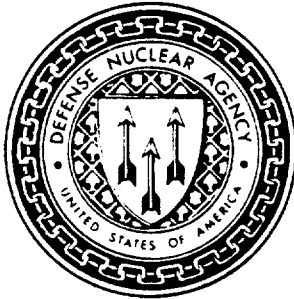


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# ENEWETAK ATOLL

*Orientation*

# GUIDE

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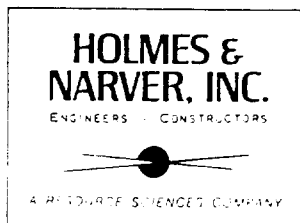
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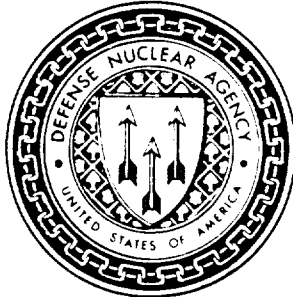
Reviewed by D. K. [Signature] Date 5/1/97



NOVEMBER

1976





# ENEWETAK ATOLL

## *Orientation*

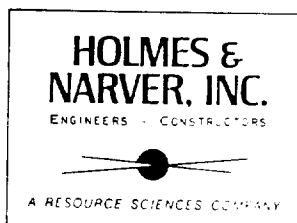
# GUIDE

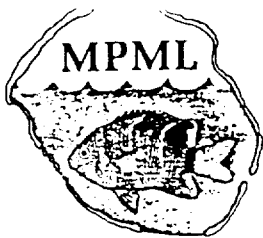


REPOSITORY P.N.N.L.  
COLLECTION Marshall Islands  
BOX No. 5690  
FOLDER Enewetak Visit

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Reviewed by [Signature] Date 5/1/97





MID-PACIFIC MARINE LABORATORY  
ENEWETAK ATOLL, MARSHALL ISLANDS

Supported by  
UNITED STATES DEPARTMENT OF ENERGY

August 19, 1978

BIRD SURVEY OF BOKEN (IRENE) 13N<sub>1</sub> to 12N<sub>2</sub>  
August 18, 1978, 6:30 pm

The most abundant nesting bird in this area is the Sooty Tern, with the White Capped Noddy found around the Northern perimeter of the nesting colony, which nests in trees as opposed to the Sootys which nest on the ground.

Sootys usually lay a single tan and speckled egg on the ground in a slight depression. Hatching takes place in 28 to 30 days. 7 to 8 weeks after hatching out the newly fledged young head out to sea with the adult birds. The adults will return sometime between May and August of the next year to breed again. The young remain at sea for two years. Sooty Terns are strong flyers and seldom land on the water, nor do they come to rest on Islands other than their breeding Island. Their feathers do not remain water proof for very long when they are placed on the water and their feet are smaller than those other types of Terns that sit on the water frequently. Biologists are, therefore, forced to conclude that Sooty Terns are capable of continuous flight for any length of time.

The area surveyed is bordered by 13N<sub>1</sub>, 13N<sub>2</sub>, 12N<sub>1</sub>, 12N<sub>2</sub>, approximately a 50 sq. meter area.

Starting at pt. 13N<sub>1</sub>, we walked diagonally to pt. 12N<sub>2</sub>. Numerous small chicks were observed at or about 13N<sub>1</sub>. Moving a few yds. in the 12N<sub>2</sub> direction, the eggs became very dense, 12 to 18 inches apart or approx. 25 to 30 eggs per sq. yd. Two birds tend one nest taking turns, thus approx. bird population of this area would be 50 birds per sq. yd. Nine eggs were examined internally along this route showing lesser development the closer to 12N<sub>2</sub> we

Administered by the Hawaii Institute of Marine Biology, University of Hawaii

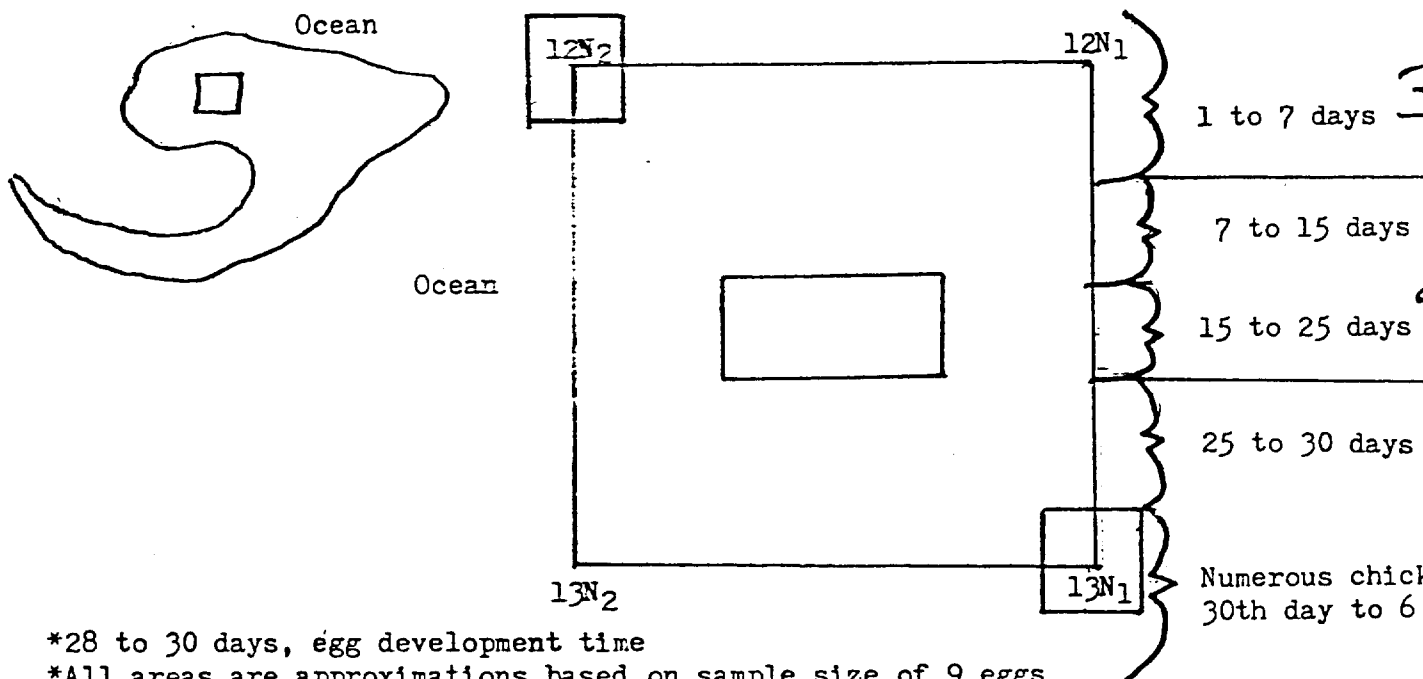
Address reply to  Box 1346, Kaneohe, Hawaii 96744

Enewetak, Marshall Islands 96737

got. Eggs sampled right at  $12N_2$  were only a few days old. There seems to be a different pattern of development moving from  $13N_1$  to  $12N_1$  in a North to South wave, from Fledgling chicks to newly laid eggs.

This patterned development was later confirmed back at the Marine Lab with support data from the Smithsonian Institute publication, Pacific Bird Observer, dated April 1968, a copy of which is attached with this report.

Survey Site: Boken (Irene)



\*28 to 30 days, egg development time

\*All areas are approximations based on sample size of 9 eggs

\*Chicks take to air 7 to 8 wks. from hatch out

**Comments:**

Bird eggs in Area 1 will take approx. 2 to 7 wks.

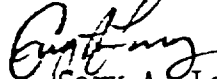
Bird eggs in Area 2 will take approx. 8 to 10 wks.


Bird eggs in Area 3 will take approx. 12 wks.

This estimate is based on date from first day of egg laid to fledgling flight out to sea, a 3 month period. Total colony breeding period spans 5 months for entire Island.

