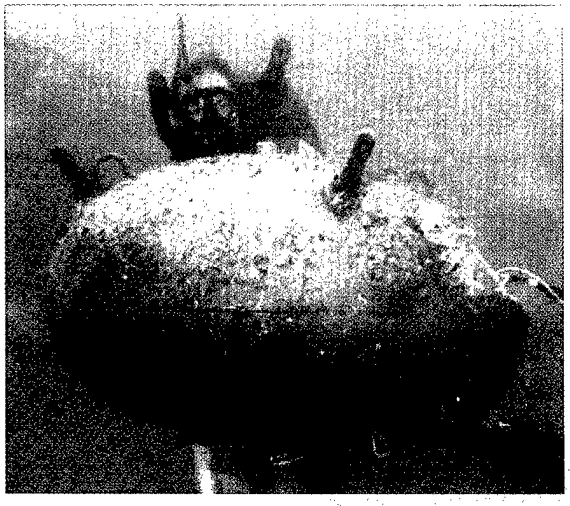


FINAL ENVIRONMENTAL IMPACT STATEMENT

MILITARY TRAINING IN THE MARIANAS

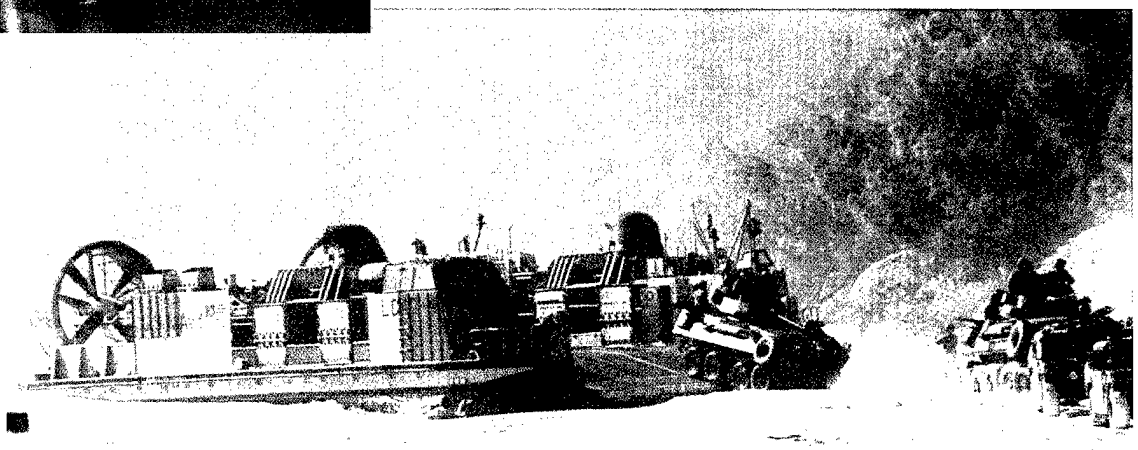


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ABSTRACT
Final Environmental Impact Statement (FEIS)
Military Training in the Marianas

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ABSTRACT. The Commander, U.S. Naval Forces Marianas, acting for the Commander in Chief, U.S. Pacific Command, requires military training sites in its area of responsibility. Approximately 4,600 military personnel from the services' regular, reserve, and National Guard components use training sites in the Mariana Islands managed by COMNAVMARIANAS and 36th Air Base Wing (ABW). The military organizations permanently assigned to Guam, as well as large transient forces such as Navy Carrier Battle Groups, Amphibious Ready Groups, and Marine Expeditionary Units depend on training areas in Guam and the Commonwealth of the Northern Mariana Islands (CNMI) for sustaining military skills that are required for operational deployments to the Western Pacific and Indian Ocean regions.

The proposed action is to define certain Department of Defense (DoD)-controlled lands for environmentally suitable military training activities that are necessary to ensure the readiness of assigned and transient U.S. forces tasked with fulfilling regional readiness and operational contingency missions. The training areas affected by the proposed action are primarily those presently in use by the military (ongoing or continuing actions). These areas include the Navy's military bases on Guam (Waterfront Annex, Ordnance Annex, and two Communications Annexes), the Military Lease Area (MLA) on Tinian, and the leased island of Farallon de Medinilla (Navy Training Range 7201). 36th ABW at Andersen Air Force Base conducts training and provides support to resident and transient units at its Main Base, Northwest Field, and Andersen South. There are certain nonmilitary properties on Guam, Tinian, and Rota that are used for specific training functions with the permission of the landowners.

The ongoing training land use includes amphibious landings and tactical field maneuvers, field logistics training, parachute exercises and aviation training certification, small arms weapons requalification, demolition training on land and under water, naval gunfire, and aerial bombardment. The training activities are primarily conducted at the individual unit level and periodically combined as part of a large-scale joint-military service exercise that may involve 2,000 or more persons. New training land uses are also being proposed and evaluated, including additional amphibious landing sites on Guam and Tinian, new or modified live fire range sites on Guam and Tinian, additional underwater demolitions training sites, and a permanent location for rapid runway repair training.

Alternatives to the proposed action include No Training Land Use, Reduced Training Land Use, No New Action, and Maximum Training Land Use as defined by the Marianas Training Plan and other training orders and directives. As a result of the comparison of alternatives at each training site, a Preferred Training Land Use Alternative for the Mariana Islands has been determined.

Essentially the preferred alternative is a continuation of ongoing training, the initiation of some but not all of the proposed activities, and the identification of specific sites where there will be no training or training will be reduced. Environmental mitigation and training management constraints have been identified for each activity contained in the Preferred Alternative.

Proposed training activities that are not selected for the preferred alternative are those that would lead to potentially significant environmental impacts that could not be satisfactorily mitigated. One exception is the continued use of FDM as a naval gunfire and aerial bombardment range, which generates significant impacts to birds and habitat that cannot be completely mitigated. There is no other naval gunfire and aerial bombardment range available. As a result of the need to retain the range, the Navy has initiated additional training constraints on FDM to lessen impacts. In addition, the Navy is provides mitigation by participating in compensatory actions (habitat enhancements) on another unoccupied island in the Mariana archipelago in cooperation with the CNMI and U.S. Fish and Wildlife Service.

The selection of the preferred training land use activities has taken into consideration the actions necessary to train at sites that are often shared with private citizens and commercial activities. Tourism is a contributor to the economics of Guam, Rota, and Tinian, and minimizing training interference with commercial activities has been one of many criteria used to select training sites and frequency.

Cultural resources on Tinian and Guam include Chamorro sites and artifacts and a variety of historic structures from World War II battles. Tinian, Guam, FDM, and Rota are subtropical islands with endangered species (birds, bats, reptiles, snails, and various plants) and migratory seabirds. Various levels of site-specific training constraints have been identified on each island to protect cultural and natural resources.

The introduction of the brown tree snake (BTS) from Guam to other locales would be ecologically disastrous. The BTS was introduced from Palau and Australia to Guam during World War II. The snake has decimated bird and bat species, some to the point of extinction. BTS control and interdiction methods were reviewed, updated, and included in the EIS. The plan's inspection and snake-sighting response procedures have been incorporated into mitigation and training management measures.

In addition to the BTS threat, other potentially significant issues, summarized below, were analyzed in detail to select the environmentally Preferred Training Land Use Alternative for the Marianas and appropriate mitigation and training management measures.

(1) Potential impacts on endangered species and other biota consist primarily of noise disturbance and habitat disturbance or destruction by fire, vegetation clearing, cross-country off-road vehicle travel, landing craft and amphibious vehicle beach crossings, and underwater demolitions. Seabirds or endangered megapodes and fruit bats on FDM may be killed by ordnance. Proposed mitigation consists primarily of restricting or not training at certain locations or during breeding seasons and compensatory mitigation of impacts on Farallon de Medinilla.

(2) Potential impacts on archaeological sites (Chamorro) and World War II historic resources will be mitigated by constraining training activities at specific locations.

The analysis indicates that no significant impacts on Tinian's wastewater disposal facilities would result from the proposed action. No significant impacts to air and water quality would occur from the proposed action through compliance with established mitigation measures and operating rules and regulations. No significant impacts on waste transportation or disposal facilities would result from continued backhauling of solid waste to Guam for disposal at a Navy landfill or from the transport of small amounts of hazardous materials from Tinian via Guam for further transportation to authorized off-island disposal sites.

The analysis indicates that no impacts to public safety would occur due to aviation training or live fire on established ranges. Certain proposed field firing range developments on leased land at Tinian are no longer a preferred alternative, primarily due to public safety concerns. Compliance with published range regulations and FAA and U.S. Coast Guard protocols such as publication of Notice to Airmen and Notice to Mariners would continue to serve as mitigation at existing ranges on federal land.

Potentially negative economic impacts on local communities caused by temporary restrictions within military training areas will be mitigated by advance communications and planning with island officials and affected commercial firms and the selection of additional training sites. Examples include actions on Tinian for alternative planning whenever the MLA is restricted to tourists and on Guam whenever portions of Apra Harbor are closed to divers and tour boats.

The analysis discusses federal policies under Executive Orders pertaining to Environmental Justice, Protection of Children from Environmental Health and Safety Risks, Protection of Wetlands, Coral Reef Protection, and Invasive Species, in order to ensure that the training actions will be implemented in compliance with said policies or that appropriate mitigation actions will be taken to eliminate or reduce potentially significant impacts.

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MILITARY TRAINING IN THE MARIANAS

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AAFB	Andersen Air Force Base
AAV	Assault Amphibian Vehicle
AAAV	Advanced Amphibious Assault Vehicle
ABW	Air Base Wing
ACC	Air Combat Command
AGL	Above Ground Level
AICUZ	Airfield Installation Compatibility Use Zone
ARE	Attack Response Exercise
ARG	Amphibious Ready Group
ASW	Anti-Submarine Warfare
ATD	Annual Training Duty
ATIS	Airport Terminal Information System
BRAC	Base Realignment and Closure
BTS	Brown Tree Snake
C7F	Commander, U.S. 7th Fleet
C-RAP	Center Radar Approach Control
CAA	Clean Air Act
CAD	Cartridge Activated Device
CAL	Confined Area Landing
CAS	Close Air Support
CCT	Combat Control Team
CDS	Container Delivery System
CEQ	Council on Environmental Quality
CES	Civil Engineer Squadron
CLZ	Craft Landing Zone (for LCAC)
CME	Combat Mobility Element
CNMI	Commonwealth of the Northern Mariana Islands
COMNAVMARIANAS	Commander, U.S. Naval Forces Marianas
COMPHIBGRU ONE/ELEVEN	Commander, Amphibious Group One/or Eleven
COMSEVENTHFLT	Commander, U.S. Seventh Fleet
CONUS	Continental United States
CPX	Command Post Exercise
CRRC	Combat Rubber Raiding Craft
CS	Combat Support
CSS	Combat Service Support
CTF	Commander, Task Force (Number)
CUC	Commonwealth Utility Commission
CVBG	(Aircraft) Carrier Battle Group
CZM	Coastal Zone Management
DAWR	Division of Aquatic and Wildlife Resources
DEIS	Draft Environmental Impact Statement
DEQ	Division of Environmental Quality
DoD	Department of Defense
DOT	Department of Transportation
DPW	Department of Public Works
DRMO	Defense Reutilization and Marketing Office
DZ	Drop Zone
EA	Environmental Assessment
EIS	Environmental Impact Statement

EMO	Emergency Management Office (CNMI)
EMR	Electromagnetic Radiation
EMUA	Exclusive Military Use Area
EOD MU-5	Explosive Ordnance Disposal Mobile Unit-Five
EPA	Environmental Protection Agency
ERA	Ecological Reserve Area
EZ	Extraction Zone
FAA	Federal Aviation Administration
FARP	Forward Area Refueling Point
FCC	Federal Communications Commission
FCLP	Field Carrier Landing Practices
FDM	Farallon de Medinilla
FEIS	Final EIS
FWS	Fish and Wildlife Service
GAA	Guam Airport Authority
GEPA	Guam Environmental Protection Agency
GIAT	Guam International Air Terminal
GovGuam	Government of Guam
GPA	Guam Power Authority
GTA	Guam Telephone Authority
GWA	Guam Waterworks Authority
HAHO	High-Altitude, High-Opening (Parachute)
HALO	High-Altitude, Low-Opening (Parachute)
HC-5	Helicopter Combat Support Squadron Five
HF	High-Frequency
HM/HW	Hazardous Materials and Hazardous Waste
HMMWV	High Mobility Multipurpose Wheeled Vehicle
HPO	Historic Preservation Officer
HW	Hazardous Waste
I MEF	I Marine Expeditionary Force
IARII	International Archaeological Research Institute, Inc.
IBB	International Broadcasting Bureau (USIA)
ID	Infantry Division
IED	Improvised Explosive Device
IFR	Instrument Flight Rules
III MEF	III Marine Expeditionary Force
III SRI	III Surveillance, Reconnaissance and Intelligence Group
IO	Indian Ocean
IWS	Individual Wastewater System
JA/ATT	Joint Airborne/Air Transportability Training
km	Kilometer
kph	Kilometers per hour
kW	Kilowatt
LAPES	Low-altitude, parachute extraction system
LAV	Light Armored Vehicle
LBA	Lease Back Area
LCAC	Landing Craft, Air Cushion
LCC	Amphibious Command Ship
LCM-8	Landing Craft, Medium
LCU	Landing Craft, Utility
Ldn	Day-Night Equivalent Sound level
LHA	Landing Helicopter, Assault

LHD	Amphibious Assault Ship (Multipurpose)
LSD	Landing Ship, Dock
LPD	Landing Platform, Dock (amphibious assault ship)
LZ	Landing Zone
m	Meter
m^3	Cubic Meter
m^3/day	Cubic Meter per Day
MARE	Major Accident Response Exercise
MARFORPAC	Marine Forces, Pacific
MEDEVAC	Medical Evacuation
MEF	Marine Expeditionary Force
MEU	Marine Expeditionary Unit
mm	Millimeter
MOA	Memoranda of Agreement
MP	Military Police (US Army and USMC)
MSA	Munitions Storage Area
MSL	Mean Sea Level
MTC	Marianas Telecommunications Corporation
MW	Megawatts
NAS	Naval Air Station
NAVFAC	Naval Facilities Command
NAVORD	Naval Ordnance Center
NCB	Naval Construction Brigade
NCRD	No Cultural Resources Disturbance
NCTAMS	Naval Computer and Telecommunications Area Master Station
NEO	Noncombatant Evacuation Operation
NEPA	National Environmental Policy Act of 1969
NGD	No Ground Disturbance
NKK	Nan'yo Kohatsu Kaisha (South Seas Development Company)
NM	Nautical miles
NMCB	Naval Mobile Construction Battalion
NMFS	National Marine Fisheries Service
NOI	Notice of Intent
NOTAM	Notice to Airmen
NOTMAR	Notice to Mariners
NRHP	National Register of Historic Places
NRMP	Natural Resources Management Plan
NSWU-1	Navy Special Warfare Unit One
NVG	Night Vision Goggles
NWD	No Wildlife Disturbance
OL	Off Limits
OSS	Operations Support Squadron
PACAF	Pacific Air Forces
PACDIV	Pacific Division, Naval Facilities Engineering Command
PAG	Port Authority of Guam
POL	Petroleum Oil, Lubricant
PT	Physical Training
PWC	Public Works Center
RCRA	Resource Conservation and Recovery Act
RHIB	Rigid Hull, Inflatable Boat

ROD	Record of Decision
ROWPU	Reverse Osmosis Water Purification Unit
RRR	Rapid Runway Repair
SAR	Search and Rescue
SARA	Superfund Amendment and Reauthorization Act
SDZ	Surface Danger Zone
SFG (ABN)	Special Forces Group, Airborne
SOCPAC	Special Operations Command, Pacific
SOG	Special Operations Group
SOP	Standing Operating Procedures
SOS	Special Operations Squadron
SP	Security Police (USAF), and Shore Patrol (USN)
SPS	Security Police Squadron
SPIE	Special Purpose Insertion and Extraction (Helicopter Rigging)
SRF	Ship Repair Facility
SRI	Surveillance, Reconnaissance and Intelligence
STS	Special Tactics Squadron
SUSV	Small Unit Support Vehicle
T-AH	Hospital Ship
T-AK	Maritime Prepositioning Ship
TD-AK	Maritime Prepositioning Ship
TACP	Tactical Air Control Party
TCGCC	Tinian Casino Gaming Control Commission
TEWT	Tactical Exercise Without Troops
TRAP	Tactical Recovery of Aircraft and Personnel
TRUE	Training in an Urban Environment
TSCA	Toxic Substances Control Act
TT 93, TT 95	Tandem Thrust '93, '95 [military exercises]
TTPI	Trust Territory of the Pacific Islands
UHF	Ultra-High Frequency
USAF	U.S. Air Force
USARPAC	U.S. Army, Pacific
USCG	U.S. Coast Guard
USCINCPAC	Commander-in-Chief, U.S. Pacific Forces
USFWS	U.S. Fish and Wildlife Service
USIA	United States Information Agency
USMC	U.S. Marine Corps
USN	U.S. Navy
UXO	Unexploded Ordnance
VFR	Visual Flight Rules
VGS	Variable Grade Sewer
VHF	Very High Frequency
VOA	Voice of America
WESTPAC	Western Pacific
WS	Wildlife Services
WW II	World War II



Latte stone on Tinian, 1944 (National Archives at College Park)

EXECUTIVE SUMMARY

FEIS: Military Training in the Marianas
Belt Collins Hawaii, 1999

EXECUTIVE SUMMARY

This Final Environmental Impact Statement (EIS) evaluates the environmental impacts of ongoing and proposed military training land uses. The lands involved are primarily Department of Defense (DoD)-controlled lands in the Mariana Islands that have been used for training for many years. The proposed action of this EIS represents the maximum training land uses that were formally requested by USCINCPAC organizations and published in the Commander, U.S. Naval Forces, Marianas Training Plan, and the content of related Navy and USAF training orders and directives.[1] All of the mitigation measures documented in the Record of Decision for the Final EIS will be incorporated in future site-specific training orders, streamlining the process of planning training exercises and assuring that necessary mitigation will be implemented.

The following sections summarize Chapters One through Four of this EIS.

1.0 PURPOSE AND NEED FOR MILITARY TRAINING IN THE MARIANA ISLANDS

1.1 Overview—U.S. Pacific Command Training Requirements

The Commander-in-Chief, U.S. Pacific Command (USCINCPAC) is responsible for an area comprising 105 million square miles (272 million square kilometers [km^2]). The U.S. has defense treaties with five nations in the U.S. Pacific Command's area of responsibility. Commander, U.S. Naval Forces Marianas (COMNAVMARIANAS), representing USCINCPAC, is responsible for supporting military training in the Marianas, conducted to develop and maintain war fighting skills and a constant state of readiness in the military forces responsible for crisis response in the Pacific and Indian Ocean operating areas. Commander, 13th Air Force/36th Air Base Wing is responsible for management and operations of Andersen Air Force Base (AAFB), which in addition to training area management is involved in support to transiting forces from all military services. Guam is centrally located in the Pacific Region providing opportunities to train while remaining within reasonable sailing distances to potential areas of conflict. See Chapter One, Figure 1-1.

The force structure assigned to USCINCPAC is projected to remain in the Pacific region for the foreseeable future. This force structure is comprised of approximately 100,000 U.S. military personnel representing all military services with major headquarters elements in the United States and abroad.

- **CONUS-based Forces**

Forces based in the Continental U.S. (CONUS) that routinely support USCINCPAC include elements of U.S. Army I Corps, the U.S. Third Fleet and the 1st Marine Expeditionary Force stationed in California. Navy Carrier Battle Groups (CVBG), Amphibious Ready Groups (ARG), and Marine Expeditionary Units (MEU) deploy from their West Coast bases on a six to seven month rotating schedule to the Western Pacific and Indian Ocean. These forces often transit the

[1] Commander, U.S. Naval Forces Marianas (June 1998). *Marianas Training Plan for DoD Facilities and Activities.*

Mariana Islands and use its training areas to sustain integrated Navy/Marine Corps skills. These forces provide USCINPAC the capability of immediate force projection as needed in the region.

Air Combat Command is responsible for the strategic bomber fleet, elements of which are supported by Andersen Air Force Base during commitments of aircraft to the Pacific and Indian oceans operating areas.

- **Forward-based Forces**

Forward-based forces include the U.S. Army's First Brigade, Sixth Light Infantry Division and 11th Air Force in Alaska, and in Hawaii, the Army's 25th Light Infantry Division (minus) and 45th Corps Support Group, the Marines' Third Marine Regiment (Reinforced), and joint-service Special Operations Command, Pacific. These commands conduct the majority of their training at home stations and provide organizations to train in the Marianas and Western Pacific region on a periodic basis, often to demonstrate their capability to respond as members of a combined or joint task force to crises in the region.[2] Such training is normally performed as part of a named joint exercise, such as Tandem Thrust.

There are forward-based forces in the Western Pacific, primarily in Japan, Korea, and Guam. The Fifth and Seventh Air Forces are located in Japan and Korea respectively. On Guam the two major command elements are 13th Air Force at AAFB and COMNAVMARIANAS. The Eighth U.S. Army is stationed in Korea, III Marine Expeditionary Force (III MEF) is stationed in Okinawa, and U.S. Seventh Fleet operates out of homeports in Japan. 353rd Special Operations Group has its headquarters in Okinawa and three Special Operations Squadrons and one Special Tactics Squadron in Okinawa and Korea. 1st Battalion, 1st Special Forces Group is stationed in Okinawa.

- **Forward-deployed Forces**

In addition to Third Fleet and I MEF deployments, Seventh Fleet and III MEF also deploy an ARG and MEU. The USS BELLEAU WOOD is the command ship. Seventh Fleet deploys a Carrier Battle Group (presently the USS KITTY HAWK and supporting ships) and a variety of naval task forces for regional contingencies, exercises and training. Fleet support is constantly on-station in the Western Pacific and/or Indian oceans.

1.2 Training Requirements in the Mariana Islands

USCINCPAC forces conduct training and exercises that build upon individual basic military occupational skills and weapons certification to develop integrated service capabilities to conduct tactical exercises and logistic support functions within a joint and combined force environment. A combined force exercise would involve U.S. and allied military commands conducting large-scale exercises involving as many as 20,000 or more personnel aboard ship and on the ground. Joint exercises integrate U.S. military forces: the Navy's Amphibious Ready Groups, Marine Expeditionary Units, USAF strategic bombing units, Naval aircraft aboard the Carrier Battle Groups, Army infantry and combat support units, joint special operations forces, and allied ships,

[2] A joint task force is comprised of any combination of U.S. military forces. A combined task force is comprised of U.S. and Allied military forces.

planes and units. These forces are required to conduct integrated amphibious assault landings and inland maneuver, aerial bombardment, naval gunfire support, and special operations training.

Various training sites and facilities are needed including relatively large areas of undeveloped and wooded terrain, urban areas, beaches with contiguous land maneuver areas, airfields and helicopter landing zones and parachute drop zones, weapons ranges, seaports, and a bombing range. Worldwide, there are few individual training areas that provide all necessary training land conditions. Each command is responsible for maximizing the use of available training areas and ranges and for identifying potential alternative locations.

1.3 Training Locations

For USCINCPAC forces, training begins at home installations and continues at training sites in proximity to operating areas. The Republic of the Philippines was once a major site for training USCINCPAC forces deployed to the Western Pacific but access to this area is not presently authorized. The few appropriate training areas in Japan and Okinawa are limited in size and scope, and are primarily made available to units permanently stationed there. Political considerations limit the ability of transient USCINCPAC forces to use the Republic of Korea's training areas. Hawaii's training areas are outside the Western Pacific theater of operations and are used extensively by organizations permanently assigned to the state's military bases. Joint and combined military exercises are conducted in other countries such as Australia and Thailand, but such training is expensive, infrequent, and serves to supplement rather than replace training conducted in the Mariana Islands.

1.4 DoD-managed Training Lands in the Mariana Islands

U.S. presence in the Mariana Islands dates back to the Spanish-American War and was consolidated during and after World War II. Presently, the U.S. military owns or controls lands on Guam, Tinian, and Farallon de Medinilla (FDM).

Military bases on Guam include undeveloped areas for training, weapons training ranges, and training facilities. COMNAVMARIANAS administers the Waterfront Annex, Ordnance Annex, Communications Annex sites at Finegayan and Barrigada, and Camp Covington. Commander, 36th Air Base Wing administers AAAFB Main Base, Northwest Field, and Andersen South. See Chapter One, Figure 1-2.

The DoD leases from the Commonwealth of the Northern Mariana Islands (CNMI) a large portion of the island of Tinian and the uninhabited island of FDM for training that is managed by the Navy.

In addition to owned or leased training land, DoD is also authorized use of a surveyed parachute drop zone in Tinian's Leaseback Area and shared use of the West Tinian Airport and San Jose Harbor. A private landowner in Dandan, Guam, has authorized DoD to survey and operate two parachute drop zones primarily for use by the Guam Army National Guard. No military training is conducted on Rota, but its municipal government provides training support space in

Songsong's West Harbor. SEAL[3] teams from the Guam-based Naval Special Warfare Unit ONE (NSWU-1) are provided a bivouac area and a raiding craft maintenance and refueling site.

Guam

Almost all training is accomplished on DoD property managed by the Navy and Air Force except for National Guard use of the two surveyed parachute drop zones in Dandan. The U.S. Naval helicopter squadron (HC-5) permanently stationed in Guam provides airlift support to the permanently assigned regular, reserve, and National Guard units.

The **Waterfront Annex**, the largest naval base on Guam, includes Orote Peninsula and much of the shoreline of Inner and Outer Apra Harbors.[4] Much of the 4,479-acre (1,813-ha) annex is intensively developed for fleet and community support. Orote Peninsula was an airfield during World War II and includes some mixed open and forested areas. One runway remains in use for training and a historic trail through the area is often opened to visitors. Available training facilities include a known-distance (KD) small arms range with 200-, 300-, and 500-yard (183-, 274-, and 457-meter) lines, a fire-and-maneuver range that is under development, and a shooting house used for urban warfare and special operations scenarios. The facilities are bounded by undeveloped land that can be used for small unit maneuvers. Roadways connect the range and maneuver areas to beach landing sites suitable for landing craft and amphibious vehicle use. Historic resources date from the pre-Contact period through phases of multi-national occupation and control. These resources include remnants of invasion sites and defenses and base-buildup during and after World War II. Some of the submerged ships in Outer Apra Harbor are historic resources from World War I and World War II, one of which contains depth charges on its main deck that may be armed and unstable. Listed (endangered and threatened) turtle species frequent the harbor, and migratory seabirds nest along the south cliffs of Orote Peninsula. Training land uses are subject to existing agreements that protect endangered species, wetlands, and cultural resources.

Waterfront Annex training also includes use of lands at **Polaris Point**, **Dry Dock Island**, and **Camp Covington**. Polaris Point is the naval facility that primarily supports submarines and submarine tenders and has a military recreation beach that is suitable for amphibious landings. Dry Dock Island once supported ship repair but at present has no occupied structures and is used to beach landing craft and to conduct the onshore portions of mine countermeasures training/mine neutralization. Camp Covington is the home of permanent and transient Naval Construction Battalions or Seabees. All three of these smaller bases are linked by Marine Drive, Guam's Highway 1, to the Waterfront Annex's main cantonment.

Ordnance Annex inland of Waterfront Annex, is 8,840 acres (3,580 ha) of mostly undeveloped land with restricted public access.[5] The annex's field training areas surround a complex of ordnance storage magazines. As a Naval munitions storage area, the military's access is also controlled between certain training areas, and certain activities are restricted within specified distances from munitions magazines (areas that are mapped as Explosive Safety Quantity

[3] Acronym based on Sea, Air, and Land.

[4] Formerly referred to as U.S. Naval Station, Guam or Apra Harbor Naval Complex.

[5] Formerly referred to as Naval Magazine, Guam or NAVMAG.

Distance arcs). Biological and cultural resources in the Ordnance Annex also generate certain training constraints. Examples of sensitive resources include Fena Reservoir, one of two major surface water bodies on Guam and a primary source of potable water for southern Guam. Archaeological surveys have found substantial numbers of pre-Contact and historic cultural resources. The area is home to various endangered or rare animal species habitats (birds, bats, butterflies, snails, and geckos) and wild carabao that attract poachers to the federal property. A commonly used public hiking trail passes through the extreme southwest portion of the annex.

Communications Annex Finegayan is a receiver facility and communications center operated by the Naval Computer and Telecommunications Area Master Station (NCTAMS). This 2,932-acre (1,200-ha) site is primarily open and undeveloped, with a large array of receiver antenna fields and associated communications structures. The annex has a KD small arms range and landing beaches (Haputo and Double Reef) suitable for raiding craft and combat swimmers. Haputo Beach and a cliff-face trail provide access through the annex to the Air Force's Northwest Field. An Ecological Reserve Area is established at Communications Annex Finegayan.

Communications Annex Barrigada is the NCTAMS transmitter facility. Primarily a complex of antennas, 15 of its 1,848 acres (748 ha) are leased to 9th U.S. Army Reserve Command for use by the U.S. Army Reserve-Marianas small unit field maneuvers and land navigation. The annex is south of Andersen Air Force Base.

Andersen Air Force Base (AAFB) is administered by 36 ABW. AAFB Main Base, comprised of about 11,500 acres (4,500 ha), is a large, working airfield primarily responsible for supporting all USAF aircraft transiting the Mariana Islands including those scheduled for field training on Tinian. The airfield's clear zones and terrain combine to provide much undeveloped open and forested land. The coastline of the base consists of high cliffs and a long narrow recreation beach. Endangered Mariana fruit bats *(Pteropus mariannus mariannus)* live in the Pati Point cliffs. A small arms range and explosive ordnance demolition (EOD) pit are near the base's recreation beach.

Adjacent to the Main Base and toward Ritidian Point is Northwest Field, 4,562 acres (1,848 ha) developed during World War II with two main runways. Most airfield supporting structures are gone but one runway is maintained for fixed-wing flight operations and training. Other paved-surfaces are used for helicopter operations. Nearby are maneuver areas and a few abandoned concrete structures suitable for TRUE (Training in an Urban Environment). Training activities at Northwest Field are subject to existing agreements protecting endangered species, wetlands, and cultural resources. A portion of Northwest Field has been determined as historically significant and eligible for the National Register of Historic Places.

A Munitions Storage Area (MSA) separates Northwest Field from Andersen Main. The few remaining endangered Mariana crows *(Corvus kubaryi)* at AAFB are nesting in the MSA. A National Wildlife Refuge overlay extends across much of Northwest Field and the MSA.

Andersen South is 1,922 acres (778 ha) of undeveloped land, family housing and dormitories. The dormitories were once used during contingency operations as housing for transient units and as shelter for refugees. The dormitories were heavily damaged during Typhoon Paka and are no

longer used to support training units. Undeveloped areas have been used for small unit field training, but requests to train at Andersen South have diminished over the past two years. Much of the land and facilities are proposed as excess to Air Force needs and are being prepared for interim leasing prior to conveyance to the Government of Guam (GovGuam).

- **Tinian**

The U.S. leases Tinian training land from the CNMI. The Military Lease Area (MLA) consists of 15,644 acres (6,017 ha) divided into the 7,429-acre (3,009-ha) Exclusive Military Use Area (EMUA) to the north and the 8,415-acre (3,408-ha) Leaseback Area (LBA) in the central portion of the island. The EMUA is controlled by the military with civilian access permitted except during certain training activities. The MLA is the site of pre-Contact Chamorro resources, a historic World War II airfield and invasion landing beaches, and a commercial airport. The MLA is essentially undeveloped and largely forested, and the LBA is used for limited cattle grazing. The EMUA is the primary training area, subject to existing agreements protecting endangered species, wetlands, and cultural resources. Military activities in the LBA (and in the town of San Jose) are normally confined to troop movements and maneuvers toward the north and the EMUA. Logistic support activities use the West Tinian Airport in the MLA, San Jose Harbor, and on occasion negotiated facilities in the village of San Jose. One surveyed parachute drop zone is east of the West Tinian Airport.

- **Farallon de Medinilla**

Since 1971, a covenant with the CNMI and related documents provides for the use of FDM for aerial bombardment and naval gunfire. The uninhabited island, 206 acres (83 ha) designated as Naval Range 7201, is home to several migratory seabird colonies. Four endangered Micronesian megapodes *(Megapodius laperouse)* were sighted in a November 1996 survey. The island's shoreline is essentially an eroding cliffline, with two small beaches that are not potential green sea turtle nesting areas. The island contains an abundance of unexploded ordnance (UXO), which decreases the island's value for amphibious training, ground maneuvers, and ground crew-served weapons firing. See Appendix D for a compilation of surveys, reports, and biological opinions for FDM.

- **Rota**

There is no DoD-owned or managed training land in Rota. A right-of-entry agreement was granted by the municipal government to support NSWU 1 (the Navy SEAL unit on Guam) that trains along the Mariana Islands chain. The unit uses West Harbor in Songsong for boat maintenance and refueling and the adjacent Angyuta Island for bivouac and regrouping before proceeding to another island for training.

1.5 Decisions Needed

The EIS revalidates ongoing training (continuing action) and related mitigation measures established as training constraints/training management requirements. In addition, the EIS evaluates new training land uses proposed for each island to maximize the use of existing lands. As a consequence of identifying potential impacts from training, the decisions to be made are:

- Whether or not to continue using certain lands for military training.
- Whether or not to adopt new proposals.
- What specific training activities are suitable for specific lands.
- What mitigation is required to offset training impacts on specific training lands.

Commander, Naval Forces Marianas, acting in his capacity as Representative, USCINCPAC, will sign the Record of Decision (ROD) for the EIS.

1.6 EIS Public Involvement

Numerous issues were raised by the public and regulatory agencies during the initial scoping process and public hearings conducted after publication of the draft EIS. The issues included potential impacts to endangered species primarily through introduction of the brown tree snake (BTS) from Guam, public safety, enforcement of mitigation measures, improved communication with local government, and future reuse of government land. Many potential impacts (both significant and not significant) are presently mitigated or constrained by compliance with existing federal, territorial, commonwealth, and military regulations and orders. One result of scoping was verification of the value of this EIS to federal, territorial, and commonwealth regulatory agencies responsible for evaluating proposed training activities and their mitigation and training management measures. The scoping also aided in identifying the areas requiring evaluation such as introduction of alien species, protection of natural and cultural resources, surface water quality, range and aviation safety, hazardous materials and hazardous waste management, and construction management practices. The public hearings confirmed that all relevant issues were being addressed.

1.7 Permits and Approvals

Consultations have been initiated with the following government agencies to obtain concurrence with the environmentally Preferred Land Use Alternative and its mitigation measures:

- U.S. Fish and Wildlife Service (USFWS) and National Marine Fisheries Service (NMFS) for activities with the potential to impact threatened and endangered species and marine mammals.
- Guam and CNMI Historic Preservation Officers for activities with the potential to impact sites determined to be significant under NHRP criteria.
- Guam Bureau of Planning and CNMI Office of Coastal Resources Management for concurrence that the proposed action is consistent with local Coastal Zone Management (CZM) programs.
- CNMI Public Works Center and Division of Environmental Quality for design review and permits needed for and training-related construction projects on Tinian with potential impact to air or water quality, noise, and generation of hazardous materials.

2.0 PROPOSED ACTION AND ALTERNATIVES

2.1 Overview

The proposed action is to use suitable sites on DoD-controlled lands in the Marianas for military training. This is largely a continuing action with a few initiatives proposed to maximize training land value. To meet the USCINCPAC purpose and need, training sites are needed that include large undeveloped and uninhabited areas, airfields, beaches and maneuver areas, live fire ranges for various ground and air-delivered weapon systems, underwater demolition sites, and a naval gunfire range. Collectively, most of these features are found at available DoD-controlled lands on Tinian, Guam, and FDM and the few non-DoD properties presently authorized for military training. The existing training areas are used for about 90 percent of the required training activities. The new training proposals primarily seek to offset certain existing deficiencies: lack of amphibious landing and underwater demolition sites, and live-fire ranges for small arms and crew-served weapons training.

Potential training locations outside the Mariana Islands are not reasonable or applicable alternatives to the proposed action. Most alternative sites once available in the Republic of the Philippines, Korea and Japan are either no longer or infrequently available. The intent of this document is to present alternatives and a preferred alternative for training land uses in the Mariana Islands that would meet the proposed action while remaining environmentally compatible. The training land use alternatives that are compared to the proposed action include:

- **No Training Land Use Alternative:** The land areas that are presently in use *would not* be used for training activities in the future. This alternative would be preferred if training land use resulted in significant environmental impacts that could not be mitigated to nonsignificance *and* other suitable training areas are available to meet the essential training requirement.
- **Reduced Training Land Use Alternative:** Land areas presently in use would be used for fewer or less intense training activities in the future. This alternative would be preferred only when the analysis concludes that additional training constraints are necessary to mitigate potentially significant impacts from either ongoing or proposed activities.
- **No (New) Action Alternative:** Also referred to as "continuing action," this alternative represents no change in ongoing training activities, existing mitigation measures, and training constraints. Adoption of this alternative would be maintaining the status quo.
- **Maximum Training Land Use Alternative:** This alternative is defined as all training land uses proposed in the Marianas Training Plan (MTP), training orders, directives, and requirement statements provided by affected military organizations. The MTP proposes continuing all ongoing training and new training initiatives. The MTP itself does not address potential impacts or suggest mitigation measures, which would be the product of this EIS.
- The **Preferred Training Land Use Alternative** is result of the evaluation of the feasible alternatives within each training environment. This alternative will reflect the appropriate mix of reduced, ongoing and proposed training activities that would meet training mission

requirements while incorporating all necessary environmental mitigation and training constraints.

2.2 Tinian

Proposed Training Activities

Most of the training land use activities are continuing (or ongoing) actions in the MLA with limited support stemming from other sites on-island. Tactical forces now come ashore from offshore amphibious ships by landing craft and helicopters, or by fixed-wing aircraft flying in from other military airfields to conduct maneuvers in the MLA. Scenarios based on "Training in an Urban Environment" (TRUE) are conducted within a few remaining historic World War II structures in North Field. Logistic support operations involve airlift support to and from West Tinian Airport and North Field. Personnel, equipment and supplies are also delivered by LCU (landing craft, utility) into Tinian Harbor. During larger training exercises, the use of San Jose facilities such as the Field House and services such as fuel, water, and waste collection have been negotiated with the commonwealth and municipal governments and commercial businesses.

The Maximum Training Land Use alternative would increase the scope of ongoing activities by incorporating the following new training proposals:

- Select additional beach landing sites for air-cushioned landing craft (LCAC).
- Select a landing beach in the MLA for assault amphibian vehicles (AAV).
- Construct a small logistics support base camp to preposition supplies or equipment in the EMUA.
- Construct permanent security gates on main roadways to block public access to the EMUA.
- Develop a live-fire, small-arms weapons training range.
- Develop a 60mm mortar training range.
- Construct a permanent shooting house and/or breacher trainer for TRUE.

Preferred Training Land Use Alternative

The evaluation of ongoing training and the effectiveness of mitigation and training management measures identified no detrimental effects that would support adopting the No Training alternative for Tinian. The mitigation and training management measures associated with ongoing training remain valid. Reduced training activities in habitat areas are proposed during Tinian monarch *(Monarcha takatsukasae)* breeding cycles as long as the species remains listed as a threatened species. The environmentally Preferred Land Use Alternative for Tinian is determined to be the No New Action Alternative (Continuing Action) expanded by only two of the seven maximum training land use proposals.

See Figure ES-1 for the Preferred Training Land Use Alternative for Tinian. Figure 2-1a in Chapter Two provides a figure similar to Figure ES-1 that differentiates among ongoing training

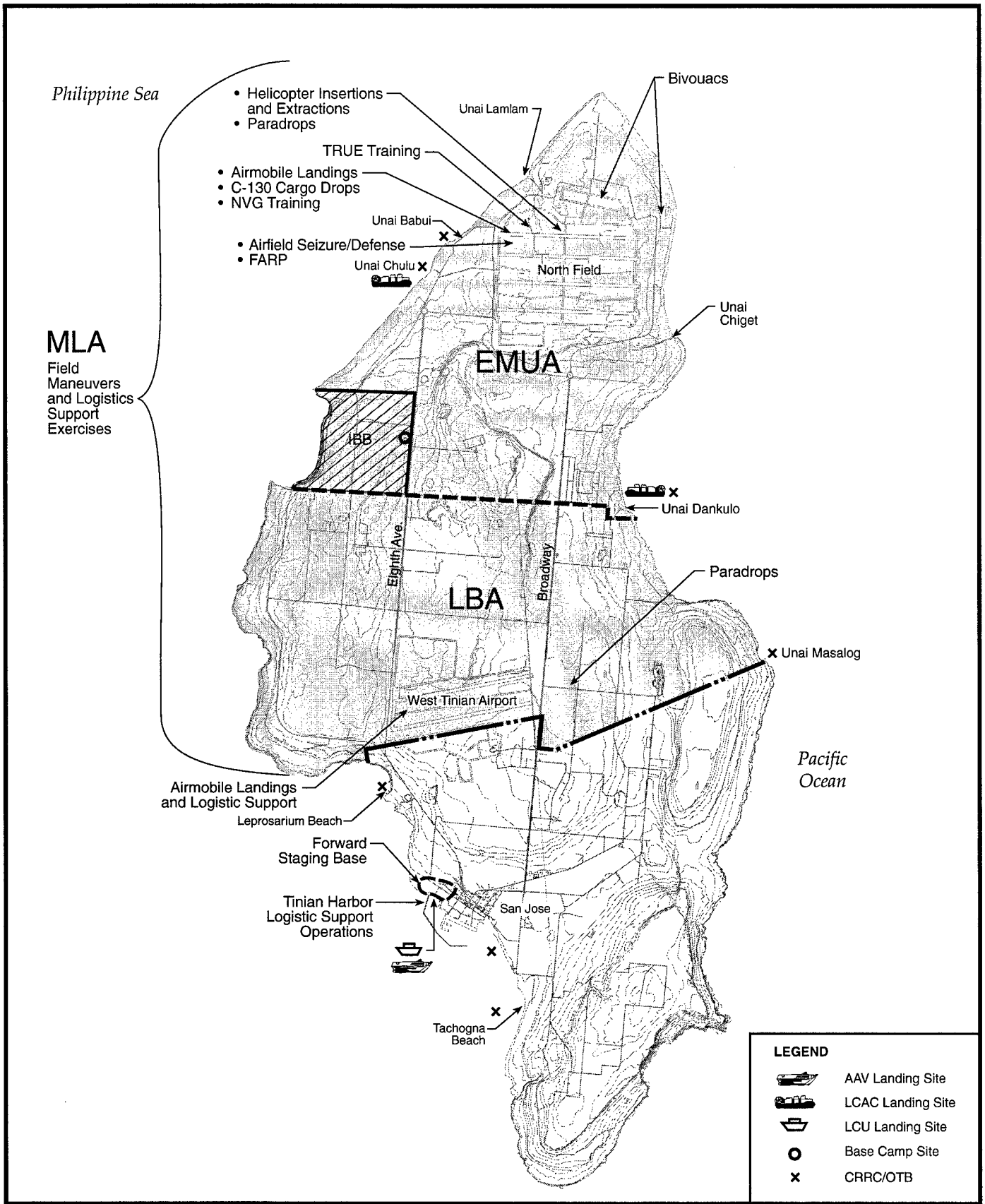
activities (labeled in black) and the new Maximum Training Land Use Alternative initiatives that are either preferred (in green) or not preferred (in red). The rationale for selecting and excluding any of the new training initiatives from the preferred alternative is summarized below.

- **Additional LCAC Landing Sites.** The primary characteristics evaluated to choose amphibious training beaches include its reef coral, nearshore obstructions, and beach dimensions and slope, and availability for training. One or more of these factors have ruled against all of the proposed landing beaches except Unai Chulu and Unai Dankulo, the preferred sites for LCAC landings on the eastern and western coasts of the MLA. A marine survey conduct during LCAC operations at Unai Chulu in March 1999 (Tandem Thrust 99) confirmed that the craft does not damage coral on the shallow reef flat (see FEIS Volume Two, Appendix C-5). The same lack of significant impact is predicted for landings at Unai Dankulo. To validate this conclusion, a similar marine survey is proposed at the next opportunity to land LCACs at Unai Dankulo.

  Outside the MLA, Tachogna and Kammer Beaches both have acceptable nearshore and beach characteristics for LCAC landings. The latter was used in the 1970s and early 1980s for amphibious training using displacement hull landing craft and AAVs. However, Tachogna, Kammer, and Leprosarium beaches were recently designated as areas to be preserved for recreation. Therefore, no training with landing craft or AAVs is preferred at these beaches. The harbor boat ramp is not wide enough for LCAC use.

- **Additional AAV Landing Sites.** Selection characteristics are similar to those for landing craft. The factors ruled against all landing beaches in the MLA except for Unai Babui. This beach was proposed because of its sparse coral in areas nearshore and on the fringing reef that would be impacted by the tracked amphibious vehicle. Preliminary surveys conducted prior to Tandem Thrust 95 and without actually landing the vehicle seemed to support AAV landings and beach exits if the landings were conducted in single file. The results of an additional survey of the beach and its reef in March 1999 no longer support this beach as a preferred AAV landing site. The area was heavily impacted by typhoons in 1997. Much of the beach sand is gone and has been slow to return, exposing multiple irregular columns of beach rock. The AAV is capable of traversing these rocks but some damage to the vehicle's suspension system could occur. More importantly, the reef face is comprised of a series of spurs and grooves and does not provide the sufficient width needed for both tracks to touch down simultaneously at the depths where the AAV transitions from water jet to tracked propulsion. At water depths of about 5 to 6 feet (1.5 to 2 meters) the spurs perpendicular to the reef face are separated by deep grooves at 12 to 20^{+} feet (3.7 to 6^{+}meters) depth. There is a potential to make contact with only one track and broach immediately within the line of surf. Damage to the AAV and to the impacted reef is highly probable. (See Figure 4-2 for photographs of the irregular reef front, which is typical for most Tinian beaches.)

  No other MLA beach is suitable for AAV landings primarily due to potential for significant impacts to coral. Use of the LCU boat ramp in San Jose's harbor is preferred in order to get AAVs ashore from amphibious ships. A large vacant field is nearby for staging, and a connector road from the harbor to the MLA skirts the town center.



Source: Final Marianas Training Plan (June 1998)

NORTH

0 1000 2000 (Meters)

0 4000 8000 (Feet)

1. CRRC - Combat Raiding Craft
2. FARP - Forward Aviation Refueling Point
3. MLA - Military Lease Area
4. NVG - Night Vision Goggles
5. OTB - Combat Swimmers
6. TRUE - Training in Urban Environment

Figure ES-1
TINIAN PREFERRED TRAINING LAND USE
FEIS: Military Training in the Marianas
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- **Logistics Support Camp**. A site within the International Broadcasting Bureau (IBB) Northern Mariana Transmitting Station[6] is preferred for developing an austere logistics support base camp. Permanent structures and fuel tanks are not included in the design. The 2,400-square-foot (223-square meter) coral based, fenced storage yard would be suitable for staging military cargo containers, training equipment and supplies that require some level of security. The Navy's newly constructed septic tank and leaching field are near the suggested support camp area. The new septic system, capable of supporting an exercise force of about 2,500, eliminates the former dependence on limited municipal septic systems.

- **Security Gates.** Permanent security gates on the main roadways leading into the EMUA are not needed and eliminate the possibility of the gates being locked when training is not taking place and becoming a traffic hazard. The training area security function can be accomplished using sentries manning temporary barriers only during such times that access to the EMUA must be restricted as a public safety measure.

- **Small Arms and Mortar Ranges.** Development of a small arms fire-and-maneuver range and a 60mm mortar range in open fields in the MLA is not preferred. Conceptual range designs and activities were evaluated and found to create unacceptable risks. Figure 2-1b illustrates the conceptual range layouts that were evaluated for potential environmental impacts. Small arms range training can be conducted on Guam, and a new 60mm mortar reusable training round will eliminate the need for a dedicated mortar range. The lack of a live-fire mortar range would remain a training deficiency to be resolved at other locations. A mortar range has the potential for dud mortar rounds to create an unexploded ordnance (UXO) land contamination issue. The risk to public safety by the presence of UXO would be eliminated by not initiating live mortar-fire in areas that could be encroached by persons other than those involved in training.

  Shooting House and Breacher Trainer. Constructing permanent training facilities for use as a shooting house (an indoor range comprised of individual rooms and passageways) or a breacher trainer (an urban-design structure used for forcible entry training) is not presently preferred. These specialized training facilities have been constructed on Guam and temporary training structures are set up when necessary on Tinian. TRUE training is presently conducted in a few of the existing World War II structures. The former Japanese Command Post is set up as a shooting house at low cost by temporarily installing bullet traps that capture lead projectiles, allowing removal of the targets, the lead, and the expended brass at the completion of training.

  Construction costs would be high for an infrequently used training structure. Since there is no permanent military presence on Tinian, project costs would also include long-term contracting for site/facility maintenance and security. Future training conditions may support revisiting this proposal. If the facilities on Guam become insufficient to support training requirements or if the World War II structures would no longer be available, further study could be conducted concerning economic feasibility and safety concerns for range facilities

[6] Previously referred to as the Voice of America (VOA) Mariana Relay Station, Tinian

on unmanned installations. Potential impacts to biological or cultural resources can be eliminated through appropriate site selection.

All potentially significant impacts of the Tinian Preferred Training Land Use Alternative can be mitigated.

2.3 COMNAVMARIANAS Waterfront Annex

Proposed Training Activities

Ongoing training is conducted throughout the base and Inner and Outer Apra Harbor. Additional offshore areas are surveyed and used for underwater demolitions and parachute operations. Orote Peninsula is used for small-unit bivouacs and tactics, fixed-wing and helicopter training, and live fire range firing. Amphibious craft land at Dry Dock Island and Polaris Point. The SeaBees conduct base camp construction training and defense at Camp Covington and Orote Peninsula. Counter-terrorist security and demolitions training is conducted throughout the base. In addition to the continuing actions, the Maximum Training Land Use alternative includes the following initiatives:

- Modify the firing line at an existing range on Orote Point for fire-and-maneuver.
- Modify another range site adjacent to the KD range on Orote Peninsula to incorporate a stress course.
- Conduct deepwater mine countermeasures (MCM) training at an additional site selected offshore of Dadi Beach.
- Select additional shallow water demolition training sites.
- Conduct LCAC, AAV, and LCU landings at additional sites in the harbor, Tipalao Cove, and Agat Bay.

Preferred Training Land Use Alternative

The evaluation of ongoing training indicates that mitigation and training management measures remain valid and there is no reason to select the No Training or Reduced Training alternatives. The environmentally preferred alternative is the No New Action alternative combined with many of the new Maximum Training Land Use proposals. Figure 2-2a illustrates the ongoing and proposed training sites and activities that were evaluated. Figure 2-2b is a close-up of activities proposed at Tipalao and Dadi Beach. Figure ES-2 is the Preferred Training Land Use Alternative for the Waterfront Annex and nearby waters.

- **Fire-and-maneuver Range and Stress Course.** The modification of the Orote Point Pistol Range to a fire-and-maneuver range and development of a stress course parallel to the existing Known-Distance (KD) small arms range on Orote Peninsula are both preferred alternatives to enhance the range capabilities at Waterfront Annex. The existing terrain features and range safety capabilities support updating the range characteristics to meet

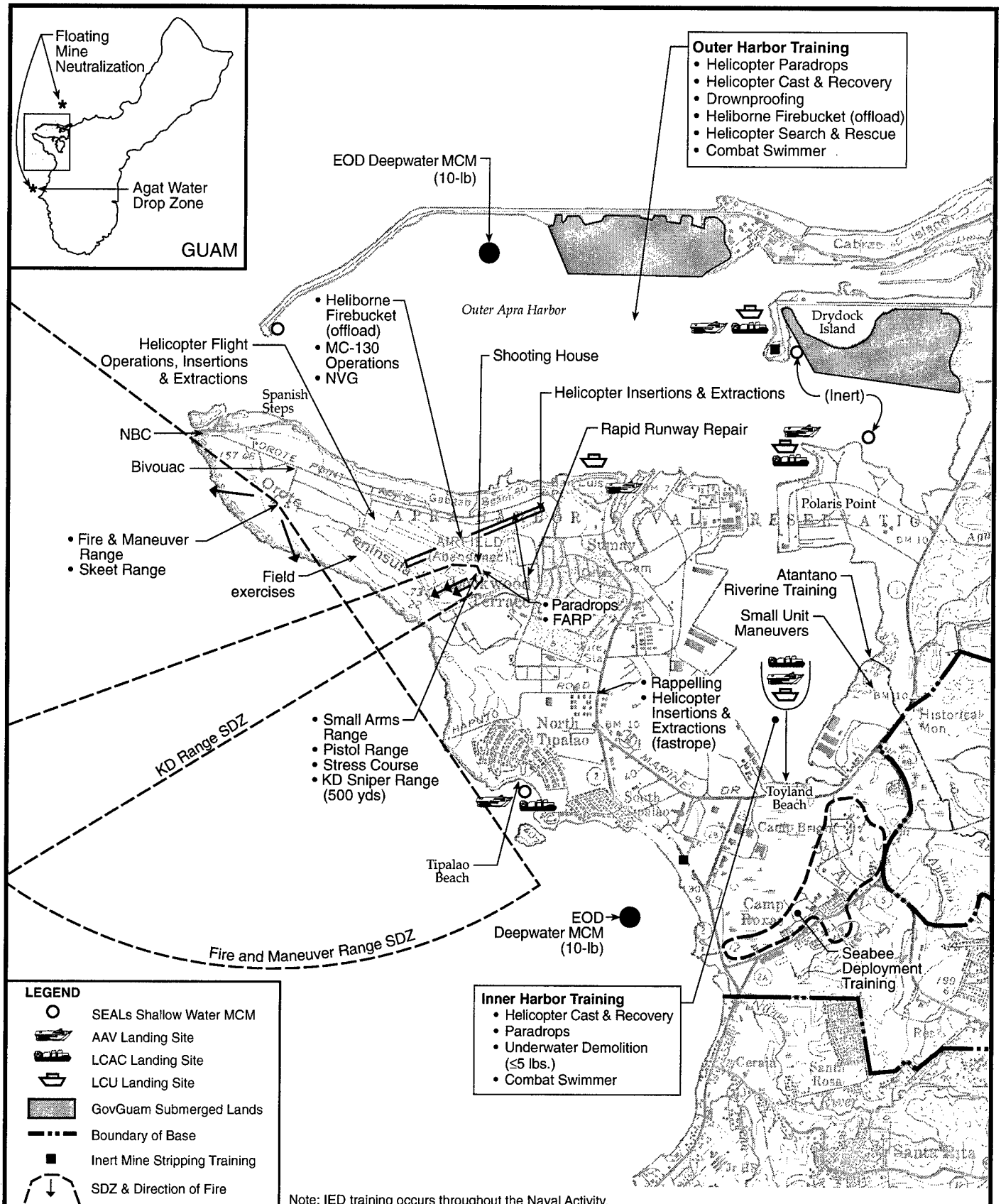


Figure ES-2
WATERFRONT ANNEX PREFERRED LAND USE ALTERNATIVE
FEIS: Military Training in the Marianas
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present mission needs. Prior to range activation, the ranges will be formally inspected and certified by the Naval Facilities Command, Washington, D.C.

- **Deep Underwater Demolition Training.** An additional deepwater MCM training site has been surveyed in Agat Bay off of Dadi Beach and is a preferred alternative for Navy EOD training following existing operational protocols. Its use will reduce the frequency of the Outer Harbor deepwater MCM training site, which will mitigate some of the economic impacts to commercial activities in the harbor. Nearby Tipalao Beach can be used to bring the training mine ashore for dismantling and avoid towing the device through Apra Harbor to reach Dry Dock Island.

- **Floating Mine Neutralization Training.** Two sites are preferred for this open ocean activity this consists of neutralizing training mines or cutting mooring cables at about 10 ft.-depth with small explosive charges. The training is conducted outside and north of the harbor entrance and at the Agat Water Drop Zone, which is about 4 nautical miles offshore of Agat Beach. Both sites are away from shipping lanes and dive sites.

- **Shallow Underwater Demolition Training.** Conflicts with ongoing harbor activities or potential blast damage to coral eliminated some of the sites proposed for this training. The preferred Tipalao Cove location has none of these drawbacks and its use will supplement the existing Glass Breakwater site in Apra Harbor. The use of Dadi Beach, Gabgab Beach, and Spanish Steps for shallow underwater demolition training was evaluated and is not preferred in order to eliminate significant impacts to nearshore coral at both beaches. Polaris Point and Dry Dock Island were identified in the MTP as sites where training is simulated by using blank demolition charges vice C4 explosives. Neither site has significant biological or cultural resource constraints, but have the disadvantage of not being remote and the training could conflict with other activities.

- **Beach Landing Sites.** A demonstration LCAC landing at Dadi Beach raised concerns from Guam Environmental Protection Agency (GEPA) regarding potential damage to coral in shallow water. Dadi Beach will not be included as a preferred alternative until such time that another LCAC landing can be conducted that includes a pre-, during and post-landing marine survey to determine actual impacts to nearshore coral. Preparation will also include preparing a Craft Landing Zone (CLZ) that is sufficient for beaching and turning the craft on land, avoiding such maneuvers at the water's edge. Dry Dock Island will remain a preferred LCAC training site along with Polaris Point and Toyland Beach (west of Abo Cove in Inner Apra Harbor). The beach and nearshore characteristics at Tipalao Bay are suitable for AAV and LCAC landings. There is no coral present to be damaged, but extensive beach rock and debris should be cleared away.

  The Sumay Cove Marina boat ramp is suitable for AAV use but the channel is too narrow for LCU operations. Toyland Beach, Dry Dock Island, and Polaris Point are also suitable beach landing sites for LCUs and AAVs. The former World War II fueling pier, when cleared of debris and with some seawall repair, could be used for LCU landings. The former fuel pier is not a preferred AAV landing site without conducting extensive seawall repair, ramp

construction, and improvements to connecting roads to eliminate road damage contributing to erosion and runoff into nearby wetlands.

2.4 COMNAVMARIANAS Ordnance Annex

Proposed Training Activities

Continuing training land uses consist of small unit patrols and land navigation, water purification (ROWPU) training, bivouacs, and helicopter supported tactical operations. The north end of Fena Reservoir is used for helicopter external lift training with fire buckets and drones. Reverse Osmosis (water) Purification Unit (ROWPU) training is also conducted at the north end of the reservoir. New land uses proposed by NSWU for some of its specialized training requirements are listed below. All are illustrated in Figure 2-3.

- Construct a sniper firing range.
- Develop a jungle trail (live-fire reaction course) range.
- Use an existing helicopter landing zone as a parachute drop zone.

Preferred Training Land Use Alternative

The environmentally preferred alternative is the Maximum Training Land Use alternative, which combines continuing actions and all of the proposed new land uses. Potentially significant impacts of ongoing training activities can be mitigated, so there is no compelling reason to select the No Training Land Use or Reduced Land Use alternatives. The extensive "No Training," "No Wildlife Disturbance," and "No Cultural Resource Disturbance" constraints that have been established for the annex will remain in effect and will be modified based on the results of additional cultural and natural resource surveys. See Figure ES-3 for the Preferred Training Land Use Alternative for Ordnance Annex.

- **Sniper Range Development.** The orientation of the sniper range line of fire has been modified to ensure that the surface danger zone (SDZ) does not cross over the public hiking trail in the southwest quadrant of the annex. The roof of the breacher trainer can be used as a sniper firing point that will be compatible with the sniper range's line of fire.
- **Jungle Trail Development**. The proposed jungle trail range is oriented in the same direction and within the larger and modified fan created by the sniper range. The ranges will be safety certified by the Naval Facilities Command prior to activation. [7]
- **Parachute Drop Zone**. There are no environmental restrictions to use of the designated surveyed zones for helicopter landings and parachute operations.

[7] The Breacher Trainer has been constructed and will be used after formal certification by Naval Facilities Command. Design and development of the sniper range and jungle trail is being coordinated with the Naval Facility Engineering Command (NAVFAC) and the COMNAVMARIANAS Cultural Resource Coordinator.

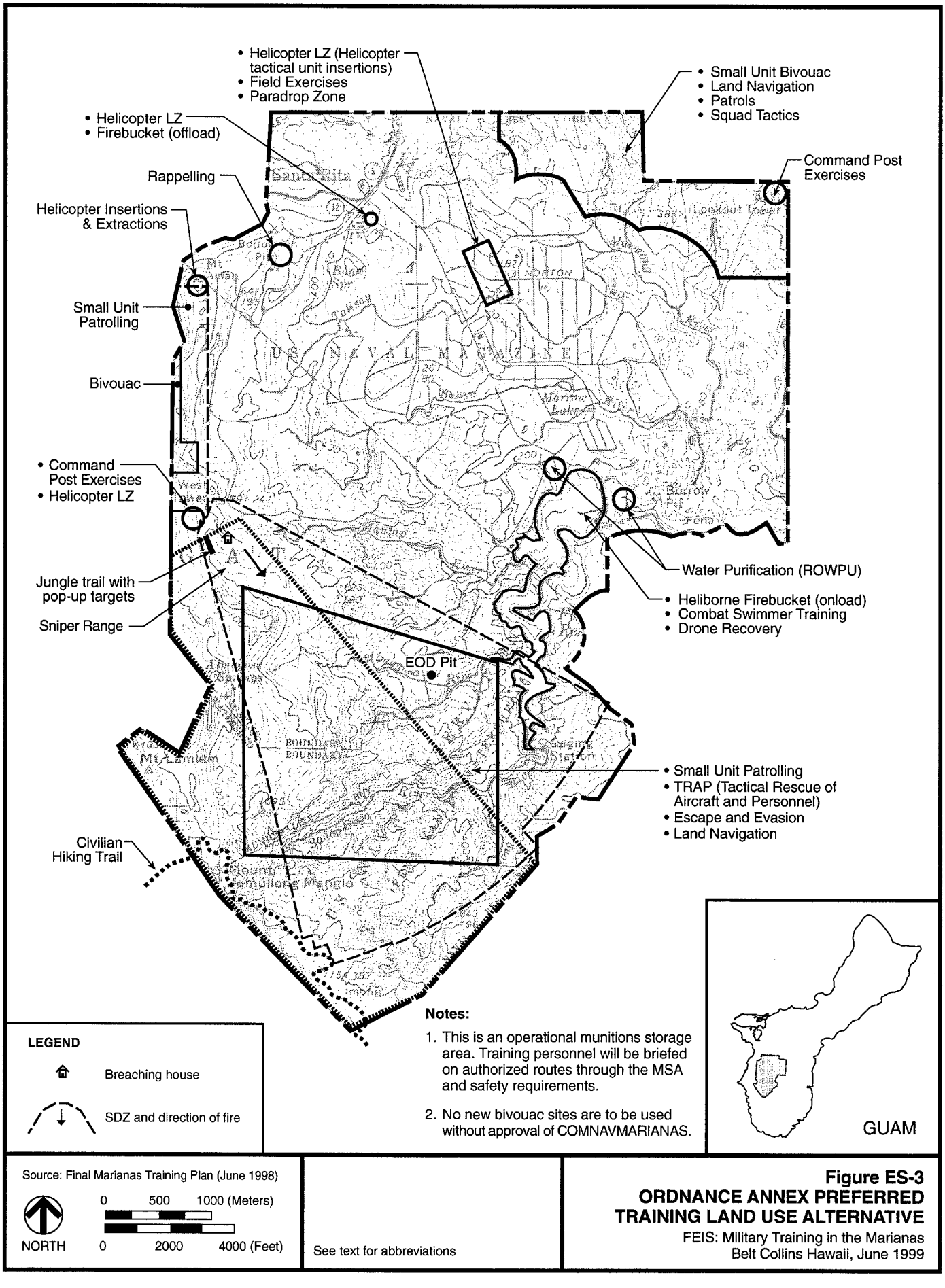


Figure ES-3
ORDNANCE ANNEX PREFERRED TRAINING LAND USE ALTERNATIVE
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2.5 COMNAVMARIANAS Communications Annexes

Proposed Training at Finegayan Annex

The proposed action adds nothing to the ongoing training at the annex. Continuing actions include Over-The-Beach (OTB) training for NSWU, Special Forces, and Marine Reconnaissance teams, use of a existing trails to scale the cliff and reach Northwest Field for inland maneuver and TRUE training, and use of the KD small arms range.

Preferred Training Land Use Alternative at Finegayan Annex

The No New Action Alternative is the environmentally preferred alternative. There is no reason to terminate or reduce the limited ongoing training activities. There are no significant impacts associated with the selected alternative. Figure ES-4 shows the locations of training at the Finegayan and Barrigada annexes and AAFB.

Proposed Training Activities at Barrigada Annex

There are no new proposed training land uses. Continuing action includes availability of about 15 acres (6.1 hectares) of land leased to the Guam Army National Guard for small unit tactics and land navigation. As part of the identification of future uses for land proposed as excess to Navy mission needs, 50 acres (20 hectares) are planned for conveyance to the National Guard Bureau.

Preferred Training Land Use Alternative at Barrigada Annex

The No New Action Alternative is the environmentally preferred alternative, which has no significant impacts.

2.6 Andersen Air Force Base

Proposed Training Activities

Andersen Main is the primary airfield used for actual support to all transient forces. Northwest Field has an expeditionary airfield used for C-130 operations, marked helicopter landing areas for confined landings and simulated shipboard landings, adjacent undeveloped maneuver terrain and unoccupied facilities used for TRUE. Ongoing training at Andersen Main primarily focuses on airfield operations to include cargo inspection and handling, and airfield security. Northwest Field is a more remote area used for fixed-wing and helicopter training, confined area landings and night vision goggle training, special operations by helicopter and reconnaissance/SEAL teams, small unit maneuvers and bivouacs, TRUE training in abandoned structures, over-the-beach training, and use of the small arms ranges. Strategic and tactical lift of personnel and cargo is provided to all military services by Andersen's resident squadrons.

The only new training land use that has been proposed is to establish a permanent site to conduct rapid runway repair (RRR) training at Northwest Field. The Reduced Training Land Use Alternative is occurring naturally at Andersen South as the USAF prepares interim leases for

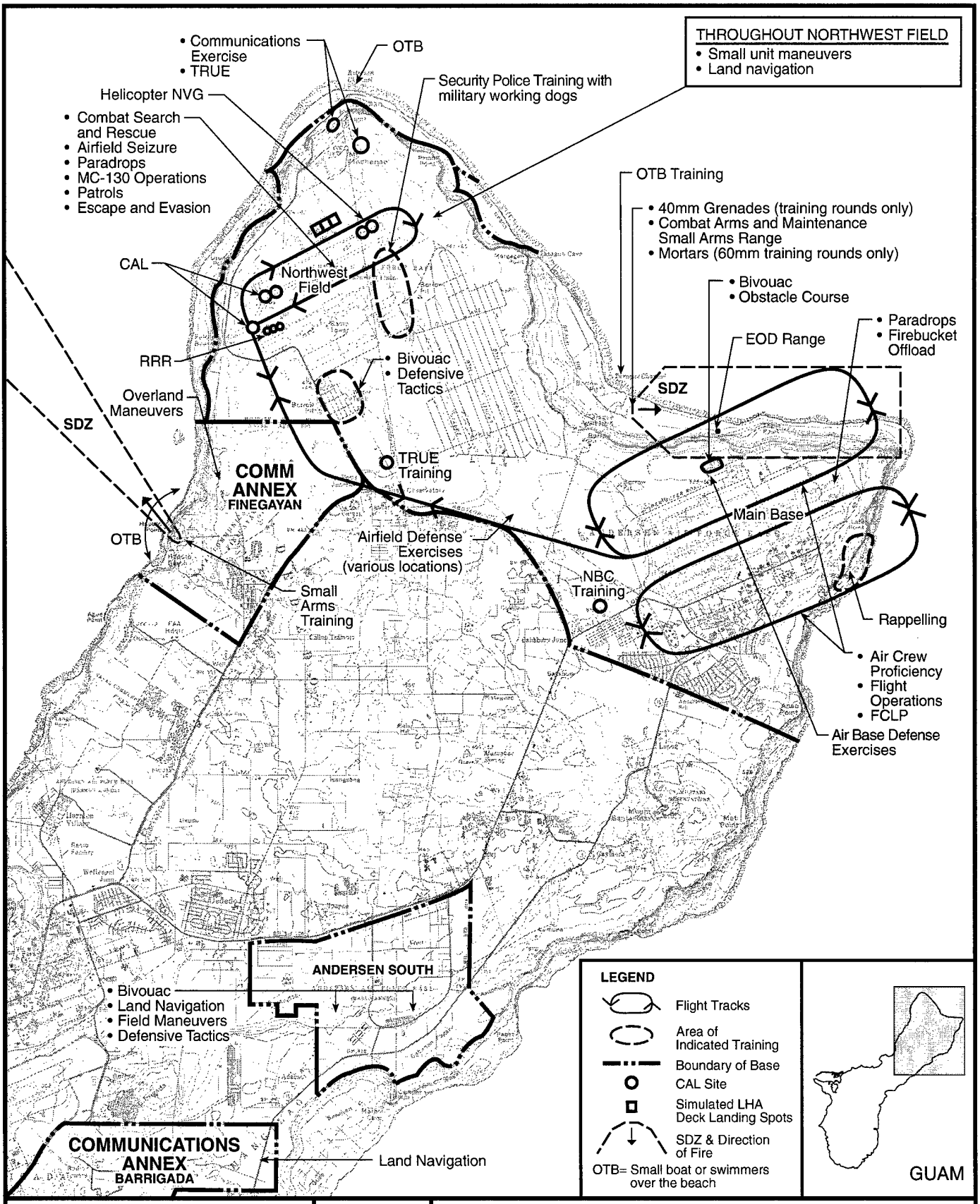


Figure ES-4
ANDERSEN AIR FORCE BASE AND COMMUNICATIONS ANNEX PREFERRED TRAINING LAND USE ALTERNATIVE
FEIS: Military Training in the Marianas
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Contingency barracks at Andersen South are no longer available, but undeveloped areas away from permanent structures remain for units that may desire to conduct small unit tactics and land navigation on a not-to-interfere basis with developments stemming from the interim lease.

Preferred Training Land Use Alternative

The environmentally preferred alternative includes all ongoing training (No New Action) and developing the RRR site on Northwest Field. Since the latter is in proximity to a site determined eligible for the National Register of Historic Places, final site approval for the RRR training area is being coordinated by the Air Force with the Guam Historic Preservation Officer (HPO). Potentially significant impacts of ongoing training activities can be mitigated, so there is no compelling reason to select the No Training or Reduced Land Use alternatives. Any field training requests for Andersen South will continue to be reviewed and approved on a not-to-interfere basis with GovGuam initiatives. See Figure ES-4 for the AAFB Preferred Training Land Use Alternative.

2.7 Farallon de Medinilla

Proposed Training Activities

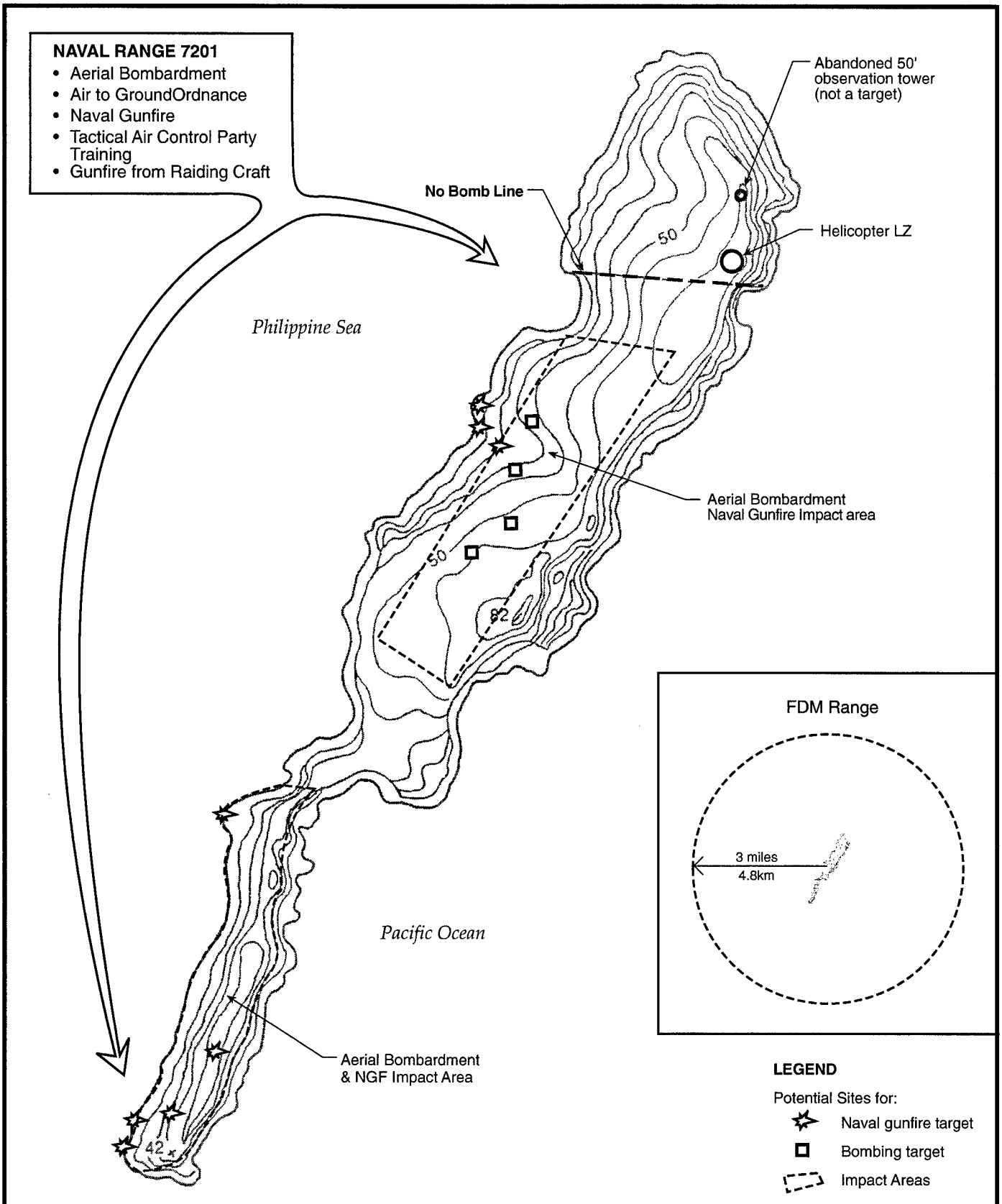
The proposals for FDM activities include the ongoing naval gunfire training and aerial bombardment by USAF bombers and Navy/Marine Corps tactical fighter aircraft, and initiating ground weapons live fire training. The proposal would continue tactical air control of close air support and precision bombing as well as high and low altitude bomb drops and live fire from raider craft along the island's western shoreline. The proposal would introduce mortar, artillery, and TOW (anti-tank missile) crews airlifted by helicopter to set up their weapon systems on the island and fire live rounds down the length of the island.

Preferred Training Land Use Alternative

The environmentally preferred alternative is similar to the No New Training Alternative in that all ongoing training for strategic and tactical bombing and strafing by aircrews and ships' gunnery crews is retained with additional constraints enacted regarding impact area boundaries and target locations. The impact areas were modified and directions of fire restricted to avoid targeting known nesting colonies. Regardless, continuing to bombard and strafe will have significant impacts on seabirds, the endangered Micronesian megapode, and wildlife habitat, which cannot be completely mitigated. There are no alternative bombardment sites available for training forces in the Western Pacific. Therefore, adopting the Reduced Land Use and No Land Use alternatives would reduce or eliminate impacts to natural resources, but the essential military mission of training readiness would be severely and detrimentally affected.

There are other uninhabited islands in the Marianas chain where habitat can be improved for the endangered megapode as well as migratory seabirds. The Navy will continue working with CNMI and the USFWS for Micronesian megapode recovery by participating in measures to improve bird habitat on Sarigan Island, which is situated north of FDM. [8]

[8] U.S. Fish and Wildlife Service (1998) *Recovery Plan for the Micronesian Megapode (Megapodius laperouse laperouse)*



Source: Final Marianas Training Plan (June 1998)

NORTH

0 100 200 300 (Meters)

0 500 1000 (Feet)

Figure ES-5
FARALLON DE MEDINILLA PREFERRED TRAINING LAND USE ALTERNATIVE
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The Maximum Training Land Use proposal to use Range 7201 for ground-based weapons fire is not preferred because the activity cannot be safely implemented. COMNAVMARIANAS restricts island access to military personnel who are DoD explosive-certified. The island, including the area north of the "No-Bomb Line," has highly sensitive UXO, including cluster bombs that were reconfirmed during sightings in 1996. See Figure 2-5 for the ongoing and proposed training activities and Figure ES-5 for the preferred alternative.

2.8 Non-DoD Land Use

Tinian

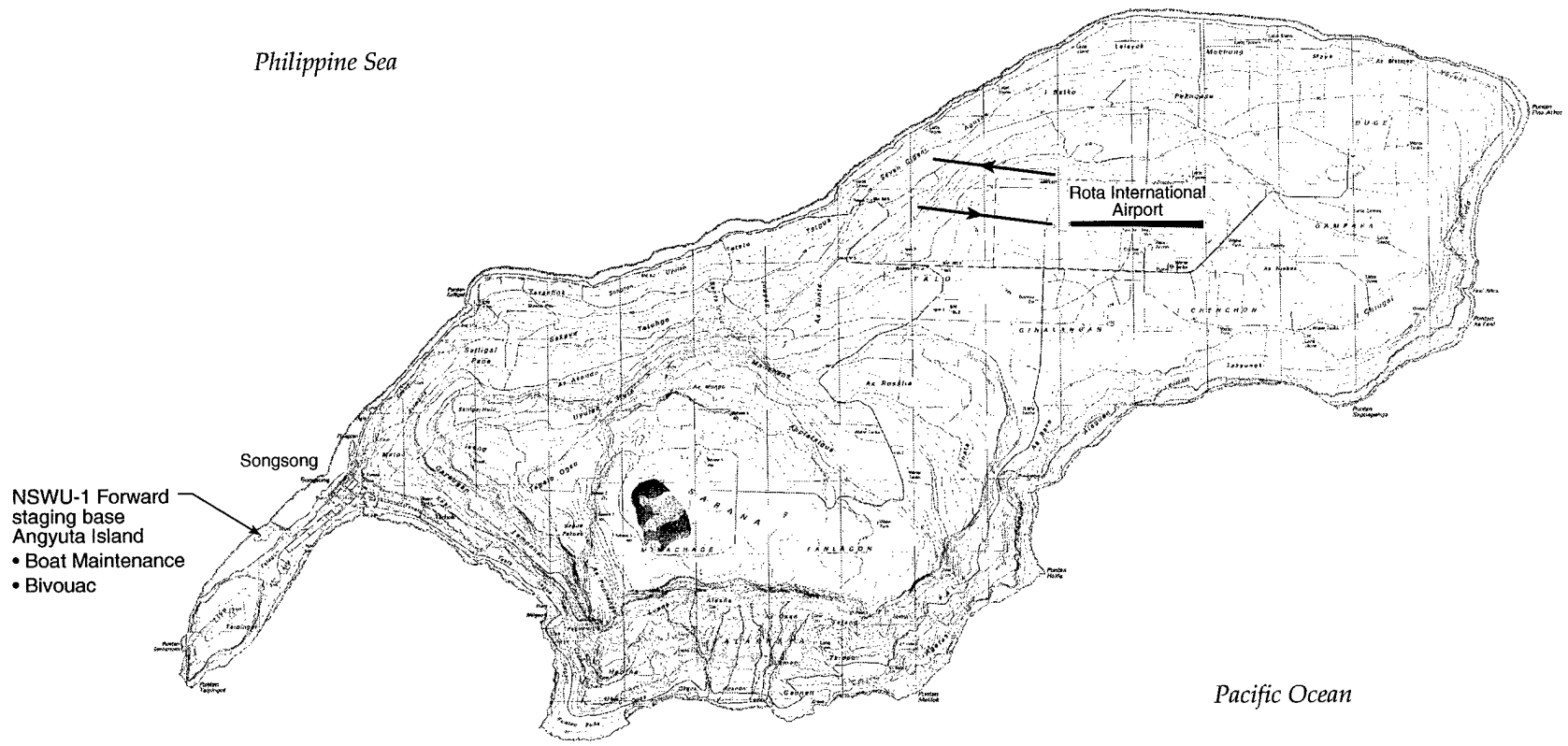
Non-DoD land use on Tinian includes the authorized use of the harbor discussed earlier as part of the preferred alternative. West Tinian Airfield is within the MLA but is identified in a lease as a shared-use facility. Significant impacts to resources and the local economy are primarily mitigated by minimizing airport/harbor use, coordinating military activities in advance, and properly integrating military and civilian uses.

Guam

Non-DoD land use on Guam includes the continued use of two parachute drop zones surveyed at Dandan. NSWU-1 proposed expanding riverine training to the Talofofo and Ylig Rivers on Guam's eastern coast. After additional site surveys and discussions regarding right-of-entry agreements, the training request was eliminated, and NSWU-1 will continue to use the Atantano River and the government land on its banks as the site for riverine training.

Rota

The proposed action for Rota includes the continued use of West Harbor and Angyuta Island at Songsong as the Navy SEALs' boat refueling/maintenance and bivouac areas. No tactical training on Rota proper is proposed. Use of Rota Airport was proposed by the Navy's Guam-based helicopter squadron (HC-5) to conduct its helicopters crew night vision goggle (NVG) training flights. The airport has no commercial traffic after early evening and provides a dark setting. Drawbacks include potential noise disturbance to endangered species and short remaining training time after the flight from Guam. This training deficiency has been resolved by establishing Confined Area Landing (CAL) sites on Northwest Field along with a simulated amphibious ship landing deck. This initiative, coupled with a known shift of Mariana crow nesting sites away from the Northwest Field flight areas to the more distant MSA, has eliminated the need for HC-5 to fly from Guam to Rota for NVG training. See Figure ES-6, which identifies the area that is used by NSWU-1 to support its transits during Guam-CNMI training.



Source: Final Marianas Training Plan (June 1998)

NORTH

0 1000 2000 (Meters)

0 4000 8000 (Feet)

LEGEND

Commercial aircraft flight tracks

See text for abbreviations

Figure ES-6
ROTA PREFERRED TRAINING SUPPORT LAND USE ALTERNATIVE
FEIS: Military Training in the Marianas
Belt Collins Hawaii, June 1999

2.9 Comparison of Alternatives, Impacts and Mitigation

The training land use alternatives have been compared at each site to identify training area resources that can be affected by training and whether these impacts can be mitigated to levels of nonsignificance (see Tables 2-5 through 2-10). The resulting preferred alternatives have been summarized in previous sections for each evaluated area. Biological resources (primarily protected species) and cultural resources have the greatest potential to be significantly affected by training. The potential for impacts exists at practically every site in the Mariana Islands. Training constraints have been established to avoid or minimize these potentially significant impacts. Figures 2-7a through 2-11 illustrate the areas constrained to various degrees as environmental protection measures. These constraints are published in training plans, orders, and regulations and adherence by training units is monitored.

The constraints to land use consist of the following:

- **No Cultural Resources Disturbance (NCRD)**: To protect known or potentially sensitive cultural resources and sites (both surface and sub-surface), no cross-country, off-road vehicular travel is allowed. No pyrotechnics, demolitions, or digging are allowed without prior written approval from COMNAVMARIANAS or Commander 13th Air Force. These protected areas are also identified "No Ground Disturbance" in other environmental documents and training constraint overlays developed for Marianas training. The terms are synonymous.

- **No Wildlife Disturbance (NWD)**: To protect sensitive species and habitat, no cross-country, off-road vehicular travel is allowed. Vegetation clearing is monitored. There are no open fires, and the use of pyrotechnics and signal/smoke devices is restricted to cleared and/or paved areas as a fire precaution. There is no blank firing, no live ammunition or training demolition use, no digging, no mechanical vegetation clearing, no flights below 1,000 feet (305 meters) above ground level (AGL), and helicopter landings are conducted only at designated zones.

- **No Training (NT):** A few areas of concentrated sensitive habitat, cultural resources, or hazardous conditions are identified as "Off-limits" or "No Training Allowed," with event specific exceptions for troop and vehicle movement along established roads.

2.10 Mariana Islands Preferred Training Land Use Alternative

Chapters Two and Four discuss and identify an environmentally preferred training land use alternative at each evaluated training site, which when combined comprise the Mariana Islands Preferred Training Land Use Alternative summarized in Table ES-1. The table is a matrix of preferred training activities and selected locations. The table illustrates the capability to conduct various training activities on more than one site, which reduces the potential for cumulative effects due to over-use of any one area. The availability of multiple sites also gives the training unit commander latitude to develop realistic training scenarios between distant island locations. Table ES-2 identifies the potential impacts and proposed mitigation measures for the Mariana Islands Preferred Training Alternative.

Selection of the preferred alternative will result in accomplishing most of the USCINPAC training requirements, while mitigating the most potentially significant impacts to levels of nonsignificance. Certain live-fire training requirements are not accommodated in the Marianas, and these activities will remain training deficits for this area.

The preferred alternative retains the use of FDM for naval gunfire and aerial bombardment. This training has potentially significant impacts that cannot be fully mitigated to levels of nonsignificance. The live-fire activities at FDM (Navy Range 7201) will cause bird mortality and habitat modification. Impact areas and target locations have been modified to reduce impacts on known colonies and no incendiary ordnance is allowed. Despite these precautionary measures, however, it is anticipated that training may still have potentially significant impacts. Because of this DoD will continue to work closely with federal and CNMI regulatory agencies to evaluate impacts and to conduct the compensatory mitigation measures underway at Sarigan Island.

The preferred alternative also retains two floating mine neutralization training sites in the open ocean and two deepwater underwater demolition training sites in Apra Harbor and off of Dadi Beach. Although this activity does not cause significant impacts that cannot be mitigated, the activity may remain controversial. Concerns regarding safety of endangered and threatened species as well as safety of persons in or near the training site have been addressed by protocols for planning, conducting, and monitoring underwater detonations. Two sites (one in the harbor and a new site in the open ocean near Dadi Beach) are now preferred for deepwater demolition training to reduce economic impacts in the harbor when temporary closures for public safety are necessary. Using no more than a 10-lb (4.5-kg) charge during deepwater demolitions will eliminate potential impacts to a larger surrounding area. Continuing to provide seven-day advance notices to commercial enterprises will facilitate their alternative tourist activities planning. Guam EPA oversight of the training activities will continue. To further reduce temporary impacts on any given demolition site, COMNAVMARIANAS and EODMU 5 will continue to explore alternative demolition sites in coordination with Guam EPA, Guam Department of Aquatic and Wildlife Resources, and NMFS representatives.

The issue of potentially significant impacts to coral during amphibious landings has been resolved by validating the non-destructive effects of LCAC operations in shallow water, and selecting beaches without coral for LCU and AAV operations. A marine survey of pre-, during and post-landing conditions is proposed at Unai Dankulo to revalidate this beach as an alternative LCAC landing site. CNMI regulating agencies will be invited to participate.

3.0 EXISTING ENVIRONMENT

3.1 Region of Influence

The Mariana Islands are a 497-mile (800-km)-long archipelago of 15 volcanic islands in the Western Pacific. Guam, Rota, and Tinian are three of the four southernmost and most populated islands in the chain. There is no record of persons ever inhabiting FDM. The primary natural hazards are typhoons and earthquakes.

3.2 Physical Environment

The islands are composed of volcanic rock capped by coralline limestone of varying thickness. Soils developed on volcanic rocks are poorly drained clays, while soils developed over limestone are shallow and highly porous. Surface water only exists in areas where clay prevents water from draining through to the porous rock below. Aquifers on the larger islands are believed to occur primarily in limestone. Groundwater and surface water quality are good in most cases. Marine water quality around the islands is generally good, except in proximity to sewage outfalls. Air quality is good due to the lack of emissions sources and the nearly constant tradewinds. There is no fresh surface water on FDM, nor is it known whether a freshwater aquifer has accumulated on FDM.

The ocean and local topographic features, primarily dramatic ocean cliffs and white sand beaches, define the islands' visual characteristics. Built environment is relatively sparse on Rota and Tinian and absent on FDM. On Guam, urban and suburban areas dominate the central portion of the island.

3.3 Biological Resources

Native limestone forest on Guam and Tinian was reduced by the impacts of World War II, as well as by development and large-scale agriculture (on Tinian). Much of the limestone forest remains on Rota; Guam and Tinian now are dominated by secondary growth forest and grasslands, with some wetlands and strand vegetation. FDM was probably originally littoral scrubland, but the vegetation has been heavily impacted due to the island's use for military bombardment. Marine habitat includes coral reefs and benthic communities.

A relatively high number of native Mariana wildlife species are listed by the federal and local governments as endangered or threatened, either as a loss of habitat or predation by humans and snakes. The greatest threat to terrestrial endangered species on Guam is from the introduced brown tree snake *(Boiga irregularis)* (BTS). The snake has so far not become established on other islands of the Marianas, although isolated snake sightings have occurred on Saipan and Tinian.

Tinian is home to the endangered Mariana moorhen *(Gallinula chloropus guami),* endangered Micronesian megapode, and threatened Tinian monarch. The monarch is ubiquitous throughout the island in large numbers, but it does not exist anywhere else. Threatened green sea turtles *(Chelonia mydas)* nest on Tinian's beaches and coconut crabs *(Birgus latro)* inhabit the woods. Mariana fruit bats visit Tinian, although no permanent colonies have been observed.

On Guam, protected species include three plant species, three bat species, two sea turtle species, two land reptiles, eight skinks and geckos, two tree snails, and 18 bird species (some of which are extinct on Guam). A small number of species has managed to survive predation by the brown tree snake. The few remaining Mariana crows on Guam inhabit areas of AAFB, together with Mariana fruit bats. Green sea turtles nest on AAFB beaches. Mariana common moorhens and sea turtles inhabit or visit the Waterfront Annex, and moorhens, fruit bats, and island swiftlets *(Aerodynamus vanikorensis bartschi)* are found at the Ordnance Annex.

Rota's forests provide habitat for the Mariana crow and the fruit bat. Several wildlife sanctuaries and conservation areas have been established on Rota to protect endangered species.

FDM is a breeding location for migratory seabirds, notably three booby species and great frigatebirds *(Frigata minor)*. Several Micronesian megapodes were observed on FDM in 1996; it is not known whether they nest on the island.

3.4 Area History and Cultural Resources

The Mariana Islands are part of Micronesia and have been controlled by many different nations since their "discovery" by Ferdinand Magellan in 1521. The oldest dated archaeological remains indicate that humans first settled the Marianas as early as 1500 BC. At the time of first European contact, the native Chamorro people exhibited a typical oceanic economy, depending on farming and marine resources. The most notable artifacts of the ancient Chamorro culture are sets of *latte* stones, upright pyramidal stone pillars topped by capstones and occurring in two parallel rows of six to 12 stones. Chamorro sites have been identified and investigated on all DoD-controlled lands except FDM.

After European contact, the Spanish claimed the Mariana Islands and depopulated the northern islands by resettling the Chamorros on Guam. After the 1898 Spanish-American War, Guam became a possession of the U.S. and the first U.S. naval base was developed. The Northern Mariana Islands passed from Spain to Germany, which leased much of Rota and Tinian to the Japanese in the early 1900s. The Japanese South Seas Development Company established sugar cane plantations on Tinian and Rota, bulldozing much of the indigenous forests and other native vegetation. Structures dating from this period still exist on Tinian and have been included in interpretive trails developed by the Navy.

As World War II approached, the Japanese military government took control of Tinian, using Korean slave labor to build Ushi Field and other facilities. Japan occupied Guam soon after. In a series of battles during 1944, Saipan, Tinian, and Guam were liberated from the Japanese by U.S. forces. Extensive rebuilding by the SeaBees converted Tinian to a major airfield for bombing missions to Japan. In 1945, two B-29s, the ENOLA GAY and BOCK'S CAR, flew from Tinian's North Field to drop atomic bombs on Hiroshima and Nagasaki, respectively. North Field is now a National Historic Landmark. The former bomb loading pits and what remains of some of the Japanese airbase structures are on display.

3.5 Infrastructure

Guam, Tinian, and Rota each have a harbor, a civilian airport, a municipal solid waste landfill, and potable water and electricity systems. Wastewater disposal on Tinian and Rota consists of individual disposal systems (septic tanks and cesspools), while Guam has wastewater treatment facilities. Civilian landfills on Guam and Tinian are not in compliance with federal solid waste regulations. The Guam landfill, under court order to close in 1997, remains open. Military bases on Guam provide their own infrastructure. The Navy also provides potable water to civilians via the Guam Waterworks Authority (GWA). Both AAFB and the Waterfront Annex maintain solid waste landfills and hazardous waste storage facilities, which are in compliance with federal regulations. FDM is not developed.

3.6 Socioeconomic Factors

Residents born on Guam and in the CNMI are U.S. citizens. Populations residing in proximity to military lands are not economically disadvantaged relative to the rest of the Marianas and Western Pacific population.

Guam has experienced steady growth of its tourist industry and business community since the end of World War II; it is now a hub of Western Pacific transportation, in addition to being the home of the only U.S. military installations on U.S. soil in the region. Military land use on Guam is being reduced in accordance with the Guam Land Use Plan (GLUP) Update and the Base Realignment and Closure (BRAC) program.

Tinian and Rota continue to develop, but at a much slower pace than Guam. Tinian residents are striving to develop a casino industry to bring more tourists onto the island from Saipan for longer stays. Rota is experiencing some resort development.

4.0 ENVIRONMENTAL CONSEQUENCES

4.1 Identification of Issues

Council on Environmental Quality (CEQ) regulations provide the criteria used to determine if an issue is significant under NEPA. Those issues screened and determined to be potentially significant were evaluated in detail and are summarized below. Nonsignificant potential impacts were evaluated in less detail but included in Chapter Four discussions. See Table ES-2 for the summary of potential impacts and proposed mitigation measures generated by the Preferred Training Land Use Alternative.

- **Brown Tree Snake Impacts**

The most significant impact that could result from the proposed action is introduction of BTS from Guam to Tinian, Rota, FDM, other islands in the Pacific, or the U.S. mainland. BTS introduction is prevented through the efforts of U.S. Department of Agriculture's Wildlife Services (WS), which directs BTS control measures for all military exercises on Guam in accordance with the Brown Tree Snake Control/Interdiction Plan for Military Training Exercises (see Appendix E). WS has a detailed protocol and existing infrastructure and arrangements to isolate and inspect military cargo and vehicles staged at AAFB and Apra Harbor prior to off-island shipments. WS also manages secondary inspections at the receiving locations. All training units arriving on Guam receive a BTS information packet and briefing delineating unit responsibilities as part of the BTS protocol, and Navy and Air Force environmental staffs monitor BTS control activities.

4.2 Impacts on Tinian

- **Biological Resources**

Potentially significant impacts can be caused by military training activities. Off-road cross-country vehicle travel and excavation activities could damage sensitive habitat and take ground-

nesting endangered species. Improper use of pyrotechnics and open fires could burn habitat and take endangered species. Noise from weapons fire, helicopter hovering and landing, and close air support could disturb endangered species. Logistics shipping could result in BTS import in cargo. AAV and LCAC beach landings could crush or break coral on reefs or compress sand over turtle nests. Clearing vegetation for training ranges or facilities could reduce endangered species habitat.

In those areas where species and habitat must be protected, training constraints such as "No Wildlife Disturbance" and "No Training" are established for specific areas as a means to mitigate potential training impacts (see Figure 2-7a). BTS hazards are mitigated as noted above and in Appendix E. The number of landing beaches for LCACs will be minimized, and AAVs and LCUs will land in San Jose Harbor rather than across MLA beaches. LCACs will be required to remain fully up on-cushion while the shallow reefs at Unai Chulu and Unai Dankulo and come fully ashore before coming off-cushion. A qualified biologist will inspect beaches prior to landing exercises for signs of sea turtle activity that could limit areas suitable for training. The small arms range, mortar range, and shooting house is not proposed on Tinian, eliminating the potential for loss of habitat.

