Runway. It is the opinion of the State that there is no alternative that will offer the social environmental balance which the Reef Runway will provide.

SUMMARY: The Reef Runway will decrease the noise level and increase public safety in the metropolitan area by shifting the flight patterns away from the densely populated area. All major aircrafts (DC 8, 707, 747 and military C-130, C-141 and C-5) will use the Reef Runway and only interisland jets will utilize the present runway.

The secondary benefits which will be derived from the construction of the Reef Runway includes improvement of the water quality of Keehi Lagoon by improving water circulation through the dredging of new channels and the subsequent improvement of the lagoon biota will also increase bait fish production.

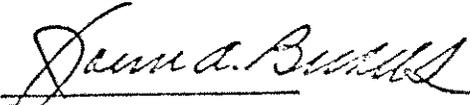
Negative environmental conditions arising prior, during and after construction of the facility have been adequately dealt with. Relocation of birds away from aircraft flight paths and creation of new habitats for the endangered species have been initiated in addition to the establishment of a bird refuge in the Pearl Harbor Area.

During the construction, precautions will be taken to minimize silting of the water by the use of a hydraulic suction dredge and impoundment of all fill areas. After construction, provisions have been made to prevent water stagnation in the impounded area by circulation. In addition, this area could be utilized for mariculture.

Although 1240 acres of shallow coral reef land and lagoon will be altered by the construction of the Reef Runway, the economic and social benefits derived from the construction greatly outweigh the temporary pollution and inconvenience which may arise during the construction.

RECOMMENDATION: After carefully evaluating the Department of Transportation's environmental impact statement, supportive studies of consultant firms, in addition to communications with various government agencies, the Office of Environmental Quality Control recommends your approval be granted to proceed with this project.

Approved:


Governor

DIRECTOR'S OFFICE:SPORTS DIVISION

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SEP 28 1971

RECEIVED DEC 16 1971

Mr. Phillip M. Swatek
Director, Pacific Region
Federal Aviation Administration
1833 Kalakaua Avenue
Honolulu, Hawaii 96816

SUBJECT Reef Runway Project
Honolulu International Airport
State of Hawaii Project No. 0-93

Dear Mr. Swatek:

The airport development proposed in the request for aid for the subject project, stated that improvements at Honolulu International Airport, State of Hawaii, do not involve the displacement and/or relocation of persons on land needed for such development.

Although there are squatters residing illegally approximately 3,000 feet from the east end of the proposed runway, it is the opinion of the Attorney General's office, State of Hawaii, that since the squatters are illegally occupying the premises, they would not qualify for legal assistance for relocation. Attached are copies of the Attorney General's opinion.

Very truly yours,

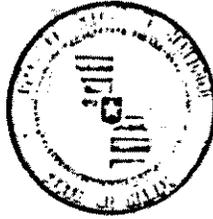


FUJIO MATSUDA
Director

Dittmar:ej
Attachments (4)

PLANNING DEPARTMENT
CITY AND COUNTY OF HONOLULU

629 POHUKAINA STREET
HONOLULU, HAWAII 96813



ROBERT R. WAY
PLANNING DIRECTOR

GEORGE S. MORIGUCHI
DEPUTY PLANNING DIRECTOR

P3/71-967

December 1, 1971

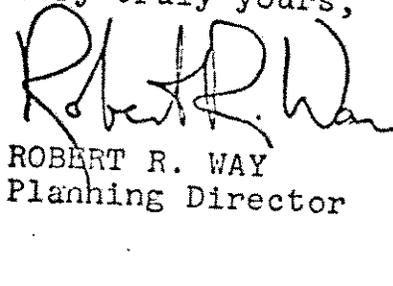
Mr. Owen Miyamoto
Airport Chief
Airports Division
Department of Transportation
State of Hawaii
Honolulu International Airport
Honolulu, Hawaii 96819

Dear Mr. Miyamoto:

REEF RUNWAY
HONOLULU INTERNATIONAL AIRPORT
STATE OF HAWAII
PROJECT NUMBER 0-93

Attached is a memorandum concerning the above project which will supersede our memorandum dated March 10, 1971.

Very truly yours,

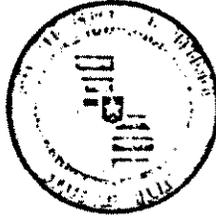

ROBERT R. WAY
Planning Director

RRW/JB:lm

Attachment

PLANNING DEPARTMENT
CITY AND COUNTY OF HONOLULU

629 POHUKAINA STREET
HONOLULU, HAWAII 96813



ANK P. FASI
MAYOR

ROBERT R. WAY
PLANNING DIRECTOR

GEORGE S. MORIGUCHI
DEPUTY PLANNING DIRECTOR

P3/71-967

December 1, 1971

MEMORANDUM

TO : MR. OWEN MIYAMOTO, AIRPORT CHIEF, AIRPORTS DIVISION
DEPARTMENT OF TRANSPORTATION, STATE OF HAWAII

FROM : ROBERT R. WAY, PLANNING DIRECTOR
CITY AND COUNTY OF HONOLULU
METROPOLITAN CLEARINGHOUSE

SUBJECT: REEF RUNWAY
HONOLULU INTERNATIONAL AIRPORT
STATE OF HAWAII PROJECT NUMBER 0-93

In accordance with Section 204 of the Demonstration Cities and Metropolitan Development Act of 1966 and Title IV of the Intergovernmental Cooperation Act of 1968, the Metropolitan Clearinghouse has completed its review of the proposed Reef Runway project at the Honolulu International Airport.

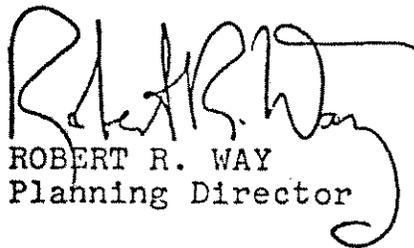
The Metropolitan Clearinghouse offers the following comments:

1. As a part of its procedures, the Metropolitan Clearinghouse has coordinated this proposal with affected State and local agencies.
2. Issues unresolved with the State Department of Health will need to be reflected in the Environmental Impact Statement of the proposed project.
3. In our capacity as the Metropolitan Clearinghouse, we find the proposed Reef Runway is in accord with the fulfillment of the General Plan for the City and County of Honolulu and with existing plans and programs of agencies contacted in our review process.

Mr. Owen Miyamoto
Page 2
December 1, 1971

4. If substantial changes in the proposal are made subsequent to receipt of this memorandum, notice of such modifications must be forwarded to us for our further consideration prior to your formal submission to the Federal granting agency.