Birds would be able to move from specific area in question (digging site) under their own power probably from 4 to 5 weeks after hatching, although they would not be able to fly. It is our belief that they would continue to be fed by the parents provided they stayed in approximate area.

Survey Prepared by,

  
Gary A. Long  
MPML Manager

  
Dr. William Templeton  
Associate Manager  
Ecosystems Dept.  
Battelle Pacific NW Lab

The life cycle of the Sooty Tern has been the subject of intensive study in the central Pacific. The first evidence that breeding activity is about to take place is the presence at night of increasingly large numbers of Sooty Terns, swirling over the island in a loose spiral. A highly social species like the Sooty Tern requires the proper social stimulus in order to commence breeding, and in this case the social stimulus is provided mainly by the dense swirls of birds near and over their intended breeding island.

At last, when all conditions appear to be right, the first birds touch down for a short time during the night. We can only speculate on what the "proper" conditions are. They probably include the assurance of a continued food supply at sea within a day's flying time from the island, enough bare ground available for nesting, and sufficient numbers of Sooty Terns swirling together to satisfy the social stimulus requirements of the colony.

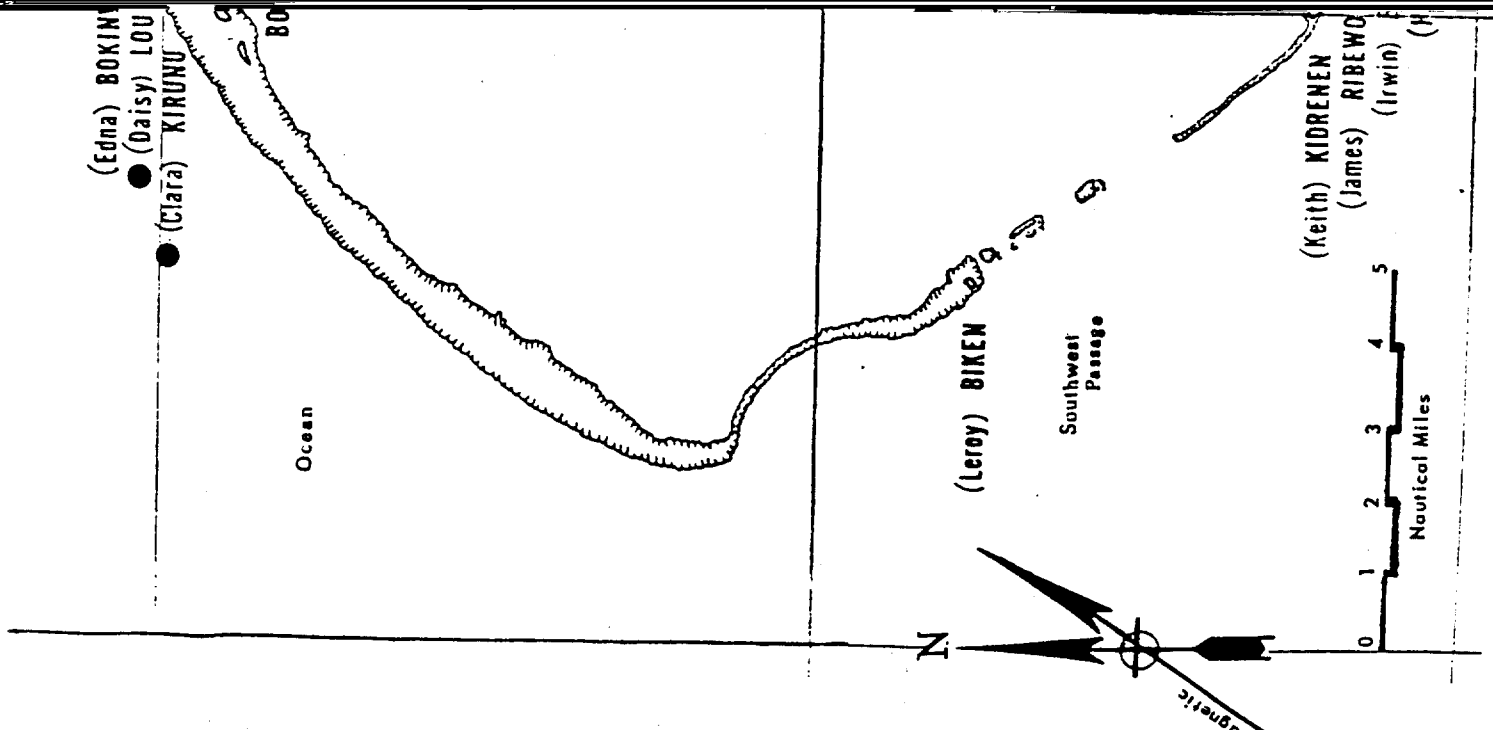
Gradually the numbers of birds touching down increases from night to night and the length of time they spend on the ground increases too. Finally, some stay through the day as well, and immediately thereafter eggs are laid. The parents take turns incubating their egg which they cover with their breast on a simple, shallow dish-shaped scrape in the sand. They are surrounded by other Sooty Terns, all incubating their eggs. Their nearest neighbors are usually only a foot away. In many colonies the available nesting space is utilized on three levels. Frigatebirds and boobies roost in the bushes, Sooty Terns on the ground, and shearwaters and petrels occupy burrows under the ground.

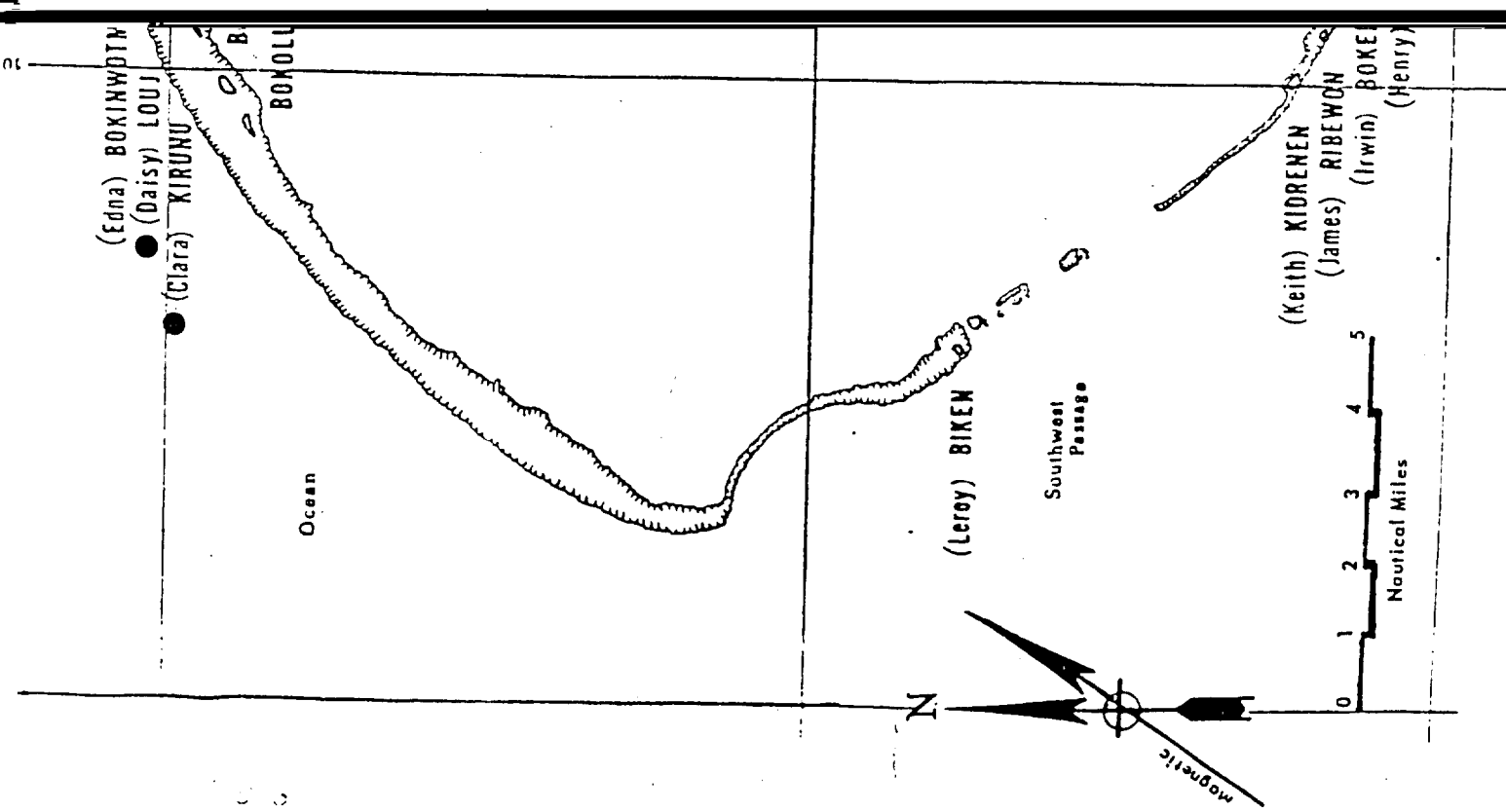
IN RECENT YEARS.