- **Cultural Resources**

Programmatic significant impacts to surface and sub-surface resources consist of ground disturbances by vehicles, bivouac activities, or excavation, or artifact defacement or removal. Site-specific impacts include possible disturbance of resources by personnel or equipment coming ashore at Unai Babui, Unai Chulu and Unai Dankulo. Cultural resources could also be affected by projectile impacts stemming from TRUE training conducted inside the former Japanese Naval Air Command Post.

Mitigation of most impacts to cultural resources involves compliance with the "No Cultural Resources Disturbance" or "No Training" constraints (see Figure 2-7a) established for sensitive areas, which are "off limits" to cross-country vehicle movement and other sources of ground disturbance. Vehicular and pedestrian routes through culturally sensitive areas adjacent to landing beaches will be marked and monitored. Potential impacts of TRUE training and its use of live fire will be addressed by photo-documentation of the building condition before and after exercises. A person qualified in architectural history will review the photographs and assist in determining whether there are adverse effects inside the World War II structures. If there are adverse effects, mitigation may consist of modifying the TRUE training or the placement of targets and bullet traps.

- **Wastewater Disposal**

In the past, wastewater generated during medium and large exercises has been disposed into one of Tinian's municipal septic systems. Analysis indicated that impacts of continued disposal have not been significant but could be further minimized by constructing an additional system exclusively for training support. The Navy has constructed a small septic system that can support about 2,500 persons during extended exercises, relieving a potential to overload a municipal septic system during major exercises.

- **Solid and Hazardous Waste Disposal**

Solid waste generated by exercises on Tinian is transported to Guam for disposal at the Navy's landfill at the Waterfront Annex or the USAF landfill at AAFB. This will not adversely impact DoD landfill capacity (less than 1 percent addition to volume). The civilian landfill situation will not be affected by this action. Waste is steamed upon arrival on Guam.

No hazardous waste has been generated during past exercises, but if generated in the future, it would be transported to Guam in accordance with DOT regulations to the Defense Reutilization and Marketing Office (DRMO) for subsequent transfer off Guam and disposal at a licensed facility.

- **Range Safety**

Significant impacts difficult to mitigate (potential safety hazards) that would be generated by the proposed live-fire training at a small-arms fire-and-maneuver range and 60mm mortar range were major factors in no longer preferring open field, live-fire range development on Tinian. A small arms fire-and-maneuver range is presently under development on Guam. A reusable practice round for the 60mm mortar will be added to military ammunition inventories shortly. When the round becomes available, 60mm mortar crews will no longer require a dedicated mortar range for basic training.

Proposed construction of a permanent shooting house or breacher trainer involved less risk to personal safety, but involved costly construction, maintenance and security of specialized training facilities that would be unmanned and idle throughout most of the training year. The continued use of World War II structures as temporary shooting houses remains the preferred alternative. A small arms fire-and-maneuver range is under development on Guam. A shooting house and a breacher trainer already exist at the Waterfront and Ordnance Annexes.

- **Aviation Safety**

Potential hazards primarily stem from possible conflicts between military aircraft at North Field and civilian air traffic approaching and departing Saipan and Tinian. The altitude of a mortar round exceeds the altitude of aircraft that would be flying above the range. A variety of paved former taxiways and parking aprons provide vehicle access to North Field. Potential conflicts between aviation training and civilian air and ground activities will be prevented by communication and coordination between military flight crews and air controllers and the Federal Aviation Administration (FAA) and Air Traffic Controllers at Isley Field, Saipan International Airport. Military training flights will be announced in advance by publishing Notices to Airmen (NOTAM). Development of a mortar range is no longer preferred for Tinian, which eliminates the potential for interference to commercial flight. EMUA roadways (Broadway and Eighth Avenue) will be temporarily closed to civilian traffic whenever aviation activities are being conducted on North Field.

- **Socioeconomic Factors**

Tourist-oriented activities on Tinian and Saipan are temporarily impacted whenever the EMUA is temporarily closed. Any military use of Tinian Harbor and West Tinian Airport could interfere with civilian/commercial traffic, including the increasing numbers of patrons to the recently introduced casino on Tinian. The lease requires seven days advance notification to CNMI officials. In practice, training requirements are almost always coordinated with more than a seven-day advance. The military training units mitigate economic impacts by minimizing periods of time that EMUA closures are necessary and by planning the shared use of the airport and harbor with the CNMI Port Authority and the municipal government at least 30 days in advance. The Office of the Tinian Mayor has a military representative who acts as a single point of contact for military representatives coordinating training requirements on the island. Contact with other affected government agencies will be initiated through the Mayor's representative.

4.3 Impacts on the Waterfront Annex

- **Biological Resources**

Underwater demolition training could injure or kill fish or endangered marine species (turtles) or could fracture coral within a certain radius of the detonation. Amphibious vehicles may damage coral on shallow reefs or compress sand over turtle nests.

Impacts of underwater demolition on endangered species will be mitigated by adhering to an existing pre-training protocol and by selecting sites clear of coral. LCAC landings proposed for Dadi Beach will not be conducted until a suitable Craft Landing Zone (CLZ) can be developed so that the craft will be on dry land when off cushion and turning, avoiding damage to coral near the shoreline. Another demonstration landing for pertinent regulatory agencies would be conducted prior to adding Dadi Beach as a preferred landing site. At all other preferred beach landing sites, pre-training surveys will be conducted by qualified biologists to ensure that training will not impact sea turtle nesting activity.

- **Cultural Resources**

Underwater demolition training in Outer Apra Harbor could impact sunken (historical) ships that are also popular commercial and recreational dive sites. There are 50-year-old depth charges on the deck of the sunken World War II vessel TOKAI MARU. This ship and others on the bottom of Apra Harbor are popular dive sites. The use of a larger 20-lb (9.0-kg) underwater charge has increased concerns that a sympathetic detonation of the old mines could occur. An analysis of explosive effects indicates that the sunken ships are unlikely to be affected by 10- or 20-lb (4.5- or 9.0-kg) charges at the proposed site. However, mitigation will include curtailing the size of the charge to 10 pounds (4.5 kg) or less at the Outer Apra Harbor training site. Proposed deepwater demolition in Agat Bay off of Dadi Beach will also be limited to a charge of 10 pounds (4.5 kg) or less in deference to impacts to natural resources.

- **Range Safety**

The small arms ranges at Orote Point and Orote Peninsula have two-dimensional surface danger zones (SDZs) extending over federally controlled, open-ocean south and west of the entry to Apra Harbor. However, range fire does not cause the expended rounds to impact the ocean. The ranges have an effective bullet stop, using the base of 60-foot (18-meter)-high hill that runs along the west edge of Orote Peninsula. Safety measures include compliance with all range control measures, public notification, radio communication among range safety observers and the Range Safety Officer, and access roadway closures.

Underwater demolitions could harm divers within the safety exclusion zone in Apra Harbor or offshore of Dadi Beach. EOD personnel patrol the area and temporarily close it to civilian activities prior to any detonations.

- **Socioeconomic Impacts**

Apra Harbor closures for underwater demolitions require commercial boat and dive operations to close or relocate their dives for four hours once a month, though frequency may vary. Mitigation includes selection and use of the second demolition site at Dadi Beach to reduce the frequency of use at Apra Harbor. When using either site, EOD will provide seven days notice to commercial operators whose business activities are affected by military training impacts.

4.4 Impacts on the Ordnance Annex

- **Biological Resources**

No significant impacts to protected species are expected. Training in much of the annex has been constrained by establishing no wildlife disturbance areas. Areas designated as No Training have been recently modified to include areas supporting tree snails that may be federally listed. See Figure 2-9 for areas of training constraint.

- **Cultural Resources**

Latte complexes have been discovered in many areas including a portion proposed for development as a sniper range and jungle trail. Range design has been reconfigured so that areas of significant cultural resources will be protected from projectile impacts by intervening topographic features.

- **Range Safety**

The proposed sniper range has been reconfigured so that its SDZ does not intersect the hiking trail that passes through a southwest portion of the annex and is made accessible to the public.

4.5 Impacts on AAFB and Communications Annexes

- **Biological Resources**

Aviation noise and visual disturbance may affect endangered Mariana crows and fruit bats at AAFB and Northwest Field. The few remaining Mariana crow nests are routinely surveyed and locations made known to the Operations Squadron. Height restrictions have been established for fixed-wing and helicopter activities, which are more stringent during crow breeding season. The USAF coordinates with the Division of Aquatic and Wildlife Resources and the USFWS regarding mitigation and natural resource management measures.

Hiking on an established trail from Haputo Beach through Communications Annex Finegayan to reach Northwest Field will not disturb tree snails, which may soon be listed by USFWS as endangered species. See Figure 2-10 for constraints at the communications annexes and AAFB.

- **Cultural Resources**

Development of a permanent site for rapid runway repair training will avoid an adverse cultural effect on the potentially historic runway area at Northwest Field. The project's construction site is being coordinated between the USAF and the Guam HPO.

4.6 Impacts on FDM

- **Biological Resources**

Seabirds and endangered Micronesian megapodes on FDM may be killed by bombing or harmed by alteration of habitat and food source as a result of bomb-induced fires. BTS could be imported in target materials shipped from Guam. No impacts to endangered sea turtles are expected since the FDM wave-washed and rocky beaches are unsuitable for sea turtle nesting. See Figure 2-11 for constraints established on FDM primarily to protect species and habitat.

Bird mortality will be managed by placing targets on sites that will avoid the most sensitive nesting and roosting areas. Targets will be concentrated inland, avoiding the isthmus and eastern cliff face. USFWS guidelines will be followed for permitted takings of bird species. A compensatory mitigation measure will be Navy participation in programs to enhance megapode habitat on Sarigan, another uninhabited island in the Marianas. The practice of using old auto and truck bodies as targets has been eliminated due to the difficulty of inspecting them for BTS. Old metal shipping containers or easily inspected wooden structures will be used for targets and subjected to BTS inspection and staging protocol prior to shipment to FDM.

- **Public Safety**

UXO has accumulated on land and to a lesser extent in the water. Fishing boats from Saipan often work the waters near this island. FDM is identified on maps and navigation charts as a Naval Gunnery Range surrounded by a three-mile exclusion zone. Mitigation involves formal advance training notices by NOTAM (Notice to Airmen) and NOTMAR (Notice to Mariners) with the latter promulgated by newspaper and marine radio broadcasts. Discussions between the

Navy and CNMI officials have been conducted to identify other means to inform the public of the dangers of range encroachment.

Surveys of the island and its three-mile exclusion zone are conducted prior to commencing naval gunfire or aerial bombardment to ensure that the area is clear of civilian/commercial boats. A proposal to allow Marines to come ashore to set up howitzers, mortars, and anti-tank missile launchers for live-fire training is not a preferred alternative due to the dangers of UXO. COMNAVMARIANAS restricts on-island presence to persons with explosive ordnance certification.

4.7 Non-DoD Lands

Impacts to public safety from parachute operations in Dandan are unlikely. NOTAMS are published for this training.

4.8 Summary of Environmental Consequences

The two matrices at the end of the executive summary summarize the results of the environmental analyses conducted for proposed training land alternatives in the Mariana Islands. Training activities and suitable sites are identified in Table ES-1; potential environmental impacts and mitigation measures are found in Table ES-2. This latter table also differentiates between mitigation measures that are site specific and those that are required at all military training sites.

TABLE ES-1: MARIANA ISLANDS PREFERRED TRAINING LAND USE ALTERNATIVE

	TINIAN			COMNAVMARIANAS—GUAM					AAFB—GUAM			NON-DOD LAND		FDM
MAJOR TRAINING ACTIVITIES	**EMUA**	**MLA**	**Non-DoD Land**	**Apra Inner Harbor**	**Apra Outer Harbor**	**Orote Peninsula /Camp Covington**	**Ordnance Annex**	**NCTAMS Finegayan/ Barrigada**	**Andersen Main**	**Andersen NW Field**	**Andersen South Note 4**	**Guam**	**Rota**	
1. Field Maneuvers								Both						
2. Logistics Training and Bivouacs Note 5			Airport and Harbor	5	5								Songsong	
3. Aviation Training:														
Helicopter:			Airport and DZs									Dandan		
Fixed-wing:			Airport											
Paradrops:			DZ									Dandan		
4. Amphibious Landings:														
Assault Amphibian Vehicles (AAV):			Harbor	Toyland	Note 2	Tipalao								
Inflatable Assault Craft (CRRC/RHIB):								Finegayan	Tarague	Ritidian Point			Songsong	
Air Cushion Landing Craft (LCAC):	Chulu Dankulo			Toyland	Note 2	Tipalao								
Landing Craft, Utility (LCU):			Harbor	Toyland	Note 2									
5. Live Fire Training Ranges:														
Pistol and Submachine Gun(9mm):							Jungle trail	Finegayan						
Rifle and SAW (5.56mm):							Jungle trail	Finegayan						
Light Machine Gun (7.62mm):								Finegayan						
Sniper Rifle														

TABLE ES-1: MARIANA ISLANDS PREFERRED TRAINING LAND USE ALTERNATIVE *(continued)*

	TINIAN			COMNAVMARIANAS—GUAM					AAFB—GUAM			NON-DOD LAND		FDM
MAJOR TRAINING ACTIVITIES	**EMUA**	**MLA**	**Non-DoD Land**	**Apra Inner Harbor**	**Apra Outer Harbor**	**Orote Peninsula /Camp Covington**	**Ordnance Annex**	**Comm. Annex Finegayan/ Barrigada**	**Andersen Main**	**Andersen NW Field**	**Andersen South Note 4**	**Guam**	**Rota**	
5. Live Fire Training Ranges *(continued)*:														
M2 Heavy MG (.50 cal):														Note 3
40mm Grenade:														Note 3
40mm Grenade Launcher (training projectiles only)														
Shooting or Breaching House:					Shooting House	Breaching House								
Artillery Crew Live Fire:														
Tank, AAV,LAV Live Fire														
60mm Mortar (M766 training projectile only):														
60mm, 81mm Mortar Live-Fire Training														
Anti-tank Missile Fire:														Note 3
6. Underwater Demolition Sites:														
EOD Deepwater MCM						Pier								
SEALs Shallow Water MCM					Breakwater	Pier								
EOD Floating Mine Neutralization					Outside Harbor	Aerial Drop Zone								
7. Naval Gun Fire														
8. Aerial Bombardment														

Notes:
1. See Figures 2-1 through 2-6 for detailed locations.
2. Outer Harbor Landings: Dry Dock Island and Polaris Point for LCAC, LCU and AAV; Sumay Cove Marina for AAV; World War II Fuel Pier for LCU.
3. SEALs embarked in RHIBs may fire from off shore to the same impact areas designated for naval gunfire on the west flank of FDM.
4. Training at Andersen South no longer includes use of facilities. Field training will be conducted on a not-to-interfere basis until final land transfer is accomplished.
5. Sites used by COMNAVMARIANAS to provide logistics support to ships in port (vice logistic support to field maneuvers) are not indicated in this table.

TABLE ES-2: MARIANA ISLANDS PREFERRED TRAINING LAND USE ALTERNATIVE—POTENTIAL IMPACTS AND PROTECTIVE MEASURES

RESOURCE	POTENTIAL IMPACTS	ENVIRONMENTAL PROTECTIVE MEASURES Mitigation and Training Management	WILL IMPACTS BE REDUCED TO NONSIGNIFICANT LEVELS?	IF IMPACT REMAINS SIGNIFICANT, WHAT MITIGATIVE ACTION IS NECESSARY?
NATURAL RESOURCES				
Vegetation	Field fire caused by training activities destroys habitat for endangered species.	Restrict use of open fires and aerial pyrotechnics to paved or low-fire hazard areas only. Curtail use of fire-causing objects during periods when fire hazard is high. Brief troops on potential for fire and contingency reactions. Have appropriate firefighting equipment readily available for response at tent camps, firing ranges, landing zones, airfields, and vehicle maintenance and refueling areas. Plan camp layouts with fire lanes; provide fire extinguishers in accordance with regulations. Incorporate firefighting response drills into area security plan. Prohibit use of tracer rounds at proposed Tinian and Ordnance Annex ranges. Maintain crash-fire-rescue equipment near flight lines for large exercises. Avoid Incendiary munitions on FDM. Restrict ordnance used at FDM to the types identified in the biological opinion.	Yes	—
	Deplete vegetation (endangered species) habitat by land clearing for tactical positions and bivouac sites.	Restrict seasons of major clearing events in designated areas, to avoid physical disturbance of nests. Select already cleared areas for administrative camp sites. Use and maintain established, surveyed DZs and LZs only. Minimize degree of vegetation clearing when preparing fighting positions and firing lanes. Use deadfall or cut vegetation that is less than wrist size in diameter. Avoid low hanging tangantangan (Tinian monarch nesting areas).	Yes	—
	Tinian: Deplete Tinian monarch habitat vegetation by clearing for new small arms and mortar ranges.	Replant native species elsewhere to replace the cleared tangantangan in the MLA as mitigation if the Tinian monarch remains a listed endangered species. (52 acres [21 ha] estimated as mitigation for small arms range development.)	Yes	Tinian Range construction is no longer preferred. See Section 2.9.1.
	Tinian: Deplete vegetation by clearing to develop a logistic support camp.	Select a grassland site requiring no tree (habitat) clearing	Yes	—

TABLE ES-2: MARIANA ISLANDS PREFERRED TRAINING LAND USE ALTERNATIVE—POTENTIAL IMPACTS AND PROTECTIVE MEASURES (continued)

RESOURCE	POTENTIAL IMPACTS	ENVIRONMENTAL PROTECTIVE MEASURES Mitigation and Training Management	WILL IMPACTS BE REDUCED TO NONSIGNIFICANT LEVELS?	IF IMPACT REMAINS SIGNIFICANT, WHAT MITIGATIVE ACTION IS NECESSARY?
NATURAL RESOURCES (continued)				
Vegetation (continued)	Introduce alien weedy plant species from one island to another.	Check clothing and boots for seeds, clean equipment before loading up for exercises, and inspect impacted construction materials for the presence of noxious weeds.	Yes	—
	Amphibious vehicles or vehicles off-loaded from landing craft may disturb strand vegetation.	Select beach ingress and egress routes that minimize vegetation impacts.	Yes	—
	Salt spray from LCAC propellers may harm terrestrial species habitat.	Impact is less common and of shorter duration than salt spray generated by typhoons, to which ecosystems are adapted.	Yes	—
Protected Birds, Bats, and Terrestrial Species	Introduce brown tree snake (BTS) or other invasive animal species to Tinian, Rota, FDM, Hawaii, or CONUS from Guam.	COMNAVMARIANAS, AAFB, USDA WS, and training units adhere to BTS Interdiction and Control Plan (see Appendix E and Section 4.1). Inspect all shipments of equipment and cargo departing Guam at beginning and end of exercises. Inspect FDM target materials prior to shipment to FDM. Update Navy and AAFB BTS control protocols as new control measures are adopted.	Yes	—
	Disturb protected bird and bat species by noise or physical interference from aircraft, off road vehicles, and vegetation habitat clearing.	Designate primary habitat and nesting sites NT or NWD, as necessary. Restrict training seasons and times of day in designated areas to avoid loud noises or physical disturbance of nests by vehicles, aircraft, or personnel during breeding seasons. **Guam:** Observe aircraft altitude restrictions at AAFB and Ordnance Annex. **Tinian:** Observe maneuver date restriction in Tinian monarch habitat areas. Direct personnel to avoid collecting or disturbing wildlife for any reason.	Yes	—
	Guam: Disturb endangered Mariana moorhens with blank firing in Atantano marshlands.	Avoid disturbing any birds or nests observed. (Moorhens are not expected to be in area used for training.)	Yes	—
	Guam: Disturb tree snails at Haputo adjacent to cliff trail.	Personnel will remain on established trail that connects the beach to the upper plateau.	Yes	—
	Guam: Injury to moorhens at Fena Reservoir caused by sniper rifle fire.	Moorhens are protected from bullets by intervening terrain that acts as a bullet backstop.	Yes	—

TABLE ES-2: MARIANA ISLANDS PREFERRED TRAINING LAND USE ALTERNATIVE—POTENTIAL IMPACTS AND PROTECTIVE MEASURES (continued)

RESOURCE	POTENTIAL IMPACTS	ENVIRONMENTAL PROTECTIVE MEASURES Mitigation and Training Management	WILL IMPACTS BE REDUCED TO NONSIGNIFICANT LEVELS?	IF IMPACT REMAINS SIGNIFICANT, WHAT MITIGATIVE ACTION IS NECESSARY?
NATURAL RESOURCES *(continued)*				
Protected Bird, Bats, and Terrestrial Species (continued)	**FDM:** Harm or kill migratory seabirds or endangered Micronesian megapodes with naval gunfire or aerial bombardment.	Limit naval gunfire to western cliffs target areas to minimize impacts to eastern cliff. Limit aerial bombardment target areas to center portions of island, avoiding eastern cliffs and the narrow central isthmus.	No	Enhance megapode habitat on Sarigan Island as compensatory mitigation. See Sect. 2.9.5.
	Guam: Injury to carabao in Ordnance Annex from sniper rifle fire.	Snipers are trained to notice movement and will be directed to avoid shooting at caribou.	Yes	
	Rota: Disturbed endangered Mariana crows with noise from NVG helicopter flight crew training	Insufficient information regarding potential impacts at specific sites.	Not Determined	NVG flights at Rota are no longer in the preferred alternative. See Section 2.9.6.
Protected Marine Species	Mortality of sea turtles from landing vehicles crushing nests or hatchlings on beaches, or inability of hatchlings to scale tire or track ruts in beach sand.	Survey landing beaches $\leq$ 6 hrs before landings, and flag areas free of nests. Landing vehicles and offloaded vehicles will remain in flagged nest-free areas. Biologist will be present during night landings to watch for turtles.	Yes	—
		Restore the beach topography disturbed by landing craft, AAVs, and wheeled vehicles.	Yes	—
	Guam: Harm or kill sea turtles, marine mammals, or fish due to shock waves from deepwater MCM.	Survey blast area to 0.6-mile (1,000-m) radius prior to exercise to identify marine animals. If protected species are encountered, halt training until the animals depart area. Use Dadi Beach site instead of Apra Harbor site, whenever weather and sea conditions may permit. Use only 10-lb (4.5-kg) charges or less at both the Apra Harbor and Dadi Beach sites. Conduct post-blast surveys to identify number of fish kills and any sea turtles killed or injured. Reevaluate protocols after two years.	Yes	— —
	FDM: Harm or kill sea turtles or whales in nearshore waters during naval gunfire or aerial bombardment.	Sea turtles have not commonly been observed near FDM and beaches are unsuitable nesting areas. Establish impact areas away from waterline. Areas will be surveyed for sea turtles and whales prior to exercises; if animals are observed, the exercise will be postponed until such have left the impact area.	Yes	—
	Guam: Harm or kill sea turtles or whales in nearshore waters during floating mine neutralization.	Survey area for protected marine animals prior to exercise.	Yes	—

TABLE ES-2: MARIANA ISLANDS PREFERRED TRAINING LAND USE ALTERNATIVE—POTENTIAL IMPACTS AND PROTECTIVE MEASURES (continued)

RESOURCE	POTENTIAL IMPACTS	ENVIRONMENTAL PROTECTIVE MEASURES Mitigation and Training Management	WILL IMPACTS BE REDUCED TO NONSIGNIFICANT LEVELS?	IF IMPACT REMAINS SIGNIFICANT, WHAT MITIGATIVE ACTION IS NECESSARY?
NATURAL RESOURCES *(continued)*				
Coral Reef and Sand Beaches	AAVs crush coral in water less than 6-ft (1.8-m) deep.	**Tinian:** Restrict AAV landings to San Jose Harbor.	A small amount of coral damage has been estimated. However, an operationally acceptable landing site in the MLA has not been identified.	Potential damage to coral is one factor leading to eliminating AAV landings at Unai Babui from the preferred alternative.
		Guam: Restrict AAV landings to areas with no live coral reefs. (Do not land AAVs at Dadi Beach.)	Yes	
	Guam: Damage to coral structure from shock waves generated by deepwater MCM.	Avoid underwater demolition within 328 ft (100 m) of reef.	Yes	
	Guam: Damage to reef flats from shallow water MCM	Restrict use of live charges to offshore areas at the west end of Glass Breakwater, and offshore of Tipalao Beach were these is no live coral in waters 10 to 25 ft (3 to 8 m) deep.	Yes	—
	Landing vehicles and off-loaded vehicles disturb beach vegetation and sand.	Select Beach ingress and egress to minimize vegetation impacts. Use beach matting if necessary to reduce erosion and rutting caused by disembarking vehicles in soft sand. Restore beach topography after exercise, and avoid other engineered modifications to beach topography and drainage patterns.	Yes	—
	The LCAC inflatable skirt or bow wave at low speeds may break off exposed coral contacted on reefs or shallow reef flats.	**Tinian:** Use Unai Chulu and Unai Dankulo, scheduling landings to take advantage of high tide. Avoid turning LCAC in shallow waters over reef flats by conducting turns while on the beach. Survey Unai Chulu and Unai Dankulo within 1 week of exercise. Evaluate slope of beach to ensure the grade will not cause the LCAC to slide back into shallow water when coming off cushion. Monitor effects by surveying the nearshore areas before and after LCAC landings for percentage of coral cover, topography, turbidity, sedimentation rates, and fish assemblage.	Yes	LCAC landings once proposed for Kammer and Tachogna Beaches are not in the preferred alternative. Both beaches have been primarily designated for recreation by residents and tourists.
Insects and Diseases	Introduction of invasive species	Transport all solid waste (SW) from Tinian in containers that can be sealed and upon delivery on Guam steam sterilize the wastes according to standard procedures.	Yes	—

TABLE ES-2: MARIANA ISLANDS PREFERRED TRAINING LAND USE ALTERNATIVE—POTENTIAL IMPACTS AND PROTECTIVE MEASURES (continued)

RESOURCE	POTENTIAL IMPACTS	ENVIRONMENTAL PROTECTIVE MEASURES Mitigation and Training Management	WILL IMPACTS BE REDUCED TO NONSIGNIFICANT LEVELS?	IF IMPACT REMAINS SIGNIFICANT, WHAT MITIGATIVE ACTION IS NECESSARY?
CULTURAL RESOURCES				
Archaeological and Historical Resources	Programmatic: Damage or data loss from ground disturbance by off-road vehicles, construction, rapid runway repair, or excavation of fighting positions or latrines.	Designate areas NT or NCRD (no cultural resources disturbance), as appropriate. Monitor training activities for adherence to the constraints.	Yes	—
	Damage or data loss from ground disturbance (continued).	Physically mark NT boundaries so they can be identified both day and night in areas lacking naturally recognizable boundaries. Publish information and maps identifying known historic and cultural areas for exercise planning. Allow no digging within 1 m of historic structures with concrete walls or in any caves.		
	Programmatic: Damage or data loss from ground disturbance by off-road vehicles, construction, rapid runway repair, or excavation of fighting positions or latrines. (continued)	If cultural resources are encountered, cease any disturbance and notify COMNAVMARIANAS environmental staff or exercise environmental monitors. **Tinian:** Install signs or flagging, as needed, to mark designated vehicle and pedestrian access lanes through NT areas.	Yes	—
	Damage or data loss from vandalism.	Brief troops on history and significance of resources. Provide educational handouts for exercise participants to understand and protect resources prior to training.	Yes	—
	Tinian: Projectile impacts on walls of former Japanese Command Post from training.	Employ qualified historic architect to evaluate the placement of targets and bullet traps in the Command Center interior. Photo-document conditions before and after training and if adverse effects are evident, modify training or target/bullet trap locations.	Yes	—
	Tinian: Damage to potential or known cultural resource sites by small arms and mortar fire	Complete archaeological surveys of proposed range locations and modify range development as necessary to protect resources.	Yes	Public Safety considerations eliminated the small arms and mortar ranges from the preferred alternative. See Section 2.9.1.
	Tinian: Disturbance of prehistoric sites and complexes adjacent to MLA beaches.	Designate adjacent archaeological sites as NT or NCRD as needed. Mark the roads and paths that can be used to traverse these sites.	Yes	—

TABLE ES-2: MARIANA ISLANDS PREFERRED TRAINING LAND USE ALTERNATIVE—POTENTIAL IMPACTS AND PROTECTIVE MEASURES (continued)

RESOURCE	POTENTIAL IMPACTS	ENVIRONMENTAL PROTECTIVE MEASURES Mitigation and Training Management	WILL IMPACTS BE REDUCED TO NONSIGNIFICANT LEVELS?	IF IMPACT REMAINS SIGNIFICANT, WHAT MITIGATIVE ACTION IS NECESSARY?
CULTURAL RESOURCES (continued)				
	Guam: Defacement of *latte* village sites in Ordnance Annex by sniper rifle projectile impacts.	Protect *latte* complexes from bullet impacts by using topographic features (hills). Obtain range certification from NAVFACENGCOM, NAVORD and the COMNAVMARIANAS Cultural Resources Mgr.	Yes	—
Archaeological and Historic Resources	**Guam:** Damage to historic runways at Northwest Field from RRR cratering.	Select RRR construction site in coordination with the Guam HPO to avoid adverse effect to an area on Northwest Field eligible for National Register of Historic Places listing.	Yes	—
	Guam: Damage to submerged historic resources in Apra Harbor from shock waves generated by deepwater MCM.	Retain the same radius of impact by using no more than a 10-pound charge at the approved Outer Harbor training site.	Yes	—
ENVIRONMENTAL QUALITY				
Air Quality	Increased amounts of smoke and dust generated by training.	Do not use smoke or tear gas in areas with civilians present or down wind. Use sanitary waste burn cans in locations down wind of camps and visitor locations.	Yes	—
Visual Resources	Damage to land and underwater scenic resources from demolition or weapons fire.	Avoid demolition and weapons training in proximity to scenic areas.	Yes	—
Climate	Increased potential for fire within training areas during droughts (cumulative with other sources of sparks).	Restrict training during droughts, particularly in areas with rudimentary or nonexistent firefighting capabilities. Maintain fire-fighting equipment on-hand/on-call as necessary.	Yes	—
Groundwater and Soil	Contamination from improper field sanitation or improper disposal of portable toilet waste.	Comply with field sanitation SOP. Remove and dispose of solid wastes, gray and black water. Ensure contractors dispose of portable toilet wastes using an authorized septic tank and field.	Yes	—
	Contamination from accidental release of fuel during vehicle/aircraft refueling, maintenance, or repair activities or at temporary hazardous materials or hazardous waste storage area(s).	Comply with existing regulations and SOPs regarding fuel and hazardous materials/hazardous waste handling, transportation, and spill control. Avoid performing scheduled maintenance during field exercises. Refuel only on paved surfaces and using standard spill containment measures. Avoid overfilling vehicle fuel tanks to allow for fuel expansion.	Yes	—

TABLE ES-2: MARIANA ISLANDS PREFERRED TRAINING LAND USE ALTERNATIVE—POTENTIAL IMPACTS AND PROTECTIVE MEASURES (continued)

RESOURCE	POTENTIAL IMPACTS	ENVIRONMENTAL PROTECTIVE MEASURES Mitigation and Training Management	WILL IMPACTS BE REDUCED TO NONSIGNIFICANT LEVELS?	IF IMPACT REMAINS SIGNIFICANT, WHAT MITIGATIVE ACTION IS NECESSARY?
ENVIRONMENTAL QUALITY (continued)				
Groundwater and Soils	Contamination from training presence at sites undergoing investigation or remediation for hazardous materials.	Do not train in any Installation Restoration Site or Solid Waste Management Unit	Yes	—
	Contamination from training presence at sites undergoing investigation or remediation for hazardous materials.	Do not train in any Installation Restoration Site or Solid Waste Management Unit	Yes	—
	Soil erosion and rutting from ground excavation, construction activities, gray water disposal to ground, amphibious vehicles traversing beaches, or projectile impacts at firing ranges.	Restore training areas to original grade and plant vegetation, as necessary, upon completion of training activities.	Yes	—
	FDM: Increased erosion due to cliff side bomb impacts.	There is no empirical evidence that bombing has greatly increased the naturally and dramatic erosion process on FDM. Regardless, avoid targeting the eastern cliffs in the vicinity of the isthmus.	Yes	—
	ROWPU effluent disposal could affect groundwater.	Discharge ROWPU effluent (brine or filter rinse water) to an infiltration trench away from bodies of water or sanitary wastewater treatment facility	Yes	—
Surface water quality (marine and fresh)	Increased siltation and/or turbidity due to erosion from amphibious landings, beachside off-loading of vehicles and cargo, riverine training.	Avoid silty (vs. sandy) shorelines whenever possible, or use matting to minimize vehicle effects on soil.	Yes	—
	Contamination from accidental release of fuel during vehicle/aircraft refueling, maintenance, or repair activities.	Avoid performing scheduled maintenance during field exercises. Refuel on paved surfaces, using spill containment measures. Avoid overfilling vehicle fuel tanks, to allow for fuel expansion.	Yes	—
	Degradation from runoff of gray water or ROWPU effluent.	Direct gray water or ROWPU effluent away from surface water bodies, in accordance with SOPs.	Yes	—
Marine Water Quality	Potential heavy metal contamination from lead bullets in water impact areas.	Construct/maintain dirt berms/bullet stops behind targets to trap rounds.	Yes	—
Flooding	None caused by training, but some training areas are within flood zones.	None required beyond awareness that equipment and personnel could require evacuation to higher ground during severe weather.	Yes	—

TABLE ES-2: MARIANA ISLANDS PREFERRED TRAINING LAND USE ALTERNATIVE—POTENTIAL IMPACTS AND PROTECTIVE MEASURES (continued)

RESOURCE	POTENTIAL IMPACTS	ENVIRONMENTAL PROTECTIVE MEASURES Mitigation and Training Management	WILL IMPACTS BE REDUCED TO NONSIGNIFICANT LEVELS?	IF IMPACT REMAINS SIGNIFICANT, WHAT MITIGATIVE ACTION IS NECESSARY?
MAN-MADE HAZARDS AND CONSTRAINTS				
Noise	**Rota:** Helicopter night flights disturbance to populated areas and birds in vicinity of airport and flight paths	Perform night landings in early evening ending by 10:00 PM	Not Determined	Night flight training proposed for Rota is no longer in the preferred alternative. See Section 2.9.6.
	Guam: Disturbances to Tipalao residents from LCAC landings at Dadi and Tipalao beaches.	Perform landings during daylight hours only.	Yes	—
Commercial Aviation Facilities and Traffic	**Tinian:** Interference with Tinian-Saipan commuter flights and international flights in/out of Saipan International Airport.	Military air-traffic controllers will coordinate with FAA during planning and have direct communication with FAA tower personnel during military flight activities, in accordance with SOPs and FAA regulations. Issue NOTAM for use of North Field.	Yes	—
	Tinian: Interference of airborne and airmobile operations with commercial and general aviation activity at West Tinian Airport.	Limit use of commercial airport. If needed, coordinate with civilian authorities at least two weeks prior to military landings. Move military aircraft of active runway as soon as possible. Maintain lateral safety clearances from active runways and landing zones; avoid conflicts between training activities and accident potential zones at ends of runways. Restrict training dates/times to avoid major holiday traffic. Publish NOTAM for parachute drops east of West Tinian Airport. Restrict flight tracks/hours, as needed. Have crash, fire, and rescue equipment readily available.	Yes	—
	Tinian: Mortar round trajectory intersects civilian flight tracks	Aerial observation during training and communication with FAA in Saipan is required. Curtail training during times of international flights crossing over North Field.	Not assured. A risk to public safety remains.	The development of a Mortar Range is no longer preferred. See Section 2.9.1.
	FDM: Interference of bomber aircraft with civilian air traffic.	Publish NOTAMS and notify FAA, warning civilian aircraft out of 2.7-mile (4.3-km)-radius restricted airspace.	Yes	—
Civilian and Military Fuel Storage	**Tinian:** EMR hazards to fuel operations (HERF).	Establish physical barriers and markers to maintain mandatory safety clearances between emitter sites and personnel, and fueling operations.	Yes	
Electronic Emissions	**Tinian:** Electromagnetic Radiation Hazards to Personnel (HERP)	Publish IBB frequencies and presence of EMR warning signs in training instructions for Tinian (COMNAVMARIANAS INSTR 5440.1C).	Yes	—

TABLE ES-2: MARIANA ISLANDS PREFERRED TRAINING LAND USE ALTERNATIVE—POTENTIAL IMPACTS AND PROTECTIVE MEASURES (continued)

RESOURCE	POTENTIAL IMPACTS	ENVIRONMENTAL PROTECTIVE MEASURES Mitigation and Training Management	WILL IMPACTS BE REDUCED TO NONSIGNIFICANT LEVELS?	IF IMPACT REMAINS SIGNIFICANT, WHAT MITIGATIVE ACTION IS NECESSARY?
MAN-MADE HAZARDS AND CONSTRAINTS (continued)				
Public Health and Safety	**Guam:** Safety hazards to civilians on historic trails adjacent to small arms ranges on Orote Point and Orote Peninsula, and flight decks in the Waterfront Annex.	Publish specific range regulations and distribute to all units planning training activities. Adhere to all safety requirements prior to and during live-fire and demolition activities, conducting the required range area sweeps and surveillance to ensure no danger to others. Curtail firing if anyone enters the range area. Close portions of historic trail to visitors during range use.	Yes	—
	Guam: Safety hazards from sniper rifles to hikers on trail passing through Ordnance Annex	The range will be designed so that SDZ does not intersect hiking trail. The Range Safety Officer will monitor the line of fire.	Yes	—
	Guam: Safety hazards to boaters and divers near deepwater MCM sites.	EOD personnel clear site and exclusion zone prior to exercise.	Yes	—
	Guam: Safety hazards to civilian divers from potential sympathetic detonation of depth charges on TOKAI MARU.	[Sympathetic detonation is unlikely to result from explosion of 10- and 20-lb (4.5- and 0.9-kg) charges over 0.6 mile (1 km) from TOKAI MARU. However, the size of the deepwater charge will not exceed 10 lbs. (4.5 kg).	Yes	—
	Guam: Safety hazards to boaters and divers in small arms range over-water SDZs adjacent to Orote Peninsula and NCTAMS Finegayan.	Publish NOTAMs and NOTMARs. Maintain observation of water SDZ during range use. Install and maintain warning signs, flags, or strobe lights on shore during range use and mark SDZs on local navigation charts. Cease firing if boat enters SDZ.	Yes	—
	Tinian: Electromagnetic radiation (EMR) hazards to personnel (HERP) from communications equipment used in training.	Establish physical barriers and markers to maintain mandatory safety clearances between emitter sites and personnel, fueling, and ordnance operations. Provide EMR hazard overlays to training units as necessary.	Yes	—
Airports	**Tinian:** Military aircraft may interfere with civilian air traffic at West Tinian Airport.	Communicate/coordinate with FAA and civil authorities 30 days in advance of any exercise. Issue NOTAMs and NOTMARs 72 hours prior to any exercise. Plan military helicopter activity avoid commercial flight tracks and Saipan approach and departure altitudes, whenever possible. Avoid parking ramp tie-ups by military aircraft.	Yes	—

TABLE ES-2: MARIANA ISLANDS PREFERRED TRAINING LAND USE ALTERNATIVE—POTENTIAL IMPACTS AND PROTECTIVE MEASURES (continued)

RESOURCE	POTENTIAL IMPACTS	ENVIRONMENTAL PROTECTIVE MEASURES Mitigation and Training Management	WILL IMPACTS BE REDUCED TO NONSIGNIFICANT LEVELS?	IF IMPACT REMAINS SIGNIFICANT, WHAT MITIGATIVE ACTION IS NECESSARY?
MAN-MADE HAZARDS AND CONSTRAINTS (continued)				
Airports (continued)	Increased demands on local customs and immigration services.	Notify local authorities 30 days before large exercises. Identify time frames and locations for customs and immigration support in advance of the exercise	Yes	—
Harbors	**Tinian, Rota, and Guam:** Interference with civilian ports of entry.	Coordinate with civilian authorities and obtain approvals 30 days in advance of any exercise.	Yes	—
	Increased demands on customs and immigration services.	Notify local authorities 30 days before large exercises.	Yes	—
Roadways and Traffic	Road damage by tracked vehicles.	Inspect tracked vehicles for serviceable track pads. Allow only rubber-padded track-laying vehicles on paved roads (no bulldozers). Use equipment haulers to move tracked vehicles with all-steel tracks (e.g., bulldozers). Avoid neutral steer/pivot turns on black top and coral roads and excessive movement on and off shoulders	Yes	—
	Interference with civilian traffic.	Establish military traffic control and security within training areas accessible to others. Notify local authorities 7 days in advance of troop transport movement of public roads	Yes	—
Public services	**Tinian:** Increased demands on public safety authorities.	Coordinate with the local fire and police departments; augment civilian forces as appropriate.	Yes	—
INFRASTRUCTURE				
Potable Water Supply	**Tinian:** Depletion of local water supply during large exercises.	Conduct advance planning with municipality to identify requirement, times, and places for issue.	Yes	—
Wastewater Disposal Systems	Chronically overload Tinian's municipal septic system capacity.	Tinian: Use Navy septic field as primary dump site to avoid overloading municipal septic fields.	Yes	—
Solid and Hazardous Waste Collection and Disposal Facilities	**Tinian:** Absence of RCRA-approved SW disposal facility for exercise-generated waste.	Back haul SW to DOD facility on Guam for proper disposal.	Yes	—
	Guam: Depletion of GovGuam or private landfill capacity.	Do not use GovGuam or private landfills. Dispose SW in DOD-managed landfills at Apra Harbor or AAFB.	Yes	—
	Interference with needed civilian shipping capacity due to transport of SW from Tinian to Guam.	Coordinate with local shipping companies and ensure adequate shipping capacity prior to large exercises. Delay shipping SW, if necessary, until adequate ships are available.	Yes	—

TABLE ES-2: MARIANA ISLANDS PREFERRED TRAINING LAND USE ALTERNATIVE—POTENTIAL IMPACTS AND PROTECTIVE MEASURES (continued)

RESOURCE	POTENTIAL IMPACTS	ENVIRONMENTAL PROTECTIVE MEASURES Mitigation and Training Management	WILL IMPACTS BE REDUCED TO NONSIGNIFICANT LEVELS?	IF IMPACT REMAINS SIGNIFICANT, WHAT MITIGATIVE ACTION IS NECESSARY?
INFRASTRUCTURE (continued)				
Waste Collection and Disposal (continued)	Disposal of ships' waste near shore.	Comply with COMNAVMARIANAS/C7F directives and federal regulations not to dispose of SW within 25 nautical miles of shore.	Yes	—
	Tinian: Absence of RCRA-approved hazardous waste (HW) disposal facility in CNMI or Guam.	Ship HW to DOD facility or continental U.S. for proper disposal.	Yes	—
Electricity and Communication	**Tinian:** Temporary increased demand for electricity.	Communicate and coordinate with appropriate local agencies prior to exercise. Supplement commercial power with field generators.	Yes	—
SOCIAL ENVIRONMENT				
Land Use	Interference with/encroachment on neighboring land use/property.	Monitor activity within training area to identify and avoid potential encroachments.	Yes	—
	Safety risks to neighboring areas and inhabitants from use of firing ranges and established EOD sites.	Establish buffer zones, traffic control, and area monitors/umpires, as necessary, to eliminate civilian encroachment into range areas.	Yes	—
	Conflicts with civilian activities.	Schedule/coordinate potentially conflicting activities with appropriate local agencies 30 days prior to exercise. Publish NOTAMs and NOTMARs.	Yes	—
	Noise disturbance by aircraft near residential areas.	Schedule/coordinate potentially conflicting activities with appropriate local agencies. Publish NOTAMs and NOTMARs.	Yes	—
	Danger to civilians from parachute drops on non-DOD lands.	Obtain permission from property owner prior to exercise. Clear the DZ of all personnel less those assigned communications, safety, and medical responsibilities.	Yes	—
	Disfigure publicly accessible land areas by littering or effects of bivouacs and logistics support activities.	Clean and inspect all training areas. Do not bury paper trash or other training residue ("Pack It In; Pack It Out").	Yes	—
	Tinian: Long-term UXO contamination at new mortar range impact area	EOD must sweeps and clear the impact area after each training evaluation.	All training units do not have EOD personnel assigned and conducting an immediate range sweep cannot be guaranteed.	The Mortar Range is not a preferred alternative. See Section 2.9.1.
Commercial Enterprises	Increased demand on various commodities.	Give notice to local officials and merchants so they can prepare for increase in demand and avoid shortages.	Yes	—
		Contract locally for required services.	Yes	—

TABLE ES-2: MARIANA ISLANDS PREFERRED TRAINING LAND USE ALTERNATIVE—POTENTIAL IMPACTS AND PROTECTIVE MEASURES (continued)

RESOURCE	POTENTIAL IMPACTS	ENVIRONMENTAL PROTECTIVE MEASURES Mitigation and Training Management	WILL IMPACTS BE REDUCED TO NONSIGNIFICANT LEVELS?	IF IMPACT REMAINS SIGNIFICANT, WHAT MITIGATIVE ACTION IS NECESSARY?
SOCIAL ENVIRONMENT (continued)				
Commercial Enterprises (continued)	**Tinian:** Closure of EMUA to subsistence fishers due to training activities.	Establish an access corridor to accommodate shoreline fishing, when not interfering with training.	Yes	—
	Tinian: Closure of EMUA to tour companies and tourists due to training activities.	Give 30 days advance notice before curtailing access to tourist sites within EMUA, and minimize times of closures.	Yes	—
	Guam: Closure of portions of Apra Harbor to commercial boat and diving operations for 4 hours once per month.	Reduce use of this site by using Dadi Beach site, weather permitting.	Yes	—
Tinian Government and Agencies	Inconveniences through joint use of civilian facilities such as the West Tinian Airport or the field house.	Notify the Mayor of Tinian's office at least 30 days prior to exercises and obtain necessary permissions, and negotiate for use of municipal facilities as needed.	Yes	—
Environmental Justice	Disproportionate hardship on local minority or economically disadvantaged population.	Design training activities to eliminate conflict, promote mutual understanding, and enhance local economy.	Yes	—
Invasive Species	Introduction of BTS from Guam	BTS Control and Interdiction Plan	Yes	—



(National Archives at College Park)

CHAPTER ONE

PURPOSE AND NEED

FEIS: Military Training in the Marianas
Belt Collins Hawaii, 1999

CHAPTER ONE: PURPOSE OF AND NEED FOR MILITARY TRAINING IN THE MARIANAS

1.1 OVERVIEW

The purpose of this Environmental Impact Statement is to evaluate environmental impacts of military training activities in the Mariana Islands that are required by the Commander-in-Chief, U.S. Pacific Command (USCINCPAC) for the foreseeable future. The proposed action is primarily to continue to perform ongoing training on lands that are owned, leased, or otherwise controlled by the U.S. Government, as well as in adjacent waters and air space. The proposed action includes new training initiatives that would increase training site utilization and reduce existing training deficiencies. The proposed actions also address a few training activities that are ongoing or proposed for non-DoD controlled lands that have been or may be authorized for specific training activities.

The areas evaluated for training are in the Territory of Guam and the Commonwealth of the Northern Marianas Islands (CNMI). The CNMI islands evaluated were Tinian, Rota, and Farallon de Medinilla (FDM). COMNAVMARIANAS and the Commander, 36th Air Base Wing are responsible for the management and supervision of training conducted at the evaluated locations (see Section 1.4 and Table 1-1).

Unlike an evaluation of a project that is commenced and concluded in a specific period of time, this EIS for military training is evaluating an ongoing activity often conducted over an unspecified period with varying frequencies, sizes of training units, and types of activities based on military mission requirements. This EIS has been designed to remain valid for training to be conducted in the Mariana Islands in the foreseeable future, but recognizes that military requirements are dynamic. The duration of this EIS is not open-ended, but is anticipated to remain in effect for military training in the Marianas unless:

- It is discovered that the environmental effects of ongoing activities are significantly and qualitatively different or more severe than predicted in this EIS.
- There is a substantial change in the ongoing activities that are discussed and evaluated in this EIS, such that there is a potential for generating significant environmental impacts. Such impacts might result from substantial changes in operational tempo, areas of use, or training methodology and equipment, or a change to the purpose and need of the training.

Development of the EIS is predicated on the **purpose and need** to maintain a high level of operational readiness and joint-service operational capability among units stationed and operating in the Western Pacific and Indian Ocean in support of the national defense strategy for the Pacific theater. Military training is a systematic approach to development of the skills needed to ensure National security. As with any dynamic system, improvements to training may result in substantial changes with the potential for significant environmental effects. The processes contained herein, including those listed as mitigation efforts, enable the DoD to evaluate systematic and substantive changes that may result in the need for further NEPA documentation. The NEPA documentation may relate to construction of additional training structures, new types

of equipment being introduced to specific training areas, substantial change to the environment, or a substantial change in the training requirements.

The following sections provide an overview of why training in the region is necessary, the commands and organizations that currently train in the Marianas, alternative training locations in the Western Pacific, and affected training sites in the Marianas.

1.2 TRAINING REQUIREMENTS IN THE MARIANA ISLANDS

1.2.1 USCINCPAC Training Requirements

USCINCPAC is responsible for an area comprising 105 million square miles and 44 countries, including two of the world's most populous countries and seven of the world's largest armed forces. The United States has mutual defense treaties with five nations in this Pacific area of responsibility, which extends from California to Diego Garcia (in the Indian Ocean).

The United States has a national security strategy of cooperative, flexible and selective engagement. This strategy requires a continued American involvement in the Pacific area to promote an environment of trust, cooperation, and stability. As part of this strategy, U.S. military presence is required in the region to deter armed conflict, guarantee lines of communication, and help ensure the continued independence of the region's numerous nations. To this end, a force structure of approximately 100,000 U.S. military personnel is projected to be in the Pacific area for the foreseeable future.

The military element of the U.S. defense strategy is achieved not only by the presence of forces in the region, but also by strong alliances and by the ability of military forces to respond quickly and effectively in a crisis. This demonstrated capability deters potential aggressors in times of crisis and provides the ability to attain a favorable outcome in military engagements, should deterrence fail.

The use of training areas in the Mariana Islands is crucial to Pacific Command forces for maintaining essential military capabilities, demonstrating combat readiness, and assuring responsiveness to crises in the region.

The following subsections describe the Pacific Command force structure (Section 1.2.2) and the specific military commands and organizations (Section 1.2.3) that require training in the region. The strategic position of the Mariana Islands is illustrated in Figure 1-1. The islands represent the last American soil available for training prior to commitment of U.S. forces in the Western Pacific and Indian Oceans.

The specific training requirements are identified in the Marianas Training Plan, discussed in Section 1.2.4.[1]

[1] Commander, U.S. Naval Forces Marianas (June 1998). *Final Marianas Training Plan for DoD Facilities and Activities.*

342.0414/021-3 r5.26.99.7

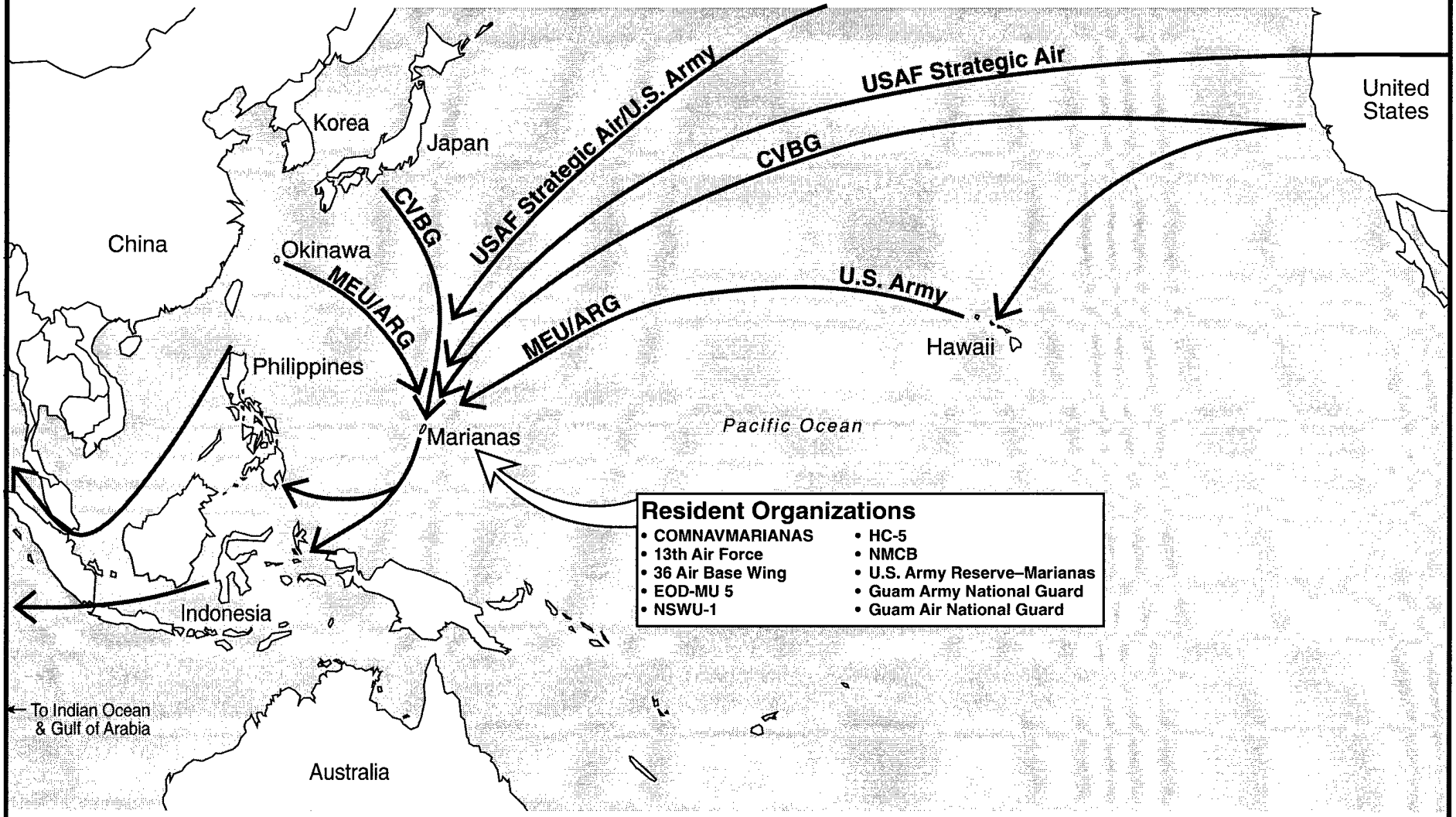


Figure 1-1
TRAINING ORGANIZATIONS

FIS: Military Training in the Marianas
Belt Collins Hawaii, June 1999

1.2.2 Pacific Force Structure

Execution of the Pacific Theater Engagement Plan requires the Pacific Command to employ forces based in a variety of deployment postures. Essentially, this means that forces assigned to Pacific Command for the defense of the Mariana Islands and other areas in the Western Pacific are not all based in the region and may need to deploy from distant bases to the region in response to world events. Because of their distant home basing, training for employment in the region is very important for these units. The various deployment postures of forces with regional responsibilities that may be involved in Mariana Islands training activity include:

- **CONUS-based forces**

Forces based in the Continental U.S. (CONUS) that routinely support USCINCPAC include elements of the Air Combat Command, U.S. Army I Corps, U.S. Third Fleet and the 1st Marine Expeditionary Force stationed in California. Elements from these commands deploy on a regular basis to the Western Pacific and Indian Ocean, where they provide a military response capability in support of Pacific Command's regional responsibilities. Of particular interest for Marianas training, I MEF and Third Fleet provide Amphibious Ready Groups (ARG) with embarked Marine Expeditionary Units (MEUs) for service in the Western Pacific and Indian Ocean. These forces provide an immediate amphibious landing capability in the area of operations and are replaced every six months. Air Combat Command is responsible for the strategic bomber fleet, elements of which are supported by Andersen Air Force Base during commitments of aircraft to the Pacific and Indian oceans operating areas.

Aircraft Carrier Battle Groups (CVBG) also deploy from CONUS through the Western Pacific to the Indian Ocean on a six-month rotation. Both of these early response forces must remain in the highest state of mission readiness. At any one time, a CONUS-based ARG/MEU and a CONUS-based CVBG are stationed near or west of the Mariana Islands. Transit time from their home bases to the western Pacific is approximately two to three weeks

- **Forward-based Forces**

Forward-based forces include the U.S. Army's First Brigade, Sixth Light Infantry Division and 11th Air Force in Alaska, and in Hawaii, the Army's 25th Light Infantry Division (minus) and 45th Corps Support Group, the Marines' Third Marine Regiment (Reinforced), and joint-service Special Operations Command, Pacific. These commands conduct the majority of their training at home stations and provide organizations to train in the Marianas and Western Pacific region on a periodic basis, often to demonstrate their capability to respond as members of a combined or joint task force to crises in the region.[2] Such training is normally performed as part of a named joint exercise, such as Tandem Thrust.

There are forward-based forces in the Western Pacific, primarily in Japan, Korea, and Guam. The Fifth and Seventh Air Forces are located in Japan and Korea respectively. On Guam the two major command elements are 13th Air Force at AAFB and COMNAVMARIANAS. The Eighth U.S. Army is stationed in Korea, III Marine Expeditionary Force (III MEF) is stationed in

[2] A joint task force is comprised of any combination of U.S. military forces. A combined task force is comprised of U.S. and Allied military forces.

Okinawa, and U.S. Seventh Fleet operates out of homeports in Japan. 353rd Special Operations Group has its headquarters in Okinawa and three Special Operations Squadrons and one Special Tactics Squadron in Okinawa and Korea. 1st Battalion, 1st Special Forces Group is stationed in Okinawa.

- **Forward-deployed Forces**

In addition to Third Fleet and I MEF deployments to the Pacific region, Seventh Fleet and III MEF also deploy an ARG and MEU. The USS BELLEAU WOOD, homeported in Japan, is the command ship for Commander, Seventh Fleet. The fleet also deploys a Carrier Battle Group (presently the USS KITTY HAWK and supporting ships) and a variety of naval task forces for regional contingencies, exercises and training. Fleet support is constantly on-station in the Western Pacific and/or Indian oceans.

1.2.3 Military Organizations Training in the Marianas

The forces that must train in the Marianas represent an entire array of combat, combat support and combat service support, special operations, and logistic missions that may be needed to respond to operational commitments with little notice. USCINCPAC is the operational commander for the forces assigned in the region. Individual service commands, such as the Navy's Pacific Fleet Command (CINCPACFLT), provide forces to the operational commander for employment. That employment may range from simply force presence to a spectrum of response contingencies including disaster relief, limited regional conflict, and major regional conflict. Each service component and the operational command staff have specific roles to fulfill in the potential employment spectrum. These must continuously be sustained and tested in training to maintain the required operational capabilities in the Western Pacific. Readiness forces conduct their training and exercises in or near their areas of responsibilities so that they may rapidly respond to actual contingencies should they occur when in a training posture. The missions and capabilities of the commands and organizations that train in the Marianas include:

1.2.3.1 Non-Guam-based Commands and Organizations

The **headquarters element** of a transient force is normally comprised of a task force commander and supporting staff responsible for planning operations, communicating with all assigned forces, expeditiously displacing to designated locations, assuming command of assigned forces, and executing operations as directed by higher headquarters. This headquarters must be able to maneuver its forces, employ them to achieve assigned missions, and take protective measures against hostile action.

The **Aircraft Carrier Battle Groups** originate in CONUS and Japan for deployment in Southwest Asia or the Western Pacific and Indian Ocean. These forces operate in and transit through the Marianas region in response to operational deployment requirements and consist of aircraft carriers and their associated surface combatant ships. Aboard the carriers are composite air groups composed of fighter, attack, electronic countermeasures aircraft, and helicopters. Capabilities to be maintained include the entire spectrum of naval aviation warfare, including air-to-ground delivery of ordnance, air-to-air interception and combat, surveillance of airspace, surface-to-air combat, and surface naval gunfire by the carrier's escort vessels.

Amphibious Ready Groups and **Marine Expeditionary Units** (Navy ARGs and Marine MEUs) form and train as a team, and then sail from CONUS, Hawaii, and Japan. These amphibious forces consist of amphibious ships, command and control ships, and surface combatant vessels. Amphibious forces include amphibious assault ships which operate as small aircraft carriers with well-decks capable of supporting helicopter and vertical short take-off and landing (VSTOL) attack aircraft and amphibious landing craft and vehicles. These forces, often employed with CVBG's, have the capability for forcible entry to a hostile shore. They employ air-to-surface and surface-to-surface ordnance delivery, perform amphibious landings using assault amphibious vehicles (AAV) or air-cushion landing craft (LCAC), and perform infantry, mechanized, artillery, engineering, and logistic operations ashore. These multipurpose, immediate response forces also provide a range of humanitarian and evacuation operations other than warfare. The nucleus of a MEU is normally an infantry battalion, reinforced with supporting arms and air-ground mobility assets.

Special Operations Command, Pacific (SOCPAC) has its headquarters in Hawaii and forces prepared for crisis response stationed in CONUS, Japan, Okinawa, and Korea. The 353rd Special Operations Group (SOG) is composed of three Special Operations Squadrons (SOS), an Operational Support Squadron (OSS), and a Special Tactics Squadron (STS), all of which train in the Mariana Islands. SOCPAC also deploys elements of the 1st Battalion, 1st Special Forces Group stationed on Okinawa by USAF tactical airlift squadrons (the 374th and 36th) from Japan to the Marianas for training in small unit patrolling, reconnaissance, and airborne/airmobile operations. USAF airlift is also provided to elements of the U.S. Army stationed in Hawaii and Alaska to participate in USCINCPAC sponsored exercises in the Marianas.

Navy Maritime Patrol Aircraft conduct unilateral and multilateral undersea warfare, surface warfare, maritime interception operations, sea surveillance and control, search and rescue (SAR) training, and actual SAR missions with detachments supported by Andersen Air Force Base (AAFB).

The **Air Combat Command** (ACC) has strategic bombing elements stationed in CONUS but assigned to USCINCPAC for employment under certain contingencies. These forces include B-52, B-1, and B-2 bombers, which fly from bases in CONUS directly to target areas in the region, or deploy from CONUS bases to regional bases such as AAFB for arming and further deployment to the area of operation. These aircraft deliver ordnance to ground targets from either high level or low level, and employ both area and precision-guided munitions.

1.2.3.2 Guam-based Commands and Organizations

The **13th Air Force**, stationed at AAFB, is responsible to Commander, Pacific Air Forces (PACAF) to plan, execute, and control aerospace operations throughout the Southwest Pacific and Indian Ocean area of responsibility. The 13th AF provides USCINCPAC a combat-ready, deployable staff to direct joint/coalition contingency operations. The 13th AF ensures that assigned combat forces are effectively employed and logistically supported and maintains military relationships with regional partners.

The **36th Air Base Wing** (ABW) hosts wing support to more than 7,000 military, civilian, and dependent personnel at AAFB. Support is provided to 13th Air Force, various Air Force supporting squadrons, and one U.S. Navy helicopter squadron (HC-5). The 36th ABW maintains

the manpower, facilities, and equipment infrastructure needed to support tactical/strategic peacetime/wartime operations. It provides personnel and equipment for generation, mobilization, deployment, and employment in support of USCINCPAC operation plans. AAFB is a major transportation complex in the Pacific, responsible for supporting most training organizations transiting the Marianas.

Commander Naval Forces Marianas (COMNAVMARIANAS) is a regional commander responsible for operations and training at all Navy-controlled training areas and for services available in the Marianas. As the USCINCPAC representative, COMNAVMARIANAS coordinates joint service use of training areas and facilities. These include a shore bombardment, strafing and aerial bombing range at FDM, a military lease area on Tinian, and Orote Point, Inner and Outer Apra Harbor, Waterfront Annex, Ordnance Annex, and Communications Annex properties on Guam. COMNAVMARIANAS also coordinates Navy and Marine Corps use of training areas managed by 36th ABW at AAFB.

Stationed at and supported by AAFB, the Navy's **Helicopter Combat Support Squadron FIVE** (HC-5) has multiple missions in the Pacific and Indian Ocean areas of responsibility. The squadron provides aircraft detachments for vertical replenishment, vertical on-board delivery, amphibious search and rescue (SAR), utility services in support of Seventh Fleet and Commander U.S. Navy Central Command, and administrative and logistics support, airborne firefighting support, and 24-hour SAR services for Guam and the CNMI. The squadron is the primary maneuver training support squadron to ground forces in the Marianas conducting airborne and airmobile operations.

Explosive Ordnance Demolition Mobile Unit FIVE (EODMU-5), stationed at the Waterfront Annex, is responsible for detecting, disarming or otherwise neutralizing/rendering safe, and disposing of explosive ordnance. They perform their mission under both tactical and administrative circumstances, both on land and in the water. EODMU-5 performs counter-mine warfare (mine countermeasures of MCM) and detects and neutralizes naval mines under water through detonation with charges up to 20 pounds of explosives. Stationed in an area still affected by the presence of World War II unexploded ordnance (UXO), EODMU-5 shares clearing responsibilities with USAF EOD personnel throughout the Marianas.

Naval Special Warfare Unit ONE (NSWU-1), stationed at the Waterfront Annex, consists of permanently assigned staff as well as SEAL platoons and a Special Boat Detachment on six-month deployment rotation. These forces deploy frequently to provide special operations capability to Commander, U.S. Seventh Fleet (COMSEVENTHFLT) and Commander, Special Operations Command, Pacific (COMSOCPAC). NSWU-1 is responsible for maintaining the battle readiness of each platoon for immediate deployment. Training requirements include skills needed for numerous air and sea mobility options and special reconnaissance, unconventional warfare, close quarter battle, foreign internal defense, direct action, and other special operations.

Naval Computer and Telecommunications Master Stations (NCTAMS) operates long-range receiving and transmitter communications at Communications Annexes Finegayan and Barrigada. Training primarily remains technically oriented and on-station for NCTAMS personnel. A known-distance small arms firing range (KD range) at Finegayan is made available for weapons requalification by other U.S. Navy units. Both annexes have areas that are available to ground units for conducting small unit tactics, scouting and patrolling, and land navigation.

NCTAMS Finegayan has a beach suitable for insertions by special operations and reconnaissance teams for subsequent training in the Air Force's Northwest Field.

Naval Mobile Construction Battalion (NMCB) personnel, better known as Seabees, are assigned to Camp Covington. In addition to permanent detachments that operate the camp and its facilities, one NMCB battalion rotates to Camp Covington from CONUS every seven months to conduct training in terrain, climate, and environment similar to those expected when responding to contingencies or disasters in the Pacific. The training stresses construction skills as well as tactical proficiency, command/control and communications, defensive tactics, convoy security and patrolling, and small arms qualification. (As an example of maintaining readiness in preparation for contingencies anywhere on the globe, two Seabee battalions that deployed to Bosnia received their tactical training during Guam deployments.) Training requirements are fulfilled on U.S. Navy and USAF bases on Guam, reducing costs to transport personnel and equipment to more distant training locales.

Guam Army National Guard (GUARNG) and **U.S. Army Reserve Marianas** (USAR-Mar) forces are assigned to Guam (with one reserve platoon on Saipan), conducting tactical training one weekend per month, during two-week annual training duty (ATD), and during joint exercises on Guam every two years. Although ATD may provide an opportunity to train away from the Marianas, the units are responsible for accomplishing all individual skills and unit-training requirements at home stations. Since home armories and reserve training centers have limited space, the units use Navy and Air Force facilities to conduct field maneuvers and firing range training. There are five GUARNG units and three USAR-Mar units based on Guam. (Three of the Reserve units are "round-out" units to U.S. Army units, meaning that their training readiness must support a call-to-active duty and deployment within 30 days. Two were activated and deployed to Desert Storm.)

1.2.3.3 Maritime Prepositioned Forces

Maritime Prepositioning Squadrons (MPS) are readily available to support CINCPAC. Manned by U.S. Merchant Marine crews, each squadron's ships provide equipment and supplies for Marine and Army forces based outside of the region. Two squadrons assigned to support U.S. Marine forces are respectively located in Diego Garcia, British Indian Ocean Territories, and in the Mariana Islands. In times of crisis or in training for such events, the MPS ships will deploy to a benign port, as the personnel assigned to Marine Expeditionary Brigades from California or Hawaii fly into the region unburdened by heavy equipment and supplies. The ships are offloaded and the transported combat vehicles, weapons, and other materials are issued to the flown-in units, who then prepare for a tactical lift to the area of conflict. Rapidly deploying these MPS ships and their associated organizations, and unloading the equipment and supplies at a benign port for issue are major components of MPS exercises.

1.3 TRAINING LOCATIONS

1.3.1 Site Selection Criteria

The availability of reasonable alternative locations for military training is dependent on numerous parameters associated with training activities. Primary among these are the required

levels of training, training frequencies, proximity to areas of potential employment for operations, and cost.

- The **levels of training** conducted in the Marianas range from individual combat and technical skills, through small unit training, to large-scale, force level exercises. Individual skills training includes such tasks as marksmanship, operating assigned equipment under field conditions, and learning to survive in a combat environment. Tactical training focuses on team performance, from ship and aircraft crews to gun crews and infantry maneuver elements. Training for these elements focuses on coordinated interactions, communications, sensing the tactical environment, and appropriately responding to various levels of threat. Force level training occurs when all elements of an assigned force are brought together to carry out a particular mission. These exercises focus on logistics, communications, and command and control, as well as a demonstration of all the foregoing levels of training. Often this level integrates Navy, Marine, Army, and Air Force components, as well as integrating forces from allied nations.

- **Training frequencies** vary based on units' mission requirements, but essentially no more than 260 days of each year are available for scheduled training with most events planned for the home station or at sea. Response to real-world contingencies could increase training frequencies for Guam-based and transient units beyond the 260-day training year. Individual skills and unit tactical training is routinely conducted to maintain proficiency, and must be conducted in a manner that permits the training units to meet their assigned responsibility for regional contingencies as members of a larger force. Since the members of these units change every one or two years, new members are continuously being integrated into unit operational procedures. Task force exercises may be performed on a scheduled basis, the frequency of which depends on the particular purpose and composition of the exercising element. For example, each Navy/Marine Corps ARG and MEU is required to exercise several times during each six to seven month deployment cycle to sustain mission response capabilities. Larger exercise forces assembled from the USCINCPAC elements may only exercise in the Marianas every other year, such as in Tandem Thrust.

- **Proximity** to areas where the training organization or command may be employed in a rapid response to world events is necessary for deployed units with contingency response missions or those assigned to USCINCPAC for regional missions. Training is conducted in the Marianas for California and Hawaii-based regional response forces, remaining available for rapid operational employment if they should be called during a training event. Training in the region integrates strategic, tactical, and logistics deployment training for forces assigned for deployment in the Western Pacific and Indian Ocean.

- **Costs** of training include both direct dollar expenses of transportation and supplies, as well as administrative overhead to arrange for the training events. The administrative effort required to arrange for training is an important but hidden cost to smaller units, because they have limited resources to arrange for training at distant or difficult to reach locations. The logistic expense of transporting the training element to and from the training area is a direct dollar cost of individual training events and is generally only warranted over long distances for exercises which have specific contingency mission response objectives. The cost of acquiring and maintaining the training areas that are suitable for the types of training to be conducted are independent of the individual training events. The more frequent the training needs, such

as for individual skills and small unit training, the more efficient and readily available training areas must be to remain cost effective.

Considering these parameters, to be reasonable alternatives for meeting training needs, training site characteristics including being:

- Routinely available on a schedule that meets training frequency needs of units assigned to regional missions.
- Available at an efficient cost.
- Suitable in size, terrain, and location to allow the variety of training necessary to meet training proficiency requirements for assigned forces and missions.
- Located primarily on military-controlled (owned or leased) lands, or lands on which the appropriate military headquarters has land use rights for training.
- Located on U.S.-controlled lands, or lands on which the United States has rights to conduct training without recourse to negotiations at the diplomatic level, or on lands in which training would not cause diplomatic destabilization.
- Located in the theater of operations such that training and exercises accomplish the multiple objectives of USCINCPAC's security strategy including presence, continued crisis response posture, and deterrence through demonstrated response capability in the region.

1.3.2 Alternative Training Sites Outside the Region

Possible training areas outside the Marianas that have potential to meet some or all of the foregoing training criteria are evaluated below. In general, these potential training areas do not provide reasonable alternatives for training in the Marianas for the reasons stated.

Republic of the Philippines. Prior to 1993, the United States military conducted training operations in the Philippines on ranges and maneuver areas associated with Clark Air Base and Naval Station, Subic Bay. With the closure of these bases and the lack of a Status of Forces Agreement with the Philippines government, potential training areas in the Philippines no longer meet any of the criteria outlined above.

Japan. A few training areas in Japan, including Okinawa, are available for use by U.S. forces primarily stationed in Japan. These training areas include some maneuver areas, limited amphibious landing areas, and some live-fire ranges for individual and crew-served weapons. Some areas are managed by U.S. military commands and others are managed by and shared with the Japanese Self-Defense Force. As a rule, these areas are small and constrained, with their training value impaired by encroachment over the years. For Okinawa-based forces, training areas and ranges are sufficient for most individual-level and small tactical unit-level training. However, MEU-sized landing areas are not available, and weapons ranges are primarily limited to small arms requalification and do not accommodate surface naval gunfire or air-to-surface ordnance. For other than individual skills training, and particularly for ARG/MEU and CVBG training, Japan does not meet the training area criteria outlined above.

Republic of Korea. The Republic of Korea has permanently stationed American forces, primarily for defense of the Republic of Korea. These forces are not normally deployed outside of Korea for training, and adequate training areas exist in Korea for maintaining their mission response capabilities. However, for diplomatic reasons and concerns that military exercises not become a destabilizing influence, transient military forces no longer routinely train or are severely limited in numbers participating and training frequency. Under these conditions, Korea does not provide alternative training areas that meet the required criteria.

Hawaii. Training areas located on Kauai, Oahu, and the Big Island of Hawaii are designed to meet specific service training requirements. The Hawaii Military Land Use Master Plan (HMLUMP) has identified the capabilities and limitation of available training areas. In terms of acreage and characteristics, no training site is suitable for the full integration of multi service training.[3] The islands are not located in the Western Pacific which increases reaction time for any force training in Hawaii to meet the USCINCPAC security strategy of forward presence for rapid crisis response and deterrence. The movement of forward-deployed forces back to Hawaii for training is estimated to double U.S. Seventh Fleet fuel costs.

Deployment Areas. Some of the transient forces that train in the Marianas do so while en route to deployments in the Persian Gulf and Southwest Asia. These are primarily the CONUS-based CVBGs and ARG/MEUs. The Marianas are the farthest west-positioned U.S. military training area available for sustainment training, since there are no U.S. military training areas for these forces in the Persian Gulf area. Farallon de Medinilla represents the last available surface and aerial bombardment range routinely available for U.S. Forces operating in the Western Pacific, Indian Ocean, and Persian Gulf. There are no others meeting the criteria above. U.S. forces in conjunction with other allied nations conduct exercises on foreign soil—for example, Australia and Thailand—but such combined exercises are infrequent, expensive, and do not meet the routine readiness training needs of forces assigned in the Western Pacific.

1.4 MARIANA ISLANDS TRAINING LANDS

The U.S. military owns or controls land on Guam, Tinian, and FDM. The U.S. presence in the Marianas dates back to the Spanish-American War and was consolidated during and after World War II.

1.4.1 History of the U.S. Military in the Mariana Islands

As a result of the Spanish-American War, Guam became a U.S. possession under U.S. Navy jurisdiction. Guam served as a location for refueling and radio communication, with a contingent of Marines assigned in the late 1930s. One of the Navy's missions was intercepting Japanese radio transmissions from Micronesian islands. The German colonies in Micronesia north of the equator became a mandate of Japan as a consequence of Japan's declaration of war against Germany in 1914. Toward the end of the 1930s, the Japanese developed airfields, seaplane bases, and defensive positions on Saipan, Tinian, and Rota. World War II arrived in Guam on December 8, 1941, with Japanese aerial bombardment of Guam villages from Saipan-based

[3] Pacific Division, Naval Facilities Engineering Command (July 1995) *Hawaii Military land Use Master Plan.*

aircraft. Japanese amphibious assault landings at Tumon and Aporguan led to the defeat of the insular Force Guard and the beginning of two-and-one-half years of Japanese occupation.

In August 1942, the Allies initiated an island-hopping campaign to drive the Japanese from Pacific islands that they occupied. American aircraft carrier-based forces first invaded the Marianas in February 1944. Saipan was invaded by U.S. forces on June 15, 1944, and secured by the Second and Fourth Marine Divisions on July 9. The invasion of Guam began on July 21, 1944, with the Third Marine Division landing at Asan and the First Provisional Marine Brigade and the Army's 77th Infantry Division landing at Agat. On July 24, the Fourth Marine Division landed on Tinian (see photos on covers of Chapters Two and Three). Tinian was declared secure on August 1, 1944; Guam was declared secured ten days later (cover of this chapter). Rota, Aguijan, and islands north of Saipan were not invaded. Instead, their Japanese defenders were shelled, bombed, and bypassed. Massive construction on Guam, Tinian, and Saipan transformed the islands into the sites of major U.S. military airfields and ports needed to continue the war effort. Guam's Northwest Field, Tinian's North and West Fields (cover of Chapter Four), and Saipan's Isley Field were constructed in minimum time to support bombing missions in preparation for the invasion of mainland Japan.

At the end of World War II, all of the Marianas came under the control of U.S. military forces. In 1946, the Military Government of Guam was reestablished as the Naval Government of Guam, and the Navy was allowed to acquire private lands. In August 1950, the Organic Act of Guam gave its people American citizenship. Postwar control of the Northern Marianas passed to the United Nations Trust Territory of the Pacific Islands (TTPI) on July 18, 1947, under U.S. administration. The Department of the Interior took jurisdiction from the U.S. Navy in July 1951. Within one year, control was passed back to the U.S. Navy for the Northern Marianas (less Rota), as the Central Intelligence Agency commenced training Chinese Nationalists at camps established on Saipan and Tinian.

The Northern Mariana Islands were returned to the jurisdiction of the Department of the Interior in May 1962. The TTPI had been divided into six districts; the Mariana Islands (less Guam) were one such district. By 1964, negotiations began regarding the future political status of the Northern Marianas. In February 1975, the Covenant to Establish a Commonwealth of the Northern Mariana Islands in Political Union with the United States of America was signed. The Northern Marianas delegation achieved their main objectives of U.S. citizenship, economic development, control over their internal affairs, and a smooth transition. American military needs were met; FDM was designated as a Navy-managed target range, the military acquired use of a portion of Tanapag Harbor and joint use of Isley Field on Saipan, and a military lease area was established on Tinian. The northern two-thirds of Tinian was planned to support an Air Force and Naval base, and the southern one-third was returned to civilian use.

1.4.2 DoD Land in the Marianas

The DoD owns or otherwise controls lands on three islands in the Marianas: Tinian, Guam, and FDM. The affected land areas are shown in Figures 1-2 and 1-3 and acreage and use listed in Table 1-1.

Tinian. Training land on Tinian is leased by the U.S. from the CNMI, pursuant to the technical agreement to the 1975 Covenant which made the Mariana Islands District of the Trust Territory of the Pacific Islands a Commonwealth of the United States. Related documents signed between 1975 and 1994 established the current land use configuration (see Figure 1-2 and Appendix O). The Military Lease Area (MLA) consists of an 8,415-acre (3,408 hectare) Exclusive Military Use Area (EMUA) in the north and a 7,429-acre (3009-hectare) Leaseback Area (LBA) in the south. The EMUA is controlled by the military, with civilian and tourist access permitted except during certain training activities. The LBA, which includes West Tinian Airport, may be used by the CNMI and its sub-lessees for agriculture, grazing, and other purposes expressly permitted by the U.S. (provided such uses are compatible with Federal Aviation Administration [FAA] safety zone requirements for the airport area). The U.S. may train in the LBA, subject to written notification of CNMI, and has agreed to minimize interference with civilian activity at West Tinian Airport.

The U.S. has also retained the following rights in the village of San Jose and the harbor area:

- The right to moor vessels, handle cargo, stage equipment and materiel, and conduct other port-related activities at Tinian Harbor
- The right to temporarily secure and use portions of the area on a not-to-interfere basis to conduct military training exercises or to perform activities in support of military training exercises
- The right to install, operate, and maintain fuel and utility lines from Tinian Harbor over CNMI lands to serve areas in the MLA

A 790-acre (320-hectare) portion of the EMUA has been allotted to the International Broadcasting Bureau (IBB) Mariana Transmitting Station (see Figure 1-3).[4] Training does not occur on the IBB parcel to avoid any electromagnetic radiation hazard to personnel (HERP) and interference with the IBB mission.

Guam. The Guam Land Use Plan, 1994 (GLUP 94) indicates that the DoD owned approximately one-third of all land on Guam as of 1994. Approximately 25 percent of this land has been proposed for release and/or has been released under the Base Realignment and Closure (BRAC) program. Both Air Force and Navy properties have been considered for release, but the BRAC 95 decision ratified by the U.S. President and the Congress in September 1995 includes only 2,800 acres of Navy land. The BRAC release affects but does not eliminate training conducted at the Waterfront Annex and Ordnance Annex[5] and the Communications Annex at Barrigada.

[4] This is a United States Information Agency, International Broadcasting Bureau (IBB), Voice of America (VOA) facility.

[5] Formerly referred to as U.S. Naval Complex, Guam (or Naval Station, Guam) and Naval Magazine, Guam (or NAVMAG).

TABLE 1-1: MILITARY-CONTROLLED LANDS USED FOR TRAINING

LOCALE	LAND AREA)		PRIMARY FUNCTION
	ACRES	HECTARES	
Leaseback Area (Tinian)	8415	3408	Military training support
EMUA (Tinian)	7429	3009	Military field and aviation training
Ordnance Annex	8840	3580	Ordnance storage, operations, administration, training, and support
Waterfront Annex	4479	1813	Support to the Fleet and Naval operations on Guam
AAFB Main Base	11050	4475	Aviation support to military operations in the Western Pacific
AAFB Northwest Field	4562	1848	Ground and aviation training
Andersen South	1922	778	Field training and maneuvers
Communications Annex Finegayan	2952	1200	Receiver facility and communication center
Communications Annex Barrigada	1848	748	Transmitter facility (15 acres leased for tactics and land navigation).
Farallon de Medinilla	206	83	Aerial bombardment and naval gunfire

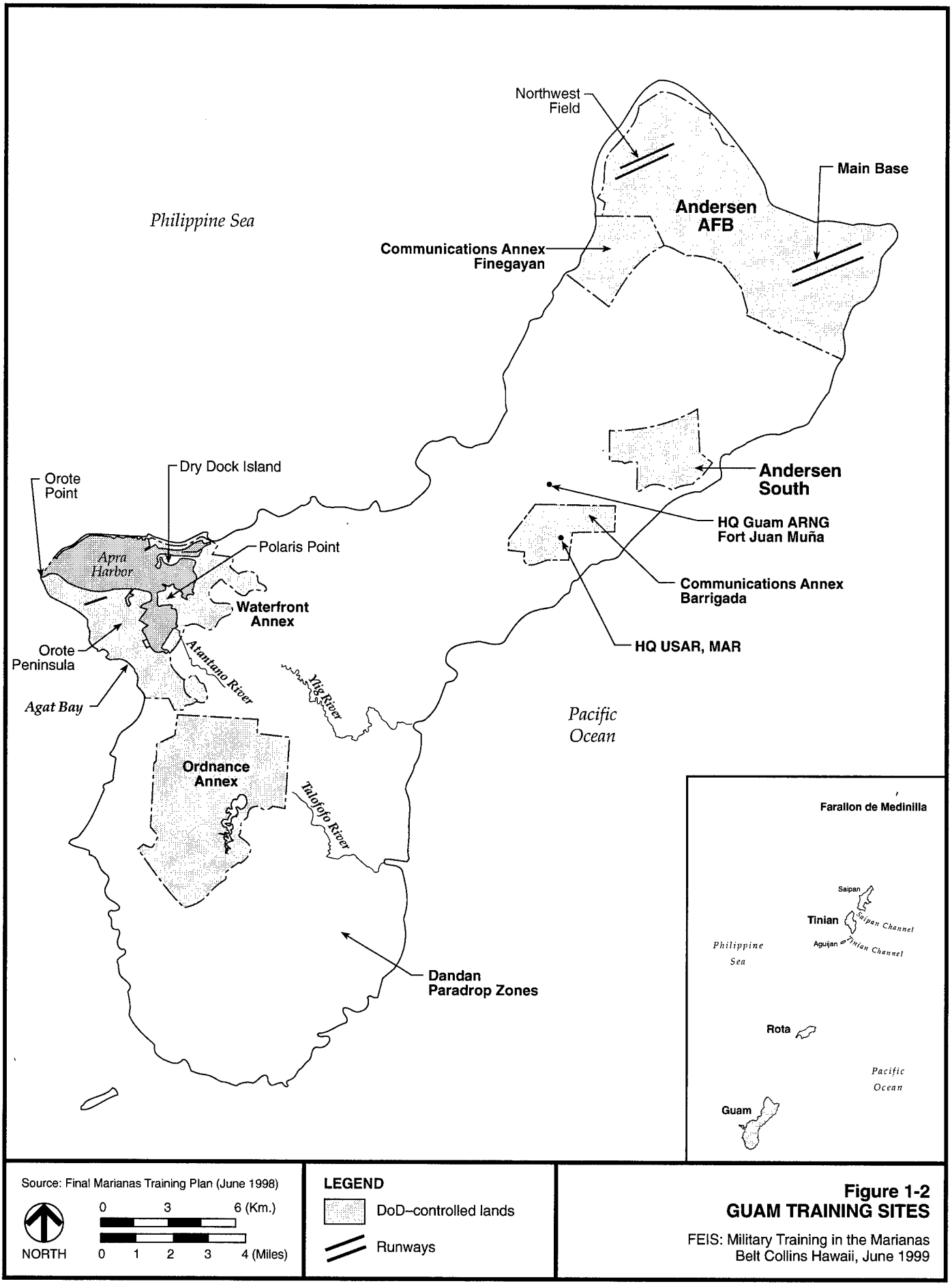
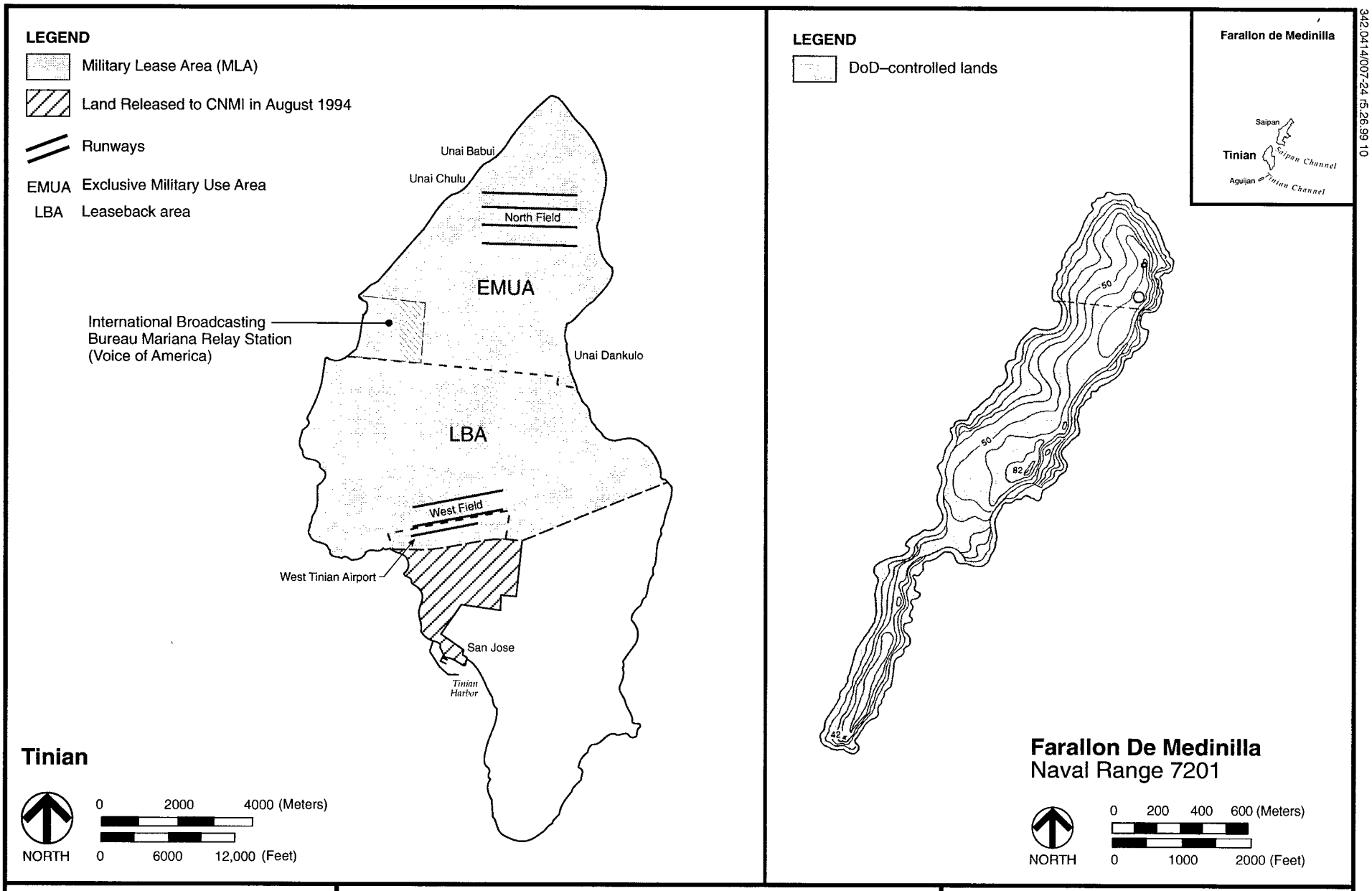


Figure 1-2
GUAM TRAINING SITES

FEIS: Military Training in the Marianas
Belt Collins Hawaii, June 1999



342.0414/007-24 r5.26.99 10

Figure 1-3
TINIAN & FDM TRAINING SITES

FEIS: Military Training in the Marianas
Belt Collins Hawaii, June 1999

Other training areas on Guam unaffected by BRAC decisions include Communications Annex Finegayan and AAFB. Andersen South has been proposed to be excess to USAF needs and the land may ultimately be conveyed.

FDM The Covenant with the CNMI and related documentation also provided for use of the uninhabited island of FDM as a target for aerial gunnery and naval bombardment. The DoD controls access to and airspace around the island.

Certain natural and man-made constraints exist at each of the training areas considered in this EIS. Such constraints affect the training options that are available to exercise planners and unit commanders operating in the Marianas. These limitations affect the types of training that can be conducted within a given area, the size of exercise forces, types of equipment that may be used, and the exercise schedule.

1.4.3 Non-DoD Training Lands

Tinian. Covenants with CNMI provide for training rights in areas other than the MLA (see Appendix O). During major exercises, use of village facilities has been negotiated. West Tinian Airport and San Jose Harbor are used in support of military training. The airport is often used to administratively transport personnel and equipment from Guam and what cannot be delivered by air is often brought ashore by landing craft from ARG ships.

Rota. NSWU-1 uses its rigid-hulled, inflatable boats (RHIBS) to transport SEAL teams from Guam as far north as FDM for training. CNMI and Rota municipal authorities provide a site in Songsong's West Harbor for boat refueling and maintenance and use of the adjacent Angyutan Island for bivouac.

Guam. Two parachute drop zones ("Casper" and "Ghost") are surveyed in Dandan and used primarily by the Guam Army National Guard with permission by the landowner.

1.4.4 Training Land Administration

COMNAVMARIANAS is the controlling and scheduling authority for Navy-managed training areas and Navy support services available in Guam and the CNMI. It coordinates Navy/Marine Corps unit requests to use Air Force training lands, as necessary. As the USCINCPAC Representative for Guam, the Commonwealth of the Northern Mariana Islands, Federated States of Micronesia, and Republic of Palau, COMNAVMARIANAS also coordinates combined and joint-service uses of Guam/CNMI training areas and facilities. This responsibility includes maintaining a shore bombardment range at FDM and submarine and antisubmarine warfare operating areas on the open sea, as well as the military land maneuver training areas on Guam and Tinian that are the focus of this EIS. COMNAVMARIANAS is also responsible for managing the use of non-DoD lands that may be made available to Navy and Marine Corps units for military training. A description of Fleet operating areas and training facilities has been published as direction for units requesting training in COMNAVMARIANAS' area of responsibility.

36 ABW is the controlling and scheduling authority for Air Force-managed training areas and services available on Guam. 36 ABW is responsible for providing training support at AAFB for units in transit for off-island training. Formalized exercise request procedures are published and are followed by all military services requesting use of Air Force training areas.

Other senior commands are responsible for identifying and coordinating training requirements within COMNAVMARIANAS/36 ABW areas of responsibilities. The U.S. Army's training needs are coordinated by Commander, U.S. Army Pacific (USARPAC), Fort Shafter, Honolulu, Hawaii. The staff of Headquarters, IX Corps in Honolulu, Hawaii, coordinates training requirements of U.S. Army Reserve-Marianas. The staff of Headquarters Regional Support, Guam Territorial Area Command, at Fort Juan Muña, Tamuning, Guam, is responsible for coordinating training requirements for the Guam National Guard. U.S. Marine Corps training requirements are coordinated by either Headquarters, III MEF in Okinawa, Japan, or Headquarters, I MEF at Camp Pendleton, California. Headquarters, PACAF coordinates training requirements submitted by USAF organizations in the Pacific and CONUS.

1.4.5 Existing and Proposed Training Land Requirements

The MTP identifies training requirements by individual organization, estimating typical training unit size and normal training frequency, and the training areas presently used or proposed for use. The MTP was developed from training mission statements provided by each military service permanently assigned to the Mariana Islands for training or frequently directed to the Marianas for training.

The content of the MTP is summarized in Table 1-2. Training areas presently in use for training are shaded; "prop" identifies proposed training areas for specific activities. The numbered notes in the columns are defined at the end of the table.