Transmitted herewith are comments received from agencies contacted in the course of our review.


ROBERT R. WAY
Planning Director

RRW/JB:lm

Attachment

PACIFIC REGION
P. O. BOX 4000
HONOLULU, HAWAII 96813



24 NOV 1970

Mr. Robert R. Way, Planning Director
Planning Department
City and County of Honolulu
629 Pohukaina Street
Honolulu, Hawaii 96813

Dear Mr. Way:

We have your letter (File: P11/70-4050) of 12 November 1970 regarding the proposed reef runway at the Honolulu International Airport.

Inasmuch as this project, if approved, will be processed through this agency, I don't believe there is a need for our review at this time as far as the Bureau of Budget Circular No. A-95 is concerned.

You may be assured that we are very much in favor of the new proposed reef runway at Honolulu International Airport, and if you feel we can contribute any information, please do not hesitate to ask.

Sincerely,

A handwritten signature in cursive script that reads "Richard T. Puckey".

RICHARD T. PUCKEY
Chief, Airports Division, PC-600

PLANNING DEPARTMENT
CITY AND COUNTY
OF HONOLULU

70 NOV 25 AM 10:28

RECEIVED

RECEIVED
70 NOV 25 PM 3:30
PLANNING DEPARTMENT
CITY AND COUNTY
OF HONOLULU

MEMORANDUM

TO : PLANNING DEPARTMENT, CITY AND COUNTY OF HONOLULU
METROPOLITAN CLEARINGHOUSE

FROM : GEORGE C. VILLEGAS, TRAFFIC ENGINEER

SUBJECT : AGENCY PROJECT REVIEW

Project Title: Honolulu International Airport
Reef Runway Project

1. (i) Is the proposed project (described in the enclosed Project Description A-95 Form 1 related to the current programs, projects, or plans of this agency?

No

(ii) If so, (a) will the proposed project influence the demand for current services and/or facilities provided by agency programs, (b) will it affect agency plans for the provision of services and/or facilities in the future, or (c) will the agency be required to develop services and/or facilities at some future date as a result of the project?

- a) No
- b) No
- c) No

Planning Department, City and County of Honolulu
Metropolitan Clearinghouse

Page 2

2. Is this agency aware of other agencies whose programs or plans may be affected by this project?

No

3. In the opinion of this agency, are the project objectives adequate? Is the project sufficient in scope and adequately funded to achieve its objectives?

Yes

4. Does this agency concur in the development of the proposed project?

Yes

George E. Williams
Signature of Agency Head

11-23-70
Date

Enclosure

A-95 Form 4

3/19/70

RECEIVED

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PLANNING DEPARTMENT
CITY AND COUNTY
OF HONOLULU

MEMORANDUM

TO : PLANNING DEPARTMENT, CITY AND COUNTY OF HONOLULU
METROPOLITAN CLEARINGHOUSE

FROM : Department of Planning and Economic Development
State of Hawaii

SUBJECT : AGENCY PROJECT REVIEW

Project Title: Honolulu International Airport Reef Runway Project

1. (i) Is the proposed project (described in the enclosed Project Description A-95 Form 1 related to the current programs, projects, or plans of this agency?

Yes

- (ii) If so, (a) will the proposed project influence the demand for current services and/or facilities provided by agency programs, (b) will it affect agency plans for the provision of services and/or facilities in the future, or (c) will the agency be required to develop services and/or facilities at some future date as a result of the project?

Yes

Planning Department, City and County of Honolulu
Metropolitan Clearinghouse

Page 2

2. Is this agency aware of other agencies whose programs or plans may be affected by this project?

Yes

3. In the opinion of this agency, are the project objectives adequate? Is the project sufficient in scope and adequately funded to achieve its objectives?

Yes

4. Does this agency concur in the development of the proposed project?

Yes

James M. Mark
Signature of Agency Head

November 30, 1970
Date

Enclosure

A-95 Form 4

3/19/70

November 24, 1970

RECEIVED
10 DEC 3 PM 2:14
PLANNING DEPARTMENT
CITY AND COUNTY
OF HONOLULU

MEMORANDUM

TO : PLANNING DEPARTMENT, CITY AND COUNTY OF HONOLULU
METROPOLITAN CLEARINGHOUSE

FROM : Sunao Kido, Chairman and Member
Board of Land and Natural Resources

SUBJECT : AGENCY PROJECT REVIEW

Project Title:

1. (i) Is the proposed project (described in the enclosed Project Description A-95 Form 1 related to the current programs, projects, or plans of this agency?

Yes

- (ii) If so, (a) will the proposed project influence the demand for current services and/or facilities provided by agency programs, (b) will it affect agency plans for the provision of services and/or facilities in the future, or (c) will the agency be required to develop services and/or facilities at some future date as a result of the project?

- a. No.
b. Not current plans
c. Not as a causal requirement.

Planning Department, City and County of Honolulu
Metropolitan Clearinghouse

Page 2

2. Is this agency aware of other agencies whose programs or plans may be affected by this project?

Yes

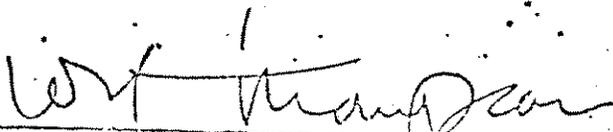
3. In the opinion of this agency, are the project objectives adequate? Is the project sufficient in scope and adequately funded to achieve its objectives?

a. Yes

b. We have not analyzed financial requirements.

4. Does this agency concur in the development of the proposed project?

Generally, yes.



Signature of Agency Head

November 24, 1970
Date

Enclosure

A-95 Form 4

3/19/70

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70 DEC 3 AM 9:04

PLANNING DEPARTMENT
CITY AND COUNTY
OF HONOLULU

MEMORANDUM

TO : PLANNING DEPARTMENT, CITY AND COUNTY OF HONOLULU
METROPOLITAN CLEARINGHOUSE

FROM : YOUNG SUK KO, DIRECTOR
DEPARTMENT OF PARKS AND RECREATION

SUBJECT : AGENCY PROJECT REVIEW

Project Title: REEF RUNWAY PROJECT NO. 0-93
HONOLULU INTERNATIONAL AIRPORT
STATE OF HAWAII PROJECT NO. 0-90

1. (i) Is the proposed project (described in the enclosed Project Description A-95 Form 1 related to the current programs, projects, or plans of this agency?

Implementation of the airport long range plan, including this reef runway project, will continue to affect Keehi Lagoon Park for better or for worse.

- (ii) If so, (a) will the proposed project influence the demand for current services and/or facilities provided by agency programs, (b) will it affect agency plans for the provision of services and/or facilities in the future, or (c) will the agency be required to develop services and/or facilities at some future date as a result of the project?