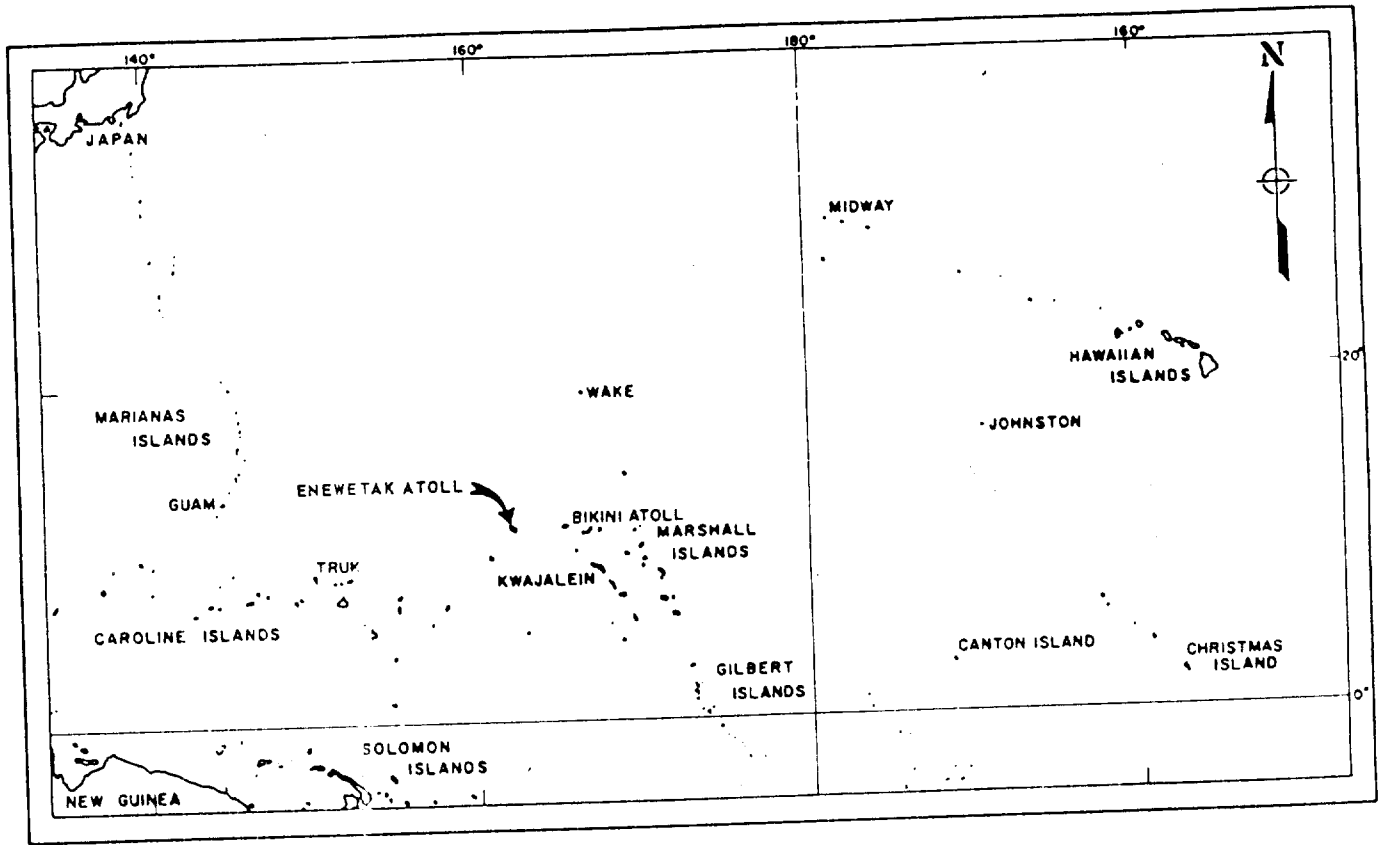
POWERS, TERNSTONES, TATTILERS, CURLEWS, WHIMPERELS, AND FRIGATE BIRDS ARE COMMONLY SEEN BUT DO NOT NEST ON ENEWETAK ATOLL.