TABLE 1-2: MARIANAS TRAINING PLAN REQUIREMENTS—EXISTING AND PROPOSED TRAINING

TRAINING UNITS, AUTHORIZED STRENGTHS, AND TRAINING UNIT SIZE		TRAINING ACTIVITY AND TYPICAL TRAINING FREQUENCY		TINIAN			COMNAVMARIANAS						AAFB			FARALLON DE MEDINILLA	GUAM NON-DOD LAND	ROTA NON-DOD LAND
				EMUA	MLA	NON-DOD LAND	INNER HARBOR	OUTER HARBOR	WATER FRONT ANNEX	ORDNANCE ANNEX	FINEGAYAN	BARRIGADA	MAIN BASE	NORTHWEST FIELD	ANDERSEN SOUTH			
				SHADED BLOCKS IDENTIFY ONGOING TRAINING. "PROP" IDENTIFIES THE NEW TRAINING INITIATIVES														
EODMU FIVE	10	Improvised Explosive Device	Bimonthly						Note: 1	1	1							
200Personnel;detachments of 8 is norm for training elements	8	Mixed Gas SCUBA Diving	Bimonthly						Dadi									
	24	Parachute Operations	Bimonthly						Agat DZ								2	
	24	Helicopter Cast and Recovery (over water)	Bimonthly						Agat DZ									
	24	Helicopter Rope Suspension Training: Fast Rope, SPIE, Rappel	Bimonthly														2	
	12	Patrolling, Land Navigation, and Maneuver	1 day/ month															
	24	Small Arms Fire (9 mm, M-16, M-203 Training Projectile)	4 days/ month															
	12	Communications																
	24	Deepwater Demolition Training 10-20# charges	Monthly						PROP at Dadi									
	12	Recompression Operator Training (chamber deployable)	Monthly															
	24	Floating Mine Neutralization	Monthly					Open Ocean	Agat DZ									
HELICOPTER COMBAT SUPPORT SQUADRON HC-5	14	Demolition Pit Training	3 days/ month															
350 Personnel and 15 helos in squadron. 2-5 helos on home guard. Remaining helos are deployed on Navy ships.	18	Lift for Airborne (parachute) Operations (1-2 helos)	5 to 10 per month			DZ east of Airport											2	
	18	Lift for Fast Rope or SPIE	5 to 10/ month			DZ east of Airport											2	
	2 helo	NVG Training	5 to 10/ month															PROP 5

Table 1-2: Marianas Training Plan Requirements—Existing and Proposed Training (*continued*)

TRAINING UNITS, AUTHORIZED STRENGTHS, AND TRAINING UNIT SIZE		TRAINING ACTIVITY AND TYPICAL TRAINING FREQUENCY		TINIAN			COMNAVMARIANAS						AAFB			FARALLON DE MEDINILLA	GUAM NON-DOD LAND	ROTA NON-DOD LAND
				EMUA	MLA	NON-DOD LAND	INNER HARBOR	OUTER HARBOR	WATER FRONT ANNEX	ORDNANCE ANNEX	FINEGAYAN	BARRIGADA	MAIN BASE	NORTHWEST FIELD	ANDERSEN SOUTH			
				SHADED BLOCKS IDENTIFY ONGOING TRAINING. "PROP" IDENTIFIES THE NEW TRAINING INITIATIVES														
	1 helo	Drone Recovery	Monthly							3								
	1 helo	Firebucket Training w/Federal Fire Department	Quarterly							3								
NAVSPECWARUNIT ONE (NSWU-1) (SEALs) **NOTE: 13**	1-2 helo	Confined Area Landings and/or Simulated LHA Landing	Daily															
Platoons of 16 augmented with RHIB	1 helo	Search-and-Rescue Training	1 flight/day														4	
	20	Over-the-Beach Insertions **NOTE 6**	3 days/ quarter															
	16	Combat Swimmer Raids **NOTE 6**	2 weeks/qtr															
	16	Shallow Water Mine Countermeasures	7 days/ quarter															
	16	Land Navigation	10 days monthly															
	16	Field Maneuvers w/blank firing	2 weeks/ month															
	8-16	Patrolling	2 weeks/ quarter															
	16	Fire-and-maneuver Small Arms Range	3 weeks/ quarter	PROP					PROP									
	16	Stress Course (Firing Range)	3 weeks/ quarter						PROP									
	All	KD Small Arms Requalification.	Annual															
	16	7.62 mm KD Sniper Range	5 days/ month															
	16	7.62 mm Unknown Distance Sniper Range	3 days/ month							PROP								

Table 1-2: Marianas Training Plan Requirements—Existing and Proposed Training (*continued*)

TRAINING UNITS, AUTHORIZED STRENGTHS, AND TRAINING UNIT SIZE		TRAINING ACTIVITY AND TYPICAL TRAINING FREQUENCY		TINIAN			COMNAVMARIANAS						AAFB					
				EMUA	MLA	NON-DOD LAND	INNER HARBOR	OUTER HARBOR	WATER FRONT ANNEX	ORDNANCE ANNEX	FINEGAYAN	BARRIGADA	MAIN BASE	NORTHWEST FIELD	ANDERSEN SOUTH	FARALLON DE MEDINILLA	GUAM NON-DOD LAND	ROTA NON-DOD LAND
				SHADED BLOCKS IDENTIFY ONGOING TRAINING. "PROP" IDENTIFIES THE NEW TRAINING INITIATIVES														
	16	Jungle Trail Range	1 week/ month							PROP								
	16	Close Quarter Battle (TRUE)	1 week/ month															
	16	Breacher Trainer	2 days/ month	PROP														
	16	Live-Firing from RHIB (40mm,.50 cal, AT-4)	2 weeks/qtr															
	16	Water Paradrops)	8 hours/ month						Agat DZ									
	16	Helicopter Insertions by "Fastrope"	20 hours/ quarter														2	
	16	Short Field Runways for MC-130 Spec Ops A/C	10 hours/ month															
	8-10	Tactical Air Control Party	Monthly													PROP		
	16-20	Shallow Underwater Demolition	7 days/ month						PROP									
	16-20	Combat Scaling	4 times per year															
NAVAL MOBILE CONSTRUCTION BATTALION (Seabees)	16-20	Riverine Training	3 weeks/ quarter														PROP 12	
	16-20	Forward Staging Base	7 days/ month			7												7
NAVAL ACTIVITY: SECURITY DEPT. 220 Personnel plus 130+ auxiliary force	400	Battalion Field Exercise: Command, Control, and Communications	2 10-day periods/ year															
	400	Defensive Tactics, Convoys and patrols, Construction Skills	Daily															
	220	Small Arms Requalification	Semi-annual															

Table 1-2: Marianas Training Plan Requirements—Existing and Proposed Training (*continued*)

TRAINING UNITS, AUTHORIZED STRENGTHS, AND TRAINING UNIT SIZE		TRAINING ACTIVITY AND TYPICAL TRAINING FREQUENCY		TINIAN			COMNAVMARIANAS						AAFB			FARALLON DE MEDINILLA	GUAM NON-DOD LAND	ROTA NON-DOD LAND
				EMUA	MLA	NON-DOD LAND	INNER HARBOR	OUTER HARBOR	WATER FRONT ANNEX	ORDNANCE ANNEX	FINEGAYAN	BARRIGADA	MAIN BASE	NORTHWEST FIELD	ANDERSEN SOUTH			
				SHADED BLOCKS IDENTIFY ONGOING TRAINING. "PROP" IDENTIFIES THE NEW TRAINING INITIATIVES														
	220	Security Alert Scenarios	3 scenarios monthly per 3 shifts						8	8	8	8						
	130	Ground Defense Force	3 scenarios monthly per 3 shifts															
	20	Explosives Detection (Military Working Dogs)	Twice weekly															
FEDERAL FIREFIGHTERS	Fire crew	Fire Response Training	Monthly															
COMMANDER 7th FLEET CARRIER BATTLE GROUPS, COMBATANT SHIPS		Fleet Carrier Landing Practice by Fixed Wing Squadrons	4-5 days/ quarter															
		Air-to-Ground Ordnance Drops	5 days/qtr															
USS Kitty Hawk and supporting ships		Naval Gunfire	Monthly															
AMPHIBIOUS READY GROUP AND MARINE EXPEDITIONARY UNIT	1300 to 1600	MEU(SOC) Landing and Field Exercise with 1300-1600 Marines	2-3 Weekly Exercises yearly															
ARG/MEU has more than 2500 personnel including 1300 to 1600 Marine and Sailors in the MEU	1300 to 1600	MEU(SOC) Special Operations	2-3 Weekly Exercises each year															
Fire Team=4 Company=150+ Battalion=600+	600	Amphibious Assault	2-3 Weekly Exercises each year															
Squad=13/Platoon=45 **Company+150+** Battalion=600+	500	Small Unit Tactics	2-3 Exercises each year															
	150-500	Small Arms KD Live Fire	"							PROP								
	70	Artillery Live Fire	"													PROP		
	60	Mortar Live Fire	"	PROP												PROP		

Table 1-2: Marianas Training Plan Requirements—Existing and Proposed Training (*continued*)

TRAINING UNITS, AUTHORIZED STRENGTHS, AND TRAINING UNIT SIZE		TRAINING ACTIVITY AND TYPICAL TRAINING FREQUENCY		TINIAN			COMNAVMARIANAS						AAFB			FARALLON DE MEDINILLA	GUAM NON-DOD LAND	ROTA NON-DOD LAND
				EMUA	MLA	NON-DOD LAND	INNER HARBOR	OUTER HARBOR	WATER FRONT ANNEX	ORDNANCE ANNEX	FINEGAYAN	BARRIGADA	MAIN BASE	NORTHWEST FIELD	ANDERSEN SOUTH			
				SHADED BLOCKS IDENTIFY ONGOING TRAINING. "PROP" IDENTIFIES THE NEW TRAINING INITIATIVES														
	120	Anti-Tank Live Fire	"													PROP		
	600	Small Arms Fire-and-maneuver	"	PROP					PROP									
	500	Shooting House	"	PROP														
	500	Breacher Trainer	"	PROP														
	120	Cliff Assaults	"															
	120-150	Rappel, Fast Rope & SPIE Insertions	"															
	12	Tactical Air Control	"													PROP		
	150	TRUE Training	"															
	150	Tactical Rescue Aircraft and Personnel	"															
	600	Airfield Seizure	"															
	250	Non Combatant Evacuation	"															
	50-150	LCAC Landings	"															
	400	LCU Landing	"			9												
	250	AAV Landings	"	PROP		9	PROP	PROP	PROP									
	175	Logistics Support	"															
	600	Bivouac	"			Field House												
	60	SCUBA/Combat Swimmer	"															
	60	Parachute Operations	"															
USAF 36 ABW	200	Attack Response Exercise	Semi-annual															
	200	Major Accident Response Exercise (MARE)	Monthly															

Table 1-2: Marianas Training Plan Requirements—Existing and Proposed Training (*continued*)

TRAINING UNITS, AUTHORIZED STRENGTHS, AND TRAINING UNIT SIZE		TRAINING ACTIVITY AND TYPICAL TRAINING FREQUENCY		TINIAN			COMNAVMARIANAS						AAFB			FARALLON DE MEDINILLA	GUAM NON-DOD LAND	ROTA NON-DOD LAND
				EMUA	MLA	NON-DOD LAND	INNER HARBOR	OUTER HARBOR	WATER FRONT ANNEX	ORDNANCE ANNEX	FINEGAYAN	BARRIGADA	MAIN BASE	NORTHWEST FIELD	ANDERSEN SOUTH			
				SHADED BLOCKS IDENTIFY ONGOING TRAINING. "PROP" IDENTIFIES THE NEW TRAINING INITIATIVES														
USAF 36 SG (Medical)	50	Mass Casualty Exercise	Quarterly						14									
USAF Engineer Squadron	150	MK Tool Set (1,2,3 Mod 5, 31,32)	Quarterly															
		Detonation and Burning	"															
		Landmines and Booby Traps	"															
		Base Recovery Operations	"															
		Ground Burst Simulations	"															
		UXO Access and Recovery	"															
		MDM Landmine Locator	"															
		Rapid Runway Repair	"											PROP				
		Tape and Line Procedures	"															
SPECIAL OPERATIONS COMMAND, PACIFIC 353rd Special Operations Group (See Note 15 for List of Squadrons)		MC-130 Airdrops	5 yearly using 8 A/C															
		Combined Force Aircraft Exercises	5 yearly with 13 A/C															
		HALO Support to SEALS	Monthly															
		Cargo Delivery System Drops	Major exercises															
		Assault Zone Training	Monthly															
		Night Vision Goggle Training	Monthly															
		CCT Team Training	Major Exercises															

Table 1-2: Marianas Training Plan Requirements—Existing and Proposed Training (*continued*)

TRAINING UNITS, AUTHORIZED STRENGTHS, AND TRAINING UNIT SIZE		TRAINING ACTIVITY AND TYPICAL TRAINING FREQUENCY		TINIAN			COMNAVMARIANAS						AAFB			FARALLON DE MEDINILLA	GUAM NON-DOD LAND	ROTA NON-DOD LAND
				EMUA	MLA	NON-DOD LAND	INNER HARBOR	OUTER HARBOR	WATER FRONT ANNEX	ORDNANCE ANNEX	FINEGAYAN	BARRIGADA	MAIN BASE	NORTHWEST FIELD	ANDERSEN SOUTH			
				SHADED BLOCKS IDENTIFY ONGOING TRAINING. "PROP" IDENTIFIES THE NEW TRAINING INITIATIVES														
374th Airlift Sqdm and 36th Airlift Sqdm		Broken Arrow Procedures	Monthly															
	100-600	Tactical Lift	Major Exercises															
	24	Static Line Paradrops, HALO/HAHO Jumps	1 to 2 monthly														2	
	16	CRRC Water Drops	Monthly															
	20	Cargo Delivery System Drops	Major Exercises															
	185	Infiltration/Exfiltration	Monthly															
		Small Arms Weapons Requalification	Annual															
36 Security Police Sqdrn	4	Air Base Defense and Jungle Patrol	Semi-annual															
	4	Military Working Dog Training	Daily															
Air Combat Command Bomber Wings (B-1, B-2 and B-52s)	2-3 A/C per mission	Strategic Bombing	Quarterly															
25th Infantry Div (Light) and 6th Inf Div (Light)	150-600	Force on Force Maneuvers and Small Unit Tactics,	Every 2 years															
		Logistic Operations	"															
		Non Combatant Evacuations	"			9												
		Bivouacs	"															
Guam Air National Guard 24 CE Services Flight		Base Construction and Repair Training	Annual															
Future Requirements for a Weather Reconnaissance Squadron Search and Rescue Squadron (Future)		Typhoon Predicting (Future)																

Table 1-2: Marianas Training Plan Requirements—Existing and Proposed Training (*continued*)

TRAINING UNITS, AUTHORIZED STRENGTHS, AND TRAINING UNIT SIZE		TRAINING ACTIVITY AND TYPICAL TRAINING FREQUENCY		TINIAN			COMNAVMARIANAS						AAFB			FARALLON DE MEDINILLA	GUAM NON-DOD LAND	ROTA NON-DOD LAND
				EMUA	MLA	NON-DOD LAND	INNER HARBOR	OUTER HARBOR	WATER FRONT ANNEX	ORDNANCE ANNEX	FINEGAYAN	BARRIGADA	MAIN BASE	NORTHWEST FIELD	ANDERSEN SOUTH			
				SHADED BLOCKS IDENTIFY ONGOING TRAINING. "PROP" IDENTIFIES THE NEW TRAINING INITIATIVES														
		In Flight Refueling																
		SAR Training																
US ARMY RESERVE-MARIANAS:		Weekend Drills and Two Weeks Active Duty for Training each Year	39 Days															
USAR-MAR:HQ/HQ Company	75-185	Small Arms Live Fire Qualification	Annual															
368th MP Company	80	Demolition Training	4 Days															
E Co 442 Infantry	185	Individual Field Training, Land Navigation, Map and Compass	39 Days	Requested, Air lift permitting											10			
297th Engineer Co (Hvy)	130	EPWI/CI	"															
	130	Battle Circulation and Control	"												10			
	185	Area Security (Offense and Defense)	"	Requested, Air lift permitting														
	75-185	Battle Drills	"															
	80-185	Nuclear, Biological, and Chemical	"															
	40	Heavy Engineer Equipment	"															
	80	Drownproofing	"															
	185	Adventure Training	"															
	12-24	Parachute Operations	"														2	
	80	River Crossings	"															
1st Bn 294th Inf. (L) – 450HQ/Hq Company and 2 Letter Companies	520	Academic Coursework	"															
Guam Army National Guard		One weekend per month and two weeks Active Duty for training	39 days annually															

Table 1-2: Marianas Training Plan Requirements—Existing and Proposed Training (*continued*)

TRAINING UNITS, AUTHORIZED STRENGTHS, AND TRAINING UNIT SIZE		TRAINING ACTIVITY AND TYPICAL TRAINING FREQUENCY		TINIAN			COMNAVMARIANAS						AAFB			FARALLON DE MEDINILLA	GUAM NON-DOD LAND	ROTA NON-DOD LAND
				EMUA	MLA	NON-DOD LAND	INNER HARBOR	OUTER HARBOR	WATER FRONT ANNEX	ORDNANCE ANNEX	FINEGAYAN	BARRIGADA	MAIN BASE	NORTHWEST FIELD	ANDERSEN SOUTH			
				SHADED BLOCKS IDENTIFY ONGOING TRAINING. "PROP" IDENTIFIES THE NEW TRAINING INITIATIVES														
Service Detachment Transportation Squad Signal Platoon–50 persons 294th MI Det–5 persons 909th QM Det—16 persons 1224th Eng. Det—5 persons	520	Small Unit Tactics, Land Navigation, Scouting and Patrolling	39 Days	Airlift Permitting														
	450	Battalion Field Exercises	Annual	Airlift Permitting														
	100	Command Post Exercises	Annual															
	50	Mobilization Processing	Annual															
	100	Leadership Development	39 Days															
	16	Water Purification/ROWPU	Monthly							3								
	54	Field Engineering	Monthly															
	54	Demolition Training	Monthly															
	12-24	Parachute Training	Monthly														2	
	550	Small Arms Requalification	Annual															

Notes used in Table 1-2.

1. Improvised Explosive Device (IED) training can be conducted at any location within government installations.
2. Two surveyed drop zones (Casper and Ghost) are on private property in Dandan near NASA Road.
3. The north end of the Fena Reservoir is used for helicopter-borne fire bucket training, drone recovery training and water purification training (ROWPU).
4. Search and Rescue training is conducted in Tumon and Agana Bays.
5. Rota Airport has been proposed for helicopter NVG training.
6. Over-the-Beach training is conducted by raiding craft or by swimming ashore. Combat swimmer training is attacks against merchant ships.
7. The Forward Staging Base at Rota is used for boat maintenance/refueling and SEAL Team bivouac. Tactical training is not conducted on Rota.
8. Security Drills may be conducted at any location on base as the scenario may dictate.
9. Tinian Harbor is used for logistic runs by LCUs and is preferred for landings by AAVs.
10. Contingency dormitories are no longer available. Requests for field maneuver training has decreased for the past 18 months in anticipation of excess land conveyance to GovGuam.
11. NSWU-1 conducts "field-firing" from RHIBS off the western coast of FDM (AT-4, .50 caliber MG and 40mm rifle grenades).
12. The Talofofo and Ylig rivers on Guam's East Coast were proposed as riverine training sites.
13. NSWU-1 provides one platoon to Special Operations Command, Pacific (SOCPAC). NSWU-1 training represents training that could be conducted by other SOCPAC units.
14. U.S. Naval Hospital, Guam, supports the USAF Mass Casualty Drills.
15. 353rd Special Operations Group is comprised of three aircraft squadrons and one Command and Control Squadron: 1st Special Operations Squadron (four MC-130H "Combat Talon" aircraft) and 17th Special Operations Squadron (four MC-130P "Combat Shadow" aircraft) are stationed in Okinawa. 31st Special Operations Squadron (five MH-53J "Pave Low" helicopters) are stationed in Korea. 320th Special Tactics Squadron (Okinawa) provides Combat Control Teams and Pararescue personnel.

1.5 DECISION NEEDED

The proposed action for which this EIS is being prepared is to use certain military and civilian lands for purposes of conducting military training as described herein. Military training use of the lands under evaluation is a continuing action, much of which predates the effective date of NEPA, January 1, 1970. Certain lands have been the subject of prior NEPA documents for particular training uses, notably the use of FDM as a bombardment range and the periodic conduct of Tandem Thrust exercises on Tinian.

The intent of the lead agency is to prepare this EIS in order to evaluate environmental effects from currently ongoing military training exercises activities that may not have previously been evaluated. The EIS is also prepared to determine whether substantial environmental degradation is occurring or is likely to occur as a result of ongoing or proposed new activities. Ongoing activities that may have changed in tempo, scale, use of new equipment, or in different locations are evaluated, as well as newly proposed activities. Ongoing activities covered in previous NEPA documents are evaluated where potential exists that ongoing environmental effects may be different qualitatively or more severe than predicted.

As a consequence of this analysis, the decision(s) to be made with regard to military training in the Marianas include:

- Whether or not to use or continue using certain lands for military training
- What training to perform on specific lands
- What mitigation to require for training impacts on specific training lands

The Commander, Naval Forces Marianas, acting in his capacity as the USCINCPAC Representative, will sign the record of decision (ROD) on these questions. The decisions implicit in the ROD will be implemented in directives prepared for use of the live fire ranges and training areas managed by COMNAVMARIANAS and 36 ABW. The ROD will also reflect policy as it pertains to the requirement to continue using, or to cease using, certain locations with strategic importance for training regional response forces to carry out missions as part of the nation's security strategy.

1.6 EIS PUBLIC INVOLVEMENT PROCESS

1.6.1 EIS Scoping

This EIS has been prepared in accordance with the National Environmental Policy Act of 1969, which requires an EIS for "major federal actions with the potential to significantly affect the environment." Council on Environmental Quality (CEQ) regulations implementing NEPA require that there be an early and open process for determining the scope of issues to be addressed and for identifying the significant issues related to a proposed action.

The scoping process began with a review of existing documentation and interviews with military organizations regarding training activities and the existing Marianas Islands training

environment. The process included opportunities for the public to comment on the proposed action (the ongoing and proposed activities listed in Table 1-2) and their environmental concerns stemming from these actions. The scoping process concluded with a review of issues to determine which were potentially significant and which were not significant and/or otherwise outside the scope of this EIS.

In November 1995, a Notice of Intent (NOI) to prepare an EIS was published in the *Federal Register* (Appendix A-1); individual copies were mailed to Guam, CNMI, and federal agency officials, as well as to potentially concerned private parties (Appendix A-2). The public was invited to communicate concerns, issues, and alternatives at public scoping meetings conducted in December 1995; the meetings were announced in the *Pacific Daily News* (Appendix A-3). Sign-in sheets and an informal record of all public comments are included in Appendices A-4 and A-5, respectively. Correspondence received as a result of scoping and the NOI is included in Appendix A-6.

1.6.2 DEIS Public Hearings

In accordance with NEPA and implementing CEQ regulations, a minimum 45-day public review period for the DEIS was conducted. During the public review period, eight public hearings were conducted on Saipan, Tinian, Rota, and Guam. Unlike the scoping meetings which is primarily an information gathering process, the public hearings allowed for open discussions regarding citizen and government reviewing agency reactions to the content of the DEIS. A list of agencies, organizations, and persons to whom copies of the DEIS were sent is included in Appendix A-7. A summary of the comments recorded during the eight public hearings conducted on Saipan, Tinian, Rota and Guam is found in Appendix A-8. The formal comment letters received by the Navy regarding the revised DEIS and the Navy's response letters are in Chapter Seven. All comments and suggestions that were within the scope of the EIS have been addressed in the FEIS.

1.6.3 Issues Raised During The Public Involvement Process

The primary issues raised by citizens and public agencies were impacts on endangered species—particularly the impact on endangered species caused by the accidental introduction of brown tree snakes from Guam—and safety issues related to live fire, demolition, and aviation training. On all islands, questions were raised concerning the timeframe and range of training covered by the EIS. There was some concern that any training not included in the EIS would be "covered up" and not properly assessed for impacts. Better protocols for communicating with civilian authorities prior to exercises were requested, particularly in regard to air traffic and natural resource impacts.

On Guam, there were also comments on possible future civilian or Government of Guam (GovGuam) reuse of military-owned lands, and questions regarding the need to train in the Marianas at all or on Guam and Rota in particular. Issues raised on Rota included the need to train on Rota, impacts on endangered wildlife species, and requests for civic works projects by visiting military units. Comments on Tinian also included requests for civic works projects, as well as questions regarding use of public beaches, a request for a new landfill, access to historic

sites in the EMUA, maintenance of cultural resources in the EMUA, and more economic benefits to Tinian from exercises.

1.6.3.1 Resources Areas with Potentially Significant Impacts

The following resources with potentially significant issues were identified during scoping and during the preliminary screening of training requirements and the training environment. Some of these issues are common to all islands considered in this EIS; other issues are particular to the island of Tinian, which has no permanently staffed military facilities. The significant issues and proposed mitigation measures are briefly identified in this section and are discussed in detail in Chapter Four.

Issue 1: Impacts on Biological Resources. Guam, Tinian, and Rota are home to a variety of threatened and endangered species, particularly native birds, migratory sea birds, and sea turtles. On Guam, proliferation of the introduced BTS has resulted in eradication of most native bird species and the prevention of BTS introduction from Guam to other locales is a major concern. In addition, certain proposed training activities might result in an "accidental take." Finally, amphibious landings could physically impact nearshore and reef coral and interfere with sea turtle activity.

Issue 2: Preservation of Cultural Resources. Training sites on Guam and Tinian contain ancient Chamorro archaeological sites as well as World War II structures of cultural significance. Training activities have the potential to result in loss of data and defacement or destruction of resources.

Issue 3: Wastewater Disposal on Tinian. Tinian currently has no large-scale civilian or military wastewater treatment facility and wastewater disposal is a major logistical component of large exercises.

Issue 4: Solid and Hazardous Waste Disposal on Tinian. Tinian has no EPA-approved solid waste landfill and no hazardous waste or hazardous material handling facility. Training activities routinely generate varying amounts of solid waste (primarily cardboard and paper) and may generate very small amounts of hazardous waste and used oil.

Issue 5: Public Safety and Aviation Activities. Aviation operations occur in airfields that are shared with the public or within airspace shared with commercial flight activities.

Issue 6: Public Safety and Firing Range Activities. The proposed action includes installation or modification of several firing ranges with the potential to introduce new impacts to public safety.

Issue 7: Socioeconomic Impacts on Tinian. Tinian's relatively small population is isolated from economic opportunities available to Saipan residents. Training activities have the opportunity to provide economic benefit by generating purchase of local goods and services or a negative effect by impeding tourism and recreation.

Issue 8: Socioeconomic Impacts of Apra Harbor Closures. Underwater demolition by EODMU-5 in Outer Apra Harbor requires certain areas of the harbor to be closed to civilian activities with the potential to cause loss of income to commercial boat and dive operators.

1.6.3.2 Specific Training Activities with Potentially Significant Impacts

From the outset of the evaluation there were three training requirements anticipated to have significant impacts on more than one resource, which could be difficult to fully mitigate to levels of nonsignificance, or would remain controversial regardless of training constraints or mitigation. These activities are summarized below and discussed in detail in Chapter Four.

AAV Landings in the MLA on Tinian: The Navy and Marine Corps have identified the establishment of an AAV landing beach at Tinian's Military Lease Area (MLA) as an important training requirement. The AAV will physically impact coral nearshore and disrupt beach topography.

Naval Gunfire and Aerial Bombardment: Farallon de Medinilla (Navy Range 7201) has been used since at least 1971 for aerial bombardment and naval gunfire training. The potentially significant impact of FDM bombardment is mortality to birds. FDM is the only range area in the region useable for training with live ordnance from ships and aircraft.

Underwater Demolition Training: Two resident Guam units (EODMU-5 and NSWU-1) conduct underwater demolitions/mine countermeasure training (MCM) primarily in Apra Harbor. Potential impacts are possible to biological and underwater cultural resources. Economic impacts are also caused by temporarily closing the general area of training as a public safety measure.

1.6.3.3 Issues Not Relevant For Detailed Consideration

Issues raised during scoping and public hearings were evaluated for relevance to the proposed action and levels of significance. Several issues raised during scoping were not directly related to the proposed action and were therefore eliminated from detailed consideration in this EIS. Specific reasons are as follows:

Issue: Need for mitigation measures to accommodate future civilian reuse of military lands on Guam.

Reason eliminated: The issue of civilian reuse is addressed in documentation relating to GLUP 94 and BRAC 95 and is not within the scope of this EIS for training. However, it is in the best interests of the DoD to avoid adversely impacting training lands, and this document identifies numerous mitigation measures intended to prevent or limit such irreversible effects or any other significant permanent damage to military lands.

Issue: Socioeconomic impact of BRAC 95.

Reason eliminated: The release of lands on Guam under the auspices of BRAC 95 is not part of the proposed action; therefore, the impact of such releases (e.g., job loss) is not within the scope of this document. With the exception of the positive impact of increased work for shipping companies in association with transporting materiel to and from Tinian, the proposed action is

not expected to have any socioeconomic impacts on Guam. The proposed action identifies training internal to the military and occurring on lands already controlled by the military. It will not create or decrease jobs, reduce land available for civilian activities, adversely effect housing availability, or generate fiscal impacts on the Government of Guam.

Issue: Cleanup of training areas.

Reason eliminated: Both the Air Force and the Navy have site investigation and cleanup programs in place to address and implement cleanup of military facilities. All military lands proposed for training are currently under investigation for potential contamination and/or undergoing site remediation. Other than mitigation proposed to avoid future significant impacts, the issue of military land cleanup is not within the scope of this EIS.

Issue: Use of the graving dock in Apra Harbor as alternative area for demolition training.

Reason eliminated: The graving dock is located in an active industrial area incompatible with live demolition training. As the dock is now closed off from the harbor, it does not provide the underwater access required by training personnel.

Issue: Risk assessment for brown tree snake introduction to Rota as a result of proposed SEAL activities.

Reason eliminated: This EIS assumes there is high risk of brown tree snake (BTS) introduction during any transport of equipment from Guam to another island. Therefore, units leaving Guam for Rota (including the SEALs) undergo BTS inspections in compliance with and updates to the October 1996 *Brown Tree Snake Control/Interdiction Plan for Military Training Exercises* discussed in Chapters Three and Four and Appendix E of this EIS. No preliminary risk assessment will be necessary.

Issue: Need to have more civic works projects, restore the veterans memorial park on Rota, build a road around Rota, and provide MEDEVAC service on Tinian.

Reason eliminated: Many individual units will arrange for civic works projects in association with training on Rota and Tinian. However, such projects will be performed at the discretion of the units and are not required for training. Therefore, such projects are not part of the proposed action and do not fall within the scope of this document. These types of requests are discussed as needed by the Government of Guam and CNMI with COMNAVMARIANAS.

Issue: Develop RCRA-approved landfill on Tinian, preferably in the EMUA.

Reason eliminated: Construction and operation of a RCRA-approved landfill is a substantial and costly undertaking, involving significant potential liability on the part of the landfill owner/operator. The military has no need for a landfill on Tinian, and construction would require a separate EIS document under NEPA. However, solid waste management in general is an issue examined in this EIS.

Issue: Clean up Tinian's port facilities.

Reason eliminated: Tinian's port facility was turned over to civilians as part of the Lease Agreement signed in 1994. Training vessels using the port operate in compliance with federal regulations prohibiting release of contaminants into the waters of the U.S. The existing condition of the port is outside the scope of this EIS.

Issue: Involve Tinian businesses in federal bidding activities.

Reason eliminated: Tinian businesses are welcome to compete for federal jobs advertised for bids. It is the responsibility of the businesses to obtain newspapers or other publications providing notice of such jobs. Government entities are strictly prohibited from giving preferential treatment to particular enterprises in the procurement process without specific Congressional authorization.

The remaining scoping issues were evaluated for significance to determine the depth of analysis required for this EIS.

1.7 GOVERNMENT PERMITS AND APPROVALS

As part of the EIS process, consultations have been initiated with various government agencies to obtain their concurrence with the preferred alternative. The agencies may request modifications to the proposed action or proposed mitigation before providing their concurrence. The following approvals are required:

Section 106 Consultation. The implementing regulations of the National Historic Preservation Act require consultation with the Guam and CNMI Historic Preservation Officers (HPOs) because the proposed action may have an effect on historic properties listed or eligible to be listed on the National Register of Historic Places. Formal consultation has been initiated. The Final EIS identifies ways by which potential adverse effects on historic properties will be avoided, minimized, or mitigated.

Section 7 Consultation. The Endangered Species Act requires consultation with the U.S. Fish and Wildlife Service (USFWS) and National Marine Fisheries Service (NMFS) because the proposed action will occur at locations inhabited by endangered plant and animal species. Consultations have been completed and the FEIS includes USFWS and NMFS biological opinions and concurrence that the proposed action will not have a negative impact on the continued existence of any federally listed threatened or endangered species or adversely impact plants or animals listed a threatened or endangered under the Act.

CZM Consistency Determinations. The Coastal Zone Management (CZM) Act requires a determination that the proposed action is consistent with local CZM programs, which protect coastal resources. On Guam, the Bureau of Planning administers CZM; in the CNMI, the Office of Coastal Resources Management administers CZM and Division of Environmental Quality is responsible for water quality. A consistency determination has been initiated to obtain the agencies' concurrence that the proposed action is consistent with their programs.

Land Use and Policies. The majority of lands to be affected by the proposed action are owned or leased by the DoD for military training and associated activities. Therefore, the proposed training activities on military-controlled lands are consistent with federal or local land-use planning and policy. Real estate agreements are generally required to authorize training when one DoD component uses the land and/or facilities of another DoD component, federal agency, local government agency, or a private owner. Such agreements are presently in place.

Construction. Other permits and approvals from CNMI and Guam agencies that would be generated by the proposed action are identified in the appropriate sections in Chapter Four.

1.8 DOCUMENT ORGANIZATION

This document is necessarily streamlined, as it covers information and analysis of the effects of a large number of training activities on nine military land parcels and several non-military-controlled areas on four islands in two political jurisdictions. This document has been published in two volumes. The first volume contains the evaluation organized in the chapters listed below. The second volume contains Appendices A through O with pertinent supporting information.

The **Executive Summary** is based on the contents of Volume One, Chapters One through Four.

Chapter One explains why the proposed action is needed. It documents the scoping process, issues raised during scoping and subsequent review of the DEIS. It summarizes the relevant issues addressed in Chapter Four, and those determined to not relate to the proposed action and scope of the EIS.

Chapter Two identifies the proposed land areas and training activities and defines the proposed action and alternatives. The alternatives are compared in terms of (1) the extent to which they meet the purpose and need for the proposed action, and (2) overall potential to adversely impact the environment. Chapter Two concludes with two tables defining the Preferred Alternative in terms of (1) training activities and locations, (2) potential impacts, both significant and not significant, and (3) associated mitigation measures or training constraints.

Chapter Three provides an overview of the affected environment on Guam and in the CNMI: physical, biological, and cultural resources, existing infrastructure, and socioeconomic conditions.

Chapter Four screens the potential environmental consequences of the alternatives to identify and analyze the significant issues. Each section includes data on existing conditions relevant to the issue, measurement criteria for evaluating potential impacts, proposed activities likely to generate significant impacts, and proposed mitigation for such impacts. This chapter identifies potential impacts mitigated or constrained by compliance with training orders and regulations.

Chapter Five is the List of Preparers.

Chapter Six lists the references used to develop the FEIS

Chapter Seven is a correspondence file with copies of the comments to the draft FEIS received from the reviewers and the Navy's responses.



U.S. forces landing on Unai Chulu, Tinian in 1944 (National Archives at College Park)

CHAPTER TWO

PROPOSED ACTION AND ALTERNATIVES

FEIS: Military Training in the Marianas
Belt Collins Hawaii, 1999

CHAPTER TWO: PROPOSED ACTION AND ALTERNATIVES

2.1 OVERVIEW

This chapter describes the alternative training land uses proposed to meet the military training requirements of Guam-based military forces and other military forces with regional responsibilities. For each land area that is either proposed or presently in use for training this chapter identifies potential training impacts for a range of training alternatives, identifies a Preferred Training Land Use Alternative for each evaluated training area, and provides a matrix of potential impacts and proposed mitigation measures. The discussions will also provide the rationale for why certain training activities are not preferred.

2.1.1 Proposed Action

The proposed action is to use suitable sites on Department of Defense (DoD)-controlled land areas in the Marianas for various military training activities. The proposed action also includes the continued use of small parcels of privately owned land with the consent of the landowners for specified training activities. The proposed action would continue all ongoing training and add a few new training activities or new training sites to maximum training land value and to eliminate existing training deficiencies.

To meet the range of ongoing and proposed training activities, training lands must include large undeveloped areas, airfields, beaches, live-fire ranges, and underwater demolition sites. These features are collectively available on DoD-controlled lands on Tinian, Guam, and Farallon de Medinilla (FDM). Training areas on which multiple training scenarios can be practiced are necessary to provide for the range of skills and capabilities of the assigned forces. Therefore, the proposed training sites are mutually supporting, providing complementary training venues which do not duplicate one another.

The proposed action includes land uses to accommodate the training requirements that have been identified in the Marianas Training Plan (MTP) and summarized in Chapter One, Table 1-1. Figures 2-1a through 2-6 identify the sites of each training activity. Color-coding used to distinguish ongoing training (activities printed in black ink) from those that are proposed in the MTP to maximize training land use (activities printed in green and red). The new initiatives that have been evaluated as environmentally suitable for adoption are printed in green. The training initiatives printed in red were evaluated and determined to have potentially significant impacts that either could not be mitigated or could not be sufficiently evaluated. The result is identification of preferred training land use at each site: the activities shown in black (ongoing) and green (acceptable new training initiatives).

2.1.2 Range of Alternatives

The range of reasonable alternative land uses for military training in the Marianas area include *no*, *more or less* use of training lands, varying the intensity of training at each training site, and

changing the types of training that are ongoing or proposed for each training area. More than 150 training activities are proposed and eight training locations considered that when combined create a great number of combinations and permutations of training land use alternatives. For the purposes of this EIS, which is largely for continuing actions, the range of training activity is represented by the following alternatives (listed in order of increasing land use):

- **No Training Land Use Alternative:** The land areas that are presently in use *would not* be used for training activities in the future. This alternative would be preferred if training land use resulted in significant environmental impacts that could not be mitigated to nonsignificance *and* other suitable training areas are available to meet the essential training requirement.
- **Reduced Training Land Use Alternative:** Land areas presently in use would be used for fewer or less intense training activities in the future. This alternative would be preferred only when the analysis concludes that additional training constraints are necessary to mitigate potentially significant impacts from either ongoing or proposed activities.
- **No (New) Action Alternative:** Also referred to as "continuing action," this alternative represents no change in ongoing training activities, existing mitigation measures, and training constraints. Adoption of this alternative would be maintaining the status quo.
- **Maximum Training Land Use Alternative:** This alternative is defined as all training land uses proposed in the Marianas Training Plan (MTP), training orders, directives, and requirement statements provided by affected military organizations. The MTP proposes continuing all ongoing training and new training initiatives. The MTP itself does not address potential impacts or suggest mitigation measures, which would be the product of this EIS.

The **Preferred Training Land Use Alternative** is result of the evaluation of the feasible alternatives within each training environment. This alternative will reflect the appropriate mix of reduced, ongoing and proposed training activities that would meet training mission requirements while incorporating all necessary environmental mitigation and training constraints.

The No Training Land Use and "No Action" alternatives are not synonymous. Implementing the No Training Land Use Alternative at certain existing training sites would have substantial negative effects; some either cumulatively or indirectly would have significant impacts on the human environment including national defense. In contrast, the "No Action" alternative equates to "no new action" or continuing to conduct training and mitigation measures without change and without incorporating any of the MTP maximized land use initiatives.

2.1.3 Chapter Organization

Alternative training locations that are outside the Mariana Islands are discussed in Chapter One. These locations are not alternatives to the use of training areas in the Marianas for accomplishing necessary training activities. Therefore, the range of evaluated training area alternatives considers only locations within Guam and the CNMI.

To evaluate the various combinations of training lands, training activities, and environmental consequences, lands are grouped into seven major training areas and training activities are placed into the five groups described in Section 2.1.4. Subsequent discussions of each training area in

this chapter will describe existing land resources, identify the range of ongoing and proposed training, identify environmentally appropriate sites for training, and summarize resulting impacts and mitigation.

The seven geographic areas and the types of ongoing or proposed training at each are described in the following sections:

- **Section 2.2 Military Lease Area, Tinian**: field maneuvers and logistic support functions, fixed-wing and helicopter aviation training, amphibious landings, and live-fire range training.
- **Section 2.3 Waterfront Annex, Guam**: field maneuvers and logistic support, aviation training and support, amphibious landings, live-fire range training, shallow and deep water underwater demolition training.
- **Section 2.4 Ordnance Annex**: field maneuvers and logistic support, aviation training, and live-fire ranges.
- **Section 2.5 Communications Annex Finegayan and Communications Annex Barrigada**: field maneuvers, raiding craft and combat swimmer amphibious training, and live-fire range training.
- **Section 2.6 Andersen Air Force Base**: field maneuvers and logistics, aviation training and support, and live-fire range training.
- **Section 2.7 Farallon de Medinilla**: live-fire range training, aerial bombardment, and naval gunfire.
- **Section 2.8 Non-DoD Lands**: parachute and riverine operations on Guam, and forward staging base and aviation training on Rota.

The potential impacts and mitigation for the proposed training at each area is summarized in **Section 2.9**. Additional discussions of potentially significant impacts and mitigation are found in Chapter Four.

The chapter concludes with **Section 2.10** and the identification of the Mariana Island Preferred Training Land Use Alternative. This alternative is a consolidation of all selected training activities, potential environmental impacts and mitigation measures.

2.1.4 Training Activity Descriptions

2.1.4.1 Field Maneuvers and Logistic Support

Field maneuvers and logistics support are defined for this EIS as all general military training that occurs on land, with the exception of amphibious landings, aviation-related activities, and live-fire weapons training. Tactical maneuvering may be conducted day and night, on foot, and in wheeled and tracked vehicles. It involves a full gamut of field activity from special clandestine operations by small groups up to reinforced battalion tactics. Other activities include area security drills and non-combatant evacuations operations with or without resistance (NEO). Training activities range from individual's basic land navigation and small unit cross-country movement using a map, compass, and global positioning system [GPS], through tactical

maneuvers by up to 2,500 or more participants combining offensive and defensive maneuvers and logistics support. Training groups range from an infantry fire team of one to four persons, a 12- to 16-man patrol, a 130-man infantry company, 560-person battalion, or 2,000-person reinforced brigade. Large-scale training may occur several times a year, whereas small unit training may occur on a daily, weekly, or monthly basis. The maximum training event duration would be a large-scale exercise lasting several weeks, combining many activities, and involving any of the armed services.

Maneuvers may consist of patrols, raids, and assaults by larger units on foot or while transported by tracked and wheeled vehicles or helicopters. The defenders may employ similar tactics or create defensive positions to retain or to give ground slowly. The maneuvers involve the use of small arms blank ammunition firing only. Signal flares and smoke grenades are used to coordinate troop movement or to mark positions. Both offensive and defensive forces require some site development, which would require digging with hand tools, mounding dirt at firing positions, selectively cutting vegetation for camouflage, some small-scale carpentry, use of concertina wire, and mounting camouflage nets.

Once ashore, combat service support units may conduct minor excavation and construct temporary tent camps (bivouacs) for housing, feeding, and supporting the exercise force. Supporting activities include water purification, food preparation, storage and supply of equipment, pre-packaged fuels, and blank ammunition, medical and dental support, field sanitation (showers and portable toilets) black and gray water disposal, and solid waste disposal. Transportation of materiel by land, sea, and air, and quarantine support are other functions conducted in the Mariana Islands.

The typical training unit sizes and training frequencies as identified in the MTP are provided in Table 1-2. Action photographs and technical information on field maneuvers are provided in Appendices B-1 and B-2.

2.1.4.2 Aviation Training

Aviation training involves both aircrew and supported ground units integrating capabilities and functions in a three-dimensional battlefield. Field maneuver training areas should have adjacent landing fields or surveyed helicopter landing zones (LZs) and parachute drop zones (DZs) to support integrated training. Strategic and tactical aviation training is conducted on Tinian and Guam by fixed-wing and rotary-wing (helicopters) both day and night. Aviation photographs and technical information are provided in Appendices B-3 and B-4. The frequencies and duration of training are included in Table 1-1.

Airmobile training involves fixed- and rotary-wing aircraft transporting ground forces, vehicles, and cargo. Training consists of staging, takeoffs, landings, and offloads. Strategic lift may involve the transportation of ground forces from Alaska, Japan and CONUS directly to a field maneuver area. Tactical lift is frequently conducted between Guam and Tinian and during intra-island training.

Tactical airlift and logistic support is provided by the USAF, USN, and USMC using aircraft or helicopters configured for personnel, cargo, special operations, and refueling. The aircraft that primarily used to support field maneuvers include the following.

- **Fixed-wing aircraft.** The four-turbo-prop engine C-130 Hercules is designed to operate from unimproved runways as short as 5,500 feet (1.7 km). The USAF and USMC use the aircraft in various configurations for carrying troops and cargo. The aircraft is also modified for special operations (the USAF MC-130H Combat Talon and MC-130P Combat Shadow) or refueling other aircraft and helicopters (USMC KC-130 Hercules). The C-130 can carry 92 combat-equipped troops or be outfitted to transport 74 litter patients. It is designed for carrying pallet-loaded cargo that can be parachuted while flying at low altitudes.
- **Helicopter assets.** The USMC CH-53E Super Stallion helicopter is used to carry up to 37 passengers (up to 55 if center seats are installed). This helicopter is often used to deliver combat equipment externally. The CH-53E can haul a 7,264-kg M198 Howitzer or an 11,804-kg Light Armored Vehicle (LAV) from ship-to-shore. The CH-53E can also be used to lift a downed aircraft up to CH-53 size/weight.

  The USAF uses MH-53J "Pave Low" helicopters for special operations such as adverse weather special operation team infiltration, extraction and resupply.

  The Navy and Marine Corps medium-lift CH46-E Sea Knight helicopter delivers ground forces to North Field and West Tinian Airport. A maximum of 14 combat-equipped troops can be lifted. Supply and equipment delivery is a secondary mission. Primary missions include combat and assault support, search and rescue, forward area (expeditionary) refueling support, and medical evacuation, all of which are practiced on Tinian as part of airmobile (and airborne) operations.

  In a few years, the CH-46E will be replaced by the MV-22 Osprey, which is designed with a tilting wing with two extremely large rotors/propellers at each end. The wing/rotors are tilted up for vertical takeoff and landing, and the wing is then rotated forward to transition to conventional, propeller-driven flight. The aircraft will operate where there is no fixed-wing runway but where there are helicopter LZs and helicopter landing decks. The MV-22 will achieve forward air speeds that are twice as fast as the CH-46E (270 knots vice 130 knots), provide 50 percent more payload, and seat 24. The Navy and Air Force are also considering procurement of the MV-22.

Airborne training involves the introduction of personnel and equipment by parachute or other means without landing the aircraft. All of the aircraft noted above and larger fixed-wing aircraft (C-141 and C-7) are capable to airdrop personnel and equipment when runways and LZs are not available.

- **Cargo drops.** Cargo drops of palletized vehicles and equipment can be conducted from low and high altitudes and are controlled by USAF Combat Control Teams (CCT) dropped in early to provide communication and coordination for airborne and airmobile operations and the FAA.
- **Parachute operations.** Parachute operations may combine aircraft and parachute units from the USAF, U.S. Army, USN, and USMC. Paradrops are conducted from fixed-wing aircraft

and helicopters. Training activities may involve small to large organizations based on the size of the drop zone and the number of aircraft in support. (The CCT is qualified to conduct pararescue operations.) The C-17 and C-130 can respectively carry 102 and 64 parachutists.[1] Other exercises have been planned around a transition on Guam. Large organizations are first flown to Guam on larger aircraft and immediately transferred to MC-130s or helicopters to land in small groups at North Field or at the surveyed DZ east of West Field.

Paradrops can be made from various altitudes and distances to designated DZs. Large and small groups may perform static-line jumps from aircraft flying at low-altitudes about 984 to 1,148 feet (300 to 350 meters) above ground surface. The aircraft makes one or more passes above the DZ; jumpers exit the aircraft wearing round canopy parachutes, which open and deploy within four seconds of departing the aircraft.

Small groups of parachute-qualified special operations personnel may conduct high-altitude operations from fixed-wing aircraft. Jumpers are equipped with steerable canopies exiting the aircraft at high altitudes with a high chute opening (HAHO jump) or low altitude chute opening (a HALO jump). Most HAHO and HALO operations commence at altitudes of 9,830 to 19,685 feet (3,000 to 6,000 meters) at long distances from the target DZ. For HAHO operations, the jumpers open their parachutes about 1,970 feet (600 meters) below the aircraft and then glide up to 25 miles (40 km), arriving silently with no associated aircraft noise. HALO jumpers will free-fall to within 3,940 feet (1,200 meters) of the ground, then open their parachutes and steer silently to the DZ.

- **Helicopter insertion and extraction** methods allow small tactical units to exit a hovering helicopter in a rapid descent by rappelling or using a "fastrope." Another method practiced is a special purpose insertion and extraction (SPIE) rig—a suspended rope with hookups for four to five soldiers/marines. A winch is not used and the troops remain suspended beneath the helicopter during the rapid extraction. These systems may offset the lack of a large cleared LZ and are suitable for tactical situations requiring surprise and speed.

Close air support. Airmobile and airborne training often includes simulated close air support (CAS) to the forces being landed or airdropped. Various fighter and attack aircraft fly simulated missions, attacking "enemy" positions to provide cover for ground troops. These aircraft are high speed and fly relatively close to the ground. The aircraft used include the Navy's F-14 Tomcat and F/A-18 Hornet and the Marine Corps' AV-8B Harrier and AH-1W Super Cobra helicopter gunships. USAF assets in the Marianas may include transient squadrons of F-15E Strike Eagle and F-16 Fighting Falcons, and AC-130H Spectre gunships. (CAS with live munitions is conducted only at FDM, Range 7201.)

Flight crews using remote airfields with little or no ambient light conduct **Night vision goggle (NVG) training**. The training involves flying multiple circular or oblong patterns in the vicinity of the designated airfield. Helicopters circle the airfield, land or hover briefly, and repeat the loop at low altitude. The training is normally conducted on moonless nights (about eight nights per month) and within from one hour after sundown to 10:00 PM. The training often involves two helicopters, with one helicopter remaining high to observe the other near the deck.

[1] USAF MC-130Es conducted one-third of all airdrops during Operation Desert Storm.

Firefighting. Helicopters are used to carry external water containers (firebuckets) filled while hovering over sources for fresh or seawater to empty on field fires.

Drone Recovery. Target drones are reusable and after dropping into the ocean are retrieved by helicopters on an external cable and returned to shore. The training may be conducted in the ocean but due to salt spray is preferred to be conducted at a fresh water source and using a cleaned drone simulator that carries no fuel or payload of any type that could prove to be a contaminant to the water source.

FARP. Aviation support may include establishing **forward area refueling points**, using pre-packaged fuel in bladders that are transported by C-130, helicopter, or truck. Personnel construct and operate a spill-controlled fueling point adjacent to an airfield or LZ.

2.1.4.3 Amphibious Landings

Amphibious landings get troops and equipment from ship-to-shore for subsequent inland maneuvers. The Navy and Marines use tracked amphibious vehicles and large landing craft to deliver troops and equipment from amphibious ships that can be as far as 25 nautical miles from the beach. The AAVs cross landing beaches without delay and function as armored personnel carriers during inland maneuvers. The Navy's large landing craft transport wheeled vehicles, equipment, and personnel. Reconnaissance teams, SEALs, and special operations forces use small inflatable boats to land on beaches or to come in close enough to deliver swimmers to beaches normally under cover of darkness.

The evaluation of training beaches involves lists of environmental and operational criteria. Training begins with the proper selection employment of each craft and assault vehicle. Equipment photographs and technical information for the following craft are provided in Appendices B-5 through B-10. The normal training frequency and duration are identified in Table 1-1.

LCAC landings. The LCAC is the largest landing craft in the inventory; it is designed to transport about 70 tons (64 metric tons) (e.g., one M1A1 Abrams Main Battle Tank) at high speed. Unlike the typical displacement-hull vessel, the LCAC rides above the water surface on a cushion of air captured within an inflatable skirt surrounding the craft. Lift fans beneath the craft create the pressure to raise the LCAC off the surface of the water, creating the cushion of air between the hull bottom and the water's surface and any underlying substrate (such as coral).[2] As craft speed increases, the depth of the depression across the surface of the water beneath the craft decreases from about 11 to 20 inches (30 to 50 cm) to a depression of 1 to 4 inches (2 to 10 cm). This condition occurs at about 18 knots, depending on the loaded weight of the vehicle. In smooth seas, little or no bow wave is created. At full stop in the water and no cushion, the craft's draft is about 2.8 feet (0.85 m).

An LCAC is designed to cross the high-water line and remain on-cushion to move inland, traversing relatively flat terrain before decreasing lift and coming to rest on the ground surface to

[2] See Appendix B for additional landing craft technical information.

offload cargo. As the craft lowers to the ground to rest on its skids, its air cushion vanes close off and prevent lift fan air from creating a deep depression in sand or light soil.

In movement across the beach, an LCAC does not leave ruts or other indentations on a beach. When the craft begins to rise up on its air cushion, the steady increase of lift fan air temporarily suspends sand and small objects. When hovering over land, there is a 1-inch (1 to 3 cm) gap between the ground surface and the skirt, allowing air to escape around the edges. As the craft rises and moves back toward the water, the craft's skirt skims and levels the sandy beach surface.

LCACs are pre-loaded with land vehicles, materiel, and personnel and are transported within well decks of large amphibious ships to within 25 nautical miles of the landing beach. The craft exits the ship's well deck and proceeds rapidly (up to 50 knots in smooth seas) toward the beach, crossing the shoreline to unload or to continue inland to a combat objective. The LCACs then return to the ship's well deck to take additional vehicles aboard for another trip to the beach. If used to transport personnel, a large prefabricated container is installed to protect the embarked Marines from sea spray and noise.

A typical Navy ARG training may use as many five LCACs to offload MEU vehicles and personnel. An LCAC can transport one tank or four AAVs at a time or, when configured with a prefabricated protective personnel transporter, can lift up to 250 persons. It may also transport a collection of smaller vehicles such as trucks or light armored vehicles (LAVs). The craft has ramps fore and aft for driving vehicles off and on.

LCU landings. The Landing Craft, Utility is a displacement hulled craft with a large, open center bay and ramps fore and aft for driving vehicles on and off with little delay. With a draft of 7 feet (2.1 m) when fully loaded, the LCU can operate in relatively shallow waters to beach prior to lowering its ramp onto the shoreline or a pier. For beach offloading in heavy seas, the LCU stern anchor may be used to keep the craft perpendicular to the shoreline during offloading and loading. The craft is large, about 135 feet (41 m) long and 29 feet (8.8 m) wide, and is capable of transporting 200 short tons of cargo. Typical loads can be 5-ton (4.5-metric ton) truck prime movers and artillery weapons, or two tanks, or combinations of smaller vehicles and trailers to a beach or harbor. It is not as fast or as loud as the LCAC and can carry up to 400 persons without any special protection. It is not landed at beaches that are protected by offshore shallow reefs that may damage the hull or restrict the craft to waters too deep for offloading wheeled vehicles. An ARG may be equipped with one to four LCUs.

AAV landings. An AAV is a lightly armored personnel carrier armed with a turret with a .50 caliber machine gun and 40mm grenade launcher (see photos and illustrations in Appendix B). It is propelled by water jets in the ocean and by a tracked suspension system in shallow water and on land. An AAV is capable of climbing a vertical wall up to one meter high. A preferred beach approach would have a less abrupt grade, allowing the tracks to gradually come into contact with the substrate at a water depth of about 6 feet (1.8 m). In about five years, the AAV will be replaced with an advanced amphibious assault vehicle (AAAV) with beach crossing characteristics similar to the AAV. At sea however, the new vehicle will be capable of 25 knots and will be launched from greater distances between ship and shore.

On land, the AAV (and the future AAAV) is a tracked armored personnel carrier capable of speeds around 25 mph (40kph). Each track block is rubber-padded, which minimizes track damage to paved roads. The amphibious ship's well deck is flooded and, as the ship remains underway, the AAVs drive off the ship and head to the beach. Beach characteristics may dictate the formation used. For example, a wide unencumbered beach may allow the entire platoon to land side-by-side simultaneously. At the other extreme, the platoon would form a column and land one at a time. Each AAV can carry up to 23 combat-equipped Marines or 5 tons (4.5 metric tons) of cargo from ship to shore. Upon reaching the beach, the Marines may or may not debark since the vehicle is designed to cross underwater and beach obstacles and continue inland without pause. A MEU normally includes one AAV platoon with 12 to 15 vehicles.

Inflatable boats and combat swimmers. Two types of inflatable boat are used to transport small groups over the beach or riverbank, or to deliver combat swimmers close inshore. The CRRC (Combat Rubber Raider Craft) is the standard raiding craft and is a military version of the Zodiac inflatable boat powered by one or two outboard motors. It can be quickly carried ashore and hidden in vegetation near the beach. A larger and faster craft used by the SEALs for longer distance missions is the RHIB—rigid hull, inflatable boat—which can be beached or used to drop swimmers off shore when a shallow reef prevents craft access to the beach. Crew-served weapons may be mounted on a RHIB to provide fire support to the inserted SEAL teams.

Force introduction by small boat is often conducted at night prior to an amphibious assault. The inserted teams conduct hydrographic surveys and inland reconnaissance patrols, gathering information needed by the larger assault force. Marines, SEALs, and Army Special Forces may conduct clandestine amphibious raids.

2.1.4.4 Live-Fire Range Training

Small-arms training may involve the use of weapons simulators, and live-fire on known-distance (KD) ranges and fire-and-maneuver ranges. Training in an urban environment exercises (TRUE) using live-fire is conducted at shooting houses. A companion structure is a breacher trainer where small explosive charges and stun grenades are used during forcible entries. Sniper teams use KD and unknown distance ranges.

All live-fire ranges are designed, surveyed, and certified for a specified set of weapons. The most common are the KD and fire-and-maneuver ranges used for pistol, shotgun, rifle, and light/medium machine gun training. There are no moving target ranges, which are designed for training crews in tanks, LAVs, AAVs, and anti-tank missile teams. Large indirect fire ranges are needed for training artillery and mortar crews but none exist in the Mariana Islands. (See photographs and technical data in Appendices B-11 through B-15.)

All ranges have associated two-dimensional safety areas identifying the firing lines/firing positions, target locations and the resulting lines of fire, maximum projectile or missile dispersion and range, and extra margins for ricochet and explosive effects. Indirect fire ranges also include height of the round as a third dimension established to ensure range safety. (See Appendix B-14 for a diagram of a generic Surface Danger Zone for a small arms range.)

2.1.4.5 Demolitions Training

Demolition ranges are established for hand and rifle grenades, breaching and cratering charges, and other forms of explosives. In the Mariana Islands, the Navy and Air Force have demolition ranges used for EOD team training and actual demolition of unexploded ordnance (UXO) remaining from World War II. Guam has two resident units that are required to be proficient in underwater demolitions. EODMU-5 is primarily concerned with mine countermeasures and at deep depths and floating mine neutralization near the surface. NSWU-1 is primarily concerned with clearing a variety of beach obstacles requiring demolition training at shallow depths.

Underwater demolition training consists of setting explosive charges to neutralize enemy mines (mine countermeasures [MCM]) or to neutralize underwater obstacles. Different water depths and amounts of explosive material are required to simulate particular combat situations. Both EOD and NSWU (SEAL) units are required to train with live demolition for certification and maintenance of skills and to create a realistic awareness of danger and the need for attention to details under controlled circumstances. (Note: This training relates directly to real world activities performed repeatedly during Operation Desert Storm.) Several photographs of mines are included in Appendix B.

The deepwater MCM conducted by EODMU-5 requires detonating explosive charges at water depths between 65 feet (20 m) to 130 feet (40 m). Divers approach an "enemy mine" (training device), set a charge to neutralize the mine, and swim away to a safe distance prior to the blast. A correctly set charge creates a shock wave sufficient to neutralize the simulated mine and/or cut its tether. Once the "enemy mine" has been neutralized, divers retrieve it to the surface and tow it ashore for dismantling.

NSWU very-shallow water MCM involves detonating strings of 1-pound (0.45-kg) charges in water depths between 6.5 feet (2 m) and 20 feet (6 m). A string could include up to 20 charges. A typical scenario may be a pre-assault clearing of landing beach lanes of any underwater obstacles or mines that could damage or destroy landing craft and vehicles. SEALs approach the site in small raider craft or by swimming to set the strings of small charges and depart the area without being detected.

EOD also trains to neutralize floating mines that are designed to sink passing ships. Ten-pound (4.5-kg) charges are attached to simulated mines in open ocean waters. The detonation is within 10 feet (3 m) of the surface to neutralize the mine or to cut its mooring cable so that the mine can be moved. Helicopters are often used to get the EOD swimmers to the site, standing by to extract them after the charge has been placed and a timed fuse activated. A safety boat is also used during training, which provides both air and surface surveillance of the training area.

2.2 MILITARY LEASE AREA, TINIAN

2.2.1 Training Land Resources

Military Lease Area. The DoD leases 16,002 acres (6,476 ha) on Tinian from the CNMI (see Figure 2-1a). The MLA is presently used for small and relatively large field exercises. There are

two runways, other paved surfaces, and remnants of World War II structures on historic North Field. Its beaches were American World War II amphibious landing sites and are suitable for modern amphibious training. Tinian is an excellent location for larger-scale amphibious assaults and joint training exercises since its landing beaches provide entry to maneuver areas, fixed-wing runways and helicopter LZs. There are abandoned buildings that can be used for urban warfare practice, and an excellent road network connecting training areas to the nearby commercial harbor and airport.

The MLA remains largely undeveloped. Roadway fences or gates are not used to control public access to North Field. Most of the MLA is forested with tangantangan; some areas are cleared for cattle grazing, and individual pastures are fenced. The island's central plateau drops over several clifflines to the northern lowlands. A number of old paved roads crisscross the MLA, with many smaller interconnecting coral roads largely overgrown by vegetation. Substantial natural and cultural resources exist in the MLA, particularly in the north. The United States Information Agency, International Broadcasting Bureau (IBB) now operates the Voice of America Marianas Relay Station from new facilities within the MLA.

The **Exclusive Military Use Area** (EMUA) (7,435 acres [3,009 ha]) occupies the northern half of the MLA and is used for military training. It contains historic and public recreation sites frequently visited by the public. Training in about 40 percent of the EMUA is constrained to protect important natural and cultural resources, and mitigation and training management measures are in place that have originated in NEPA documentation.[3] North Field is a National Historic Landmark. Tourists regularly visit the World War II sites, as well as beaches, a blowhole, and several shrines in the EMUA.

The southern portion of the MLA is the **Leaseback Area** (LBA) (8,423 acres [3,409 ha]), which is also available for military training. The area has been leased back to the CNMI for uses compatible with long-term DoD needs. Under the leaseback agreement, the LBA may be used for training activities that would not be of detriment to ongoing CNMI economic and agriculture activity. For example, the tactical movement of forces through the LBA is common, and forces are commonly introduced via West Tinian Airport.

San Jose and Tinian Harbor. The remaining portions of the island are inhabited and training activities are minimized to avoid conflict with day-to-day activities on the island. Shared use of Tinian Harbor is common during major exercises for logistic support functions. Other facilities in town have been used after negotiation with the appropriate Tinian municipal officials.

2.2.2 Proposed Training Activities

The proposed action for Tinian's training areas is to continue all ongoing training activities (shown in black on Figure 2-1a) and to adopt new proposals to maximize in the MLA. Termination or reductions of ongoing training activities are not proposed for Tinian. The activities are described below and their locations are shown on Figures 2-1a and 2-1b. The MLA

[3] Belt Collins & Associates (June 23, 1993) *Environmental Assessment: Military Exercises, Island of Tinian, Commonwealth of the Northern Mariana Islands.* Prepared for the Commander, Pacific Division, Naval Facilities Engineering Command; and Belt Collins Hawaii (November 1994) *Environmental Assessment Military Exercise, Island of Tinian: Tandem Thrust 95.* Prepared for Commander, Pacific Division, Naval Facilities Engineering Command.

is available to support small unit training on a daily basis. Tinian is best known for its use by larger groups such as the joint military force that participates in biennial "Tandem Thrust" field exercises, which integrate Army, Navy, Air Force, and Marine organizations. Many of the proposed training activities stem from requirements identified by the MEU that are suitable for both small unit training and joint exercises.

2.2.2.1 Field Maneuvers and Logistics Support on Tinian

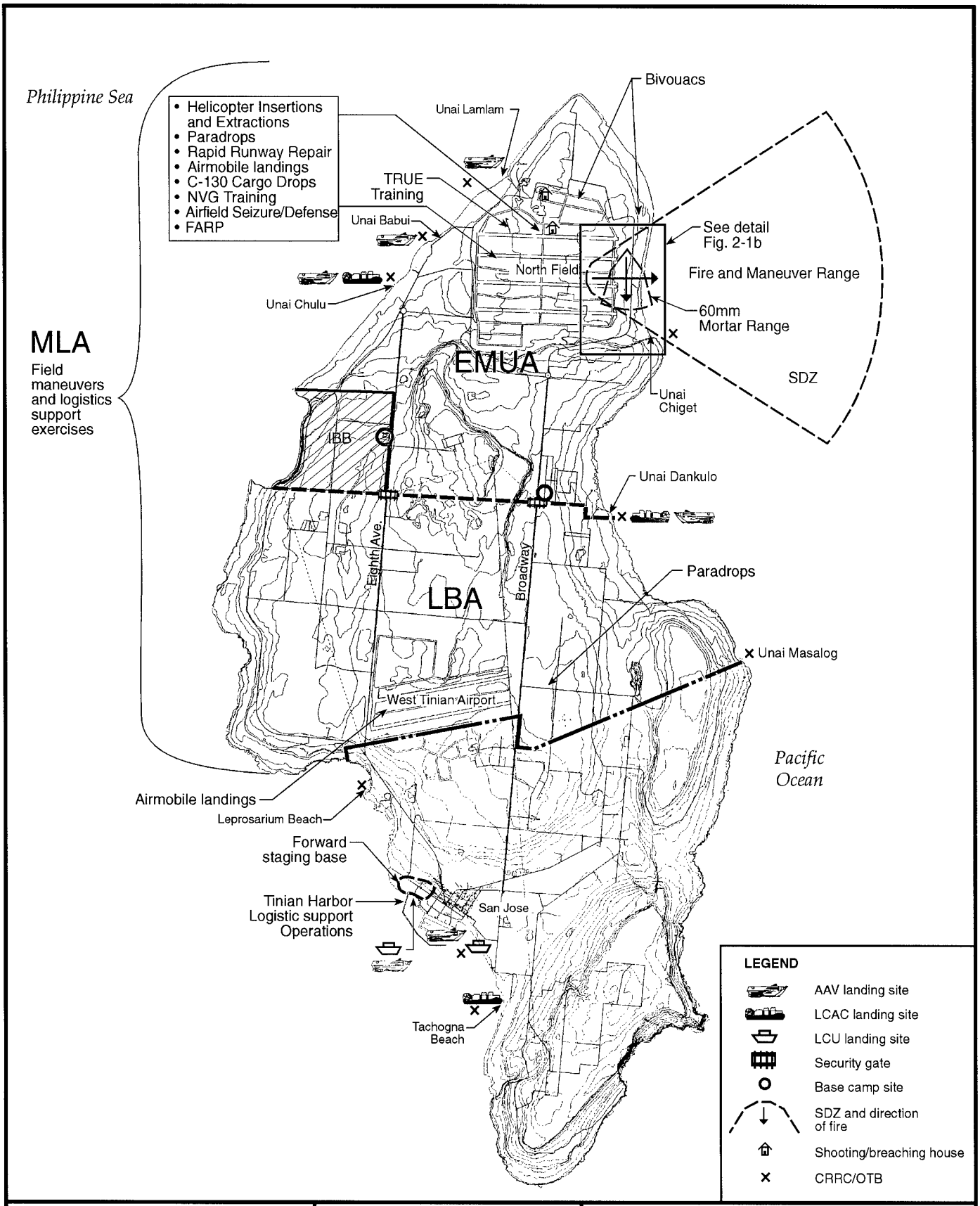
Ongoing training. Ongoing field maneuvers and logistic support are proposed to continue. Tactical maneuvers are, by their nature, not site-specific and occur throughout much of the EMUA and Leaseback Area. New sites for field maneuvers or logistics support training on Tinian are not proposed.

Use of the harbor, as well as West Field, as ports of entry for troops, vehicles, and equipment would continue as a means to provide realism for persons responsible for logistic support. Military training activities are integrated with actual commercial port and airport operations. Staging, maintaining, and inspecting equipment and cargo in transit is conducted to ensure that quarantine and control procedures for BTS and other noxious species are effective.

Proposed training. The MTP (Maximum Land Use Alternative) proposes the following logistics training/training support activities or projects:

- **Logistics support camp**. Constructing a small, austere camp for secure storage of exercise support materials and equipment. The project would clear a small grassy area, pave it with a crushed coral base, and surround the site with a chain-link fence for security. The open storage areas would be made available to training units as a command and control or logistics support center. Originally the facility was envisioned as a site for a permanent storage facility and fuel storage tank. The concept has been simplified to provide a locked storage yard suitable for temporary storage of such items as electrical generators, field shower units, containerized supplies and portable toilets, and to be used a fuel distribution point for prepackaged fuels. The Navy has constructed a septic tank and leaching field in the vicinity of the proposed logistics support campsite. Long-term storage of equipment and supplies between training events is not envisioned due to lack of security and deterioration of stored materials.
- **Roadway security gates**. Rather than relying on temporary barriers, the proposal is to construct permanent security gates on the main entryways to the EMUA on Broadway, Eighth Avenue, and Ninth Avenue. The gates would be manned during the exercises to ensure that unauthorized persons do not enter portions of the EMUA when conditions are unsafe. Closing these roads to visitors is necessary to ensure personal safety during beach landings, active maneuvering, and fixed-wing aircraft and helicopter operations.

  This proposal is not selected for the preferred alternative. See Section 2.9.1.



Source: Final Marianas Training Plan (June 1998)

NORTH

0 1000 2000 (Meters)

0 4000 8000 (Feet)

ALTERNATIVES:
Black = No new action (continue)
Green = Preferred (new)
Red = Not-preferred (new)

See text for abbreviations

Figure 2-1a
TINIAN LAND USE

FEIS: Military Training in the Marianas
Belt Collins Hawaii, June 1999

- **Rapid runway repair**. The MTP proposes reinitiating rapid runway repair (RRR) in the EMUA as engineer support training. RRR was once conducted in North Field to give combat engineers practice in repairing damaged runways. The activity normally included demolitions training using cratering charges to create spots on runways needing patching, leveling or matting. A variety of hard-surfaced areas that need repair already exist in North Field without the need for cratering.

  The RRR training could be conducted if the training unit is equipped with appropriate repair equipment and materials. Since this is seldom the case with transient organizations. Considering that North Field is a National Historic Landmark, the Tinian community requested during scoping that this training be conducted elsewhere to eliminate the potential for cratering the World War II surfaces without conducting a complete repair. RRR training sites are proposed for construction at AAFB and Orote Peninsula.

  This proposal is not selected for the preferred alternative. See Section 2.9.1.

2.2.2.2 Aviation Training on Tinian

Ongoing training. The aviation units train as they deliver personnel and cargo to maneuver areas and provide various support functions to forces already on the ground, such as cargo delivery, firefighting, and search-and-rescue (SAR). North Field's four runways, associated taxiways, and parking aprons support various tactical scenarios without interfering with commercial and community activities south of the MLA. The remote area is suitable for a full spectrum of aviation support training (less live-munitions CAS). Use of North Field also reduces or eliminates the need to share use of West Tinian Airport with commercial flight activity.

During Tandem Thrust 99, the size of the force allowed all activities to be conducted at North Field. C-130 aircraft provided tactical lift for forces deploying from Guam, landing on Runway One at North Field. Low-altitude parachute drops using the Container Delivery System (CDS) on Runway Two are used to resupply troops on the ground. Portions of the remaining two North Field runways, connecting taxiways, and parking aprons are also available for use. Simulated CAS is also conducted over North Field, and parachute operations may use the designated DZ east of West Tinian Airport.

Proposed training. No new aviation training sites or activities have been proposed

2.2.2.3 Amphibious Landings on Tinian

Ongoing training. Special operations teams (Navy SEALs, Army Special Forces, and Marine Reconnaissance) cross Tinian's beaches via small inflatable craft or as combat swimmers.[4] Larger forces are introduced into the training area by amphibious craft and vehicles (as well as by fixed wing aircraft and helicopter). A boat ramp at Tinian Harbor is used by LCUs (a displacement hull landing craft) to transport wheeled vehicles, personnel and cargo to Tinian.

[4] Combat Rubber Raiding Craft (CRRC) or Rigid Hull Inflatable Boats (RHIB) are used by small teams to come over the beach (OTB) or to deliver swimmers close to shore.

Proposed training. The MTP proposes maximizing the use of Tinian's beaches.

- **AAV landing sites**. At least one MLA beach is desired for AAV landings on Tinian. An alternative proposal is use of the LCU ramp in Tinian Harbor. The Marines rely on the AAV to bring assault elements ashore and to provide rapid cross-country mobility. No AAVs have landed on EMUA beaches in recent years, which hinders the Marines' maneuver.
- **LCAC landing beach**. Eight Tinian beaches were proposed for evaluation as additional sites for LCAC landings: six in the EMUA plus Leprosarium, Kammer, and Tachogna beaches (see Appendix C). (Only Unai Chulu is presently used.).

Beach selection. Appendix C contains the hydrographic and marine biology surveys that were conducted to determine landing beach suitability. Beach selection criteria include military control of the land, suitable ocean and beach characteristics for landing, and adjacent training land potential. Environmental impact evaluations were conducted by marine biologists to characterize the nearshore environment (with an emphasis on potential impacts to coral). The hydrographic surveys that were conducted at each beach identified suitable landing craft or vehicle selection. Table 2-1 summarizes the general description of these beaches and their suitability.

TABLE 2-1: TINIAN SITES CONSIDERED FOR AMPHIBIOUS LANDINGS

Beach	Usable Area, Physical Features	Training Features & Suitability	Environmental Features and Possible Constraints
Military Lease Area			
Unai Lamlam	None. Extremely narrow and rocky beach.	Not suitable for landing craft, AAVs, or combat swimmers	Shallow reef, heavy surf, vertical lava cliffs, and less than 65 ft (20 m) of usable beach.
Unai Babui	Narrow rocky beach. Shallow reef extends 230 feet (70 m) from shore with multiple spurs and grooves at the surf line Sparse coral development. Subject to heavy surf.	Fair beach trafficability; direct road access to land maneuver area. Suitable for CRRCs and swimmers, weather permitting	2% living coral on reef flat. Potential turtle nesting. Pre-landing survey of sea and beach conditions will be mandatory. Major cultural resources adjacent to beach are marked as NCRD areas. Access routes from the beach will require flagging.
Unai Chulu	Broad sandy level beach. Shallow reef extends 492 ft (150 m) from shore. Moderate to low coral development between reef and shoreline. Subject to heavy surf.	Good beach trafficability. Direct access to land maneuver area. Suitable for LCAC and CRRC landings. Extensive shallow reef combined with surf makes this beach suitable for CRRC and swimmers only during mild seas.	Potential turtle nesting. 25 to 35% (northern regions) and 50 to 60% (southern regions) living coral on reef flat. Major archaeological resources adjacent to beach are designated as No Training with access routes designated for pedestrian and vehicle passage. Pre-landing survey of sea and beach conditions will be mandatory. Access routes through sensitive areas will require flagging.
Unai Chiget	Lagoon with sheer cliff and high rock ledge on flanks. Foot traffic only on narrow beach.	Not suitable for landing craft, AAVs, CRRCs, or swimmers	Powerful surf breaks on top of exposed rock and reef.

TABLE 2-1: TINIAN SITES CONSIDERED FOR AMPHIBIOUS LANDINGS *(continued)*

Beach	Usable Area, Physical Features	Training Features & Suitability	Environmental Features and Possible Constraints
Military Lease Area *(continued)*			
Unai Dankulo (also identified as Long Beach)	Series of sandy level beaches with high reef crest, frequently heavy surf. Largest beach with roadway access to MLA is called Long Beach One. Coral on reef was heavily damaged during recent typhoons.	Surf break at the reef. Partial channel faces Long Beach #2.Very good water trafficability. Single roadway access to MLA after crossing soft sandy beach. Suitable for LCAC and CRRC only.	Potential turtle nesting. 50% to 70% living coral formerly on reef flat was heavily damaged/killed during 1997 typhoons. Portions of reef are exposed and remainder is extremely shallow. Suitable for CRRC sea conditions permitting. Pre-landing survey of sea and beach conditions will be mandatory.
Unai Masalog	98-ft (30-m) beach exit with connecting small vehicle trail.	Suitable for CRRC and combat swimmers only, sea conditions permitting.	Cultural resources in vicinity of beach and inland. NCRD constraints when traversing adjacent fields. Support vehicles will use roadways only. Shallow reef and strong surf zone will require protective clothing for combat swimmers. Pre-landing survey of sea and beach conditions will be mandatory.
Non-DOD Land Areas			
Leprosarium Beach	196-ft (60-m) beach with connecting trail and dirt road, lava rock and dense brush coastal terrain	Negligible surf zone and reef about 328 ft (100 m) from shore. Suitable for CRRCs and combat swimmers	Paddle CRRCs last 328 ft (100 m) to protect the reef. Area designated as a public recreation beach, and cultural resources are recorded in this area. Special operations teams will review scenarios with local authorities for approval. Pre-landing survey of sea and beach conditions will be mandatory.
Kammer Beach	Broad, sandy and level beach with calmer waters (50 x 100 ft [15 x 130 m]).	Suitable nearshore and beach topography for landings but developed for public recreation. 6.2 miles (10 km) on public roads to land maneuver area. Not suitable for amphibious landings by LCAC, AAV, and LCU due to land use conflicts. Suitable for Special Operations using CRRCs (with local authorization).	Reef off shore of eastern half,; inland area developed and used by the public. Kammer Beach has been officially designated by CNMI as a public recreation beach. Approval for its use for CRRC landings is required from Tinian Mayor and CNMI cultural and natural resource coordinators.
Tachogna Beach	Shallow nearshore reef that would hinder AAV landings and block LCU landings. Extensive strand vegetation, steep beach gradient.	Fair beach traffic feasibility. Large vehicle assembly areas nearby. Road network through Tinian to EMUA. Not suitable for LCAC or CRRC due to land use conflicts.	Subsurface cultural deposits would hinder maneuvers off of this beach. Hotel casino construction has increased recreational use of the beach and development of beach related small business ventures. Tachogna Beach has been officially designated as a public recreation area by CNMI.
Tinian Harbor	Boat ramp	Suitable for LCU and AAV using LCU ramp to west of commercial harbor	Commercial port activities will require coordination with CNMI Port Authority.

- **LCAC landing beaches**

The most feasible LCAC landing site on Tinian is Unai Chulu, most recently used during Tandem Thrust 99. The beach's offshore and inland characteristics will support LCAC landings to offload or take aboard equipment and personnel. There are sufficient connecting roadways to EMUA inland maneuver areas.

The beach at Unai Dankulo was proposed as an LCAC landing site, but until late 1997 was protected by an extremely shallow, coral-rich, partially exposed reef. There was concern that the LCAC could damage shallow coral formations. A marine survey conducted at Unai Chulu in March 1999 indicates that the air-cushioned vehicle does not harm coral in shallow waters. In addition, recent typhoons have heavily impacted Unai Dankulo's reef and coral between the reef and beach. Unai Dankulo (Long Beach One) is the preferred second LCAC landing beach on Tinian.

Approaches to Kammer Beach and its beach profile are both excellent for landings, but its feasibility for training is limited due to extensive recreational development (lawns, picnic pavilions, sidewalks, and fences). The Tachogna Beach nearshore and beach characteristics are also suitable for LCAC landings but is no longer remote. Nearby hotel development has increased tourists' use of both beaches, and the CNMI legislature has designated Kammer, Tachogna, and Leprosarium beaches as sites to be preserved for recreation. The proposals to use Kammer, and Tachogna beaches for LCAC landings do not remain in the preferred alternative.

- **LCU landing site**

The only location suitable for LCU loading and unloading is the concrete boat ramp in Tinian Harbor. All other beaches (less Kammer Beach) are protected by coral reefs that would close out the beach to LCUs. Kammer Beach is no longer a preferred alternative for amphibious landings by landing craft or assault amphibians.

- **AAV landing sites**

The World War II invasion beaches (Unai Lamlam, Unai Chulu, and Unai Babui) were proposed for landings, but only Unai Babui was evaluated since the impact to coral could be minimized. AAV landings at Unai Chulu and Unai Lamlam would cause considerable damage to nearshore coral. Unai Dankulo is not suitable for AAV landings due to the existence of a shallow offshore reef that would be impacted by the AAVs. The abrupt reef ledge at Tachogna Beach and its spurs and grooves causes it to be an unsuitable AAV landing site. The restrictions at Kammer Beach for LCAC and LCU also apply to AAV landings and inland maneuver.

Repeated site surveys to Unai Babui fail to support its use for AAV landings. A smooth portion of reef with sufficient width to ensure both of the vehicle's tracks touching down simultaneously was not found. Spurs and grooves on the reef face would make landing difficult. There is a possibility that one track would remain in a groove and the vehicle would bottom out on a spur or broach in the surf zone. There is a high probability for damaging the suspension system or damaging coral on the vertical face of the reef within a groove.

The LCU ramp at Tinian's harbor is also wide enough for AAVs to come ashore and there is a large, open field nearby for vehicle staging. Once ashore, the AAVs could move administratively through San Jose and use Eighth Avenue or Broadway to enter the EMUA.

- **Small boat landing sites**

Hydrographic surveys at potential beach landing sites supported using the CRRC to beach or deliver combat swimmers at Unai Babui, Unai Dankulo, and Unai Masalok in the MLA. Unai Chulu has also been used and is suitable during acceptable sea conditions. Other MLA beaches were ruled out due to high wave action across shallow and rocky nearshore reefs. Two beaches closer to San Jose (Kammer Beach and Leprosarium Beach) are also suitable. CRRC and swimmer operations are preceded by hydrographic surveys and surf reports since dynamic sea conditions can close out these beaches at any time. The special operations conducted at Leprosarium and Kammer beaches normally occur at night and are scheduled and reviewed with local authorities on a case-by-case basis. If permitted, the night activity would not conflict with daytime beach recreation use.

2.2.2.4 Live-fire Range Training on Tinian

Ongoing training. The former Tinian small arms range has been inactive for three years. It was used for rifle, pistol, 40mm rifle grenade, and 60mm mortar firing. The area is now fenced off and posted for the presence of 60mm and 40mm unexploded ordnance (UXO). The range is a designated No Training Area (see Figure 2-7a for range location). Reopening this range has not been proposed. There are no other ranges in the Mariana Islands that are certified for live-fire 60mm mortar or 40mm grenade training.

At present TRUE training clandestine reconnaissance and raids, in extremis hostage rescues, and noncombatant evacuations. When small arms live-fire is involved, the activity is confined to the interior of the World War II Japanese Air Command Post on North Field. This building is converted to a temporary "shooting house" training facility by using portable bullet traps and silhouette targets set up in rooms inside the structure. If forcible entry is required, a small charge may be used to blow (breach) a reusable door or window. The units involved in TRUE consist of NSWU-1 (the SEALs), Army Special Forces, and the MEU. Remaining weapons training on island relies upon the use of blank ammunition and simulators.

During Tandem Thrust 99,the Tinian municipal government authorized a nighttime landing by a special operations team using CRRCs on Kammer Beach followed by breacher trainer training (blank fire and small charges) using an unoccupied structure near the beach.

Proposed training. The MTP proposes to maintain ongoing training and to develop new live-fire ranges. To eliminate firing range training deficiencies on Tinian, the MTP proposes development of the following ranges:

- **Small arms fire-and-maneuver range.** This range would replace the inactive range and support small groups moving among various shooting positions to engage several targets. The range would be primarily used by infantry personnel armed with 5.56mm and 7.62mm rifles, 5.56mm squad automatic weapons (SAW), and 7.62mm light machine guns (LMG).

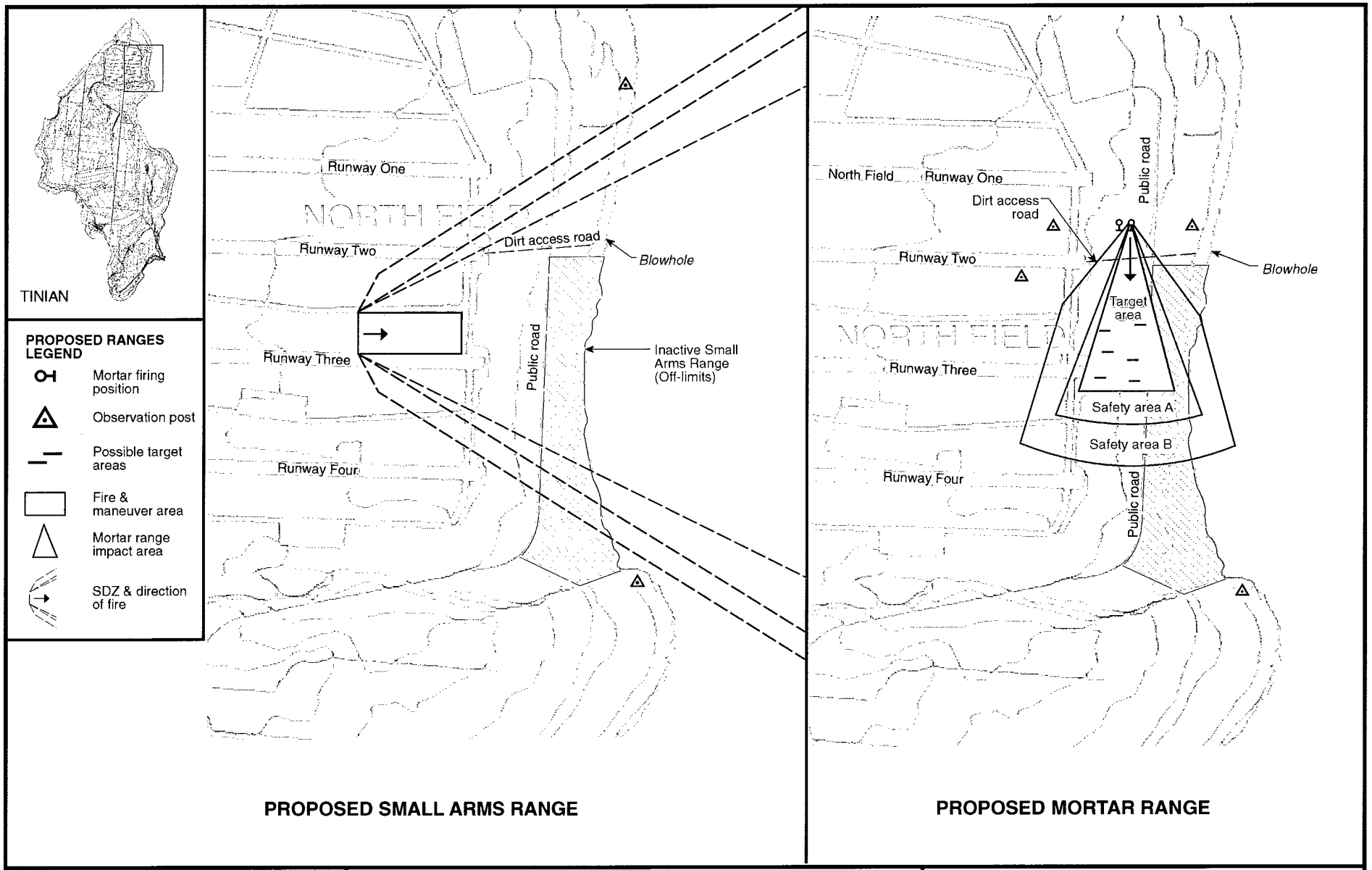
This range (see Figure 2-1b) would be designed for infantry unit fire-and-maneuver using 5.56mm and 7.62mm rifles, 5.56mm SAW, and 7.62mm LMG. These weapons fire lead bullets often cased in copper and not exploding projectiles. The range would be approximately 650 feet (200 m) wide by 1,640 feet (500 m) long, oriented to fire west to east. Individual targets with sandbagged backstops and bullet stop revetments would be constructed west of the public road. Range construction would require clearing a limited amount of tangantangan brush and excavating each target position. The range would be situated so that the SDZ—the area calculated to contain all possible strays and ricochets from the weapons used on the range—would impact the open ocean to the east but not the cliff of Puntan Chiget. The safety fan could be wider than the fan on a KD range, based on a greater range of permitted angles of fire.

- **60mm or 81mm mortar range.** The proposed range would replace the inactive range for training the mortar crews support infantry units training on Tinian.

  An 81mm mortar range would require more land area than is readily available within the EMUA. The proposal has been confined to development for the shorter-range 60mm mortar. The firing range would need a dedicated 0.4 square-mile (1-km^2) box, with the impact area extending approximately 2,300 to 3,000 ft (700 to 900 m) from the firing line. An additional 1,000 ft (300 m) would be added to the SDZ length as a safety buffer in case of long rounds (see Figure 2-1b). The conceptual range would be perpendicular to the fire-and-maneuver range and south of the two runways used for aviation training. A certain percentage of mortar shots will be duds and the firing lines and SDZ would be fenced and require some vegetation clearing in target areas. To maintain visibility downrange and to be able to locate UXO, a pesticide such as Roundup would be needed to control vegetation growth.

- **Shooting house** (or firing maze) and/or a **breacher trainer**. If constructed as proposed, these facilities could replace or supplement the temporary TRUE training facilities established in the World War II structures on North Field.

  A 150-square-foot (14-m^2), one- or two-story shooting house and/or breacher trainer could be constructed on paved surfaces on North Field reducing the requirement to clear vegetation. The interior walls of the shooting house rooms and hallways would be constructed as bullet traps so that fired rounds do not ricochet or leave the building (the construction technique facilitates replacing wall materials as needed). A roof with vented overhang provides ventilation without allowing rounds to escape the confines of the structure. An observation catwalk if often included. The construction technique means that unlike open field firing ranges with extended SDZs, the shooting house would have a small exterior safety radius of about 75 feet (23 m) and would not require closing large portions of the EMUA. Guards would be posted at all points of approach to prevent civilians from entering the shooting house safety perimeter during training.



Sources: AR 385-63, MCO P3570.1A

NORTH

0 250 500 (Meters)

0 1000 2000 (Feet)

ALTERNATIVES:
Black = No new action (continue)
Green = Preferred (new)
Red = Not-preferred (new)

See text for abbreviations

Existing UXO contamination

Figure 2-1b
CONCEPTUAL PLANS FOR SMALL ARMS AND MORTAR RANGES ON TINIAN

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The breacher training would be constructed with doors and windows that can be breached (blown in) and reused or easily replaced. No live ammunition would be used at the breacher trainer, and any firing would be done with blanks or training ammunition similar to paint gun projectiles. ("Simunitions" is one commercial brand used by NSWU-1.) This allows tactical play involving friendly and enemy forces/hostages, terrorists and rescuers without the danger of live fire in confined spaces.

The shooting house and breacher trainer would be constructed in proximity to the North Field runway or helicopter LZs so that aviation support can be integrated into TRUE scenarios.

Figure 2-1b illustrates conceptual range layouts and sites within sections of the EMUA that will minimize interference with other training activities. These concepts do not represent formal approved range designs, which are the responsibility of Naval Facilities Engineering Command (NAVFAC) personnel and subject to Chief of Naval Operations approval with regard to safety measures. If these range proposals were approved, the live-fire training would require area-specific firing range operations and training directives and procedures for coordination, planning, and execution by representatives of COMNAVMARIANAS, the FAA, USCG, and CNMI authorities. At present, military construction funding has not been planned or provided for these projects.

Open field, live-fire range development on Tinian is not selected for the preferred alternative. This activity has the potential to significantly impact the environment and create major public safety risks since it would be conducted in areas that are accessible to the public. A discussion of potential impacts to natural and cultural resources, public safety and socioeconomic conditions is found in Section 2.9.1 and 4.2.

2.2.2.5 Demolition Training on Tinian

Ongoing training. Ongoing training consists of the use of small breacher charges during TRUE in World War II abandoned structures in the EMUA. This activity is discussed in section 2.2.2.4 above.

Proposed training. The Maximum Training Land Use Alternative proposes reestablishing rapid runway repair (RRR) training on Tinian which could involve cratering. This engineer support training was discussed in section 2.2.2.1 above and is not preferred as a Tinian training activity.

2.3 COMNAVMARIANAS WATERFRONT ANNEX

2.3.1 Training Land and Water Resources

The annex has about 4,479 acres (1,813 ha) of training land including about 860 acres (348 ha) on Orote Peninsula, the primary maneuver area (see Figures 2-2a and 2-2b). The annex consists of Orote Peninsula (bounded by the Pacific Ocean, the south shoreline of Apra Outer Harbor and

west shoreline of Apra Inner Harbor) and property along the eastern coast of Apra Inner and Outer Harbor. The MTP proposes training activities on Orote Peninsula, in surrounding waters of Apra Inner and Outer Harbors, on or near Dadi Beach and Tipalao Cove on Agat Bay, Dry Dock Island, Polaris Point, and Camp Covington. Much of the Waterfront Annex is developed as a port facility and Navy community, but much of Orote Peninsula is an undeveloped former World War II airstrip with mixed open and forested areas. About 20 percent of the peninsula's open lands are restricted from training to protect natural resources, but without detriment to ongoing or proposed training.

Beyond the main gate, few internal access roads are gated. The historic trails and sites on Orote Peninsula are open to visitors, periodically restricted whenever there is ammunition ship activity and Kilo Wharf, active firing range use, or aviation activity. The ongoing transfer of a few developed areas around Inner Apra Harbor to civilian ownership will have no effect on existing or proposed training land uses.

The DoD controls much of the Outer Harbor and all of the Inner Harbor. Certain areas of submerged land to the north of the harbor have been transferred to the jurisdiction of GovGuam. The harbor contains significant historic resources in the form of various ships sunk during World Wars I and II. Protected turtle species are known to frequent the harbor and migratory seabirds nest along the southern cliffs of Orote Point.

2.3.2 Proposed Training Activities

The proposed action for Waterfront Annex is to continue all ongoing training activities shown in black on Figures 2-2a and 2-2b, and to expand training by incorporating the activities shown in green (preferred) and red (not preferred). Neither the No Training and Reduction of Training Land Use alternatives are preferred for Tinian. (As constraints to protect sensitive resources, no training ("off-limits") and reduced training at specific locations are incorporated as appropriate within the preferred alternative.) The following sections describe ongoing and proposed training activities.

The Waterfront Annex is currently used for all types of training activities except naval gunfire and aerial bombardment. The Navy base has two small-arms firing ranges, a shooting house, a runway and connecting paved surfaces suitable for fixed- and rotary-wing aviation training, a rappelling tower, and adequate undeveloped land for small-scale field maneuvers. DoD-controlled beaches in the inner and outer harbors have been used or proposed for amphibious landings. The inner and outer harbors have been used for underwater demolition training and various helicopter training activities.

2.3.2.1 Field Maneuvers and Logistics Support at the Waterfront Annex

Ongoing training. Field maneuvers and logistics support training are routinely conducted by organizations assigned to Guam, and infrequently conducted by transient units. Ongoing maneuvers and logistic support includes bivouacs on Orote Peninsula or within the main cantonment, small unit tactics, live-fire range training and land navigation. See Figure 2-2a for a view of the variety of training/training areas at the annex.

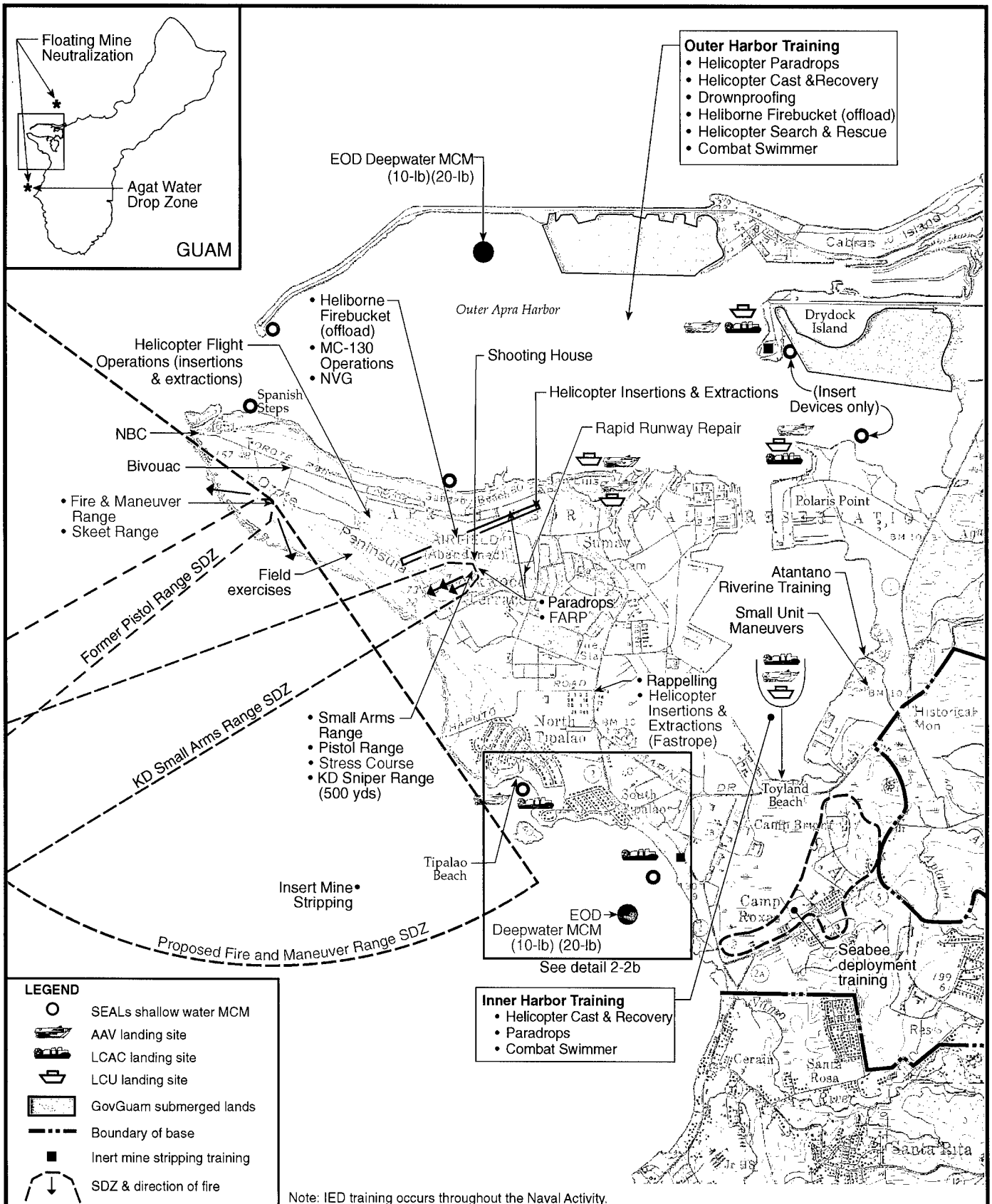


Figure 2-2a
WATERFRONT ANNEX LAND USE

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NBC (nuclear-biological-chemical) training consists of individual refresher training with protective masks and clothing (while exposed to a riot-control agent) or extended maneuvers while wearing full protective attire.