This particular project will probably not have any direct affect on services in our parks, except to the extent that the project will enhance their environmental quality (reduction of noise).

Planning Department, City and County of Honolulu
Metropolitan Clearinghouse

Page 2

2. Is this agency aware of other agencies whose programs or plans may be affected by this project?

The proposed Sand Island Park, which will probably be developed by the State Parks Division, will be affected.

3. In the opinion of this agency, are the project objectives adequate? Is the project sufficient in scope and adequately funded to achieve its objectives?

It is our understanding that this project is concerned about noise pollution, safety for heavily populated areas, and future airport problems. We are not aware, but must assume that sufficient study has been made to determine that the expected benefits outweigh any possible adverse effects to the island's shoreline and abutting waters by the proposed fillings.

4. Does this agency concur in the development of the proposed project?

We do not object to the concept of this project, except as noted above.

William A. K.
Signature of Agency Head

Dec. 1, 1970
Date

Enclosure

A-95 Form 4

3/19/70

RECEIVED
NOV 25 PM 3:26
PLANNING DEPARTMENT
CITY AND COUNTY
OF HONOLULU

MEMORANDUM

TO : PLANNING DEPARTMENT, CITY AND COUNTY OF HONOLULU
METROPOLITAN CLEARINGHOUSE

FROM : Department of Health, State of Hawaii

SUBJECT : AGENCY PROJECT REVIEW

Project Title:

1. (i) Is the proposed project (described in the enclosed Project Description A-95 Form 1 related to the current programs, projects, or plans of this agency?
 - Yes. A. The proposed reef runway will most certainly affect the noise abatement program of the Department of Health by lessening the airport noise in the Kalihi-Palama area.
 - B. In addition the proposed fill necessary for the runway will have an effect on the currents in the Kechi Lagoon area and could adversely change the condition of the area with respect to water quality.

- (ii) If so, (a) will the proposed project influence the demand for current services and/or facilities provided by agency programs, (b) will it affect agency plans for the provision of services and/or facilities in the future, or (c) will the agency be required to develop services and/or facilities at some future date as a result of the project?
 - Yes. A. The proposed project will increase the demands for current service significantly.
 - Yes. B. Will receive more complaints relative to water pollution.
 - Yes. C. More frequent monitoring and surveillance.

Planning Department, City and County of Honolulu
Metropolitan Clearinghouse

Page 2

2. Is this agency aware of other agencies whose programs or plans may be affected by this project?

It is possible that the desirability of a State Park on Anuenue Island could be lessened by the noise caused by takeoffs and landings on the reef runway. The Department of Land and Natural Resources would have an interest in this area.

3. In the opinion of this agency, are the project objectives adequate? Is the project sufficient in scope and adequately funded to achieve its objectives?

Airport objectives may be adequate.

It may lessen the intensity of noise but the project will increase water pollution since the runway will act as a barrier and affect the currents in Keeki Lagoon.

4. Does this agency concur in the development of the proposed project?

It is a much needed project but alternatives should be sought to lessen water pollution.

Signature of Agency Head

Date

Enclosure

A-95 Form 4

3/19/70

MEMORANDUM

TO : PLANNING DEPARTMENT, CITY AND COUNTY OF HONOLULU
METROPOLITAN CLEARINGHOUSE

FROM : ALBERT C. ZANE, DIRECTOR AND CHIEF ENGINEER
DEPARTMENT OF PUBLIC WORKS, CITY AND COUNTY OF HONOLULU

SUBJECT : AGENCY PROJECT REVIEW

Project Title: HONOLULU INTERNATIONAL AIRPORT
REEF RUNWAY PROJECT

1. (i) Is the proposed project (described in the enclosed Project Description A-95 Form 1 related to the current programs, projects, or plans of this agency?

NO

- (ii) If so, (a) will the proposed project influence the demand for current services and/or facilities provided by agency programs, (b) will it affect agency plans for the provision of services and/or facilities in the future, or (c) will the agency be required to develop services and/or facilities at some future date as a result of the project?

Planning Department, City and County of Honolulu
Metropolitan Clearinghouse

Page 2

2. Is this agency aware of other agencies whose programs or plans may be affected by this project?

NO

3. In the opinion of this agency, are the project objectives adequate? Is the project sufficient in scope and adequately funded to achieve its objectives?

YES

4. Does this agency concur in the development of the proposed project?

YES

Signature of Agency Head
ALBERT C. ZANE

Date

Enclosure

A-95 Form 4

3/19/70

HEADQUARTERS
FOURTEENTH NAVAL DISTRICT
DIRECTOR'S OFFICE BOX 110
FPO SAN FRANCISCO 96810

0-4
4960
4970

IN REPLY REFER TO:
48A:JBM:de
1186
MAY 1971

MAY 6 2 09 PM '71

DEPT. OF
TRANSPORTATION

Dr. Fujio Matsuda, Director
State of Hawaii
Department of Transportation
869 Punchbowl Street
Honolulu, Hawaii 96813

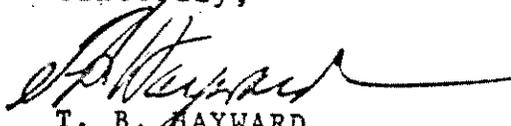
Reef Runway Project
Honolulu International Airport

Dear Dr. Matsuda:

I have received your letter AIR-E 6572 dated April 28, 1971 relating to the need for replacement of tideland bird habitat for the Hawaiian Stilt (Himantopus mexicanus). As you may be aware, the Navy already has over 300 acres of marshland within Pearl Harbor dedicated to the preservation of wildlife. I consider your proposal for mitigating the loss of wildlife bird habitat through a cooperative program to be compatible with the Navy's objectives of preserving, improving and expanding its Pearl Harbor area wildlife sanctuaries. You may be assured of our complete cooperation on this subject.

In this regard, I have referred your letter to the Commander, Pacific Division, Naval Facilities Engineering Command for coordination and action. The Natural Resources personnel from that Command will contact your staff shortly to obtain more details and explore the possibilities further.