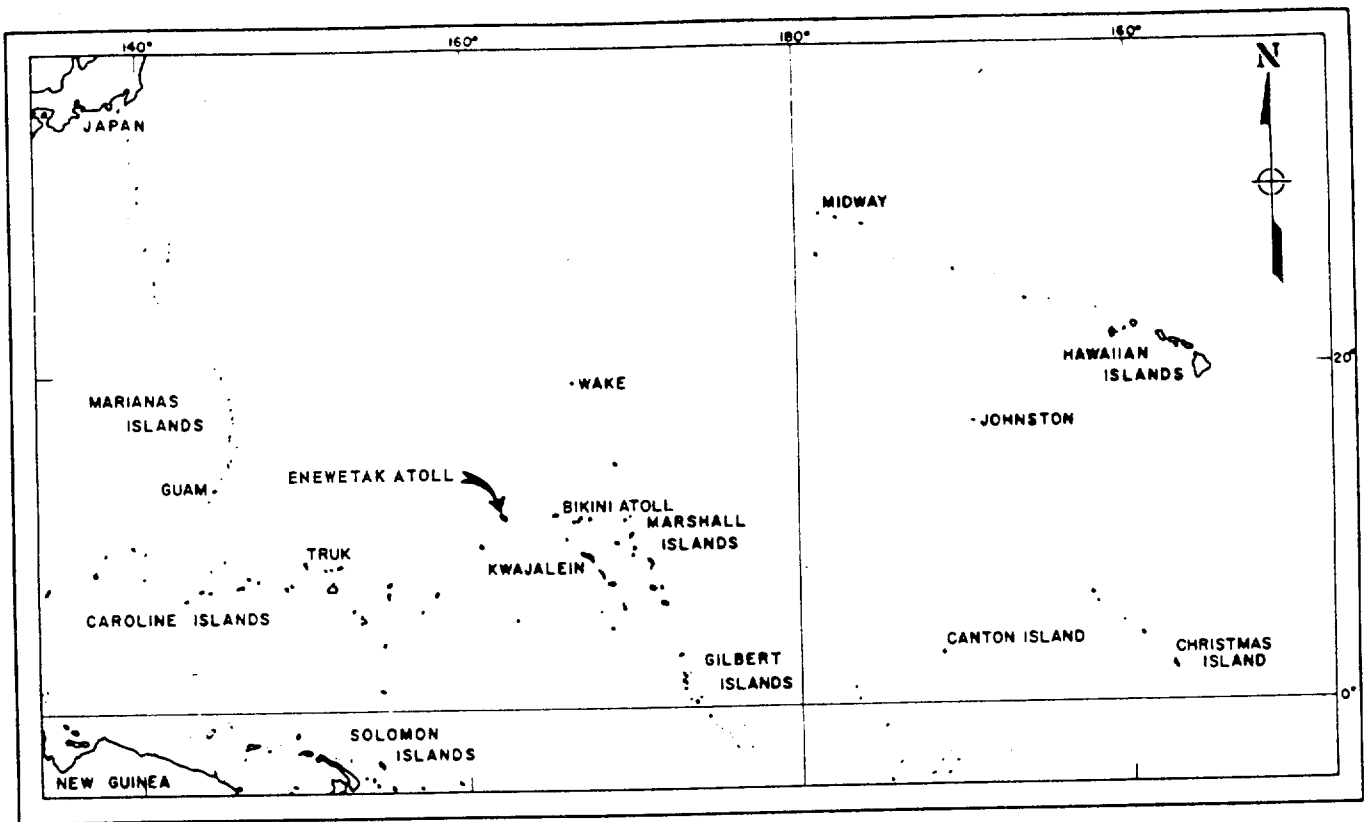




**REGIONAL MAP**



GRAPHIC SCALE IN NAUTICAL MILES



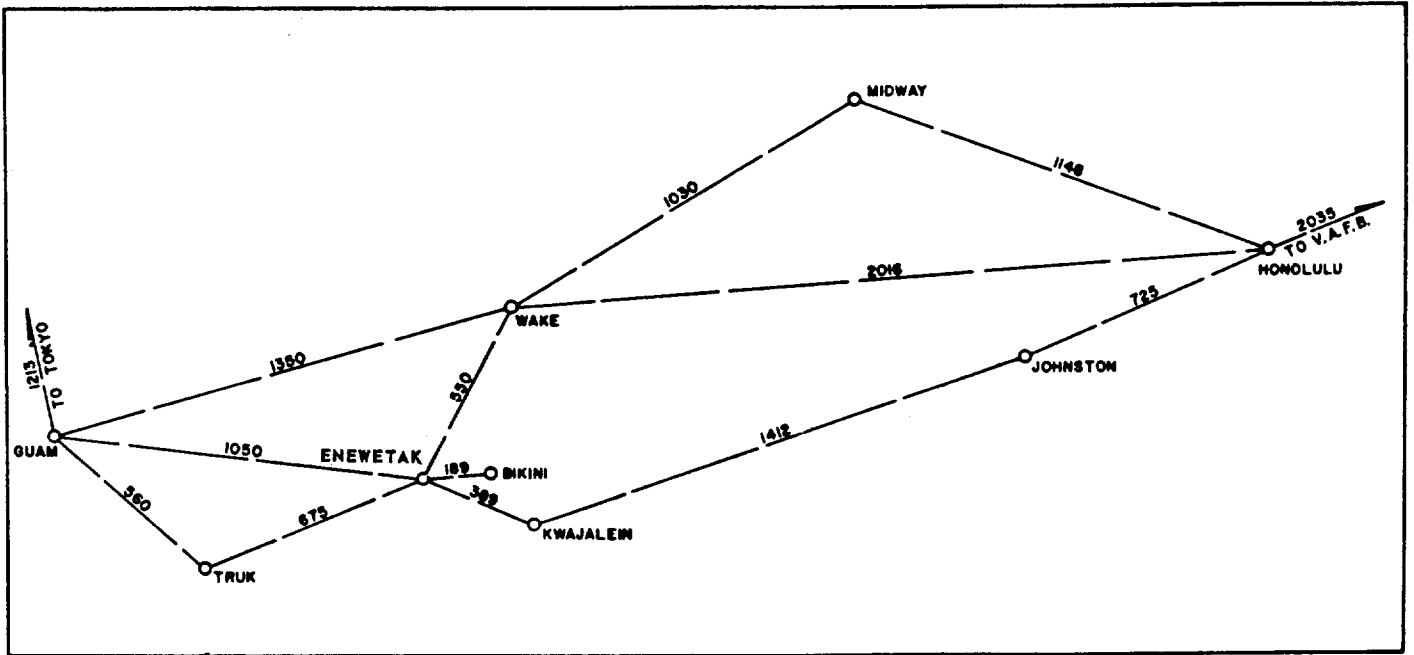
### REGIONAL MAP



GRAPHIC SCALE IN NAUTICAL MILES

## FOREWORD

This publication is intended to serve as a ready reference concerning Enewetak Atoll, its history, physical environment, functional policies, facilities and support services.



**AIRLINE DISTANCES MAP**  
NO SCALE

## LOCATION

At Latitude 11 degrees, 21 minutes North, 162 degrees, 21 minutes East, and approximately 2380 nautical miles southwest of Honolulu, Enewetak is the most northwestern atoll in the Western (Ralik) Chain in the Marshall Islands which form the northern part of the U.S. Trust Territory of the Pacific Islands (Micronesia) in the central Pacific Ocean.

## MISSION

In November 1972, the Director, Defense Nuclear Agency (DNA), was designated the Department of Defense Project Manager for matters concerning the cleanup of Enewetak Atoll to make it safe for resettlement by the Enewetak People. Field Command Defense Nuclear Agency (FCDNA) has been assigned operational responsibility for providing base support services to tenant activities and for the maintenance of facilities and utilities preparatory to and during planned cleanup operations scheduled to begin in FY 77. FCDNA has an appointed Atoll Commander with command and control jurisdiction over the atoll islands and their territorial waters.

## PHYSICAL DESCRIPTION OF ENEWETAK ATOLL

### GEOGRAPHY

The atoll consists of 40 islands on an elliptically shaped reef approximately 23 by 17 nautical miles, with the long axis running northwest to southeast. The total land area is 2.75 square miles, with the land height generally averaging 6 to 8 feet above mean sea level. The Vicinity Map shows the atoll configuration.

### CLIMATOLOGY

Enewetak's climate is the tropical marine type, with temperatures ranging from 71° to 94° F and humidity in the 73 to 80 percent range. There is much cumulus cloud cover, moderate variable rainfall (57 inches mean annual rainfall) and frequent northeasterly tradewinds of 10 to 30 knots.

### GEOLOGY

Enewetak Atoll rises 15,000 feet above the ocean floor, while the top of the eroded volcano which forms the island base is approximately 4,200 feet below the surface. Steep coralline reefs reaching to the surface form a flat oval ring of reef and low-lying islands, within which is a shallow lagoon with a maximum depth of about 200 feet.

Enewetak is a classic example of the Darwinian concept of atoll formation in which an atoll is born when an oceanic volcano, surrounded by a fringing coral reef, begins to subside slowly below the ocean surface. As the coral and coralline algae (which require shallow, clear, warm, oxygenated marine waters) maintain an upward growth commensurate with the subsidence, the fringe of reef flourishes, particularly on the ocean side. As the volcano continues to subside, the fringe reef gives way to a barrier reef, and then to an atoll.