Navy Construction Battalions (SeaBees) rotate through Guam for seven months of training in construction skills and training under tactical conditions. Each new battalion learns how to establish, operate, maintain, and secure a tactical base camp prior to deployment to conduct construction tasks in more remote locations in the Pacific. Camp Covington is the SeaBee compound on Guam.

Related to field maneuver training are the security training events involving both Base Security personnel and EOD who periodically conduct security reaction within all parts of the base and its facilities. Based on antiterrorist or hostage scenarios, EOD trains to neutralize "improvised explosive devices" (IED) and Security Police conduct various antiterrorist neutralization/hostage rescue scenarios. These functions do not require special or dedicated training areas.

Proposed training. The MTP proposes RRR training at Orote Peninsula. There are many former airfield surfaces that can be used for RRR without interference to other training activities. The method adopted by the USAF to develop a single site for RRR is proposed for Orote Peninsula also. If adopted, no impacts to resources are anticipated.

2.3.2.2 Aviation Training at Waterfront Annex

Ongoing training. Helicopter insertion and extraction of tactical units is conducted at landing zones (LZs) established on Orote Peninsula. Parachute operations are conducted at designated drop zones (DZs) on land and water. HC-5 conducts firefighting bucket dumps at simulated fire scenes using external water containers loaded offshore or at Fena Reservoir. (HC-5 responds to both military and civilian community fires.) HC-5 conducts search-and-rescue (SAR) training over land and water. (Actual SAR missions are flown in support of the military and civilian community.) C-130 tactical airlifts of SEALs are conducted on Orote Peninsula.

Helicopter insertions of small reconnaissance units and their raiding craft (CRRCs) are conducted into the harbor. Helicopter cast and recovery training supports various special-function forces. The "cast" consists of hovering over the water at a 20-foot (6-m) altitude proceeding at 6 mph (5 knots). Twelve to 16 swimmers jump into the water and swim (or ride in a CRRC dropped from the helicopter) to the objective. The recovery is also accomplished at six-mph (5 knots) using a Jacob's ladder or retrieval ring to get the swimmers back into the helicopter.

Proposed training. No additional aviation training activities have been proposed by the MTP.

2.3.2.3 Amphibious Landings at the Waterfront Annex

Ongoing training. Dry Dock Island is used for LCAC and LCU landings. LCACs have landed at Polaris Point. There have been no AAV landings reported. Vehicles offloaded at Dry Dock Island and Polaris Point use Marine Drive (Hwy 1) to reach the annex (see Figure 2-2a). CRRCs and RHIBs may land at various points along shorelines.

Riverine training is an ongoing activity at the Atantano River. It consists of a SEAL team of 10 to 16 persons attempting small boat (RHIB or CRRC) insertions (anchoring the boat, swimming and wading to shore), coming under ambush, and then fighting their way back to the raiding craft. Blank ammunition is used in weapons.

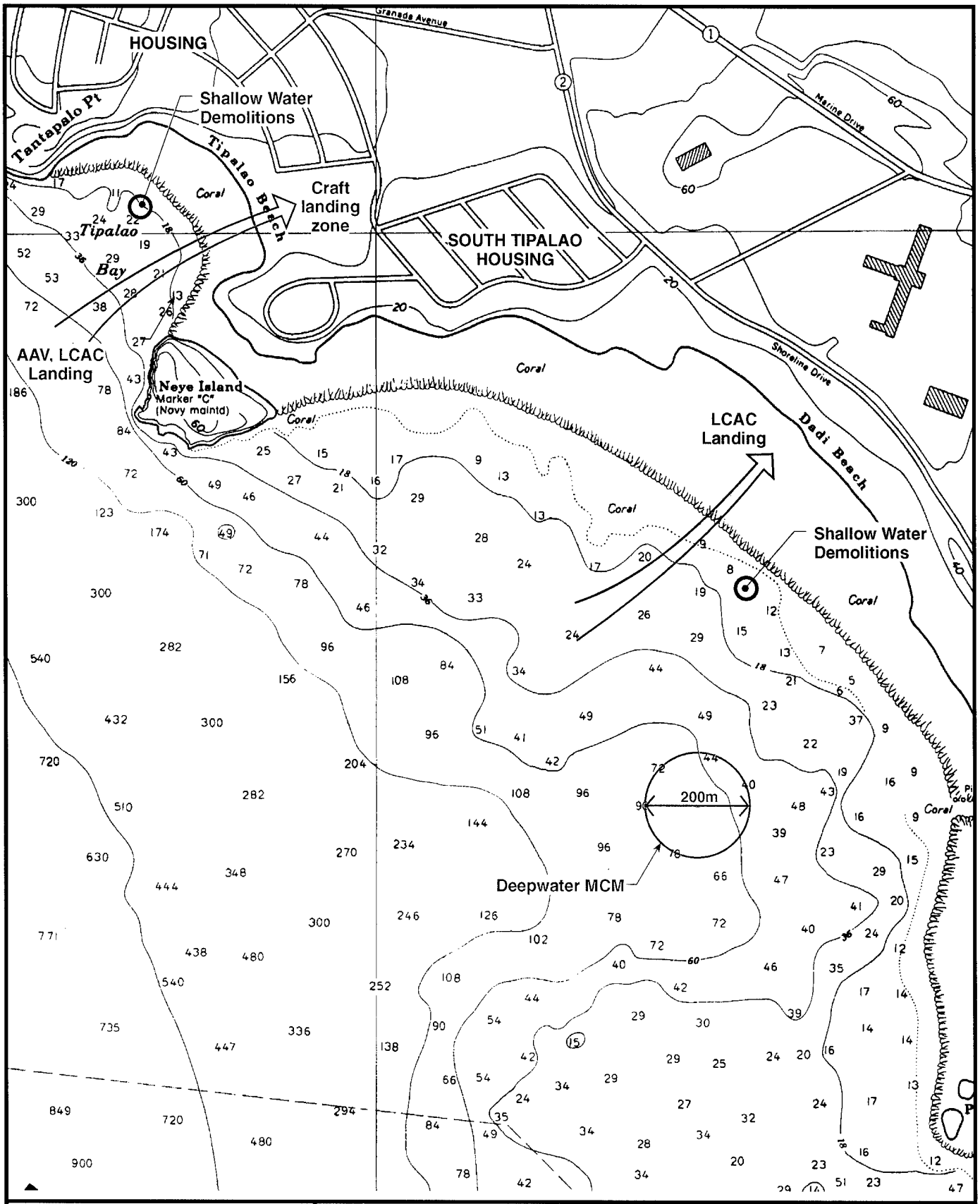
Proposed training. The MTP proposes to expand on landing opportunities by using Dry Dock Island for AAVs and landing craft, Polaris Point and Toyland Beach for LCAC, LCU and AAV, and a former World War II refueling pier and the Sumay Cove Marina boat ramp for LCU and AAV landings. Dadi Beach is proposed as an LCAC landing site and Tipalao Beach is proposed for LCAC and AAV landings. Beach selection criteria and the activities at each beach would be similar to those described previously for Tinian in Section 2.2.2.3.

From certain landing areas, AAVs and the vehicles offloaded from landing craft would travel through developed portions of the base to reach inland maneuver areas and ranges. The landing craft and AAVs are the means by which the transiting ARG may get the MEU ashore, and their training can be anticipated in the Marianas two or three times annually. The MEU is also special operations capable (SOC) and will conduct various special operations training events in conjunction with amphibious training.

The following text and Table 2-2 summarize the training pros and cons of the locations evaluated for landings by specific craft or AAV. Other beaches in Apra Harbor or south of Orote Point were not considered due to conflicting land use, inappropriate hydrographic characteristics and terrain, or the presence of living coral.

- **LCAC landing sites**

A variety of sites have been proposed for LCAC landings: Dadi Beach, Tipalao Beach, Toyland Beach, Polaris Point, and Dry Dock Island. All have been determined to be suitable except for Dadi Beach. Landings are feasible provided storms do not increase beach slopes to unacceptable levels that would hinder the LCAC from coming fully ashore. According to site surveys performed by the Marines in September 1997, most of the sites require some vegetation clearing or cleanup to provide adequate, unencumbered turning space on dry land for one or more LCACs.



Source: NOAA Nautical Chart Catalogue No. 2, Panel B, Apra Harbor, Island of Guam

0 100 200 (Meters)

NORTH 0 400 800 (Feet)

ALTERNATIVES:
Black = No new action (ongoing)
Green = Preferred (new)
Red = Not-preferred (new)

Depth in feet MLLW

Figure 2-2b
TIPALAO AND DADI BEACH DETAILS

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A landing on Dadi Beach would require removal of at least two trees and vegetation beyond the beach road to allow two LCACs to land and turn. Archaeological resources at Dadi Beach were surveyed as part of a previous NEPA document[5] and can be avoided when clearing the shoreline for a craft landing zone (CLZ). Limited staging area is available between the beach and highway. Offloaded vehicles would use the established beach roads to proceed immediately to the highway and inland sites.

A demonstration landing was conducted and observed by regulatory agencies. Vegetation was not extensively cleared and subsequently the beach depth was narrow, causing the LCAC to do much of its turning in shallow water instead of on the beach. GEPA and DAWR expressed concerns about potential damage to the extensive shallow coral being crossed at low tides. Since other sites are feasible and available, the Navy does not consider Dadi Beach to be suitable for LCAC landings without developing a suitable CLZ and conducting another demonstration landing. Figure 2-2b shows the LCAC landing on Dadi Beach as presently not preferred (in red).

Tipalao Beach can be used, but the beach itself is cluttered with boulders and riprap in the surf zone that should be cleared away. There is room for one LCAC on the beach and four LCACs in the adjacent grassed ball field. The slope to the ball field requires regrading and a portion of the ball field's fence must be removed.

Toyland Beach requires minor regrading on its banks and removal of up to a half dozen trees and a few boulders along the shoreline. The offshore substrate is sandy silt and rock with no live coral. Onshore the area is crushed coral and mown grass. The trees consist of mature coconut trees (about 20 feet [6 m] tall) and immature ironwoods (less than 20 feet [6 m] tall). There is room in a former parking lot to stage offloaded vehicles. Upon offloading from the LCACs, wheeled vehicles can access inland portions of the Waterfront Annex by traveling along a short (1,640 feet [500 m]) portion of Marine Drive (Route 1) owned and controlled by the Navy to and through the Main Gate.

Use of the Polaris Point Beach will require relocation of swim buoys and small structures near the beach to avoid wind and sandblast effects from the LCAC fans. Slight regrading along the grassy bank to the right of the beach would allow the LCAC to come ashore adjacent to the recreation beach.

Dry Dock Island is uninhabited and is suitable for one LCAC without any clearing. Two LCACs can be landed if three to four trees are removed. Sufficient cleared area exists to stage offloaded vehicles prior to a motor march to Orote Peninsula or the Ordnance Annex.

- **LCU landing sites**

LCU landings were considered for Toyland Beach, the former World War II refueling pier, Polaris Point, and Dry Dock Island. The latter two sites have been used in the past. The Sumay Cove Marina boat ramp was proposed but ruled out due to insufficient width in the channel.

[5] Helber, Hastert & Fee, Planners (March 1995) *Environmental Assessment for the Navy Lodge, Waterfront Annex, U.S. Naval Activities, Guam.* Prepared for Navy Exchange Service Command.

Toyland Beach will need the same modifications noted for LCAC landings. Offloaded vehicles can assemble in the adjacent parking lot before driving inland.

Submerged lands at the former World War II refueling pier requires extensive clearing, the sea wall needs major repair, and the beach needs regrading. Five to six trees must be removed along the beach line. Offloaded vehicles can travel along a dirt road adjacent to a wetland to access Orote Peninsula.

Polaris Point requires no modifications for two LCUs to land. The beach could accommodate four LCUs if the old (broken) seawall was removed and the shoreline graded. The swim buoys must be temporarily removed during exercise.

Dry Dock Island requires no modifications for one LCU to land, and two LCUs could land if the shoreline modifications noted above for LCAC operations are completed. A hydrographic survey noted a submerged pipe for removal.

AAV landings. Tipalao Beach, the former World War II refueling pier, Sumay Cove Marina, Toyland Beach, Polaris Point, and Dry Dock Island were considered as AAV landing areas. From all locations, AAVs could travel along existing roads to support training on Orote Peninsula.

All are considered suitable except for the refueling pier. The refueling pier would require a concrete boat ramp for the AAV to traverse the seawall, plus all of the modifications and repair identified for LCU operations. The only exit road is unpaved and is immediately adjacent to a large wetland. Repeated use by AAVs will require road maintenance. Considering that Sumay Cove Marina is available, the Navy does not consider the refueling pier to be a required AAV landing site.

The boat ramp at the Sumay Cove Marina requires no modifications but should be inspected for damage particularly at the edges after each AAV use. Potential turtle nesting sites on the far bank of the cove are one reason that a "no wake rule" is in effect for all craft using the cove and marina ramp.

The same beach cleanup needed for LCAC landings at Tipalao Beach is desired but not mandatory for AAV landings.

Toyland Beach requires the onshore modifications identified for LCUs. Repeated landings and backloads would cut a tracked vehicle path through the existing lawn turf, which could cause some storm water runoff and siltation into the harbor.

Polaris Point and Dry Dock Island require no modifications, although AAVs may disturb mown grass.

CRRC and RHIB landings. CRRC and RHIB are often used to deliver swimmers to shoreline that may be closed out to landings or swimmer insertions due to nearshore conditions, weather, and tides. Hydrographic surveys are required for each landing to ensure safe conduct of training. Two additional riverine training sites away from DoD property were considered to supplement the ongoing training at the Atantano River on Navy property. Neither non-DoD site is logistically

feasible (see Section 2.8.1. and 2.9.6). Because the training groups are small and there are varieties of usable ambush areas, additional sites are not required to provide training variables.

TABLE 2-2: WATERFRONT ANNEX SITES CONSIDERED FOR AMPHIBIOUS VEHICLE LANDINGS

Beach	Usable Area, Physical Features	Training Features & Suitability	Environmental Features & Land Use Constraints
Dadi Beach: Proposed LCAC site	Shallow reef extends about 328 ft (100 m) from beach. Sandy low- to moderate angle beach with room for 5 LCACs. Access to roadway for offloaded vehicles. Slight masking by hill on right flank will reduce LCAC prop/thruster wash.	Good beach trafficability for offloaded vehicles. Reef would damage LCU. AAVs would damage reef. Nearshore suitability questioned by GEPA and DAWR. Development of a suitable CLZ and conducting a marine survey are necessary before identifying this beach as a preferred landing site.	Exposed coral heads on shallow nearshore reef could be impacted by LCAC skirt. Turtle nesting, beach strand vegetation, and archaeological resources may constrain beach use. Family housing is nearby. There are no adjacent maneuver areas.
Tipalao Beach: Proposed LCAC and AAV site.	Shallow reef strewn with visible boulders and metal debris; no live coral. Adjacent fenced athletic field large enough to park 4 LCACs. No road network from beach except through family housing.	Satisfactory beach trafficability for tracked vehicles and LCACs. Can be improved if riprap and other debris are removed. No adjacent maneuver area. Reef and riprap would damage LCUs, CRRCs and RHIBs. Suitable for LCAC & AAV landings	With family housing adjacent to beach, LCAC landings should be conducted during the day. Athletic field fence will require removal. No adjacent maneuver areas.
Polaris Point: Ongoing LCAC landings and proposed for LCU and AAV.	No reef and a sandy bottom. Recreation beach with 4-ft (1.2-m) high sea wall. A level, grassy field to right of beach is large enough for 2 LCACs.	Good beach trafficability. Clear approach if swim buoys removed. Limited access to paved roads. No adjacent land maneuver area. Suitable for LCACs, LCUs, AAVs, CRRCs and RHIBs.	Developed recreation beach and adjacent open lawn areas, picnic shelters, volleyball court. Requires use of public highway (Marine Drive [Route 1]) as a connector to the Waterfront Annex.
Dry Dock Island: Ongoing LCAC and LCU landings; proposed for AAVs	No reef and sandy bottom. Recreation beach. Gently sloping grassy field behind beach large enough for 1 LCAC.	Excellent trafficability and access to paved roads and highways. No accessible land maneuver area. Suitable for LCACs, LCUs, AAVs, CRRCs, and RHIBs.	Recreation beach access is controlled. Relatively remote. Former temporary support structures were removed after typhoon damage. Public highway (Marine Drive [Route 1]) is the connector to the Waterfront Annex.
World War II Refueling Pier (FISC Beach): Proposed LCU and AAV site.	Nearshore area filled with riprap. Remnants of concrete and metal sea wall. Relatively abrupt bank accesses road between harbor and wetland.	Provides access to Orote Peninsula in a relatively remote area. Coral roadway is satisfactory for wheeled vehicle traffic without major damage. Suitable for LCU only.	Access road borders a wetland. Access road paving will not support tracked vehicles. Will require ramp repair and riprap clearing. Will require inspection and repair for seawall area erosion.

Table 2-2: Waterfront Annex Sites Considered for Amphibious Vehicle Landings (continued)

Beach	Usable Area, Physical Features	Training Features & Suitability	Environmental Features & Land Use Constraints
Sumay Cove Marina: Proposed for LCU and AAV landings.	Man-made cove with steep walls and a concrete boat ramp wide enough for LCU and AAV.	Sheltered landing site, excellent trafficability Road connector to Orote maneuver areas and ranges. Suitable for AAV at boat ramp	Insufficient turning room for LCUs. Shared use of a recreational boat marina. Hawksbill turtles may nest on cove shoreline. No wake rule in effect in cove.
Toyland Beach: Proposed LCAC, LCU and AAV site.	Nearshore area flat with clean bottom. Gentle, sloping to flat grassy fields suitable for vehicle offloading and staging.	Satisfactory trafficability for tracked and offloaded wheeled vehicles. No accessible land maneuver area but immediate access to Navy road provides access to Waterfront Annex. Suitable for LCUs, AAVs, LCACs, CRRCs and RHIBs.	A few small trees and boulders need to be removed. Does not require use of public highways to reach inland maneuver areas.
Atantano River	Remote water body with surrounding mangroves along the shoreline.	NSWU-1 shoreline ambushes and reaction drills on Navy property west of Marine Drive (Route 1). Suitable for CRRC and RHIB supported exercises	Mangroves at mouth of river. Nearby moorhen habitat.

Notes: 1. Source: On-site surveys by COMNAVMARIANAS, ACU-5/NBG (September 1997), and Naval Special Warfare Unit ONE Beach Reports (December 1992).

2.3.2.4 Live-Fire Range Training at the Waterfront Annex

Ongoing training. There are three existing firing ranges at the Waterfront Annex. All are operated under stringent range regulations (see Section 4.1.2.2):

A small arms known distance (KD) range with 200-, 300-and 500-yard (183-, 274-, and 457-m) firing lines is used by resident and transient organizations and Guam Guard and Reserve units. The 500-yard (457-m) firing line is used for NSWU snipers' training (at a known distance) with the 7.62mm sniper rifle. The KD range is oriented so that personnel fire to the southeast at targets placed forward of a 65-foot (20-m)-high backstop (see Figure 2-2a). Although the range's SDZ extends out over the ocean southwest of Orote Point, the backstop effectively stops the flight of rounds beyond land.

A pistol range is situated immediately behind the KD range target line. This range can only be used when the rifle range is not in use. The pistol range uses the same 65-foot (20-m)-high backstop.

NSWU and other special operations units use a shooting house east of the KD range.

Proposed Training. The Maximum Training Land Use Alternative proposes the following range improvements:

- **Construct Stress Course**. A former small arms range corridor parallel to the KD range is proposed for development as a small arms stress course, incorporating physical obstacles for the shooters as well as targets for live-fire weapons training. The modification would be conducted in an area of individually bermed, firing points and target at short ranges suitable for shotgun familiarization training and setting rifle battle sights.
- **Construct Fire-and-Maneuver Range**. A former pistol range on Orote Point is proposed by NSWU for modification as a fire-and-maneuver range. This modification requires constructing a new target array and firing positions. It would widen the area covered by the range's SDZ due to the increased angles of fire permitted during fire-and-maneuver (see Figure 2-2a and Appendix B). However, the range remains oriented with all lines of fire directed toward the base of a 65-foot (20-m)-high backstop.
- **Use 40mm and 60mm Training Projectiles**. The range areas are also proposed for firing 40mm rifle grenade training projectile (TP) and a new 60mm reusable training round that will enter the inventory in 1999. The training projectiles substitute for the lack of live fire 40mm rifle grenade and 60mm mortar ranges on Guam and Tinian.

The proposed range enhancements are suitable. Live firing takes advantage of the natural and high backstop for any range existing or developed in this portion of Orote Peninsula. The open fields facilitate observation of the flights of training projectiles and quick retrieval of the reusable 60mm mortar round. The shooting house is adjacent to the runway on Orote Peninsula, facilitating certain special operations scenarios involving aviation support and live-fire. When not in use, all four locations are accessible by civilians and pose no danger. The range modifications are being conducted with NAVFAC for design review and range certification. Due to proximity to Kilo Wharf, range development will also be coordinated with the Naval Ordnance Center.

2.3.2.5 Underwater Demolitions at the Waterfront Annex

Ongoing training. The existing deepwater demolition site is near the Glass Breakwater in Outer Apra Harbor (see Figure 2-2a). The site has a sandy bottom, a water depth of about 125 feet (38 m), is about 2,000 feet (600 m) from the nearest known submerged historic ship, and is a safe distance from commercial and Navy shipping operations. A safety protocol is established as part of the training activity. An area of about 0.6-mile (1,000-m) radius around the site is closed to civilian water traffic and divers during the exercise. The water surface areas within about 1,000 feet (300 m) of the site are surveyed for absence of marine animal and civilian presence prior to any detonations. Existing training involves EODMU-5 using one charge no larger than 10 pounds (4.5 kg)

Ongoing shallow-water demolition training is conducted near Glass Breakwater close to the harbor mouth by NSWU-1. One-pound charges (up to 20) are rigged to "clear a beach of obstacles" that could impede amphibious landings. Similar safety protocols are taken as described above to secure the site to protect non-training persons involved in harbor activities.

Ongoing floating mine neutralization training is conducted in the open ocean north of the entrance to Apra Harbor and at the Agat Drop Zone (see Figure 2-2a). No additional sites near land are proposed. A charge of 10-lbs or less is detonated near the surface to "neutralize' the floating mine or to cut its mooring cable.

Proposed Training. The Maximum Training Land Use Alternatives proposes expanding the number of training sites that would be available to EOD MU-5 for deepwater demolitions and to NSWU-1 for shallow water demolitions. Proposed deepwater demolition training would increase the size of the demolition from 10 to 20 pounds (4.5- and 9.0-kg).

- **Alternative deepwater demolition site**. The proposed alternative deepwater site is south of Orote Point, offshore of Dadi Beach in waters 42 to 98 feet (13 to 30 m) deep. This area is approximately 0.3 miles (450 m) off shore (see Figure 2-2b). There are no significant submerged historic resources in the general area, which is geographically isolated from harbor traffic. The nearest recreational dive sites are Haps Reef (about 1.2 miles [2 km] away) and Blue Hole (about 2.2 miles [3.5 km] away). Both marine mammals and turtles are known to visit the area but are not continuously present. The area may also be populated with dolphins, rays, and grass eels that would suspend training until the area is clear.
- **Alternative shallow-water demolition sites**. Nine shallow-water sites were proposed by NSWU for evaluation. Two are suitable for training with live charges without conflicting with other activities or damaging abundant coral or reef fish. The site near the tip of Glass Breakwater is in use, and is a feasible and suitable location that can be readily observed to ensure public safety. Although near family housing, the underwater training near Tipalao Beach is a remote location that can be observed and provides an appropriate depth and a lack of coral. Inert training mines can also be brought to the surface and taken ashore for dismantling. Underwater demolitions in shallow water near Gabgab Beach, Spanish Steps, or Dadi Beach would cause extensive damage to coral. Dry Dock Island is close to commercial businesses. Polaris Point is used for supporting a submarine tender and other related activities. Dry Dock Island and Polaris Point are not "remote" locations. Table 2-3 summarizes proposed alternative MCM sites.

The criteria for demolition site selection are as follows:

- The deepwater sites will be accessible by small boat and within reasonable distance to a nearshore area suitable for dragging in the neutralized device at the end of the exercise.
- The area will have a sandy or rubble substrate devoid of coral a depth of about 65 to 130 feet (20 to 40 meters) for deepwater training and about 10 to 12 feet (3 to 4 meters) for shallow water training. The site will be remote from underwater cultural resources (Apra Harbor sunken ships) that would sustain damage by explosive overpressure.
- The site will offer some level of protection from weather and stormy seas, be remote from areas heavily used by commercial or recreational divers, fishers, and boaters, and can be readily secured and observed by safety monitors.

TABLE 2-3: WATERFRONT ANNEX SITES FOR DEMOLITION TRAINING

Site	Access	Depth and Substrate	Weather Protection	Security Considerations and Suitability	Environmental Features and Land Use Conflicts
EOD: Deepwater Mine Countermeasures (MCM)					
Outer Apra Harbor	Good	Suitable (125 ft [38 m], sandy, no living coral).	Good	Excellent site observation. Suitable at designated site for monitored training.	Recreational dive sites within safety radius require temporary closing.
Dadi Beach (offshore)	Good	Suitable (42-98 ft [13 to 30 m], sandy, no living coral).	Exposed from south and west.	Clear of commercial activities and excellent site observation. Suitable at designated site. Training site must be confirmed as clear of endangered or threatened species or species of concern.	Deep expansive sand flat adjacent to areas of low coral. Dolphins and eels have been sighted in the area. Nearest commercial dive site is 1.2 miles (2 km) away.
EOD: Floating Mine Neutralization					
Open Ocean north of Apra Harbor and Agat Water DZ	Good	Not Applicable. Detonation near surface	Exposed	Clear of commercial and recreations activities. Excellent site observation.	None
NSWU (SEALs): Shallow Water Obstacle and Mine Countermeasures (MCM)					
Glass Breakwater	Good	Suitable	Good	Good. Clear of ship channel and excellent site observation. Temporary restrictions to commercial dive activities. Suitable for training.	None
Spanish Steps	Good	Suitable	Good	Good. Clear of ship channel. No interference to commercial dive activities. Excellent site observation. Unsuitable due to potential damage to coral.	Abundant live coral on shallow reef that would be damaged at depths used for demolition training.
Gabgab Beach	Good	Suitable	Good	Unsuitable. Potential damage to coral in an established recreation beach area.	Abundant live coral on shallow reef that would be damaged at depths used for demolition training.
Polaris Point	Good	Suitable	Good	Unsuitable. Training may conflict with mission requirements and recreation in area. Other more remote sites are available.	Training may conflict with adjacent recreation beach and submarine tender activities. **Inert training devices can be used.**
Dry Dock Island	Good	Suitable	Good	Unsuitable. Readily secured but close to refueling and commercial harbor activities. More suitable/remote sites exist. Used by EOD for bring neutralized mine training devices ashore from Glass Breakwater.	Training may conflict with scheduled recreation and ship refueling activities. **Inert training devices can be used.**
Dadi Beach	Good	Too shallow (<6.5 ft [2 m])	Exposed from south and west.	Unsuitable due to potential harm to coral.	Abundant live coral on shallow reef that would be damaged at depths used for demolition training.
Tipalao Cove	Good	Suitable	Exposed from south and west.	Suitable. Beach and water approaches easily monitored. No interference with commercial activities.	None

2.4 COMNAVMARIANAS ORDNANCE ANNEX

2.4.1 Land Resources

The Ordnance Annex consists of 8,840 acres (3,580 ha) of mostly undeveloped land surrounding ordnance storage magazines. The central magazine area of the Ordnance Annex is not available for training. Training units are informed of training restrictions and limitations generated by munitions storage and activities are monitored. The wooded areas in the western and northeastern edges are appropriate for field maneuvers and bivouacs. Connecting roadways traversing the munitions storage areas are designated by the Annex Safety Officer.

In addition to the magazines, the annex has a small complex of administration and support buildings and connecting roadways. Non-ammunition related permanent structures and certain activities are prohibited within the ESQD arcs generated by ordnance stored in magazines in the central portion of the annex.

The restrictions affect about 50 percent of the total land area. The area south of the magazine is also well suited to small field maneuvers and portions have been selected for range development. Very few vehicles support maneuver training in the Ordnance Annex, but helicopter landing zones have been designated to facilitate movement of training units to and from other sites on Guam.

The annex contains Guam's only major surface water body, Fena Reservoir, and is home to a variety of endangered species, notably the Mariana common *moorhen (Gallinula chloropus guami)* and the island swiftlet *(Aerodynamus vanikorensis bartschi).* A National Wildlife Refuge overlay has been established over parts of the Ordnance Annex. It is intended to protect endangered species and their habitats while still giving priority to the military mission.

The Ordnance Annex has many ancient Chamorro habitation sites, some with *latte* complexes, as well as World War II resources including fighting positions in fields and caves and former gun emplacements. The annex is home to many wild carabao whose existence is threatened by civilian poachers. A well-known and advertised public hiking trail passes through the southwest edge of the annex, but civilians do not routinely have access to other areas of the annex.

2.4.2 Proposed Training Activities

The proposed action for the Ordnance Annex is to continue all ongoing training activities and to develop new live-fire ranges. The termination or reduction of training activities is not proposed. The relatively isolated annex is suitable for small-scale field maneuvers, aviation training, and weapons ranges. Located inland, it has no rivers that can be used for riverine training; Fena Reservoir, a major source of potable water, is not used for training other than fire bucket practice and military engineers operating the ROWPU (Reverse Osmosis Water Purification Unit). HC-5 also practices recovery of target drones in the same area as their external fire bucket training.

The MTP proposes live-fire range development, primarily for NSWU snipers and special operations units on the limited amount of land unrestricted by ordnance storage regulations.

Ongoing training activities (in black) and the proposed range area and surface danger zone (SDZ) are shown in green on Figure 2-3.

2.4.2.1 Field Maneuvers and Logistics Support Training at the Ordnance Annex

Ongoing training. The maneuver areas are used for small-unit patrolling, land navigation, and command post exercises. Bivouacs are possible for extended stays in the training area

- **Land navigation.** Exercises by up to 500 Army Reservists and National Guardsmen assembled into small groups have been conducted in the northeast corner of the Ordnance Annex one weekend per month for many years. This activity consists of on- and off-road maneuvers on foot. The southern portion of the Ordnance Annex is also proposed for land navigation. Training would involve two groups of up to 10 people for one day of training as frequently as 15 times per year.
- **Small-unit reconnaissance patrolling.** Reconnaissance patrolling in the Ordnance Annex consists of groups of no more than five persons proceeding on foot under stealth conditions. It does not include cutting or crushing vegetation or otherwise marking the surroundings. This has occurred in the southern portion of the annex and along the western ridge. This area is often used by NSWU-1 for its stealth patrolling activities.
- **Escape and evasion (E&E).** E&E training combines patrolling and land navigation skills to reach a pickup point without being detected. This training is conducted in the remote southwest sector of the annex.
- **Command post exercises (CPX).** CPX in the Ordnance Annex consist of establishing a base camp in the bivouac area on the western ridge or in the land navigation area in the northeast corner of the annex.
- **Bivouacs for small- to medium-sized units**. National Guard and Reserve units often train over a weekend, establishing a bivouac for overnight stays. The maximum number anticipated to be supported is about 500. The Tandem Thrust 99 environmental assessment included a review of bivouac and maneuver by opposing forces in this area.
- **Water Purification.** Recent exercises at the annex have included the use of ROWPU units to provide potable water to the bivouac areas. The U.S. Army Reserve and the MEUs both training with this device.

Proposed training. There are no new maneuvers or logistic support activities proposed.

2.4.2.2 Aviation Training at the Ordnance Annex

Ongoing training. Aviation training is limited to helicopter insertions and extractions by landing, parachute, rappelling, SPIE and "fastrope." (See Section 2.1.4 for definitions.) There are two existing LZs and one proposed near the old West Tower that would support the activities on the west ridge, bivouac area, sniper range and breacher trainer house Helicopter insertions and extractions are also practiced on the west ridge near Mount Alifan. Helicopter crews practicing with the external firebucket use Fena Reservoir north of the spillway.

Proposed training. An additional helicopter LZ is proposed near the old West Tower. A parachute training DZ is proposed using an existing LZ in the north central area of the annex.

The parachute training DZ is also proposed as a site for simulated CAS with aircraft flight restricted to altitudes of about 630 m above ground level (AGL) for fixed wing and 315 m AGL for helicopter gunships aloft in support of a rescue team on the ground. The EOD pit was proposed as a pickup point for rescued airmen during a Tandem Thrust 99 TRAP scenario. The Annex Safety Officer reviews site feasibility during the planning of these exercises. A typical tactical rescue of aircraft and personnel (TRAP) scenario would follow an E&E drill by making the pickup of a downed pilot or flight crew by helicopter, providing the rescue team air cover by helicopter gunships (AH-1) and AV-8B Harrier jets at approved altitudes.

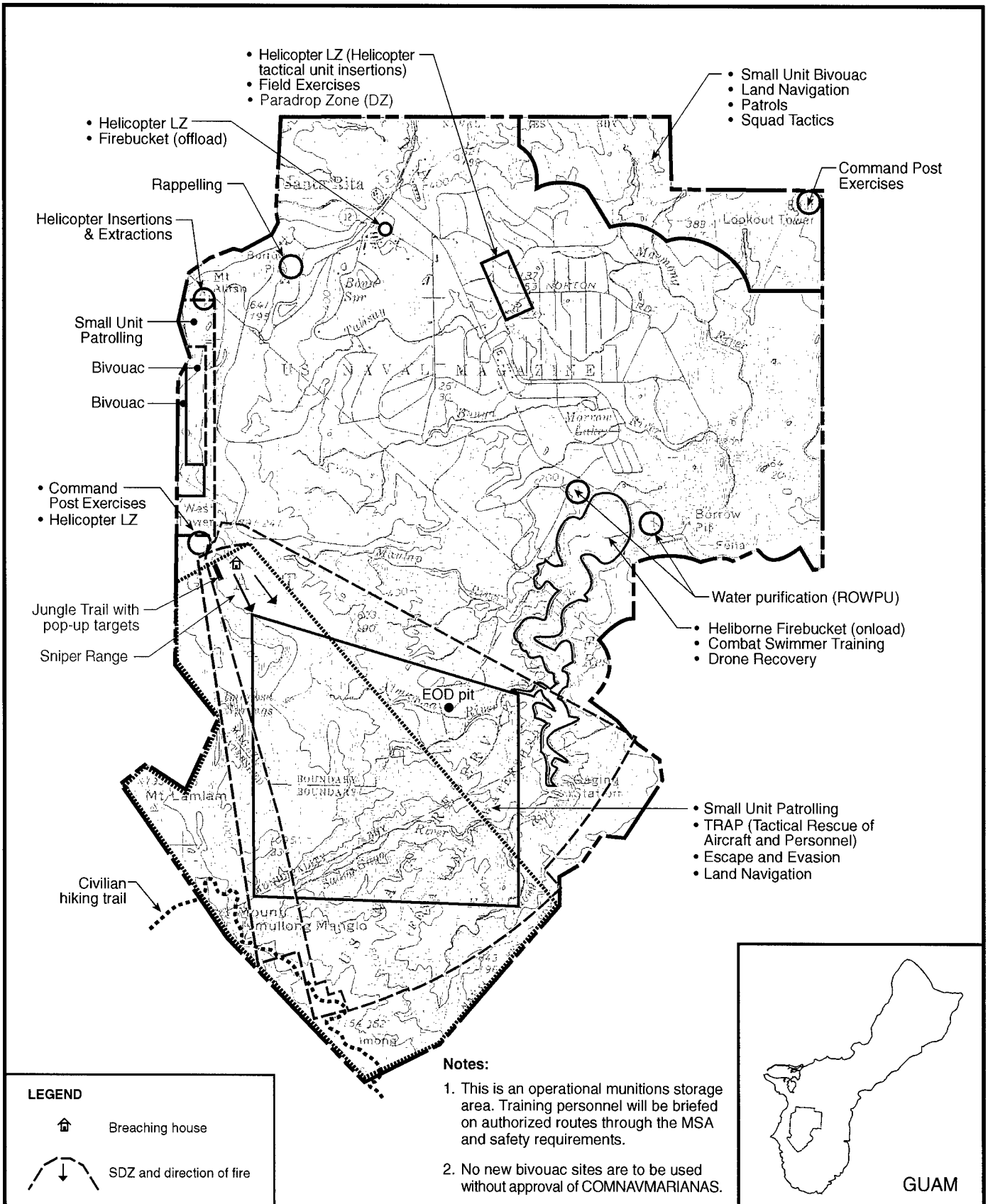
2.4.2.3 Live-Fire Range Training at the Ordnance Annex

Ongoing training. The Ordnance Annex does not currently have any firing ranges. A 45 feet by 45 feet (14 m by 14 m) breacher training house has been constructed. Its primary use is training persons to conduct forced entry. Small arms fire within the structure is restricted to blanks or other forms of training ammunition. NSWU-1 uses "Simunitions," which are training rounds similar to paint gun pellets. This training facility is located on the firing line of the proposed sniper range, and the facility's roof would be one of the approved external firing positions at the range that will keep the line of fire within the center portion of the proposed sniper range SDZ.

Proposed training. A new range area has been proposed for development in the southwest segment of the annex that would combine a sniper range and jungle sniper trail within a single SDZ with proximity to a breacher trainer. See Figure 2-3 for range sites.

- **Sniper Range Development**. The sniper range would be designed for long-distance range fire with 7.62mm sniper rifles, to be fired only by experienced marksmen. It would be used daily by small groups (two to six snipers) each firing up to 20 rounds. There would be several shooting positions and a variety of targets mounted 2,460 feet (750 m) to 3,281 feet (1,000 m) from the firing line(s) (see Figure 2-3). Training at the range would involve two snipers patrolling on foot to a designated firing position, acquiring the target, determining the direction of fire, distance to the target, and the difference in elevation. Prior to firing this information is checked with the range safety officer. The RSO would ensure that firing would remain within the designated SDZ and would clear the team to fire. If criteria were not met, the team would be directed to a different firing position to recalculate.

  The RSO will be responsible to orient the lines of fire, keeping the SDZ within the boundaries of the Ordnance Annex. The SDZ would be approximately 2.5 miles (4 km) long and about 2 miles (3 km) wide at its widest point, encompassing the maximum range of the weapon fired at a variety of angles. "Construction" would consist of hand-placing targets (cardboard or plastic silhouettes on wooden or plastic stakes).



LEGEND

Breaching house

SDZ and direction of fire

Notes:

1. This is an operational munitions storage area. Training personnel will be briefed on authorized routes through the MSA and safety requirements.
2. No new bivouac sites are to be used without approval of COMNAVMARIANAS.

Source: Final Marianas Training Plan (June 1998)

NORTH

0 500 1000 (Meters)

0 2000 4000 (Feet)

ALTERNATIVES:
Black = No new action (continue)
Green = Preferred (new)
Red = Not-preferred (new)

See text for abbreviations

Figure 2-3
ORDNANCE ANNEX LAND USE

FEIS: Military Training in the Marianas
Belt Collins Hawaii, June 1999

- **Jungle Trail Development**. The jungle trail range would be a 650-foot (200-m)-long trail with pop-up targets installed along its length. The trail would require minimal clearing, as is intended for use by only one SEAL team member at a time using 9mm and 5.56mm weapons. Targets would be dug into the soil and have elevated dirt backstops.

The proposed range development sites are located in areas outside endangered bird and bat nesting/roosting areas, and situated so that the SDZ is oriented away from the magazines and entirely contained within government property. The suitability of range design and placement has been coordinated among NSWU-1 (the project proponent), the COMNAVMARIANAS Cultural Resource and Natural Resource Coordinators, the Annex Safety Officer and NAVFAC range planners. Final approval of the range and its operational constraints is the responsibility of NAVFAC and NOC.

2.4.2.4 Demolition Training at the Ordnance Annex

Ongoing training. There is a demolition pit west of Fena Reservoir primarily used by EOD MU-5 for detonating unexploded World War II ordnance (UXO) discovered on Guam. Training at the pit is conducted by EOD only on about three days per month by 14 persons. This range is certified for up to 3,000 pounds (1,361 kg) net explosive weight (see Figure 2-3).

Proposed training. No new activities are proposed.

2.5 COMNAVMARIANA COMMUNICATIONS ANNEXES

2.5.1 Land Resources

Naval Computer and Telecommunications Area Master Station Communications Annex (NCTAMS) operates the communications facilities at both annexes. Finegayan Annex consists of 2,952 acres (1,200 ha) used as a transmitter station (see Figure 2-4). The annex's west boundary is a high ocean cliff with a steep trail providing access to Haputo and Double Reef beaches. The plateau is primarily wooded or managed grassland with one communications receiver facility and a small arms range currently in use. A utility line access trail leads to undeveloped areas of Northwest Field. An Ecological Reserve Area has been established at Communications Annex Finegayan, including Haputo Beach.

Communications Annex Barrigada consists of 1,848 acres (748 ha) of mostly undeveloped land in central Guam, surrounded by developing civilian residences and commercial areas. This is the receiver antenna field. Portions of the annex are planned for transfer.

2.5.2 Proposed Training Activities

The proposed action for the Communications Annexes is to continue all ongoing training activities. No new activities are proposed. The termination or reduction of training activities is not proposed.

Ongoing training. The undeveloped areas of the annexes are used for various small unit field maneuvers, and the beaches at Finegayan are currently used for clandestine small boat landing training. The primary mission at Finegayan does not include extensive field maneuvers but does require periodic weapons requalification and security drills for NCTAMS personnel. A KD small arms range at the Finegayan Communications Annex is oriented to fire southeast-to-northwest on the plateau above the high cliffs between Haputo and Double Reef Beaches. The range's two-dimensional SDZ extends to the northwest over water, but the range itself is physically confined by high dirt berms on both sides and behind the targets, the latter being the bullet stop.

NCTAMS, Guam National Guard, and reserve units use this range; transient units may also request its use for small-arms requalification training.

NSWU, Special Operations, and Marine Reconnaissance units use Haputo and Double Reef beaches as entries to the peninsula for field training in the neighboring Northwest Field. To scale the cliff to the high plateau, the units stay on the cliff trail and then use a utility line trail to traverse Finegayan and reach the maneuver areas in Northwest Field.

The Barrigada Annex consists of widely dispersed antennas and open land that can be used for low-impact maneuvers and land navigation. The U.S. Army Reserve and the Guam Army National Guard, both with headquarters nearby in central Guam, are the primary users of this training area.

Proposed Training. The MTP does not propose any new training land use of either annex (see Figure 2-4).

2.6 ANDERSEN AIR FORCE BASE

2.6.1 Land Resources

Andersen Main Base, the Munitions Storage Area (MSA), and Northwest Field comprise about 15,612 acres (6,323 ha). Most of the base is dedicated to its primary airfield mission. The Main Base and Northwest Field are on a peninsula bounded by steep cliffs to the sea. Much of the narrow shoreline below the cliffs west and north is private property or owned by the U.S. Fish and Wildlife Service (USFWS). Guam's few remaining Mariana crows *(Corvus kubaryi)* inhabit portions of AAFB (primarily in the MSA), and its endangered fruit bats *(Pteropus marianus marianus)* roost along the cliffs near Pati Point. A National Wildlife Refuge overlay has been established over much of northwest AAFB; it is intended to protect endangered species and their habitats while still giving priority to the military mission.

Main Base. The Main Base contains the large active airfield and a full array of operations, maintenance, and community support facilities, as well as a small arms range and EOD pit. The base is currently used for aviation, small arms, and USAF EOD training.

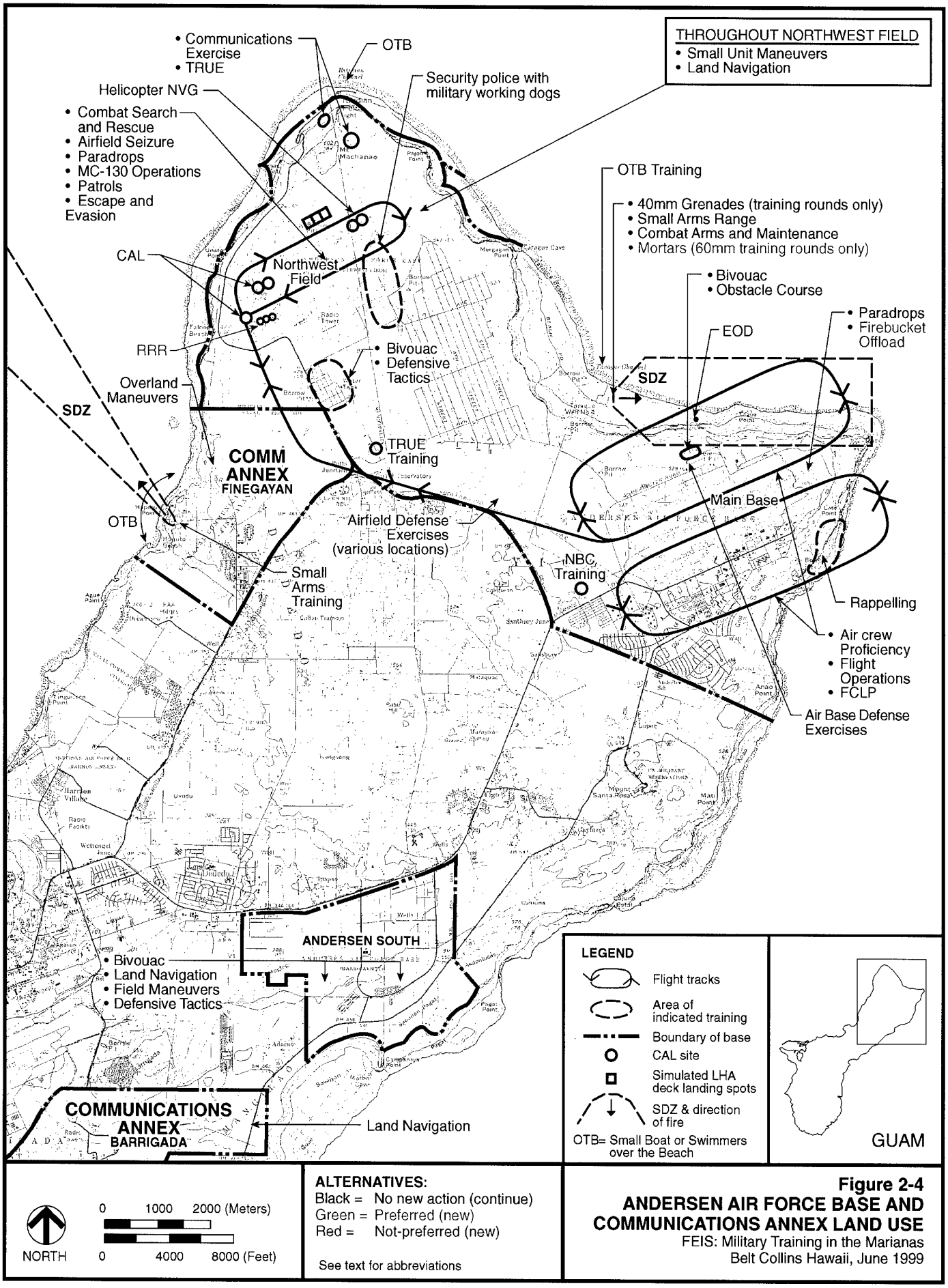


Figure 2-4
ANDERSEN AIR FORCE BASE AND COMMUNICATIONS ANNEX LAND USE
FEIS: Military Training in the Marianas
Belt Collins Hawaii, June 1999

Northwest Field. Northwest Field was one of the many major complexes constructed during World War II. One of its runways remains in active use for fixed-wing aircraft training. Helicopter units use other paved surfaces for confined area landing (CAL) training and simulated amphibious ship helicopter deck landings. About 3,562 acres (1,422 ha) in Northwest Field are the primary maneuver training areas presently used for various field exercises and bivouacs.

Munitions Storage Area (MSA). The MSA is wooded and crisscrossed with old roads connecting the munitions storage bunkers. The MSA is not currently used for training. NSWU-1 has been allowed to traverse the MSA to move between Northwest Field and Tarague Beach.

Andersen South. South of the Main Base are 1,922 acres (778 ha) containing family housing units, dormitories, and open lands. Andersen South facilities were heavily damaged during Typhoon Paka (December 1998), eliminating the use of its dormitories as contingency support facilities for training units. Many facilities at this site are in the process of being leased to GovGuam prior to permanent land conveyance.

2.6.2 Proposed Training Activities

The proposed action for AAFB is to continue all ongoing training. A new site for RRR training is the only new initiative. No termination or reduction of training is proposed.

Ongoing training. The undeveloped areas of AAFB are suitable sites for small-scale field maneuvers and bivouacs, and TRUE training in abandoned buildings. The two airfields are suitable for various airmobile and airborne training scenarios and unit bivouacs. Small-boat insertions and over-the-beach (OTB) training can be accomplished at few spots along the rugged coastline. The small arms range is available for continued live-fire training and for use by 40mm grenade launchers equipped with training projectiles. There are no sites suitable for amphibious vehicle landings, underwater demolition, or bombing. Anderson South remains available for small unit tactics but requests for its use are tapering off pending permanent land transfer.

Proposed training. The MTP proposes only a few new uses of AAFB land for training: develop a rapid runway repair (RRR) site at Northwest Field, conduct 60mm mortar crew training using inert training projectiles at the small arms range, and conduct helicopter firebucket offloading at Main Base.

These proposed new land uses, shown in green on Figure 2-4, are identified in the sections below. No new training use of Andersen South is proposed.

2.6.2.1 Field Maneuvers and Logistics Support Training at AAFB

Ongoing training. Field maneuvers are primarily activities in Northwest Field such as bivouacs, small-unit maneuvers, military working dog training, special operations exercises, TRUE, and airfield security. Since the field contains a runway and helicopter LZs, training scenarios integrate introduction or extraction of maneuver forces by air.

Proposed training. USAF engineer squadrons also conduct field training, which includes RRR. The previous remote site (Texas Area) is no longer suitable due to adjacent facility development. The proposed site is remote from incompatible adjacent land uses and would confine training to a single managed area. Northwest Field was selected as the RRR so that the training could be integrated and evaluated as a subset of a larger "recovery after attack" scenario. An advantage of developing and maintaining a single site is the elimination of potential damage to a variety of hard-surfaced areas in historic Northwest Field. Rather than repair sites being selected at random, the USAF proposes to create four permanent craters for demonstration and repeated excavation and repair.

The craters will be initially created with explosive charges. One crater will remain in its "damaged" state to illustrate the degree of runway damage that will require repair. The excavated material from the other three will be repeatedly used as fill during the repair, leveling, and matting process needed to restore a smooth surface to a runway. Fiberglass traffic covers will be used to protect the four craters and site materials until the next evolution of mechanical excavation, gravel fill compaction, and matting. The site selected for RRR training will be coordinated with the Guam State Historic Preservation Officer to ensure that it doesn't adversely affect the portion of Northwest Field recommended by the National Park Service to be listed on the National Register of Historic Places (NRHP).[6] Northwest Field is noted as the origin of the last bombing mission of World War II.[7]

Limited maneuvers and training support have been conducted at Andersen South. Its open fields, wooded areas and vacant dormitories have been made available to transient units for staging, bivouac equipment inspection, and small-unit tactics prior to movement for training on other islands. The dormitories are no longer available for support and unit requests to use Andersen South for field training are on the decline in anticipation of the Air Force preparing to lease and then convey excess property at Andersen South.

2.6.2.2 Aviation Training at AAFB

Ongoing training. With the exception of the Navy's HC-5 Squadron, AAFB has no resident aviation squadrons. Its primary mission aviation support to transient aircraft and units. Aviation functions/ training conducted at AAFB includes the following:

- **Strategic and tactical airlift.** Strategic and tactical airlift is provided to and from AAFB and to and from other Guam and Tinian training areas. Whereas C-130s are the primary aircraft supporting training on Tinian and the Waterfront Annex, larger strategic aircraft land at AAFB. The airlift of maneuver units to AAFB may include an airmobile exercise upon landing or an airborne assault and/or parachute cargo drop.

  The C-141B Starlifter is the workhorse of the Air Mobility Command, designed to airlift combat forces and equipment over long distances, to resupply employed forces, and to extract the wounded and sick. The C-141 can lift about 200 troops or 103 litter patients. A payload as large as 91,250 pounds (41,400 kg) is possible. For airmobile cargo delivery, a

[6] Proposed boundary confirmed by memorandum dated January 21, 1999, from the Historian, National Register of Historic Places, Washington, D.C., to Cultural Resources Officer, Environmental Flight 36 CES/CEV, Andersen Air Force Base.

[7] Memorandum (Electronic mail) from the Guam Historic Preservation Officer to PACNAVFACENGCOM dated May 5, 1999.

load of 67,460 pounds (30,600 kg) can be palletized for rapid offload by forklifts. The cargo bay is large enough for wheeled and small tracked vehicles or helicopters with folded or removed blades.

A strategic airlift partner to the C-141 is the C-5A/B Galaxy which is designed to transport larger, heavier cargo loads and up to 73 equipment operators and crews. This is one of the world's largest aircraft, configured to transport the 74-ton M1A1 Main Battle Tank, scissors bridge, or various helicopters. Its maximum payload is 102 tons (92 metric tons).

The C-17 Globemaster III is the latest addition to the strategic lift inventory with a payload capacity of 65 tons (59 metric tons), 102 troops, or 48 litter and 54 ambulatory patients and attendants. All of these cargo aircraft can be refueled in flight by either the KC-10A Extender or KC-135 Stratotanker, military variants of the DC-10 and Boeing-707, respectively.

The four-turbo-prop USAF MC-130H Combat Talon (USMC KC-130 Hercules) operated by the 1st Special Operations Squadron (SOS) can operate from unimproved, shorter runways than those required by the C-141. Its carrying capacity is smaller: 92 combat-equipped troops or 74 litter patients. It too is designed for carrying pallet-loaded cargo. This aircraft is often involved in strategic lift of U.S. Army Special Forces units from Japan to the Mariana Islands for training and support to SOCPAC to infiltrate, extract, and resupply special operations teams. 17th SOS is equipped with MC-130P aircraft capable of clandestine aerial refueling of special operations helicopters.

- **Field carrier landing practices (FCLP).** FCLP by Navy fighter/attack and patrol aircraft simulate aircraft carrier landing and takeoff patterns. Exercises consist of repeated high-speed approaches to an airfield and simulated landings, followed by takeoff and tight turn to repeat the maneuver. Aircraft include F/A 18s, F-14s, and S-3s often from offshore Navy carriers.
- **Helicopter confined area landings (CAL).** CAL consist of flying a prescribed route from the Main Base and landing in a tightly configured areas marked on pavement. HC-5 is the primary unit using the CAL LZs in Northwest Field. The field is relatively remote and has little ambient light. See NVG training below. CAL as part of special operations is conducted by the 320th Special Tactics Squadron, which flies CH53J Pave Low Helicopters.
- **Simulated Amphibious ship landings.** Amphibious ship landings by helicopter are simulated at a landing helicopter assault (LHA) ship's landing deck painted on the pavement at Northwest Field. The training may include transporting troops involved in ground maneuver training, airfield seizure or defense, or other related activities.
- **Night vision goggle (NVG) training.** NVG training requires night flights and landings in unlighted areas while the helicopter crew wears special goggles. Helicopters circle Northwest Field, and land at CAL or LHA spots hover briefly, and repeat the loop at low altitude. The training can only occur on moonless nights (about 8 nights per month) and takes place from one hour after sundown to 10:00 PM.
- **External firebucket training.** External firebucket training is designed for helicopter crews to become proficient in carrying a large steel buck beneath the helicopter that is dipped in the ocean or reservoir, flown to a field fire, and then dumped. This training is proposed for the Main Base area. (The ocean and Fena Reservoir to the south are two sources of water.) This

mission is assigned to HC-5 and to transient helicopter squadrons supporting field training on Guam and Tinian. These missions are flown in support of the military and civilian communities.

- **Combat search and rescue (SAR).** SAR consists of CH-46 helicopters training to locate and rescue downed aircrews or civilians in wooded terrain or in the ocean. The missions originate at AAFB. This training supports actual SAR missions conducted for both the military and civilian communities.

2.6.2.3 Live-Fire Range Training at Andersen Air Force Base

Ongoing training. The USAF Combined Arms Training and Maintenance range (CATM) is used for requalification firing with pistols and rifles. Training is also conducted with the M203 40mm grenade launcher using training projectiles The CATM Range is adjacent Tarague Beach, oriented for firing west-to-east parallel to the adjacent cliffline, with half of the SDZ over water. No tracer rounds are authorized.

Proposed training. An alternative to developing a 60mm mortar range will be use of a new 60mm training projectile. The CATM Range has been proposed as a training site since the area can be observed and the new reusable training projectile will not create any UXO hazards.

2.7 FARALLON DE MEDINILLA

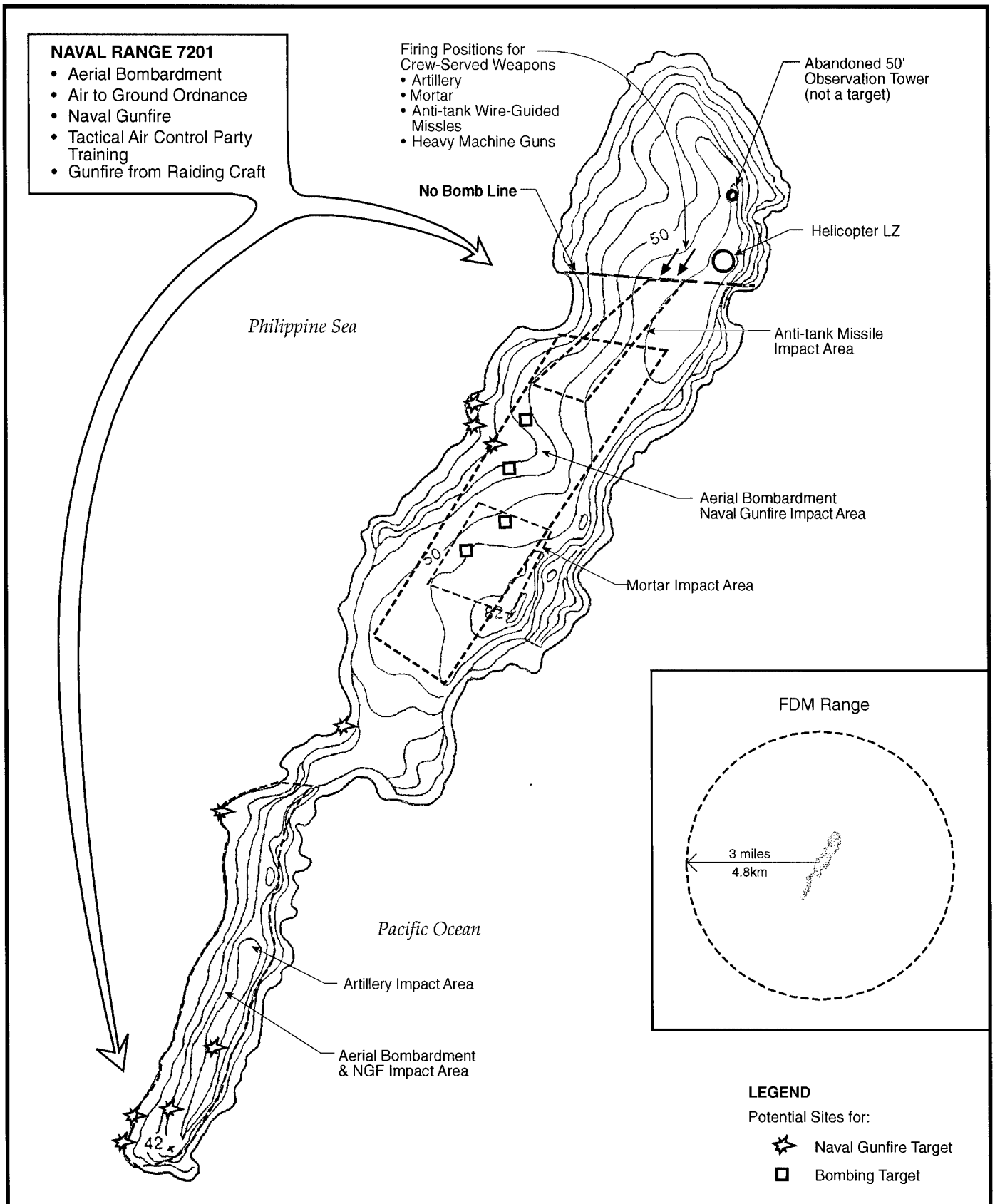
2.7.1 Land Resources

FDM is an uninhabited island approximately 1.7 miles (2.8 km) long and 0.3 miles (450 m) wide. Its 206 acres (83 ha) are leased by the Navy from CNMI. It consists of a hilly plateau with cliffs dropping as much as 328 feet (100 m) to the ocean on all sides. A narrow submerged shelf with limited coral development surrounds the island. There is no evidence of past permanent habitation, and there is no source of potable water. FDM is home to several migratory seabird colonies, and endangered Micronesian megapodes *(Megapodius laperous)* have been observed on the plateau.

The island is used only as a live-fire training range. The island has been a bombing range for more than 25 years and contains an abundance of UXO, including highly sensitive cluster bombs. Military personnel other than those certified to work with explosive ordnance do not go onto the island due to UXO.

2.7.2 Live-Fire Weapons Training

The proposed action for FDM is to continue all ongoing training and to incorporate ground weapons firing. No termination or reduction of range training is proposed. See Figure 2-5.



Source: Final Marianas Training Plan (June 1998)

NORTH

0 100 200 300 (Meters)

0 500 1000 (Feet)

ALTERNATIVES:
Black = No new action (continue)
Green = Preferred (new)
Red = Not-preferred (new)

Figure 2-5
FARALLON DE MEDINILLA LAND USE

FEIS: Military Training in the Marianas
Belt Collins Hawaii, June 1999

Ongoing training. Four types of bombardment are performed on Navy Range 7201, which includes FDM and a SDZ encompassing a 3-mile (4.8-km) radius from the center of the island. Photographs of aircraft, ordnance, and bombing on FDM are shown in Appendices B-16 and B-17.

- **Air-to-surface gunnery.** Navy and Marine Corps fighter/attack aircraft operating from transiting aircraft carriers practice routine interdiction, strike, and Close Air Support (CAS). The carriers' relatively low-flying, fast-moving fighter and attack aircraft deliver bombs (mostly 500-lb bombs) and air-to-ground missiles to the southern end of the island. Fixed wing AV-8B Harriers and AH-1W Super Cobra helicopters from a transiting MEU also conduct gunnery training at FDM, engaging surface targets with machine gun, cannon, and missile fire. Ordnance expended annually from Navy aircraft is about 80 missiles, 840 rockets (400 2.75-inch, 400 5-inch), and 4,020 conventional bombs (1,400 small [250 to 500 lbs.] 1,240 large [1,000 to 2,000 lbs.] and 1,380 inert bombs). Annual training consists of four 5-day Naval exercises, three 3-week Marine Corps exercises, and five 14-day combined force exercises. Transiting USAF AC-130 gunships use FDM for air-to-ground bombardment with 20mm cannon and the 105mm howitzer.
- **Strategic bombing.** Each USAF Air Combat Command (ACC) bomber wings is required to complete a number of global power-projection missions per year, and the majority occur at the FDM range. These aircraft may conduct high-, medium- and low-altitude bombing runs dropping conventional 500-, 750-, and 2000-lb (227-, 340-, and 907-kg) bombs, precision-guided munitions, and mines. These missions, together with bomber deployments to Guam, account for about 160 flying days and approximately 320 FDM range sorties per quarter. Between 5 and 612 live and inert weapons are dropped each month, with lower numbers being more typical. Approximately 45 percent of the sorties drop inert bombs only.
- **Naval gunfire.** COMSEVENTHFLT ships fire 5-inch (127mm) deck-mounted guns at the west cliffline (see photo in Appendix B-16). Range ordnance includes high explosive, point-detonating rounds, with mechanical and variable time-fused rounds. Illumination rounds may be used to light up the impact area so that strikes may be observed and adjusted by spotters either aboard ship or airborne. These activities may occur monthly during Pacific transits, with a ship remaining on station for about two days and expending about 100 rounds, and as part of joint exercises in the Marianas for approximately 12 days every two years. A total of approximately 1,040 5-inch/54 shells and 400 76mm shells are expended annually.
- **Small arms firing**. Navy SEALs in RHIBs offshore of FDM fire AT-4, 40mm grenades, 7.62 mm rifles, and .50 caliber machine guns at the same cliff impact areas designated for naval gunfire. Ordnance expended annually by NSWU-1 is about 11,700 rounds of 7.62 mm, 600 rounds of .50 caliber ammunition, 2600 rounds of 40mm grenades, and 40 AT-4s (about 10 AT-4s per quarter). Training lasts one day and occurs approximately four times per year. The AT-4 will be replaced soon by the "Karl Gustav" shoulder-launched AT missile. It improves on the firing distance capable with the AT-4.

Proposed training. The MTP identifies the lack of firing ranges in the Marianas that can be used by combat support units such as mortar platoons, artillery battalions, and anti-tank missile sections. Navy Range 7201 was proposed as a site for transient MEUs to helicopter airlift crew-served weapons and ammunition ashore to establish a firing line north of the present "No Bomb

Line" at the north end of the island and fire toward impact areas on the island to the south. The proposed weapons mix included 60mm and 81mm mortars, 155mm towed artillery, shoulder-launched AT-4 missiles, and the tripod-mounted TOW (wire-guided) antitank missile. Mortars and artillery are indirect-fire weapons, meaning that the projectile has a high arc that can "lob" the projectile over intervening obstacles. To adjust rounds on target requires observation of the impact area. Since the topography of the island does not provide clear observation from the suggested gun emplacements to the impact areas, observing the strike of the round would require either a high observation tower behind the firing line or the use of an aerial observer. The AT-4 and TOW are direct fire weapons and target hits are visible to the gunners.

The proposal to place crew-served weapons (TOW anti-tank missile launchers, mortars, and artillery) and their crews onto FDM for live-fire range training is not selected as a preferred alternative. See Figure 2-5 and Sections 2.9.5 and 4.6.

2.8 NON-DOD TRAINING LANDS

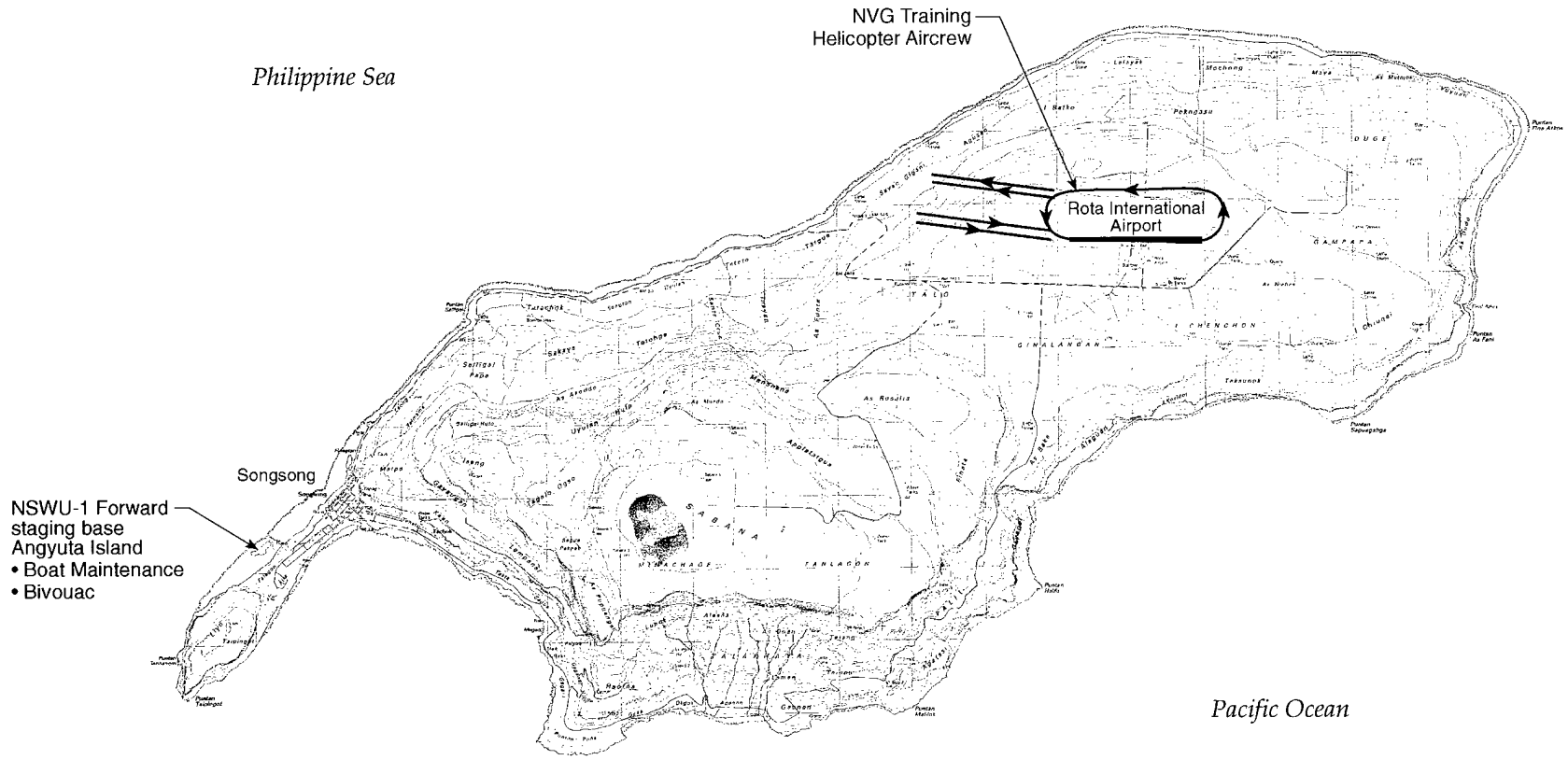
The proposed action includes ongoing and new initiatives on non DoD-managed lands on Rota and Guam as well as the use of Tinian's airport and harbor. No termination or reduction of the ongoing training on Rota or Guam has been proposed.

2.8.1 Rota: Proposed Training/Training Support Activities

2.8.1.1 Forward Staging Base

Ongoing training support. NSWU-1 uses its RHIBs for extended distance missions within the Mariana Islands. This involves trips from Guam to FDM and back. Boat refueling is conducted at commercial marinas on Saipan and Tinian. Rota, about 40 miles (64 km) from Guam, is an ideal site for launching missions to Guam. The SEALs have obtained permission from the Mayor of Rota to use Angyuta Island seaward of Song Song's West Harbor as a Forward Staging Base/overnight bivouac site and adjacent commercial port facilities for boat refueling and maintenance (see Figure 2-6). No maneuver training is conducted on Rota. There have been no significant impacts generated by this activity, which is welcomed by the Rota population. NSWU-1 adheres to the BTS protocol and inspects its craft and all embarked equipment prior to departing Guam (see Section 4.1.5 and Appendix E).

Proposed training support. No changes to the present training support arrangement have been proposed.



Source: Final Marianas Training Plan (June 1998)

NORTH

0 1000 2000 (Meters)

0 4000 8000 (Feet)

LEGEND

Commercial aircraft flight tracks

Training flight tracks

ALTERNATIVES:
Black = No new action (continue)
Green = Preferred (new)
Red = Not-preferred (new)

See text for abbreviations

Figure 2-6
ROTA LAND USE

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2.8.1.2 Aviation Training at Rota International Airport

Proposed training. HC-5 needs suitable sites to conduct NVG training for its crews. They proposed using the Rota International Airport, which at present has no commercial flights after 7:00 PM (See Figure 2-6). The proposed training would consist of CH-46E helicopter crews hovering and flying at low altitudes (approximately 492 feet [150 m]) above the airfield. The helicopters would circle to the northwest on established civilian flight tracks at an altitude of no less than 1,312 feet [400 m]. This pattern would be repeated for a maximum of 19 closed-loop patterns. Approximately two helicopters would participate in any given exercise, which would occur only on moonless evenings (approximately 8 evenings per month). Training exercises were envisioned to commence one hour after sunset or after the last commercial flight, whichever is later, and to end by 10:00 PM.

The proposal is no longer required by HC-5. Since the proposal was made, AAFB has developed multiple helicopter landing sites and a simulated ship's landing deck at Northwest Field. This provides HC-5 suitable NVG training sites on Guam. The training can be conducted at less expense. Therefore, the proposed use of the Rota Airport is not a preferred alternative for NVG training.

2.8.2 Guam: Proposed Training Activities

2.8.2.1 Parachute Drop Zones in Dandan

Ongoing training. Parachute jumps by small units are practiced bimonthly at two surveyed DZs in Dandan (Casper and Ghost) adjacent to NASA Road near the Talofofo area. The surveyed DZs have been established in accordance with a lease with the landowner, and are used primarily by the Guam Army National Guard. Support is provided by the Navy's HC-5 helicopter squadron, which may land at the DZs as necessary to support the training or for a medical evacuation (medevac) of injured persons.

Proposed training. No additional DZs or uses of Dandan zones area proposed.

2.8.2.2 Riverine Training on Talofofo and Ylig Rivers

Proposed training. Riverine training was proposed by NSWU-1 at the mouth and lower 0.62 miles (1 km) of the Talofofo and Ylig rivers on Guam's eastern coast. However, due to potential lease problems or right-of-entry agreements, NSWU-1 no longer considers this training to be logistically feasible. The proposal was eliminated from further consideration.

2.9 COMPARISON OF ALTERNATIVES, IMPACTS, AND MITIGATION

The remainder of this chapter provides a comparison of training land use alternatives at each evaluated training area. Tables 2-5 through 2-11 identify training area resources affected by proposed training and whether the affects on resources can be mitigated to nonsignificant levels. See Chapter Four for a discussion of the screening process conducted to identify potentially significant impacts and mitigation.

Vulnerability to impacts. The resources with greatest potential to be significantly affected by training are biological resources (primarily protected species) and cultural resources. Such resources exist at virtually all DoD-controlled lands in the Marianas, partly due to the protection afforded by restricted access and restricted development. In general, cultural resources are vulnerable to ground-disturbing activity. Endangered bird species are vulnerable to predation by the BTS and, in some cases, to noise disturbance. Potential impacts to infrastructure and public safety are site-specific issues. They are discussed in various sections of Chapter Four.

Establishing training constraints. Avoiding or minimizing potentially significant impacts to resources is presently achieved by adherence to training constraints that have been established within specified geographic areas. Three categories of land use constraints are used to protect known or potential cultural resources and sensitive species and habitat. Figures 2-7a through 2-11 illustrate the areas of training constraints. By implementing them, DoD land areas may be used at the cost of not maximizing training activities and the benefit of avoiding significant impacts. Definitions of each constraint follow and are summarized in Table 2-4.

No Cultural Resource Disturbance (NCRD) is established to protect known or potentially sensitive sites. A NCRD constraint limits ground disturbances by restricting cross-country and offroad vehicle travel, the use of pyrotechnics (except for actual emergency signaling) and the use of demolitions. Any digging or excavation requires written approval from COMNAVMARIANAS or 36th Air Base Wing environmental staffs. Since many sensitive areas are overgrown, only the cleared shoulders along established roads and trails in NCRD areas may be used for vehicle parking and camouflaging.

No Wildlife Disturbance (NWD) constraints limit land use in habitat areas by prohibiting cross-country, off-road vehicle travel. No pyrotechnics may be used except for actual emergency signaling. Open fires, the use of live ammunition or training demolition, blank firing, and digging or mechanical vegetation clearing are not allowed. Helicopters remain above 1000 feet (305 m) AGL except for activities at established LZs.

No Training (NT) limits land use to personnel and vehicle movement along established roads. No Training (or Off-Limits) areas have been designated to preserve highly sensitive cultural resource sites, to ensure public safety, and to preserve certain protected species habitat.

TABLE 2-4: LAND USE CONSTRAINTS

Activity Limitations	NCRD	NWD	No Training
No cross-country, off-road vehicle travel; vehicle parking permitted on cleared shoulders of existing roads and trails	X	X	X
No pyrotechnics	X	X	X
No open fires		X	X
No demolition	X	X	X
No training demolitions/breaching charges		X	X
No digging or excavation without prior approval of COMNAVMARIANAS or 36 ABW environmental monitors	X	X	X
No mechanical vegetation clearing		X	X
No live ammunitions		X	X
No firing blanks		X	X
No flights below 1,000 ft (305 m) above ground level (AGL)		X	X
No helicopter landings except in designated landing zones		X	X
No entry or training whatsoever except authorized administrative troop and vehicle movement on designated roads or trails			X

2.9.1 Tinian Alternatives

The proposed training land use and training activities for Tinian are illustrated in Figures 2-1a and 2-1b. No change to ongoing training was proposed and new initiatives were based on eliminating deficiencies in amphibious landing beaches, live-fire ranges, and certain logistic support needs. A comparison of alternatives is summarized below and in Table 2-5 with regard to whether each meets the purpose and need, has significant impacts that can be mitigated to nonsignificance, or has significant impacts that cannot be mitigated to nonsignificance. Additional discussion of potentially significant impacts is provided in Section 4.2.

No Training Land Use Alternative (not illustrated)**:** If selected for all of Tinian, this alternative would fail to meet the purpose and need for military training in the Marianas with regard to several critical capabilities. The MLA is the only location in the Marianas capable of supporting a relatively large-scale, joint military service training exercise including an amphibious assault and inland maneuvers. To select this alternative for Tinian equates to giving up the government lease for the training area. The MLA would lose its NEPA-related protection of natural and cultural resources and could be susceptible to other than the present relatively low-impact usage.

From a training standpoint, this alternative is not preferred and would result in reduced national defense readiness. There is no environmental basis for eliminating most ongoing training land uses as no significant impacts (including cumulative) result from most of these land uses.

However, the evaluation of potential impacts leads to the selective use of the NT (Off-Limits) constraint. To protect biological resources the follow NT constraints will apply:

- Tangantangan is prevalent in much of the MLA and is habitat vegetation for the threatened Tinian monarch *(Monarcha takatsukasae)*. As long as the bird remains on the federal list of protected species, additional constraints within certain maneuver areas will be in effect. No large organizations (more than 1,000) will maneuver through Tinian monarch habitat at night in January and September (a reduced land use) and all field maneuvers through tangantangan will be curtailed during May (breeding season). The constraints to field maneuver will be lifted when the bird is delisted.
- The endangered Mariana common moorhen (*Gallinula chloropus guami*) nests in Lake Hagoi, an area designated as NT. The endangered Micronesian megapode *(Megapodius laperous)* is not thought to nest on Tinian. However, its primary habitat is surveyed periodically and there will be no land use of the limestone forest cliffs south of North Field if any megapode nests are identified.

The NT constraint will also be established to protect cultural resource sites. Areas adjacent to Unai Chulu, Unai Dankulo, and Unai Babui contain sensitive cultural resources and have been designated NT. To traverse between beaches and inland maneuver areas, routes have been identified for maneuvering personnel and vehicles to ensure no impact to cultural resources.

Reduced Land Use Alternative: Because some small-unit training conducted on Tinian is also conducted on Guam, it has been argued that such training could be discontinued or reduced on Tinian with no adverse effect on the training mission. As explained in Chapter One, this is not the case. No single training area in the Marianas exhibits all needed training land characteristics. The continued availability of existing training areas in the Mariana Islands ensures maintaining a variety of sites and the flexibility and capacity to expand training from the day-to-day activities conducted by Guam-based forces to extended tactical training by transient multi-service forces.

The training of battalion-sized maneuver forces and similar sized organizations requires substantial land/sea/air spaces. This type of training, as well as large-scale joint training with amphibious assault, may not always be feasible on Guam because of insufficient land area available for training. Planning for Tandem Thrust 99 indicated the types of training activities and size of opposing force that could train on Guam, and when the scenarios would demand a shift of activities to Tinian to ensure as much realism as possible for opposing maneuvering forces. Any reduction in training land use on Tinian would reduce this unique training capability in the Mariana Islands.

This alternative has the potential to generate potentially significant impacts (including cumulative impacts) as a result of unreasonable training area compression and increased training frequencies at alternative sites.

This alternative is not preferred. As a result of consultations with USFWS, reduced use of Tinian monarch habitat as field maneuver sites is proposed during the nesting seasons of this threatened species. As long as this bird remains on the endangered species list, battalion-size maneuvers (about 1,000 persons) would be limited to daytime only in the months of January and September

and no off-road maneuvers in habitat areas would be conducted during the month of May (see Section 4.2.1).

No New Action: The ongoing training describes earlier in Section 2.2 and established mitigation and constraints have been revalidated. All activities with potentially significant impacts are mitigated to acceptance levels. See Section 4.2 for a more detailed discussion of potential impacts and mitigation.

Maximum Land Use Alternative: The MTP proposes using Tinian for all of the proposed activities illustrated in Figures 2-1a and 2-1b, with no new constraints on land use for training in the MLA. This alternative proposes establishing additional amphibious craft and AAV landing sites, developing live-fire ranges and shooting houses, and installing permanent security gates at major roadway entries to the EMUA. Construction of an austere logistics support camp is preferred. This alternative meets the purpose and need for training and seeks to remedy some of the existing live-fire range training deficiencies.

Any permanent training facilities constructed in the MLA and then left unattended could be subject to vandalism or destruction. Structures such as a shooting house and breacher trainer could be costly to maintain. A continuous military presence on Tinian or contractual arrangement for maintenance and security would be required before permanent facilities could be erected. An exception is the proposal to construct an austere logistics support camp consisting only of fencing and crushed coral substrate (no infrastructure or fuel stands). The logistics support camp will be located near the IBB site for increased security. Nothing of value will remain in the camp upon the completion of exercises. Construction of the support camp is a preferred alternative.

Constructing roadway security gates is not selected for the preferred alternative due to potential safety considerations and unnecessary cost. During Tandem Thrust 99, temporary barriers and signs, and safety observers at key positions were sufficient to maintain safety and still allow tourist access to most of North Field's historic sites, even when Runways One and Two were in use. Another concern is that permanent gates could be locked at night when not manned, leading to auto accidents and personal injury.

Open field, live-fire range development would generate significant impacts that are difficult to mitigate satisfactorily to nonsignificance. The small-arms fire-and-maneuver and mortar ranges would generate additional public safety hazards by using areas normally accessible by the public. The mortar range impact area would become a second UXO-contaminated area in the MLA susceptible to public encroachment. Conducting live-fire training would require additional area security and closures to tourists and island residents.

AAV landings at Unai Chulu, Unai Babui or Unai Dankulo would impact offshore coral reefs. No suitable AAV landing beach in the MLA has been identified.

This alternative does not change any existing mitigation or training constraints, such as the additional NT and reduced land use constraints that are identified for Tinian training. The Maximum Training Land Use Alternative without modification is not preferred. Initiatives that are not preferred are depicted in red in Figures 2-1a and 2-1b).

Preferred Alternative: This alternative consists of using Tinian land for the ongoing and newly proposed activities identified in black and green on Figures 2-1a and 2-1b. Approximately 40 percent of the EMUA will be constrained to varying degrees as a protection to natural and cultural resources (see Figures 2-7a through 2-7d). The Preferred Alternative also incorporates the specific areas of no training and reduced training land uses described above.

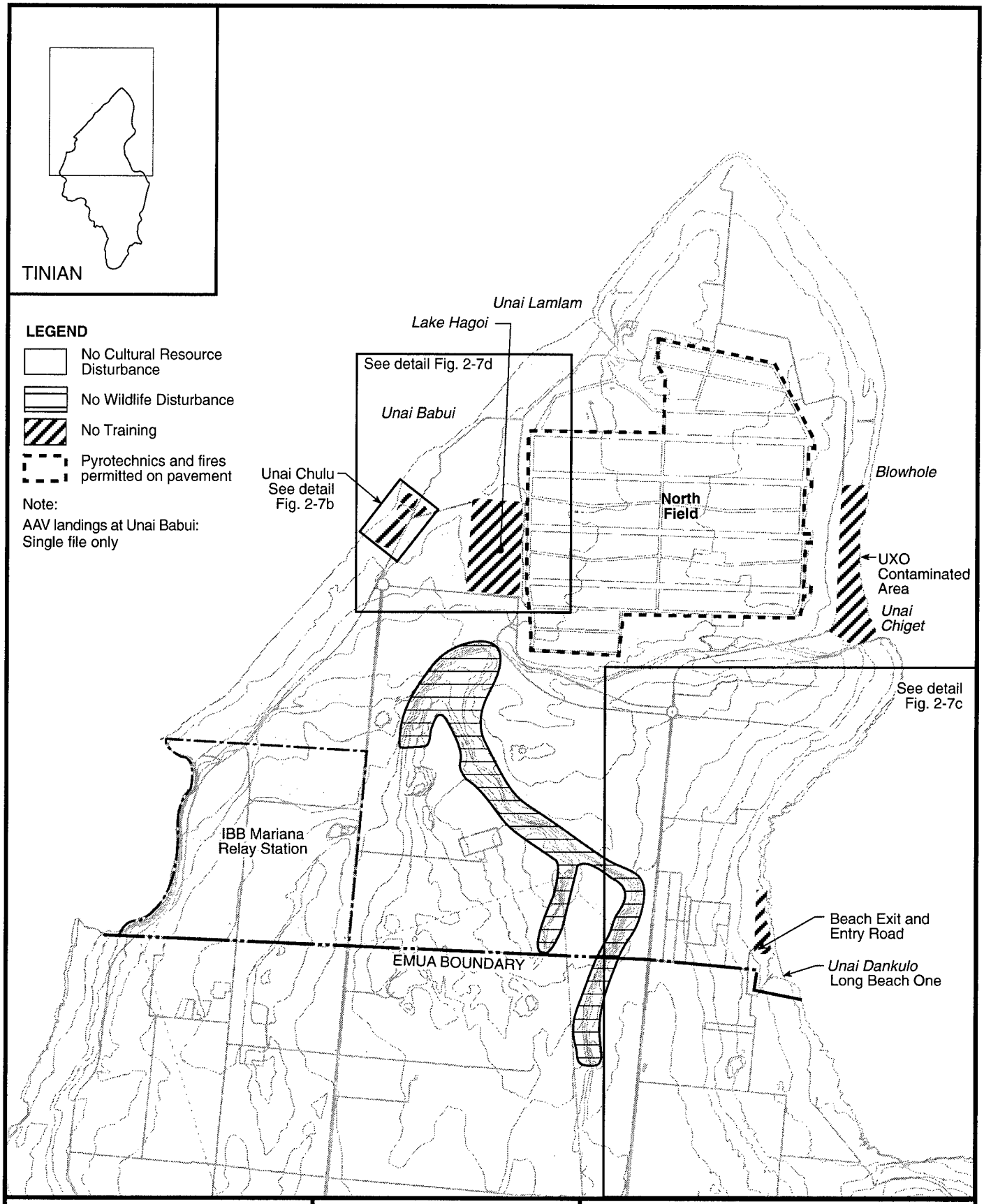
This alternative meets the purpose and need for most training. There is still no suitable beach in the MLA for landing or launching AAVs but the amphibious vehicles can get ashore in the harbor and land march to the MLA. With the exception of TRUE training, other live-fire range training will be conducted on Guam. The austere logistic support camp would be established and made available for secure storage of training equipment and supplies.

Beach assaults and field maneuvers by small teams up to large units will be monitored to ensure adherence to NT, NCRD, and NWD area constraints. Where passage through sensitive areas is necessary, the lanes will be marked. No damage by CRRCs or combat swimmers is anticipated at the beaches selected for their use (marked with an "x" on Figure 2-1a). The potential physical impacts to the environment caused by large landing craft and AAV contact does not pertain. A greater concern is the safety of the teams in CRRCs or swimming ashore due to the dynamic nature of the sea surrounding Tinian. Hydrographic surveys and surf observation reports will be conducted to ensure their safety. The beaches used by LCACs and CRRCs will be monitored for possible impacts on natural resources. If significant impacts are identified, damaging activities will be suspended until supplemental impact analysis is performed and procedures modified to avoid significant impacts.

TABLE 2-5: COMPARISON OF TINIAN LAND USE ALTERNATIVES

Impacts	No Land Use	Reduced Land Use	No New Action	Maximum Land Use	Preferred Alternative[1]
Meets training needs for battalion-size landings and maneuvers and joint exercises?	No. Training cannot be fully duplicated on Guam.	No. Training cannot be duplicated on Guam.	Meets all needs except for AAV amphibious assaults and live fire.	Yes, including integrated live-fire range training.	Yes, except for small arms and mortar range deficiencies.
Will impact physical factors: climate, geology, hydrology, water or air quality?	No change from existing conditions.	No change from existing conditions.	No change from existing conditions.	No change from existing conditions.	No change from existing conditions.
Could result in BTS being introduced from Guam?	No	Yes. Training on Tinian often requires transport from Guam.	Yes. Training on Tinian often requires transport from Guam.	Yes. Training on Tinian often requires transport from Guam.	Yes. Training on Tinian often requires transport from Guam.
Will take endangered species?	Absence of protection afforded by military lease could result in development and takes.	Yes. Potential loss of habitat from fire.	Yes. Potential loss of habitat from fire.	Yes. Potential loss of habitat from fire with increased risks from range projectiles	Yes. Possible loss of habitat from fire.
Will destroy any wetlands, coral, or endangered species habitat?	Absence of protection afforded by military lease could result in development and destruction.	No	No	Yes. Coral on spurs and grooves on reef at Unai Babui could be damaged by AAVs.	No
Expected to reduce species reproductive success from noise or other major disturbance?	Absence of protection afforded by military lease could result in development and more continual noise disturbance.	No	No	No	No
Potential to destroy historically significant cultural resources?	Absence of protection and investigations afforded by military lease could result in site development and destruction.	No.	Mitigation measures established for protection.	Mitigation measures are established for protection.	Mitigation measures are established for protection.
Exposes public to safety hazards?	Yes. UXO contamination cannot be fully eliminated, and Navy oversight would be lost.	Mitigated by management actions.	Mitigated by management actions.	Increased risk and potential for no complete mitigation for effects of mortar UXO.	Mitigated by management actions and training activity selection.
Closes commercial access to tourist destinations?	No	Yes, during certain training activities.	Yes, during certain training activities.	Yes, during certain training activities.	Yes, during certain training activities.
Reduces civilian jobs on Tinian?	No, but coordination with local officials would no longer be required.	No. Additional on-island support may increase jobs.	No. Some local hire and services would be needed.	No. Some local hire and services would be needed.	No. Some local hire and services would be needed.

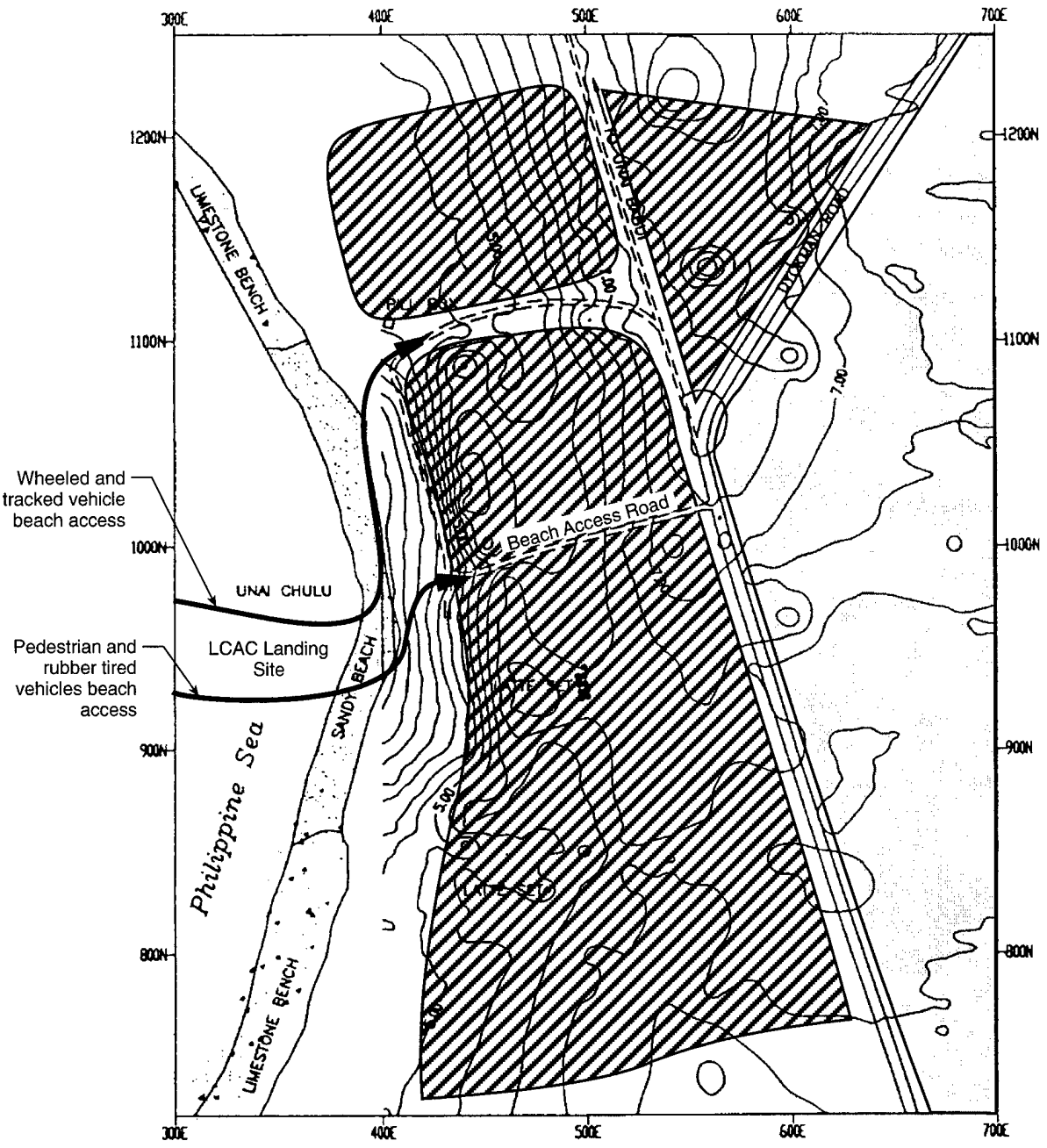
Note: 1. The Marianas Training Preferred Alternative (Table 2-12) incorporates this alternative and all of its mitigation and training constraint measures.