Sincerely,



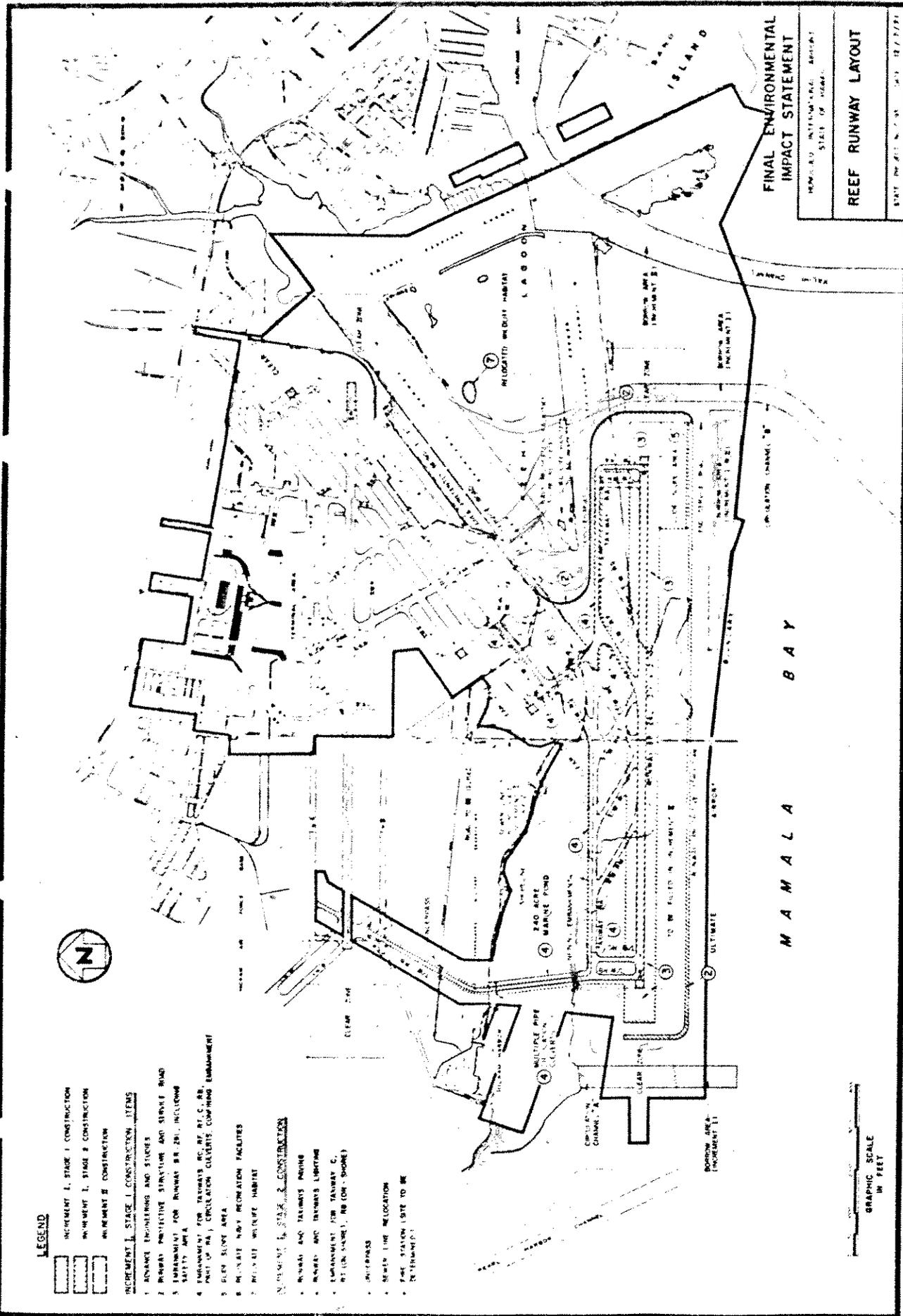
T. B. HAYWARD
Rear Admiral, U. S. Navy
Commandant, Fourteenth Naval District

Copy to:
COMPACNAVPACENGCOM

DRAWINGS

ATTACHMENT NO.

1. Reef Runway Layout
2. Arrival & Departure Flight Paths -
Trade Wind Conditions
3. Arrival & Departure Flight Paths -
Kona Wind Conditions
4. Typical Noise Levels - Trade Wind Conditions
5. Noise Contours - Trade Wind Conditions
6. Noise Contours - Kona Wind Conditions
7. Reef Runway Land Requirements
8. Area Map
9. Wildlife and Recreational Facilities
10. Alternate Runway Configurations
11. Vicinity Map



LEGEND

- INCREMENT I, STAGE 1 CONSTRUCTION
- INCREMENT I, STAGE 2 CONSTRUCTION
- INCREMENT II CONSTRUCTION

INCREMENT I, STAGE 1 CONSTRUCTION ITEMS

- 1 RENOVATE ENGINEERING AND STORES
- 2 RUNWAY PROTECTIVE STRUCTURE AND DRIVE ROAD
- 3 IMPROVEMENT FOR RUNWAY BRIDGE INCLUDING SAFETY AREA
- 4 IMPROVEMENT FOR RUNWAYS 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100
- 5 ENHANCEMENT FOR RUNWAYS 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100
- 6 OPEN SLUMP AREA
- 7 RENOVATE NAVY RECREATION FACILITIES
- 8 RENOVATE WILDLIFE HABITAT

INCREMENT I, STAGE 2 CONSTRUCTION

- 1 RENOVATE AND REPAIRS PAVING
- 2 RENOVATE AND REPAIRS LIGHTING
- 3 IMPROVEMENT FOR TAXIWAY C
- 4 (ON VARIOUS AIR (ON SHORE))