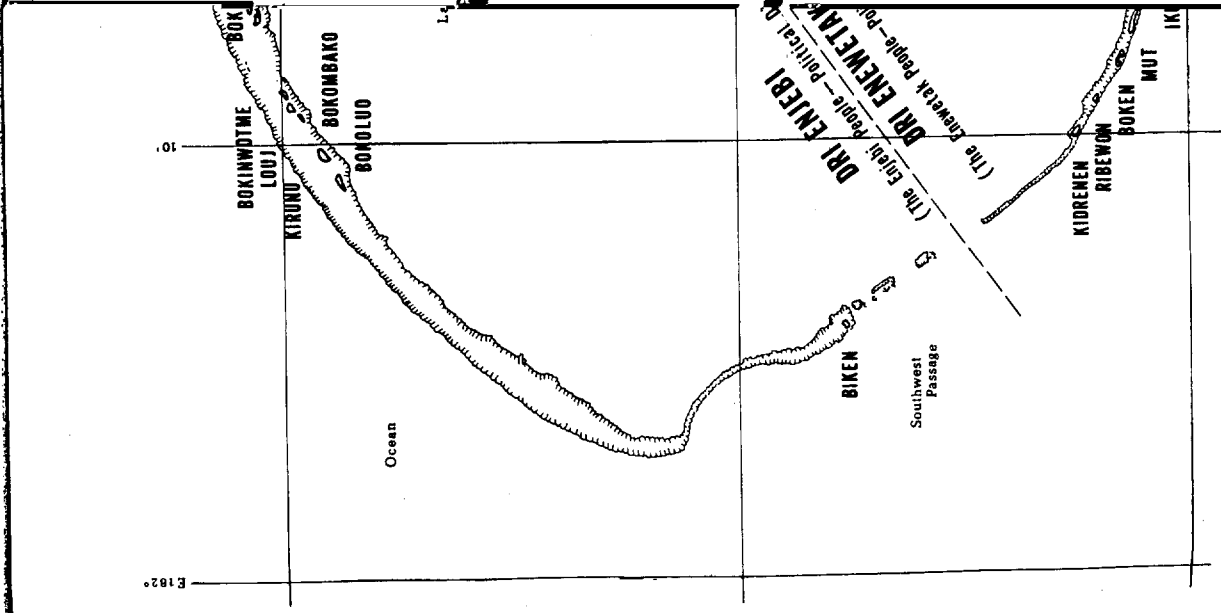


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Enewetak Atoll is managed by Field Command Defense Nuclear Agency (FCDNA). The FCDNA is the Host Agency for providing services and facilities to other Agencies engaged in operations at Enewetak. The relationships and responsibilities of the Host and Tenants are formalized in documents, broadly known as "Host-Tenant Agreements". In general, the Tenants are required to coordinate with the Host on activities affecting Enewetak Atoll current and planned operations, and to provide planning information which will permit the Host to carry out his responsibilities in the most efficient and economical manner.

Engineering, construction, maintenance and operations support services are provided at Enewetak through a single United States Energy Research and Development Administration (ERDA) contractor, Holmes & Narver, Inc., on a reimbursable basis. The contract is administered by the USERDA/Nevada Operations Office (NV) through the USERDA/Pacific Area Support Office (PASO). USERDA/NV and FCDNA have an agreement whereby the Commander, FCDNA, Enewetak Atoll (COMEA), has Contract Administrator Representative (CAR) authorities for operational control of all contractor activities at Enewetak Atoll.

## HISTORICAL BACKGROUND

The recorded history of Enewetak dates from the sixteenth century and can be separated into four distinct periods: the discovery era from 1526 to 1885; the German Protectorate from 1885 to 1914; the Japanese Mandate from 1914 to 1944; and the United States Trusteeship from 1944 to the present time.

### DISCOVERY ERA

The atoll was first reported sighted by Spaniards in 1526, three years before a landing was made by Alvaro de Saavedra in October 1529. Several other sightings were reported by the British from 1792 through the end of the 18th century. However, it appears that no significant contacts were effected prior to the 19th century although the first official survey and charting was made in 1798.

### GERMAN PROTECTORATE

In 1886, following several years of commercial trading, Germany formally established a protectorate over the Marshall Islands. The Marshallese, including the Enewetak People, accepted coconut seedlings from German traders and sold the resulting copra back to the Germans for trade goods and food. This involved the Enewetak People in a move from a subsistence economy to a mixture of a cash and a subsistence economy.

### JAPANESE MANDATE

The Japanese Mandate commenced with the seizure of Enewetak and all other German Micronesian possessions in 1914. Visits to Enewetak were made in 1920 by the Japanese Navy and Japanese traders; however, no attempts were made to establish a full-time administration at Enewetak. Both Enewetak and Ujelang were administered from

Ponape in the Carolines and the only foreign residents on Enewetak were a Japanese trader and his two assistants. Aside from a weather station established in the 1930's, Japanese contact with the atoll languished until the years 1939 to 1941. During this period, the Japanese decided to make Enewetak a strategic base. The atoll was elaborately fortified and a large airfield was built on Enjebi Island, using both Marshallese and imported labor. Thousands of Japanese military personnel occupied the atoll during this period.

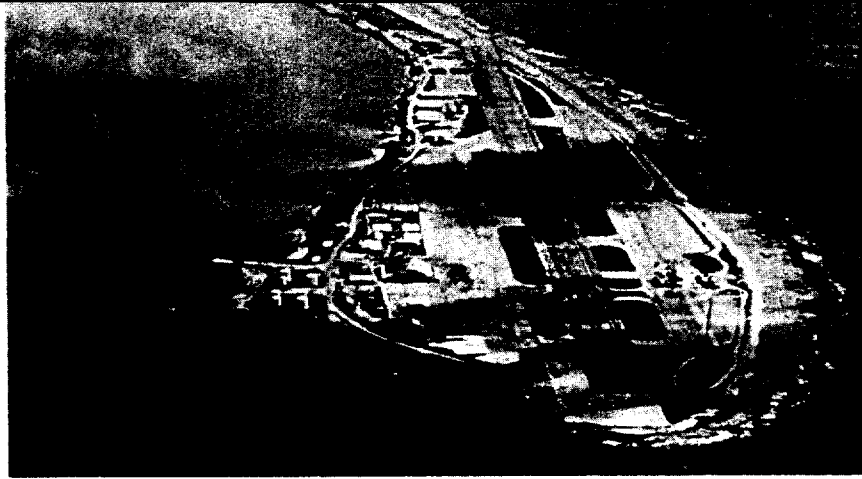
#### UNITED STATES TRUSTEESHIP

Enewetak remained as a key bastion of the Japanese until it was captured by United States forces in February 1944. The United States occupied the atoll until the end of the war, using it as an advance base for further operations to the west. The Enewetak People were moved to Aomon Island during the wartime occupation. At the conclusion of the war, the United States was given the trusteeship of the Marshall Islands by the United Nations. During the early United States occupancy of the atoll, 136 people were in residence. In December 1947, the People of Enewetak were transferred 124 miles to the southwest to then uninhabited Ujelang where they have remained. Between 1948 and 1958, the United States used Enewetak as a nuclear proving ground and conducted 43 nuclear tests on the atoll.