Source: IARII (Dec. 1998) Military Exercises and Historic Sites in the Military Lease Area of the Island of Tinian, CNMI: An Archaeological Assessment, (Figure 6).

Figure 2-7a
TINIAN CONSTRAINED AREAS

FEIS: Military Training in the Marianas
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LEGEND

- Permissible vehicle traffic areas
- No Cultural Resource Disturbance
- No Training

Source: IARII (Dec. 1998) *Final Military Exercises and Historic Sites in the Military Lease Area of the Island of Tinian, CNMI: An Archaeological Assessment*

Note: Contour lines at 0.5m intervals.

NORTH

0 25 50 75 100 (Meters)

0 100 200 300 (Feet)

Figure 2-7b
DETAILED CONSTRAINTS AT UNAI CHULU
FEIS: Military Training in the Marianas
Belt Collins Hawaii, June 1999

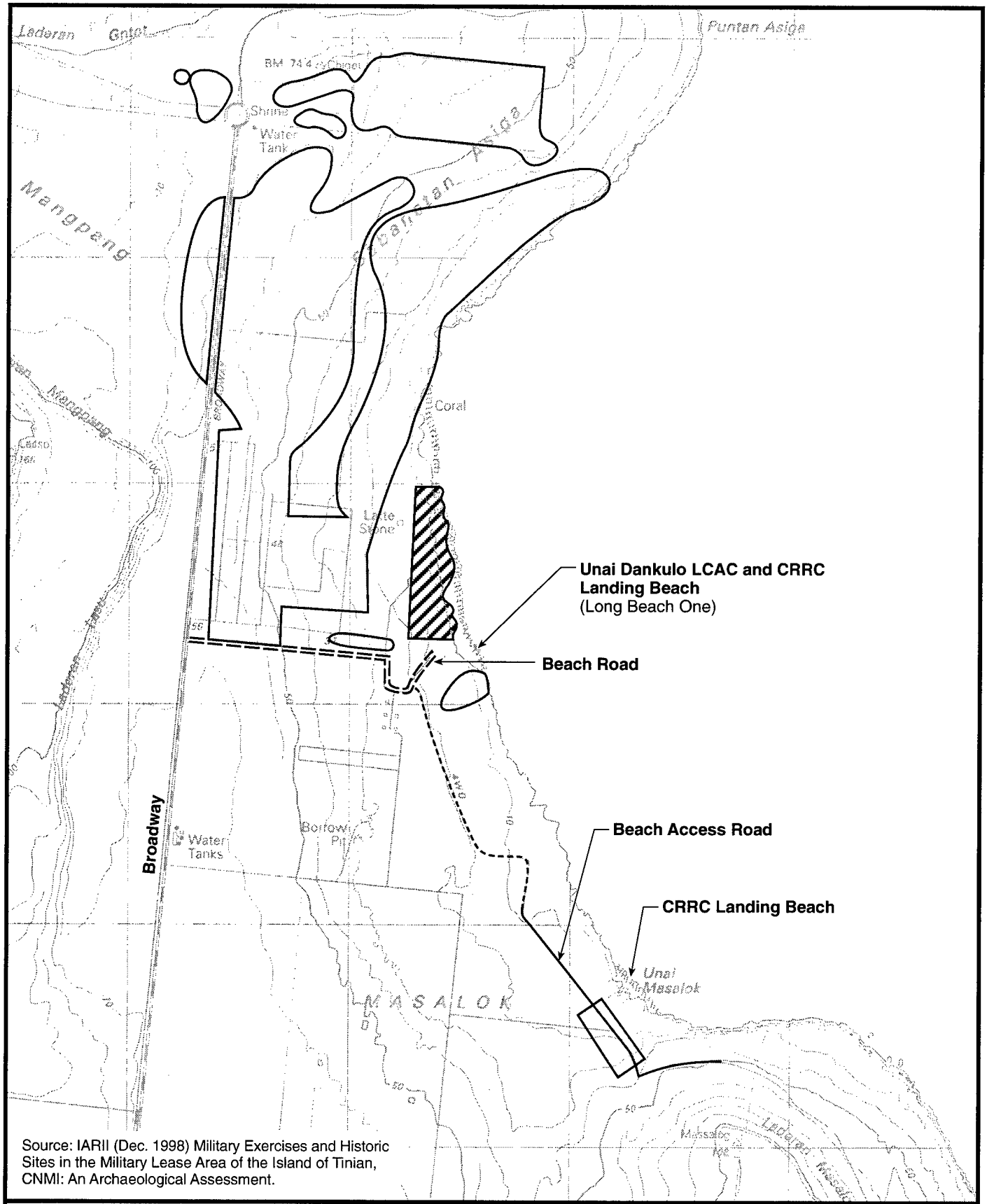
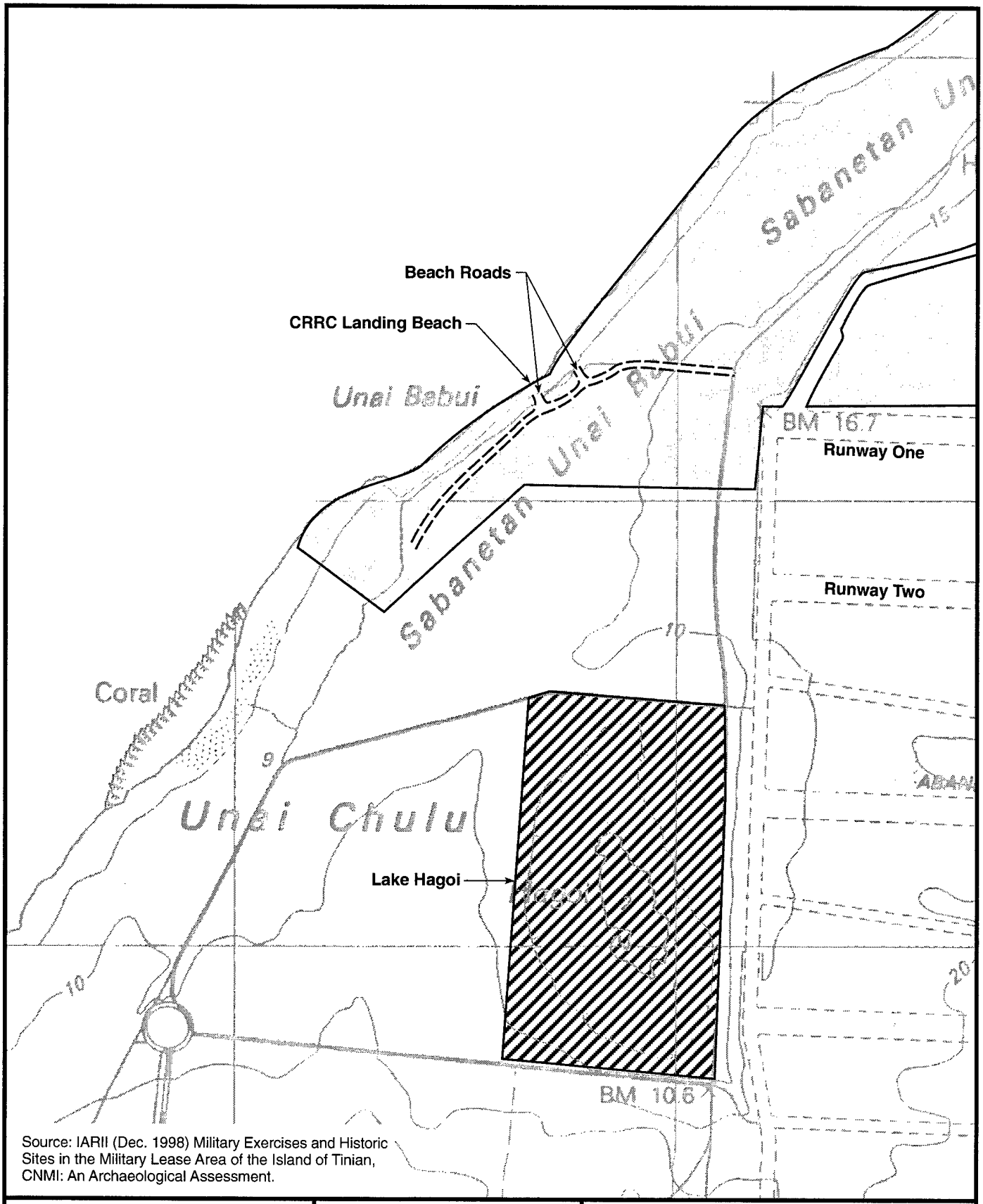


Figure 2-7c
DETAILED CONSTRAINTS AT UNAI DANKULO
FEIS: Military Training in the Marianas
Belt Collins Hawaii, June 1999

342.0414/018-3 r5.26.99 6



Source: IARII (Dec. 1998) Military Exercises and Historic Sites in the Military Lease Area of the Island of Tinian, CNMI: An Archaeological Assessment.

Figure 2-7d
DETAILED CONSTRAINTS AT UNAI BABUI
FEIS: Military Training in the Marianas
Belt Collins Hawaii, June 1999

2.9.2 Waterfront Annex Alternatives

The proposed training land use and training activities for Waterfront Annex are illustrated in Figures 2-2a and 2-2b. No elimination or reduction of ongoing training was proposed and new initiatives were based on enhancing live-fire range training and identifying additional underwater demolition sites. The comparison of alternatives is summarized below and in Table 2-6 with regard to whether each meets the purpose and need, has significant impacts that can be mitigated to nonsignificance, or has significant impacts that cannot be mitigated to nonsignificance. Additional discussion of potentially significant impacts is provided in Section 4.3.

No Training Land Use Alternative (not illustrated)**:** This alternative would fail to meet the purpose and need for military training in the Marianas that includes small-unit water-related exercises, special forces aviation training, underwater demolitions training, and small arms qualifications training. Apra Harbor provides sheltered water capable of being easily secured by military personnel during underwater demolitions training. It is the home base of two units with unique capabilities and training requirements. EOD MU-5 and NSWU-1 SEAL train to maintain capabilities to deploy immediately in response to contingency plans. These units must train continuously to maintain skills demanded for high-risk tasks. Having adequate training areas close at hand is a mandatory requirement.

As no significant impacts (including cumulative) result from continuing ongoing training and because a loss of military readiness would result if No Training were imposed, this alternative is not acceptable and not preferred.

Reduced Land Use Alternative (not illustrated)**:** The alternative would generally fail to meet the need for training on Guam. Most activities currently conducted at the Waterfront Annex are not feasible at other training areas, particularly others on Guam.

Multiple facilities are available to specifically support the Navy and Air Force population assigned to Guam. For example, small arms requalification ranges exist at Waterfront Annex, Communications Annex Finegayan, and AAFB. Each range has the capacity needed to support assigned and transient units. There is no environmental reason to reduce these duplications, as no potentially significant impacts result from their ongoing use. Their retention also offsets the lack of live-fire ranges on Tinian. No significant impacts result from duplicate LCAC landing sites at Polaris Point and Dry Dock Island. The latter is also used for LCU landings and for dismantling training mines removed from Apra Harbor by EOD. The evaluation of ongoing training did not identify any impacts that would suggest adoption of this alternative.

The most controversial land use in the Waterfront Annex is underwater demolition in Apra Harbor. This training is mission-essential for EOD MU-5 and cannot be eliminated, and there is no evidence of significant impacts to endangered species, coral, or submerged historic resources from continuing detonation of 10- and 20-pound (4.5 and 9.0-kg) charges at the present site. However, reducing the frequency of use of this site and reducing charges to 10 pounds (4.5 kg) or less would reduce agency concerns about potential impacts to protected sea turtles in the harbor.

The reduced frequency of deepwater underwater demolitions at the existing Apra Harbor is incorporated in the preferred alternative based on successful initiation of deepwater demolition training in Agat Bay at Dadi Beach.

No New Action Alternative (continuing/ongoing action)**:** Under this alternative Waterfront Annex would continue to be used for the activities shown in black on Figure 2-2a, primarily conducted by Guam-based units on a day-to-day basis. It would largely meet the purpose and need for training but would fail to expand existing range capabilities, underwater demolition training areas, and landing craft and AAV training sites. Training densities at existing sites would not be reduced since the number of training locations will remain the same.

This alternative does not have any significant impacts that cannot be mitigated to nonsignificance. Although underwater detonation of a 10-pound (4.5-kg) charge at a single Apra Harbor site would remain controversial, there is no evidence of significant impacts on endangered species from this activity. The socioeconomic impacts of related temporary harbor closures would be partially mitigated by establishing a more effective public notification system. This alternative is not preferred.

Maximum Land Use Alternative: The MTP proposed all ongoing training plus additional landing craft and AAV beach sites and additional underwater demolition training sites. Many were determined to be not suitable (shown in red on Figure 2-2a) since they could cause potentially significant impacts that could not be mitigated to levels of nonsignificance. Inadequate data is available to determine whether the LCAC demonstration landing at Dadi Beach generated significant impacts to the nearshore reef, but until additional information is available and a suitable Craft Landing Zone (CLZ) is developed, LCAC landings at Dadi Beach will not be initiated. Proposed shallow mine countermeasures training could impact abundant coral present in shallow waters at Dadi Beach, Gabgab Beach, and Spanish Steps. Demolition training using live-charges could also conflict with other activities at Polaris Point and Dry Dock Island. These sites are not preferred for live-charge underwater demolition. The use of inert charges is acceptable at Dry Dock Island and Polaris Point.

Preferred Alternative: This training land use alternative consists of using the Waterfront Annex for the ongoing and proposed activities identified in black and green on Figure 2-2a, with approximately 20 percent of Orote Point and 5 percent of Outer Apra Harbor waters constrained from full training availability (Figure 2-8). This alternative meets the purpose and need for water-related aviation and demolition training, small arms fire, and localized amphibious landings. Limited inland maneuver capability exists on Orote Peninsula in proximity to the existing and proposed ranges that are made available to both permanent and transient organizations.

This alternative has no significant impacts that cannot be mitigated to nonsignificance. The Preferred Alternative would lower the training frequency at many individual sites by expanding the number of sites for deepwater MCM and amphibious landings. Adding a second deepwater MCM training site at Dadi Beach would reduce the economic impacts now caused whenever portions of Apra Harbor and commercial dive sites must be closed to ensure public safety during underwater demolition training.

TABLE 2-6: COMPARISON OF WATERFRONT ANNEX LAND USE ALTERNATIVES

Impacts	No Land Use	Reduced Land Use	No New Action	Maximum Land Use[1]	Preferred Alternative[2]
Meets training needs for live-fire and underwater demolitions training, amphibious landings, field maneuver, and aviation support training?	No. No other amphibious landing and larger unit maneuver area on Guam. NW Field provides limited maneuver; AAFB and Finegayan have small arms ranges.	No. No other amphibious landing and larger unit maneuver area on Guam. NW Field provides limited maneuver; AAFB and Finegayan have small arms ranges.	Meets all needs except fire & maneuver range, and AAV landing site.	Yes	Yes
Will impact physical factors: climate, geology, hydrology, water or air quality?	No change from existing conditions.	No change from existing conditions.	No change from existing conditions.	No change from existing conditions.	No change from existing conditions.
Will take endangered species?	No	No	Underwater demolition impacts mitigated by site surveys prior to detonation.	Underwater demolition impacts mitigated by proper site selection and pre-training surveys.	Underwater demolition impacts mitigated by proper site selection and pre-training surveys.
Will destroy any wetlands, coral, or endangered species habitat?	No	No	No	Yes. AAV landings at former fuel pier could lead to harm or species disturbance in adjacent wetland. LCAC at low tide could damage coral off Dadi Beach.	No
Will destroy historically significant cultural resources?	No	No	No	Mitigated by establishing No Culture Resource Disturbance areas and training rules.	Mitigated by establishing No Culture Resource Disturbance areas and training rules.
Closes commercial access to tourist destinations?	No	No–if underwater demolition eliminated.	Yes. 4 hours/month (<1%) during underwater demolition in Outer Apra Harbor.	Yes. 4 hours/month (<1%) during underwater demolition in Outer Apra Harbor.	Yes. 4 hours/month (<1%) during underwater demolition in Outer Apra Harbor.
Reduces civilian jobs or income?	Yes. No land use available for training would decrease military presence on Guam and reduce civilian jobs.	No	No. Advance information provided to commercial firms for their alternative site planning during short-term safety closures.	No. Advance information provided to commercial firms for their alternative site planning during short-term safety closures.	No. Advance information provided to commercial firms for their alternative site planning during short-term safety closures.

Notes: 1. The MTP proposed additional small arms ranges, landing craft and AAV landing sites, and underwater demolition training sites.

2. The Marianas Training Preferred Alternative (Table 2-12) incorporates this alternative and all of its mitigation and training constraint measures, which are shown on Figure 2-8: Waterfront Annex Training Constraints.

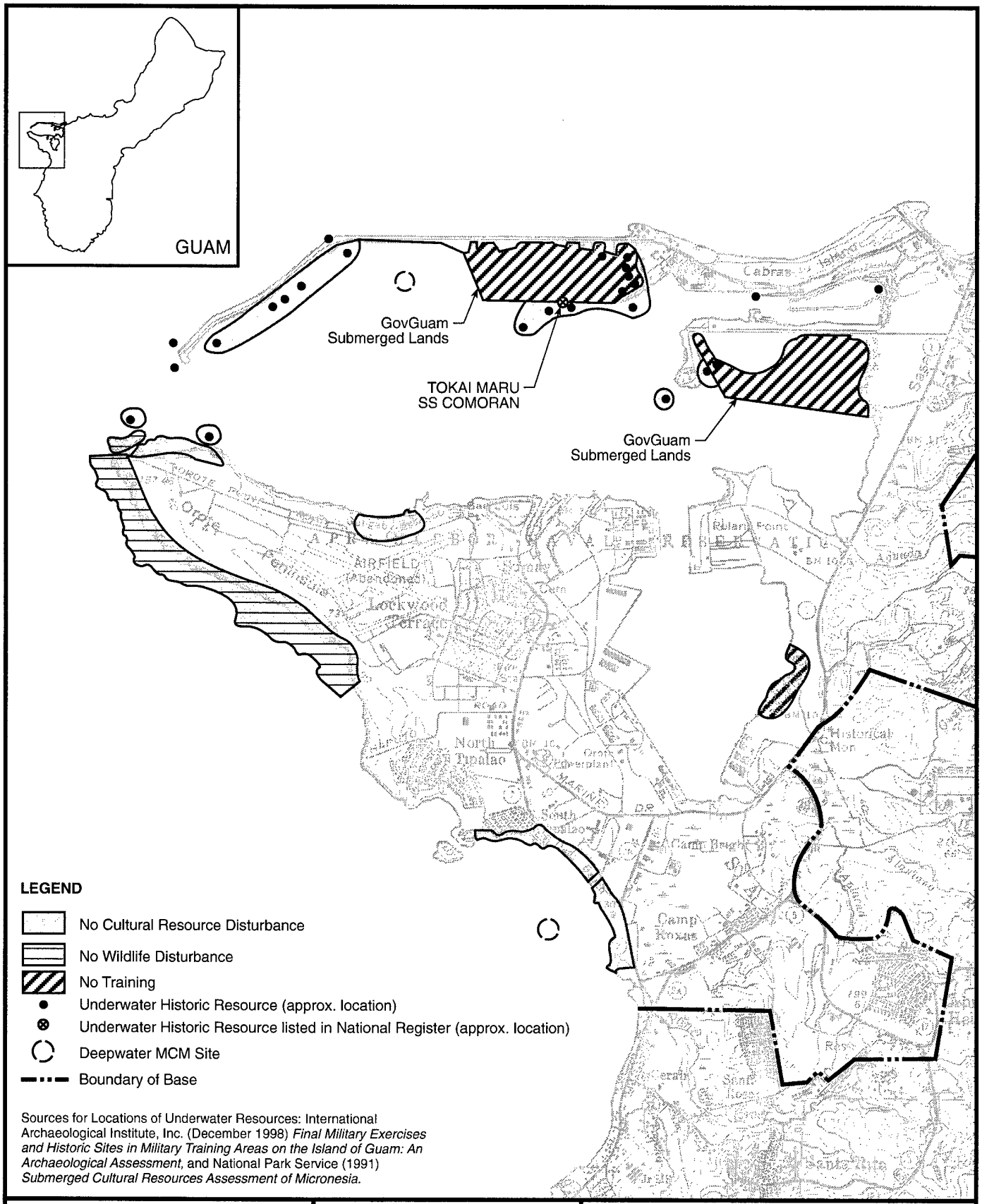


Figure 2-8
WATERFRONT ANNEX CONSTRAINED AREAS
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Concerns about potential impacts of underwater demolitions on the harbor's submerged historic resources, endangered sea turtles and other marine species in the harbor would also be relieved by the presence of a second underwater demolition site outside the harbor. The preferred alternative limits the size of the underwater explosive charge at either deepwater site to no more than 10 pounds (4.5 kg).

No significant impact will result from development a fire-and-maneuver range at the Orote Point small arms range. This alternative will extend the width, but not length, of the SDZ plotted offshore of Orote Point. The range's backdrop consisting of a 65-foot (20-m)-high hill will continue to effectively stop rounds before they could impact the sea.

2.9.3 Ordnance Annex Alternatives

The proposed training land use and training activities for Ordnance Annex are illustrated in Figure 2-3. No change to ongoing training was proposed and new initiatives were based on enhancing live-fire range training. A comparison of alternatives is summarized below and in Table 2-7 with regard to whether each meets the purpose and need, has significant impacts that can be mitigated to nonsignificance, or has significant impacts that cannot be mitigated to nonsignificance. Additional discussion of potentially significant impacts is provided in Section 4.4.

No Training Land Use Alternative (not illustrated): This alternative would fail to meet the purpose and need for various ground maneuver training activities that require rugged, forested land. Army Reserve and Guam National Guard units rely on the Ordnance Annex for much of their training and do not have funds to travel off-island for all their training needs. Their headquarters areas offer limited terrain for maneuver, and the use of land determined to be excess at Andersen South is diminishing in preparation for the permanent land transfer. The terrain at the annex also provides a genuine jungle setting for small unit maneuvers, NSWU SEAL Team infiltration, and Escape and Evasion exercises. As no significant impacts (including cumulative) result from continuing ongoing training and because a loss of Guam-based military readiness would result if No Training Land Use were imposed, this alternative is not preferred.

There is no environmental impact that would support curtailing training in the Ordnance Annex. The NT constraint areas may be modified as necessary based on ammunition storage activities or identification of additional sensitive areas. Cultural surveys continue to be performed as well as identification of endangered tree snail (*Succinea*) habitat. This information will be used as necessary to modify the annex training constraints overlay (Figure 2-8.)

Reduced Land Use Alternative: Elimination of ongoing and proposed training land uses is not necessary based on any potentially significant impacts or land use controversy. The training that is conducted and proposed does not interfere with munitions storage and handling, which is the primary mission of the annex. If the annex were to be required to modify any ammunition storage or movement requirements, a temporary reduction of training activities could result. This alternative is not preferred.

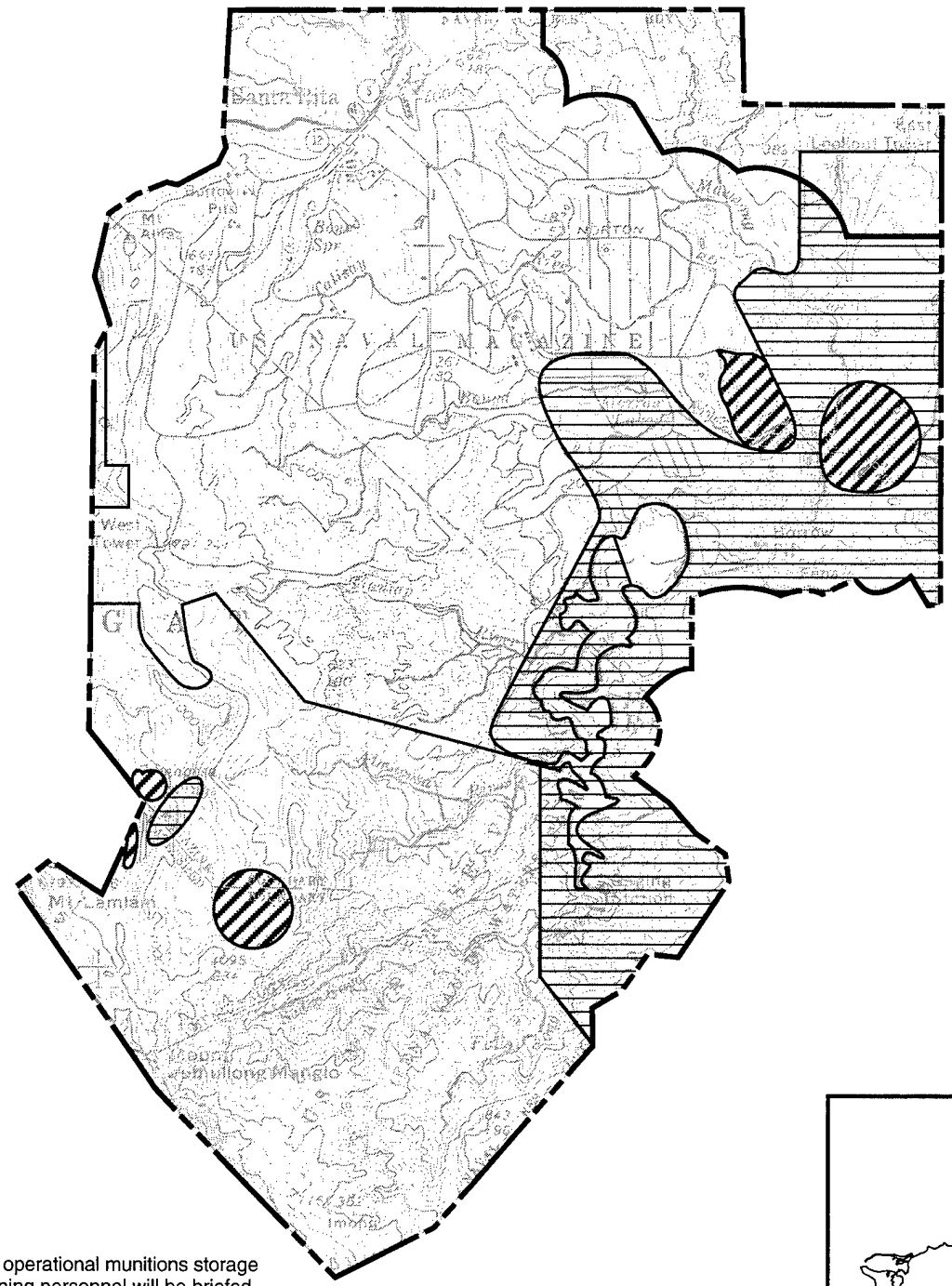
No New Action Alternative (continuing/ongoing action): This alternative would involve continuing use of the Ordnance Annex for the activities shown in black on Figure 2-3. It would

fail to meet the need for special purpose ranges (jungle trail, sniper). The breacher trainer has been constructed but it would not be integrated into training at the sniper range. No other suitable parcel of DoD-controlled land on Guam exists for the development of the sniper range planned for the annex. This alternative does not have any significant impacts that cannot be mitigated to nonsignificance. Because it fails to incorporate the sniper range and jungle trail range, this alternative is not preferred.

Maximum Land Use Alternative: The initial design of the sniper range could have generated risks to public safety since the safety margin within the range SDZ overlapped a public hiking trail. Modification of the sniper range line-of-fire has eliminated the hazard.

Preferred Alternative: This alternative consists of using the Ordnance Annex for activities identified in black and green on Figure 2-3, with approximately 50 percent of the total land area constrained by munitions storage from full training availability (Figure 2-9). This alternative meets the purpose and need for training and does not generate any significant impacts that cannot be mitigated to nonsignificance. The Preferred Alternative incorporates reduced bivouac areas along the western boundary to protect endangered snails.

The proposed sniper range firing and target positions have been reconfigured to reorient the SDZ so that it does not intersect an existing hiking trail passing within a small portion of the Ordnance Annex. Target placement has been done to ensure that cultural resources will not be impacted. Large areas of the Ordnance Annex have been designated as NCRD and NWD areas to protect endangered species and cultural resources (see Figure 2-9).



Notes:

1. This is an operational munitions storage area. Training personnel will be briefed on authorized routes through the MSA and safety requirements.
2. No new bivouac sites will be used without approval of COMNAVMARIANAS.

NORTH

0 500 1000 (Meters)

0 2000 4000 (Feet)

LEGEND

- No Cultural Resource Disturbance
- No Wildlife Disturbance
- No Training

Figure 2-9
ORDNANCE ANNEX CONSTRAINEDAREAS
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TABLE 2-7: COMPARISON OF ORDNANCE ANNEX LAND USE ALTERNATIVES

Impacts	No Land Use	Reduced Land Use	No New Action	Maximum Land Use[1]	Preferred Alternative[2]
Meets training needs for sniper range, ground maneuvers, bivouac on Guam?	No (sniper range). Ground maneuver and bivouac can be conducted elsewhere.	No (sniper range). Ground maneuver and bivouac can be conducted elsewhere.	No (sniper range). Yes (other activities will continue).	Partially. Proximity of munitions storage, biological and cultural resources constrain levels of maneuver and aviation support.	Partially. Proximity of munitions storage, biological and cultural resources constrain levels of maneuver and aviation support.
Will impact physical factors: climate, geology, hydrology, water or air quality?	No change from existing conditions.	No change from existing conditions.	No change from existing conditions.	No change from existing conditions.	No change from existing conditions.
Will take endangered species?	No	No	No	Without altitude restrictions, some aviation activity might harass endangered species.	No
Will destroy any wetlands or endangered species habitat?	No	No	No	No	No
Will destroy historically significant cultural resources?	No	No	No	No	No
Closes access to hiking trails?	No	No	No	Possible conflict with safety fan and hiking trail.	No
Disproportionately affects minorities?	No	No	No	No	No

Notes: 1. The MTP introduces a sniper range, breaching house, and jungle trail range.

2. The Marianas Training Preferred Alternative (Table 2-12) incorporates this alternative and all of its mitigation and training constraint measures.

2.9.4 AAFB and the Communications Annexes Alternatives

The proposed training land use and training activities for Communications Annex Finegayan and Communications Annex Barrigada comprise the No (New) Action Alternative. The proposed action for AAFB is its Maximum Training Land Use Alternative. Proposed training activities are illustrated on Figure 2-4. A comparison of alternatives is summarized below and in Tables 2-8 and 2-9. Additional discussion of potentially significant impacts is provided in Section 4.5.

No Training Land Use Alternative (not illustrated)**:** This alternative would fail to meet the purpose and need for training in the Marianas. It would undermine the primary mission of AAFB and its support to both ground and air transient organizations. It is not a preferred alternative.

Potentially significant impacts of discontinuing aviation training at AAFB include degradation of military readiness by units assigned to the western Pacific, as well as economic loss to the Guam community if the AAFB mission is seriously reduced.

NCTAMS training supports its mission to operate, maintain, and safeguard communications stations and is mandatory. Loss of the training area to others would result in major inconveniences to special operations team who may use Haputo and Double Reef beaches to transit the annex and enter Northwest Field. Maneuver areas at the two communications annexes are relied upon by the USAR-Marianas and GUARNG, neither of which have maneuver areas associated with their home armories.

Reduced Land Use Alternative (not illustrated)**:** Field training on the annexes is infrequent. This alternative could be a reduction of ongoing training activities or training tempo at Main Base or Northwest Field, none of which have significant impacts that cannot be mitigated to nonsignificance. Previously, Mariana crow nesting sites were closer to the Northwest Field runway, inhibiting aviation training activities. At present, no crows nest in the vicinity of the Northwest Field aviation activities. Recently instituted training management measures ensure that if any crow territories were rediscovered in areas significantly affected by aviation training areas, reduced land uses would be enacted by 36th ABW.

Reduced land use at Andersen South is occurring as a result of Air Force preparing to first lease and then convey excess land and facilities to the Government of Guam. Units that formerly trained in undeveloped areas of Andersen South are shifting their activities to other locations. The dormitories are no longer used for military contingency support. Former training activities caused no significant impacts to the environment. Continued or future use of this area for the same types of training would be subject to agreement with the ultimate landowner after lease/transfer from the USAF.[8] Because no significant impacts result from ongoing training, the Reduced Land Use alternative is not preferred at Andersen Main and Northwest Field. The Reduced Land Use alternative is now a natural progression for training at Andersen South.

[8] Federal property transferred as surplus after the date of this EIS may only be used for training with agreement of the property owner.

No New Action Alternative (continuing/ongoing action): AAFB and the Communications Annex locations would continue to be used for field maneuvers, aviation, USAF EOD demolition, and live-fire training activities shown in black on Figure 2-4. This alternative would largely meet the purpose and need for training. The Navy leases 15 acres on Communications Annex Barrigada directly north of the headquarters of USAR-Marianas for land navigation training. About 773 acres of the annex have been determined excess to the NCTAMS communication operations, to include the 15 acres.[9] The future landowner may continue to support the Reserve. An additional 50 acres nearer Fort San Juan Muño is proposed for transfer to the National Guard Bureau as a training and facility development site for the Guam Army National Guard.[10]

There are no significant impacts on the annexes or AAFB that cannot be mitigated to nonsignificance. Despite a three-year USFWS study, the impact of aviation noise on endangered Mariana crows at the MSA is not well understood. Mitigation measures negotiated with USFWS restrict aircraft altitude to no less than 1,000 feet (305 m) over known crow territories and to no flights within one nautical mile of known nesting sites. Guam's Division of Aquatic and Wildlife Resources (DAWR) monitors active nesting sites and notifies the 36 ABW environmental and training staffs so that flight crews are briefed on new nesting areas to be avoided.

Maximum Land Use Alternative: This alternative consists of using AAFB and the Communications Annexes for activities identified in black and green on Figure 2-4, constrained as indicated in Figure 2-10. About 40 percent of AAFB lands are constrained from full training availability. This alternative meets the purpose and need for military training. New initiatives with no significant impact establishing a rapid runway repair (RRR) training site at Northwest Field, conducting fire bucket offload training for helicopter squadrons, and initiating 60mm mortar training using the M766 training projectile (reusable and no threat of UXO).

Airmen training with rifles, pistols, and the inert M203 40mm rocket grenade, which produces no UXO, use the AAFB firing range. None of these activities will generate significant impacts. Any concern that the RRR training site would cause an adverse impact to areas eligible for listing on the NRHP is being resolved between the Air Force and the Guam Historic Preservation Officer.

Preferred Land Use Alternative: This alternative is identical to the Maximum Land Use Alternative. There are no ongoing or proposed new training land uses that would have significant impacts that cannot be mitigated. Training constraints are established to protect sensitive biological and cultural resources and to restrict training within the MSA (Figure 2-10).

[9] Commander, Pacific Division, Naval Facilities Engineering Command (April 1995). Guam *Land Use Plan Update (GLUP 94)*.

[10] Commander, Pacific Division, Naval Facilities Engineering Command letter 11011 over serial RPM24112/1153 dated 5 April 1999, "Determinations of Surplus for BRAC Properties on Guam."

TABLE 2-8: COMPARISON OF COMMUNICATIONS ANNEXES FINEGAYAN AND BARRIGADA LAND USE ALTERNATIVES

Impacts	No Land Use	Reduced Land Use	No New Action [1]	Maximum Land Use[2]	Preferred Alternative[2]
Meets training needs for small unit maneuvers and range training?	No. Small unit traverse or maneuver is primarily the only activity. Range is a necessity for permanent personnel.	No. The U.S. Army Reserve has no other site near its headquarters. NCTAMS personnel require a range.	Yes	Yes	Yes
Will impact physical factors: climate, geology, hydrology, water or air quality?	No change from existing conditions.	No change from existing conditions.	No change from existing conditions.	No change from existing conditions.	No change from existing conditions.
Will training noise disturb endangered species?	No	No	No	No	No
Will over-the-beach training and cliff scaling at Haputo harm rare tree snails?	No	No. Established trail must be used to scale cliff from Haputo Beach.	No. Personnel will not stray from Haputo cliff trail.	No. Personnel will not stray from Haputo cliff trail.	No. Personnel will not stray from Haputo cliff trail.
Will training destroy any wetlands, coral, or endangered species habitat?	No	No	No	No	No
Will training damage any historically significant resources?	No	No	No	No	No

Notes: 1. The No New Action alternative assumes appropriate real estate agreements can be arranged to use former DoD property if they are released as excess in the future.

2. The Marianas Training Preferred Alternative (Table 2-12) incorporates this alternative and all of its mitigation and training constraint measures

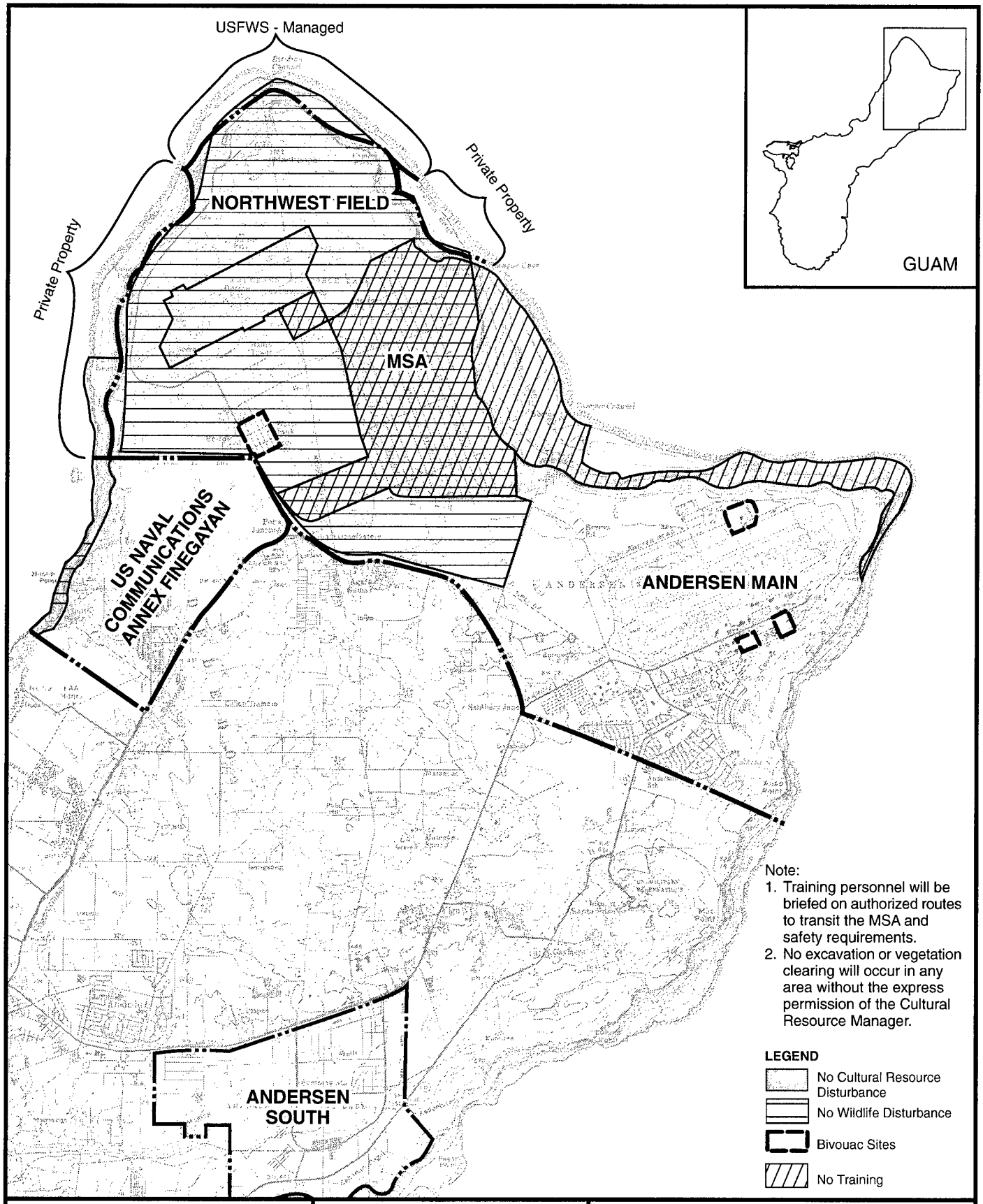
TABLE 2-9: COMPARISON OF AAFB LAND USE ALTERNATIVES

Impacts	No Land Use	Reduced Land Use	No New Action[1]	Maximum Land Use[2]	Preferred Alternative[3]
Meets training needs for strategic airlift, aviation unit training, rapid runway repair, and small unit ground maneuvers?	No. There is no alternative aviation training area on Guam.	No. There is no alternative aviation training area on Guam.	Yes, except for the lack of a rapid runway repair site for USAF engineer training.	Yes	Yes
Will impact physical factors: climate, geology, hydrology, water or air quality?	No change from existing conditions.	No change from existing conditions.	No change from existing conditions.	No change from existing conditions.	No change from existing conditions.
Will aircraft noise disturb endangered species?	No	No	No. Flight tracks avoid crow territories. Altitude restrictions are also established.	No. Flight tracks avoid crow territories. Altitude restrictions are also established.	No. Flight tracks avoid crow territories. Altitude restrictions are also established.
Will training destroy any wetlands, coral, or endangered species habitat?	No	No	No	No	No
Will training destroy historically significant cultural resources?	No	No	No	No. The RRR site will be established to cause no adverse affect to NRHP eligible Northwest Field.	No. The RRR site will be established to cause no adverse affect to NRHP eligible Northwest Field.

Notes: 1. The No New Action alternative assumes appropriate real estate agreements can be arranged to use former DoD property (Andersen South) when released as excess in the future.

2. The MTP adds RRR at NW Field, and the use of the AAFB range as a site for 60mm mortar training (with inert training round only).

3. The Marianas Training Preferred Alternative (Table 2-12) incorporates this alternative and all of its mitigation and training constraint measures.



USFWS – U.S. Fish and Wildlife Services

Figure 2-10
ANDERSEN AFB AND COMMUNICATIONS ANNEX FINEGAYAN
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2.9.5 Farallon de Medinilla Alternatives

The proposed action for FDM is to continue naval gunfire and aerial bombardment and allow weapons crews to go on the island for artillery, mortar and anti-tank missile live-fire training. The alternatives for military training areas at FDM are illustrated in Figure 2-5. Proposed target placement sites based on minimizing biological impacts are illustrated in Figure 2-11. The alternatives are compared below and in Table 2-10. Detailed impact evaluations are provided in Section 4.6. A summary comparison of the alternatives follows:

No Training Land Use Alternative (not illustrated): No training use of FDM would eliminate impacts to natural resources while failing to meet the need for training. Loss of the range would impact the training readiness of Navy, Marine and Air Force aviation to respond to real world contingencies. Although of beneficial effect to bird colonies on FDM, the range has been in use since at least 1971 and there is little evidence of direct bird mortality as a result of bombing and naval gunfire. It is assumed that birds would respond positively to the absence of noise, impact, and ground fire from bombing and naval gunfire, but over time the bird population has remained as training has continued. Because this alternative would prove to be a major impact on U.S. military aviation and naval readiness, and compensatory mitigation measures are being practiced to enhance bird habitat on other uninhabited islands in the Mariana archipelago, this alternative is not preferred.

Reduced Land Use Alternative (not illustrated): This alternative could involve either eliminating or reducing naval gunfire or aerial bombardment, increasing the use of inert aerial munitions, or bombing and gunfire only on one portion of the island, such as the southernmost peninsula. All of these would fail to meet the purpose and need for training by the carrier battle groups and air combat command elements that depend on this range. Handling inert munitions does not realistically train the air support crews and although cannot replace the need to handle live munitions. However, reducing the boundaries of the impact area has been accomplished as a result of EIS development and analysis.

This alternative might have a slight beneficial impact on some birds on FDM by reducing the areas of direct impact and potential bomb-related ground fires. It would not eliminate potential impacts of loud and unexpected noise. Because a major loss of military readiness would result, this alternative is not preferred.

No New Action Alternative (continuing/ongoing action): FDM would continue to be used for aerial bombardment and naval gunfire activities identified in black on Figure 2-5. This alternative would meet the purpose and need for naval gunfire and air-to-ground aerial bombardment training within the bounds of ammunition expenditures that have been coordinated with USFWS. This alternative would not include proposals to expand the bombardment range for use by artillery, mortar, and anti-tank missile crews

There would be significant impacts on great frigatebird colonies and on a small number of endangered Micronesian megapodes if any breeding population exists on the island. This alternative would also result in mortality to seabirds that nest all over FDM, although there is little evidence of direct mortality. It would not impact endangered sea turtles, as no viable

nesting beaches exist on the island. This alternative would not include proposed mitigation measures such as modification of impact areas, and therefore is not preferred without changes to constraints.

Maximum Land Use Alternative: Due to the lack of crew-served weapons ranges in the Marianas, the MTP proposed that crew-served weapons crews, their weapon systems, and ammunition be helicopter transported to the north end of the island. The weapons would have been fired to the south at a variety of target locations (see the red items in Figure 2-5). This proposal would expose those on island to surface and sub-surface UXO, including sensitive cluster bombs. UXO is also present north of the theoretical "No Bomb Line" at the north end of the island proposed as weapons firing positions. COMNAVMARIANAS policy restricts human presence on island to military personnel who are DoD explosive-certified with responsibilities for range operation and maintenance. This alternative is not preferred.

Preferred Alternative: This alternative differs slightly from the No New Action Alternative by retaining naval gunfire and aerial bombardment training but revising the boundaries of impact areas and potential target locations (see Figure 2-11). Training frequencies would vary based on preparations or deployments for real-world contingencies. Ships and aircraft could either be scheduled for additional training, or have their deployments extended, which might reduce training time in the Mariana Islands. The range was used heavily during the latter stages of the Vietnam War era, and range use has fluctuated during recent periods of unrest.

This alternative, as mitigated, would reduce the area to be targeted by naval gunfire and aerial bombardment. The eastern cliffs, isthmus area, and northern end of the island will be avoided to reduce impacts on cliff-nesting and roosting birds. Discrete target areas will be established. The "No Bomb Line" would remain in effect on the north end of the island. To eliminate potential introduction of BTS, junked auto and truck bodies are no longer be used as target materials since they are difficult to inspect. Instead, metal containers will be used as much as possible and all targets will be subject to BTS cleaning, inspection and staging protocol prior to shipment.

This alternative will continue to significantly impact bird species and habitat, including any endangered Micronesian megapodes that might attempt to breed on the island (none are known to do so). It will result in mortality to seabirds nesting on the plateau and western cliffs. Target placement and target area boundary changes will minimize but not eliminate significant impacts to bird species and habitat. As compensatory mitigation, the Navy is participating in efforts to enhance the megapode habitat on Sarigan, an uninhabited island north of FDM. The megapode population on FDM is estimated to be less than 10 individuals and declining. The population estimate for Sarigan is about 600 to 800 and increasing.[11]

Although a significant impact results, the alternative to continue the use of Range 7201 is preferred because it meets an essential training need. Extensive discussions with Navy and USAF representatives have resolved mission profile requirements with the reductions in target areas that are being accomplished at this range. The amounts of ordnance to be dropped are controlled and

[11] USFWS (April 1998) *Recovery Plan for the Micronesian Megapode.*

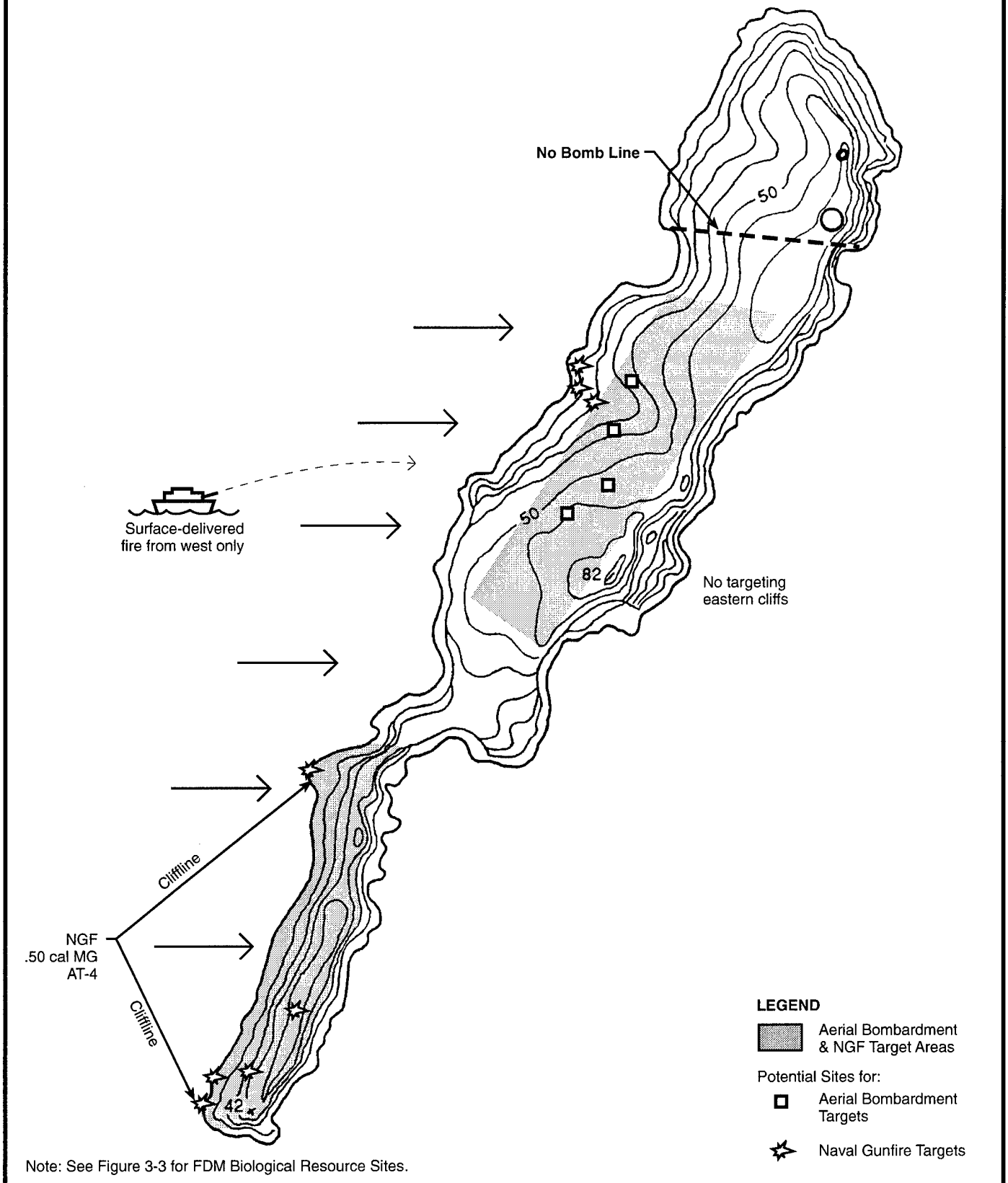
TABLE 2-10: COMPARISON OF FDM LAND USE ALTERNATIVES

Impacts	No Land Use	Reduced Land Use	No New Action	Maximum Land Use [1]	Preferred Alternative[2]
Meets training needs for aerial bombardment range in Pacific theater?	No	No	Yes	Yes	Yes
Meets training needs for naval gunfire range in the Pacific theater?	No	No	Yes	Yes	Yes
Meets training needs for NSWU weapons fire from RHIBs?	No	No	No	Yes	Yes
Meets training needs for Marine Corps crew-served weapons fire?	No	No	No	No	Yes
Will impact physical factors: climate, geology, hydrology, water or air quality?	No change from existing conditions	No change from existing conditions	No change from existing conditions	No change from existing conditions	No change from existing conditions
Will take endangered species?	No	Yes, if megapodes are present.	Yes, if megapodes are present.	Yes, if megapodes are present.	Yes, if megapodes are present.
Will kill seabirds nesting on island?	No	Yes	Yes	Yes	Yes
Will destroy any wetlands, coral, or endangered species habitat?	No	Yes, if megapode habitat burns.	Yes, if megapode habitat burns.	Yes, if megapode habitat burns.	Yes, if megapode habitat burns.
Will destroy historically significant cultural resources?	None are present.	None are present.	None are present.	None are present.	None area present.
Closes commercial access to fishing grounds?	No	Yes. Closes small area (3-mile [4.8-km] radius) to civilian vessels.	Yes. Closes small area (3-mile [4.8-km] radius) to civilian vessels.	Yes. Closes small area (3-mile [4.8-km] radius) to civilian vessels.	Yes. Closes small area (3-mile [4.8-km] radius) to civilian vessels.
Reduces civilian jobs or income?	No	No. The nearest productive fishing grounds are outside exclusion area.	No. The nearest productive fishing grounds are outside exclusion area.	No. The nearest productive fishing grounds are outside exclusion area.	No. The nearest productive fishing grounds are outside exclusion area.

NOTES:

1. The MTP proposes weapons crews be placed on the island for firing artillery, anti-tank missiles, and mortars. Since the island is an impact area with unexploded ordnance, this type of training is not permitted by COMNAVMARIANAS.

2. The Marianas Training Preferred Alternative (Table 2-12) incorporates this alternative and all of its mitigation and training constraint measures.



Note: See Figure 3-3 for FDM Biological Resource Sites.

NORTH

0 100 200 300 (Meters)

0 500 1000 (Feet)

Figure 2-11
FDM FIRING DIRECTION AND TARGET PLACEMENT CONSTRAINTS
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monitored. Off-island compensatory mitigation measures have been developed to compensate for the potential loss of bird species or habitat in conjunction with CNMI DLNR and USFWS.

2.9.6 Non-DoD Land Alternative

Alternatives for military training areas on non-DoD lands are illustrated in Figures 1-2 (Guam) and Figure 2-6 (Rota). The alternatives are compared below with regard to whether they meet the purpose and need, have significant impacts which can be mitigated to nonsignificance, and have significant impacts which cannot be mitigated to nonsignificance. Detailed impact evaluations are provided in Section 4.7.

2.9.6.1 Rota Training/Training Support

No Training Land Use Alternative (not illustrated): This alternative would fail to meet the purpose and need for maintaining a SEALs support base for training activities that cause the teams to travel by raiding craft between Guam and CNMI. As no significant impacts (including cumulative) would result from continuing this activity and because a loss of military readiness would result if No Training were imposed, this alternative is not preferred.

Reduced Land Use Alternative (not illustrated): This alternative would be the same as No Training or it could involve boat refueling only and no bivouac. This would impair NSWU-1 long distance training between Guam, Tinian, and FDM that is now possible due to cooperation provided by CNMI and the Rota municipal government.

No New Action Alternative (continuing/ongoing action): Under this alternative a small island in Songsong Harbor would continue to be used as a small forward staging base (shown in black on Figure 2-6). This alternative would largely meet the purpose and need for training but does not address providing an additional NVG training area for helicopter squadrons.

The analysis in Chapter Four indicates that this alternative does not have any significant impacts that cannot be mitigated to nonsignificance.

Maximum Land Use Alternative: The MTP proposed the use of the Rota Airport for military helicopter nighttime training using night vision goggles. However, noise impacts of this training on Mariana crows and fruit bats as well as to residents near the airport are of concern. Additional long-term study would be needed to more accurately assess impacts to crows, and future development plans near the airport could influence training.

Since the MTP was published the proposal has been cancelled. HC-5 landings on Northwest Field are now approved for nighttime training. The purpose and need is now met using existing training land.

The **Preferred Alternative** is No New Action, as it does not generate any significant impacts that cannot be mitigated and provides sufficient training support areas to meet the purpose and need for NSWU-1's inter-island training.

2.9.6.2 Guam Training

No Training Land Use Alternative: Since no significant environmental impacts result from continuing use of the two drop zones ("Casper" and "Ghost") and because the landowner continues to primarily support Guam Army National Guard and USAR-Marianas this alternative is not preferred.

Reduced Land Use Alternative: There is no evidence of overuse of this area. Training frequency remains low considering the limited amount of time available for Army Reserve and National Guard drills and the scarcity of supporting helicopter resources.

No New Action Alternative (continuing/ongoing action)**:** The Dandan parachute drop zones on private land near NASA Road in Talofofo would continue to be used. This alternative would meet the purpose and need for National Guard training and is performed in accordance with a lease with the landowner. There are no significant impacts.

Maximum Land Use Alternative: The MTP-proposed riverine training on the Talofofo and Ylig rivers to supplement training now conducted on the Atantano River. There is insufficient data to evaluate potential impacts on archaeological resources that may exist in training areas, and the requesting unit, NSWU-1, determined that the training could require difficult to obtain leases or right-of-entry agreements with private landowners. The Atantano River, on federal property, remains available for this training. NSWU-1 no longer requests use of the two rivers on Guam's eastern coast.

The **Preferred Alternative** at each non-DoD properties on Guam is No New Action.

2.10 MARIANAS TRAINING PREFERRED ALTERNATIVE: IMPACTS AND MITIGATION

The result of the training land use evaluations on Tinian, Guam, FDM, and Rota is an identification of potentially impacted resources and the means to constrain or mitigate these impacts to acceptable levels. Table 2-11 compares training activities to each alternative, identifies affected resources, and identifies the few impacts that cannot be mitigated to required levels. In those instances the activity is not listed as a preferred alternative, with the exception of continuing to bomb and strafe FDM, which leads to compensatory mitigation measures for potential impacts to biological species.

The MTP emphasizes maximizing training land uses. In some instances, proposed training activities could not be achieved. Table 2-12 identifies what is the Mariana Islands Preferred Training Land Use Alternative by activity and location. In most instances, more than one site has been determined to be environmentally suitable. This is a desirable result since there are options available to the commander in selecting Tinian and/or Guam training sites as appropriate to train individuals and small units, and to participate in major exercises.

Table 2-13 is an additional comparative matrix focusing on the preferred alternative. The table identifies potential impacts and mitigation by resource areas. The protective measures identified for each resource will be included in training orders and directives and made available to units involved in Mariana Islands training activities. Many of the mitigation measures are identical regardless of the training area in use. Other mitigation measures are site-specific. Regardless, appropriate levels of precaution will be taken at every training site owned, leased, or authorized for DoD use.

Table 2-13 also identifies naval gunfire and aerial bombardment at FDM as the activities that generate a significant impact that would require compensatory mitigation. These live-fire range activities remain in the preferred alternative since there is no alternative venue for their accomplishment. Bombardment of FDM is likely to significantly harm, harass, or kill individual endangered or migratory birds. These significant impacts can only be mitigated by compensatory mitigation rather than by additional land use constraints that would negate range use. Appropriate compensation will be developed among the DoD and appropriate regulatory agencies.

Potential damage to coral by amphibious landing exercises has been eliminated by careful selection of beaches that are appropriate for certain types of landing craft and amphibious vehicle.

Underwater demolition training in Apra Harbor will remain controversial but does not cause impacts that could not be mitigated. Regardless, the Navy will continue to work with GEPA and DAWR to investigate additional sites that could reduce training frequency in Apra Harbor.

All other training activities with potentially significant impacts that would be difficult to mitigate to satisfactory levels are no longer identified as preferred training activities.

The Preferred Alternative for the Mariana Islands provides suitable land areas to meet all basic training requirements except the for following field-firing ranges requested in the Mariana Training Plan:

- .50 caliber M2 heavy machine gun
- 60mm and 81mm mortar ranges (except using the new 60mm M766 training projectiles)
- 40mm M203 grenade (except using inert 40mm grenade training projectiles)
- Antitank shoulder-launched and mobile TOW missiles (other than AT-4 fire from raiding watercraft)
- 155 mm field artillery

These training requirements will continue to be objectives for training that is conducted on the U.S. mainland or other U.S.-controlled training sites, or conducted during combined exercises on allied force ranges as diplomatic situations, deployments, and annual training schedules allow.

TABLE 2-11: COMPARISON OF ALTERNATIVES AND AFFECTED RESOURCES

LOCATION AND TRAINING ACTIVITY	INCLUDED IN ALTERNATIVE? (YES/NO)					AFFECTED RESOURCES	CAN BE MITIGATED TO LEVELS OF NONSIGNIFICANCE? IF "NO," PRIMARY ADVERSE FACTOR
	No Land Use	Reduced Land Use	No New Action	Maximum Land Use	Preferred Alternative		
TINIAN							
1. Field Maneuvers	No	Yes	Yes	Yes	Yes	Biological Resources, Cultural Resources, and Public Safety	Yes
2. Amphibious Landings: AAVs at Unai Babui	No	No	No	Yes	No	Biological Resources and Public Safety	No. Coral damage on reef edges and potential damage to the AAV.
LCACs at Unai Chulu	No	Yes	Yes	Yes	Yes	Biological Resources, Cultural Resources, and Public Safety	Yes
LCACs at Unai Dankulo	No	No	No	Yes	Yes	Biological Resources, Cultural Resources, and Public Safety	Yes
LCACs, LCUs and AAVs at Kammer Beach	No	No	No	Yes	**No**	Biological Resources, Cultural Resources, Public Safety, and Socioeconomic Factors	No. Socioeconomic Factors: Training conflicts with recreation use and tourist development.
LCACs at Tachogna Beach	No	No	No	Yes	**No**	Biological Resources, Cultural Resources, Public Safety, and Socioeconomic Factors	No. Socioeconomic Factors: Training conflicts with recreation use and tourist development.
LCUs and AAVs at San Jose Harbor	No	Yes	Yes	Yes	Yes	Public Safety and Socioeconomic Factors	Yes
3. Logistics Support	No	Yes	Yes	Yes	Yes	Biological Resources, Cultural Resources, Public Safety, and Socioeconomic Factors	Yes
4. Construct EMUA Security Gates	No	No	No	Yes	**No**	Public Safety	No. Public Safety: Without a permanent military presence, the use of the gates cannot be monitored.
5. Construct a Logistics Support Camp	No	No	No	Yes	Yes	Biological Resources	Yes
6. Aviation Training	No	Yes	Yes	Yes	Yes	Biological Resources and Public Safety	Yes
7. Live-fire Training: Small Arms Range	No	No	No	Yes	**No**	Biological Resources, Cultural Resources, Public Safety, and Socioeconomic Factors	No. Public Safety with live-fire training in area accessible to the public. Training projectile available.
60mm Mortar Range	No	No	No	Yes	**No**	Biological Resources, Cultural Resources, Public Safety, and Socioeconomic Factors	No. Public Safety and Future Land Use issues: live-fire training in areas accessible to the public and UXO in impact area. Inert training round will be available.
Permanent Shooting House	No	No	No	Yes	**No**	Biological Resources, Cultural Resources, Public Safety, and Socioeconomic Factors	No. Alternative sites available. Live-fire training in area accessible to public, and lack of oversight of training facilities without full-time military presence.
Permanent Breacher Trainer (Demolition Charges)	No	No	No	Yes	**No**	Biological Resources, Cultural Resources, Public Safety, and Socioeconomic Factors	No. Alternative sites available. Lack of oversight of training facilities without full-time military presence.

TABLE 2-11: COMPARISON OF ALTERNATIVES AND AFFECTED RESOURCES *(continued)*

LOCATION AND TRAINING ACTIVITY	INCLUDED IN ALTERNATIVE? (YES/NO)					AFFECTED RESOURCES	CAN BE MITIGATED TO LEVELS OF NONSIGNIFICANCE? IF "NO," PRIMARY ADVERSE FACTOR
	No Land Use	Reduced Land Use	No New Action	Maximum Land Use	Preferred Alternative		
GUAM: WATERFRONT ANNEX							
1. Field Maneuvers	No	Yes	Yes	Yes	Yes	Biological Resources, Cultural Resources, and Public Safety,	Yes
2. Amphibious Landings: Dry Dock Island	No	Yes	Yes	Yes	Yes	None	None Required
Polaris Point	No	Yes	Yes	Yes	Yes	None	None Required
Toyland Beach	No	No	No	Yes	Yes	Public Safety	Yes
Tipalao Cove	No	No	No	Yes	Yes	Public Safety	Yes for LCAC and AAV
Dadi Beach	No	No	No	Yes	**No**	Biological Resources, Cultural Resources, and Public Safety	Not until a suitable Craft Landing Zone is cleared on the beach for preferred LCAC landing methods.
Sumay Cove Marina	No	No	No	Yes	Yes	Biological Resources	Yes for AAV
Former Fuel Pier	No	No	No	Yes	Yes	Biological Resources	Yes for LCU
3. Logistics Support	No	Yes	Yes	Yes	Yes	Biological Resources, Cultural Resources, and Public Safety	Yes
4. Aviation Training	No	Yes	Yes	Yes	Yes	Biological Resources, Cultural Resources, and Public Safety	Yes
5. Live-fire Training: Small Arms Range	No	Yes	Yes	Yes	Yes	Public Safety	Yes
Sniper Range	No	Yes	Yes	Yes	Yes	Public Safety	Yes
Fire-and-Maneuver Range	No	No	No	Yes	Yes	Public Safety	Yes
Stress Course	No	No	No	Yes	Yes	Public Safety	Yes
Shooting House	No	Yes	Yes	Yes	Yes	Public Safety	Yes
6. U/W Demolitions by EOD in deep water: Outer Apra Harbor	No	Yes	Yes	Yes	Yes	Biological Resources, Cultural Resources, and Public Safety	Yes
Agat Bay/Dadi Beach	No	No	No	Yes	Yes	Biological Resources, Cultural Resources, and Public Safety	Yes
7. Floating Mine Neutralization Open Ocean near harbor	No	No	Yes	Yes	Yes	None	
Agat Drop Zone	No	No	No	Yes	Yes	None	
8. U/W Demolition-by NSWU in shallow water: Outer Apra Harbor	No	Yes	Yes	Yes	Yes	Biological Resources, Cultural Resources, and Public Safety	Yes

TABLE 2-11: COMPARISON OF ALTERNATIVES AND AFFECTED RESOURCES (continued)

LOCATION AND TRAINING ACTIVITY	INCLUDED IN ALTERNATIVE? (YES/NO)					AFFECTED RESOURCES	CAN BE MITIGATED TO LEVELS OF NONSIGNIFICANCE? IF "NO," PRIMARY ADVERSE FACTOR
	No Land Use	Reduced Land Use	No New Action	Maximum Land Use	Preferred Alternative		
WATERFRONT ANNEX *(continued)*							
Inner Apra Harbor	No	No	No	Yes	**No**	Biological Resources, Cultural Resources, Public Safety, and Socioeconomic Factors	No. Potential Conflict with inner harbor activities. Availability of more suitable sites.
Agat Bay/Dadi Beach	No	No	No	Yes	**No**	Biological Resources, Cultural Resources, and Public Safety	No. Potential damage to extremely shallow coral.
Tipalao Cove	No	No	No	Yes	Yes	Public Safety	Yes
ORDNANCE ANNEX							
1. Field Maneuvers	No	Yes	Yes	Yes	Yes	Biological Resources and Cultural Resources	Yes
2. Logistic Support	No	Yes	Yes	Yes	Yes	Biological Resources and Cultural Resources	Yes
3. Aviation Training	No	Yes	Yes	Yes	Yes	Biological Resources and Cultural Resources	Yes
4. Breacher Trainer	No	No	Yes	Yes	Yes	Biological Resources and Cultural Resources	Yes
4. Live-fire Ranges: Sniper Range	No	No	No	Yes	Yes	Biological Resources and Cultural Resources	Yes
Jungle Course	No	No	No	Yes	Yes	Biological Resources and Cultural Resources	Yes
COMMUNICATIONS ANNEXES FINEGAYAN AND BARRIGADA							
1. Field Maneuvers	No	Yes-both	Yes-both	Yes-both	Yes-both	Biological Resources and Cultural Resources	Yes
2. Over-the-Beach Landings (CRRC and Swimmers)	No	Yes-Finegayan	Yes-Finegayan	Yes-Finegayan	Yes-Finegayan	Biological Resources and Cultural Resources	Yes
3. Live-fire Range	No	Yes-Finegayan	Yes-Finegayan	Yes-Finegayan	Yes-Finegayan	Biological Resources, Cultural Resources, and Public Safety	Yes
ANDERSEN AIR FORCE BASE							
1. Field Maneuvers	No	Yes	Yes	Yes	Yes	Biological Resources and Cultural Resources	Yes
2. Aviation Training	No	Yes	Yes	Yes	Yes	Biological Resources and Cultural Resources	Yes
3. Rapid Runway Repair	No	N	No	Yes	Yes	None	None Required
4. Logistic Support	Yes	Yes	Yes	Yes	Yes	Biological Resources and Cultural Resources	Yes
5. Live-fire Ranges-Small Arms	No	Yes	Yes	Yes	Yes	Public Safety	Yes
6. 40mm Training Projectile	No	Yes	Yes	Yes	Yes	Public Safety	Yes
7. 60mm Mortar TP	No	No	No	Yes	Yes	Public Safety	Yes
8. CRRC and Swimmers	No	Yes	Yes	Yes	Yes	Biological Resources	Yes
FARALLON DE MEDINILLA							
1. Live-fire Ground Training: Artillery, Mortars, AT-Weapons	No	No	No	Yes	**No**	Biological Resources and Public Safety	No. Non DoD explosive-certified personnel are not allowed to train on the island due to the presence of unexploded ordnance.

TABLE 2-11: COMPARISON OF ALTERNATIVES AND AFFECTED RESOURCES *(continued)*

LOCATION AND TRAINING ACTIVITY	INCLUDED IN ALTERNATIVE? (YES/NO)					AFFECTED RESOURCES	CAN BE MITIGATED TO LEVELS OF NONSIGNIFICANCE? IF "NO," PRIMARY ADVERSE FACTOR
	No Land Use	Reduced Land Use	No New Action	Maximum Land Use	Preferred Alternative		
2. 40mm grenade, .50 cal MG, and AT missiles from the RHIB	No	Yes	Yes	Yes	Yes	Biological Resources and Public Safety	No. Mitigation will require on-island constraints, NOTAM and NOTMAR, public notification and compensatory mitigation on Sarigan.
3. Naval Gunfire	No	Yes	Yes	Yes	Yes	Biological Resources and Public Safety	No. Mitigation will require on-island constraints, NOTAM and NOTMAR, public notification and compensatory mitigation on Sarigan.
4. Aerial Bombardment and Close Air Support	No	Yes	Yes	Yes	Yes	Biological Resources and Public Safety	No. Mitigation will require on-island constraints, NOTAM and NOTMAR, public notification and compensatory mitigation on Sarigan.
OTA							
1. Logistic Support and RHIB maintenance	No	Yes	Yes	Yes	Yes	Biological Resources	Yes
2. Helicopter Crew Training-Night Vision Goggle Flights	No	No	No	Yes	No	Biological Resources	No. The affects of night helicopter flight noise on birds are unknown, and potentially adverse.

TABLE 2-12: PREFERRED MARIANAS TRAINING LAND USE ALTERNATIVE[1]

MAJOR TRAINING ACTIVITIES	TINIAN			COMNAVMAR TRAINING AREAS					AAFB			NON-DOD LAND		FDM
	EMUA	MLA	Non-DOD Land	Apra Inner Harbor	Apra Outer Harbor	Waterfront Annex	Ordnance Annex	NCTAMS Finegayan/ Barrigada	Andersen Main	Andersen NW Field	Andersen South	Guam	Rota	
1. Field Maneuvers and Logistics Support			Harbor	Note 5	Note 5						Note 4		Songsong	
2. Aviation Training Helicopter			West Tinian Airport									Dandan		
Fixed-wing	North Field		West Tinian Airport											
Paradrops												Dandan		
3. Amphibious Landings Using: Assault Amphibian Vehicles (AAV)			Harbor	Toy land	Note 2	Apaka								
Inflatable Assault Craft (CRRC/RHIB)								Finegayan	Dar Rue				Songsong	
Air Cushion Landing Craft (LCAC)	Chulu Dankulo			Toy land	Note 2	Apaka								
Displacement Hull Landing Craft (LCU)			Harbor	Toy land	Note 2									
4. Live-fire Ranges Pistol and Submachine Gun (9 mm)							Jungle trail	Finegayan						
Rifle and SAW (5.56 mm)							Jungle trail	Finegayan						
M60 Light Machine Gun (7.62 mm)								Finegayan						
Sniper Rifle														Note 3
.50 cal Heavy Machine Gun														Note 3
40mm rifle grenade (live rounds														Note 3
40mm rifle grenade (inert training round														

TABLE 2-12: PREFERRED ALTERNATIVE TRAINING LAND USE[1] *(continued):*

MAJOR TRAINING ACTIVITIES	TINIAN			COMNAVMAR TRAINING AREAS					AAFB			NON-DOD LAND		FDM
	EMUA	MLA	Non-DOD Land	Apra Inner Harbor	Apra Outer Harbor	Orote Peninsula /Camp Covington	Ordnance Annex	Comm. Annex Finegayan/ Barrigada	Andersen Main	Andersen NW Field	Andersen South	Guam	Rota	
TRUE (Urban Warfare)	WW II Structures					Shooting House	Breaching House							
60mm Mortar (M766 training projectile only)														
Shoulder Launched Anti-tank Missile Fire														Note 3
5. Underwater Demolitions Deepwater MCM (EODMU-5)														
Shallow Water MCM (SEALs)					Glass Breakwater	Haputo								
Floating Mine Neutralization						Open Ocean Note 6								
6. Naval Gun Fire														
7. Aerial Bombardment Bombing Close Air Support														

Notes
1. See Figures 2-1 through 2-6 for Site Locations and 2-7a through 2-11 for site constraints
2. Outer Harbor Landings include AAV at Dry Dock Island, Polaris Point Sumay Cove Marina; LCAC at Dry Dock Island, Polaris Point; LCU at Dry Dock Island, Polaris Point, and the World War II refueling pier.
3. SEALs embarked in RHIBs may fire at the areas designated as naval gunfire targets with shoulder-fired AT missiles, 40mm rifle grenade launchers and .50cal machine guns.
4. Land and facilities at Andersen South have been identified as excess and will transition from federal to territorial land. Training may continue on a not-to-interfere basis with GovGuam plans for development.
5. COMNAVMARIANAS provides logistic support to all in-port ships.
6. EOD MU-5 conducts floating mine neutralization training outside and north of the Apra Harbor entrance and at the Agat Water DZ.

TABLE 2-13: PREFERRED ALTERNATIVE—POTENTIAL IMPACTS AND PROTECTIVE MEASURES

RESOURCE	POTENTIAL IMPACTS	ENVIRONMENTAL PROTECTIVE MEASURES Mitigation and Training Management	WILL IMPACTS BE REDUCED TO NONSIGNIFICANT LEVELS?	IF IMPACT REMAINS SIGNIFICANT, WHAT MIGATIVE MEASURE IS NECESSARY?
NATURAL RESOURCES				
Vegetation	Field fire caused by training activities destroys habitat for endangered species.	Restrict use of open fires and aerial pyrotechnics to paved or low-fire hazard areas only. Curtail use of fire-causing objects during periods when fire hazard is high. Brief troops on potential for fire and contingency reactions. Have appropriate firefighting equipment readily available for response at tent camps, firing ranges, landing zones, airfields, and vehicle maintenance and refueling areas. Plan camp layouts with fire lanes; provide fire extinguishers in accordance with regulations. Incorporate firefighting response drills into area security plan. Prohibit use of tracer rounds at proposed Tinian and Ordnance Annex ranges. Maintain crash-fire-rescue equipment near flight lines for large exercises. Avoid incendiary munitions on FDM. Restrict types of ordnance used on FDM to those identified in the biological opinion.	Yes	—
	Deplete vegetation (endangered species) habitat by land clearing for tactical positions and bivouac sites.	Restrict seasons of major clearing events in designated areas, to avoid physical disturbance of nests. Select already cleared areas for administrative campsites. Use and maintain established, surveyed DZs and LZs only. Minimize degree of vegetation clearing when preparing fighting positions and firing lanes. Use deadfall or cut vegetation that is less than wrist size in diameter. Avoid low hanging tangantangan (Tinian monarch nesting areas).	Yes	—
	Tinian: Deplete Tinian monarch habitat vegetation by clearing for new small arms and mortar ranges.	Replant native species elsewhere to replace the cleared tangantangan in the MLA as mitigation if the Tinian monarch remains a listed endangered species (52 ac [21 ha] was estimated if a small arms range was to be developed).	Yes	Tinian Range construction no longer preferred. See Section 2.9.1.
	Tinian: Deplete vegetation by clearing to develop a logistic support camp.	Select a grassland site requiring no tree (habitat) clearing	Yes	—
	Introduce alien weedy plant species from one island to another.	Check clothing and boots for seeds, clean equipment before loading up for exercises, and inspect impacted construction materials for the presence of noxious weeds.	Yes	—
	Amphibious vehicles or vehicles off-loaded from landing craft may disturb strand vegetation.	Select beach ingress and egress routes that minimize vegetation impacts.	Yes	—

Table 2-13: Preferred Alternative— Potential Impacts and Protective Measures (continued)

RESOURCE	POTENTIAL IMPACTS	ENVIRONMENTAL PROTECTIVE MEASURES Mitigation and Training Management	WILL IMPACTS BE REDUCED TO NONSIGNIFICANT LEVELS?	IF IMPACT REMAINS SIGNIFICANT, WHAT MIGATIVE MEASURE IS NECESSARY?
NATURAL RESOURCES (continued)				
Vegetation (continued)	Salt spray from LCAC propellers may harm terrestrial species.	Impact is less common and of shorter duration than salt spray generated by typhoons, to which ecosystems are adapted.	Yes	—
Protected Birds, Bats, and Terrestrial Species	Introduce brown tree snake (BTS) or other invasive animal species to Tinian, Rota, FDM, Hawaii, or continental U.S. from Guam.	COMNAVMARIANAS, AAFB, USDA WS, and training units adhere to BTS Interdiction and Control Plan (see Appendix E and Section 4.1). Inspect all shipments of equipment and cargo departing Guam at beginning and end of exercises. Inspect FDM target materials prior to shipment to FDM. Update Navy and AAFB BTS control protocols as new control measures are adopted.	Yes	—
	Disturb protected bird and bat species by noise or physical interference from aircraft, off-road vehicles, and vegetation habitat clearing.	Designate primary habitat and nesting sites NT or NWD as necessary. Restrict training seasons and times of day in designated areas to avoid loud noises or physical disturbance of nests by vehicles, aircraft, or personnel during breeding seasons. **Guam:** Observe aircraft altitude restrictions at AAFB and Ordnance Annex. **Tinian:** Observe maneuver date restriction in Tinian monarch habitat areas. Direct personnel to avoid collecting or disturbing wildlife for any reason.	Yes	—
	Guam: Disturb endangered Mariana moorhens with blank firing in Atantano marshlands.	Avoid disturbing any birds or nests observed. (Moorhens are not expected to be in area used for training.)	Yes	—
	Guam: Disturb tree snails at Haputo adjacent to cliff trail.	Personnel will remain on established trail that connects the beach to the upper plateau.	Yes	—
	FDM: Harm or kill migratory seabirds or endangered Micronesian megapodes with naval gunfire or aerial bombardment.	Limit naval gunfire to western cliffs target areas to minimize impacts to eastern cliff. Limit aerial bombardment target areas to center portions of island, avoiding eastern cliffs and the narrow central isthmus.	No	Enhance megapode habitat on Sarigan Island as compensatory mitigation (see Sect. 2.9.5).
	Guam: Injury to moorhens at Fena Reservoir caused by sniper rifle fire.	Moorhens are protected from bullets by intervening terrain that acts as a bullet backstop.	Yes	—
	Guam: Injury to carabao in Ordnance Annex from sniper rifle fire.	Snipers are trained to notice movement and will be directed to avoid shooting carabao.	Yes	—
	Mortality of sea turtles from landing vehicles crushing nests or hatchlings on beaches, or inability of hatchlings to scale tire or track ruts in beach sand.	Survey landing beaches $\leq$ 6 hrs before landings, and flag areas free of nests. Landing vehicles and offloaded vehicles will remain in flagged nest-free areas. Biologist will be present during night landings to watch for turtles. Restore the beach topography disturbed by landing craft, AAVs, and wheeled vehicles.	Yes	—

Table 2-13: Preferred Alternative—Potential Impacts and Protective Measures (continued)

RESOURCE	POTENTIAL IMPACTS	ENVIRONMENTAL PROTECTIVE MEASURES Mitigation and Training Management	WILL IMPACTS BE REDUCED TO NONSIGNIFICANT LEVELS?	IF IMPACT REMAINS SIGNIFICANT, WHAT MIGATIVE MEASURE IS NECESSARY?
NATURAL RESOURCES (continued)				
Protected Birds, Bats, and Terrestrial Species (continued)	**Guam:** Harm or kill sea turtles, marine mammals, or fish due to shock wave from deepwater MCM.	Survey blast area to 0.6-mile (1,000-m) radius prior to exercise to identify marine animals. If protected species are encountered, halt training until the animals depart area. Use Dadi Beach site instead of Apra Harbor site, whenever weather and sea conditions may permit. Use only 10-lb (4.5-kg) charges or less at both the Apra Harbor and Dadi Beach sites. Conduct post-blast surveys to identify number of fish kills and any sea turtles killed or injured. Reevaluate protocols after two years.	Yes Yes	— —
	FDM: Harm or kill sea turtles or whales in nearshore waters during naval gunfire or aerial bombardment.	Sea turtles have not commonly been observed near FDM and beaches are unsuitable nesting areas. Establish impact areas away from waterline. Areas will be surveyed for sea turtles and whales prior to exercises; if animals are observed, the exercise will be postponed until such have left the impact area.	Yes	—
	Guam: Harm or kill sea turtles or whales in nearshore waters during floating mine neutralization.	Survey area for protected marine animals prior to exercise.	Yes	—
	Rota: Disturbed endangered Mariana crows with noise from NVG helicopter flight crew training	Insufficient information regarding potential impacts at specific sites.	Not Determined	NVG flights at Rota are no longer in the preferred alternative. See Section 2.9.6.
Coral Reef and Sand Beaches	AAVs crush coral in water less than 6 ft (1.8 m) deep.	**Tinian:** Restrict AAV landings to San Jose Harbor.	The degree of coral damage has not been measured. However, an operationally acceptable landing site in the MLA has not been identified.	Potential damage to coral is one factor considered when eliminating AAV landings at Unai Babui from the preferred alternative.
		Guam: Restrict AAV landings to areas with no live coral reefs. (Do not land AAVs at Dadi Beach.)	Yes	—
	Guam: Damage to coral structure from shock waves generated by deepwater MCM.	Avoid underwater demolition within 328 ft (100 m) of reef.	Yes	—
	Guam: Damage to reef flats from shallow water MCM	Restrict use of live charges to offshore areas at the west end of Glass Breakwater, and offshore of Tipalao Beach were these is no live coral in waters 10 to 25 ft (3 to 8 m) deep.	Yes	—

Table 2-13: Preferred Alternative— Potential Impacts and Protective Measures (continued)

RESOURCE	POTENTIAL IMPACTS	ENVIRONMENTAL PROTECTIVE MEASURES Mitigation and Training Management	WILL IMPACTS BE REDUCED TO NONSIGNIFICANT LEVELS?	IF IMPACT REMAINS SIGNIFICANT, WHAT MIGATIVE MEASURE IS NECESSARY?
NATURAL RESOURCES (continued)				
Coral Reef and Sand Beaches (continued)	Landing vehicles and off-loaded wheeled and tracked vehicles disturb beach vegetation and sand.	Select beach ingress and egress to minimize vegetation impacts. Use beach matting if necessary to reduce erosion and rutting caused by disembarking and driving vehicles through soft sand. Restore the beach topography after exercises, and avoid other engineered modifications to beach topography and drainage patterns.	Yes	
	The LCAC's inflatable skirt or bow wave at low speeds may break off exposed coral contacted on reefs or shallow reef flats.	**Tinian:** Use Unai Chulu and Unai Dankulo, scheduling landings to take advantage of high tide. Avoid turning LCAC in shallow waters over reef flats by conducting turns while on the beach. Survey Unai Chulu and Unai Dankulo within onel week of exercise. Evaluate slope of beach to ensure the grade will not cause the LCAC to slide back into shallow water when coming off cushion. Monitor effects by surveying the nearshore areas before and after LCAC landings for percent of coral cover, topography, turbidity, sedimentation rates, and fish assemblage.	Yes	LCAC landings once proposed for Kammer and Tachogna Beaches are not in the preferred alternative.
Insects and Diseases	Introduction of invasive species	Transport all solid waste (SW) from Tinian in containers that can be sealed and upon delivery on Guam steam-sterilize according to standard procedures.	Yes	—
CULTURAL RESOURCES				
Archaeological and Historic Sites and Structures	Programmatic: Damage or data loss from ground disturbance by off-road vehicles, construction, rapid runway repair, or excavation of fighting positions or latrines.	Designate areas NT or NCRD (no cultural resources disturbance), as appropriate. Monitor training activities for adherence to the constraints. Physically mark NT boundaries so they can be identified both day and night in areas lacking naturally recognizable boundaries. Publish information and maps identifying known historic and cultural areas for exercise planning. Allow no digging within 3 ft (1 m) of historic structures with concrete walls or in any cave.	Yes	—
		If cultural resources are encountered, cease any disturbance and notify COMNAVMARIANAS environmental staff or exercise environmental monitors.	Yes	—
		Tinian: Install signs or flagging as needed to mark designated vehicle and pedestrian access lanes through NT areas.	Yes	—

Table 2-13: Preferred Alternative—Potential Impacts and Protective Measures (continued)

RESOURCE	POTENTIAL IMPACTS	ENVIRONMENTAL PROTECTIVE MEASURES Mitigation and Training Management	WILL IMPACTS BE REDUCED TO NONSIGNIFICANT LEVELS?	IF IMPACT REMAINS SIGNIFICANT, WHAT MIGATIVE MEASURE IS NECESSARY?
CULTURAL RESOURCES (continued)				
Archaeological and Historic Sites and Structures (continued)	Damage or data loss from vandalism.	Brief troops on history and significance of resources. Provide educational handouts for exercise participants to understand and protect resources prior to training.	Yes	—
	Tinian: Projectile impacts on walls of former Japanese Command Post from TRUE training.	Employ qualified historic architect to evaluate the placement of targets and bullet traps in the Command Center interior. Photo-document conditions before and after use of proposed temporary bullet traps; suspend training if damage to walls occurs.	Yes	—
	Tinian: Disturbance of prehistoric sites and complexes adjacent to MLA beaches.	Designate adjacent archaeological sites as NT or NCRD as needed. Mark the roads and paths that can be used to traverse these sites.	Yes	—
	Tinian: Damage to potential or known cultural resource sites by small arms and mortar fire	Complete archaeological surveys of proposed range locations and modify range development as necessary to protect resources.	Yes	Ranges not preferred due to risks to public safety. See Section 2.9.1.
	Guam: Defacement of *latte* village sites in Ordnance Annex by sniper rifle projectile impacts.	Protect *latte* complexes by keeping clear of lines of fire/impact area by using topographic features (hills). Do not use range and jungle trail until COMNAVMARIANAS Cultural Resources Manager has approved target locations, and range certified by NAVFACENGCOM.	Yes	—
	Guam: Damage to historic runways at Northwest Field from RRR cratering.	Select RRR construction site in coordination with the Guam HPO to avoid adverse effect to the area eligible for listing in the National Record of Historic Places to avoiding an adverse cultural impact.	Yes	—
	Guam: Damage to submerged historic resources in Apra Harbor from shock waves generated by deepwater MCM.	Retain the same radius of impact by using no more than a 10-pound (4.5-kg) charge at the approved Outer Harbor training site.	Yes	—
PHYSICAL FACTORS				
Air Quality	Increased amounts of smoke and dust generated by training.	Do not use smoke or tear gas in areas with civilians present or down wind. Use sanitary waste burn cans in locations down wind of camps and visitor locations.	Yes	—
Visual Resources	Damage to land and underwater scenic resources from demolition or weapons fire.	Avoid demolition and weapons training in proximity to scenic areas.	Yes	—
Climate	Increased potential for fire within training areas during droughts (cumulative with other sources of sparks).	Restrict training during droughts, particularly in areas with rudimentary or nonexistent firefighting capabilities. Maintain firefighting equipment on-hand/on-call as necessary.	Yes	—

Table 2-13: Preferred Alternative— Potential Impacts and Protective Measures (continued)

RESOURCE	POTENTIAL IMPACTS	ENVIRONMENTAL PROTECTIVE MEASURES Mitigation and Training Management	WILL IMPACTS BE REDUCED TO NONSIGNIFICANT LEVELS?	IF IMPACT REMAINS SIGNIFICANT, WHAT MIGATIVE MEASURE IS NECESSARY?
PHYSICAL FACTORS (continued)				
Groundwater and Soils	Contamination from improper field sanitation or improper disposal of portable toilet waste.	Comply with field sanitation SOP; remove and dispose of solid wastes, gray and black water. Ensure contractors dispose of portable toilet wastes using an authorized septic tank and field.	Yes	—
	Contamination from accidental release of fuel during vehicle/aircraft refueling, maintenance, or repair activities or at temporary hazardous materials or hazardous waste storage area(s).	Comply with existing regulations and SOPs regarding fuel and hazardous materials/hazardous waste handling, transportation, and spill control. Avoid performing scheduled maintenance during field exercises. Refuel only on paved surfaces and using standard spill containment measures. Avoid overfilling vehicle fuel tanks to allow for fuel expansion.	Yes	—
	Soil erosion and rutting from ground excavation, construction activities, gray water disposal to ground, amphibious vehicles traversing beaches, or projectile impacts at firing ranges.	Restore training areas to original grade and plant vegetation, as necessary, upon completion of training activities.	Yes	—
	Contamination from training presence at sites undergoing investigation or remediation for hazardous materials.	Do not train in any Installation Restoration Site or Solid Waste Management Unit.	Yes	—
	FDM: Increased erosion due to cliff-side bomb impacts	There is no empirical evidence that bombing has greatly increased the naturally and dramatic erosion process on FDM. Regardless, avoid targeting the eastern cliffs in the vicinity of the isthmus.	Yes	—
	ROWPU effluent disposal could affect groundwater.	Discharge ROWPU effluent (brine or filter rinse water) to an infiltration trench away from bodies of water or sanitary wastewater treatment facility.	Yes	—
Surface Water Quality (marine and freshwater)	Increased siltation and/or turbidity due to erosion from amphibious landings, beachside off-loading of vehicles and cargo, riverine training.	Avoid silty (vs. sandy) shorelines whenever possible, or use matting to minimize vehicle effects on soil.	Yes	—
	FDM: Increased erosion due to cliff side bomb impacts.	(There is no evidence that bombing has greatly augmented the naturally dramatic erosion process on FDM.) Avoid targeting eastern cliffs.	Yes	—
	Contamination from accidental release of fuel during vehicle/aircraft refueling, maintenance, or repair activities.	Avoid performing scheduled maintenance during field exercises. Refuel on paved surfaces, using spill containment measures. Avoid overfilling vehicle fuel tanks, to allow for fuel expansion.	Yes	—
	Degradation from runoff of gray water or ROWPU effluent.	Direct gray water or ROWPU effluent away from surface water bodies, in accordance with SOPs.	Yes	—
	Potential heavy metal contamination from lead bullets in water impact areas.	Construct/maintain dirt berms/bullet stops behind targets to trap rounds.	Yes	—

Table 2-13: Preferred Alternative—Potential Impacts and Protective Measures (continued)

RESOURCE	POTENTIAL IMPACTS	ENVIRONMENTAL PROTECTIVE MEASURES Mitigation and Training Management	WILL IMPACTS BE REDUCED TO NONSIGNIFICANT LEVELS?	IF IMPACT REMAINS SIGNIFICANT, WHAT MIGATIVE MEASURE IS NECESSARY?
PHYSICAL FACTORS (continued)				
Flooding	None caused by training, but some training areas are within flood zones.	None required beyond awareness that equipment and personnel could require evacuation to higher ground during severe weather.	Yes	—
MAN-MADE HAZARDS AND CONSTRAINTS				
Noise	**Rota:** Helicopter night flights disturbance to populated areas and birds in vicinity of airport and flight paths	Perform night landings in early evening ending by 10:00 PM.	Not Determined	Night flight training is no longer in the preferred alternative. See Section 2.9.6.
	Guam: Disturbances to Tipalao residents from LCAC landings at Dadi and Tipalao beaches.	Perform landings during daylight hours only.	Yes	—
Commercial Aviation Facilities and Traffic	**Tinian:** Interference with Tinian-Saipan commuter flights and international flights in/out of Saipan International Airport.	Military air-traffic controllers will coordinate with FAA during planning and have direct communication with FAA tower personnel during military flight activities, in accordance with SOPs and FAA regulations. Issue NOTAM for use of North Field.	Yes	—
	Tinian: Interference of airborne and airmobile operations with commercial and general aviation activity at West Tinian Airport.	Limit use of commercial airport. If needed, coordinate with civilian authorities at least two weeks prior to military landings. Move military aircraft of active runway as soon as possible. Maintain lateral safety clearances from active runways and landing zones; avoid conflicts between training activities and accident potential zones at ends of runways. Restrict training dates/times to avoid major holiday traffic. Publish NOTAM for parachute drops east of West Tinian Airport. Restrict flight tracks/hours as needed. Have crash, fire, and rescue equipment readily available.	Yes	—
	Tinian: Mortar round trajectory could intersect civilian flight tracks	Aerial observation during training; communications with FAA in Saipan; curtail training during times of international flights crossing over North Field.	Not assured. A risk to public safety remains.	The development of a Mortar Range is no longer preferred. See Section 2.9.1.
	FDM: Interference of bomber aircraft with civilian air traffic.	Publish NOTAMS and notify FAA, warning civilian aircraft out of 4.3-km-radius restricted airspace.	Yes	—
Civilian and Military Fuel Storage	**Tinian:** EMR hazards to fuel (HERF) and personnel (HERP).	Establish physical barriers and markers to maintain mandatory safety clearances between emitter sites and personnel, and fueling operations.	Yes	—
		Publish IBB frequencies and presence of EMR warning signs in training instructions for Tinian (COMNAVMARIANAS INSTR 5440.1C)	Yes	—

Table 2-13: Preferred Alternative— Potential Impacts and Protective Measures (continued)

RESOURCE	POTENTIAL IMPACTS	ENVIRONMENTAL PROTECTIVE MEASURES Mitigation and Training Management	WILL IMPACTS BE REDUCED TO NONSIGNIFICANT LEVELS?	IF IMPACT REMAINS SIGNIFICANT, WHAT MIGATIVE MEASURE IS NECESSARY?
MAN-MADE HAZARDS AND CONSTRAINTS (continued)				
Public Health and Safety	**Guam**: Safety hazards to civilians on historic trails adjacent to small arms ranges on Orote Point and Orote Peninsula, and flight decks in the Waterfront Annex.	Publish specific range regulations and distribute to all units planning training activities. Adhere to all safety requirements prior to and during live-fire and demolition activities, conducting the required range area sweeps and surveillance to ensure no danger to others. Curtail firing if anyone enters the range area. Close portions of historic trail to visitors during range use.	Yes	—
	Guam: Safety hazards from sniper rifles to hikers on trail passing through Ordnance Annex	The range will be designed so that SDZ does not intersect hiking trail. The Range Safety Officer will monitor the line of fire.	Yes	—
	Guam: Safety hazards to boaters and divers near deepwater MCM sites.	EOD personnel clear site and exclusion zone prior to exercise.	Yes	—
	Guam: Safety hazards to civilian divers from potential sympathetic detonation of depth charges on TOKAI MARU.	Sympathetic detonation is unlikely to result from explosion of 10- and 20-lb [4.5- and 9.0-kg] charges over 0.6 mile (1 km) from TOKAI MARU. However, the size of the deepwater charge will not exceed 10 lbs. (4.5 kg).	Yes	—
	Guam: Safety hazards to boaters and divers in small arms range over-water SDZs adjacent to Orote Peninsula and NCTAMS Finegayan.	Publish NOTAMs and NOTMARs. Maintain observation of water SDZ during range use. Install/maintain warning signs, flags, or strobe lights on shore during range use. Mark SDZs on local navigation charts. Cease firing if boat enters SDZ.	Yes	—
	Tinian: Electromagnetic radiation (EMR) hazards to personnel (HERP) from communications equipment used in training.	Establish physical barriers and markers to maintain mandatory safety clearances between emitter sites and personnel, fueling, and ordnance operations. Provide EMR hazard overlays to training units as necessary.	Yes	—
Airports	**Tinian**: Military aircraft may interfere with civilian air traffic at West Tinian Airport.	Communicate/coordinate with FAA and civil authorities 30 days in advance of any exercise. Issue NOTAMs and NOTMARs 72 hours prior to any exercise. Plan military helicopter activity avoid commercial flight tracks and Saipan approach and departure altitudes, whenever possible. Avoid parking ramp tie-ups by military aircraft.	Yes	—
	Increased demands on local customs and immigration services.	Notify local authorities 30 days before large exercises. Identify time frames and locations for customs and immigration support in advance of the exercise.	Yes	—