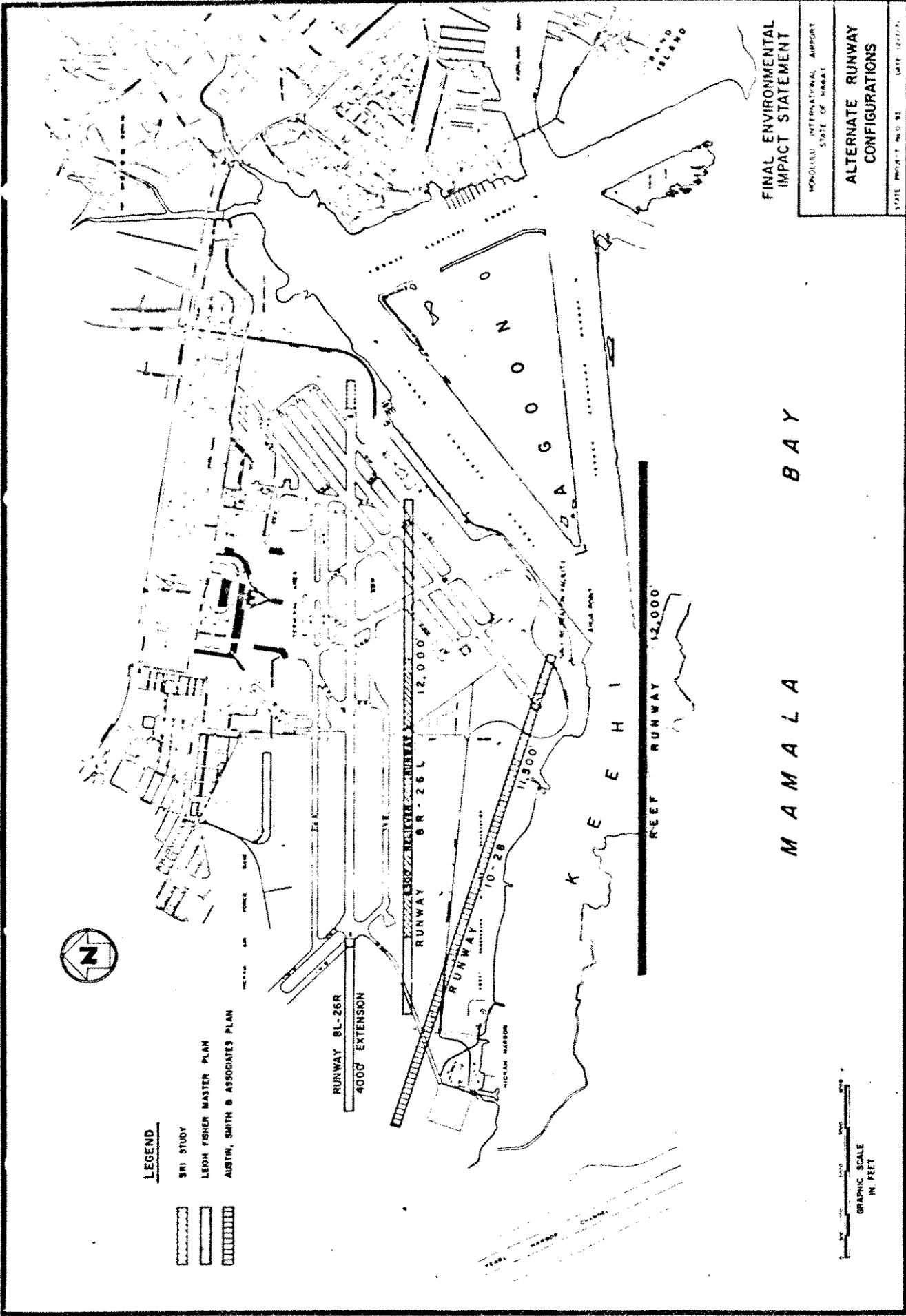
- 5 UTILITIES
- 6 NEW LINE RELOCATION
- 7 FINE STATION (SITE TO BE RE-EVALUATED)

FINAL ENVIRONMENTAL IMPACT STATEMENT
 HAWAII INTERNATIONAL AIRPORT
 STATE OF HAWAII

REEF RUNWAY LAYOUT

DATE PREPARED: 11/1/81
 DRAWN BY: J. W. WILSON
 SCALE: 1" = 100'

GRAPHIC SCALE
 IN FEET



LEGEND

-  SRI STUDY
-  LEIGH FISHER MASTER PLAN
-  AUSTIN, SMITH & ASSOCIATES PLAN

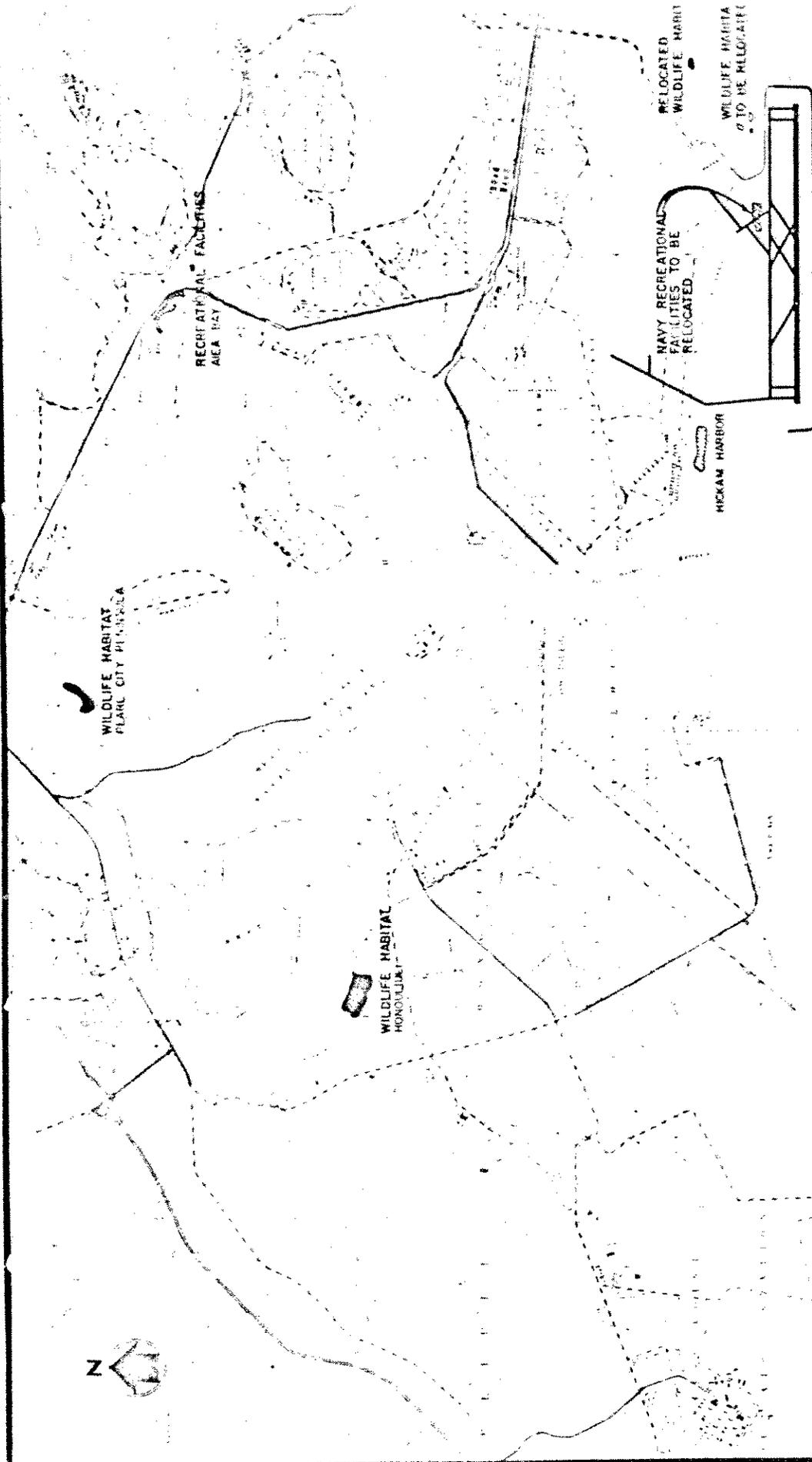
**FINAL ENVIRONMENTAL
IMPACT STATEMENT**