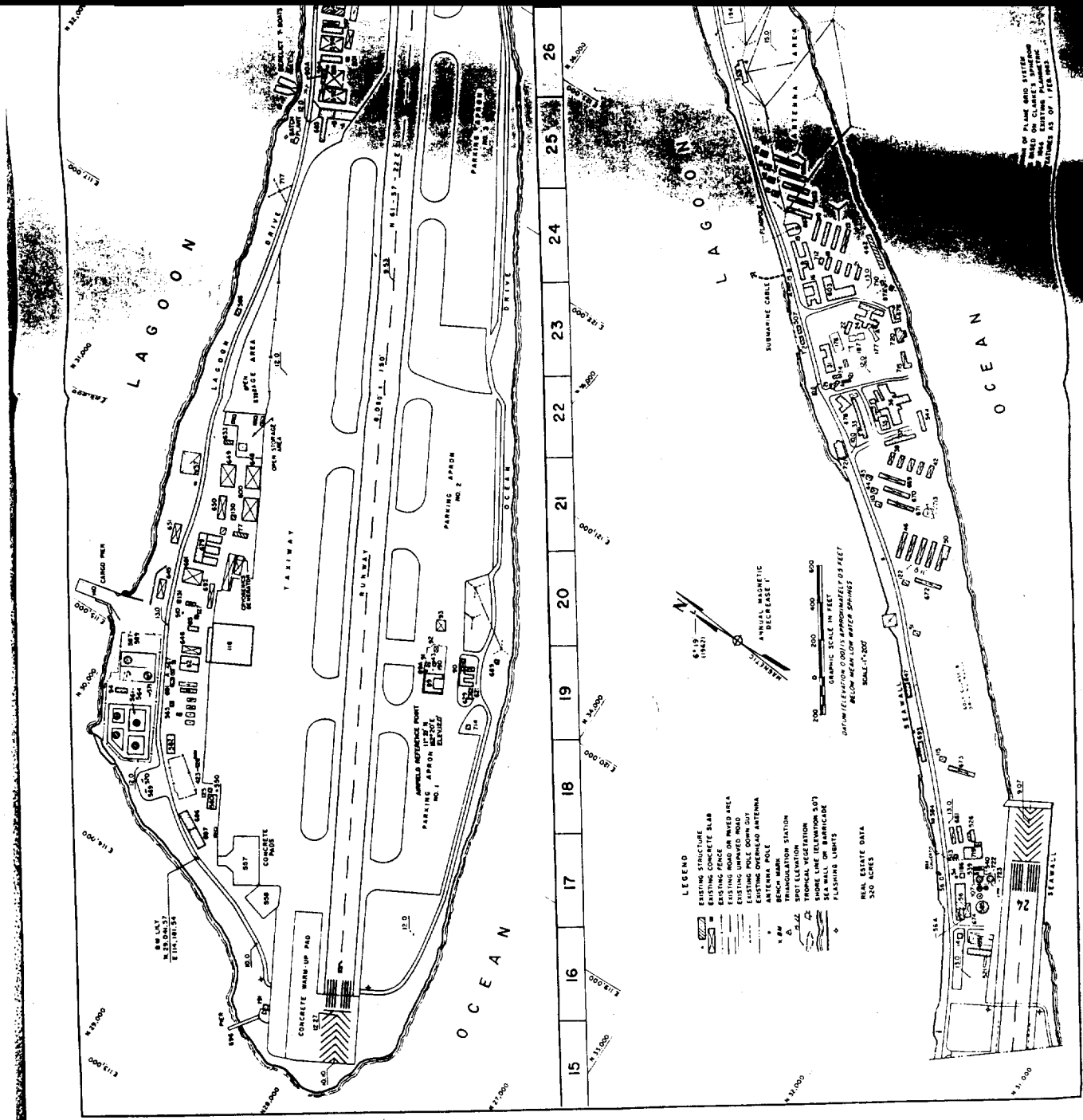
In April 1972, the United States announced its intention to transfer the administration of Enewetak Atoll to the Government of the Trust Territory of the Pacific Islands, subject to the retention of some residual rights. On September 16, 1976, the United States ended 32 years of use and occupancy of the atoll, when Acting High Commissioner Peter T. Coleman, Acting for the United States and the Trust Territory signed documents to return control of the Atoll to the Enewetak People. In ceremonies conducted on the atoll on

this date, Enewetak representatives also signed an agreement which permitted the United States to undertake a program to remove tons of debris remaining from the period of nuclear testing as well as the removal or neutralization of radioactive debris within the atoll which might be dangerous to the people when they return. During 1977, an advance group of 50 Enewetak People will move from Ujelang to the noncontaminated Enewetak Island of Japtan.

The cleanup of physical and radiological debris and hazards is expected to begin during the latter half of FY 77, taking approximately twenty-eight months to complete. The rehabilitation and resettlement process leading to eventual return of the people remaining at Ujelang is expected to commence shortly after the cleanup operation begins. During the September 16 signing ceremonies at Enewetak, Ujelang Atoll was conveyed to the Enewetak People by quit claim deed thus giving the people two atolls for their future home.

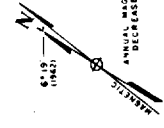


ENEWETAK ISLAND



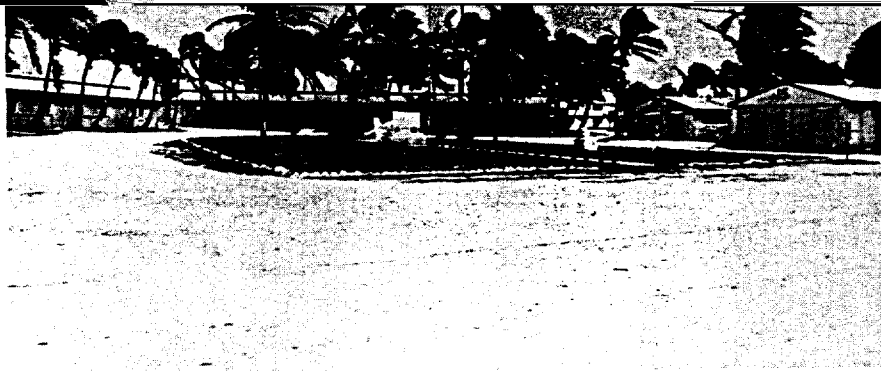
**LEGEND**

- ▣ EXISTING STRUCTURE
  - ▤ EXISTING CONCRETE SLAB
  - ▥ EXISTING FENCE
  - ▧ EXISTING IMPAVED ROAD
  - ▨ EXISTING UNIMPAVED ROAD
  - ▩ EXISTING POLE DOWN DUT
  - EXISTING OVERHEAD ANTENNA
  - ▬ ANTENNA POLE
  - ⊙ TRANSLATION STATION
  - ⊙ SPOT ELEVATION
  - ⊙ TROPICAL VEGETATION
  - ⊙ TROPICAL VEGETATION
  - ⊙ SEA WALL OR BARRICADE
  - ⊙ FLASHING LIGHTS
- REAL ESTATE DATA  
520 ACRES



GRAPHIC SCALE IN FEET  
0 200 400 600  
SCALE 1"=200'  
DEFINITE ELEVATIONS APPROXIMATELY 0.5 FEET  
BELOW MEAN LOW WATER SHOWN

THIS PLAN AND STATE  
PLANNING  
AS OF 1 FEB 1963

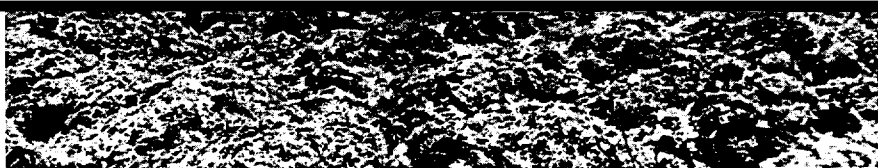


### FLAG POLE SQUARE

The Flag Pole Square is bordered by Barracks Building 667 (left background), Barracks Building 10 (center background) and Administrative Office, Building 15 (right background).

Officers of the Base Command, ERDA Representative and Holmes & Narver Base Support Management are located in the east wing of Building 667.





## POL FUEL STORAGE

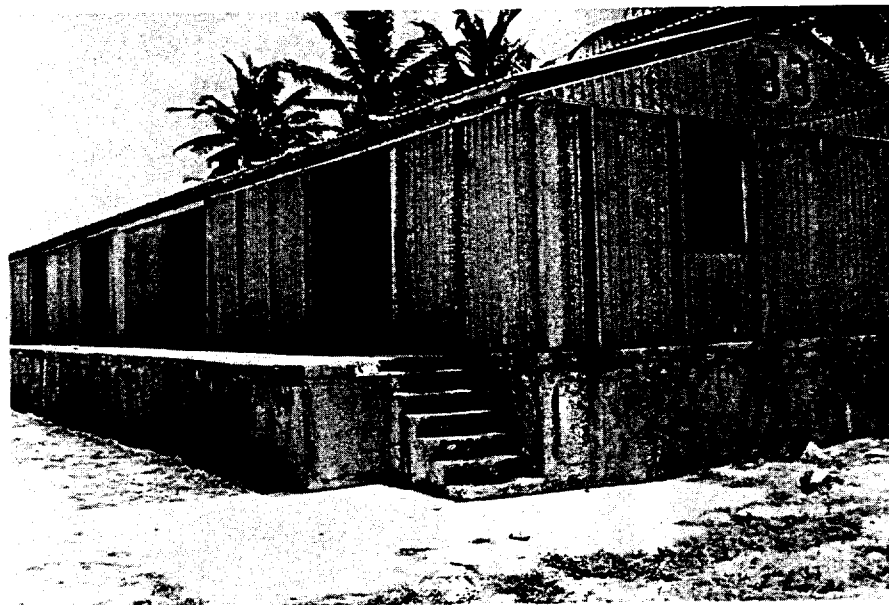
This complex originally included storage facilities for Jet Fuel, AvGas, Diesel Fuel and MoGas, a POL pump station, truck fill stands and interconnecting piping. At present only the Diesel Fuel and MoGas tanks are in use.