Table 2-13: Preferred Alternative—Potential Impacts and Protective Measures (continued)

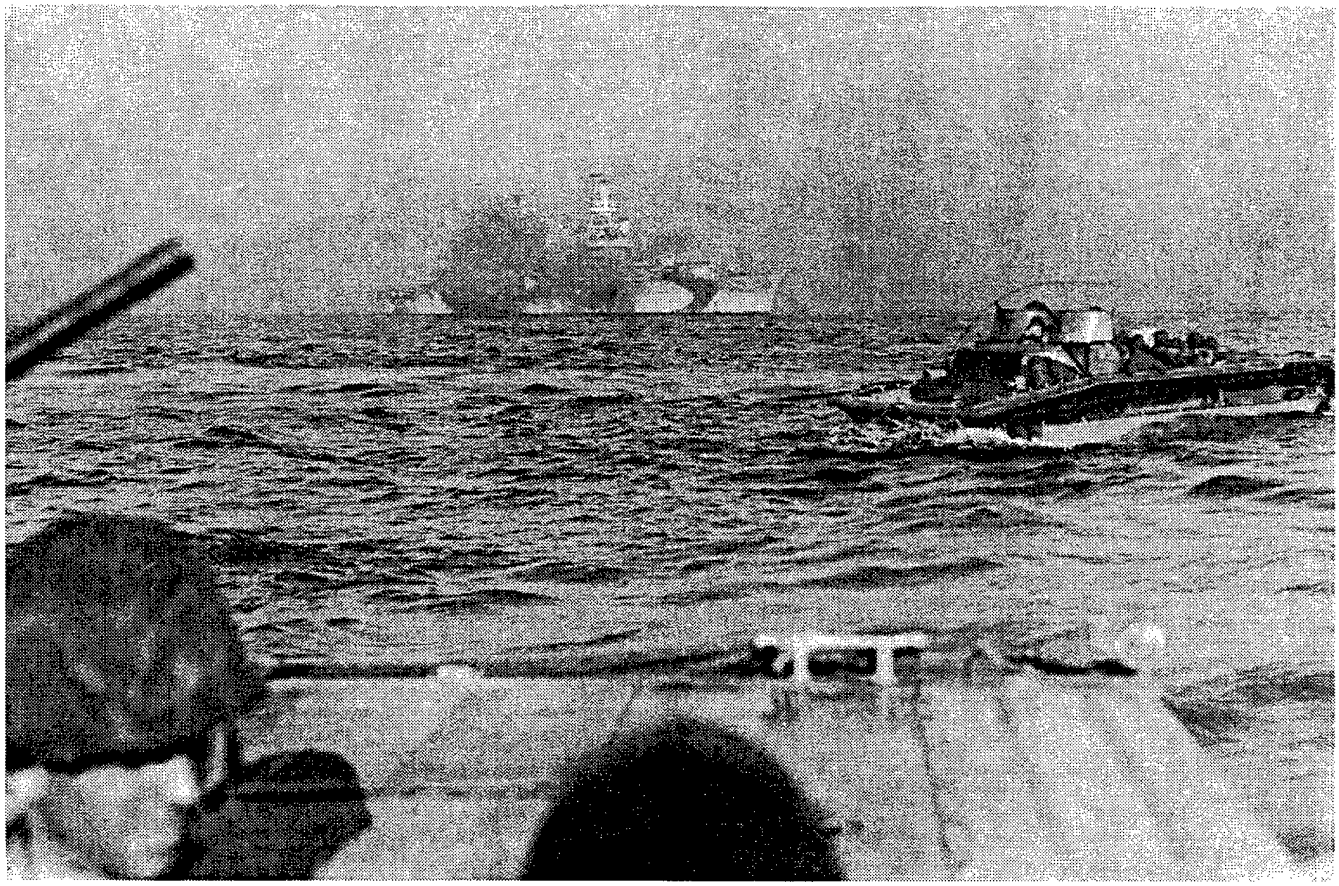
RESOURCE	POTENTIAL IMPACTS	ENVIRONMENTAL PROTECTIVE MEASURES Mitigation and Training Management	WILL IMPACTS BE REDUCED TO NONSIGNIFICANT LEVELS?	IF IMPACT REMAINS SIGNIFICANT, WHAT MIGATIVE MEASURE IS NECESSARY?
MAN-MADE HAZARDS AND CONSTRAINTS (continued)				
Harbors	**Tinian and Rota**: Interference with civilian ports of entry.	Coordinate with civilian authorities and obtain approvals 30 days in advance of any exercise.	Yes	—
	Increased demands on customs and immigration services.	Notify local authorities 30 days before large exercises.	Yes	—
Roadways and Traffic	Road damage by tracked vehicles.	Inspect tracked vehicles for serviceable track pads. Allow only rubber-padded track-laying vehicles on paved roads (no bulldozers). Use equipment haulers to move tracked vehicles with all-steel tracks (e.g., bulldozers). Avoid neutral steer/pivot turns on black top and coral roads and excessive movement on and off shoulders.	Yes	—
	Interference with civilian traffic.	Establish military traffic control and security within training areas accessible to others. Notify local authorities 7 days in advance of troop transport movement of public roads.	Yes	—
Public Services	**Tinian:** Increased demands on public safety authorities.	Coordinate with the local fire and police departments; augment civilian forces as appropriate.	Yes	—
INFRASTRUCTURE				
Potable Water Supply	**Tinian:** Depletion of local water supply during large exercises.	Conduct advance planning with municipality to identify requirement, times, and places for issue.	Yes	—
Wastewater Disposal Systems	Chronically overload Tinian's municipal septic system capacity.	Tinian: Use Navy septic field as primary dumpsite to avoid overloading municipal septic fields.	Yes	—
Solid and Hazardous Waste Collection and Disposal Facilities	**Tinian:** Absence of RCRA-approved SW disposal facility for exercise-generated waste.	Back haul SW to DoD facility on Guam for proper disposal.	Yes	—
	Guam: Depletion of GovGuam or private landfill capacity.	Do not use GovGuam or private landfills. Dispose SW in DOD-managed landfills at Apra Harbor or AAFB.	Yes	—
	Interference with needed civilian shipping capacity due to transport of SW from Tinian to Guam.	Coordinate with local shipping companies and ensure adequate shipping capacity prior to large exercises. Delay shipping SW, if necessary, until adequate ships are available.	Yes	—
	Disposal of ships' waste near shore.	Comply with COMNAVMARIANAS/C7F directives and federal regulations not to dispose of SW within 25 nautical miles of shore.	Yes	—

Table 2-13: Preferred Alternative— Potential Impacts and Protective Measures (continued)

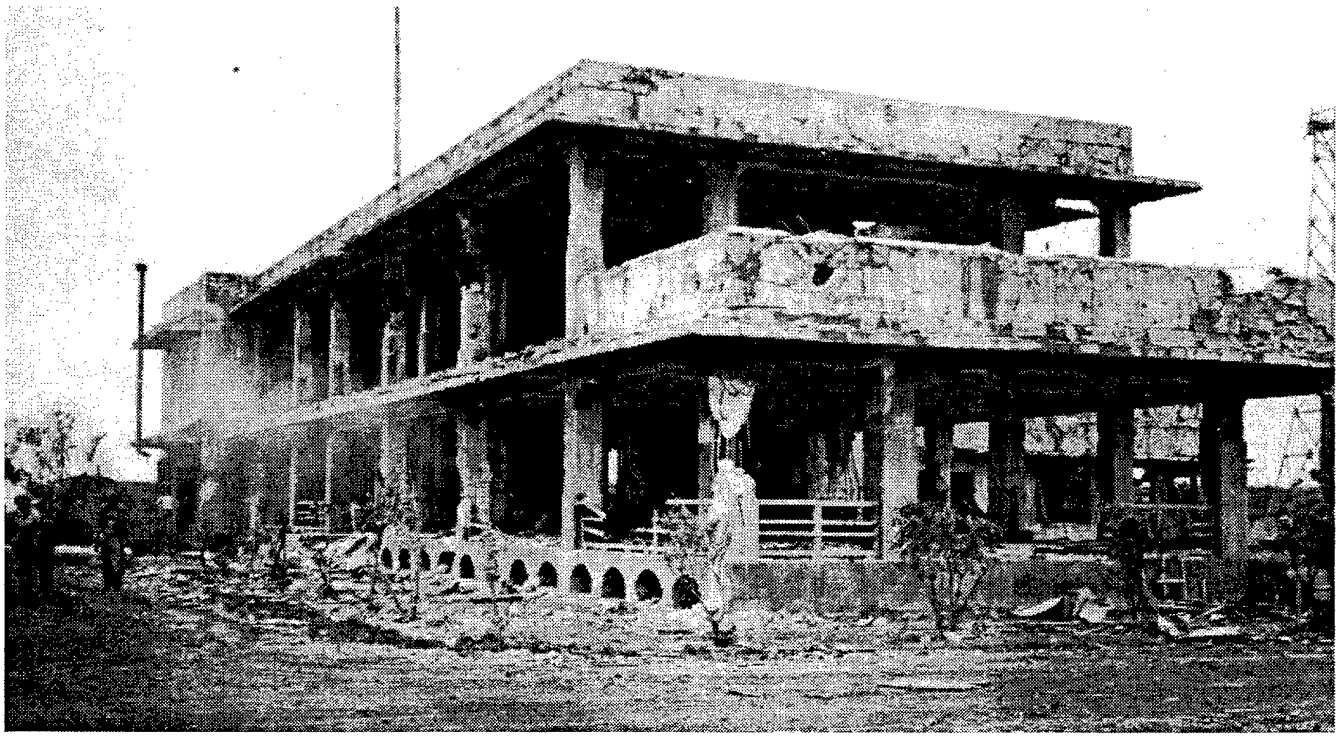
RESOURCE	POTENTIAL IMPACTS	ENVIRONMENTAL PROTECTIVE MEASURES Mitigation and Training Management	WILL IMPACTS BE REDUCED TO NONSIGNIFICANT LEVELS?	IF IMPACT REMAINS SIGNIFICANT, WHAT MIGATIVE MEASURE IS NECESSARY?
INFRASTRUCTURE (Continued)				
	Tinian: Absence of RCRA-approved hazardous waste (HW) disposal facility in CNMI or Guam.	Ship HW to DoD facility or continental U.S. for proper disposal.	Yes	—
Electricity and Communication	**Tinian:** Temporary increased demand for electricity.	Communicate and coordinate with appropriate local agencies prior to exercise. Supplement commercial power with field generators.	Yes	—
SOCIAL ENVIRONMENT				
Land Use	Interference with/encroachment on neighboring land use/property.	Monitor activity within training area to identify and avoid potential encroachments.	Yes	—
	Safety risks to neighboring areas and inhabitants from use of firing ranges and established EOD sites.	Establish buffer zones, traffic control, and area monitors/umpires, as necessary, to eliminate civilian encroachment into range areas.	Yes	—
	Conflicts with civilian activities.	Schedule/coordinate potentially conflicting activities with appropriate local agencies 30 days prior to exercise. Publish NOTAMs and NOTMARs.	Yes	—
	Noise disturbance by aircraft near residential areas.	Schedule/coordinate potentially conflicting activities with appropriate local agencies. Publish NOTAMs and NOTMARs.	Yes	—
	Danger to civilians from parachute drops on non-DOD lands.	Obtain permission from property owner prior to exercise. Clear the DZ of all personnel less those assigned communications, safety, and medical responsibilities.	Yes	—
	Disfigure publicly accessible land areas by littering or effects of bivouacs and logistics support activities.	Clean and inspect all training areas. Do not bury paper trash or other training residue. ("Pack It In; Pack It Out.")	Yes	—
	Tinian: Long-term UXO contamination at new mortar range impact area.	EOD must sweep and clear the impact area after each training event since the area is accessible to the public.	Probably not. Few units have EOD personnel, EOD MU-5 may not be available and range sweeps would be delayed.	The Mortar Range is not a preferred alternative. See Section 2.9.1
Commercial Enterprises	Increased demand on various commodities.	Give notice to local officials and merchants so they can prepare for increase in demand and avoid shortages.	Yes	—
	Increased demand for required services.	Contract locally for required services.	Yes	—
	Tinian: Closure of EMUA to subsistence fishers due to training activities.	Establish an access corridor to accommodate shoreline fishing, when not interfering with training.	Yes	—
	Tinian: Closure of EMUA to tour companies and tourists due to training activities.	Give 30 days advance notice before curtailing access to tourist sites within EMUA, and minimize times of closures.	Yes	—

Table 2-13: Preferred Alternative—Potential Impacts and Protective Measures (continued)

RESOURCE	POTENTIAL IMPACTS	ENVIRONMENTAL PROTECTIVE MEASURES Mitigation and Training Management	WILL IMPACTS BE REDUCED TO NONSIGNIFICANT LEVELS?	IF IMPACT REMAINS SIGNIFICANT, WHAT MIGATIVE MEASURE IS NECESSARY?
SOCIAL ENVIRONMENT (Continued)				
	Guam: Closure of portions of Apra Harbor to commercial boat and diving operations for 4 hours once per month.	Reduce use of this site by using Dadi Beach site, weather permitting.	Yes	—
Tinian Government and Agencies	Inconveniences through joint use of civilian facilities such as the West Tinian Airport or the field house.	Notify the Mayor of Tinian's office at least 30 days prior to exercises and obtain necessary permissions, and negotiate for use of municipal facilities as needed.	Yes	—
Environmental Justice	Disproportionate hardship on local minority or economically disadvantaged population.	Design training activities to eliminate conflict, promote mutual understanding, and enhance local economy.	Yes	—
Invasive Species	Introduction of BTS from Guam	BTS Control and Interdiction Plan	Yes	—



Naval gunfire support to amphibious forces, Tinian, 1944 (National Archives at College Park)



Japanese Command Post, Tinian, after U.S. landing, 1944 (National Archives at College Park)

CHAPTER THREE

ENVIRONMENTAL SETTING

FEIS: Military Training in the Marianas
Belt Collins Hawaii, 1999

CHAPTER THREE: ENVIRONMENTAL SETTING

The purpose of this chapter is to provide adequate background for the reader to understand the potentially significant impacts of alternatives compared in Chapter Two. Chapter Four provides a more detailed discussion of conditions relevant to the significant issues identified.

3.1 REGIONS OF INFLUENCE

The Mariana Islands are a chain of 15 volcanic islands situated in the western Pacific Ocean approximately 3,598 miles (5,790 kilometers [km]) west of Hawaii and 1,398 miles (2,250 km) south of Japan. The island chain extends approximately 497 miles (800 km) from Guam in the south to the uninhabited active volcano of Farallon de Pajeros in the north and also includes the islands of Tinian and Rota. Tinian is about 12.4 miles (20 km) long and has a total land area of 40.5 square miles (105 square kilometers [km^2]). Guam is approximately 32 miles (52 km) long with a land area of 209 square miles (542 km^2). Farallon de Medinilla (FDM) is approximately 1 mile (1.6 km) long and has a land area of 0.3 square miles (0.9 km^2). Rota is 11.8 miles (19 km) long and has a land area of about 32 square miles (83 km^2).

The primary regions of influence are the military lands on each of these islands or areas that will be directly affected by military training activities (see Figures 1-1, and 2-1 through 2-6). Secondary regions of influence include community or habitat areas surrounding the primary regions.

3.2 PHYSICAL ENVIRONMENT OF THE MARIANAS

This section presents a general overview of the physical environment of the Mariana Islands, including climate, geology, hydrology, water quality, air quality, noise, visual setting/aesthetics, and natural hazards and constraints. Some details specific to each island of concern are also presented when appropriate.

3.2.1 Climate

The climate in the Marianas is generally warm and humid throughout the year, although rainfall and wind conditions vary with the seasons. Average temperatures range from 84° to 90° F (29° to 32° C) during the day and 70° to 75° F (21° to 24° C) in the evenings. Relative humidity is about 65 to 75 percent in the afternoons and 85 to 100 percent at night. Two primary seasons, the dry and wet seasons, are separated by periods of transitional weather. The dry season (mid-January through July) is characterized by very little rainfall and consistent trade winds blowing from the east to northeast at 15 to 25 miles per hour (mph) (24 to 40 km per hour [kph]). May, June, and July are the driest months of the year. The rainy season (August through mid-January) features heavy winds and rains with occasional typhoons and tropical storms.[1]

[1] Personal communication with Gil Borja, CNMI Department of Public Safety, May 21, 1996.

3.2.2 Geology and Hydrology

The Marianas are volcanic islands developed west of the Mariana Trench, an active subduction zone where one section of the ocean crust is pushed beneath another. Coralline limestone covers much of each island, in some cases in a layer several hundred meters thick. Soils developed on volcanic rock tend to be poorly drained clays, while soils developed on limestone are usually shallow and highly porous. Surface water bodies and streams can only exist in regions with enough clay to prevent water from draining through to the porous rock below.

Tinian. Almost no volcanic rock is exposed on Tinian; its topography consists of a series of limestone plateaus and rocky shoreline cliffs. The highest point on the island is 584 feet (178 meters [m]) above mean sea level (MSL). There are no streams and only a few small surface water bodies on Tinian. Tinian has an aquifer of fresh water in the older limestone unit in the south-central portion of the island and may have a smaller aquifer in the north.[2]

Guam. A limestone plateau covers the northern half of Guam. The plateau elevation ranges from 295 to 590 feet (90 to 180 meters [m]) above MSL and drops to the shoreline in steep cliffs. Rainwater easily percolates through the limestone; recharging Guam's only drinking water aquifer, the Northern Lens Aquifer. In the southern portion of Guam, bedrock is mostly volcanic rock with clay soils on top. Streams have carved this half of the island into a rugged mountainous region; its highest peak is Mount Lamlam (1,335 feet [407 m] above MSL) near the southwest coast. No significant groundwater aquifer has been identified here. The two halves of the island are joined by a transition region of hilly terrain and mixed limestone and volcanic rock.

FDM. Although there is no published information on the island's geology or hydrology, the island is expected to be similar to Guam, Tinian, and Rota. Because FDM has no surface water bodies, it is suspected to be completely covered by limestone and related porous soils. The existence or extent of any freshwater aquifer is unknown.

Rota. Rota is best depicted as a series of limestone terraces surrounding a volcanic core that protrudes slightly above the top terrace as Mount Manira (1,627 feet [496 m] above MSL). Volcanic rock is also exposed along the south and southeast slopes of the island in an area known as the Talakhaya, where all the surface drainageways are located. A perched aquifer under the Talakhaya gives rise to Rota's two main water sources, the Matanhanom and As Onaan springs.[3] A basal lens of fresh to brackish water is also known to exist on the central north coast.[4]

3.2.3 Water Quality

Marine waters. Marine water quality around the Mariana Islands is good. Various locations in Tinian Harbor are tested monthly for fecal coliform. There were three incidents of coliform violations due to fishing boat discharges into the harbor in 1995, but none since. Guam's ocean

[2] David B. Doan, Harold W. Burke, Harold G. May, and Carl H. Stensland (1960) *Military Geology of Tinian Mariana Islands.* Prepared under direction of the Chief of Engineers, U.S. Army.

[3] Juan C. Tenorio & Associates, Inc. (December 1995) *Physical and Economic Master Plan for Rota.* Prepared for The First Senatorial District of Rota and the Department of Public Works.

[4] Tom Nance Water Resource Engineering and Belt Collins Hawaii (June 1994) *Groundwater Monitoring Plan SNM Rota Island Resort.* Prepared for SNM Corporation.

water quality is relatively good, with the exception of locations close to river mouths or sewage treatment outfalls. Guam beaches are tested weekly using biological parameters.[5] Several beach and harbor areas on Rota are tested quarterly for fecal coliform. No testing is done on FDM, which is uninhabited.[6]

Groundwater and Surface Waters. Groundwater and surface water quality in the Marianas, in general, is good. Groundwater aquifers on Tinian and Rota are vulnerable to contamination by substances introduced onto the soil surface because the porous soil and underlying limestone do not significantly impede the passage of contaminants to the shallow aquifers. Guam's groundwater is relatively free from point source pollutant discharges that are usually associated with larger landmasses. This results in water quality remaining at a consistently high level island wide. Groundwater in the northern aquifer is protected from surface contamination by natural filtration through hundreds of feet of coralline limestone.

Guam's surface waters are vulnerable to contamination from sewage disposal overflows, animal wastes, and sediment erosion carried into streams during periods of heavy rainfall. Inland surface water bodies are of highest quality, whereas coastal regions contain surface water bodies of medium to low quality.[7] Surface water bodies on Tinian and Rota are similarly vulnerable to contamination.

3.2.4 Air Quality

Favorable meteorological conditions, i.e., the nearly constant trade winds, maintain generally good air quality on all islands. Guam is generally free from serious air pollution; trade winds prevent accumulation of a significant amount of pollutants in Agana-Tamuning metropolitan area and the airport. However, there are nonattainment areas associated with power plant operation at Piti, Cabras, and Tanguisson.[8] Tinian and Rota have no significant sources of atmospheric emissions at this time.

3.2.5 Noise

The primary sources of noise in the Marianas are aircraft and vehicular traffic and industry. The sources of noise on Tinian are aircraft and vehicular traffic. The north end of the island, including the EMUA, is in the landing approach for Saipan International Airport and is subject to periodic elevated noise levels from low-altitude jet aircraft throughout the day. Aircraft and generic traffic and industrial noise sources in the Agana-Tamuning metropolitan area generate noise on Guam. Noise from power plants, aircraft, and vehicular traffic on Rota is limited. The only source of noise on the uninhabited FDM is periodic military bombardment and aircraft overflights.

[5] Personal communication with H. Victor Wuerch, GEPA, March 4, 1996.

[6] Personal communication with Edna Buchan, CNMI DEQ, March 5, 1996.

[7] GEPA (January 1992) Revised Guam Water Quality Standards.

[8] The U.S. EPA has designated the areas within a two-mile radius of the Piti, Cabras, and Tanguisson power plants as a nonattainment area for SO_2, and therefore, is subject to more stringent emission control requirements. The Orote Power Plant is not located in a nonattainment.

3.2.6 Visual Setting/Aesthetics

The ocean and local topographic features define the islands' visual settings. Various hills and cliffs provide scenic vantage points with expansive views of the ocean and coastline areas. Tinian's built environment is sparse and is concentrated in the southwestern portion of the island. In most areas, the visual setting consists of fields and wooded areas covering the relatively gentle topography. Small beaches occur intermittently around the island and several ridges provide a backdrop to many views. Tinian's most notable physical attraction is a blowhole on the northeast coast.

On Guam, large expanses of undeveloped land exist in the northern and southern regions, while the built environment tends to dominate the visual setting in urban and suburban areas in the central part of the island. Steep cliffs edge the northern half of the island, while mountains and hills serve as backdrop to the central and southern areas.

FDM has few beach areas and is completely undeveloped. Steep cliffs that drop off into the ocean define the outline of the island. The base areas of these cliffs have eroded in several places leaving behind large caverns. The northern half of the island is relatively flat and covered with vegetation. The southern portion is rocky with some vegetation.

On Rota, beaches line the northern coast of the island and coral reefs can be found just off shore on the southwestern coast. Steep cliffs define the southern coast while gentle hills connect the southern plateau, known as the Sabana, to the northern plateau. Much of Rota is covered with vegetation and rural/agricultural land. Except for a few towns, the airport, and the increasing resort development in the northern region, very little urbanization has occurred. Most of Rota's built environment is concentrated in Songsong Village on the narrow isthmus that connects Mount Taipingot to the rest of the island.

3.2.7 Natural Hazards and Constraints

The primary natural hazards are typhoons and earthquakes. The Mariana Islands are in a typhoon belt and are frequently subjected to the powerful winds and heavy rains that characterize these storms. Typhoons are most common during the rainy season, with high winds extending out more than 100 miles (160 km) from the center of a storm.

The Marianas are also in a seismically active area. The nearby Mariana Trench is a low point in the ocean floor where two sections of the ocean floor collide and one slides beneath the other, causing periodic earthquakes. Earthquakes of low magnitude occur throughout the year.

3.3 BIOLOGICAL ENVIRONMENT OF THE MARIANA ISLANDS

Several endangered species and their primary habitats occur in the Mariana Islands at or near the proposed training sites. Native species of concern on the islands of Tinian, Guam, FDM, and Rota

include endangered birds, an endangered bat, threatened and endangered sea turtles, and endangered plants. There are no designated critical habitat areas in the Mariana Islands. Primary habitats for these endangered species include wetlands, native limestone forests, coral reefs, and beaches. In some cases, primary habitat for an endangered species may occur on more than one island, since some species occasionally migrate or recruit between islands.

The major terrestrial habitat types common to the Mariana Islands include limestone and ravine forests, secondary growth forests, savannas, tangantangan *(Leucaena leucocephala)* stands, open weedy areas, wetlands, and strand vegetation. The major marine habitat types include shoreline and strand vegetation, beaches, coral reef, and benthic communities.

Native species are those which occur naturally in a defined area. They are either endemic, meaning they are found only in one locale (such as on one island), or indigenous, meaning they are found in more than one geographic location (such as throughout the Pacific). Populations of various native species have declined or become extinct on these islands for many reasons, including historical poaching pressure, the loss and modification of habitat, noise disturbance, and predation—all of which have resulted in mortality, decreased nesting success, and reduced reproductive success. The greatest threat to terrestrial endangered species on the Mariana Islands is the brown tree snake (BTS) (*Boiga irregularis*). The BTS has reached very high densities on Guam and caused the population decline and, in some cases, extinction of many of Guam's birds, lizards, and bats. The potential for this snake to be introduced to other islands, including Tinian, FDM, Rota, and Hawaii, is high and would have catastrophic results. The BTS is discussed in more detail in Section 3.3.2.4.

An overview of biological resources of the islands of Guam, Tinian, Rota, and FDM is given below. A list of rare and protected native species in the Marianas is provided in Table 3-1: Species of Interest in the Mariana Islands.

TABLE 3-1: SPECIES OF INTEREST IN THE MARIANA ISLANDS

LATIN NAME	COMMON NAME	STATUS	ENDEMIC	LOCATION			
				GUAM	TINIAN	ROTA	FDM
BIRDS							
Acrocephalus luscinia	nightingale reed-warbler	E	√	*			
Actitis hypoleucos	common sandpiper	M,R(G)		X			
Aerodramus vanikorensis bartschi	island swiftlet	E		X	*	*	
Anas acuta	northern pintail	M,R(G)		X	X		
Anas crecca	green-winged teal	M,R(G,T)		X	X		
Anas oustaleti	Mariana mallard	E	√	*	*		
Anas penelope	Eurasian widgeon	M,R(G,T)		X	X		
Anas querquedula	garganey	M,R(G,T)		X	X		
Anas strepera	gadwall	M,R(G,T)		X	X		
Aplonis opacas guami	Micronesian starling	GE		X	X	X	X
Ardeola speciosa	Chinese pond heron	M,R(G)		X			
Arenaria interpres	ruddy turnstone	M		X	X	X	X
Aythya ferina	common pochard	M,R(G)		X			
Aythya fuligula	tufted duck	M,R(T)		X	X		
Bubulcus ibis	cattle egret	M		X	X	X	X
Buteo sp.	buteo	M,R(G)		X			
Calidris ferruginea	curlew sandpiper	M,R(G)		X			
Charadrius mongolus	Mongolian plover	M,R(T)		X	X		
Chlidonias leucopterus	white-winged tern	M,R(G,T)		X	X		
Corvus kubaryi	Mariana crow	E	√	X		X	
Egretta garzetta	little egret	M,R(G)		X			
Egretta intermedia	intermediate egret	M,R(G,T)		X	X		
Gallicolumba x. xanthonura	white-throated ground dove	GE		*	X	X	X
Gallinago sp.	snipe	M,R (G,T)		X	X		
Gallinula chloropus guami	Mariana common moorhen	E	√	X	X	X	
Halcyon c. cinnamomina	Micronesian kingfisher	E		▲			
Heteroscelus bervipes	gray-tailed tattler	M		X			
Heteroscelus incanus	wandering tattler	M		X	X		
Himantopus himantopus	black-winged stilt	M,R(G)		X			
Megapodius laperous	Micronesian megapode	E	√	*	X	*	X

GE Listed as endangered by Guam government
E Federally listed as endangered
T Federally listed as threatened
S Species of concern (may be deserving of federal endangered status, but listed yet)
C Candidate for federal listing
R Rare or uncommon
P Protected locally (through hunting laws)
M Migratory

(G) on Guam
(R) on Rota
(T) on Tinian
(F) on FDM

X present
* presumed extinct on this island
▲ in captive breeding program (no longer found in the wild)
√ if endemic

Table 3-1: Species of Interest in the Mariana Islands *(continued)*

LATIN NAME	COMMON NAME	STATUS	ENDEMIC	LOCATION			
				GUAM	TINIAN	ROTA	FDM
BIRDS *(continued)*							
Milvus migrans	black kite	M,R(G)		X			
Monarcha takatsukasae	Tinian monarch	T	√		X		
Motacilla cinerea	gray wagtail	M,R(G)		X			
Myiagra freycineti	Guam flycatcher	E	√	*			
Myzomela rubrata saffordi	cardinal honeyeater	GE		*	X	X	
Numenius phaeopus	whimbrel	M,R(T)		X	X	X	X
Numenius tahitiensis	bristle-thighed curlew	M,S		X			X
Pluvialis fulva	Pacific golden plover	M		X	X	X	X
Pluvialis squatarola	black-bellied plover	M,R(G)		X			
Porzana cinerea	white-browed crake	GE		*			
Ptilinopus roseicapilla	Mariana fruit-dove	GE	√	*	X	X	
Puffinus pacificus	wedge-tailed shearwater	GE		*	X		
Rallus owstoni	Guam rail	E		▲			
Rhipidura rufifrons	rufous fantail	GE		*	X	X	
Sula dactylatra	masked booby	R(T)			X		X
Sula leucogaster	brown booby			X	X	X	X
Sula sula	red-footed booby					X	X
Tringa glareola	wood sandpiper	M,R(T)		X	X		
Tringa nebularia	common greenshank	M,R(G)		X			
Tringa stagnatilis	marsh sandpiper	M,R(G,T)		X	X		
Zosterops c. conspicillatus	Guam bridled white-eye	E		*			
Zosterops conspicillatus rotensis	Rota bridled white-eye	C(R)	√			X	
MAMMALS							
Emballonura semicaudata	sheath-tailed bat	GE		*		*	
Pteropus mariannus mariannus	Mariana fruit bat	E(G), S(T,R)		X	X	X	X
Pteropus tokudae	little Mariana fruit bat	E	√	*			
REPTILES							
Chelonia mydas	green sea turtle	T		X	X	X	X
Cryptoblepharus poecilopleurus	snake-eyed skink	GE		X			
Emoia astrocasteta	tide-pool skink	GE		X			
Emoia cyanura	azure-tailed skink	GE		X			
Emoia slevini	Slevin's skink	GE	√	X			
Eretmochelys imbricata	hawksbill sea turtle	E		X	X		
Gehyra oceanica	oceanic gecko	GE		X			
Lipinia noctua	moth skink	GE		X			

Table 3-1: Species of Interest in the Mariana Islands *(continued)*

LATIN NAME	COMMON NAME	STATUS	ENDEMIC	LOCATION			
				GUAM	TINIAN	ROTA	FDM
INVERTEBRATES							
Nactus pelagicus	Pacific slender-toed skink	GE		X		X	
Perocinis ateles	Micronesian gecko	GE		*			
Birgus latro	coconut crab	P(T)		X	X		X
Catacanthus sp.	bronze boonie bug	R(G)		X			
Euploea eleutho	Marianas euploea butterfly	C(G,R)		*		*	
Hypolimnas octocula marianensis	Marianas eight-spot butterfly	R(G)		X			
Isabelloscia sp.	Almagosa cave isopod	R(G)		X			
Melita sp.	Almagosa cave amphipod	R(G)		X			
Partula gibba	Mariana Islands tree snail	GE, C (G,R)		X		X	
Partula radiolata	Pacific tree snail	GE, C (G)		X			
Partula salifana	Guam tree snail	GE,S		*			
Salomona guamensis	Guam karst cricket	R(G)		X			
Samoana fragilis	Mariana Islands fragile tree snail	GE, C (G,R)		X		X	
Succinea guamensis	Guam tree snail	S		*			
Succinea piratarum	Guam tree snail	S		X			
Succinea quadrasi	Guam tree snail	S		X			
PLANTS							
Callicarpa lamii	no common name	R(T)		X	X	X	
Canthium odoratum	no common name	R(T)		X	X	X	
Coelogyne guamensis	orchid	S(G,R)		X		X	
Cyanthea lunulata	tree fern	GE		X			
Digitaria gaudichaudii	bunch grass	R(F)	√		X		X
Enhalus acoroides	no common name	R(T)			X		
Euphorbia sparrmannii	seagrass	R(T)		X	X		
Gossypium hirsutum	seaside cotton	R(F)			X		X
Heritiera longipetiolata	ufa tree	GE		X	X		
Lycopodium phlegmaria	club moss	S(G,R)		X		X	
Nervilia jacksoniae	no common name	S(G,R)		X		X	
Nesogenes rotensis	no common name	C(R)				X	
Osmoxylon mariannense	no common name	C(R)				X	
Serianthes nelsonii	fire tree	E(G,R)		X		X	
Tabernaemontana rotensis	no common name	C(G,R)		*		X	

Note: Sources include The Status and Distribution of Marine Turtles on Tinian Report; the Micronesian Forest Bird Survey; the USFWS table of listed, proposed, and candidate species; the Guam Natural Resource Management Plans; the Ornithological and Mammalian Surveys for Tinian; the Final EIS for FDM; the Final Report for Flora and Fauna Survey of Tinian; the Botanical Survey of FDM, the Avifaunal Survey Report of FDM, and a personal communication with USFWS (December 10, 1996).

3.3.1 Tinian Biological Resources

3.3.1.1 Habitat

The terrestrial vegetation community of Tinian has been disturbed during the last 300 years by both man-made and natural forces. Although historical evidence is sparse, it appears that in the late 1700s and 1800s, Tinian was densely covered with thicket. The Japanese, who controlled Tinian after the outbreak of World War I, cleared most of the island in the 1920s in order to plant sugar cane. The cane plantations were abandoned during the intense military actions of World War II. Aerial photographs reveal that World War II bombing, fires, and military reconstruction reduced the amount of native limestone forest on Tinian so that, by 1945, it represented less than four percent of the total vegetation cover. The most conspicuous change between 1946 and 1980 was the enormous increase in the introduced, weedy tangantangan.

Fire is an existing periodic threat to habitat on Tinian. In addition to being a direct threat to individuals of protected species, fire has the potential to destroy vegetation and expose soil, making areas vulnerable to encroachment by undesirable species and reducing their usefulness as wildlife habitat. Since active firefighting is not practiced in all areas due to limited accessibility and few municipal firefighting resources, some fires are allowed to just burn out, which can take three to four days. Fires on Tinian may be the result of the local method of clearing forested land for grazing (i.e., burning with inadequate controls), careless use of campfires or cigarettes, or military use of pyrotechnics. The worst fire hazard occurs during the driest months (May through July) of the dry season, when 1 km^2 or more may be burned each year.[9]

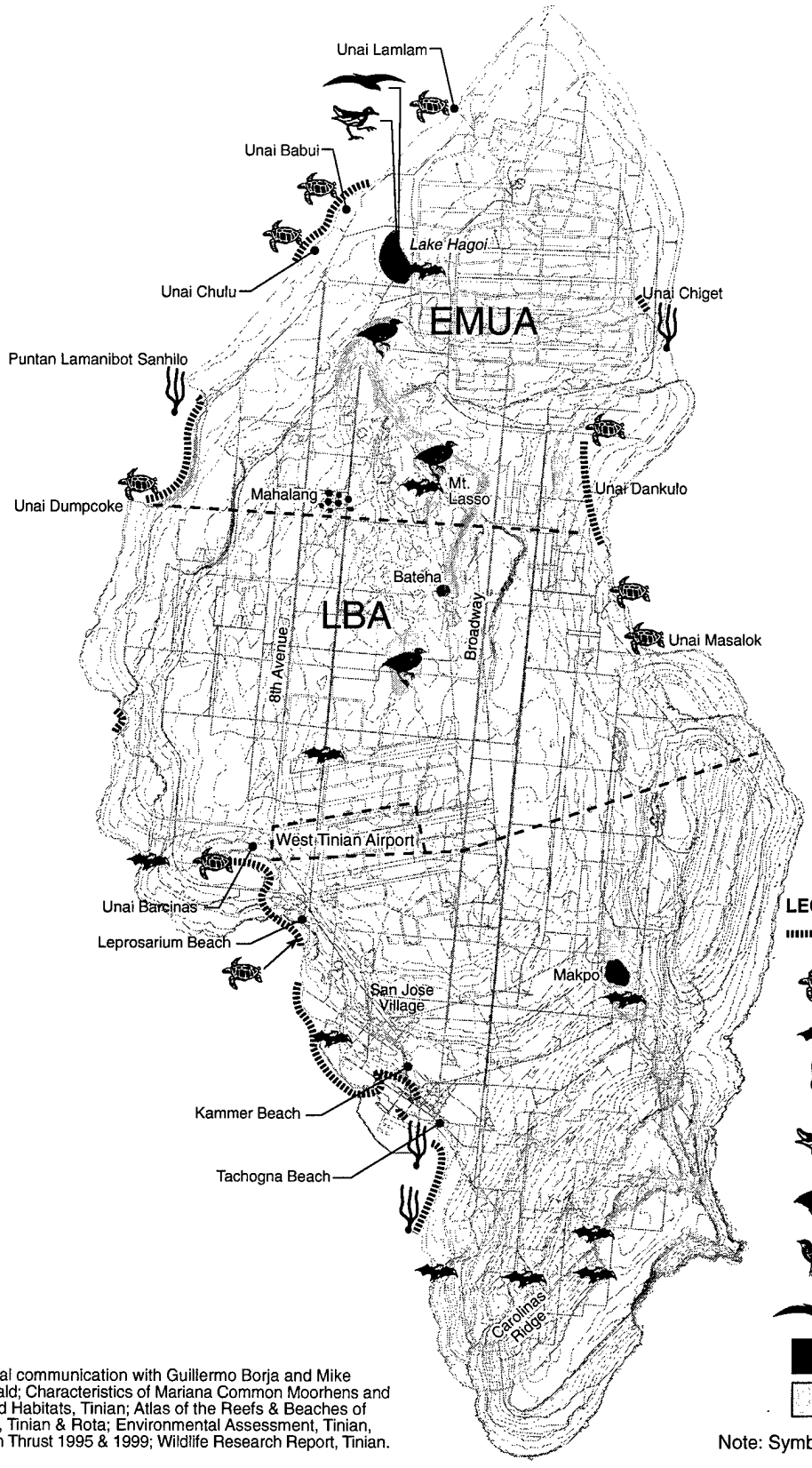
Vegetation on Tinian today is predominantly disturbed secondary growth. Secondary growth forests presently cover 19 percent of the island, in areas where primary vegetation has been disturbed. Tangantangan stands dominate most of the level and moderately sloping area of the island and serve as secondary habitat for endangered species and other native wildlife. Within the EMUA, the predominantly tangantangan forest is interspersed with 6-foot (1.8-meter)-tall Guinea grass (*Panicum maximum*). Small areas of primary habitat, such as wetlands, limestone forest, beaches, seagrass beds, and coral reefs, also occur in the EMUA and LBA. No federally listed endangered plant species were identified in a thorough survey of the MLA in 1984,[10] but there are many plants scattered throughout the island that have medicinal use, such as the Polynesian arrowroot or gap-gap (*Tacca leontopetaloisa*).[11]

Native limestone forest is restricted to clifflines and escarpments around the plateau on the southeast side of Tinian, and a corridor on the central escarpment (see Figure 3-1). The remaining limestone forest on Tinian is an important habitat for endangered species.

[9] Tinian fire records for 1990 and 1991 from Captain John Barsinas, Tinian Fire Department, May 15, 1996.

[10] Belt Collins Hawaii (November 1994) *Environmental Assessment Military Exercise, Island of Tinian: Tandem Thrust 95.* Prepared for Commander, Pacific Division, Naval Facilities Engineering Command.

[11] Personal communication with Historic Preservation Office personnel, Tinian, February 8, 1996.



LEGEND

- Coral Reef
- Potential Green Sea Turtle Nesting Sites
- Recent Fruit Bat Sitings
- Seagrass Beds (turtle feeding areas)
- Mariana Common Moorhen
- Micronesian Megapode
- Tinian Monarch (distributed throughout the island)
- Migratory Birds
- Wetland
- Limestone Forest

Sources: Personal communication with Guillermo Borja and Mike Fitzgerald; Characteristics of Mariana Common Moorhens and Wetland Habitats, Tinian; Atlas of the Reefs & Beaches of Saipan, Tinian & Rota; Environmental Assessment, Tinian, Tandem Thrust 1995 & 1999; Wildlife Research Report, Tinian.

Note: Symbols are representational only.

NORTH

0 1000 2000 (Meters)

0 4000 8000 (Feet)

Figure 3-1
SENSITIVE HABITATS AND THREATENED AND ENDANGERED SPECIES, TINIAN
FEIS: Military Training in the Marianas
Belt Collins Hawaii, June 1999

There are three terrestrial wetland areas within the MLA.[12] The largest is Lake Hagoi, a freshwater marsh about .06 square mile (0.15 km^2) in extent, and the surrounding .07 square-mile (0.18-km^2) depression, which is seasonally immersed and dried out. Lake Hagoi, the only major body of open water on Tinian, is an important habitat for the endangered Mariana common *moorhen (Gallinula chloropus guami)* and for migratory birds, especially during the wet season.[13] It provides seasonally abundant food sources (e.g., invertebrates and seeds) for migratory and resident waterbirds as well as nesting and foraging habitat for moorhens and native forest birds. There are also two much smaller wetlands, Mahalang and Bateha (see Figure 3-1), that are used by a small number of moorhens and migratory birds. The only other area considered a wetland on Tinian is Makpo Swamp, which is outside of the MLA. This wetland no longer supports open water or emergent vegetation.[14]

Tinian has several beaches supporting shoreline and strand vegetation, and the waters around Tinian support seagrasses. Chaguan-tasi (*Enhalus acoroides)*, a large seagrass, is found at Unai Chiget (which has a marine wetlands system of less than 0.004 km^2), Puntan Lamanibot Sanhilo, and possibly Tachogna Beach. Most beaches serve as green sea turtle nesting areas. Seagrass beds are preferred feeding sites for sea turtles (see Figure 3-1).

3.3.1.2 Marine Environment

Marine fauna on Tinian includes 129 coral species, 84 species of marine benthic algae, other benthic species such as the spiny lobster (*Panulirus*) and the larvae of the coconut crab (*Birgus latro*),[15] as well as 246 species of fish.[16] Coral reef is developed around much of Tinian. In general, reefs on the western (leeward) coastline are better developed and have greater species diversity than those on the eastern (windward) coast that receive more physical force from breaking waves. A recent indicator of the impacts from typhoons in 1997-1998 to the windward coast is the extensive damage to the once high-quality fringing coral reef at Unai Dankulo (see Appendix C5). An exception to coral abundance on the leeward coastline is the low-quality coral seen at Unai Babui where there is no outer fringing reef to protect the coral from wave energy (see Appendices C-1 and C-2). Local regulations prohibit harvesting of corals.

According to Dr. Robert Richmond at the University of Guam, coral spawning occurs on a lunar cycle, with the predominant period in the Marianas occurring six to 12 days following the June and July full moons. To avoid interference with spawning, water quality and substratum quality

[12] Belt Collins Hawaii (November 1994).

[13] When surface water disappears from Lake Hagoi during dry years or during the dry season, the number of moorhens on Tinian is significantly reduced, sometimes to zero. [Source: USFWS (February 1996) *Characteristics of Mariana Common Moorhens and Wetland Habitats within U.S. Department of the Navy's Military Lease Area and Exclusive Military Use Area on the Island of Tinian, Commonwealth of the Northern Mariana Islands, July 1994-August 1995.* Prepared for the U.S. Department of the Navy, Pacific Division, Naval Facilities Engineering Command.]

[14] USFWS (February 1996).

[15] Marine Research Consultants and Pacific Basin Environmental Consultants (1994) *Preliminary Assessment of the Nearshore Marine Environments Off of Beaches on the Island of Tinian, CNMI.* Prepared for Belt Collins Hawaii.

[16] R.S. Jones, R.H. Randall, and R.T. Tsuda (1974) A candidate marine environmental impact survey for potential U.S. military projects on Tinian Island, Mariana Islands. University of Guam Marine Lab. Technical Report 9.

should be maintained for the period from 10 days prior to 10 days following the spawning event. However, certain species of coral may spawn during other full moon cycles throughout the year.

3.3.1.3 Rare, Threatened, and Endangered Species

The terrestrial fauna on Tinian includes birds, mammals, amphibians, and reptiles, some of which are indigenous or endemic to the island (see Table 3-1). Tinian has three extant federally protected bird species, one extinct bird, and one extirpated bird. These birds and two species of protected sea turtles are all on the CNMI Endangered Species List. The coconut crab is locally protected from harvesting by nonresidents, and the island is sometimes frequented by the Mariana fruit bat (*Pteropus mariannus mariannus*), which is also on the CNMI Endangered Species List and is proposed for federal listing throughout the Marianas archipelago (including Guam). There have been five unconfirmed BTS sightings on Tinian; one snake was spotted in February 1990 and four were spotted during one sighting in November 1995.[17] The locations of protected species that could potentially be impacted by proposed training activities are shown on Figure 3-1.

Five protected bird species have been identified on Tinian. The endangered Mariana mallard *(Anas oustaleti)* is believed to be extinct due to overhunting and loss of wetland habitat. The endangered island swiftlet *(Aerodynamus vanikorensis bartschi)* has not been seen on Tinian since 1976 and may be extirpated from the island. The populations of the endangered Mariana common moorhen, which nest on the water at Lake Hagoi, have declined due to mortality and decreased nesting success caused by historical poaching pressure, the loss and modification of wetland habitat, the presence of humans, and predation.[18] The endangered Micronesian megapode *(Megapodius laperous)* was confirmed in 1995 as still occurring on Tinian but is quite rare.[19] The only endemic bird species on the island, the Tinian monarch *(Monarcha takatsukasae)*, is quite common despite its threatened status.[20] An August/September 1997 USFWS report tallied approximately 55,721 individuals on Tinian.[21]

No permanent fruit bat colony is believed to exist on Tinian, but the neighboring island of Aguijan (approximately 6 miles [10-km] southwest of Tinian Harbor) has a small, resident population. Notable numbers of fruit bats fly between islands in the southern Marianas on an irregular basis.[22] These interisland movements may represent dispersing juveniles or migrants responding to roost disturbances (such as poaching) or limited food availability. The fruit bat is reported to roost in large trees surrounding Lake Hagoi and along the clifflines and forest plateau south of Lake Hagoi near Mount Lasso (see Figure 3-1). It is also known in limited numbers

[17] T.H. Fritts, M.J. McCoid, and D. Gomez (January 1997) *Assessing the Risk of Brown Tree Snakes on Saipan: Incidents of the Brown Tree Snake (Boigus irregularis) Dispersing to Saipan and Other Islands in the Commonwealth of the Northern Mariana Islands.*

[18] USFWS (April 1996) *U.S. Fish and Wildlife Service Wildlife Research Report for Navy-leased Lands on the Island of Tinian, Commonwealth of the Northern Mariana Islands.* Prepared for Department of the Navy, Pacific Division, Naval Facilities Engineering Command.

[19] USFWS (April 1996).

[20] USFWS (April 1996).

[21] Michael Lusk, Steve Hess, Michelle Reynolds, and Scott Johnson (September 1997) *Population Status of the Tinian Monarch (Monarcha takatsukasae) from the Island of Tinian, CNMI.*

[22] Gary J. Wiles and P.O. Glass (September 1990) *Interisland Movements of Fruit Bats (Pteropus mariannus mariannus) in the Mariana Islands.* Atoll Research Bulletin No. 343.

elsewhere, including areas near the West Tinian Airport and the Carolinas Ridge. It is protected from hunting throughout the CNMI.

The threatened green sea turtle (*Chelonia mydas*) and the endangered hawksbill sea turtle (*Eretmochelys imbricata*) have been observed in the vicinity of Tinian. The green sea turtle nests on Tinian's beaches. Successful nesting requires a deep sand beach with open ocean exposure and minimal disturbance. Green sea turtle nesting activity occurs as early as late January and ends in August on most of Tinian's beaches. The hawksbill sea turtle is known to occur in offshore waters, but is not known to nest on the island. Although poaching of sea turtles and their nests has been an ongoing problem on Tinian (half of all green sea turtle nests were thought to have been poached during the 1994 nesting season),[23] public education programs, better enforcement by local officials, and continuous monitoring of beaches during nesting periods has substantially reduced poaching of green sea turtle eggs. Sea turtle nesting beaches are protected and periodically surveyed by the CNMI Division of Fish and Wildlife.

3.3.2 Guam Biological Resources

Guam is distinct from Tinian, FDM, and Rota in being very intensively developed in some areas. Despite this development, however, habitat for both birds and mammals is still extensive on the island, especially in areas under protection by the Navy and Air Force. Protected areas on the island include the Guam National Wildlife Refuge at Ritidian Point, military lands designated as Refuge Overlay Units, and Government of Guam Conservation Areas. The primary use of the overlay units is for the military mission, but these areas also serve secondarily as species habitat. The U.S. Fish and Wildlife Service (USFWS) completed floral, faunal, and wetland surveys in the Ordnance Annex in September 1996.

3.3.2.1 Habitat

Today only 38 percent of Guam is forested. Much of the limestone forest acreage has been reduced by a variety of human and natural influences and converted to brush and grassland. Erosion is now a major problem in some areas.[24] A long history of island settlement, combined with more recent urbanization, fire, agricultural development, and the impacts of World War II, have all contributed to the alteration of Guam's forests. They now contain various proportions of introduced species, mostly naturalized cultivars. The most suitable habitats for native fauna are native limestone and ravine forests. Wetlands also provide important habitat for native and migratory bird species. More disturbed areas, such as tangantangan stands or weedy fields, are less suitable as habitat for native fauna.

Limestone forests occur most frequently on the limestone plateau of northern Guam, which includes Andersen Air Force Base (AAFB), Andersen South, the two Communications Annex sites, and Orote Point. Relatively well preserved and pristine native limestone forest growth

[23] USFWS (April 1996).

[24] The Guam EPA developed the *Guam Soil Erosion and Sedimentation Control Manual* in 1986, and the Navy is currently spending $750,000 on erosion control in the NAVACTS Ordnance Annex, in part to prevent the siltation of Fena Reservoir.

occurs at AAFB and Orote Point; it contains 27 endemic and 7 rare plant species,[25] including the last individual fire tree (*Serianthes nelsonii*) on Guam at Ritidian Point. The limestone forest is an important refuge for endangered birds and bats. Southern Guam also contains areas of limited ravine forest and extensive open grasslands (savanna). The *Merrilliodendron* forest in southern Guam, which is a mixed limestone forest characterized by the *Merrilliodendron megacarpum* tree, supports populations of rare species, such as the Marianas eightspot butterfly (*Hypolimnas octocula marianensis*).

The dominant introduced, weedy species is tangantangan, which may have been seeded from the air to revegetate the island after World War II.

Aquatic habitats include rivers, freshwater wetlands, estuarine wetlands, and marine waters. Freshwater wetlands offer potential habitat for the endangered Mariana common moorhen and for nonendangered native and migratory waterbirds. Estuarine wetlands, including mangrove swamps, provide nursery grounds for numerous marine and estuarine animals. The protection they provide is essential to the continued survival of many marine organisms.

Coastal vegetation on Guam includes coastal strand, which borders flat sandy beaches and contains sand-binding herbs and salt-tolerant vegetation. Coastal strand is found at the Waterfront Annex, in a thin band in Apra Harbor near the high tide line. Deep, sandy beaches (important for the successful nesting of sea turtles) are located at Ritidian Point, in the Marine Resources Preserve Shoreline at AAFB, and in Apra Harbor. The shallow coastal areas, reefs, and lagoons in these areas are frequented by sea turtles.

Conservation areas include the Guam National Wildlife Refuge areas at Ritidian Point, Communications Annex, AAFB, Apra Harbor, and the Ordnance Annex; the Anao, Cotal, Bolanos, and proposed Falcona Beach Conservation Areas; and the Haputo and Orote Ecological Reserve Areas (ERAs) (see Figure 3-2).

A Cooperative Agreement among the Navy, Air Force, and the USFWS has been established to identify Navy and USFWS commitment to a coordinated program centered on the protection of endangered and threatened species and other native flora and fauna, maintenance of native ecosystems, and the conservation of native biological diversity in cooperation with the Guam Department of Agriculture-Division of Aquatic and Wildlife Resources, consistent with the national defense missions of the Navy and Air Force.[26]

3.3.2.2 Marine Environment

Approximately 220 species of marine benthic algae, three species of seagrasses, 267 species of stoney corals, and 800 fish species inhabit the coastal waters of Guam.[27] Coral reef surrounds at least three-quarters of the island, including several areas in the Waterfront Annex vicinity.

[25] Personal communication with Gary Wiles, Guam DAWR, July 1996.

[26] One primary document is the Cooperative Agreement between the U.S. Navy and the U.S. Fish and Wildlife Service for the establishment of the Guam National Wildlife Refuge, Guam, dated March 1994.

[27] University of Guam Marine Laboratory (1981) A Working List of Marine Organisms from Guam. Technical Report No. 70.

Existing conditions at specific nearshore and beach sites are described in Chapter Four in relation to ongoing or proposed training activities as follows:

- Section 4.3.1.1: Deepwater Mine Countermeasures training in Apra Harbor and off Dadi Beach.
- Section 4.3.1.4: LCAC landing sites at Dadi Beach, Tipalao Beach, Dry Dock Island, Polaris Point and Toyland Beach.
- Section 4.3.1.5: AAV landing sites at Tipalao Beach, Dry Dock Island, Sumay Cove Marina, Toyland Beach, and the former fuel pier at Orote Outer Harbor.
- Section 4.3.1.6: LCU landing sites at Dry Dock Island, Polaris Point, Sumay Cove Marina, Toyland Beach, and the former fuel pier.

Additional information regarding the marine environment is provided in Appendices C-2 and C-3.

3.3.2.3 Rare, Threatened, and Endangered Species

Currently, three plant, three mammal, 10 reptile, four invertebrates, and 18 bird species are listed as threatened or endangered by the federal and/or Guam territorial governments, although some of these are extinct on Guam (see Table 3-1). These species have benefited from inhabiting military land, which indirectly serves as wildlife preserves because of a relative lack of development and restricted access. The locations of protected species that could potentially be impacted by proposed training activities are shown in Figure 3-2.

The three plant species listed as endangered on Guam are the Hayun-lago or fire tree, the ufa tree (*Heritiera longipetiolata*), and the tree fern (*Cyanthea lunulata*). The only known adult endangered fire tree is found in the limestone forest at AAFB in a fenced-in area not used for training. Threats to the survival of this tree include typhoons, herbivory by feral ungulates, insect infestations, wildland fires, and damage from other wildlife, and loss of genetic diversity.[28] A recovery program is currently in effect for this species. The ufa plant is a rare endemic limestone forest plant found at AAFB, Orote Point, and the Ordnance Annex. The tree fern is found in the Ordnance Annex, mostly along the banks of the Emong River south of Fena Reservoir. The *Tabernaemontana rotensis* (no common name), a species of concern that is rare on Guam and found at AAFB, is a candidate for federal listing under the Endangered Species Act (ESA).

[28] USFWS and USAF with Guam DAWR *(November 1995) Integrated Natural Resources Management Plan for Andersen Air Force Base, Guam.*

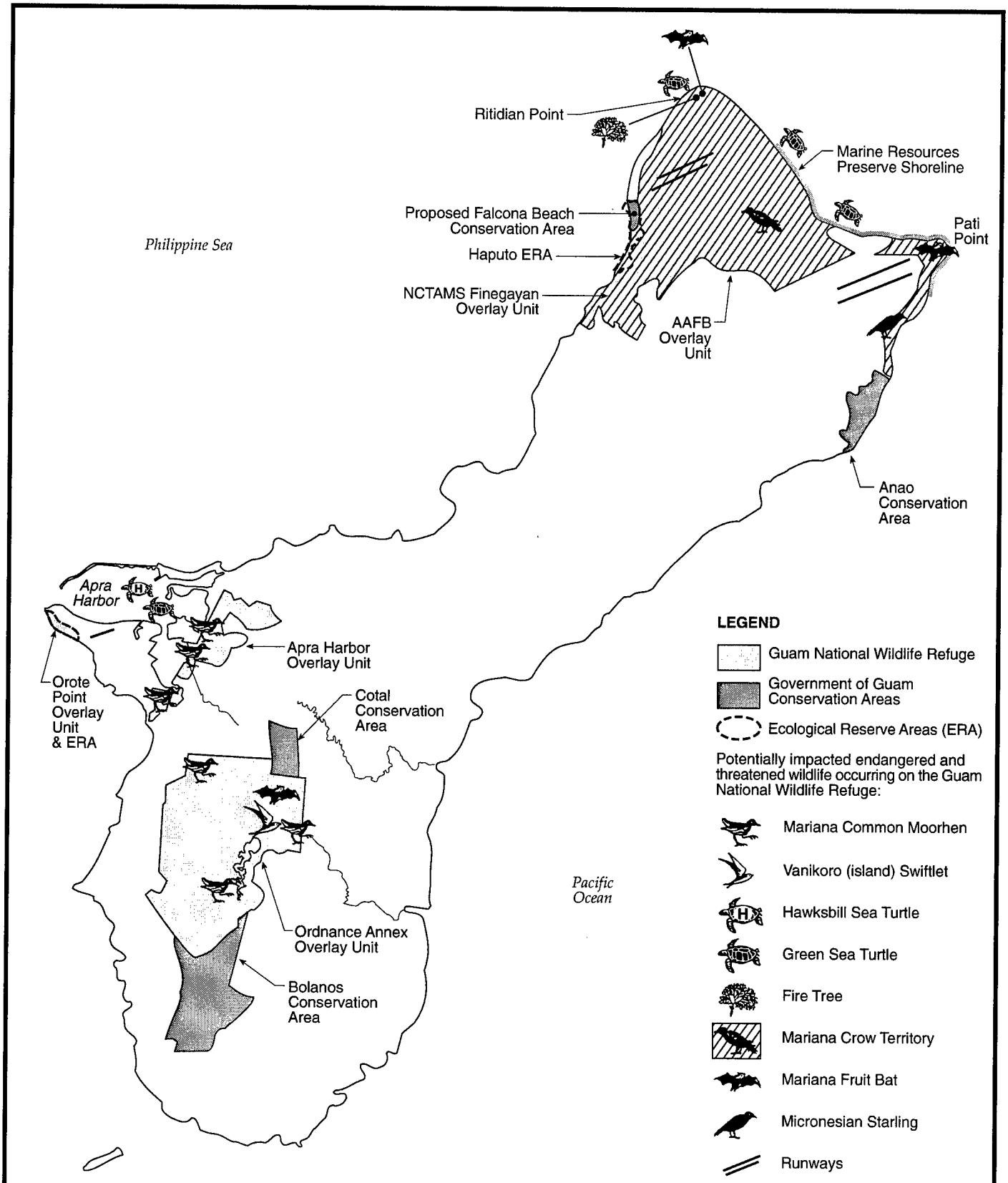


Figure 3-2
NATIONAL WILDLIFE REFUGE, OVERLAY UNITS, AND CONSERVATION AREAS OF GUAM
FEIS: Military Training in the Marianas
Belt Collins Hawaii, June 1999

Two bat species on Guam, the endangered little Mariana fruit bat (*Pteropus tokudae*) and the sheath-tailed bat *(Emballonura semicaudata)* (a species of concern), have not been sighted in approximately 20 years and are thought to be extinct on the island. If any colonies of these bats exist on Guam, it is likely that they would be in the limestone forest areas of the Ordnance Annex.[29] The remaining extant species, the Mariana fruit bat, which is proposed for federal listing throughout the Marianas archipelago, including Guam, number fewer than 400 individuals.

Most of these bats aggregate at a roost site on Pati Point and Ordnance Annex.[30] They forage along the northern cliffline between Ritidian and Pati points. A small number of bats (10 to 25 individuals) occur in the Ordnance Annex, foraging at night between Mount Almagosa and East Tower. Preferred habitats for the bat include inaccessible cliffline and native limestone and ravine forests.[31] They are extremely sensitive to human disturbance and have been known to abandon their roosts at the slightest interference. Two of the most important reasons for the decline of these fruit bats have been poaching by local residents and predation by the BTS. Fruit bats are considered a gastronomic delicacy by the Chamorros and, although law protects these bats, illegal poaching still occurs. A 1991 poaching event at the last remaining bat roost on Guam reduced the population by 30 percent.[32] BTS are capable of preying on young bats, which are particularly vulnerable to predation because they are not yet able to fly and are too large to be carried by their mothers during nighttime foraging.[33] Several snakes have been captured or seen within approximately 325 feet (100 m) of the colony at Pati Point.

Endangered and threatened reptile species on Guam include two sea turtles, three geckos, and five skinks (see Table 3-1). Threatened green sea turtles use the beaches at the Waterfront Annex and AAFB for nesting. The green sea turtle nesting season is generally January through August. The hawksbill sea turtle nests sporadically in Guam, between the months of January and April.[34] The sandy beach at Sumay Cove is a known hawksbill turtle-nesting site. The primary threat to green sea turtles is habitat destruction, followed by poaching and nest predation by feral dogs and pigs. AAFB beaches and offshore areas have been protected from large-scale development and human activity. Current management programs include law enforcement, population surveys, tagging, and nesting studies. In the Ordnance Annex, the National Biological Survey and the USFWS have recently located the Pacific slender-toed geckos (*Nactus pelagicus*) and moth skink *(Lipinia noctua)*.[35] Both occur in substantial numbers (200 to 800 per acre [500 to 2,000 per ha]).

Protected invertebrates on Guam considered to be rare are the endangered Mariana Islands fragile tree snail (*Samoana fragilis*), endangered threatened Pacific tree snail (*Partula radiolata*), and the rare Marianas eightspot butterfly, all of which occur in the Ordnance Annex. The Pacific Tree

[29] Personal communication with Gary Wiles, Guam DAWR, May 16, 1996.

[30] Wiles et al. (1995) *The Status and Distribution of Endangered Animals and Plants in Northern Guam.* Micronesia 28:31-49.

[31] BioSystems Analysis, Inc. (September 1990) *Natural Resources Management Plan: Naval Station, Guam.* Prepared for the Department of the Navy, Pacific Division, Naval Facilities Engineering Command.

[32] USFWS and USAF with Guam DAWR (November 1995).

[33] Gary Wiles, DAWR (November 1990) *Mariana Fruit Bat and Little Mariana Fruit Bat Recovery Plan.*

[34] Karen L. Eckert, Ph.D. (September 1991) *The Biology and Population Status of Marine Turtles in the North Pacific Ocean.*

[35] USFWS (December 1996) *Faunal Survey for the Ordnance Annex, Naval Activities, Guam.* Prepared for the Department of the Navy.

snail also occurs in the valley behind Haputo Beach in the Haputo ERA, along with the Mariana Islands tree snail *Partula gibba*, which occurs in only two locations on the island and is listed as Guam endangered. The three snail species are proposed by the USFWS for listing as endangered. The major impediment is the lack of a population location maps.

The avifauna of Guam once included many native forest birds, waterbirds, seabirds, and numerous migrant species. Today, however, many of the native birds are experiencing severe population declines due to both human activities, such as habitat destruction, and BTS predation. Native birds listed by the territory of Guam as endangered are the rufous fantail (*Rhipidura rufifrons*), Mariana fruit-dove (*Ptilinopus roseicapilla*), cardinal honeyeater (*Myzomela rubrata saffordi*), Micronesian starling (*Aplonis opacus guami*), white-throated ground-dove (*Gallicolumba x. xanthonura*), wedge-tailed shearwater (*Puffinus pacificus*), and white-browed crake (*Porzana cinerea*). All of these species are presumed to be extinct on Guam with the exception of the Micronesian starling, which is found on AAFB in the southeastern section near the base housing and is also found in the Anao Conservation Area to the south.

Federally listed endangered native birds presumed to be extinct on Guam include the bridled white-eye (*Zosterops c. conspicillatus*), Micronesian megapode, Guam broadbill (*Myiagra freycineti*), nightingale red-warbler (*Acrocephalus luscinia*), and Mariana mallard (*Anas oustaleti*). The Micronesian kingfisher (*Halcyon cinnamomina*) and Guam rail (*Rallus owstoni*) are probably extirpated from the wild but are the subjects of captive breeding programs.[36] Experimental reintroduction of the Guam rail is ongoing within Area 50, a protected area within Northwest Field that is away from training areas.

Federally listed native birds still known to occur on the island are the endangered Mariana crow (*Corvus kubaryi*), island swiftlet, and Mariana common moorhen. The Mariana crow (endemic to Guam and Rota) is estimated to have a current Guam population of fewer than 12 individuals restricted in distribution to AAFB, mostly occurring in the MSA and eastward to Pati Point. These include four birds that are survivors of a group of six captive crows that originated on Rota and were transferred to Guam from the National Zoo's Conservation and Research Center in Front Royal, Virginia, and the Houston Zoo and released into the wild.[37] Crows have not been recorded from southern Guam since the 1960s or 1970s. The island swiftlet occupies limestone caves in the COMNAVMARIANAS Ordnance Annex, located southeast of Fena Reservoir near the Bonya River and the Maemong River drainage area, and also in the Talafofo River Valley. Swiftlets are found in the Fachi Cave, but the Mahlac Cave harbors the most significant colony of swiftlets on Guam. Approximately 300 to 350 individuals remain on the island.[38]

The complex of marshes, ponds, and mangrove swamps near the entrance to Apra Harbor provides breeding, nesting, and foraging habitat for the Mariana common moorhen. No moorhens are found on the Atantano River, but approximately .25 mile (0.4 km) due east of Atantano River and Marine Drive,[39] they are found in man-made wetlands at the Shell and Island Equipment

[36] BioSystems Analysis, Inc. (September 1990) *NRMP: Naval Station, Guam.*

[37] Personal communication with Robert Anderson, Guam DAWR, April 27, 1998.

[38] Personal communication with Gary Wiles, Guam DAWR, July 1996.

[39] Personal communication with Mike Ritter, Guam FWS, August 22, 1996.

businesses. This area, one of Guam's three primary habitats for the Mariana common moorhen, is considered to have the highest habitat quality of the primary moorhen sites.[40] However, these wetlands dry out seasonally, forcing the birds to move to permanent water sources, such as Fena Reservoir, the largest of four moorhen-supporting wetlands in the COMNAVMARIANAS Ordnance Annex. The southern half of the reservoir is a moorhen sanctuary and is also used by several species of migratory shorebirds and waterbirds. Moorhens also occasionally use two small wetlands to the east and one northwest of the reservoir. Both the Fena Reservoir and the Waterfront Annex marsh were identified in the 1992 Mariana Common Moorhen Recovery Plan as areas that should be secured and managed as primary moorhen habitat. The southern cliffline of Orote Peninsula is the Orote Ecological Reserve. This area is considered an essential habitat for fish and birds.

3.3.2.4 Brown Tree Snake

The introduced BTS has become a serious pest species on Guam. Native to the Solomon Islands, Papua New Guinea, and the northern coast of Australia, it is believed to have been introduced in the postwar years in cargo shipped from Papua New Guinea. Snakes became conspicuous throughout central Guam by the 1960s, and by 1968, they had probably dispersed throughout the island. Today, up to 12,000 snakes per square mile (4,633 per km^2) occur in some forested areas of Guam. In the absence of natural predators and other population controls, the snake population has reached very high densities, causing the decline and, in some cases, extinction, of many of the island's birds, lizards, and bats. The BTS is nocturnal and cryptic. Difficulty of detection is compounded by its natural camouflage, exceptional climbing ability, potential to survive for weeks without food, and propensity to seek dark, cool hiding places during the heat of the day. Due to their nocturnal habits and hiding ability, the snakes are frequently accidental stowaways in cargo leaving Guam. Unless intercepted, the BTS could become established on Tinian, Rota, FDM, or Hawaii, causing ecological and economic problems similar to those found on Guam. The BTS has already been sighted on Oahu,[41] Saipan, and Rota, but is not thought to be established on any of those islands. There have been five unconfirmed BTS sightings on Tinian: one in February 1990 and four reported in one sighting in November 1995.[42]

The October 1996 *Brown Tree Snake (BTS) Control/Interdiction Plan for Military Training Exercises* implements a Memorandum of Agreement (MOA) signed by the Department of Defense, the U.S. Department of Agriculture, the Government of Guam, and the State of Hawaii. The MOA states that these agencies will cooperate in BTS research, control, inspection, and eradication efforts. The BTS control and interdiction protocol is published in training orders for the Tandem Thrust series of exercises conducted about every two years. (See Appendix E for additional information regarding BTS interdiction and control.)

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[40] USFWS (September 1992) *Recovery Plan: Mariana Common Moorhen (Gallinula chloropus guami).*

[41] T. H. Fritts, G. H. Rodda, and E. F. Kosaka. *Brown Tree Snake Update. Memorandum to Brown Tree Snake Cooperators* dated July 1, 1995.

[42] T.H. Fritts, M.J. McCoid and D. Gomez (January 1997) "Assessing the Risk of Brown Tree Snakes on Saipan: Incidents of the Brown Tree Snake (*Boigus irregularis*) Dispersing to Saipan and Other Islands in the Commonwealth of the Northern Mariana Islands."

3.3.3 Farallon de Medinilla Biological Resources

3.3.3.1 Habitat

FDM is an uninhabited island that has historically been used by the military as a bombing site since at least 1971. Steep, eroding sea cliffs make it virtually inaccessible except by helicopter. With the exception of sharp, irregular limestone outcroppings, the entire surface of the island is vegetated, mostly by herbaceous and shrubby vegetation, dominated by littoral species.[43] The vegetation structure is not homogenous, but rather a mosaic of several types and lacking clear boundaries. Birds nest, forage, and shelter in the dense vegetation.

There are no known threatened or endangered plant species on the island. Nearly all the species encountered on the island are widespread, littoral plants. However, there are two plant species that are considered rare or uncommon: bunch grass *Digitaria gaudichaudii* (the only endemic species recorded from the island), and seaside cotton (*Gossypium hirsutum* var. *taitense*).

There are apparently no sensitive types of vegetation on FDM. The lone wetland area observed was too small and lacked some of the prerequisites to be considered an official wetland. However, these areas may be a vital source of fresh water for land birds on the island, such as the endangered Micronesian megapode.

Eleven of the 40 plant species identified in a half-day botanical survey (Appendix D-3) were introduced. Two of these species, tangantangan and morning glory vine (*Operculina ventricosa*) pose a potential threat to the environment. Once established, they are difficult to eradicate.

3.3.3.2 Marine Environment

The emergent shoreline of FDM consists primarily of large boulders and rock outcroppings that have calved off of the island margin. There are two small beaches: one on the northern part of the eastern shoreline and one in the central area of the western shoreline (see Figure 3-3). These wave-swept beaches, composed of very coarse carbonate sand and small rubble/cobble fragments, do not serve as good turtle nesting habitat.[44] There is little shoal area around most of the island, with the exception of the northern and southern ends. Deep water surrounds much of FDM, and the submarine slope of the island is very steep. Unexploded ordnance (UXO) occurs in waters around the entire island, is concentrated primarily in the middle portion of the island and, in some cases, is colonized by living coral and algae.

The combination of steep vertical profiles of the submarine shoreline and the massive physical forces from breaking waves on the windward (eastern) side of the island results in a limited assemblage of benthic biota, at least to the depth of wave base. Marine resources are primarily concentrated on the leeward (western) side of the island, where substrate drops gradually seaward;

[43] Art Whistler (December 1996) *Botanical Survey of Farallon de Medinilla, CNMI.* Prepared for Belt Collins Hawaii.

[44] Marine Research Consultants (September 1997) *Assessment of the Marine Environment, Farallon de Medinilla, CNMI, Military Training in the Marianas EIS.* Prepared for Belt Collins Hawaii.

coral growth of *Pocillopora, Acropora, Porites, Montiport* and *Millepora* is good, with approximately 50 percent coverage of the available substratum. Coconut crabs inhabit cracks in the rocks near the shoreline, and green sea turtles have been observed in the nearshore waters.

The nearshore fishery resources surrounding FDM are popular for commercial and subsistence fishermen; low numbers of commercially desirable reef fish in this area indicate fishing pressure. The greatest abundance and diversity of fish species are found primarily on the western side, particularly in the areas offshore of the central and northern portions of FDM.[45]

3.3.3.3 Rare, Threatened, and Endangered Species

Recent avifauna surveys of FDM (November 1996 and August 1997) have recorded a total of 17 avian species, including nine species of seabirds, five species of migratory birds, and three species of resident land birds. All of the avian species recently observed are native to the Marianas except for the Eurasian tree sparrow *(Passer montanus)*. If survey reports since 1975 are compiled, the total number of avian species recorded at FDM is 24, which includes a second non-native species, the Philippine turtle dove (*Streptopelia bitorquata*). (See Appendix D-1, Tables 2 and 3 for a compilation of bird species and bird abundance estimates recorded since 1902.)

The only endangered species recorded on FDM was the Micronesian megapode. Although only up to four megapodes have been observed during any one survey, the USFWS estimates that less than 10 birds occur on the island.[46] Three bristle-thighed curlews (*Numenius tahitiensis*), listed by the USFWS as a species of concern, were observed on FDM. Also observed were two Mariana fruit bats, which are proposed for federal listing. Already listed on the CNMI Endangered Species List, they are protected from hunting throughout the CNMI.

Of the species found nesting on FDM, the most widespread were seabirds, including three species of boobies (masked [*Sula dactylatra*], red-footed [*Sula sula*], and brown [*Sula leucogaster plotus*] boobies) and the white tern (*Gygis alba*). FDM is the site of the largest known masked-booby breeding colony in the Marianas and also represents one of only two small breeding populations of the great frigatebird *(Fregata minor)* in the Marianas. The other species of birds nesting on FDM are broadly distributed throughout the Pacific. Masked and brown boobies nest along the eastern (windward) side, where they can more easily take flight from their ground nests (see Figure 3-3). Red-footed boobies and great frigatebirds breed on the western side of the island, where there is less wind and higher brush to support their nests. Terns and noddies use the limestone sea cliffs for roosting and nesting. Megapodes and doves inhabit densely vegetated areas where shelter and food are more readily available. Shorebirds, such as the plover, curlew, and turnstone, require open habitat and are found in barren or sparsely vegetated areas.

[45] National Marine Fisheries Service letter dated Sept 11, 1997, "FDM Survey July 8-10 1997."

[46] USFWS (May 16, 1997) *Biological Opinion of the U.S. Fish and Wildlife Service for Gunnery and Aerial Bombardment Practice at Farallon de Medinilla, CNMI.*

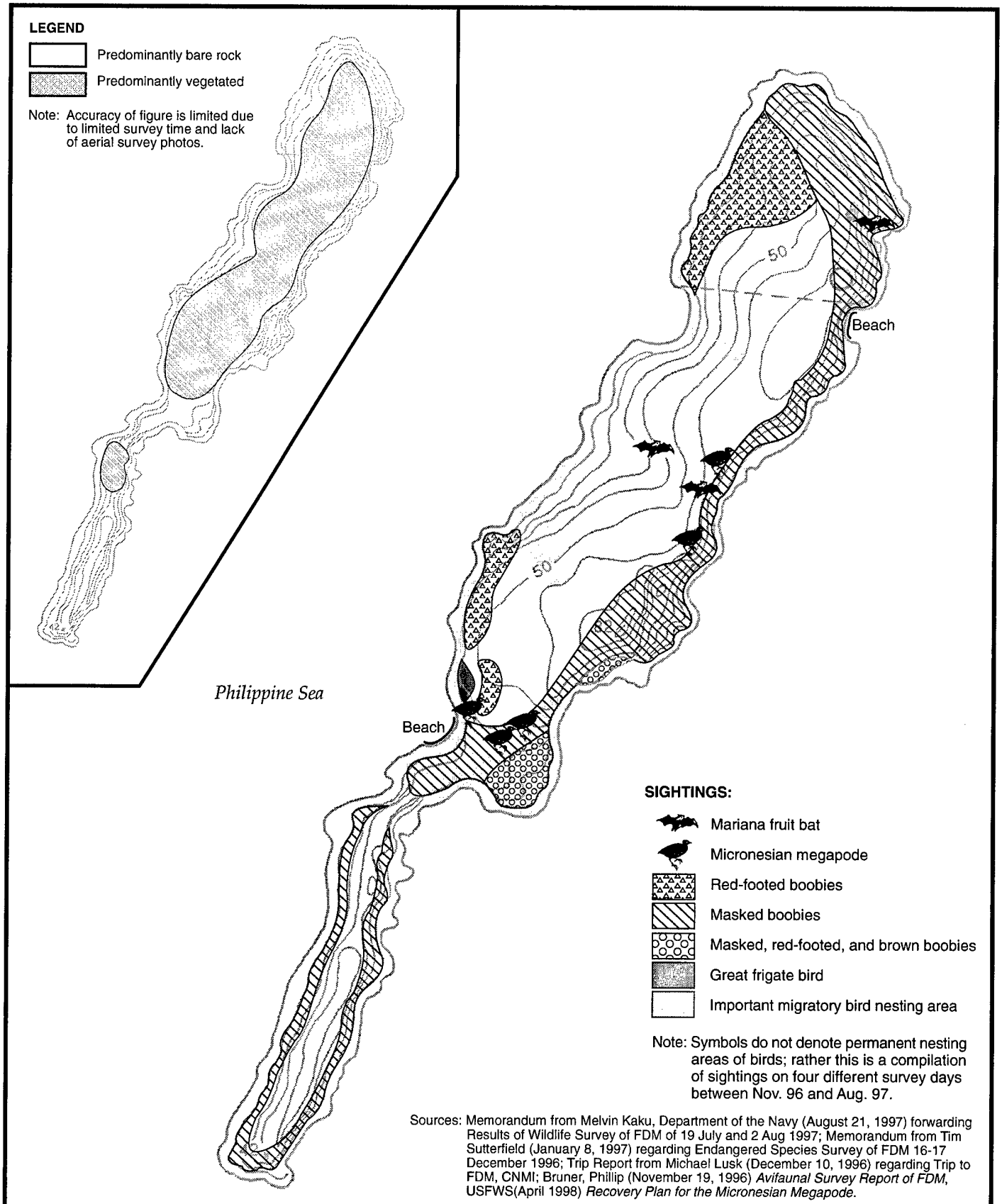


Figure 3-3
BIRD AND BAT SIGHTINGS, FARALLON DE MEDINILLA
FEIS: Military Training in the Marianas
Belt Collins Hawaii, June 1999

3.3.4 Rota Biological Resources

3.3.4.1 Habitat

Although the Japanese cleared some areas for sugar cane cultivation in the 1920s, Rota was much less disturbed during World War II than the other islands and no U.S. military bases were established there. Vegetation on Rota consists primarily of native forest with some secondary vegetation and minor stands of tangantangan.

The largest remaining limestone forest in the Marianas is found on Rota, where it covers 60 percent of the island. These areas are important refuges for endangered species, such as the Mariana fruit bat and the Mariana crow. Nine percent of the land area on Rota is covered by secondary vegetation, characterized as mixed brush and weeds, which developed after the removal of native forest. The secondary vegetation scattered throughout the island is mostly a remnant of formerly cultivated fields and coconut groves. Rota supports only minor stands of tangantangan, which are relatively homogeneous and make up less than one percent of the island's land area.

Three conservation areas were established on Rota in 1994: the Sasanhaya Marine Reserve, Puntan Taipingot (Wedding Cake) Conservation Area, and Sabana Heights Wildlife Conservation Area (see Figure 3-4). Additional conservation areas are proposed, including the Sasanlagu Marine Preserve, Paliii Medicinal Plant Reserve, Kantan Aftao Commonwealth Forest, and a conservation area between Saguagaga and Puntan Fina Atkos.[47]

3.3.4.2 Marine Environment

Coral reefs are found offshore around nearly the entire island. One seagrass variety, (*Enhalus acoroides),* occurs in limited distribution in a narrow band along the shore between West Dock and Anjota Island near Songsong Village. Other marine resources will not be discussed in detail since no training in offshore waters is proposed.

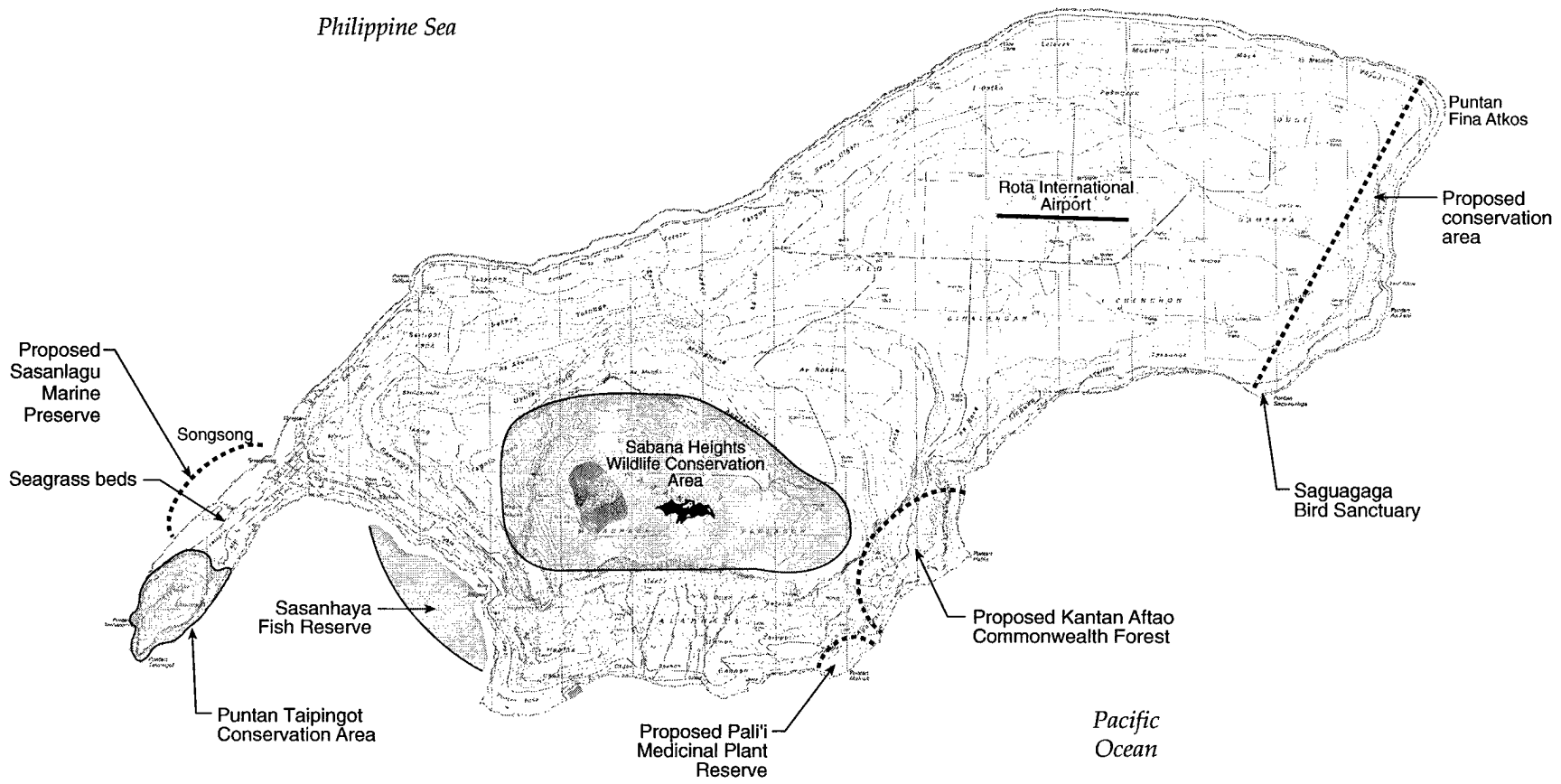
3.3.4.3 Rare, Threatened, and Endangered Species

Native species on Rota include the endangered Mariana crow (endemic to Rota), threatened green sea turtle, Mariana fruit bat (a species of concern on Rota), and the Rota bridled white-eye, which is a candidate for listing as a federally endangered species. According to a 1996 study,[48] the population of the Mariana crow on Rota has decreased 56 percent between 1982 and 1995, most likely due to habitat loss. The remaining approximately 600 crows are widely distributed throughout the island, both in mature and secondary forests and coastal strand vegetation.[49]

[47] Juan C. Tenorio & Associates, Inc. (December 1995).

[48] Daniel J. Grout, Michael Lusk, and Steven Fancy (USFWS) (June 1996) *Results of the 1996 Mariana Crow Survey on Rota.*

[49] USFWS (July 1996).



Note: The exact boundaries of the conservation areas and proposed conservation areas have not yet been established.

Source: Atlas of the Reefs and Beaches of Saipan, Tinian, and Rota; Physical and Economic Master Plan for Rota; Letter from Arnold Palacios

NORTH

0 1000 2000 (Meters)

0 4000 8000 (Feet)

LEGEND

- Proposed Conservation Area
- Conservation Area
- Runway
- Mariana crow (distributed throughout the island)
- Mariana fruit bat (disperses throughout island for nighttime feeding)

Figure 3-4
SENSITIVE HABITATS AND THREATENED AND ENDANGERED SPECIES, ROTA
FEIS: Military Training in the Marianas
Belt Collins Hawaii, June 1999

There is also a fairly large roost of Mariana bats that depend on the native forest in the Sabana Heights area for habitat (see Figure 3-4). Some of these bats are known to migrate from Rota to Guam.

BTS are not established on Rota. The only confirmed BTS siting on the island was in October 1991 at a seaport: two dead snakes were found inside a cargo container that had been shipped from Guam.[50] Presumably the snakes died of dehydration or the high temperature inside the container.

The first permanent BTS barrier was installed in November 1997 around the Rota commercial port. Made of fine metal mesh that the snake cannot climb, it was attached to the existing port facility's high fence. Any BTS arriving in cargo by boat or ship will be contained.[51]

3.4 CULTURAL RESOURCES

The history and cultural resources of Tinian, Guam, FDM, and Rota are discussed in this section. This historical overview spans from the time of initial human settlement to the present day and includes information on Chamorro, Spanish, German, Japanese, and U.S. influences. As each of these cultures took turns in controlling the Marianas, they left behind many cultural artifacts that can still be seen today.

3.4.1 Brief History

The Mariana Islands are historically part of Micronesia and have been controlled by many different nations since their discovery by Ferdinand Magellan in 1521. The oldest dated archaeological remains indicate that humans first settled the Mariana Islands about 1500 BC. Early historical documents indicate that at the time of first European contact, the Chamorro people in the Mariana Islands exhibited a typical Oceanic economy consisting of farming and exploitation of marine resources.

The Spanish claimed the islands in 1565, but left them undisturbed until they established a Jesuit mission on Guam in 1668, significantly changing the lives of the Marianas Chamorros. By 1698, the Spanish resettled most of the Chamorros, except for those hiding on Rota, into church towns on Guam, leaving the northern Marianas virtually uninhabited. Religious activities were not Spain's only concern. The islands also served as a valuable port for the golden galleons and other Spanish merchantmen. Tinian was used by the Spanish as a store for supplying the Guam garrison, as noted in British reports from their first visit in 1742.

Guam became a possession of the United States in 1898 as a result of the Spanish-American War. Under the administration of the U.S. Navy, Guam became a coaling station and later a naval base for the Western Pacific. Spain sold the other (northern) Mariana Islands to the Germans in 1899.

[50] T. H. Fritts (May 1996).

[51] Pacific Daily News, Monday, December 1, 1997, page 3, "Snake-proof fencing will protect Rota."

The short-lived (1899-1914) German administration was marked by little change, except for the reorganization of the Tinian cattle ranch established by the Spaniards. The Germans leased out Tinian in 1904, primarily to the Japanese for the purpose of copra cultivation.

The northern Mariana Islands came under Japanese military control at the outbreak of World War I and the League of Nations awarded the mandate over Micronesia to Japan in 1920. The Japanese then began economic exploitation of the Marianas. In 1926, Tinian was leased by Naniyo Kohatsu Kaisha (NKK or South Seas Development Company). The firm established sugar cane plantations and developed Tinian Town. Most of the indigenous forests and local vegetation on Tinian were bulldozed to make way for sugar cane and other crops.

The Japanese focused on developing Rota in 1930. NKK started its agricultural efforts in the Sinapalo area. Once the land was cleared of vegetation, sugar plantations were laid out and infrastructure was constructed. A refining mill was built on the west side of Songsong village and a railroad was built to connect Songsong and Sinapalo. The Japanese also undertook small-scale mining on Rota. In 1939, the Japanese constructed an airfield at the north end of Tinian, using Korean slave labor.

The Japanese military government took control of Tinian in 1940; Guam was invaded on December 8, 1941. As discussed in Section 1.4.1, the Mariana Islands became battlegrounds during World War II. Tinian and Guam were eventually invaded and occupied by U.S. troops in mid-1944, but the U.S did not occupy either Rota or FDM. The B-29s carrying the atomic bombs dropped on Hiroshima and Nagasaki departed from Tinian's North Field, which was designated a National Historic Landmark in 1987.

The U.S. military essentially abandoned Tinian within a year of the end of World War II and, in 1947, the U.S. and the United Nations reached a trusteeship agreement establishing the Trust Territory of the Pacific Islands. Guam remained under the jurisdiction of the U.S. Navy until 1950, when President Harry S Truman signed the Organic Act, which ended military control and made Guam a U.S. territory. Negotiations in the 1970s resulted in the signing of a Covenant to Establish a Commonwealth of the Northern Mariana Islands in Political Union with the United States of America. The covenant included an agreement to lease approximately 71 percent (28 square miles [72 km^2]) of Tinian's land area to the Department of Defense (DoD) for military training use and as a contingency base, should future conditions require significant forward deployment in the Western Pacific. The amount of land leased by DoD has since been reduced to approximately 60 percent of the island.

Significant historic and prehistoric sites remain from the different cultures that have occupied the Mariana Islands. The most notable artifacts of the ancient Chamorro culture are sets of *latte* stones. These are upright pyramidal stone pillars topped by semispherical capstones, set in two parallel rows in groups of 6 to 12 (see cover of Executive Summary). Numerous *latte* sites, complexes, and remnants can be found throughout Guam and Tinian. In fact, *latte* sets are still being identified and discovered. The most famous is Tinian's House of Taga in the village of San Jose. Its twelve columns once supported a structure at least 54 feet by 10 feet (16.5 m by 3.0 m).

Other Chamorro artifacts that can be found on Guam and Tinian include pottery scatters and stone adzes.

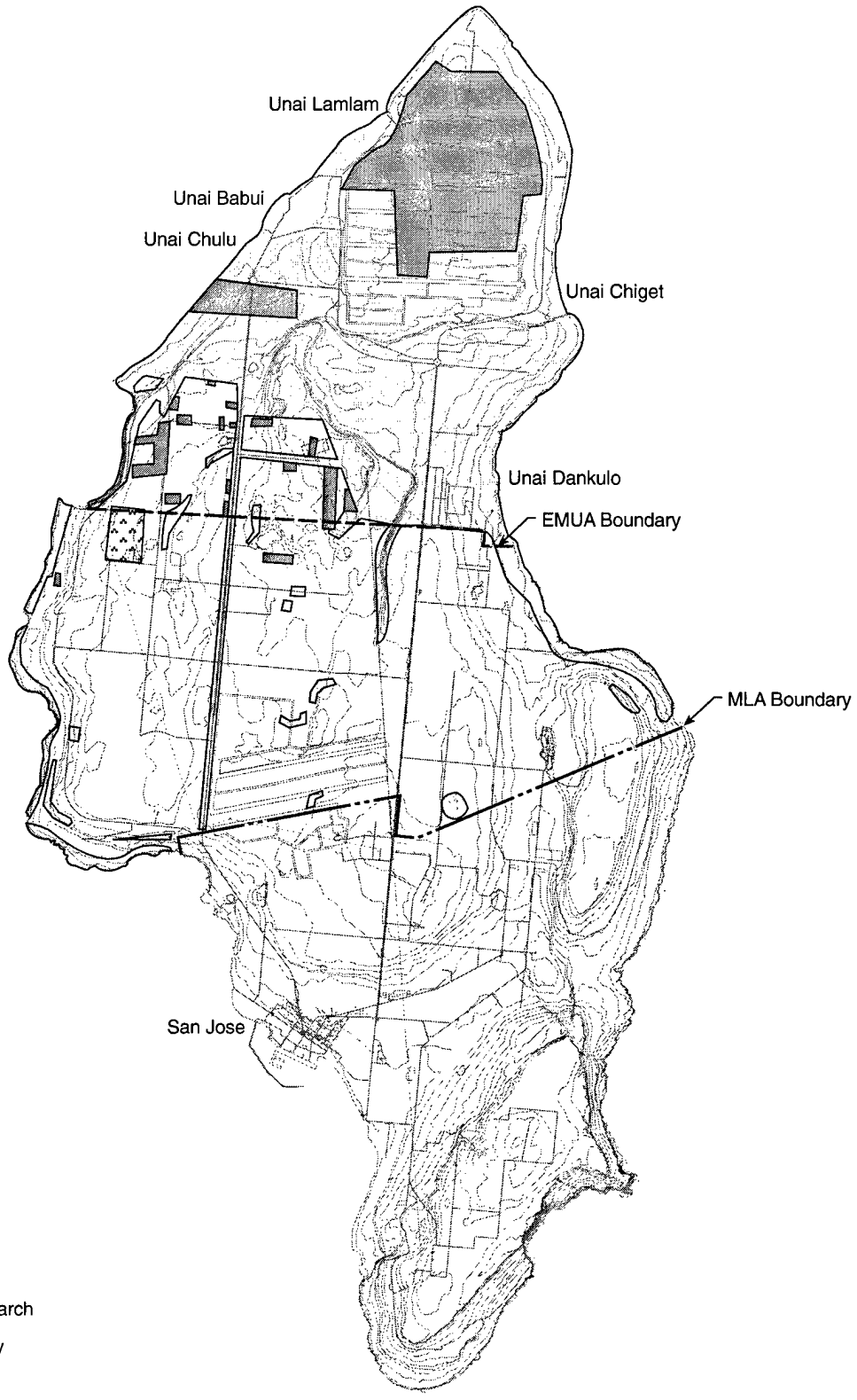
Many cultural resources are located on DoD land on both Guam and Tinian. These cultural resources include buildings, structures, objects, sites, districts, and archaeological resources. Because access to areas under DoD control, such as the Ordnance Annex, is restricted, the cultural resources have been left undisturbed and are well preserved. Detailed information on sites within military lands and training areas is provided in Chapter 4.

3.4.2 Tinian Cultural Resources

Tinian's cultural resources include pre-contact Chamorro sites and many World War II-era sites and artifacts associated with island development by the Japanese and the subsequent U.S. invasion and development. The House of Taga, with the largest *latte* stones in the Marianas, is in a park setting near Tinian Harbor. A large *latte* complex is adjacent to Unai Chulu; other *latte* habitat sites with surface and sub-surface deposits are found near Unai Babui, Unai Dankulo, and Tachogna Beach.

The North Field National Historic Landmark was designated as such by the National Park Service in 1987. The area was a B-29 airbase with four runways, and includes the sites used to assemble and load the two atomic bombs used to end the war. The two bomb-loading pits, many former Japanese military structures, coastal gun emplacements and unit memorial plaques are some of the features in the Landmark District visited by Tinian's tourists.