HONOLULU INTERNATIONAL AIRPORT
STATE OF HAWAII

**ALTERNATE RUNWAY
CONFIGURATIONS**

STATE PROJECT NO. 0-91 DATE 12/77

M A M A L A B A Y



**FEDERAL ENVIRONMENTAL
IMPACT STATEMENT**

PROJECT INFORMATION: PROJECT	STATE OF HAWAII
WILDLIFE AND RECREATIONAL FACILITIES	
(REEF RUNWAY PROJECT)	
DATE TO BE HELD: 11/11/88	DATE: 11/11/88

ATTACHMENT 8

NAVY RECREATIONAL FACILITIES
BARBER'S POINT

GRAPHIC SCALE
1" = 1/2 MILE

W I L D L I F E

RECREATIONAL FACILITIES

TO BE RELOCATED

WILDLIFE HABITAT

TO BE RELOCATED

RELOCATED WILDLIFE HABITAT

NAVY RECREATIONAL FACILITIES TO BE RELOCATED

HICKAM HARBOR

WILDLIFE HABITAT HONOLULU

WILDLIFE HABITAT PLANK CITY PENNSA

RECREATIONAL FACILITIES AREA MAY

NAVY RECREATIONAL FACILITIES BARBER'S POINT

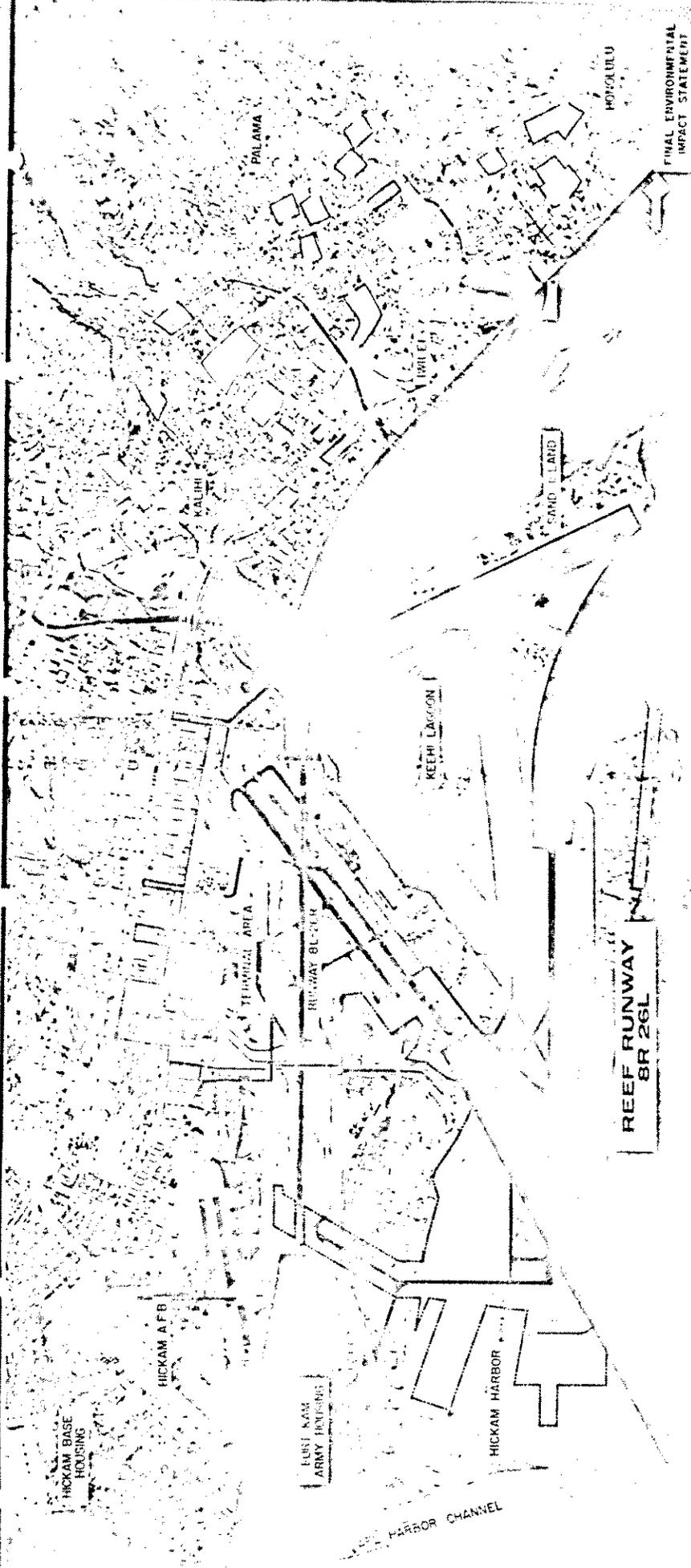
GRAPHIC SCALE 1" = 1/2 MILE