Fuel is brought into the storage area through three 6-inch floating fiberglass lines from tankers anchored to three buoys approximately 1,300 feet offshore in the lagoon. Through valves and pumps in the pump station, Building 94, fuel can be distributed to one or all of the seven storage tanks. Storage facilities include one 2,610 barrel, four 10,000 barrel, and two 5,000 barrel tanks for a total POL storage of 52,610 barrels.

The location of these fuel storage tanks is at the west end of the Island near the Cargo Pier.

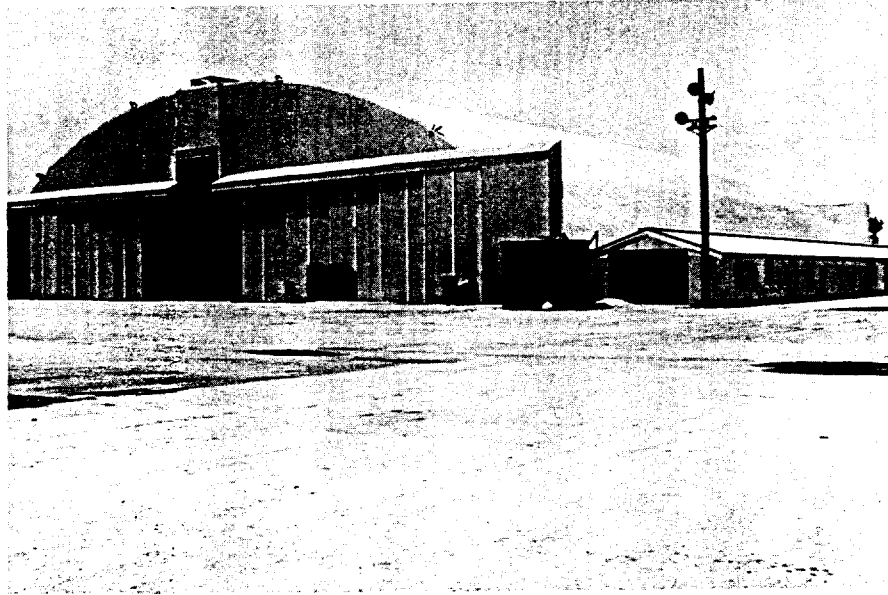
## FACILITY NO. 33 - COLD STORAGE

This building houses two 4-cubicle and six 2-cubicle walk-in refrigerators used for storing food supplies that require chill or freeze storage. The building is a standard Pacific Iron & Steel building 24 feet x 238 feet constructed on a dock height concrete foundation.



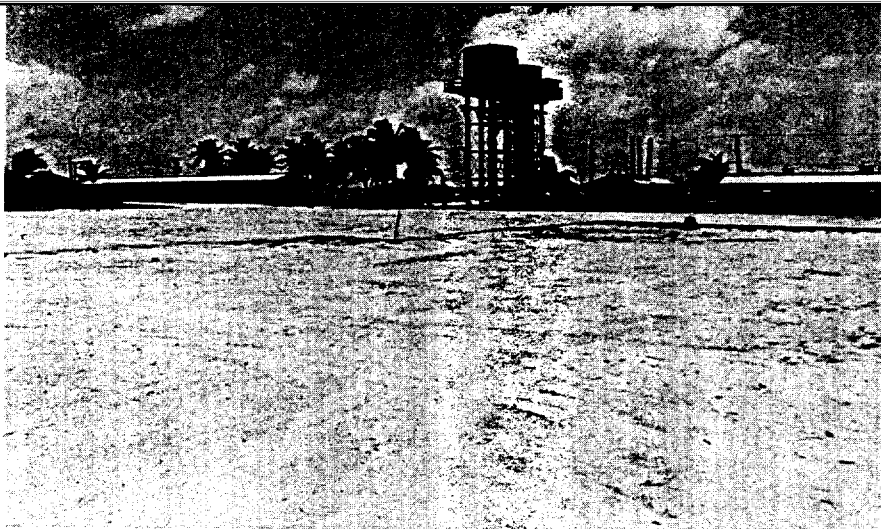


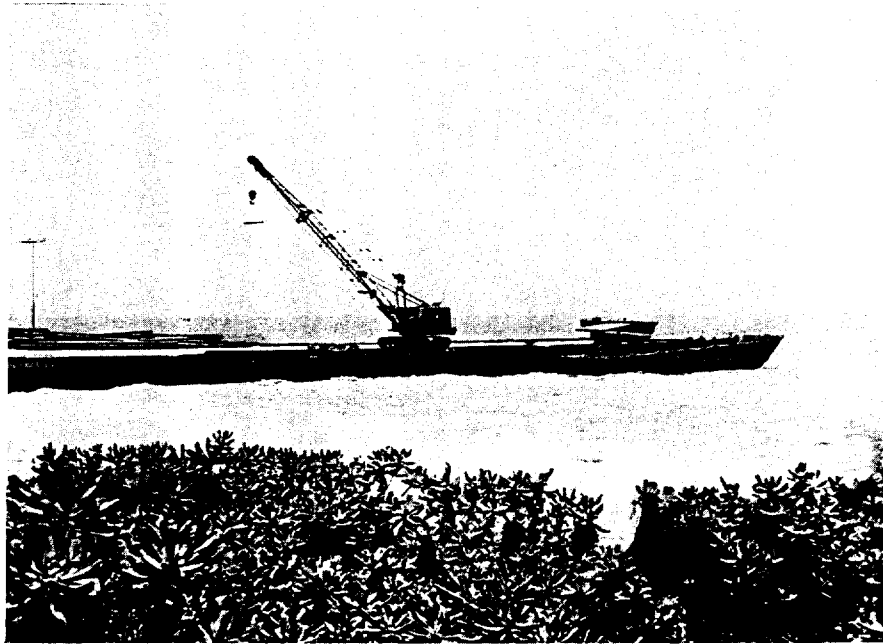




#### FACILITY NO. 118 - AIRCRAFT HANGAR

This structure is a steel-trussed, aluminum-sided building, 210 feet x 240 feet, constructed on a concrete foundation with a concrete floor. It was originally constructed as an aircraft repair hangar. It is presently used for heavy equipment storage.