Cultural resources in the LBA were identified in a series of surveys (see Figure 3-5) and motivated the Navy to implement various measures, such as a Memorandum of Agreement signed in 1994 prior to the Tandem Thrust 95 training exercise. To supplement these agreements, the Navy also developed an interpretive program and trail (see Figure 3-6) for north Tinian, the purpose of which is to inform the public of Tinian's cultural and natural resources and to instill an ethic that emphasizes preservation and protection.



SURVEY INTENSITY

- High
- Medium
- Low
- Site-specific Search
- EMUA boundary
- MLA boundary

Source: Welch & Tuggle, 1996

NORTH

0 1000 2000 (Meters)

0 4000 8000 (Feet)

Figure 3-5
TINIAN ARCHAEOLOGICAL SURVEYS

FEIS: Military Training in the Marianas
Belt Collins Hawaii, June 1999

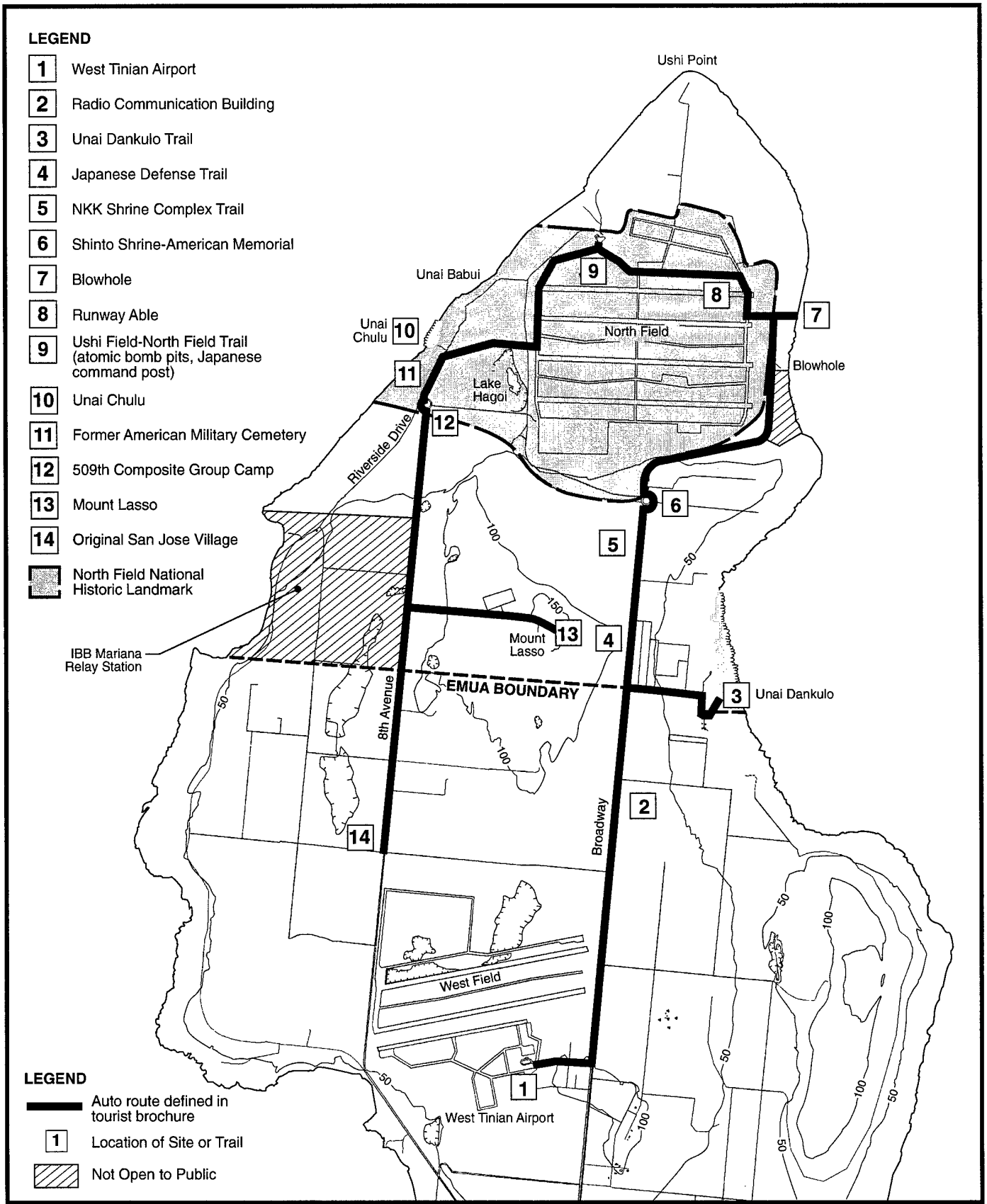


Figure 3-6
TINIAN HISTORIC SITES

FEIS: Military Training in the Marianas
Belt Collins Hawaii, June 1999

3.4.3 Guam Cultural Resources

Guam's oldest archaeological sites are from the Chamorro period, prior to Western contact in 1521. Other sites show evidence of Guam's status as a former possession of Spain, while numerous structures and relics attest to the island's major role in World War II. Many of the known historically significant sites are located on DoD land and are described in detail in Appendix J. Complete inventory surveys for all Guam training areas have not been performed; Figures 3-7 through 3-9 show locations surveyed to date. Surveys are currently being performed on portions of AAFB and areas of the Ordnance Annex. Surveys are ongoing at the Waterfront Annex and Ordnance Annex. A complete survey of the sub-plateau region at the Finegayan annex and predictive surveys of the plateau regions of both Finegayan and Barrigada annexes were recently completed. [52]

The proposed training areas on Guam where activities could be constrained due to known or potentially significant cultural sites include: [53]

- Southern and western portions of Ordnance Annex (numerous *latte* sites)
- Orote Airfield (World War II site)
- Outer Apra Harbor (submerged World War I and II shipwrecks)
- Haputo Beach (remains of 20 *latte* structures in the Haputo embayment)
- Northwest Field at AAFB (World War II site)

Although most of the known cultural resources within the training areas are not vulnerable to training activities, there is a potential for impacts to some important sites on Guam which are listed or eligible for listing on the Guam Register and/or the National Register of Historic Places (NRHP).

Ordnance Annex. The COMNAVMARIANAS Ordnance Annex has many ancient Chamorro habitation sites, some with latte stones, World War resources including structures, former fighting positions in fields and caves, and former gun emplacements. The Alifan Ridge Complex, and recently discovered large *latte* village are located within training areas. The village consists of more than 40 *latte* sets and may be the largest and best preserved of such sites on Guam. A second latte complex consists of 12 *latte* sets and is in the vicinity of the breaching house. The Chamorro habitat and many World War II sites are determined to be historically significant under the National Historic Preservation Act (NHPA).

[52] IARII (April 1999). *Draft Final Report, Phase II Archaeological Survey and Detailed Recording at COMNAVMARIANAS Communications Annex, Territory of Guam, Mariana Islands.*

[53] Significant sites are defined as those eligible for listing on the National Register of Historic Places.

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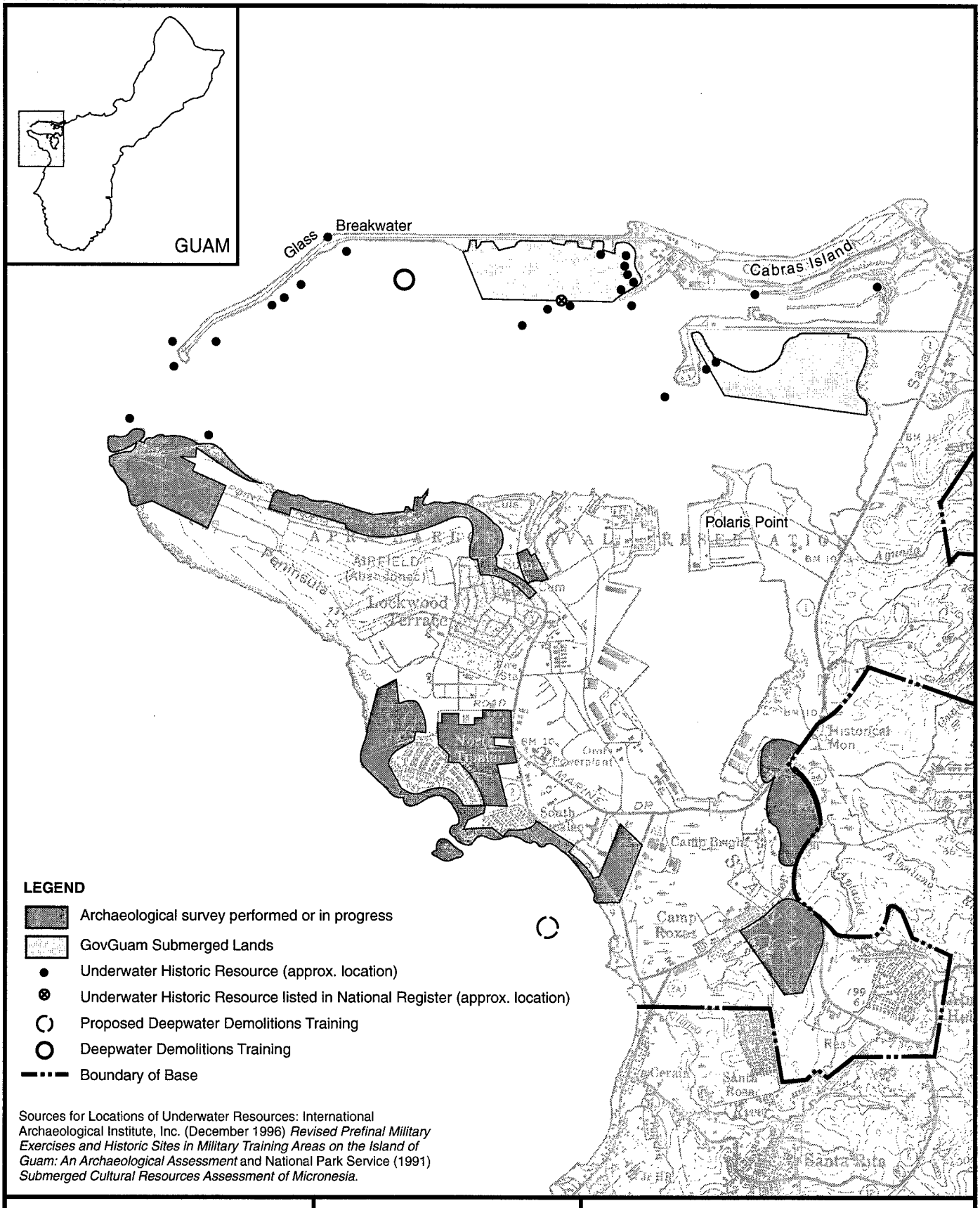
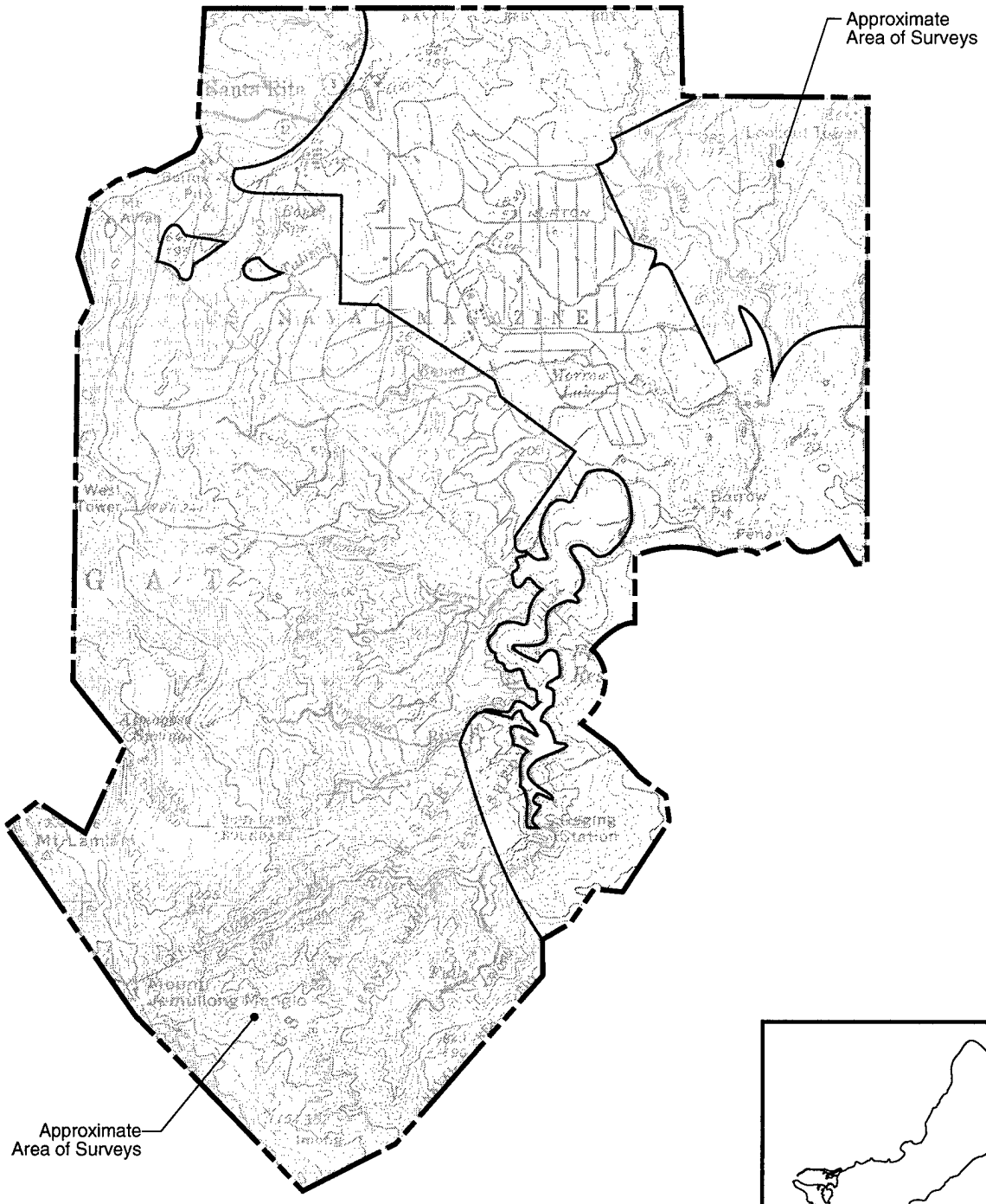


Figure 3-7
WATERFRONT ANNEX
ARCHAEOLOGICAL SURVEYS
FEIS: Military Training in the Marianas
Belt Collins Hawaii, June 1999



NORTH

0 500 1000 (Meters)

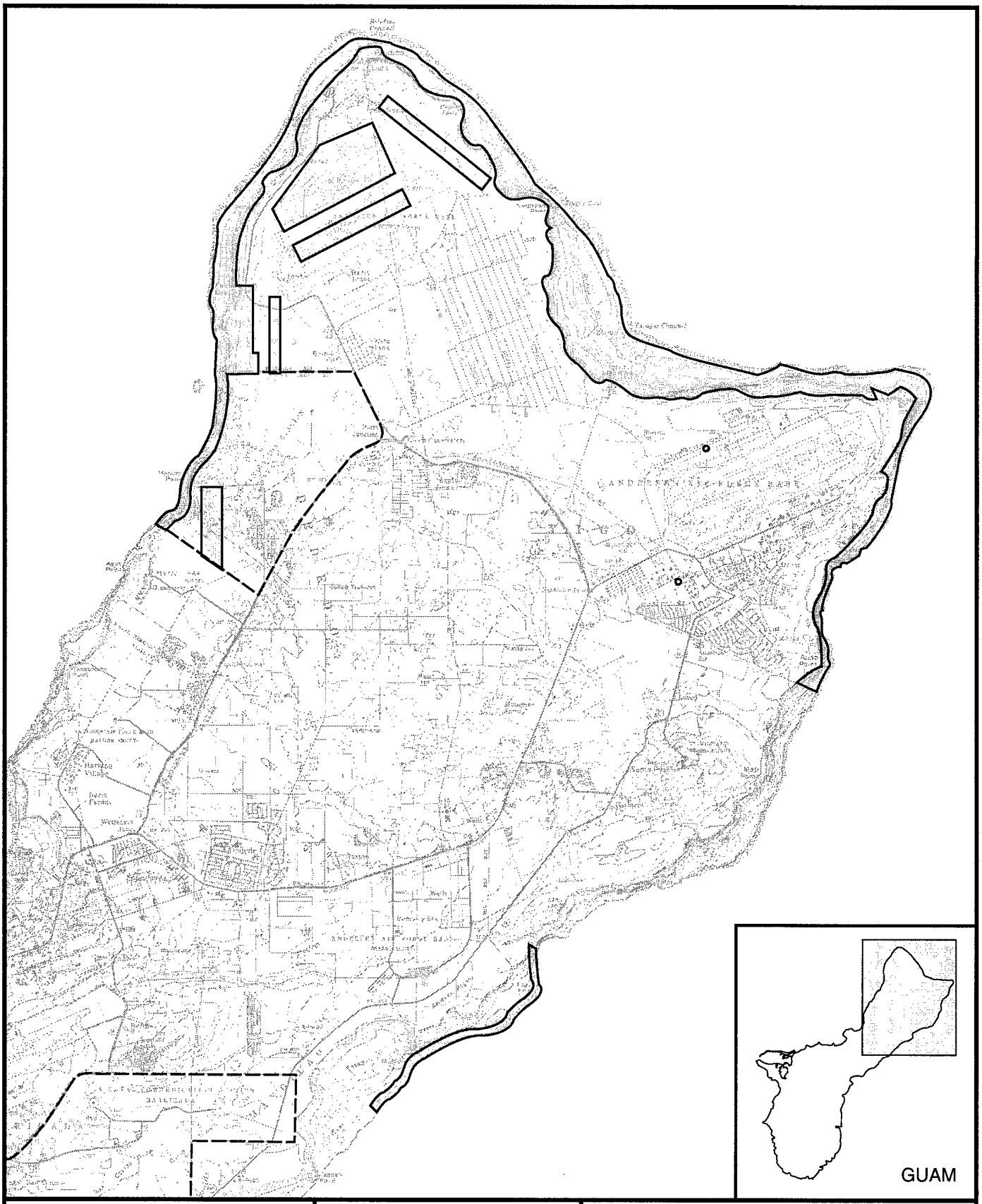
0 2000 4000 (Feet)

LEGEND

Archaeological Surveys
Performed 1995-1998

Figure 3-8
ORDNANCE ANNEX
ARCHAEOLOGICAL SURVEYS
FEIS: Military Training in the Marianas
Belt Collins Hawaii, June 1998

342.0414/018-2 r5.26.99 5



NORTH

0 1000 2000 (Meters)

0 4000 8000 (Feet)

LEGEND

Archaeological Surveys Performed

Figure 3-9
ANDERSEN AIR FORCE BASE/ COMMUNICATIONS ANNEX FINEGAYAN ARCHAEOLOGICAL SURVEYS
FEIS: Military Training in the Marianas
Belt Collins Hawaii, June 1999

Waterfront Annex. The COMNAVMARIANAS Waterfront Annex contains several pre-World War II and World War II Navy structures, and the former Sumay Village area. There are three areas of general concern regarding potential training impacts. Orote Airfield, a significant World War II site, is listed on both the NRHP and the Guam Register.

The Orote Historic Complex contains several important historic features promoted as tourist visit sites. Outer Apra Harbor contains several submerged historic resources including the TOKAI MARU (a Japanese vessel torpedoed in World War II), and SMS CORMORAN (a German vessel scuttled during World War I). Both vessels are listed on the Guam Register and NRHP. (The site used for Outer Apra Harbor underwater demolitions training is more than 0.6 mile [1 km] from them.) Dadi Beach has several significant sites associated with World War II.

AAFB. The coastal areas and Northwest Field are the main areas of concern at AAFB. Several sites listed on the Guam Register, including burial areas, *lattes*, rock shelters, and remnants of prehistoric villages, are located at Pati Point and Tarague. AAFB sites associated with World War II include primarily a large portion of Northwest Field. As a result of an evaluation for its eligibility for National Historic Landmark or NRHP status, the National Park Service issued a determination in November 1998, finding the runways and associated surfaces eligible for listing on the NHRP. Actual boundaries are being determined. The runways remain in use as active training sites for fixed-wing and helicopter units. The only known historic structure at Andersen South is Building 1125. Andersen South also has one prehistoric site, the Pagat Point *latte* site. Both Building 1125 and the Pagat Point *latte* site may have potential significance, although their eligibility status has not been determined.

Haputo Beach in the Communications Annex is the site of a *latte* complex that is listed on the NRHP and Guam Register. Also located in this area are the Pugua Point rock shelters and Tweed's Cave, both of which are potentially eligible to be listed on the NRHP.

3.5 INFRASTRUCTURE, UTILITIES, AND PUBLIC SERVICES

Tinian, Guam, and Rota all have infrastructure, utilities, and public services in place. Each island has its own roads, airports, drinking water systems, municipal solid waste landfills, electrical power plants, fire departments, and telecommunications systems.

In the case of telecommunications, the islands have both individual systems and a shared system. Public telecommunications on Guam is provided by the Guam Telephone Authority (GTA) and in the CNMI by the Marianas Telecommunications Corporation (MTC). The telephone systems on each island are also connected to each other by microwave. Presently, plans are being made to install an undersea fiber-optic cable between the islands to make telecommunications more efficient and cost-effective. Although the resources available on each island are similar, they have developed at very different rates and will be discussed separately. Guam is the most developed of the islands addressed by this EIS. FDM is not discussed since it is an uninhabited, undeveloped island.

3.5.1 Tinian Infrastructure

Roads. Tinian has approximately 68.4 miles (110 km) of roads, most of which were constructed prior to and during World War II. Most roads were developed, graded, and paved for heavy truck traffic when the island's U.S. military population was about 150,000. Roads throughout Tinian are now in good to poor condition and traffic is extremely light. Roadways in the MLA include former runways, taxiways, and parking aprons constructed to support B-24 and B-29 bombers. CNMI's Department of Public Works (DPW) administers the road system. Vegetation clearing along roadway shoulders is supervised by the Tinian Mayor's office.

Airports. The West Tinian Airport has one runway (5,985-feet by 150-feet [1,824 m by 45.7 m]) that was formerly part of West Field, Tinian's second World War II-era airfield. The airport is equipped with a navigational light system but has no control tower or other navigational aids. The FAA at the Saipan International Airport conducts air traffic control for flights in and out of West Field. The limited parking apron space can accommodate two Boeing 727-size aircraft; the passenger terminal is sufficient for about 30 passengers. Airfield activity consists of small commuter flights between 6:00 a.m. and 2:00 a.m. connecting Tinian with Saipan, Rota, and Guam.

Plans have been completed to develop an international airport on Tinian by expanding the existing site. Abandoned West Field Runway #1, north of and parallel to the West Tinian Airport's present runway, will be reconstructed into an 8,700-foot by 150-foot (2,652-m by 45.7-m) runway suitable for large turbo-prop and multi-engine jet aircraft. The existing runway will become a taxiway. Additional connecting taxiways, parking aprons, and a two-story terminal will also be constructed and 8th Avenue will be realigned. The development project will be phased and may begin in 1999.[54]

About 605 acres (245 ha) of additional land will be required for the project. The land is adjacent to the airport's north property line and part of the 1994 Leaseback Agreement between the CNMI government and the U.S. government. Mitigation for the loss of Tinian monarch habitat is planned as 937 acres (379 ha) of reforestation for habitat for the Tinian monarch as well as other wildlife and plant species. [55]

Harbors. Tinian Harbor was constructed in 1944 to accommodate up to eight Liberty Ship cargo vessels, each with a length of about 465 feet (142 m), a beam of 57 feet (17.4 m), and a draft up to 27-feet 9-inches (8.3 m). Harbor capacity remains about the same. There has been extensive deterioration of the sheet piling used for pier and breakwater facing. There has been minor shoaling due to the collapsed breakwater, but very little maintenance dredging has been necessary. The piers are constructed of sheet pile, back-filled with coral material, and topped with concrete and asphalt. The two finger piers (A and B) are generally unusable due to deterioration. The west quay is also degraded and basically unusable for heavy cargo loading or unloading. West of the

[54] Juan C. Tenorio & Associates (1998) *Final Environmental Assessment for Airport Improvements at Tinian International Airport, Island Of Tinian, Commonwealth of the Northern Mariana Islands.*

[55] USFWS Biological Opinion and Conference Report for Military Training in the Marianas dated January 4, 1999.

piers is a concrete ramp suitable in size for use by LCUs and AAVs with an adjacent grassy staging area for vehicles brought ashore or for staging, cleaning, and reloading.

The 2,000-foot (609.6-m) north quay is in better condition; the Navy estimates that it could handle up to 4,500 tons (4,082 metric tons) of cargo daily. The quay is used to moor commercial barges operating between Tinian and Saipan and for hydrofoil ferry service for visitors from Saipan. Two stevedore companies service commercial shipping traffic. Gasoline and diesel fuel can be obtained at the Mobil Oil tank compound at the harbor. The position of the Mobil refueling point and the direction of the harbor flow directs any fuel spill toward the closed end of the two finger piers. A boom is on hand and is used by any boat that is refueled. There are no tugboats at this port.

A master plan exists for the harbor area, reserving heavy industrial port services for Saipan. The plan envisions the Tinian Harbor as a resort, recreation, and general cargo port with sufficient capacity for general and containerized cargo to serve a larger residential and tourist population. [56]

Power supply. Electric power is supplied by three 1,000 kW generators operated by the Commonwealth Utility Commission (CUC). Peak demand on Tinian was 2 megawatts (MW) as of 1994. The system has operated without unplanned outages. The IBB Mariana Relay Station has four 2.5-MW primary power electrical generators and one supplemental generator of approximately 500 MW.

Potable water supply. The Commonwealth Utilities Commission (CUC) supplies Tinian's potable water from a single well located in Makpo Swamp. A 1.9 billion cubic meter (m^3) tank and 0.95 billion m^3 tank are used for potable water storage. Agricultural water is supplied by a well also located in Makpo Swamp. Potable water has been provided to military training units with advance coordination to identify quantities and times to be provided in order to ensure no adverse depletion of municipal storage levels and water pressure.

Wastewater disposal. Tinian does not have a wastewater treatment plant; public and private buildings are equipped with septic tanks or cesspools. The Navy has constructed a septic tank and leach field in the MLA with a capacity to support approximately 2,500 military personnel during major exercises.

Solid waste and hazardous materials disposal. Solid waste (SW) generated on the island by residents is disposed at an open dump located north of San Jose and southwest of the airport managed by the CNMI DPW. Most residents transport their own trash to the dump. The dump is not in compliance with federal solid waste regulations and is not used for the disposal of waste generated by military training activities.

Training generates varying amounts of SW (primarily cardboard and paper) and very small amounts of used oil. Some ongoing training activities generate used lithium batteries, which

[56] Juan C. Tenorio & Associates, Eugene P. Dashiell, Planning Services, Honolulu, and Sea Engineering, Inc., Honolulu (July 1997) *Tinian Harbor Master Plan.*

require transport as hazardous materials, if fully expended.[57] Military training on Tinian does not routinely generate hazardous waste (HW). There is no existing military infrastructure for waste disposal.

A study developed from information provided in a study of waste disposal practices and options generated after the 1995 Tandem Thrust (TT 95) exercise is useful in planning for SW and HW disposal for subsequent major exercises.[58] TT95 involved about 2,000 persons over a thirty-day period with most living and subsisting in bivouac.

Approximately 222 cubic yards (107 cubic meters) of SW was generated and at least 90 percent of the waste consisted of "traypack" meals, associated paper and cardboard packaging, and paper plates. The remaining 10 percent consisted primarily of plastic eating utensils, aluminum, glass and plastic beverage containers. SW was transported to Guam by a contractor (Guahan Waste Control, Inc.) and disposed at the PWC landfill at the Waterfront Annex after steam sterilization.

SW generated during relatively small exercises, e.g., National Guard and Army Reserve units training on Tinian, has been backhauled to Guam by the training unit and disposed at the PWC or AAFB landfill. Waste generated by other organizations training on Tinian has been backhauled to the originating unit's home location and disposed with that location's SW.

The volume of SW to be backhauled annually to Guam from Tinian could range from about 143 to 287 cubic yards (110 to 220 cubic meters). This assumes that the total SW generated by National Guard and Army Reserve units annually approximately equals the volume of TT95 waste, and that TT exercises will continue to occur every other year.

Tinian does not have a hazardous waste or hazardous material handling facility. Any hazardous waste or material generated by military activities would be transported off island for action by the Defense Reutilization and Marketing Office (DRMO).

No HW is routinely generated during military training. Small amounts of used oil resulting from unexpected vehicle repair or small releases are transported as SW. Once received by PWC or DRMO on Guam, the oil can be tested for hazardous characteristics to determine whether it should be classified as HW. All HW is managed and stored at PWC or AAFB temporary storage areas operated in compliance with RCRA regulations

Lithium batteries are used to power most field radio equipment. These batteries are considered to be hazardous materials (HM) by virtue of their potential to rupture, causing an explosion and/or fire. Used lithium batteries are recycled They may be transported from a simulated combat area without special packaging. Upon reaching a nontactical airport, they are transported in accordance with DOT and DoD regulations regarding HM.[59]

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[57] Expended lithium batteries are recyclable materials, which are returned to the U.S. mainland for recycling. If not recycled, they must be classified as HW.

[58] Earth Tech, Inc. (1996) *Tandem Thrust 95 Solid Waste and Sludge Management Plan.* Prepared for Department of the Navy, Pacific Division, Naval Facilities Engineering Command.

[59] Joint publication AFJMAN 24-204/TM 38-250/NAV SUP PUB 505/MCO P4030.19F/DLAM 4145.3 (25 November 1994) *Preparing Hazardous Materials for Military Air Shipments.* Chapter 3 Tactical Contingency or Emergency Airlift, Section 3-8 "Lithium Batteries" specifies that used lithium batteries may be transported installed in electronic equipment if installed in a battery box or

Installation Restoration and Solid Waste Management Units. Various sites at AAFB and COMNAVMARIANAS annexes may be designated as Installation Restoration (IR) or Solid Waste Management Units (SWMU), or as other sites that are undergoing site investigation or cleanup. These areas are off-limits to training activities to avoid spreading hazardous materials throughout any of the bases. Upon completion of site remediation, appropriate future land uses that could include training will be identified.

Firefighting capabilities. The Tinian Fire Department is undermanned and relies on residents acting as a volunteer fire department. Firefighters primarily protect inhabited structures. Field fires are often allowed to burn themselves out if no structures are in danger. San Jose Village has two fire engines, one pickup truck for brush fires, an ambulance, and a water tanker truck. Additional firefighting equipment is assigned to the West Tinian Airport.

3.5.2 Guam Infrastructure

Roads. Guam's public road network consists of over 404 miles (650 km) of paved roads, which range from two-lane rural to seven-lane urban arterial roads. The Government of Guam's Department of Public Works is responsible for system management and maintenance. Most of the highway infrastructure was built by the U.S. military following the end of World War II and is a reflection of the desire for efficient connections between various military installations. Following a vigorous road improvement program, the island's road network is in relatively good condition. Traffic on Guam is heavy in certain areas. The traffic on major routes is particularly heavy during morning and evening commuter rush hours.

Airports. The only civilian air transportation facility on Guam is the Guam International Air Terminal (GIAT), operated by the Guam International Airport Authority (GIAA), a public corporation and autonomous agency of the Government of Guam (GovGuam). GIAT, about 5 km northeast of Agana, uses two runways and related facilities that are part of the now-closed Naval Air Station (NAS) Agana. GIAT handles nearly all of the military and commercial flights into and out of Guam. Eight major airlines operate there, making it the hub of air transportation for Micronesia and the Western Pacific. The only other major aviation facility on Guam is at AAFB, which handles Air Mobility Command flights for military personnel and their dependents. Commercial aircraft may occasionally fly through Andersen's airspace, but only with permission from the AAFB control tower.

Harbors. Apra Harbor is an improved natural harbor that provides sheltered anchorage. The outer harbor features a general anchorage area for the commercial port, as well as 14 Navy moorings. The Navy owns and operates the entire inner harbor south of the main port area and its 11 moorings. Both Navy and civilian facilities exist in the outer harbor. The Navy controls the majority of the outer harbor's submerged lands. The commercial Port of Guam handles all commercial activity and is managed by the Port Authority of Guam (PAG). All goods shipped to

compartment, without additional packaging. Used lithium batteries not installed in equipment may be airlifted from a forward area (i.e., close proximity to combat or simulated area) provided each battery is wrapped in nonconductive material to prevent short-circuit. However, at the first en route airport before further airlift, batteries must be properly packaged (i.e., individually wrapped in nonconductive material) and placed in an outer container.

Guam (with the exception of military weapons, ammunition, and heavy equipment) are received at the Port of Guam. As the tourist industry grows and Guam continues to ship in approximately 90 percent of its commercial goods, the port stands as one of the busiest and most important areas on the island.

Power. The Guam Power Authority (GPA) is the main supplier of Guam's electrical power. Electricity is produced primarily by three base load steam-electric generating stations at Cabras, Tanguisson, and Piti. The Cabras facility generates more electricity than the other two plants combined. Prior to the construction of GPA facilities, the Navy provided electrical power to the entire island. A series of joint-use agreements made since 1972 have gradually turned over power generation responsibilities to GPA. In August 1992, a Customer Service Agreement established the Navy and Air Force as customers of GPA. In addition to the regular supply from GPA, all Navy and Air Force installations maintain facilities for emergency power and peak power generation.[60]

Potable water supply. The Guam Waterworks Authority (GWA)[61] maintains and operates the island-wide water distribution system. This integrated system has a capacity of 11,400 cubic meters per day (m^3/d) and services a majority of the civilian areas on Guam. About 70 percent of GWA's water is supplied by 92 wells tapping the Northern Lens Aquifer, which has an estimated sustainable yield of up to 60 mgd. In south-central Guam, GWA's Ugum River Diversion Project diverts 7,500 to 15,000 m^3/d from the Ugum River to supply the districts of Talofofo and Umatac. The GWA system relies on direct well-to-consumer service with only minimal water storage. Therefore, power outages significantly hinder its water distribution capability. The Navy and Air Force acquire potable water from five and 10 wells, respectively. The Navy operates and sells water from its Fena Watershed system to GWA for distribution to civilian areas in southern Guam. Eight private water supply wells are located on civilian property in various locations on Guam.

Wastewater disposal. The civilian wastewater collection system is operated and maintained by GWA. A separate wastewater collection system serves the Navy's Waterfront Annex. The GWA-operated system is divided into three regions, two of which contain DoD commands. One additional region is formed by the Navy-owned and -operated Waterfront Annex collection system. A total of eight wastewater treatment plants service the island.

Solid and Hazardous Waste Disposal. Municipal solid waste (SW) is collected by the Department of Public Works (DPW) and private haulers, and disposed of at the Ordot, Asan, and Cabras Sanitary Landfills. The military also maintains sanitary landfills on Guam. The Air Force operates a landfill at AAFB and the Navy's Public Works Center (PWC) operates one in the Orote Peninsula area of the Waterfront Annex. No military-generated municipal SW is disposed of at the Ordot Landfill.

Civilian-generated hazardous waste (HW) is handled by private operators; the Defense Reutilization and Marketing Office, Guam (DRMO) is responsible for cataloging and storing HW

[60] Guam Power Authority (1992) 1992 Long Range Transmission Planning Study.

[61] GWA was formerly the Public Utility Agency (PUAG).

and hazardous materials (HM) for military installations. DRMO Guam receives the HW/HM, stores and packs them as necessary, and arranges for their eventual disposal or recycling. DRMO Guam is also responsible for the disposal of HW/HM from DoD activities at places such as Yap, Chuuk, Saipan, and Diego Garcia. The Navy PWC handles the packing and transporting of hazardous wastes and materials from most Navy activities to DRMO. The PWC goes to the activity storage area, loads the HW/HM, and returns to the PWC HW/HM storage facility, where they further pack the materials. The HW/HM are then transported to DRMO for inventory control and storage until they can be sent off island for disposal. The materials generated by the Air Force are stored and packaged at AAFB and transported by Air Force personnel to the DRMO facility.

Installation Restoration and Solid Waste Management Units. Various sites at Andersen AFB and COMNAVMARIANAS annexes may be designated as IR, SWMU or other sites requiring investigation and cleanup. These areas are off-limits to training until remediation is completed and land use is restored in order to eliminate the potential to spread hazardous materials throughout the bases.

Firefighting capabilities. Guam has both civilian and military firefighters, either of which may respond to emergencies as necessary. There are approximately 300 full-time professional civilian firefighters operating eight civilian fire stations. The Navy operates seven fire stations and the Air Force operates three fire stations. Both the Navy and Air Force have mutual aid agreements with the GovGuam fire department as well as an interservice support agreement with each other. In addition, the Navy contributes water buckets that can be used as external loads for fire extinguishing. HC-5, the Navy's on-island helicopter squadron, flies the fire bucket missions and provides area search-and-rescue support (and routine MEDEVAC service from Rota to Guam).

3.5.3 Rota Infrastructure

The information in this section is summarized from a 1995 master plan study of Rota's physical and economic resources.[62]

Roads. Rota's roadway system consists of 87 miles (140 km) of road and village streets. All of the streets are in the villages of Songsong and Sinapalo. Most of the roads were built during the post-World War I period, when Rota was controlled by the Japanese, and are presently in poor physical condition. Only about 12 miles (19 km) of the roadway system, between Songsong and the airport and within the village itself, is paved. Although the roadway system is in relatively poor condition, the entire island, except for the southern sloped areas, is accessible.

Airports. Rota International Airport is about 11 miles (18 km) northeast of Songsong and is surrounded by agricultural activities and pastureland. A single asphalt runway services the facility. The terminal lies approximately .5 mile (730 m) from the eastern end on the south side of the airfield. A single taxiway connects the runway with the aircraft parking apron and air passenger terminal.

[62] Juan C. Tenorio & Associates, Inc. (December 1995) *Physical and Economic Master Plan for Rota, Commonwealth of the Northern Mariana Islands, Rota Island.*.

Harbors. Rota has two harbors, the West Harbor at Sasanlagu and the East Harbor at Sasanhaya. The West Harbor is west of the Tapingot Peninsula and was originally developed to serve a Japanese sugar mill operation. The existing facilities were constructed around 1978 and consist of an entrance channel and turning basin. The narrow channel entrance combined with the prevailing crosswinds and variable currents restricts navigation to boats and other small crafts.

The East Harbor is on the southeastern tip of the island. The East dock is mainly used for discharge of fuel and as a docking facility for glass-bottomed tour boat operations.

Power supply. Electric power is supplied by a CUC-operated 5.2-MW power plant located in Songsong Village. The power plant contains two 2.6-MW Mitsui diesel engines. As of June 1, 1995, Rota's power has been rationed because one of the 2.6-MW units is out of service. Nonessential services, such as streetlights, have been temporarily disconnected.

Potable water supply. Potable water on Rota is supplied by the Matanhanom and As Onaan springs. A ductile iron water line connects the springs to 3.8 billion m^3 and 1.9 billion m^3 reservoirs that supply Songsong and Sinapalo, respectively. The existing water supply and distribution system barely meets the population's needs. Primary concerns are the lack of adequate pressure in some areas of Songsong and Sinapalo, water rationing during evening and night hours, and the inability to provide chlorinate (disinfect) an adequate and consistent water supply.

Wastewater collection. Presently, Rota does not have an operating sewer system. The Variable Grade Sewer (VGS) system installed on certain streets of Songsong was never activated due to a storm that destroyed the outfall shortly after completion. Either septic tanks or cesspools presently service public and private facilities.[63]

Solid and hazardous waste collection. A majority of the SW is disposed of in the Songsong Dump, which located in Northern Rota approximately 2 miles (3 km) from Songsong and operated by CNMI DPW. The Tatachog dump, granted permits by the CNMI's Department of Environmental Quality (DEQ), is located in an abandoned quarry site. Residents and businesses are responsible for transporting their own waste to the dump. Neither dumpsite is in compliance with federal SW regulations. Rota does not have a HW disposal facility and there are no provisions for off-island transport of HW.

Firefighting capabilities. Ten firemen, two cadets, and three civilians staff the existing fire station in Songsong Village. There are three fire trucks, including one large and two small vehicles. As of 1996, one of the small trucks was out of service. The fire station also has two ambulances that service the entire island.

[63] Personal communication with Crispin M. Ayuyu, Office of the Mayor, Rota, January 20, 1997.

3.6 SOCIOECONOMIC ENVIRONMENT

Residents born in Guam and the CNMI are U.S. citizens. Since the end of World War II, Guam has experienced steady and considerable growth of its tourist industry and business community. It has become a hub of Western Pacific transportation and communication, in addition to being the home of the only U.S. military installations on U.S. soil in the Western Pacific. Tinian and Rota continue to develop, but at a much slower pace than Guam. FDM is not discussed in this section because it is uninhabited.

The majority of Marianas residents are Chamorro or part-Chamorro. The main employers are the government, tourism, construction, and the military. Tourism is the fastest growing industry in the islands and may soon surpass other industries as more resorts are developed.

3.6.1 Tinian Culture and Economy

Tinian's population is concentrated in the village of San Jose, which is situated on the southwest coast at the site of a natural harbor. As of the 1990 census, there were 2,118 residents and nonresidents on the island, of whom about half were of Micronesian ancestry. No military personnel are permanently stationed on Tinian. Languages spoken on the island include Chamorro, English, Tagalog, Carolinian, Japanese, Korean, and Sri Lankan (Tamil).

Tinian is a largely undeveloped island. Its economic growth has been slow despite the 1989 initiative to legalize casino gambling. Tinian's economy can be broken down into the following sectors: government employment, tourism, agriculture and fishing, consumer trade, and air service and airport operations. The government employs about 75 percent of the Tinian labor force.[64] Many island residents also engage in subsistence farming/fishing. Hopes for Tinian's future economic growth is mainly dependent on the success of its casino and hotel industry.

3.6.2 Guam Culture and Economy

Guam's population is concentrated in the central portion of the island, particularly in the capital city of Agana. In 1994, the population of Guam was 145,881. The ethnic composition of the island is 43 percent Chamorro or part-Chamorro, 23 percent Filipino, 14 percent Caucasian, 5 percent other Pacific Islanders, and 15 percent other ethnic groups. Approximately half of all residents were born on Guam, and 70 percent of them were under the age of 34 in 1990.[65] Languages spoken on the island include English, Chamorro, Tagalog, and Japanese.

The major components of Guam's economy are the government, military, tourism, and construction. Government and military employment account for approximately one out of every three jobs, while tourism is the fastest-growing industry. Unemployment on the island was about

[64] Ernst & Young (March 1996) *Draft Socioeconomic Report.* Prepared for Belt Collins Hawaii.

[65] Community Resources, Inc. (August 1992) *Socioeconomic Impact Assessment of New U.S. Navy Activities in Guam.* Prepared for Belt Collins & Associates.

7.8 percent at the end of 1995.[66] In several industries, most notably construction, a severe labor shortage requires the importation of foreign workers to fill the positions.[67]

3.6.3 Rota Culture and Economy

In 1992, the population of Rota was 2,561, comprising mostly residents of Chamorro descent. The people reside in Songsong and Sinapalo villages. The main languages spoken on the island are Chamorro, English, and Carolinian. Most of Rota remains agricultural or natural habitat with a few scattered, mixed-use residential, commercial, and industrial areas located in the rural interior.

Rota's economic base relies primarily on the CNMI government, construction, and small-scale tourism activities. There is a high degree of subsistence activity with many families supplementing their income with farming and fishing. Several new hotel/golf resort developments are either proposed, permitted, or under construction.

3.7 MILITARY LAND USE

The Mariana Islands offer a prime strategic location for military installations. Guam has had a U.S. military presence since the 1898 Spanish-American War, was invaded and occupied by Japanese military forces between December 8, 1941 and March 1942, and retaken by the U.S. in June to August 1944. U.S. forces retook Saipan and Tinian during the same time frame. Major air bases were developed on all three islands and served as launching points for World War II bombing raids on Japan. During the Korean War and Vietnam War, additional air forces were sent to perform long-distance reconnaissance and combat missions. To keep a strong presence in the Pacific and Asia, the U.S. military has continued to maintain several bases on Guam. The bases currently have fewer permanently stationed personnel than in the past and primarily perform a supporting role for transient military forces deployed to the Pacific for training and operations. The military installations comprise approximately 20 percent of Guam's land area (including the former NAS Agana, which is in the process of being returned to GovGuam). A major initiative affecting the military use of land on Guam is the Guam Land Use Plan Update (GLUP '94) published in June 1995. The plan reviewed all DoD land requirements on Guam, considered the rationale for military landholdings, combined services' use of real property, and the environmental effects of military land use. The plan identified 8,081 acres (3,64 hectares) of land that are considered releasable and another 126 acres (51 hectares) as potentially releasable. Obtaining development controls was recommended for approximately 133 acres (54 acres).[68]

Another land use initiative affecting military training is the Base Realignment and Closure (BRAC) program. BRAC is a congressional program that has decreased the number of bases operated by the U.S. military at home and abroad. It has resulted in the planned closure and release of various military lands on Guam. Before the lands can be transferred to the GovGuam,

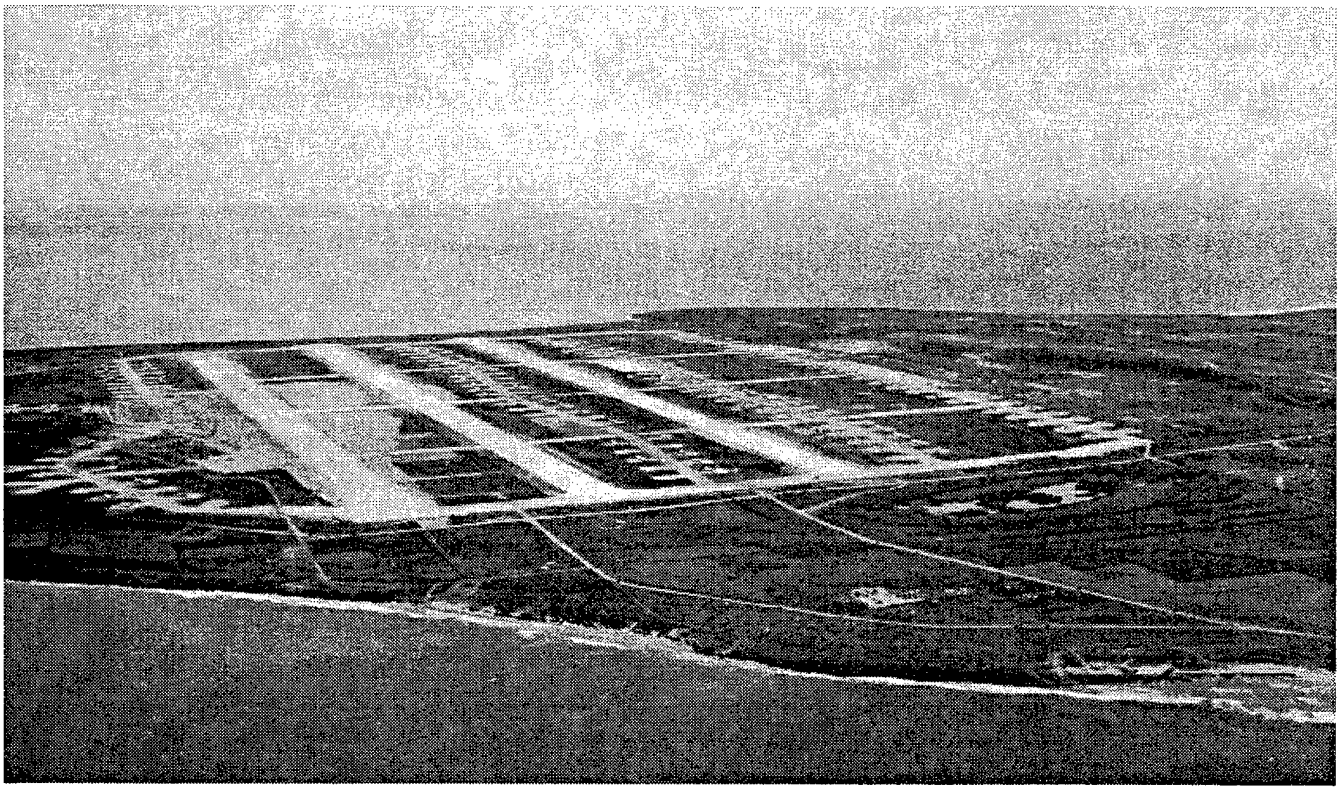
[66]Personal communication with Rick Boice, Ernst & Young, May 29, 1996.

[67]Community Resources, Inc. (August 1992).

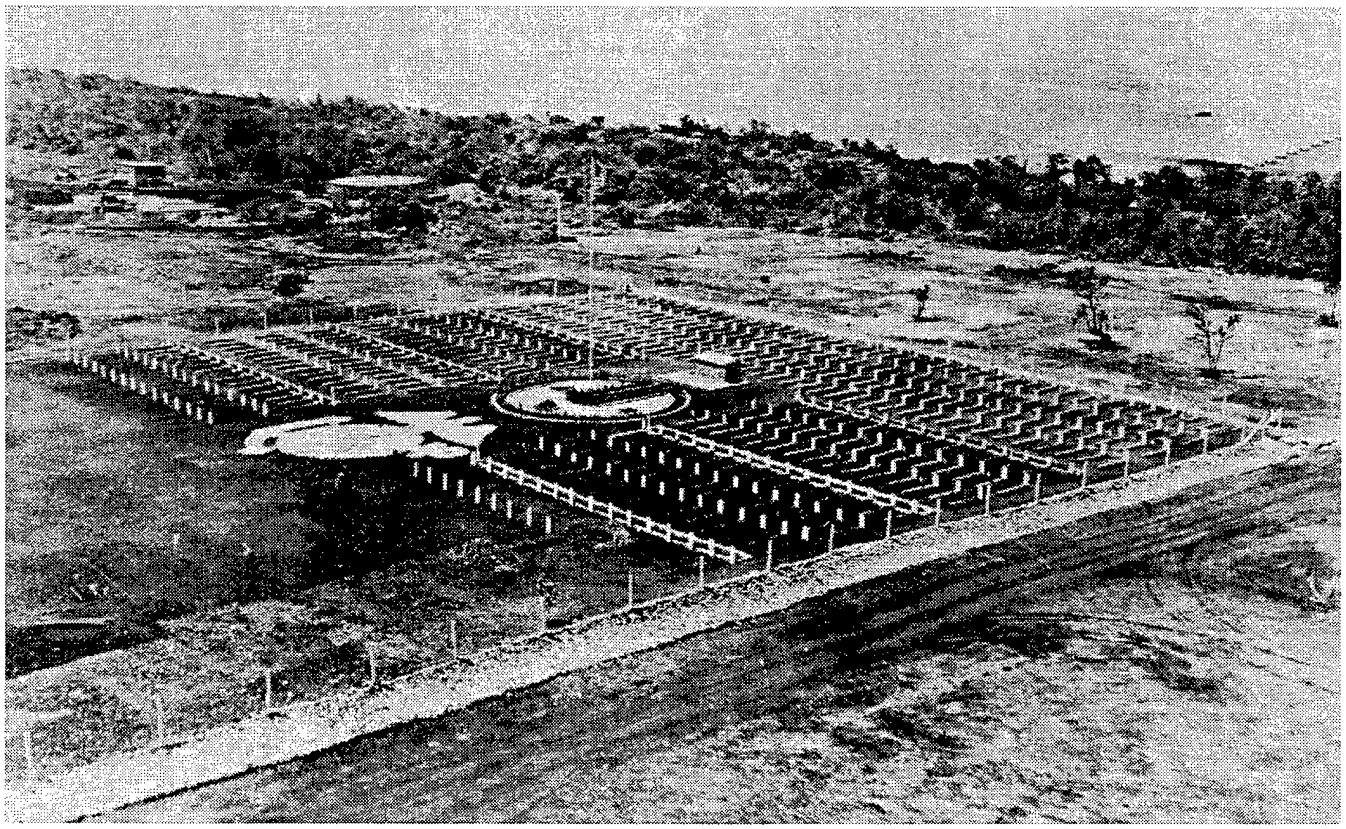
[68] Pacific Division, Naval Facilities Engineering Command (April 1995). *GLUP 94, Guam Land Use Plan Update*. Prepared for CINCPACFLT/PACAF.

local officials must decide on how to use the land. GovGuam has submitted a proposed master plan for the future civilian use of NAS Agana. Business Reuse Plans are also prepared for the former U.S. Naval Ship Repair Facility (SRF) and portions of lands once managed by the Fleet Industrial Supply Center (FISC). Through interim leases, GovGuam has use of facilities at the former naval air station and the shipyard as base cleanup procedures continue in preparation for permanent land and facility conveyance. On October 1, 1997, the Navy leased the SRF area to the Guam Economic Development Agency (GEDA), which in turn sublet to XenoTechnix Corporation, which now operates the Guam Shipyard repairing Navy and commercial vessels.

The U.S. military does not have any permanently stationed personnel on any CNMI island. On Tinian, use of military land is affected by the terms of various lease agreements and the allocation of a portion of the EMUA to the IBB for its transmitting facility. Certain maneuver training is permitted in the LBA, provided that the CNMI is notified in writing prior to a given exercise. Training on the IBB parcel is not permitted to ensure that personnel do not enter the antenna fields. (See Appendix O for copies of Lease and Leaseback Agreements between the CNMI and the U.S. government.)



North Field, Tinian, 1944-1945 (National Archives at College Park)



American cemetery, Tinian (Smithsonian Institute, National Air and Space Museum)

CHAPTER FOUR

ENVIRONMENTAL CONSEQUENCES

FEIS: Military Training in the Marianas
Belt Collins Hawaii, 1999

CHAPTER FOUR:ENVIRONMENTAL CONSEQUENCES

This chapter primarily focuses on detailed evaluations of the potentially significant issues that were identified during scoping and the significance screening summarized below: protected species, archaeological resources, public safety stemming from range and aviation activities, socioeconomic impacts, and, specific to Tinian, wastewater and solid waste (SW) disposal.

4.1 IDENTIFICATION OF ISSUES

4.1.1 Determining Levels of Significance

CEQ regulations provide that the following should be considered in determining if an issue is significant under NEPA:

- Affects public health and safety.
- Affects unique characteristics of a geographic area (historic/cultural resources, wetlands, ecologically critical areas, wild/scenic rivers, and parks).
- Is highly controversial.
- Involves highly uncertain, unique, or unknown risks.
- Establishes a precedent.
- Generates cumulatively significant effects.
- Involves sites listed or with the potential to be listed on the National Register of Historic Places.
- Affects plants or animals listed as threatened or endangered under the Endangered Species Act.
- May violate laws or requirements imposed for protection of the environment.

Table 4-1 on page 4-7 summarizes the screening analysis and identifies the reasoning by which issues were determined to be potentially significant or not significant. Issues determined to be potentially significant were studied in greater detail. Those issues and potential impacts identified as not significant and readily mitigated have been considered and are itemized, but detailed analysis was deemed not necessary.

4.1.2 Impacts Mitigated to Nonsignificance by Existing Training Management Requirements

Military organizations are required to comply with existing federal environmental regulations and Executive Orders, as well as with military orders which specify detailed means to implement environmental management and protection measures. Compliance with military orders and with federal environmental regulations enables training units to routinely avoid many otherwise potentially adverse impacts. Therefore, because CEQ regulations direct that environmental

analysis in an EIS focus on significant issues, such impacts are itemized but not analyzed in detail in this document.

The sections below review certain potential impacts that will be routinely mitigated (i.e., avoided) by adherence to existing orders and regulations. All mitigation specified in this EIS will be written into standing orders regulating training on Guam and Tinian. In addition, environmental protection measures are developed and published as annexes for large scale exercise plans. Therefore, all proposed mitigation measures will be available for distribution to training units and their compliance will be monitored.

In addition to site-specific orders, all training units have organic orders and SOPs that regulate their activities and mitigate potential environmental impacts. These orders provide information and guidance for certain training activities and for training at specific locations, including notifications, pollution prevention, supply and logistics constraints, waste management procedures, and spill prevention for petroleum products and hazardous substances. Specific impacts to be mitigated by compliance with existing orders and regulations are discussed in the following sections.

4.1.2.1 Surface and Marine Water Quality

Training units and facility training orders specify measures to prevent contamination of surface waters and groundwater by discharges produced by training personnel. The measures apply to mess and medical facilities, field sanitation, and vehicle fueling, equipment maintenance and repair, and disposal of water purification process discharge. The following preventive measures are specified:

- Containment berms, pans, or liners will be used during all activities involving POL transfer or replacement.
- Mess facilities will direct all wastewater through a grease trap prior to discharge to the soil or will use tray-packs, which do not generate any cooking waste.
- Medical waste will be contained and disposed of at an appropriate, licensed facility.
- Ships engaged in training activities will not discharge solid waste within 25 nautical miles (nm) of any island and will use all available means to cause unprocessed garbage to sink as rapidly as possible.
- All construction performed by the Seabees will include erosion controls to prevent sediment runoff into surface waters.
- Grey water generated from Reverse Osmosis Water Purification Unit (ROWPU) operations will not be emptied into any body of water and will be allowed to leach or will be hauled to a wastewater treatment plant for disposal.

4.1.2.2 Range Safety

This EIS is evaluating potential impacts of existing as well as proposed live-fire ranges on lands shared with other activities. Site-specific, potentially significant impacts to persons on or near a live-fire range will be addressed in more detail in this chapter as a public safety issue. As

background for the discussion of potential public safety issues, the following information regarding routine range management is provided.

Range Development. The EIS discusses new proposed ranges in concept only, concentrating on environmental feasibility. Actual range design and siting criteria are published for each weapon system and approval for design, development and range operations must be obtained from the Chief of Naval Operations (CNO) and the Commander, Naval Facilities Engineering Command (NAVFAC). For ranges proposed for development in the COMNAVMARIANAS Ordnance Annex, the plans also have to be approved by the Naval Ordnance Center (NOC).

Range Regulations. Safety regulations are established for all live-fire ranges. The range area normally includes both a firing line and associated surface danger zone (SDZ) in which all activities are stringently restricted and safety measures enforced. Prior to live-fire training activities, the designated officers-in-charge of training and the range safety officers are required to demonstrate knowledge of range regulations, restrictions, and responsibilities. The Standing Operating Procedures (SOPs) and orders for each range list the specific constraints used to manage potential impacts caused by weapons and demolition training. These directives identify the responsible command and define range boundaries, firing lines and SDZs, permissible live-fire training activities, required levels of supervision, communication, and medical and firefighting support required on the range or on-call during training. The range regulations are distributed to all units requesting the use of training areas and live-fire ranges in the Marianas

Notifications. FAA and USCG regulations define required publication and notice procedures to airmen (NOTAM) and mariners (NOTMAR), which warn the public to avoid certain areas at published times. The USCG and CNMI Emergency Management Office conduct marine-band broadcasts of NOTMARs in advance of any training activity at FDM and at-sea Naval ranges. COMNAVMARIANAS and AAFB are responsible for public announcements for newspaper, radio, and television dissemination as needed. Weapons activity with the potential to interfere with civilian aviation is required to occur within a defined Controlled Firing Area and to meet other requirements of FAA Order 7400.2D.

Warning Signs and Observation. To ensure tourist and resident safety within training areas that are accessible to the public, military traffic control and range safety observation posts (including oversight of SDZs) are established, with positive communication to officers-in-charge of training and range safety personnel. Warning signs are posted on land and shorelines to warn those approaching an SDZ and training range area on foot, in vehicles, and in watercraft. Range gates, range flags and sentry posts are established as necessary to provide security at ranges and SDZs. If necessary, manned roadblocks are established to ensure that unauthorized persons remain clear of the range training activity.

4.1.2.3 Electromagnetic Radiation

Zones of electromagnetic radiation (EMR) are generally found around transmitting antennas where high density electromagnetic fields may pose a hazard to personnel, ordnance, or fuel operations (HERP, HERO, and HERF, respectively), or where such fields may interfere with aviation electronics equipment. Each piece of equipment has a known hazard radius, and all portable transmitters will be sited to avoid such hazards. All field military communications

equipment have been tested for HERP, HERF, and HERO and are operated only in modes that do not present a hazard. Standard communications equipment is operated in an authorized manner in frequency bands assigned for use in accordance with Federal Communication Commission (FCC) and military policy. During transmission periods, personnel manning the vehicles monitor the equipment and the surrounding area to ensure that no one comes within hazardous range. These transmissions are not known to be of sufficient strength to pose a hazard to wildlife.

The International Broadcasting Bureau's Voice of America Mariana Relay Station on Tinian does not pose any radiation hazard to persons training in nearby authorized areas. Training is not conducted in the vicinity of the station's antennas.

4.1.2.4 Hazardous Materials/Hazardous Waste Management

All military units follow unit and site-specific SOPs regarding hazardous materials and hazardous waste (HM/HW) management. Protocols are established for HM/HW management on Guam's military bases. HM/HW SOPs and plans comply with federal regulations (Resource Conservation and Recovery Act [RCRA], Comprehensive Environmental Response, Compensation, and Liability Act [CERCLA], Superfund Amendment and Reauthorization Act [SARA], Toxic Substances Control Act [TSCA], Clean Air Act [CAA]. Department of Transportation [DOT] regulations cover transport of HM/HW) and Territorial and Commonwealth regulations on HM/HW management.

A Solid Waste and Hazardous Materials Plan is published for major exercises conducted on Tinian where there is no established HM/HW facility. (Potential impacts related to inter-island transportation are discussed in more detail in Section 4.2.4.)

4.1.2.5 Construction Management Practices

No proposed construction will be approved and initiated without complying Guam/CNMI permitting requirements and establishment of standard Best Management Practices to prevent sediment runoff, fugitive dust, and erosion.

4.1.3 Issues of Potential Significance

The screening process summarized in Table 4-1 identified eight issues that required more detailed evaluation to determine required mitigation and training constraints:

Issue 1: Impacts on Biological Resources. Guam, Tinian, Rota, and Farallon de Medinilla are homes to a variety of threatened and endangered species, particularly native birds, migratory sea birds, and sea turtles. On Guam, proliferation of the introduced BTS has resulted in eradication of most native bird species. Prevention of BTS introduction from Guam to other islands of the CNMI or Hawaii during personnel or equipment transport may be the most significant issue addressed in this EIS. In addition, certain proposed training activities might result in an "accidental take" (including noise impacts) of an endangered or threatened bird, bat, or other listed animal. Finally, proposed amphibious vehicle landings and underwater demolition training have the potential to damage nearshore and reef coral.

Issue 2: Preservation of Cultural Resources. Training sites on Guam and Tinian contain ancient Chamorro archaeological sites valuable for data collection and, in some cases, recommended for preservation. In addition, it is important to preserve certain remains of World War II structures as part of local and world history. Proposed training activities include ground disturbance by vehicles and other activities, which have the potential to result in loss of data and defacement or destruction of resources.

Issue 3: Wastewater Disposal on Tinian. Tinian currently has no large-scale civilian or military wastewater treatment facility. Wastewater disposal is a major logistical component of large training exercises involving several hundred or more ground troops. Potential concerns are impacts of periodic wastewater disposal on existing municipal septic systems in San Jose, in addition to impacts on groundwater resources, air quality, and public health if wastewater is improperly disposed.

Issue 4: Solid and Hazardous Waste Disposal on Tinian. Tinian has no EPA-approved solid waste landfill and no hazardous waste or hazardous material handling facility. Training activities routinely generate varying amounts of solid waste (primarily cardboard and paper) and may generate very small amounts of hazardous materials, hazardous waste and used oil.

Issue 5: Public Safety and Aviation Activities. Ongoing and proposed new training activities include aviation operations with the potential to affect public safety. Fixed- and rotary-wing aircraft move in and out of military airfields and landing zones, as well as certain civilian airfields. Some military airfields are accessible to the public; others have approach or departure avenues with the potential to interfere with commercial aircraft. Finally, parachute drops at an existing drop zone relatively near to the civilian airfield on Tinian could interfere with civilian aircraft approach or departure.

Issue 6: Public Safety and Firing Range Activities. The proposed action includes installation or modification of several firing ranges to introduce additional weaponry training to the Marianas. Some of these ranges have the potential to introduce new impacts to public safety. The two ranges proposed for modification on Orote Point are accessible to the public, as would be the two proposed range locations on Tinian. A proposed firing range in the Ordnance Annex for sniper training was originally oriented so that a portion of the range surface danger zone (SDZ) had the potential to affect a small portion of public hiking trail. The proposed ranges on Tinian are in North Field would be developed within a historic area that is open to the public whenever training activities are not in progress. The SDZ for both ranges encompasses public space. The impact area for the proposed mortar range on Tinian could contain unexploded ordnance (UXO). The public could unknowingly enter the impact area.

Issue 7: Socioeconomic Impacts on Tinian. Tinian's relatively small population is isolated from many economic opportunities that are available to Saipan residents. Training activities have the opportunity to provide economic benefits through the purchase of local goods and services. Training activities also occasionally impact the cost and logistics of certain public services and facilities, such as firefighting capability, use of the airport and harbor, and potable water supply. Exclusion of tours from sites in the EMUA would have a negative effect. One casino hotel has opened and another is planned, and cumulative socioeconomic impacts may result from the combination of military training and large-scale tourism.

Issue 8: Socioeconomic Impacts of Apra Harbor Closures. Underwater demolition by EODMU-5 in Outer Apra Harbor requires certain areas of the harbor (including a number of popular dive sites) to be closed to civilian activities once a month for approximately four hours. This has the potential to cause loss of income to commercial boat and dive operators.

4.1.4 Specific Training Activities with Significant Impacts

From the outset of the evaluation there were three proposed training activities anticipated to have significant impacts on more than one resource, which could be difficult to fully mitigate to levels of nonsignificance, or would remain controversial despite indications that all impacts could be could be mitigated. Normally, such activities would not be considered or would be eliminated from the Preferred Training Land Use Alternative. The activity may remain a preferred alternative for specific locations if the training was necessary to maintain an assigned military mission capability and there are no suitable alternative sites, or because the impacts, although significant, can be compensated. These activities are summarized below.

- AAV Landings in the MLA on Tinian: The Navy and Marine Corps identified as an important training requirement establishing at least one AAV landing beach at Tinian's Military Lease Area (MLA). The AAV is an armored personnel carrier designed for ocean transit and is a principal means to bring Marines from ship-to-shore and to provide rapid transportation during inland maneuvers. The primary significant impacts through use of this tracked amphibious vehicle would be damage to nearshore coral and ground disturbances that could damage or destroy cultural resources. If AAV entry to Tinian were confined to the boat ramp in Tinian Harbor, the movement would be administrative in nature since tactical exercises could cause interruptions to day-to-day activities in San Jose and potential economic and public safety impacts
- Naval Gunfire and Aerial Bombardment: Farallon de Medinilla (Navy Range 7201) has been used since at least 1971 for aerial bombardment and naval gunfire training. The potentially significant impact of FDM bombardment is mortality to birds. The island's bird populations appear to be stable, and fishery resources appear not to be affected by the training. However, it is apparent that impacts and fires have altered habitat vegetation and that individual birds are killed. FDM is the only live-ordnance range in the region designated for training naval gun crews, Air Force bomber crews, and Navy, Marine, and Air Force fighter/attack and helicopter gunships.
- Underwater Demolition Training: EODMU-5 and NSWU-1 are resident units required to conduct underwater demolition training locally. Primary training sites are in Apra Harbor and potential impacts to biological and underwater cultural resources are possible. Economic impacts are caused by the necessity to temporarily close off the areas surrounding the blast sits to the public, which affects commercial tour boats and divers. Proposed mitigation includes establishing additional training sites in more remote locations. There are no alternatives to conducting training with live ordnance for which the environmental effects are predictable and limited in extent. Regardless of the mitigation measures and advance communication to those affected, underwater demolition training is anticipated to remain controversial within certain elements of the economic community and with Government of Guam regulatory agencies.

TABLE 4-1: SCREENING PROCESS TO IDENTIFY SIGNIFICANT ISSUES

GENERAL TOPIC	POTENTIAL ISSUE	IS ISSUE SIGNIFICANT DUE TO TRAINING ACTIVITIES?
I. BIOLOGICAL FACTORS		
Threatened or endangered species, migratory birds	Will training activities affect the population of threatened or endangered species? Yes.	**Yes** (Issue 1). May disturb or take individuals; may transport BTS to CNMI, Hawaii, or the continental U.S.
Wetlands, reefs, & habitat	Will training activities adversely affect wetlands, reefs, and habitat? Yes.	**Yes** (Issue 1). May damage coral reef or habitat.
Wilderness resources	Will training activities affect the wilderness resources? No.	No. No change from existing conditions.
Insects and disease	Will training activities introduce any new/noxious insects to the islands? No.	No. Managed by existing quarantine procedures.
II. CULTURAL RESOURCES		
Archaeological features, historic structures, National Landmarks	Will training activities affect archaeological/historic resources? Yes.	**Yes** (Issue 2). May cause damage/loss/destruction of significant resources or resources listed in National Register of Historic Places.
Cultural Practices	Will training activities interfere with traditional cultural practices? Possibly on Guam, but not elsewhere.	**Yes** (Issue 6). Ordnance Annex: If line of fire not altered, public may be within range safety fan during traditional cultural practice on established hiking trail.
Visual resources	Will training activities affect visual resources? No.	No. No substantial change from existing conditions.
III. PHYSICAL FACTORS		
Air quality	Will training activities affect air quality? No.	No. No change from existing conditions.
Climate	Will training activities alter the climate? No.	No. No change from existing conditions. (Weather conditions affect training schedules and construction criteria for training support facilities.)
Geology	Will training activities alter unique landforms? No.	No. No change from existing conditions.
	Will proposed activities generate new hazards associated with earthquakes or flooding? No.	No. No change from existing conditions.
	Will training activities increase erosion? No.	No. No substantial change from existing conditions. Construction has the potential to cause localized erosion, which will be mitigated by routine erosion control practices.
Surface water quality (marine and fresh)	Will training activities affect the drainage of surface water? No.	No. No change from existing conditions.
	Will training activities contaminate surface water resources? No.	No. Potential effects mitigated by routine compliance with SOPs and environmental regulations.

TABLE 4-1: SCREENING PROCESS TO IDENTIFY SIGNIFICANT ISSUES *(continued)*

GENERAL TOPIC	POTENTIAL ISSUE	IS ISSUE SIGNIFICANT DUE TO TRAINING ACTIVITIES?
Flooding	Will training activities reduce existing flood storage area? No.	No. No change from existing conditions.
	Will proposed action expose facilities or personnel to flood hazards? No.	No. No change from existing conditions.
Groundwater	Will training activities affect groundwater quality? No.	No. No substantial change from existing conditions. Most potential effects will be mitigated by routine compliance with SOPs and environmental regulations. (See Section 4.2.3 for discussion of wastewater disposal on Tinian.)
Noise	Will noise levels increase enough to disturb nesting threatened or endangered bird species and/or civilians? Yes.	**Yes** (Issues 1 & 5). May disturb Mariana crow and fruit bat habitats may disturb Rota homeowners.
IV. MAN-MADE HAZARDS AND CONSTRAINTS		
Airfield approach and departure	Will training activities interfere with existing airfield approach and departure patterns? Maybe on Tinian, but not elsewhere.	**Yes** (Issue 5). May interfere with approaching/departing aircraft.
	Will training activities affect health and safety at and near airfields? Maybe on Tinian, but not elsewhere.	**Yes** (Issue 5). May pose hazards to civilians on the ground in areas accessible to the public.
Firing ranges	Will proposed weapons training affect public health and safety? Maybe.	**Yes.** (Issue 6). Has potential to interfere with civilian aviation, generate new surface danger zone (SDZ), or generate additional UXO within existing UXO hazard area.
Electromagnetic radiation (EMR)	Will training activities increase EMR exposure? No.	No. No change from existing conditions. Training personnel will not enter EMR hazard zone to be generated by future VOA transmitter on Tinian.
Hazardous materials (HM) storage	Will training activities increase HM exposure? No.	No. No change from existing conditions.
Contaminated land and water	Will training activities expose the public to contaminated media? No.	No. No change from existing conditions.
Fire	Will training activities increase the number of wildfires? Maybe.	**Yes** (Issues 1 & 6). Demolition, pyrotechnics, and tracers have potential to ignite fires in relatively remote areas.
V. INFRASTRUCTURE		
Potable water supply	Will training activities affect the supply of potable water? No.	No. Demand on Tinian will be sporadic; public water supply has accommodated Tandem Thrust (TT) in the past.
Waste collection and disposal (stormwater, wastewater, solid & hazardous wastes)	Will training activities affect waste collection and disposal? Yes on Tinian, but not elsewhere.	Tinian: **Yes** (Issue 4). No EPA-approved disposal facilities exist on Tinian; solid waste will be returned to Guam for disposal.
	Will the waste produced by training activities have adverse effects on the population? No.	No. No change from existing conditions.

TABLE 4-1: SCREENING PROCESS TO IDENTIFY SIGNIFICANT ISSUES *(continued)*

GENERAL TOPIC	POTENTIAL ISSUE	IS ISSUE SIGNIFICANT DUE TO TRAINING ACTIVITIES?
Floodwater storage	Will training activities affect existing floodwater storage area? No.	No. No change from existing conditions.
Electricity and communications	Will training activities affect electricity and communications? No.	No. No change from existing conditions.
Airports	Will training activities affect airport operations? Maybe on Tinian during Tandem Thrust but not elsewhere.	Tinian: **Yes** (Issue 7). Increase in aircraft at West Tinian Airport during TT; need to establish communication protocol with civilian authorities.
Harbors	Will training activities affect harbor operations? Maybe on Tinian during Tandem Thrust, but not elsewhere.	Tinian: **Yes** (Issue 7). Increase in vessels in harbor during TT; need to establish communication protocol with civilian authorities.
Roadways and traffic	Will training activities affect roadways and traffic? Maybe on Tinian during Tandem Thrust, but not elsewhere.	Tinian: **Yes** (Issue 7). Increase in road traffic during TT; need to establish communication protocol with civilian authorities.
Public services	Will training activities affect the availability of public services? Maybe.	**Yes** (Issue 7). Potential forest or grass fire may require substantial use of public firefighting equipment; certain proposed activities may require periodic agency consultations and/or additional customs/immigration effort.
VI. SOCIAL ENVIRONMENT		
Land use	Will training activities affect present land use? No.	No. No change from existing conditions.
Socioeconomic conditions	Will training activities affect present socioeconomic conditions? Maybe.	Tinian: **Yes** (Issue 7). Possible interference with civilian plans for tourist development and with continued tourist access to destinations in EMUA. Guam: **Yes** (Issue 8). Temporary Apra Harbor closure affects recreational accesses to dive sites.
Environmental justice	Will training activities affect separate segments of the population differently? No.	No. No change from existing conditions. Tinian: Socioeconomic study did not find that the population is disadvantaged in comparison to the rest of the CNMI population.

4.1.5 The Significance of Brown Tree Snake Introduction

The most significant impact to biological resources that could result from Mariana training activities is introduction of the brown tree snake (BTS) (*Boiga irregularis*) from Guam (or Australia) to Tinian, Rota, FDM, other Pacific islands, or the U.S. mainland. This potentially significant impact to biological resources could be caused by any activity that would cause the movement of military personnel, cargo and equipment during or after a military exercise, or by civilian commerce originating on Guam.

Evaluation criteria. Establishing a BTS population at a new location would be a significant impact to the biological resources of that area.

Existing conditions. A BTS population was established on Guam in the years after World War II, and as many as 12,000 snakes per square mile now occupy some forested areas of the island. Tinian, Rota, and FDM are believed to be free of BTS infestation, although BTS have been sighted on Rota. Potential prey populations are present on all three islands used by the military as well as on Saipan.

In recognition of the threat posed by BTS, a Memorandum of Agreement (MOA) was developed and signed in March 1993 by the DoD, U.S. Department of Agriculture (USDA), U.S. Department of the Interior (DOI), GovGuam, and the State of Hawaii. An amendment to the MOA added CNMI to the list of signatories. These government agencies are cooperating in efforts to participate in and pursue BTS research, control, inspection, and eradication efforts. The MOA is subject to review, updating, and re-endorsement every five years by the USFWS and Assistant Secretary of the Interior. All revisions must be agreed to by the original signatories of the BTS Plan.

The *Brown Tree Snake (BTS) Control/Interdiction Plan for Military Training Exercises* published by COMNAVMARIANAS (Appendix E-1) is the primary management tool used to guide military participation in the processes established to prevent BTS introduction. The plan establishes the process to be followed at air and sea terminals when preparing for the movement of troops, cargo, and equipment through Guam. The plan identifies the responsibilities of military commands and the support that is provided by USDA Wildlife Services (WS), formerly called Animal Damage Control (ADC). The USDA WS office on Guam is the primary agent for BTS control. While WS has no enforcement authority, the BTS Plan has been incorporated into military training orders and training personnel must comply with its requirements. A detailed protocol developed and updated by WS has been implemented for all military exercises (see Appendix E).

USDA WS maintains a continuous trapping and night search protocol at high-risk areas at airfields and ports, whether training occurs or not. Cargo to be transported by major commercial shippers is also inspected prior to containerization.

USDA WS implements four basic BTS control tools at AAFB and Waterfront Annex: trapping along fenced permanent and temporary storage yards, use of canine detection teams, use of a temporary barriers at loading and unloading sites, and spotlighting and patrolling barrier fences

after dark.[1] Inspected cargo is date tagged as part of a flagging system to ensure that aircraft do not depart Guam with cargo that has not been inspected. The process also confirms for those offloading the aircraft that the inspection process was conducted for the tagged pallets, containers, and vehicles. All training units arriving on Guam are provided with a BTS information packet, and WS provides additional information and assistance for cargo and equipment inspection. Individuals are responsible for inspecting personal items of equipment.

COMNAVMARIANAS or AAFB environmental personnel advise WS as many days in advance as possible when assistance is required. WS assigns manpower and detector dog teams (14 teams of Jack Russell Terriers are now available on Guam). WS also constructs cargo containment areas using snake-proof barrier materials, and sets live-bait snake traps along the boundary of staging/cargo quarantine areas. WS ensures that military personnel have used steam-cleaners particularly on undercarriages and wheel-wells on all heavy equipment and vehicles prior to their entry into WS-controlled areas. BTS are nocturnal and the barrier and fences used to isolate inspected cargo are patrolled and illuminated. USDA WS personnel can readily repair the temporary barrier material if damage occurs.

AAFB and Waterfront Annex have permanently fenced and paved storage yards and warehouses that are used for staging palletized and containerized cargo. In 1996, AAFB supported a research project to develop an effective "mobile" temporary barrier structure that could be used to support deployments from Guam. The barrier was first used in Australia during Tandem Thrust 98 and evaluated as successful. The barrier remains available for exercise support such as the biennial Tandem Thrust exercises conducted in the Marianas. Smaller-scale exercises seldom need a barrier storage yard since the Air Mobility Support Squadron (AMSS) warehouse at AAFB and the Navy's Supply Facility warehouse are sufficient for cargo staging and inspection. USDA WS assistance is on call to any transient Guam unit preparing for off-island deployment. The same inspection and storage procedure is followed when assembling and transporting target materials from Guam to FDM.

USDA WS cargo inspection procedures are conducted on receiving islands in CNMI (and Hawaii). In the CNMI, BTS control is tailored to specific exercises, as the conditions are more variable. WS provides personnel, traps, lights, bait, and guidance for exercises on Tinian. CNMI now has two trained Jack Russell terriers to help with inspections. During Tandem Thrust 99, a snake-barrier reception area was established on North Field and all cargo and personnel passed through this area prior to entering the training fields.

USDA WS has been involved in military unit education regarding BTS threat, mandatory cleaning and inspection procedures, and immediate action (kill or capture) if a snake is sighted. The education process is particularly important for transient units. Local Guam units (active, National Guard and reserve) are aware of the threat and contact USDA WS for support of off-island training deployments as needed. The Guard and reserve are located in areas where BTS have infiltrated parked military vehicles and BTS inspections of equipment and cargo being staged for off-island transportation is routine.

[1] Memorandum (Electronic mail) between USDA WS Guam and COMNAVMARIANAS (Code 45) dated October 5, 1998.

NSWU-1 often uses RHIBs to transport SEAL teams from island to island for special operations training. A BTS was once discovered in an anchored boat. NSWU-1 personnel are responsible for inspecting the boats and embarked cargo and individual equipment to ensure no BTS presence prior to the raiding craft and teams departing Guam.

Potentially significant impacts. BTS could be transported in personal equipment, military cargo, vehicles, or construction equipment shipped from Guam. A single gravid female snake could establish a BTS population, having devastating long-term impacts on native bird and bat populations and potentially extirpating many species.

Proposed mitigation. BTS control and interdiction demands strict compliance with the most recent version of the BTS Plan and the military's full cooperation and coordination with local and federal natural resource agencies to tailor BTS measures for large and small exercises. All training personnel arriving on Guam for an exercise will be briefed on the BTS hazard prior to leaving Guam. They are instructed to kill or to trap any BTS that is sighted and to immediately report the incident to WS officials or an exercise Environmental Monitor.

The USDA WS office on Guam will continue to coordinate with the military for the cargo-handling and inspection requirements of cargo departing Guam, requesting support from CNMI and the USDA in Hawaii as needed. No materiel will be transported to Tinian from Guam without a label indicating that it has been inspected. COMNAVMARIANAS and 36th ABW environmental staffs or their representatives will monitor BTS control/interdiction compliance during exercises, and will coordinate with WS on at least a quarterly basis to keep abreast of lessons learned and new problem-solving techniques that can be applied in Guam and CNMI.

4.2 IMPACTS ON TINIAN

4.2.1 Biological Resources on Tinian

Biological resources of particular concern are listed threatened and endangered fauna and their habitat, migratory birds, wetlands, threatened and endangered or medicinal plants, and coral reef. Reduced, ongoing, or maximized training activities can impact (at varying degrees) protected species and their habitat through noise, visual disturbance, vegetative clearing, ground disturbance, fire, projectile impacts, underwater shock waves, explosions, or BTS introduction. The evaluation criteria presented below were used to determine whether these impacts are potentially significant.

The proposed mitigation measures are subject to consultation with and concurrence by several government agencies. The USFWS and NMFS have purview under Section 7 of the Endangered Species Act, and the Guam Bureau of Planning and the CNMI Office of Coastal Resources Management administer the Coastal Zone Management Act. Consultation has been initiated with these agencies.

Evaluation criteria. The fundamental evaluation criteria for significance are as follows. If the answer to either of the queries is yes, the potential impacts are considered significant.

- Are threatened or endangered plants or animals or migratory birds (collectively referred to as protected species) present at the training site, and is training land use likely to result in takes or in habitat reduction that would affect species survival potential or otherwise reduce chances of survival and recovery?
- Are wetlands, coral reefs, important habitat areas, or culturally or economically important plant or animal communities present at the training site, and will the natural function or usefulness of these areas or communities be appreciably reduced?

In addition, survival and recovery of protected species could be affected by training activities with side effects such as noise, visual disturbance, vegetative clearing, ground disturbance, fire, projectile impact, underwater shock waves, or explosions (Table 4-2). When viewed in isolation, a side effect may not necessarily be significant but could still result in individual takes or reduced survival and recovery of protected species populations. The side effect could cause disturbance, distress, disruption or abandonment of nests or feeding grounds, decreasing breeding success, forcing relocation, interrupting feeding, sleeping, or mating activities, or introducing weedy species to habitat.

TABLE 4–2: EVALUATION CRITERIA FOR SIDE EFFECTS THAT COULD RESULT IN REDUCED SPECIES SURVIVAL OR RECOVERY

ACTIVITY SIDE EFFECT	PARAMETER	SIGNIFICANT IF
BTS introduction	Transported from Guam	Population is established at a new location
Loud noise generation	Unexpected especially during times of heightened sensitivity.	During an atypical time of day/night or by an atypical source at a sensitive location and time
Visual disturbance	Appearance	Threatening enough to trigger nest abandonment by a federally listed species
Vegetative clearing	Loss of habitat	Loss of habitat of a federally listed species and no equivalent substitute available
Substrate disturbance	Land: Destruction of eggs, nests, or young of federally listed species Water: Destruction of coral	Land: Ground-nesting species known to be present Water: Permanent degradation of a coral reef ecosystem.
Fire	Likelihood of occurrence	Ignition source and dry tinder present in habitat areas, and a means to extinguish is not present or a plan is not in place
Projectile impact and explosion	Area of effect Presence of protected species or habitat	Takes of federal trust species or habitat modification are likely
Underwater shock wave	Charge size, depth, and distance	Impulse greater than 2 pounds per square foot per millisecond and overpressure greater than 50 psi affect marine resources of intrinsic importance
Explosion	Effective casualty radius and dud rate	Occurs in critical or other important habitat

The likelihood of reduced species survival and recovery depends on the characteristics of a training activity's side effects. For instance, clearing habitat vegetation would displace foraging or nesting adult and juvenile birds. Depending on the timing of the clearing with breeding

seasons, a portion of the displaced bird population may not successfully relocate and may die. Impacts of training activities on site-specific species were evaluated for significance based on these criteria.

Protected species and habitat. The following summary of protected habitat and species on Tinian is limited to those conditions relevant to training activities. A more complete description of existing conditions is given in Chapter Three.

Three protected bird species (Tinian monarch, Mariana common moorhen, and Micronesian megapode) and the Mariana fruit bat (listed on the CNMI Endangered Species List) are known to occur on Tinian.[2] The island is believed to be free of BTS infestation. The Tinian monarch[3] nests in trees in limestone forest, secondary forest, and tangantangan. Mariana common moorhen nest near the water at Lake Hagoi. The Micronesian megapode inhabits native limestone forest along the clifflines of Tinian.[4] The Mariana fruit bat roosts in large trees surrounding Lake Hagoi and along the clifflines and forest plateau near Mount Lasso. (See Figure 3-1.)

Coral reefs, beaches, and coastal strand vegetation are sensitive habitats on Tinian. Reefs provide important habitat for threatened and endangered sea turtles. The green sea turtle nests at virtually all beaches on Tinian, and the endangered hawksbill sea turtle is found in the nearshore waters. The coral reef flat at Unai Babui is sparse and almost barren, with one percent or less living coral coverage at depths shallower than two meters.[5]

Overview of training impacts. This section evaluates the following potentially significant impacts on biota that could be caused by varying degrees of reduced, ongoing or maximized training:

- Offroad vehicle travel and excavation damaging sensitive habitat and taking ground-nesting endangered species.
- Pyrotechnics and open fires igniting habitat vegetation and take endangered species.
- Disturbing noise levels from firing weapons, helicopter hovering and landing, close air support.
- Logistics shipping importing BTS to Tinian in cargo.
- Amphibious vehicles or landing craft crushing or breaking coral on reefs and compressing sand over turtle nests.
- Clearing vegetation habitat to construct a firing range, mortar range, and shooting house.

[2] The island swiftlet may also be present, but it has not been sighted on Tinian since 1976.

[3] The USFWS has indicated that it plans to delist the Tinian monarch.

[4] It is not known whether a resident breeding population exists on Tinian (USFWS, April 1996, Wildlife Research Report).

[5] Personal communication with Steve Dollar, Marine Research Consultants, December 12, 1996, based on qualitative visual survey.

4.2.1.1 Field Maneuvers

Existing conditions. Practically all of the EMUA is used for field maneuvers. Endangered bird species nest in trees including the cliff faces and limestone forest, on the ground, and in wetlands at Lake Hagoi. Endangered sea turtles nest on most Tinian beaches. Strand vegetation is present on several beaches in the EMUA.

Potentially significant impacts:

- Off-road travel by wheeled or tracked vehicles damaging tangantangan trees and other Tinian monarch habitat. The travel could also destroy megapode nests or chicks, compact sand over green sea turtle nests and create ruts too deep for baby turtles to traverse (from vehicles exiting a landed LCAC on a beach), and damage strand vegetation on the beach.
- Use of signal flares and smoke igniting field fires, damaging tangantangan and endangered birds and their nests.
- Noise from firing weapons (with blanks), hovering and landing helicopters or Harriers, and low-flying close air support agitating endangered birds and bats to the point that they fail to reproduce successfully (a take).

Proposed mitigation. Mitigation of these significant impacts, initiated for the Tandem Thrust 93 exercise,[6] have remained in effect and consist of restricting training activities in certain areas (see Figure 2-7a):

- Offroad and cross-country travel is constrained in NWD areas. Beach landing sites are selected that will not suffer significant impacts to coral. Beach topography is restored after amphibious landings.
- No noisy activities—helicopter hovering and landing, firing blanks, or low flying at high speed—are allowed in areas delineated NWD (no wildlife disturbance).
- The area around Lake Hagoi is designated a No Training (NT) area with all foot and vehicle travel conducted along perimeter roads.

The NWD and NT areas are delineated on all training maps, where they are represented as areas to be avoided for tactical reasons (for example, Lake Hagoi might be marked as "contaminated with radiation" and unsafe to enter). Trainees are penalized for improper activities in these areas. In addition, these areas will be defined in updated area training orders, and all troops training on Tinian will continue to be briefed regarding endangered species prior to arrival on the island.

Clearing vegetation and gathering camouflage materials will be limited to deadfall and branches smaller than wrist-size in diameter. Caution will be taken when cutting tangantangan where lower branches can be Tinian monarch nest areas.

To further minimize potential harm to the Tinian monarch during breeding seasons, nighttime cross-country maneuvers through tangantangan, limestone forest and secondary forest will be

[6] Belt Collins & Associates (1993) *Environmental Assessment: Military Exercises, Island of Tinian, Commonwealth of the Northern Mariana Islands.*

limited to exercise forces no larger than battalion size (1,000) during January, May, and September. No cross-country troop movements would be conducted through monarch habitat during the month of May. These constraints will remain in effect as long as the Tinian monarch is listed as a threatened species. In February 1999, the USFWS initiated the process that could delist the Tinian monarch. If there are no strong objections to the recommendation, delisting could occur within 12 to 18 months and the constraints to maneuver would no longer apply.

The megapode has not been known to nest on Tinian and only a few birds thought to be transient have been reported in the last ten years. Potential nesting sites in the limestone forest are monitored. If a nest is discovered in the limestone cliffline, the area will be restricted from all training activity.

4.2.1.2 Logistics Support Training

Existing conditions. Logistic support materials needed for training arrive at Tinian Harbor, West Tinian Airport, and North Field. There are bushes and other vegetation that could conceal BTS at both Tinian Harbor and North Field. There are cleared paved areas that can be patrolled and defined with snake barriers near both sites that could be used for staging offloaded military training equipment. Both Tinian Harbor and West Tinian Airport are commercial ports with several arrivals and departures each day, but there are few BTS searches of civilian cargo and no routine canine detection program in place.

Potentially significant impacts. Introduction of a BTS population is the most significant impact that could result from training activities on Tinian. Import of BTS in military cargo, vehicles, or construction equipment shipped from Guam could result in establishing a BTS population on Tinian. This would have devastating long-term impacts on Tinian's native bird and bat population,[7] potentially extirpating these species.

Proposed mitigation. COMNAVMARIANAS will notify WS on Guam and CNMI DLNR prior to exercises on Tinian. WS will establish infrastructure for human and canine inspections, snake-free staging areas, fencing, and traps at AAFB and Waterfront Annex as needed. Military personnel will thoroughly clean and inspect all heavy equipment and vehicles prior to staging cargo and equipment in designated and monitored snake-free areas. All cargo, vehicles, and personal equipment will be inspected by snake detector dogs on Guam and re-inspected by USDA WS prior to shipment. No aircraft or material will be permitted to leave Guam for Tinian without an appropriate label indicating when it was fully inspected.[8] Detector dogs will also inspect accessible transport craft (ships, barges, aircraft) prior to departure from Guam. All training units will strictly comply with WS inspectors and protocols, which will be based on the 1996 BTS Plan and published updates that include the most up-to-date technology and techniques. USDA WS personnel will tailor BTS control measures to meet the demands of a particular exercise.

[7] USFWS (April 1996).

[8] Personal communication with Michael Pitzler, USDA Wildlife Services, June 1, 1998.

WS may establish the quarantine procedures and perform a second inspection of all cargo arriving on Tinian, in coordination with CNMI FWS. Quarantine activities at ports of entry include establishing sterile areas, erecting temporary snake barriers adjacent to aircraft/ships offloading sites, and erecting spotlights for night searches, and activating snake traps and canine inspections.

All training personnel will be briefed on the BTS hazard prior to leaving Guam for Tinian. All are instructed to kill or capture a BTS and to report the incident immediately to WS officials. COMNAVMARIANAS environmental staffs or their representatives will monitor BTS control/interdiction compliance during exercises and will coordinate with WS on at least a quarterly basis to keep abreast of lessons learned and new problem-solving techniques that can be applied.

4.2.1.3 LCAC Landings

Existing conditions. LCAC landings have been successfully conducted at Unai Chulu. Other beaches were evaluated and of those, Unai Dankulo is included as another preferred alternative for LCAC beach landings.

A nearshore reef flat with coral extends from Unai Chulu but at sufficient depth for air-cushioned landing craft operations without damaging coral.[9] This was confirmed during Tandem Thrust 99 after 14 reef crossings beginning at high tide and extending for about four hours. Unai Chulu has some strand vegetation and a row of trees ironwood trees backing the beach that leave about 130 feet of clear beach for single LCAC landings. Two roadways lead through culturally sensitive areas to connect the beach to training areas in North Field.

Unai Dankulo is protected by an offshore barrier reef that is shallow, partially exposed and, prior to 1997 replete with abundant coral. Typhoons in 1997 and 1998 have severely damaged and stripped the reef of its coral as well as leaving only sparse coral from the reef to shoreline. Unai Dankulo (the southernmost area also known as Long Beach One) was stripped of vegetation by typhoon flooding and tidal action. There is sparse beach strand vegetation and a few palm tree seedlings. It is a relatively flat, obstacle free beach that extends more than 400 feet to a cliff face and one vehicle roadway that connects to Broadway.

Tachogna Beach has a spur and groove reef flat with coral at sufficient depths to suffer no damage by LCAC landings. Kammer Beach has a sandy nearshore area. Tachogna and Kammer beaches are backed by a wooded and grassy recreation areas with picnic pavilions, paved pathways, recreation concessions, and a roadway leading to San Jose. The recently constructed Tinian Dynasty Casino and Hotel is within walking distance.

Green sea turtles may nest on Tinian's remote beaches between late January and July/August. Hatchlings emerge from the nest 62 days later (between April and September/October).[10]

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[9] See Appendix C-5 for the results of the marine survey of nearshore coral at Unai Chulu that was conducted in March 1999 during Tandem Thrust 99.

[10] USFWS (May 30, 1996) *USFWS Wildlife Research Report Part III: Status and Distribution of Marine Turtles on the Island of Tinian*, CNMI–1994 and 1995. Prepared for Department of the Navy.

Potentially significant impacts.

The marine survey conducted during LCAC operations at Unai Chulu in late March 1999 determined that the air-cushioned landing craft does not impact coral at this beach's shallow nearshore depths (see Figure 4-1 and Appendix C-5). The only visible signs of contact after seven landings was near the shoreline caused by an instance of one LCAC coming off-cushion while the stern was still over water, and subsequently turning to depart at the shoreline instead of on the beach.