W I L D L I F E

RECREATIONAL FACILITIES

TO BE RELOCATED

WILDLIFE HABITAT



FINAL ENVIRONMENTAL
IMPACT STATEMENT

ARRIVAL & DEPARTURE
FLIGHT PATHS
TRADE WIND CONDITIONS

REEF RUNWAY
8R 26L

N





HICKAM BASE HOUSING

HICKAM AFB

FORT KAM ARMY HOUSING

HICKAM HARBOR

TUSIHALA AREA

BIKINI PLAZA

REEFI LAGOON

SAND ISLAND

REEF RUNWAY BR 26L

PALAMA

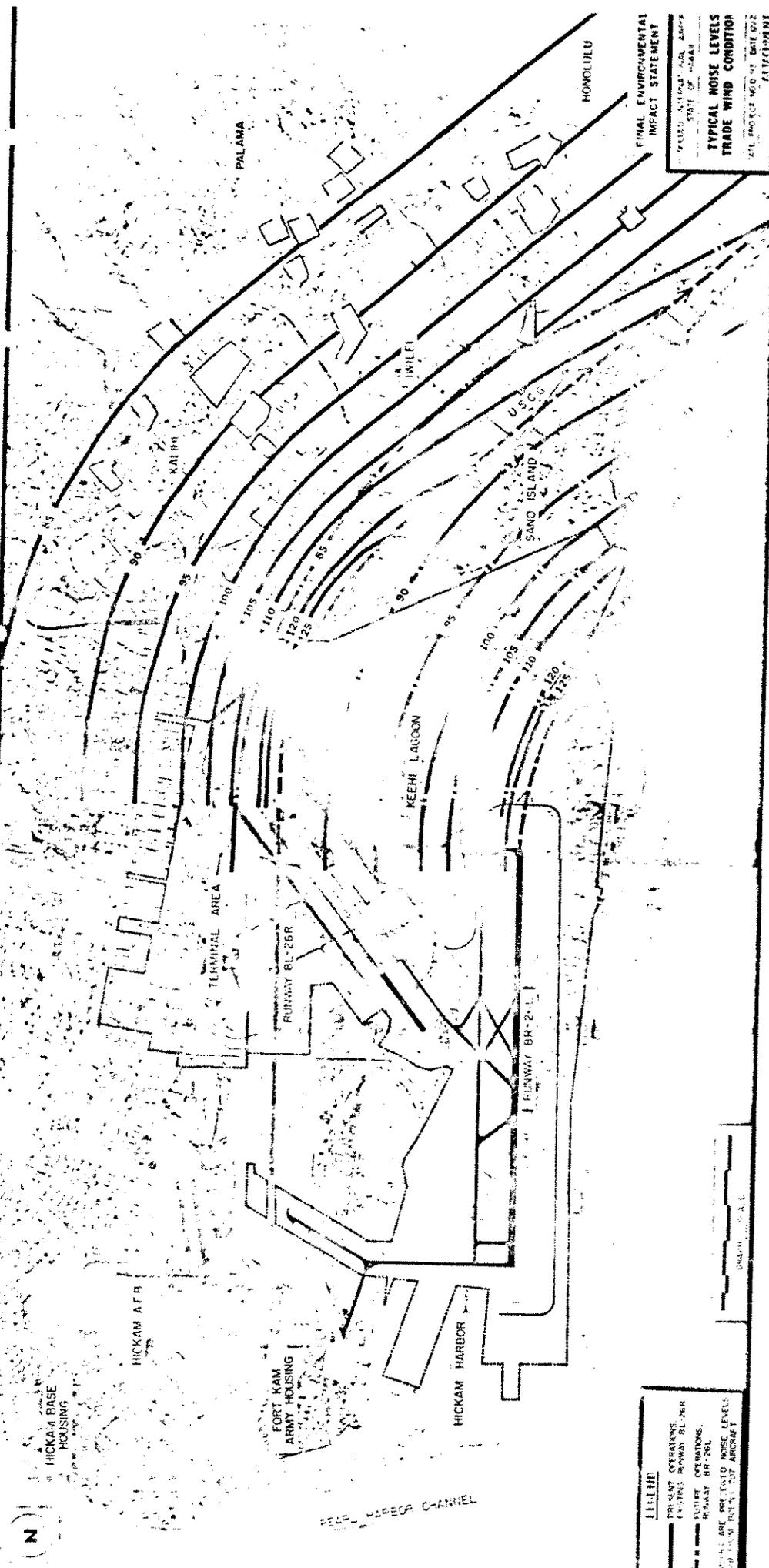
FINAL ENVIRONMENTAL IMPACT STATEMENT

ARRIVAL & DEPARTURE FLIGHT PATHS KONA WIND CONDITIONS



0 1 2





FINAL ENVIRONMENTAL
IMPACT STATEMENT
VALLEY AIRPORT AND LOGS
STATE OF HAWAII
TYPICAL NOISE LEVELS
TRADE WIND CONDITION
DATE: 1990/03/20 BY: DATE: 022
ATTACHED

LEGEND

- EXISTING OPERATIONS
- EXISTING RUNWAY BL-26R
- EXISTING OPERATIONS
- EXISTING RUNWAY BR-21L
- PROPOSED NOISE LEVELS
- TRADE WIND CONDITION