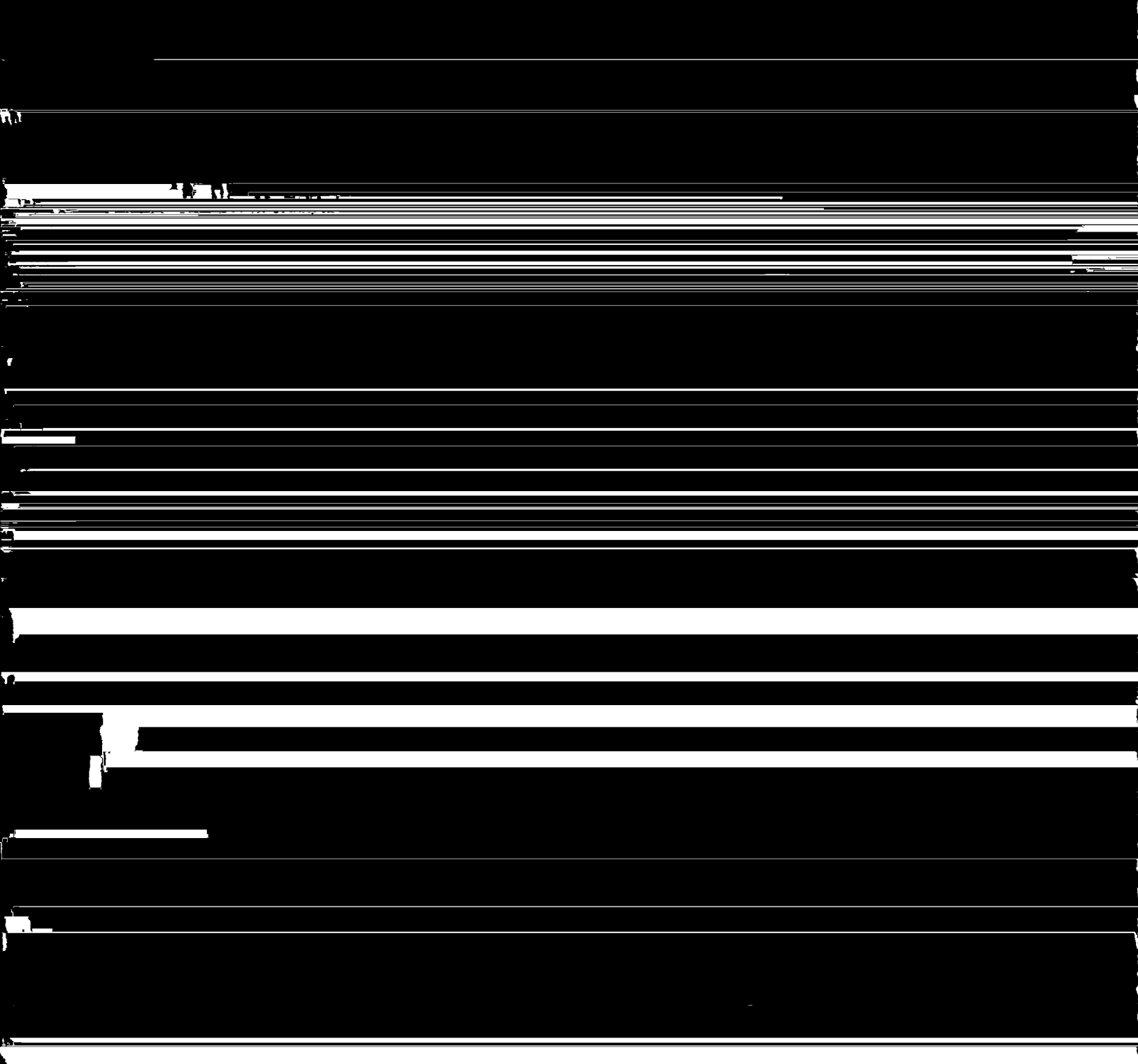
#### FACILITY NO. 140 - CARGO PIER

The Cargo Pier is located at the west end of the Island near the POL Fuel Storage tanks. The structure is constructed of a concrete retaining wall at the approach end, steel-sheet pile filled with coral and a concrete surface. It is 70 feet wide and 200 feet long accommodating shallow craft and barge docking limited to 11 foot draft.

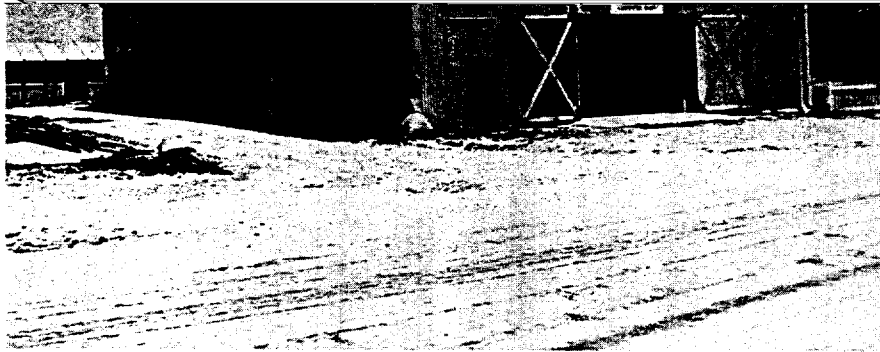
This facility is used for daylight unloading as no lighting for night operation now exists.





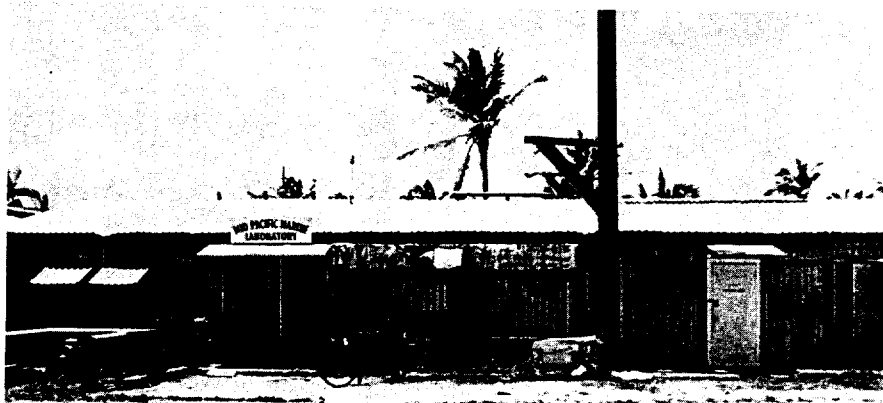


...and ...making a total of 20,000 gallons of fresh water ground storage.



FACILITY NO. 594 - CARPENTER SHOP

This structure is a steel framed building with aluminum siding and roofing, 40 feet x 120 feet constructed on a concrete slab.

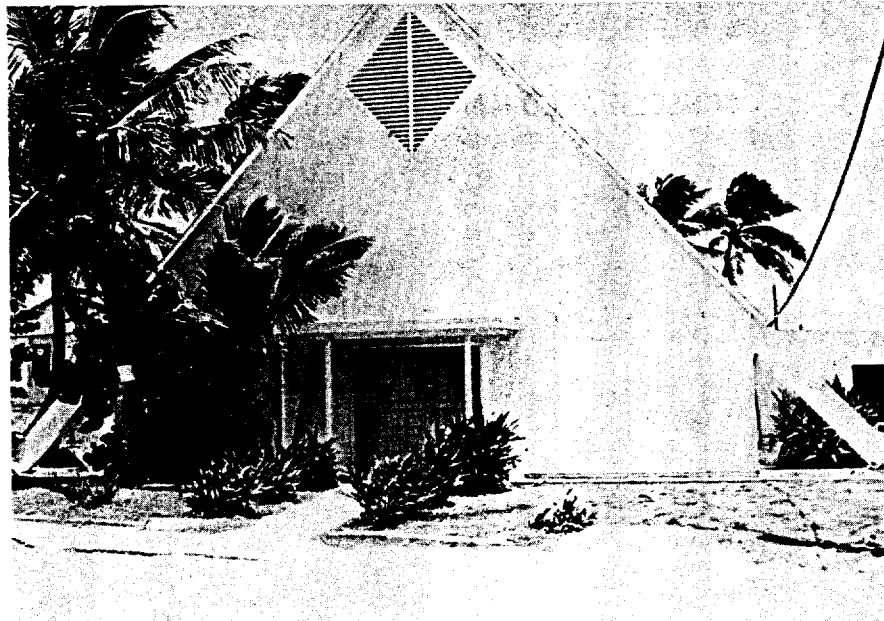


#### FACILITY NO. 603 - MID-PACIFIC MARINE LABORATORY

The structure is a series of standard Pacific Iron & Steel aluminum buildings (side by side 24-foot bays) "L" shaped covering 11,500 square feet and constructed on a concrete slab. The major occupant of this building is the ERDA Mid-Pacific Marine Laboratory operated by the University of Hawaii's Institute of Marine Biology.

FACILITY NO. 628 - CHAPEL

This facility is currently not utilized, but is ready for future use for church services and as a general assembly room for large groups of people.







FACILITY NO. 677 - SWIMMING POOL

The structure is constructed of reinforced concrete 40 feet x 105 feet varying from 3-foot depth at the shallow end to 8-1/2 feet deep at the deep end. The structure is in good condition and continues to get frequent use.