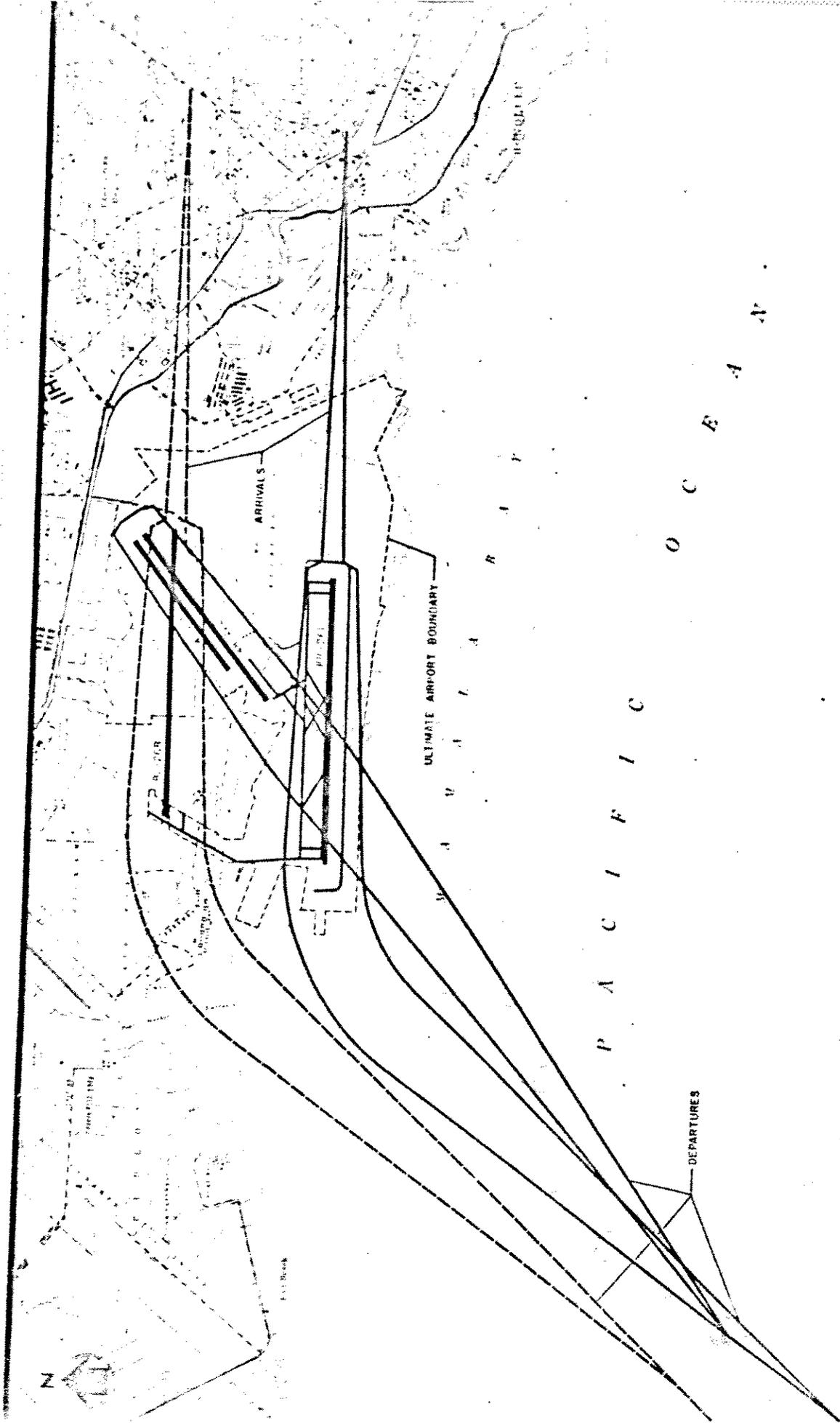
FINAL ENVIRONMENTAL
IMPACT STATEMENT

HONOLULU INTERNATIONAL AIRPORT
STATE OF HAWAII

NOISE CONTOURS
KONA WIND CONDITIONS

STATE PROJECT No. 0-98 DATE 1/19/98

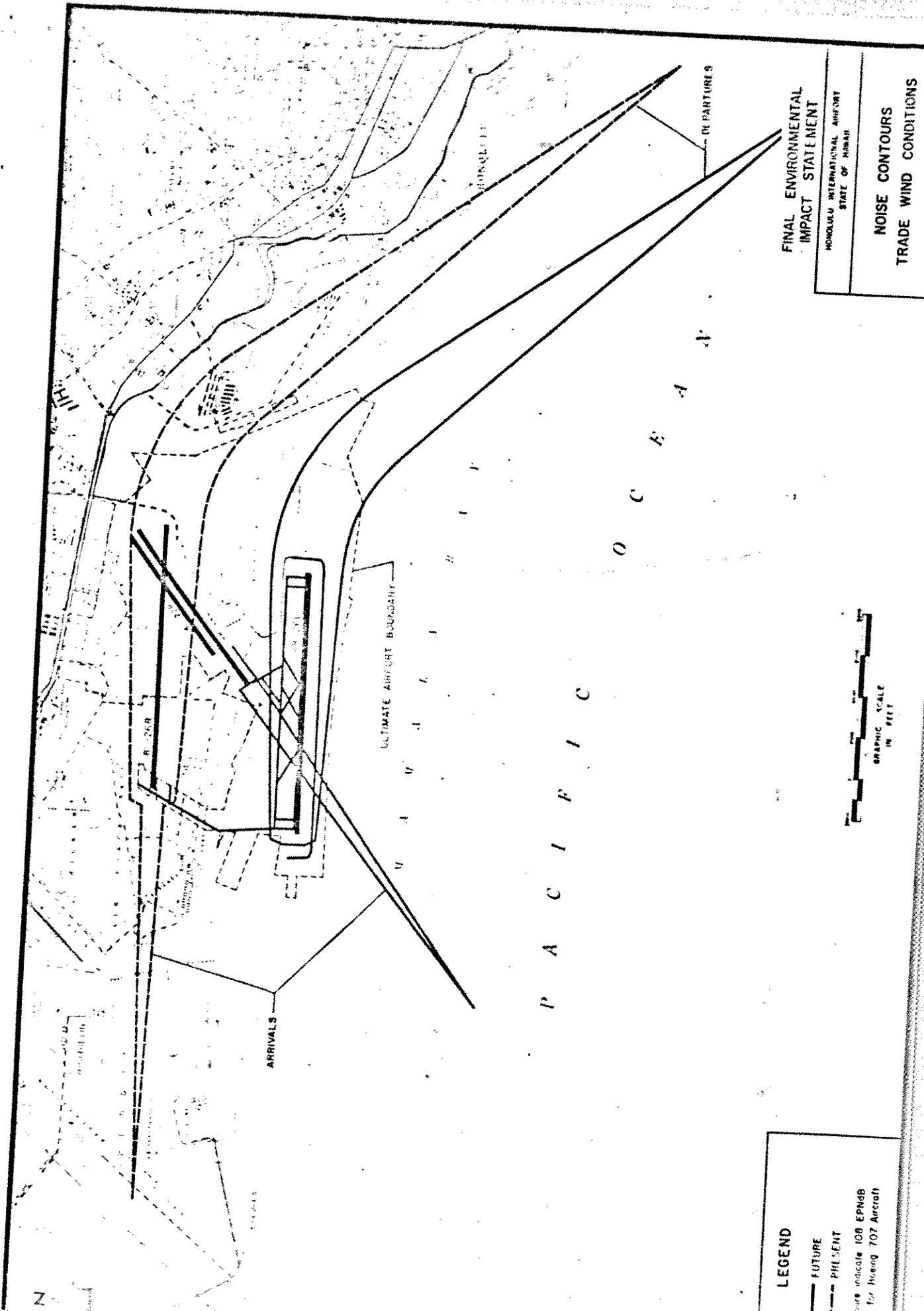
ATTACHMENT 6



LEGEND

- FUTURE
- - - PRESENT

Contours indicate 108 EPNdB
noise for Boeing 707 Aircraft



LEGEND

- FUTURE
- - - PRESENT

Contours indicate 108 EPNdB
Noise for Boeing 707 Aircraft

**FINAL ENVIRONMENTAL
IMPACT STATEMENT**

HONOLULU INTERNATIONAL AIRPORT
STATE OF HAWAII

**NOISE CONTOURS
TRADE WIND CONDITIONS**

LEGEND

AREA	APPROX. ACRES	STATUS
1	18	STATE APPLYING FOR 25-YEAR LEASE
2	10	STATE APPLYING FOR 25-YEAR LEASE
3	5	STATE APPLYING FOR 25-YEAR LEASE
4	41	STATE APPLYING FOR 25-YEAR LEASE
5	27	STATE APPLYING FOR 25-YEAR LEASE
6	95	STATE APPLYING FOR 25-YEAR LEASE
7	543	TITLE APPLIED FOR UNDER SEC 16/23 ON 7/29/68
8	178	TITLE APPLIED FOR UNDER SEC 16/23 ON 5/27/68
9	31	STATE PREPARING APPLICATION UNDER PROVISIONS OF LAND UNDER SEC 23 AS OF 12/7/71



CONCRETE'S EXISTING OWNER FOR TRANSFER OF TITLE HAS BEEN REQUESTED

10 STATE

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