The craft's lift fans depress the water's surface and diminish the depth of water cover over near shore or shallow reefs. The cushion of air is captured by an inflatable skirt that at low speeds may come into contact with anything above the water surface but keeps the bottom of the craft about 4 feet above the water. Illustrations in Appendix C-5 show how the skirt is on the surface and air spills from the edges even at slow speeds when departing the beach. The effect is very little disturbance to submerged coral on nearshore beach rock and the reef when fully on the air cushion. When landing, LCACs are normally kept on-cushion until the entire craft is clear of the water's edge and fully on dry land. This ensures that the propulsion fans in the rear are clear of any incoming surf and eliminates the need to turn the craft right at the water's edge.[11]

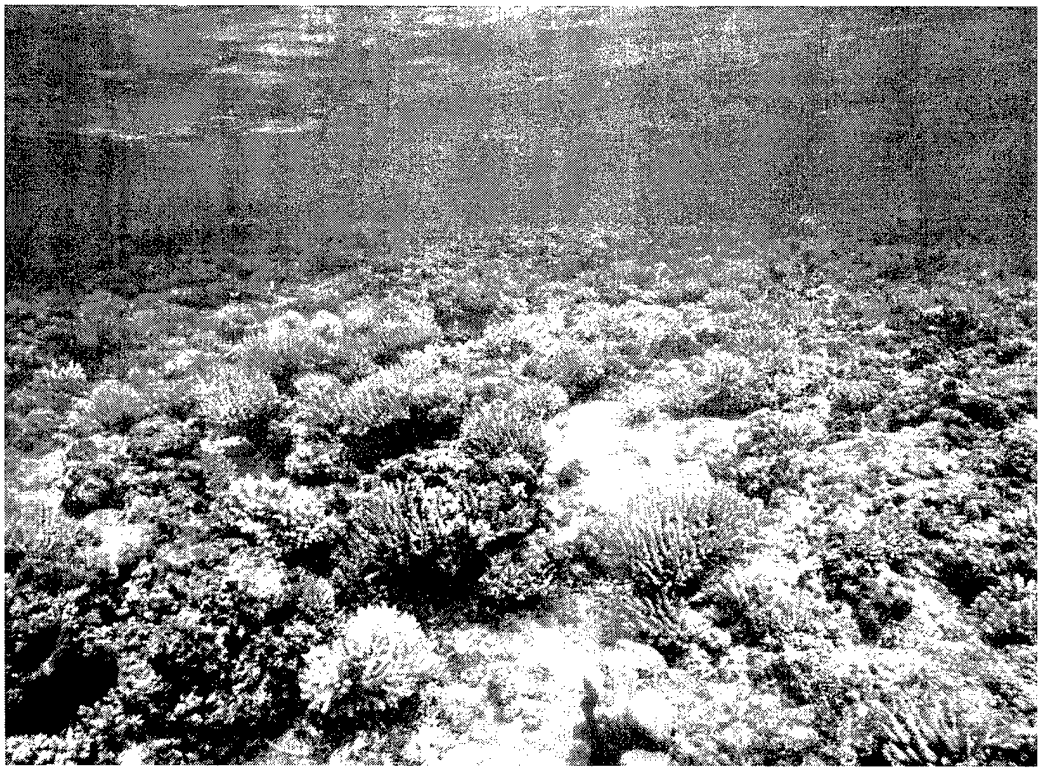
If a fully-loaded LCAC is moving slowly or is only partly on-cushion while in the water, it could create a bow wave that would be capable of moving large (1 m diameter) loose rocks or breaking off exposed coral heads. Minor and temporary turbidity is possible at the shoreline during launches due to the air under pressure spilling from beneath the skirt and displacing sand. However, the majority of sand beneath the craft is suspended and redistributed as the craft departs the beach leaving very little footprint.

Once parked on land, the craft's weight will compact the sand and leave a footprint 2 to 10 cm deep. Green sea turtle nests, buried approximately 3 feet (1 meter) underneath the sand, are not likely to be damaged, but compaction of the sand could make exit from the nests difficult for hatchlings. Offloaded vehicles driving across the beach may crush turtles' nests or leave deep tire track ruts that serve as physical barriers to hatchlings crossing the beach.

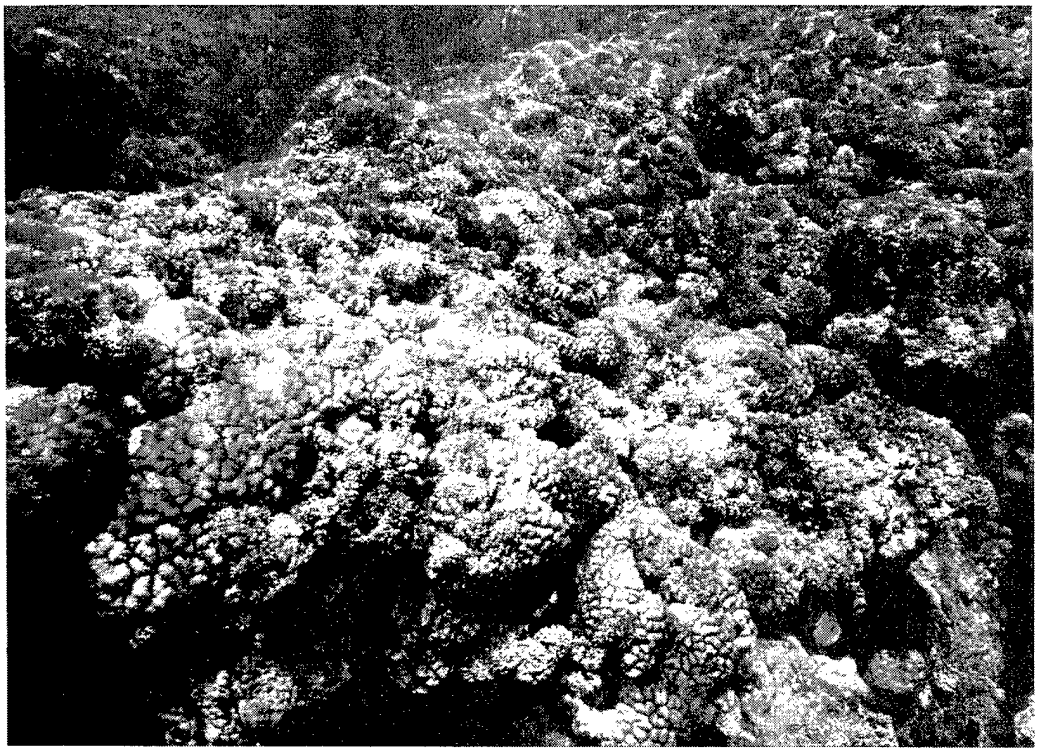
Proposed mitigation. Tachogna and Kammer beaches are no longer available for training with large landing craft and no mitigation is necessary these beaches. To minimize potential effects to shallow coral or to turtle nesting activities on Unai Chulu or Unai Dankulo, the following mitigation measures will be accomplished:

Additional marine biological surveys to determine effects to coral are not necessary at Unai Chulu. However, prior to initiating routine LCAC landings at Unai Dankulo, a pre-, during and post-landing marine survey similar to that conducted for Tandem Thrust 99 will be conducted Navy-contracted marine biologists to validate the predicted absence of impacts to the reef and shallow coral at increasing water depths between the shoreline and reef face. Tide height and surf conditions will be recorded along with any evidence of turbidity, impacts to fish and beach topography.

[11] If an LCAC were to come off-cushion while waterborne, the craft would have a draft of 0.76 m.



South end of reef flat: 1 meter deep



Reef front: 3 meters deep

Source: Marine Research Consultants

Figure 4-1
UNAI CHULU CORAL COVER

FEIS: Military Training in the Marianas
Belt Collins Hawaii, June 1999

The survey protocol developed for Unai Chulu and reviewed and approved by CNMI agency representatives will be modified as needed to fit sea conditions at the time of landing. Cognizant CNMI and Tinian natural resource and water quality representatives will be invited at least 30 days in advance to actively participate in the survey.

Unai Chulu and Unai Dankulo will be surveyed by a Navy biologist for possible sea turtle nests no more than 6 hours prior to a landing. If turtle nests are detected, areas free of nests will be flagged for vehicle and personnel movement to and from the beach. [12] The Navy biologist will monitor the beach during any nocturnal landings. If turtles are observed or known to be in the area, training will be discontinued until all nests have been located and turtles have departed the area.

Beach characteristics are dynamic as evidenced by changes to Tinian's beaches as a result of recent typhoons. Published operational criteria are used to evaluate beach profiles prior to training exercises to ensure that they are operationally suitable for LCAC landings. Navy-conducted hydrographic surveys will be conducted no more than one week prior to a landing. When their operational schedules permit, LCAC crewmen will conduct a beach reconnaissance and orientation prior to the training exercise.

Ideally a slope of no more than six degrees is desired but the craft can negotiate and cross more severe gradients by approaching the beach at higher speeds. (During Tandem Thrust 99 the beach slope at Unai Chulu averaged 10 degrees and a few practice runs were necessary to determine the best approach speed to get the entire craft off the water's edge. Therefore, persons qualified to conduct a hydrographic survey and the LCAC crew reconnaissance will determine that the nearshore and beach topography are suitable for allowing a fully-on-cushion approach and clearing the water prior to coming off cushion. Beach center will be clearly marked and communications between the beach and LCAC crews will be established to control beach entry. Landings will be scheduled to take advantage of higher tidal intervals to ensure maximum water depth across outlying reefs. While over the nearshore and shallow reef areas, LCACs will operate fully on-cushion. When departing the beach the craft will go on cushion and will turn when over land rather than over shallow coral beds near the shoreline.

4.2.1.4 AAV Landings

Six landing beaches and the Tinian harbor were proposed and evaluated for AAV landings. Hydrographic and marine biological surveys conducted by the Navy in 1994 and 1996 provided sufficient information to rule out further consideration of Unai Dankulo, Unai Chulu, and Unai Lamlam due to potential impacts to nearshore and barrier reef coral and possible impact damage to the vehicle itself. CNMI CRM suggested Tachogna Beach but a cursory inspection determined that its shallow depths and dramatic spur and groove reef formations would make landings by anything besides an LCAC extremely difficult. The Navy used Kammer Beach for AAV landings until the early 1980s when the beach was developed for recreation. Kammer Beach remains environmentally suitable for landing any type of landing craft and AAV but is no longer

[12] Actual nests will not be flagged, as this may direct poachers to nests.

available for training with AAVs, LCACs or LCUs. As a result, Unai Babui remained as the landing beach proposed for AAV entry into and from the MLA.

Existing Conditions. When initially evaluated, Unai Babui was determined to be approximately (230 feet/70 meters) wide with a more narrow sandy shoreline (160 feet/50 meters) due to large limestone outcroppings at the water's edge on both the northern and southern ends of the beach.[13] Approximately beach center was determined to be the landing site that would avoid more abundant coral and exposed beach rock at each flank. Inland from the shoreline is strand vegetation, dense brush up to 10 feet (3 meters) tall and scattered trees 9 to 20 feet (3 to 6 meters) tall. Two sandy roads lead from the beach to an unimproved dirt road lined with tangantangan. Sea turtles are known to nest at this beach. The proposed mitigation to limit vehicle impacts to offshore coral was to conduct AAV landings in single file, which would reduce the width of the area used to cross the reef and beach.

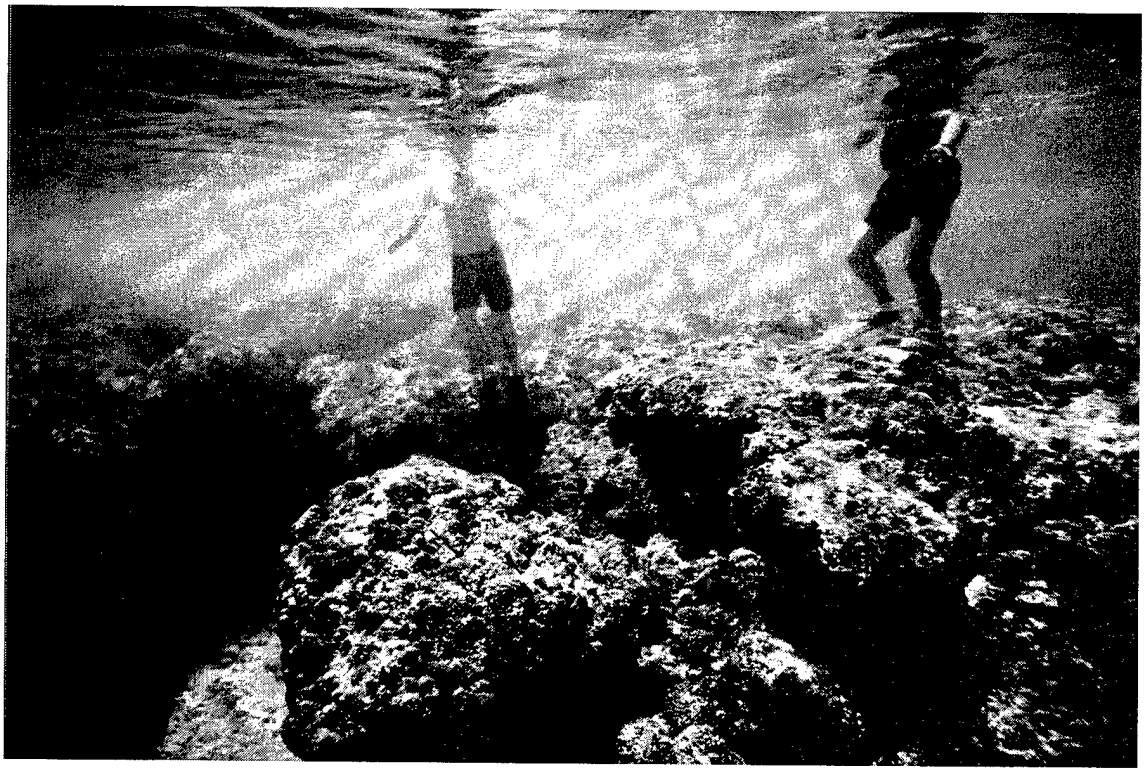
The dynamic sea and weather conditions that can dramatically alter beach characteristics were evident after Typhoon Paka in December 1997, which removed much of the beach sand and left tall exposed limestone columns across the entire beach front. By October 1998 much of the beach sand had returned, filling in many of the spaces between the exposed limestone columns and reducing their heights to one foot or less, which would be no obstacle to a landing or beach crossing by the AAV.

The hydrographic surveys conducted in 1994 (primarily for CRRC amphibious raids) deemed the beach feasible for AAV landings. A marine biology survey in 1996 (Appendix C) focused on the coral cover on the reef that would be contacted by an AAV on its approach to shore. The coral cover was estimated at one percent or less live coral cover for the first 130 feet (60 meters) nearest the shoreline. This portion of the reef is in water four feet deep or less and dominated by mats of algae and sediment. For the next 32 feet (10 meters) seaward where an AAV would be in transition from being afloat or touching bottom, the coral cover is estimated at 10 percent and water depth increases to about 6.5 feet (2 meters) along spurs from the reef face. Discussions with CNMI Fish and Wildlife personnel confirmed that the majority of the live coral in this portion of the reef is within narrow channels (grooves) in the reef face.[14]

After determining that a single lane would be used for AAV reef crossings, another survey of the beach and its reef was conducted in March 1999 with discouraging results. The survey failed to identify a portion of suitable reef platform (in terms of width at appropriate water depth) that would allow an AAV to conduct a smooth transition from being afloat propelled by water jets to touching down and coming ashore under tracked propulsion. At the point where an AAV approaching the beach would first touch bottom (in about 5 to 6 feet [1.5 to 1.8 meters] of water), long shallow spurs were separated by deep and wide grooves (20+ feet [6.1+ m]). This irregular reef face where the AAV water to land transition would begin is also situated just prior to the line of breaking surf.

[13] LTJG Smith, AOIC, SEAL Team ONE BRAVO Platoon (April 14, 1994) Memo to Commander, Naval Special Warfare Unit ONE regarding Post-Operations Report For Tinian Island Training Conducted From 20-25 March 1994. Appendix D in Belt Collins Hawaii (November 1994) *Environmental Assessment Military Exercise, Island of Tinian: Tandem Thrust 95.*

[14] Personal communication with Katharine Miller, CNMI Division of Fish and Wildlife, October 1997.





Two views of rubble-filled channels and vertical ridges on the reef front of Unai Babui.

Source: Marine Research Consultants

Figure 4-2
UNAI BABUI SPUR AND GROOVE REEF FRONT
FEIS: Military Training in the Marianas
Belt Collins Hawaii, June 1999

The result of attempting to land at the irregular reef face could be the AAV making contact on a spur with only one track, losing positive steer, and possibly broaching in heavy surf. The AAV could bottom-out on the reef with one track on a spur and the other in a groove possibly damaging the AAV suspension system and the impacted portions of the reef face. See Figure 4-2 for the radical depth change between spur and groove on the reef front.

Compounding the reef's lack of suitability is a repeated loss of sand on the beach exposing multiple irregular columns of beach rock. Although the heights of these columns are within the capability of the vehicle's traversing capability, there is a potential for damage on the beach that could increase the cost of training. A few trees would have to be removed at center beach to open a satisfactory lane between beach and road.

The results of the March 1999 survey do not support the original plan envisioned for AAV landings at Unai Babui. Damage to coral by normal track impact is no longer the primary issue and has been overshadowed by potential damage to the vehicle by impact at an irregular reef edge that could cause lubricant spills or leaks and require performance of maintenance activities on the beach. Appendix C-5 provides more information regarding the unsuitability of this beach for AAV training.

The only site selected as a preferred alternative for AAVs coming ashore on Tinian is the LCU ramp in Tinian Harbor followed by administrative movement through the west side of San Jose, using 8th Avenue to enter the MLA for tactical exercises.

Potentially significant impacts.

- The 23-to 27-metric ton amphibious tracked vehicle contacts bottom in about 5.5 feet (1.8 meters) of water and would crush or compact on coral that it contacts, reducing or eliminating a reef's natural function. When crossing and particularly turning on the beach, the vehicle would disturb the upper layer of sand, with potential damage to green sea turtle nests. The next generation of AAV expected to be in service in 2006 will have similar nearshore and beach impact potential.
- All other beaches proposed for AAV landings (Unai Chulu, Unai Lamlam, and Unai Dankulo) have higher percentages of living coral than Unai Babui, and all are likely green sea turtle nesting areas.[15] Since Unai Chulu was determined to be suitable for LCAC landings, its coral characteristics were revisited to ascertain if it would be suitable for landings by LCACs and AAVs combined. Figure 4-1 shows the high amount of coral cover at Unai Chulu that begins relatively close to shore and becomes more abundant as water depth increases. The AAV would impact and damage this nearshore coral.

The goal of establishing an AAV landing beach in the MLA has not been achieved. The preferred alternative identifies landings across the LCU boat ramp in Tinian harbor as the means to introduce AAVs to Tinian's tactical maneuvers. Employment of the AAVs in the MLA after

[15] Marine Research Consultants (September 26, 1994) *Preliminary Assessment of the Nearshore Marine Environments Off of Beaches On the Island of Tinian, CNMI: Potential Impacts From Amphibious Troop Landings, Tandem Thrust 95.* Appendix F in Belt Collins Hawaii (November 1994) *Environmental Assessment Military Exercise, Island of Tinian: Tandem Thrust 95.*

landing at Tinian's harbor would be conducted under the same constraints established for ground and vehicle maneuver in areas of natural or cultural sensitivities.

Proposed mitigation. None are required to minimize impacts to coral. AAV operations on Tinian will be subject to the NWD, NT, and NCRD constraints to maneuver in the vicinity of the beaches and the MLA.

4.2.1.5 Shooting House and Breacher Trainer

The Maximum Training Land Use Alternative proposes construction of a shooting house and/or breacher training, which are specialized range facilities used to support TRUE training and special operations. The shooting house has numerous rooms and passageways with walls that act as bullet traps. (Appendix B-12 is a picture of the shooting house at Orote Peninsula equipped with an observer catwalk on its second level.) The breacher trainer is a one- or two-story structure designed to practice forcible entry through doors or windows (e.g., hostage rescue). Small demolition charges are used for breaching, but live ammunition is not used in the structure.

This proposal is not preferred at the present time for reasons other than any potential impacts to biological resources, which can be mitigated. Alternative training sites exist. A shooting house and breacher trainer have been constructed on Guam and abandoned World War II structures are being made available as a shooting house on Tinian (see Section 4.2.2.4). There are also public safety considerations in opting to develop live-fire training facilities in areas shared with the public and an assessment of costs to construct and properly maintain facilities on non DoD land that are used infrequently (see Section 4.2.5).

Existing conditions. These proposed locations for shooting house/breacher trainer construction would take advantage of sites already cleared and lacking large stands of tangantangan, which is habitat for the threatened Tinian monarch.

Potentially significant impacts. No significant impacts to biological resources are anticipated. Construction would require minor clearing of tangantangan (just a fraction of a hectare). Only a few individual Tinian monarchs, representing less than 0.0002 percent of the population, would potentially be affected. This is based on the current estimated population of 55,721 monarchs on Tinian.

Proposed mitigation. If the Tinian monarch remains a threatened species, its nesting season (May through December) would be avoided when scheduling the vegetation clearing to minimize the number of adult or juvenile birds that are displaced and may not relocate.[16] Native trees would be planted offsite to compensate for the quantity of removed tangantangan.

[16] Michael Lusk, Steve Hess, Michelle Reynolds, and Scott Johnson (September 1997) *Population Status of the Tinian Monarch (Monarcha takatsukasae) from the Island of Tinian, CNMI.*

4.2.1.6 Small-Arms Range

The Maximum Training Land Use Alternative also proposes development of an open field, fire-and-maneuver range using rifles, squad automatic weapons, and light machine guns. A site suitable in dimension and direction of fire was selected on North Field in an area vegetated with tangantangan and grasses. This proposal is also not preferred although impacts to biological resources can be mitigated. Range safety considerations and the development of a fire-and-maneuver range on Guam eliminated this project from the Tinian Preferred Land Use alternative (see Section 4.2.5).

Existing conditions. The proposed fire-and-maneuver range that was considered would have been about 1,475 feet (450 meters) long and (200 meters) 660 feet wide (see Figure 2-1b) and was oriented to fire toward the ocean. Medicinal plants, which occur throughout the island, may be present. While Unai Chiget, a known green sea turtle seagrass feeding area, is nearby, no turtle nesting beaches or seagrass feeding areas occur within the proposed SDZ.

Potentially significant impacts. Potential impacts to natural resources from the live-fire range are loss of vegetation habitat, groundwater contamination, and fire hazards.

- The proposed site has small patches of tangantangan (about 20 trees per acre/50 trees per hectare). Clearing 80 percent of the range area would result in a loss of about 17 acres (7 hectares) of habitat vegetation. The Tinian monarch population could be impacted by an inability to relocate leading to harm or death.
- CNMI DEQ is concerned about groundwater contamination by the 9mm to 7.62mm small arms bullets (presently made of lead with a copper jacket) embedded in the soil. Targets would be constructed at a maximum distance of 200 to 300 meters from firing points with each target having an individual sand backstop or bullet trap designed to stop the majority of the projectiles. Live-fire training has the potential to initiate field fires particularly during drought conditions. Prevailing winds could quickly spread the fire to the west resulting in the loss of additional habitat vegetation.

A fraction of the projectiles that miss the backstops would continue on and impact the ocean. No significant impacts to marine life would result from projectiles (bullets) landing in the ocean. Lead and associated trace metals acquire a coating of hard-water minerals, which prevent release of free lead or other metals into the water and prevents lead exposure to marine organisms, except in the unlikely event that a bullet is swallowed. [17]

Proposed mitigation. Based primarily on public safety concerns, development of an open field firing range is not preferred. The training can be conducted at the fire-and-maneuver range is being developed on Orote Peninsula.

[17] Memorandum from Leslie Au, Hawaii Dept of Health toxicologist, February 2, 1998 regarding "Assessment of Possible Health Risk from Lead Shotgun Pellets." Also see Long, DT and Angino, EE (1977) Chemical speciation of Cd, Cu, Pb and Zn in mixed freshwater, seawater, and brine solutions. Geochim et Cosmo Acta: 41: 1183-1191.

If training conditions change such as the Guam range being inadequate to handle all training requirements and a fire-and-maneuver range were needed on Tinian at a future date, the following mitigation measures would be implemented:

- If the Tinian monarch remains listed as a threatened species, native species would be planted offsite to compensate for the removal of tangantangan.
- When available for use, the new tungsten-nylon ammunition would be used to eliminate potential risks to groundwater quality.
- Tracer rounds would not be permitted on the range and live-fire training would not be conducted during drought conditions with high winds. Afire prevention and response plan would be developed by COMNAVMARIANAS such as the plan published for Tandem Thrust 99 (see Appendix F). The range would be equipped with firefighting equipment (water trailers, shovels, and fire extinguishers) readily available for immediate response.

4.2.1.7 Mortar Range

Development of a 60mm mortar range development was also proposed for Tinian but is not preferred due to public safety considerations (Section 4.2.5). The discussion of mortar range development remains in the EIS since impacts to biological resources could be mitigated.

Existing Conditions. The area selected for evaluation is undeveloped land vegetated by tangantangan (see Figures 2-1a and 2-1b).

Potentially significant impacts. Impacts to biological resources with potential significance could be loss of habitat vegetation for protected species through range construction or fire.

- The range would require about 174 acres (71 hectares) estimated to contain about 89 acres (35 hectares) of Tinian monarch habitat. Remaining plants and shrubs, including medicinal plants, would be periodically cleared by herbicide spray so that any unexploded 60mm rounds (UXO) could be found and cleared from the range area.
- Mortar rounds are explosive and could start field fires. Fires on the range itself would not impact monarch habitat, since tangantangan would be previously cleared. However, under windy conditions the fires could spread to nearby tangantangan habitat.

Proposed mitigation. If a mortar range were constructed, at least 60 percent of the amount removed would be replaced with native species. A fire prevention and response plan including immediate action capability would also be required.

4.2.2 Cultural Resources on Tinian

Significance criteria. A significant impact would be changes to the characteristics that contribute to a property's eligibility for inclusion in the National Register of Historic Place (NRHP). The changes would be determined to be to such an extent that the property is no longer eligible for inclusion, or the changes to characteristics of a property already listed in the NRHP would be to the extent that it would no longer be eligible for listing.

Cultural resources are evaluated for historic significance in terms of their ability to meet the criteria of eligibility for nomination to the NHRP. To be considered eligible, sites must possess integrity and meet at least one of the four criteria of historic value:

A. The site is associated with events that have made a significant contribution to the broad patterns of our history.

B. The site is associated with the lives of persons significant in our past.

C. The site embodies the distinctive characteristics of a type, period, or method of construction or represents the work of a master, or possesses high artistic values, or represents a significant and distinguishable entity whose components may lack individual distinction.

D. The site has yielded, or may be likely to yield, information important in prehistory or history.

Tinian has numerous cultural resources, including ancient to recent Chamorro sites and World War II historic sites. The potential for the training land use alternatives to impact sites protected under the National Historic Preservation Act (NHPA) is the primary criterion for determining a significant training impact. To the questions below, the answers are yes.

- Are cultural resources in the area where training will take place listed or eligible to be listed on the NRHP?
- Is there potential for the activity to have a harmful effect on a cultural resource and then no longer be eligible for listing on the NRHP?

To determine the likelihood of the integrity of historically significant cultural resources being diminished, a detailed evaluation of training activities has been performed since historically significant resources do exist and could be affected by ground-disturbing training activities, ricochets, underwater shock waves, or vandalism. The evaluation criteria used for the detailed analysis on Tinian (as well Rota and Guam) are listed in Table 4-3.

TABLE 4-3: EVALUATION CRITERIA FOR POTENTIAL IMPACTS ON CULTURAL RESOURCES

Resource	Effect Of Training Activities	Potentially Significant If
NRHP-eligible or a listed site	Ground disturbance/damage to resources	Mechanical vegetation clearing activities are conducted.
		Vehicles used off of the established roads.
		Subsurface excavation activities are conducted.
		Large numbers of personnel are present.
	Direct impact of projectile/ ricochets	Live-fire is used and resources are in line of fire.
	Vandalism (includes removal, defacement, and movement of resources	Training activities require movement of resources.
		Large numbers of personnel are present.

4.2.2.1 Programmatic Impacts

This section analyzes potentially significant non-site-specific (programmatic) impacts of ground-based training and impacts of certain site-specific training activities on particular resources listed in the National Register of Historic Places. Impacts on four training locations of concern (Unai Chulu, Unai Babui, Unai Dankulo, and the former Japanese Naval Air Command Post) are addressed in the following two sections. Cultural resources in the Lake Hagoi area are also discussed. This area has been determined to be a No Training site to eliminate potentially significant impacts to natural resources. Information regarding programmatic impacts is based on a review of inventory and overview survey reports, draft and final cultural resource management plans, discussion with archaeological contractors conducting surveys in proposed training areas, and data gathered during several site visits in 1996. See Appendix G for a compilation of survey information that identifies sites, determines historical significance, and proposes mitigation measures.

Potentially significant programmatic impacts. Potentially significant impacts of various ongoing and proposed ground-based training activities are summarized below.

- Vehicle or troop movements, removal, or defacement of important artifacts or structural features, resulting in loss of archaeological or historic data or inherently important features.
- The loss of a major portion of the historic and/or archaeological record and the resulting loss of information from repeated, cumulative impacts (e.g., small disturbances) or the loss of an artifact with intrinsic importance within its historic context. This could result from repetitive training and cumulative impacts from tourism activities in the MLA. Repetitive impacts of ongoing training on Tinian have been addressed in detail in the past[18] and continue to be mitigated by limiting ground-disturbing activities and by complying with the recently developed *Tinian Historic Site Protection Plan for the Military Lease Area.*[19]

Proposed mitigation for programmatic impacts. Mitigation of many potential impacts to cultural resources consists primarily of prohibiting certain training activities in certain locations. These measures include identifying NT areas and NCRD areas, where excavation and off-road vehicle travel will be prohibited (see Figures 2-7 through 2-10). Additional mitigation measures will be incorporated in the next revision of COMNAVMARIANAS INST 5440.1_, the order governing training on Navy lands in the Marianas:

- No digging will be permitted within one meter of any historic structure with concrete walls or in any cave.
- All exercise personnel will be briefed on the significance of archaeological resources and historic structures, including certain areas where activities are limited and areas are off limits. The briefing will include a description of cultural resource indicators (e.g., charcoal-stained soil, pottery fragments, and bones). Training personnel will be instructed to stop any digging

[18] Belt Collins Hawaii (November 1994) *Environmental Assessment Military Exercise, Island of Tinian: Tandem Thrust 95.*

[19] International Archaeological Research Institute, Inc. (December 1996) *Prefinal Tinian Historic Site Protection Plan for the Military Lease Area.*

if such materials are found and to immediately notify the COMNAVMARIANAS Cultural Resources Manager to determine whether digging may be resumed.

- Selected sites within NCRD areas will be flagged or otherwise visually identified prior to any ground-based exercise. Permanent signs may be installed at boundaries to some sites.
- Specific sites will be monitored by Navy archaeologists during and immediately after an exercise.

4.2.2.2 Amphibious Landings in the MLA

Unai Chulu has been used for LCAC landings and Unai Dankulo is proposed as another LCAC landing alternative. LCACs bring additional vehicles and personnel ashore for maneuvers in the MLA. These two beaches and Unai Masalok are used by Navy SEALs, Marine Reconnaissance units and Army Special Forces for landings in CRRCs (Zodiac inflatable boats) or for swimming ashore. Boats are hidden in the nearby brush and the teams maneuver inland.

Existing cultural resources. Several intact prehistoric sites and relatively unique and significant historic sites such as World War II gun emplacements have been identified at these beach areas.

A prehistoric complex at Unai Chulu contains latte remains, burials, and one of the earliest habitation sites in the Marianas. This site was inadvertently altered several years ago by bulldozing and clearing an additional access road at beach center. The road floods during typhoon seasons causing additional disturbance to this site. But the road is compacted and provides better trafficability than the soft sand road leading from the beach and exiting to the north. The center road is used by beach visitors and has been used by military personnel and wheeled vehicles. The tall grasses to both flanks may be hiding additional resources and there is no desire to widen the existing roadway.

Unai Babui has several intact prehistoric deposits and numerous human burials. During World War II, U.S. troops landed large numbers of amphibious vehicles at both Unai Chulu and Unai Babui to begin the American invasion of Tinian (See photographs on cover sheet of Chapter Two). A former gun emplacement is visited frequently by tourists.

The beach at Unai Dankulo is comprised of about 13 segments identified by Tinian residents as Long Beach One through Thirteen. Long Beach One and Two have former gun emplacements readily visited by tourists. The area just inland of these beaches is a prehistoric complex of latte sets and associated deposits and burials. (See Figure 2-7c.)

One latte set complex made up of three sites was recorded at Unai Masalok. Sites inland from Unai Masalok were developed by the Seabees during World War II. Access from this beach to the MLA is conducted using established roadways.

Potentially significant impacts. Offloaded vehicles and personnel at landing beaches would possibly affect intact historic sites if they wander off of the established beach roads. In particular, the archaeological resources at Unai Chulu are obscured from view by tall grass and are vulnerable to unintentional ground disturbance. No impacts are anticipated by the light activities conducted by special operations teams at this or any other MLA beach.

Beaches are tourist destinations and fishing sites, and the existing cultural resources are not protected. There is a possibility that large resources could be vandalized (e.g., chipping off a "memento" from the pillbox at the beach entrance) and smaller artifacts removed. The number of tourists is projected to increase as a result of casino construction in San Jose and the possibility of damage to resources will increase

Proposed mitigation.

- Portions of adjacent inland areas will be designated as NT or NCRD to protect cultural resources at Unai Chulu, Unai Dankulo, and Unai Babui. The areas of constraint will be published on training map overlays; routes to and from the beach will be designated and marked. During Tandem Thrust 99, engineer tape was used to define the boundary of the Unai Chulu Beach exit road, eliminating any potential off-road vehicle parking in sensitive areas. Environmental monitoring will be conducted to ensure compliance to the training constraints (see Figures 2-7b, 2-7c, and 2-7d).
- The Navy will develop a Memorandum of Agreement with the CNMI HPO concerning historic preservation. CNMI is the legitimate custodian for all artifacts located in the leased area. Present training rules restrict relocating or removing any found artifacts. The MOA will identify those who are responsible to report, maintain and curate artifacts unearthed or inadvertently discovered.

4.2.2.3 Special Operations Landings outside the MLA

The Tinian municipal government allows special operations teams with CRRCs to use Leprosarium and Kammer beaches for nighttime training landings. Although CRRC and combat swimmer activities are "low-impact," indiscriminate cross-country maneuver could affect nearby cultural resource sites at any of these beaches.

Existing cultural resources. The coastline at Leprosarium Beach has been surveyed. There are two latte sets recorded near the north and south coves and other artifacts and former facility foundations. The Leprosarium cemetery is nearby.

Kammer Beach is close to the "House of Taga," which is an excellent latte set established in a park setting. The area also has high potential for subsurface deposits.

Potentially significant impacts. The cultural resources in vicinity of Leprosarium Beach should suffer no impacts from the light activity of special operations landings. No heavy equipment is brought ashore at these beaches. The training scenarios may differ, with personnel remaining off established roads and purposely using more heavily wooded terrain. No damage is anticipated as long as personnel adhere to the constraints established for NCRD areas.

Kammer Beach is a developed recreation area adjacent to a sensitive cultural resource site and close to San Jose residences and the Tinian Dynasty Hotel. Only the beach and nearby abandoned structures are authorized for special operations training.

Proposed mitigation. The military will review special operations training scenarios in advance for approval by the Mayor of Tinian (Military Representative) and the CNMI cultural resource staff.

4.2.2.4 TRUE Training at Former Japanese Naval Air Command Post

Ongoing training at this location involves personnel using small arms and live firing at silhouette targets in bullet traps on the outside of the building and the interior of particular rooms. The portable bullet traps are removed following the exercises. Expended brass and lead rounds are collected by the training unit and removed from Tinian.

Existing cultural resources. The former Japanese Naval Air Command Post (Air Administration Staff B..ding) at Ushi Field was a major target for American air and naval bombardment before the invasion of Tinian.[20] Although heavily damaged by bombs, strafing and demolitions, the two-story concrete-reinforced structure still stands within the North Field National Historic Landmark and is a popular tourist attraction (see photograph on cover sheet of Chapter Three).

Potentially significant impacts. This training activity has the potential to cause more damage to the building since live-fire is conducted outside of and within the building. The likelihood of bullets impacting the walls rather than a bullet traps is small however, given the short range at which firing will occur and the caliber of special operations teams that perform this type of training. Therefore, no significant impact to the building's structure from bullets is expected.

There is potential for cumulative impacts due to the repetitive nature of the training activity and increasing numbers of tourists. Protection of this resource is the subject of a Programmatic Agreement. [21]

Proposed mitigation. Written and photographic documentation will be prepared by an architectural historian, followed by field monitoring of the building's condition to verify whether the live-fire training is damaging the building. The Navy will coordinate monitoring efforts with the CNMI HPO regarding the placement of targets and portable bullet traps and collection and removal of shell casings and expended rounds.

The CNMI HPO may elect to observe the training and to participate in evaluating the effectiveness of mitigation measures. Comparison of photo-documentation and written reports of site visits will be used to determine cumulative effects over time. A person qualified in architectural history will review the photographs and assist in determining whether there are adverse effects inside the World War II structures. If there are adverse effects, mitigation may consist of modifying the TRUE training or the placement of targets and bullets traps. If these facilities would no longer be available, the alternative to construct a permanent shooting house

[20] Don A. Farrell (1992) *Tinian.*

[21] (Draft) Programmatic Agreement among the Commander –in-Chief, U.S. Pacific Command Representative Guam and the Commonwealth of the Northern Mariana Islands, The Advisory Council on Historic Preservation, and the CNMI Historic Preservation Officer regarding Implementation of Military Training on Tinian dated January 22, 1999.

and/or breacher trainer may be revisited and appropriate environmental documentation developed.

4.2.2.5 Lake Hagoi

This entire area has been found to contain prehistoric deposits and remnants of a Japanese village site that existed prior to World War II. The area has been identified as "No Training" to protect natural and cultural resources. Hagoi is bordered by established roadways to eliminate the need to traverse the area during training.

4.2.3 Wastewater Disposal on Tinian

This section analyzes the impacts of disposing domestic wastewater generated by ongoing training on Tinian. This is a significant issue because improper wastewater disposal can create public health impacts from contaminated drinking water or surfacing effluent. Tinian has no public or private wastewater treatment plant, but the municipality owns relatively large septic systems at the Field House and at the former administration/school building, both of which have been used by training organizations in the past. The following sections focus on the impacts of disposing wastewater to existing or future municipal wastewater disposal facilities, including cumulative impacts resulting from activation of the IBB transmitting facility and one or more casinos and hotels.

Evaluation Criteria: Potential impacts of military wastewater disposal are evaluated using criteria presented in Table 4-4.

TABLE 4-4: EVALUATION CRITERIA FOR POTENTIAL IMPACTS OF WASTEWATER DISPOSAL

Wastewater Treatment System	Parameters	Potentially Significant If
Existing municipal septic systems	Capacity	Addition of military wastewater* exceeds capacity causing one or more overflow or surfacing events
		Addition of wastewater* would increase maintenance requirements by 10%
Future municipal wastewater treatment plant (if constructed)	Capacity	Addition of military wastewater* would cause one or more overflow of surfacing events
Navy septic system	Impacts on groundwater quality	Contaminants leach to drinking water source
Field disposal	Impacts on groundwater quality	Contaminants leach to drinking water source

NOTE: The combination of portable toilet wastewater and direct additions by military use of showers and toilets at Field House.

Proposed action. The continued use of municipal facilities by small training units as well as leasing portable toilets for larger training exercises was the initial proposal when development of the EIS began. The Navy has constructed a septic tank and field that is capable of supporting a training force of about 2,500. Leasing portable toilet support and waste collection and dumping the waste at the Navy septic tank can support training under all alternatives. Negotiating for use

of the two municipal septic systems remains an alternative if exercise play would involve the support of forces in San Jose facilities.

Overview of training impacts. This analysis focuses on impacts on wastewater disposal systems.[22] The analysis is divided into small-scale exercises (defined here as not more than 50 persons) and large-scale exercises. Because it is assumed that the Navy's septic system has been properly designed, sited, and permitted by CNMI Public Works Center, this section does not focus on impacts of the proposed septic system on groundwater in the EMUA. Nor does this section evaluate the impacts that could be caused by disposal of toxic wastes in a Tinian wastewater system, which is prohibited.

Impacts on wastewater systems would result from overloading, which would affect a system's ability to break down wastes.

- If a septic system is overloaded on a single occasion, wastewater or septic tank effluent may surface, causing potential public health hazards in addition to nuisance odors. No long-term damage to the system is likely to result.
- Chronic overloading has the potential to affect the long-term functioning of the system. These actions can impair biological activity, increase the frequency of maintenance to remove and dispose sludge, and increasing costs to the system owner. Increased accumulation of solids would eventually deteriorate the soil absorption system, shortening a system's functional life.

4.2.3.1 Existing Wastewater Disposal Facilities on Tinian

The Municipality of Tinian and Aguijan has two large septic systems at the Field House and the former administration/school building. Use of these systems was contracted for disposing of black water waste during Tandem Thrust 95.

- The Field House septic system has a capacity of approximately 8.6 cubic meters per day (m^3/d). The septic tank volume is 8.64 m^3/d, and the absorption field area is approximately 170 m^2.
- The capacity of the septic system at the former administration/school building is not known. The septic system served approximately 350 daytime staff and students during the 1970s.[23] Based on a generation rate of 0.05 m^3/d per student or staff member,[24] this equates to a design flow of approximately 18 m^3/d.[25]

There are no existing wastewater disposal facilities for tourist use in the MLA. Military field sanitation practices consist of contracting for portable toilets temporarily installed at the harbor

[22] The impacts of improper wastewater disposal practices, such as discharge of untreated wastewater over land or into coastal waters, are not addressed as no such practices are proposed.

[23] M&E Pacific, Inc. (June 1979) *Supplement B, Facilities Plan for the Island of Tinian, Mariana Islands.* Prepared for Department of Public Works, Government of the Mariana Islands.

[24] Hawaii Administrative Rules, 11-62, Table I.

[25] Note that available records do not contain specific information on the actual design capacity, septic tank and leach field sizes, and the condition of the existing system. The system was constructed before the existing IWS permitting program was established by the CNMI Department of Public Works, Division of Environmental Quality (DEQ).

and a various sites in the EMUA, or by allowing individual cat-holes (dig-and-bury) to be dug by units in tactical situations. The black water waste collected from the portable toilets was disposed into municipal septic tanks as a contract service. The Navy now has a septic tank and leaching field adjacent to the IBB parcel in the EMUA.

4.2.3.2 Wastewater Disposal for Small-Scale Exercises

4.2.3.2.1 Municipal Facilities

Potential impacts. Military personnel may train in the vicinity of San Jose Village and West Tinian Airport. They will use sanitary facilities at the Field House, the airport, and other public places. Loads upon public facilities will be increased;[26] however, due to the small numbers of personnel and the short duration of small-scale exercises, the additional loads will be within the operating capacity of properly functioning systems. If 50 people are housed at the Field House, they will generate a maximum of about 1,321 gallons (5 cubic meters) per day of wastewater, which will not overload the facility's septic system capacity of approximately 22,900 gallons (8.6 cubic meters per day). Impacts will not be significant.

Proposed mitigation. If public functions at the Field House preclude use of the sanitary facilities by military personnel, portable toilets will be used at the site and waste will be disposed into the Field House septic system after public functions have finished. No other mitigation is required.

4.2.3.2.2 Field Sanitation

Potential Impacts. Common field sanitation practices, such as temporary pit toilets and small individual excavations (commonly referred to as "cat holes"), are not easily practiced on Tinian. Difficulties in controlling such procedures are exacerbated by the predominance of shallow soils over limestone bedrock and by the occurrence of compacted granular surface soils at many locations. Resulting shallow burial of human wastes could result in health hazards for future users of the sites, which would potentially be a significant impact over time if practiced by a large number of individuals.

An alternative field-sanitation practice is use of diesel-fired "burn cans" as toilets, and subsequent field burial of residual ash.[27] Burn cans would generate minimal emissions, would be more easily controlled, and would not leave potentially contaminating residue, which could be a nuisance and a hazard for future users of the site.

Proposed mitigation. Proper management of field sanitation will adequately mitigate the potential for significant impacts. The U.S. EPA has indicated that they do not anticipate adverse air quality impacts from use of burn cans for small-scale training exercises where troops are concentrated in camps. Burn cans are, therefore, the preferred method of disposal for sanitary wastes from small-scale field exercises where troops are concentrated in camps. Burn cans will

[26] A planning factor for military personnel housed in facilities with restrooms and showers is each person generating approximately 26 gallons (0.1cubic meter) of wastewater per person per day.

[27] No diesel residue remains in the ash.

be properly sited and supervised to minimize potential nuisance from smoke emissions and to prevent brush fires (which could have significant impacts on endangered species, as indicated in Section 4.1). Dig-and-bury techniques on Tinian are only appropriate for very small units.

4.2.3.3 Wastewater Disposal for Larger-Scale Exercises

Potential impacts. Proper treatment and disposal of wastewater from large field exercises, for which no permanent sanitary facilities are available, will minimize the potential for significant public health hazards and pollution that can occur if sanitary waste disposal is not handled properly. The practice of contracting a number of portable toilets, as has been done for past Tandem Thrust exercises, significantly reduces potential health hazards. Assuming that an adequate number of portable toilets are provided at suitable locations, the only potential impact is overloading of municipal septic systems.

According to the *Tandem Thrust 95 Solid Waste and Sludge Management Plan, Draft Report* by Barrett Consulting Group, Inc., about 30 portable toilets were used to support about 1,500 people during the exercise. The plan indicates that the wastewater generation rate from the portable toilets averaged 211 to 396 gallons (0.8 to 1.5 cubic meters) per day. This total daily volume is no more than half of the design rate of an average single family house.[28] If this average generation rate were produced for approximately 10 days, a total of no more than 3,963 gallons (15 cubic meters) would be generated. When disposed in a municipal septic system, this would increase sludge accumulation in the tank(s) and would increase the hydraulic loading and possibly the solids loading to the soil absorption system(s). The increased solids loading to the existing septic system(s) may require more frequent removal and disposal of the septic tank sludge.

- The septic system at the Field House has a capacity of approximately 2,272 gallons (8.6 cubic meters) per day. It would able to accept 396 gallons (1.5 cubic meters) per day of additional wastewater if base flows from other sources do not exceed approximately 1,875 gallons (7.1 cubic meters) per day.[29]
- Because the actual size and condition of the septic tank system at the former administration/school building is not known, it is not possible to predict the specific impact of the discharge of PT wastes from large-scale exercises.

Portable toilet wastes are highly concentrated in comparison with typical domestic wastewater. If disposed of improperly, the wastes could be a public health threat or could cause pollution of stormwater runoff, coastal waters, or groundwater. If deodorizing solutions contain disinfectants (biocides), emptying the waste into a municipal septic system could damage or destroy needed septic system microorganisms.

For field exercises in locations that are not served by portable toilets, the potential impacts would be similar to those for small-scale exercises.

[28] Hawaii Administrative Rules, Chapters 11-62, "Wastewater Systems."

[29] For Tandem Thrust exercises, up to 50 military personnel may occupy the field house for several weeks. As indicated in Section 4.1.3.2, these personnel are expected to generate a total maximum of about 5 m^3/day [0.1 m^3 per person].

Proposed mitigation measures

- Portable toilets. Continue to contract for portable, self-contained toilets during large-scale exercises on Tinian. This will adequately mitigate the potential for health hazards or pollution that could otherwise result from inadequate sanitation facilities. The portable toilets typically hold up to 0.23 m^3 but are often pumped out well before they are filled to capacity. The contract for services will specify that no disinfectants (biocides) may be used in the toilets. Non-disinfecting deodorizing solutions, employing bacteria and/or enzymes are available.[30] The service will be contracted with local suppliers whenever possible.

- Navy septic tank system. Former potential impacts of wastewater generated at the Field House can now be mitigated by use of the newly constructed septic tank system adjacent to IBB, which combines a septic tank and leach field within a fenced, secured lot to prevent unauthorized use. It is designed to support about 2,500 personnel. Activation of this facility will alleviate both municipal and DEQ concerns regarding capacity and sludge accumulation issues at the Field House and other existing municipal septic tank systems. The septic tank system will be annually inspected to determine the volume of sludge accumulation. When the accumulated sludge reaches a specified level, the tank will be pumped out. If the leach field is found to have failed, it will be reconstructed or replaced prior to the next larger-scale exercise.

  Disposal of the septage is normally to a wastewater treatment plant if one is available. In the absence of treatment facilities, as is the case on Tinian, septage will be discharged to a properly designed sludge-drying bed for drying and further stabilization. The dry sludge can then be hauled to a landfill or used as a soil amendment under controlled conditions.

- **Wastewater disposal at existing municipal septic systems**. When necessary and with permission of the municipality and proper coordination with other events at the Field House, dispose of portable wastes in the septic system at the Field House. This would be convenient for supporting units who may be billeted in San Jose rather than in the EMUA. If other functions at the Field House preclude the use of the Field House septic system, toilet wastes will not be disposed until Field House use decreases or, with permission of the Municipality, disposal can be accomplished at the septic system at the former administration/school building. Both of these options are now considered alternatives to primary use of the Navy septic system.

- Composting toilets for treatment. Composting toilets would not be the best method of waste treatment for training activities on Tinian. Although they provide more complete biodegradation of organic wastes, several characteristics make them undesirable:

  • Composting toilets require more maintenance than septic tank systems.

  • Many models require electrical power to enhance evaporation and ventilation for both moisture control and odor control.

[30] Personal communication with Fred Newmark, J & J Chemical Company, May 1996.

- They generally require the addition of a "bulking agent" to absorb moisture and facilitate aerobic conditions.

- Moisture buildup can be a problem, especially in non-electrical units.

- The control of vectors would be more difficult than with portable toilets and septic tank systems.

- Composting toilets are more sensitive to shock loading than septic tanks.

- Although concentrated, portable toilet wastes contain excess liquid, which make them unsuitable for discharge to composting toilets.

- They do not represent final disposal, as the composted wastes must be disposed of as a soil amendment or hauled to a landfill.
- They are generally less portable and more expensive than portable toilets.

4.2.3.4 Cumulative Impacts with Hotel Casino Development

Potential impacts. The Tinian Dynasty Casino Hotel is now open and another casino is planned. Resort development could significantly impact wastewater management on the island. However, because wastewater flows generated by military training activities would be a very small percentage of flows generated by a large casino development, the impact of the military contribution of wastewater would not be significant.

The casino hotel developer has been required to build a self-contained wastewater treatment and disposal system. The only cumulative impact on wastewater disposal systems in San Jose Village and other parts of the island would be due to the increased demand by larger numbers of visitors. Assuming that any new individual wastewater systems around the island would be designed to accept increased wastewater flows from additional tourist activity, the wastewater contributions from military training activities would not lead to the new system capacity being exceeded. This assumes that the Field House would be supported by a new wastewater treatment system. Thus, the cumulative impact of wastewater generated by military training activities would not be significant.

In the long term, the population and economic growth resulting from large-scale casino development would probably require development of a municipal wastewater collection and treatment system designed to serve a population of 20,000 or more residents and tourists.[31] A typical per capita generation rate for design of municipal wastewater collection and treatment systems is 0.4 m^3/d per person. This suggests a minimum treatment plant capacity of approximately 8,000 m^3/d. Wastewater flows generated by the proposed military training activities would represent less than one percent of the wastewater treatment plant's design flow.[32]

[31] Dames & Moore, Juan C. Tenorio & Associates, and Austin Hansen International (March 1994) *Island of Tinian Master Plan Strategy Study.*

[32] Estimated to be approximately 5 m^3/d at the Field House plus 1.5 m^3/d of concentrated wastes from portable toilets during a large-scale exercise.

This small percentage would not be expected to exceed system capacities, indicating that the impact of the military contribution would not be significant.

Proposed mitigation. No mitigation would be required.

4.2.3.5 Cumulative Impacts with IBB Operations

Potential impacts. The cumulative impact of wastewater treatment and disposal from military training activities and the IBB Mariana Relay Station operation will not be significant. The IBB operates its own individual wastewater system (IWS) at the relay station. Preliminary estimates indicated that the IBB station generates approximately 792 gallons (3 cubic meters) of wastewater per day.[33] There will be no cumulative impact upon wastewater facilities because wastewater generated by military training activities will not be discharged to the IBB facility. Also, because the IBB wastewater generation rate approximately equals the design rate for a single-family house, the cumulative impact upon wastewater disposal on groundwater through leach fields from military exercises and the IBB station would not be significant.

Proposed mitigation. No mitigation is required.

4.2.4 Disposal Of Solid And Hazardous Waste Generated On Tinian

This section analyzes the cumulative impacts of waste disposal from continued training on Tinian. The issue is significant because there are no approved on-island waste disposal facilities.

Significance criteria. Waste disposal activities resulting from ongoing training were evaluated to determine whether they would have a potentially significant impact on the environment. The criteria used are presented in Table 4-5.

4.2.4.1 Existing Conditions

Solid waste facilities. Tinian does not have either military or civilian facilities available for disposal of SW generated by training personnel. Tinian's municipal landfill is an open dump, which is not in compliance with federal solid waste regulations.[34] The dump is located downwind of San Jose, near the site of a former leprosarium north of town. There is no public or private waste-hauling service; residents bring their own trash to the dump.

There are no landfills on Saipan or elsewhere in the CNMI in compliance with federal regulations. As a result, the nearest landfills available for disposing SW generated by training are those on Guam, which has two military landfills and one civilian landfill:

[33] U.S. Information Agency, Voice of America (August 1995) *Public Review Copy: Final Environmental Assessment and Finding of No Significant Impact for the Voice of America Mariana Relay Station, Tinian, Commonwealth of the Northern Mariana Islands.*

[34] 40 CFR Part 257 *EPA Regulations on Criteria for Classification of Solid Waste Disposal Facilities and Practices*, and Part 258, *EPA Criteria for Municipal Solid Waste Landfills.*

TABLE 4-5: EVALUATION CRITERIA FOR POTENTIAL IMPACTS OF SOLID AND HAZARDOUS WASTES GENERATED ON TINIAN

Criterion	Parameter	Potentially Significant If
SW transportation	Means of controlling pest/disease import	No protocols and associated infrastructure established
	Import from CNMI to Guam	Prohibited by law
SW disposal facility	Presence	No RCRA-compliant facilities available within Guam/CNMI region (per 40 CFR 257 and 258)
	Landfill service life	SW from Tinian would shorten service life by 5% or more
HW and HM transportation	Presence	No DOT-compliant commercial or military aircraft or vessels available (per 49 CFR 257 and 258)
	Import from CNMI to Guam or continental U.S.	Prohibited by law
Permitted HW TSDF	Presence	No RCRA-permitted facilities available within Marianas (per 40 CFR 171-173)
HW Storage	Presence	No temporary (<90 day) storage facility or permitted HW TSDF in Guam or CNMI (per 40 CFR 261 and 262)
HW, HM, used oil handling and storage	Means of preventing and controlling spills	No SOPs and associated infrastructure are established or present

The Navy Public Works Center (PWC) operates a 93-acre (37.6-hectare) landfill in the southern portion of the COMNAVMARIANAS Waterfront Annex. The landfill is currently being studied to determine its capacity and annual fill rate. The currently established maximum landfill height is about 30 feet (9 meters) above mean sea level (msl) and the annual volume of SW entering the landfill is estimated to be between 78,500 and 150,000 cubic yards (60,000 to 115,000 cubic meters). The remaining service life is estimated to be between 14 and 17 years, respectively. However, a proposed vertical expansion to 48 feet msl (14.63-meters) would extend the life span to between 22 and 41 years.[35]

AAFB has a landfill that is nearing capacity and is not able to accept wastes other than that generated by the Air Force.

The only civilian waste disposal facility on Guam, Ordot Landfill, is an open dump out of capacity and out of compliance with RCRA regulations. Under a consent order signed with U.S. EPA, GovGuam was required to close Ordot in 1997. The Guatali Landfill is planned as its replacement. Regardless, SW generated by military activities will continue to be disposed at the PWC landfill after recycling/waste minimization procedures.

SW delivered to Guam from aircraft and ships arriving from all sites outside the continental U.S. and Canada must be steam-sterilized prior to disposal in landfills on Guam.[36] PWC maintains pier side dumpsters in Apra Harbor and the Guam Commercial Port with approved sterilization capability.

[35] Personal communication with Michael Miyahira, GMP Associates, Inc., May 9, 1996.

[36] U.S. Department of Agriculture, Animal and Plant Health Service (3 May 1995) *Compliance Agreement for the Handling and Disposal of Foreign Garbage by the U.S. Navy Public Works Center, Apra Harbor, Naval Station, Guam.*

Hazardous waste facilities. There are no RCRA-approved HW treatment, storage and disposal facilities on any island in the CNMI or Guam. HW and used oil generated by military organizations in the Marianas are managed and disposed by the Defense Reutilization and Marketing Office (DRMO), which transports HW from PWC and AAFB on Guam for disposal at authorized licensed facilities off-island.

4.2.4.2 Potentially Significant Impacts of Solid Waste Disposal

Transporting SW from CNMI to Territory of Guam. SW shipments from the CNMI to Guam are considered imports by GovGuam, which has indicated it prefers not to approve SW imports into the territory, even for disposal at a DoD-owned and -operated facility. However, GovGuam has not attempted to prohibit such imports and has established a protocol for handling such waste. Therefore, although occasionally transporting exercise-generated SW to Guam could generate some friction between GovGuam and the Navy, it is not expected to have a significant impact on solid waste disposal resources.

Licensed Disposal Facilities. No significant impact is expected from lack of a licensed SW landfill with adequate capacity.

The AAFB and Navy PWC SW landfills on Guam are available to receive SW from military activities in and around the Marianas, and are in compliance with RCRA regulations. The Navy PWC landfill has been the primary site used and has the capacity to accept additional SW without decreasing its service life by 5 percent or more. An estimated 650 cubic yards (500 cubic meters) of SW per year could be generated by exercises on Tinian. However, actual training tempo compared to actual training tempo indicates that the estimate is conservatively high, so about half that amount is more likely. This represents less than one percent of the waste annually accepted by PWC landfill.[37] This equates to the back haul of SW from Tinian could potentially shorten the service life of the Guam PWC landfill by a maximum of 21 days in seven years, its minimum anticipated service life.[38] This reduction of less than 1 percent in the landfill service life does not meet the volume criterion for significant impact to the landfill capacity.

There would be no impact on the civilian landfill. PWC is not a potential repository for civilian SW; therefore, disposal of Tinian's military-generated SW at the PWC landfill would not affect the island-wide capacity for civilian-generated SW disposal.

4.2.4.3 Proposed Mitigation of SW Impacts

The potential impact on GovGuam-Navy relations from transporting SW from Tinian cannot be entirely mitigated without providing for SW disposal on Tinian, which would be extremely

[37] 650 yd^3/78500 yd^3 = 0.008 = 0.8% < 1%, where 650 yd^3 = volume generated annually on Tinian and 78,500 yd^3 = lowest estimate of annual volume entering PWC landfill at the present time.

650 yd^3 /150,500 yd^3 = 0.004 = 0.4%<1%, where 150,000 jd^3 = highest estimate of annual volume entering PWC landfill at the present time.

[38] 0.8% x 2555 days = 20.4 days, where 2555 days = 7 years, the minimum estimated service life.

0.8% x 5110 days = 40.9 days, where 5110 days = 14 years (maximum estimated service life without proposed expansion)

costly and difficult to control in the absence of any staffed DoD base on Tinian. The Navy will continue to work closely with GovGuam to allay concerns regarding imported SW.

Implementing waste minimization measures, in accordance with current Navy policy may mitigate the funding and logistical impacts on training organizations.

4.2.4.4 Potentially Significant Impacts of Used Oil and HW Disposal

Spill Prevention Measures. No significant impact from an unexpected release is expected on Tinian, as all units operating on Tinian must be in compliance with military orders regarding spill prevention and response.[39] Storage and handling of HW, HM, and used oil are managed in accordance with federal regulations and associated military instructions.[40]

The used oil and other HM/HW are collected for transportation to Guam or to offshore amphibious ships. Wastes removed to Guam are then treated as necessary for disposal at the Navy landfill at NAVACTS Waterfront Annex or the Air Force landfill at AAFB or when necessary, off-Guam transportation by the Defense Reutilization and Marketing Office (DRMO). Potential impacts include shortening the useful life of a landfill, as well as impacts on groundwater resources, air quality, and public health if waste is not properly disposed.

4.2.4.5 Proposed Mitigation of Used Oil and Hazardous Waste Impacts

Any HW generated on ships and off Guam must be approved by GEPA prior to being offloaded on Guam.[41] To reduce the amount of used oil that may be generated on Tinian, no scheduled vehicle maintenance will be permitted during exercises on Tinian.

Any used oil that is transported back to Guam is periodically tested for HW characteristics.[42] If used oil is determined to be HW by the toxicity characteristic, future shipments of used oil from Tinian to Guam will be managed in accordance with federal and Guam regulations regarding HW shipping and import.

All expeditionary refueling will occur on paved/impervious surfaces with spill containment barriers. Spill containment equipment will be available. Any release of petroleum, oil or lubricant during a training exercise on Tinian will be contained, collected/absorbed in accordance with existing SOPs. The resulting waste will be placed in a secure container for transportation by the generating unit for disposal at its home location.

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[39] U.S. Department of the Navy, Commander, Naval Forces, Marianas (16 February 1993) COMNAVMARIANAS Instruction 5090.2 *Oil and Hazardous Substance (OHS)* Pollution Contingency Plan.

[40] E.g., RCRA solid waste regulations at 40 CFR Parts 240 and 250, RCRA hazardous waste regulations at 40 CFR Parts 260 and 270, OPNAVINST 5090.1B *Environmental and Natural Resources Protection Manual,* COMNAVMARIANAS INST 5090.2 *Oil and Hazardous Substance (OHS) Pollution Contingency Plan,* and various site-specific OHS (oil and hazardous substances) Spill Contingency Plans.

[41] Such waste is considered an import by GovGuam and must conform to Guam EPA regulations. A generator must be identified, must have or obtain a generator identification number from the U.S. EPA, and must initiate an import request involving a 60-day approval period.

[42] See 40 CFR 261.20-261.24, *Characteristics of Hazardous Waste.*

4.2.5 Range Safety on Tinian

This section addresses potential public access conflicts and public safety measures in place for proposed weapons training. The Maximum Land Use Alternative proposed the development of open field, live-fire ranges in the EMUA for small arms infantry fire-and-maneuver and 60mm-mortar crew training. This alternative also proposed constructing a shooting house and breacher trainer as permanent facilities. Live ammunition is expended in the shooting house whereas blank ammunition, simulated ammunition and small demolition charges are employed in the breacher trainer.

Significance criteria. Due to the nature of this kind of training, live-fire ranges have the potential to pose significant safety risks to military personnel and the public. Range operating orders are based on safety criteria and training procedures published by responsible government agencies. These regulations are then tailored for specific ranges, reviewed and published prior to any range being activated. Significance criteria are included in Table 4-6.

TABLE 4-6: EVALUATION CRITERIA FOR POTENTIALLY SIGNIFICANT EFFECTS OF LIVE-FIRE TRAINING

Activity Side Effect	Parameter	Potentially Significant if
Personnel safety	Risk of injury to personnel on the range, its surface danger zone, nearby roads and trails, and adjacent waters	Lack of range SOP, range and SDZ safety observers, communications, and positive range control to keep all unauthorized personnel clear of the ranges
		Lack of ability to inspect a range (range sweep) for UXO prior to using a range for training, and prior to departing a range after training
		Lack of standard public notifications (NOTMAR, maps, press releases, etc.)
		Lack of roadblocks and sentries to stop vehicular traffic through the range area
	Risk of injury by UXO	Lack of means to clear UXO caused by training activities
Aviation safety	Risk of damage to aircraft by aloft munitions	Lack of NOTAM publication and direct communication with FAA to coordinate mortar training and commercial/military flight activity

4.2.5.1 Existing Conditions at Existing and Proposed Range Areas

The proposal to maximize training on Tinian by adding live-fire training was based on there no longer being a training range on Tinian as discussed in Section 2.2.2.4. Conceptual range areas were selected for evaluation (Figure 2-1b). At one time, a live-fire small arms, mortar and 40mm rifle grenade range was established along the shoreline east of North Field. The range has been inactive for a few years. The range has been fenced-off and posted for the presence of UXO in the impact area. Regardless, island residents cross the fence to gather native plants used for ethno-botanic uses.

The areas that were evaluated as potential sites for open field live-fire ranges are within historic North Field and inland of the former range. Former taxiways and runways that define range areas are also open to the public. A specific site for a shooting house or breacher trainer was not selected beyond designating North Field as a logical location so that the facilities would be in

proximity to the active runway and helicopter LZs. The proposed shooting house would replace or supplement the infrequent use of the former Japanese Naval Air Command Post, a two-story building on North Field that sustained substantial bomb damage during World War II. This historic facility is within a complex of structures visited by tourists during the day. TRUE training is normally conducted at night.

4.2.5.2 Potentially Significant Impacts

Fire-and-maneuver range. The SDZ for the proposed small-arms fire-and-maneuver range would extend over navigable waters and a public road, creating potential hazards to boaters as well as to tourists visiting historic trails and sites in the EMUA. Military personnel not involved in range training could encroach the SDZ also.

Mortar range. The 60mm mortar has the potential for causing dud (UXO) contamination in the range impact area and on or near adjacent roads. Although the impact area can be swept, fenced, and posted with warning signs, such measures cannot guarantee that the mortar impact area would not be entered. The limestone terrain and heavy underbrush in the proposed impact area would make post-training dud clearing by EOD personnel extremely risky. UXO would accumulate in the designated impact areas, constraining future land use. Few training units also have EOD personnel, and EODMU-5 from Guam may have other commitments that would make it impossible to remain "on-call" for all mortar crew training that could occur on Tinian. Potential impacts of mortars on aviation safety are discussed in Section 4.2.6.

Shooting house or breacher trainer. It would be possible for civilian visitors to leave a historic trail and, by using the many former taxiways and parking aprons, inadvertently enter the areas where there facilities may be while urban training was underway. The potential for this hazard is low given that the training site can be easily observed and the shooting house design captures the fired rounds. There is no SDZ per se but there is a safety radius of about 75 feet [23 m] that is kept clear of personnel not involved in the training. In addition, priority is given to scheduling training after dark when tourists are not present.

TRUE training. The same requirements for shooting house/breacher trainer safety observation and range control and potential risks as identified above apply to the temporary adaptation of former World War II structures for urban training.

4.2.5.3 Proposed Mitigation

Live-fire training is inherently dangerous and has resulted in volumes of rules and regulations to be followed by those conducting and participating in live-fire range training. Approvals, regulations, notifications, and warning measures are standardized (see Section 4.1.2.2). Adherence to range requirements has as its objective mitigating significant impacts to nonsignificance.

Prior to the introduction of any live-fire training to Tinian, the range designs would have to be evaluated and certified by the Naval Facilities Engineering Command. Due to their location beneath active flight paths, restricted air space and the SDZs (over land and water) would be formally established and any operations restrictions within these spaces processed with the FAA

and USCG. Prior to live-fire training being conducted, publication of a NOTAM and NOTMAR would be required to forewarn the aviation and boating communities. Early notification for boaters would also rely on CNMI Emergency Management Office marine band broadcasting simultaneously with USCG NOTMAR broadcasting from Guam.

General. Temporary roadblocks would be established during training activities, due to the number of former runways, taxiways, and roadways that allow access to the proposed range areas and World War II structures. Depending on the nature of a particular exercise, alternate civilian routes would be required to provide safe access to unaffected tourist attractions during training events. The Tinian Mayor's Office and Marianas Visitor Bureau would be informed at least one week in advance if access to tourist destinations must be closed due to range use. A water observation sentry post would be established for use of the fire-and-maneuver range overlooking the SDZ.

Mortar range. This range is not included in the Preferred Alternative. If it were implemented, its impact area would require sweeps by military DoD explosive-certified personnel, primarily calling upon Guam EOD MU-5 to conduct the missions. Pre-use clearing and maintenance with nonpersistent herbicides such as Roundup would be required to facilitate finding any duds after each training evolution. In addition, the impact area would require fencing and warning signs posted at close intervals. The proposed impact area is extremely close to a public roadway. The roadway could not be rerouted and still avoid the former range impact area, which lies between the road and the ocean. The public roadway would require an EOD team sweep following every training session. If a mortar round damaged the roadway, repairs could be delayed until qualified personnel and equipment could be dispatched to the range, and the road would be inaccessible for some period of time. The range impact area would require fencing and signs, but anecdotal evidence indicates that the existence of warning signs and fences on the former range does not guarantee that there is no entry to the impact area by unauthorized personnel. Therefore, development of a mortar range on lands available to the public would create a potentially significant risk to safety that could not be entirely eliminated.

As an alternative, use of a new reusable 60mm mortar training round is preferred. Due to enter the ordnance inventory in 1999, this round will create no UXO hazard and can be used in any open field that can be observed (to include observation of aircraft activity). Introduction of this training round would eliminate the need to construct a dedicated mortar range.

Fire-and-maneuver range. This range is no longer preferred alternative. Although this range does not create a UXO hazard, it introduces the potential for live-fire across a large expanse of open lands. To counter the potential for injury to civilians, the Range Safety Officer (RSO) would require absolute control of the SDZ. The RSO would employ visual warning markers on shore (large red flags and/or flashing red/white strobe lights), safety observers for boating activity, and roadblocks and sentries to stop traffic from entering the range area. The SDZ would be shown on local navigation charts. NOTMARs would be published and broadcast prior to and during scheduled training. Radio communication would be established and maintained among the RSO, firing positions, and range safety observers. Boats entering the SDZ would cause firing to cease until they were clear of areas of potential impact. Berms and bullet traps would be placed behind each target, thus limiting the number of rounds that may impact the water area.

As an alternative, use of the fire and maneuver range being developed on Orote Peninsula is preferred.

Shooting house or breacher trainer. Development of permanent training facilities is no longer in the preferred alternative. The risk to non-training individuals is less than those associated with the open field firing ranges. Safety observation would not be as difficult as that required for the two ranges noted above. However, the World War II structures now in use are sufficient. Safety observation and conducting the training at times when tourists are not expected to be in the area mitigate potential safety impacts.

Cost is another major drawback to development, construction, and follow-on maintenance and security for the two facilities. There is no permanent military presence on Tinian. Maintenance and security would require contracting and periodic monitoring to ensure that the facilities remain serviceable and are not vandalized or used improperly by island residents or visitors.

The preferred alternative is to use the shooting house and breacher trainer on Guam and the World War II structures. As noted in Section 4.2.2.4, if these structures become unavailable for urban training and the training cannot be accommodated at existing facilities on Guam, the cost of permanent facility construction on Tinian may then be justified and would include development of appropriate environmental documentation for construction.

4.2.6 Aviation Safety on Tinian

Significance Criteria. All potential impacts of aviation training are significant, if they affect human safety. Military training SOPs and area-specific constraints are established to prevent accidents associated with aviation. The SOPs are established on safety criteria and related operational/training procedures published by responsible government agencies and tailored for specific airfields. All airfields have designated accident potential zones, clear zones, and safety buffers imposing safety restrictions on adjacent land use. Site-specific criteria were used to evaluate impacts at existing and proposed airfields, LZs, and DZs (Table 4-7).

TABLE 4-7: EVALUATION CRITERIA FOR POTENTIAL AVIATION

Activity Side Effects	Parameter	Potentially Significant if
Personnel safety at airfields	Hazards to civilians on ground	Civilians have access to North Field runways during military air operations
Shared airspace	Interference with/interference by civilian aircraft	Lack of NOTAM publication and advance FAA notification in advance AND Lack of communications with FAA during military flight operations.

4.2.6.1 Existing Conditions

North Field is a National Historic Landmark visited by tourists. Aircraft flying into West Tinian Airport and Saipan International Airport use flight tracks above North Field. North Field Runway One is used for military fixed-wing and helicopter activity. North Field Runway Two is used for parachute drops and helicopter operations. As a result, these relatively low altitude

military activities may occur below flight paths used by large commercial jet aircraft on approach to Saipan. Prevailing winds cause aircraft to normally approach and depart West Tinian Airport on an ENE heading along an informally defined track intersecting the southeastern portion of the EMUA at an altitude of about 1,650 feet (500 meters) over North Field. (Figure 4-3).

Air activity at all airfields is controlled by FAA Air Traffic Control (ATC) at Saipan International Airport tower. West Tinian Airport, a VFR (visual flight rules) facility with a navigational light system but no control tower, is used for scheduled interisland flights by Pacific Island Air and Freedom Air from Rota and Saipan, charter flights from Guam, and military aircraft during training.

There are about 40 flights each day by small commercial aircraft (5- to 30-seaters) between 6:15 am and midnight.[43] Saipan International also serves inter-island and international carriers, such as Continental, Northwest and Japan Airlines using DC-10 and C-747 aircraft. The Saipan terminal uses an airport terminal information system (ATIS), providing repetitive UHF broadcasts. (NOTAMS are broadcast on this system.) The west to east approach track is on the same approximate heading and about three miles northeast of the North Field approach and departure (used only by the military). International flights on approach to Saipan International pass over North Field Runway One at an altitude of about 2,200 to 2,600 feet (650 to 800 meters).

The IBB site northeast of West Field has an antenna array. The array's location and height are clear of flight tracks approaching West Tinian Airport and do not affect aviation operations. All towers are marked with strobe lights.

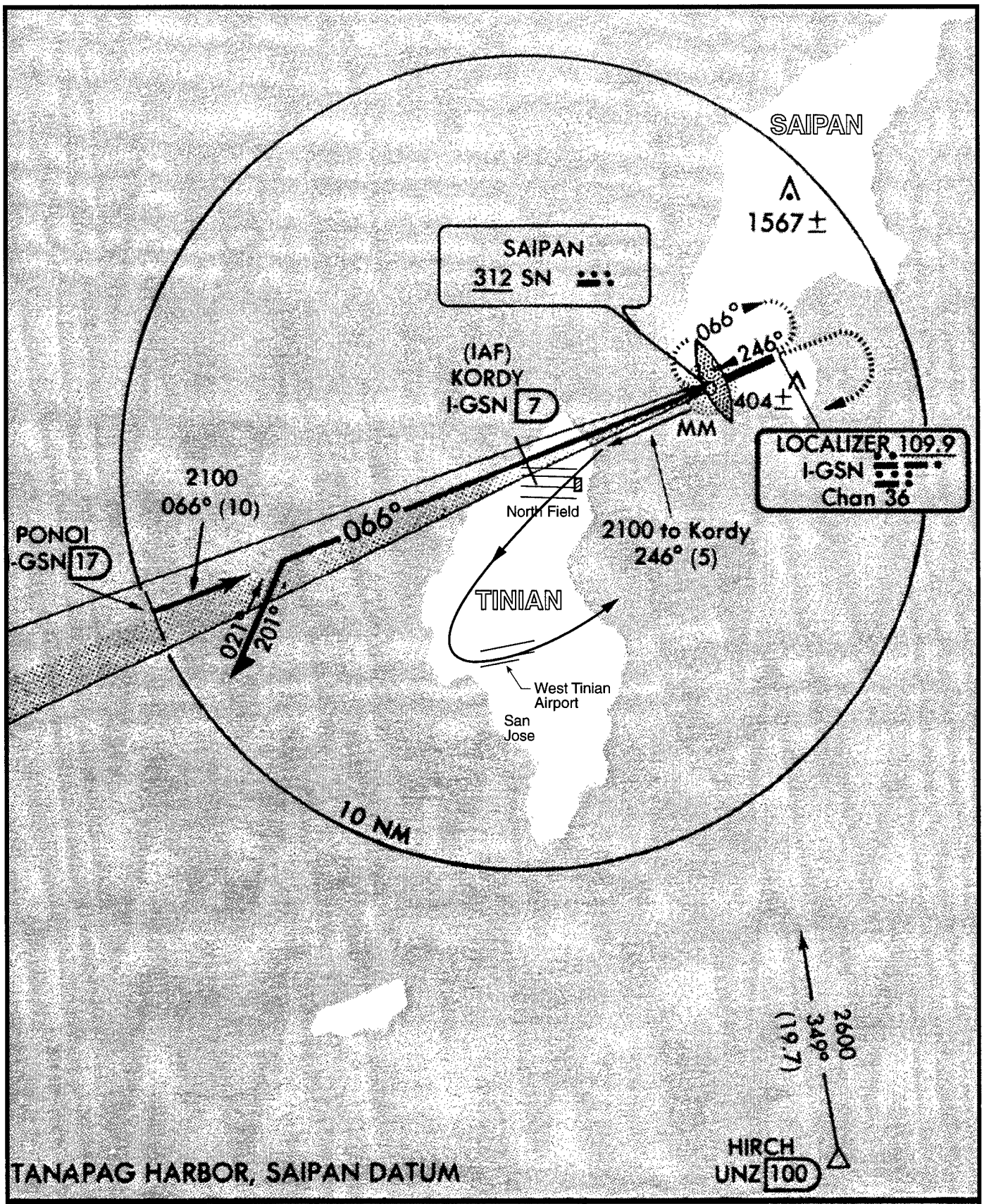
4.2.6.2 Potentially Significant Impacts

Use of North Field and West Tinian Airport for training has the potential to place civilians at risk and to interfere with civilian air traffic. Relevant training activities are:

- West Tinian Airport: fixed-wing air traffic transporting troops and equipment to and from Tinian for training, temporary use of parking aprons, and parachute jumps east of the airport.
- North Field: fixed-wing and rotary-wing landings and takeoffs both day and night, aircrew NVG training, and low-altitude fixed-wing personnel and cargo parachute operations.
- EMUA airspace: proposed (but not a preferred alternative) mortar range firing.

North Field ground and airspace encroachment. Significant impacts to civilians are possible on the ground. There is an established historic trail with 14 points of interest in the LBA and EMUA, including sites on North Field (see Figure 3-6). The EMUA has a large number of intersecting roadways, former runways, and taxiways that allow tourists broad access to North Field. Persons who inadvertently intrude onto aviation operating surfaces during aviation operations could cause or suffer from aviation hazards.

[43] Personal communication with Ed Villagomez, FAA Saipan, June 30, 1998.



Source: *High and Low Altitude Pacific, Australasia and Antarctica*, DOD Flight Information Publication (terminal), June 24, 1993

NOT TO SCALE

LEGEND

Approximate track of Saipan-Tinian commuter flights

Proposed Mortar Range

Figure 4-3
SAIPAN FLIGHT APPROACHES AND DEPARTURES
FEIS: Military Training in the Marianas
Belt Collins Hawaii, June 1999

If these is a lack of knowledge of military activities or a lack of direct communication between military ATC at North Field and the FAA's ATC at Saipan's International Airport, significant impacts is possible as a result of North Field aviation activity interference to or by commercial flights.

West Tinian Airport shared use. Significant impacts are possible at Tinian's airport due to its single runway and limited parking apron space. The volume of commercial traffic has increased with the opening of the Tinian Dynasty Hotel, and a future airport development plan predicts international flights arriving at Tinian using large, wide-body aircraft. Shared use may become more difficult to schedule without interference to commercial flights. There is a surveyed parachute drop zone east of West Tinian Airport. Activities at the DZ must also be fully coordinated to avoid significant impacts to airport operations.

Mortar Range Airspace. No longer proposing to develop a mortar range on Tinian eliminates a potentially significant safety hazard to civilian aircraft from high-altitude indirect mortar fire. In addition to ground safety hazards in the range SDZ, the maximum height of the mortar range exceeds the altitude of approaching and departing aircraft creating a three-dimensional requirement for observation, communication and ability to immediately cease training.

4.2.6.3 Proposed Mitigation

Roads and trails leading to North Field Runways One and Two will be blockaded, with security posts established at key intersections. Pre-landing checks of runways, DZs and LZs will be conducted to ensure the areas are clear of non-training personnel or obstructions.

Flight operations within or near commercial airspace will be coordinated with the FAA, CNMI EMO, and Tinian Mayor's Office with sufficient lead-time to ensure sufficient public notification. A NOTAM will be published 72 hours in advance of any such activity, both military and civilian aircraft will be informed of the time frames for planned aviation activities within shared or restricted airspace. A zone of restricted airspace between Tinian and Saipan may be established by the FAA and activated for scheduled training via the NOTAM process.[44] During training activities at both North Field runways and West Tinian Airport, communication will be maintained between the military (USAF CCT/ALCE [Airlift Control Element] or USMC Arrival/Departure Airfield Control Group) and the FAA ATC at Saipan International Airport.

4.2.7 Socioeconomic Impacts on Tinian

Tinian is the only populated island in the Mariana Islands that has not experienced dramatic economic development over the past ten years. Residents of the island have identified the presence of the MLA, which covers approximately two-thirds of the island, as the possible cause of this disparity. The MLA was leased to the U.S. Department of Defense as part of the CNMI's responsibilities under the 1976 Covenant establishing the Commonwealth. The Covenant granted

[44] Federal Aviation Administration, U.S. Department of Transportation (September 16, 1993) *7400.2D Procedures for Handling Airspace Matters.*

all CNMI residents with full U.S. citizenship and provided the Commonwealth with substantial extended financial support from the U.S. Although access to the MLA is generally unrestricted, its land area may not be privately owned or developed. This has resulted in less land available for homesteading and a perceived shortage of land available for tourism-related development.

To determine socioeconomic conditions on Tinian, the firm of Ernst & Young reviewed available government records and interviewed individuals on Tinian and Saipan. Their report is summarized below and included as Appendix H.

4.2.7.1 Existing Conditions

This section identifies both the current situation on Tinian and the conditions that might result if the casino ventures prove successful.

Demographics. The published population of Tinian was 2,118 in 1990 (U.S. Census) and 2,553 in 1992, with an estimated 1995 year-end population of 3,718, based on records of airport activity between January 1992 and December 1995. Interviews with residents indicated that the majority of this increase is due to arrival of alien contract workers, matching a trend throughout the CNMI.

Island population was calculated on the basis of the extrapolated 1995 population and the land area that is available for its use—about 13.0 square miles outside the MLA. This provided a population density of approximately 285 persons per square mile (in comparison to 60 persons per square mile if the entire island area of 39 square miles were available). By contrast, Saipan's population density is estimated at about 1,062 persons per square mile.

Economy. In 1990, the mean annual family income on Tinian was $33,651,[45] which is relatively affluent compared to other CNMI residents and to the rest of Micronesia. Although no statistical information is available, it is widely agreed that most of the resident labor force, approximately 75 percent, is employed by the local government. This proportion may drop with operation of the new hotel and casino.

Tinian does not currently have any significant industry, natural resources, or exports. Tourism has increased in recent years and is anticipated to expand dramatically if major casinos are successful on the island (see below). Available information indicates that an average of 1,200 to 2,000 tourists per month (roughly 60 per day) visit Tinian, mostly on day-trips from Saipan. These are primarily Japanese and Korean visitors, with occasional groups of war veterans, eco-tourists, hikers, and bicyclists. Tourists arrive by air or by the new ferry service from Saipan. Most day-trip tours are scheduled months in advance and include a half-day at a beach in San Jose, lunch, and a tour of World War II sites in the EMUA. Future tours may be aimed more at casinos and less at attractions in the EMUA. Tourists wishing to spend the night may be accommodated in small hotels/motels in town, or at the new Tinian Dynasty Hotel with more than 400 guestrooms. Rental car offices are established at the airport and in San Jose.

[45] CNMI Department of Commerce and Labor (1993) *1993 Commonwealth of the Northern Mariana Islands Statistical Yearbook.*

Commercial agriculture on Tinian consists of small-scale vegetable and fruit cultivation (marketed locally and also shipped to Saipan). Although commercial tuna fishing operations ended on Tinian in the mid-1990s, most families practice subsistence fishing (Figure 4-5). Commercial transport ships sporadically dock in the harbor, providing business for the local stevedore companies, nightclubs, and dockside fueling facility.

Commercial cattle grazing has dwindled from the Bar K's 10,000 head of cattle several years ago to a herd of 1,000 in 1995. The Bar K is equipped with a slaughterhouse and cold storage facility; it supplies beef to Saipan and Guam as an alternative to more expensive U.S. and Australian beef. Tinian also has three smaller family-owned ranches, and many families raise cattle or pigs for their own consumption.

Retail establishments on Tinian consist of six nightclubs; several convenience stores, hardware stores, and gas stations; several small restaurants and bakeries; and assorted other small businesses. There are also branches of the Bank of Guam and Bank of Saipan, two part-time insurance agents, one certified public accountant, and several manpower agencies supplying alien contract workers. Casino operations are discussed in the next section.

Freedom Air and Pacific Island Aviation provide inter-island connections to and from West Tinian Airport. Most Tinian residents travel to Saipan at least once a month, averaging 265 passengers a day (96,725 passengers a year) in 1995. The Commonwealth Port Authority has completed its airport master plan to develop an international airport. A 300-passenger ferry service (Saipan Express) has been established between Saipan and Tinian to bring casino customers to the Tinian Dynasty. A shuttle bus transports visitors and employees from San Jose harbor to the casino. The ferry service operates approximately five times a day.

Casino industry. Tinian has worked for 10 years to develop a casino industry, overcoming differences between political parties and opposition from the Catholic Church. The Tinian Casino Gaming Control Commission (TCGCC), created in 1990, regulates the casino business. The first casino to open was the Lone Star, which operated in a converted small office building from May through December 1995. The Lone Star's license was revoked in 1996. Two licenses were awarded to Hong Kong companies (currently fully financed), and one was awarded to a Taiwan-Saipan company. A memorandum of understanding has been signed for a luxury casino ship to be berthed in the harbor area. In addition, the governor has announced a floating casino/hotel, but no license application or fee has been filed.

The first major casino/resort has been constructed and opened. The Tinian Dynasty Casino and Hotel, in San Jose inland from Taga and Tachogna beaches, has about 400 rooms, an entertainment theater, night club, restaurants, and fitness center, as well as an employee village for an estimated 800 employees. The next site planned for development is further south on the same road outside San Jose.

The Commonwealth Ports Authority planned expansion of the West Tinian Airport would result in constructing a main runway (about 8,000 feet [2,438 meters]) parallel and north of the existing runway that would be used by international wide-body aircraft (747 or DC-10) aircraft. An estimated 515,520 passengers per year have been projected to travel to Tinian with only one 400-

room hotel/casino in operation (see Appendix H). Airport improvements (runway, taxiways, parking aprons, and terminal) will be phased and may begin in mid-1999.

Flights of small passenger aircraft, ranging from six to thirty seat-capacity, have increased slightly. While the present runway can accommodate smaller passenger jets, such as the Boeing 727, there are no fuel storage facilities for jet fuel. The runway is used by the military to land C-130 aircraft.

Significance criteria. Impacts were evaluated for significance according to criteria presented in Table 4-8. These criteria essentially identify notification periods required in order to keep socioeconomic impacts from being significant.

TABLE 4-8: EVALUATION CRITERIA FOR POTENTIAL SOCIOECONOMIC IMPACTS

Resource	Activity	Potentially Significant if
Tourism revenues	Close access to tourist destination	EMUA closed with less than 7 days prior notice OR EMUA closed for more than 10% of each year (36 days) OR EMUA closed for more than 5 days sequentially without one month's prior notice
Subsistence fishing	Close access to EMUA	No other fishing locations are available at the time
West Tinian Airport and San Jose Harbor commercial activities	Temporary closures and interference with commercial schedules.	Scheduled airline, Saipan Ferry, commercial ship and barge activity is temporarily curtailed.

4.2.7.2 Potential Impacts

Tourism revenues: Both positive and adverse impacts on Tinian's economy are expected to result from the proposed action. Known impacts of the ongoing training activities include positive impacts such as those in evidence during Tandem Thrust 99: training personnel visiting the island in advance and during exercises, patronizing the hotels, restaurants, and rental car agencies. The Navy has also initiated ship visits to Saipan, and sailors and Marines use the ferry service on shore leave.

Known adverse impacts of ongoing activities are inconvenience to local authorities caused by poor communications with local authorities (see Appendix H), temporary loss of use of the municipal gym (Field House) during major exercises, lost tourism revenue from closure of the EMUA.

Temporary restrictions of public access to the EMUA have the potential to affect tourism in several ways. First, revenue may be lost to airlines, rental car companies, and tour guides on days when the EMUA is closed. This impact is expected to decrease if tourists come to Tinian for casinos than for World War II sites and stay for several nights instead of just several hours. Second, Tinian's reputation as a tourist attraction may suffer if many Asian tourists or tour companies have trips (scheduled months ahead) canceled with only one or two days' notice.

Interviews with local businesses indicate the second impact is of greater concern, but again this impact may decrease in importance as the casino business grows.

The potentially negative economic impacts stemming from EMUA temporary closings has been reduced by eliminating the firing range and mortar range development projects from the Preferred Land Use Alternative.

Continued use of the World War II structures for urban training is not expected to increase the number of days on which the EMUA would be closed to the public. Shooting houses have very small areas that must be kept clear of non-training personnel. In addition, TRUE training is often conducted at night when no one else is in the training area.

Subsistence fishing: No significant impacts are anticipated. Limited numbers of LCACs, LCUs, AAVs and CRRCs are available at any given time. If a beach were temporarily closed, such as the four-hour LCAC training exercise at Unai Chulu during Tandem Thrust 99, other beaches remain available for subsistence fishing. No impact to the local economy is anticipated.

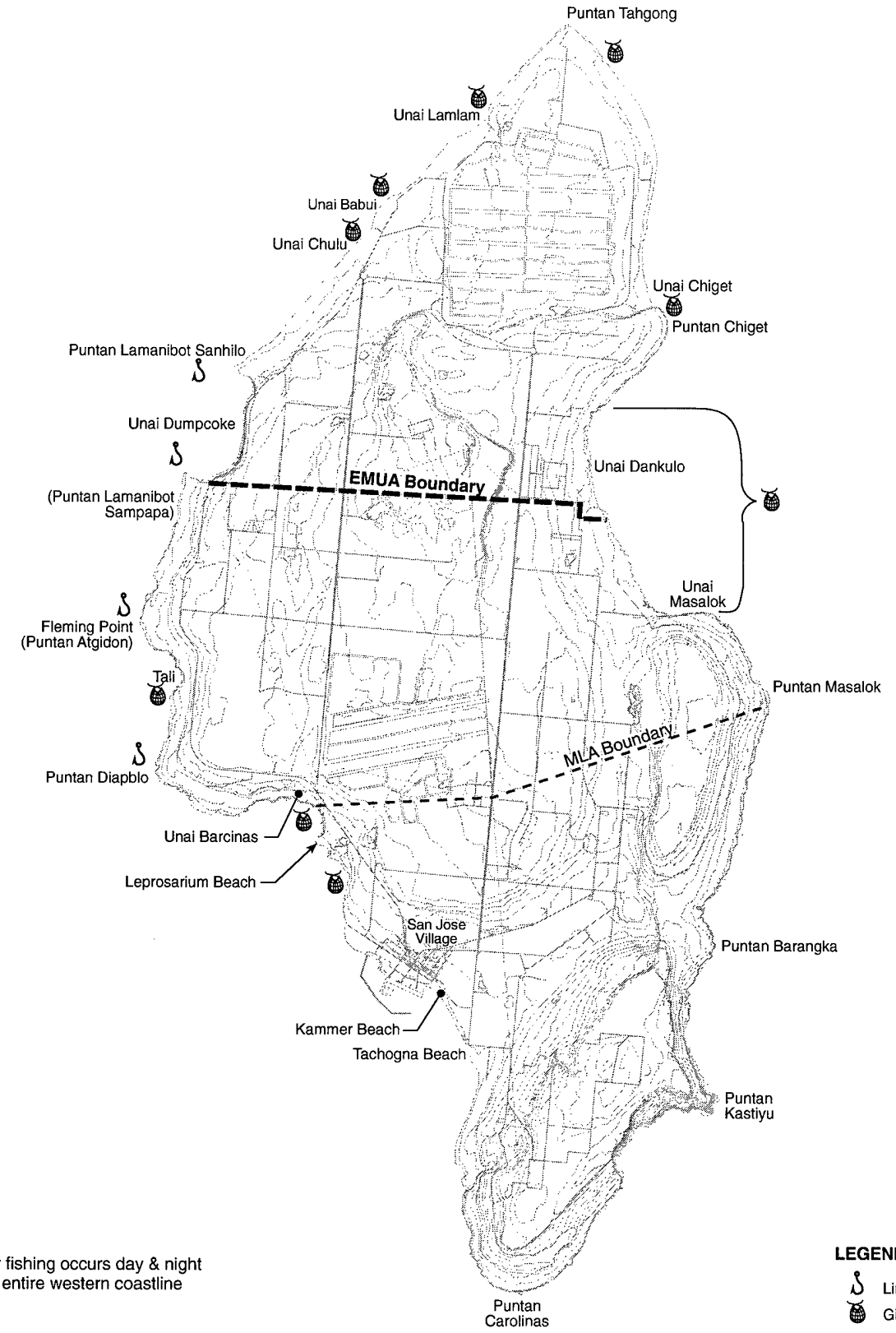
Airport and harbor commercial activity. No significant impacts are anticipated. Shared use of both facilities will be coordinated in advance with the Commonwealth Port Authority and Tinian municipality to avoid interference with commercial activities.

Construction projects in the EMUA: No significant impacts are anticipated due to the minor construction proposed in the EMUA. The preferred base support camp is not expected to adversely impact the local economy or government resources. The development of firing ranges and range facilities is not preferred but if pursued in the future would not adversely impact the local economy or government resources. The construction phases could be favorable impacts due to hiring regional construction project workers and commercial transportation firms, and the use of local hotels and services by any outside contractor living on Tinian. After construction and over the long-term, maintenance and security services may be contracted for the support camp, field ranges, and range facilities. No mitigation is required.

Cumulative impacts with casino and hotel development. No significant impacts to nearby beach activity is anticipated The proposed training use of Tachogna Beach is no longer a preferred alternative, and approved special operations at Kammer Beach are conducted at night. The LCAC landings at Unai Chulu during Tandem Thrust 99 did not close the entire area to the public. An observation area was established at a safe distance from the training site, which was used by a small group of residents and tour groups to observe the landings. Upon completion of the training, the beach was cleaned, topography restored and the beach opened to the public.

Military barges and landing craft periodically load and offload equipment and materiel in Tinian Harbor. Use of the LCU ramp does not interfere with operations of the Saipan Express or the commercial port's piers used for cargo offloading. The introduction of casino ships to the harbor could increase the potential for conflicts between military and commercial harbor use.

If additional hotels and casinos are constructed and tourism increases, use of West Tinian Airport can be anticipated to increase and be affected by military shared use of the airport.



Source: Tinian Division of Fish and Wildlife

NORTH

0 1000 2000 (Meters)

0 4000 8000 (Feet)

Figure 4-4
FISHING AREAS ON TINIAN

FEIS: Military Training in the Marianas
Belt Collins Hawaii, June 1999

4.2.7.3 Proposed Mitigation

To mitigation these impacts the military will continue to communicate with local authorities well in advance, specifically with the Commonwealth Ports Authority, the Marianas Visitors Bureau (Tinian Field Office), the West Tinian Airport Manager, and the Mayor's Office (Military Affairs Representative). These officials will be notified of any planned closure of the EMUA and of any military use of the airport and/or harbor at least 30 days in advance. Units planning aviation exercises and amphibious landings will notify the FAA and USCG one week in advance and ensure that publication of NOTMARs and NOTAMs is accomplished 72 hours in advance of the activities. NOTMARs will also be provided to the CNMI Emergency Management Office for broadcasting on marine channels.

To minimize impacts on residents and tourists, exercises will be scheduled to avoid interference with the following special events to the extent possible:

- Cliff Fishing Derby — 3rd weekend in February
- San Jose Fiesta — 1st weekend in May
- San Isidro Fiesta — 4th weekend in May
- Agri-Food Fair — 1st weekend in June
- MVB 10K Fun Run — 4th Saturday in September

Using past major exercises as a guide, the EMUA should not be closed for more than 36 days (10 percent) of any calendar year. Exercise planners will continue to limit EMUA closures and accommodate partial access during exercises as long as public safety is not compromised. If casino ships are introduced to Tinian, their harbor activity will also be taken into consideration when COMNAVMARIANAS initiates discussions with the Mayor's Office to coordinate the military's use of the harbor without interference to civilian navigation.

AAV operations in Tinian's harbor and subsequent inland movement to the MLA will be coordinated with the Tinian Mayor's office and Office of Public Safety.

Many fishing locations exist outside the EMUA (see Figure 4-4). The Tinian Mayor's office will assist in ensuring public notice of EMUA closures to advise residents of the need to fish in alternate locations.

4.3 IMPACTS ON WATERFRONT ANNEX

4.3.1 Biological Resources on Waterfront Annex

The endangered hawksbill sea turtle and threatened green sea turtle frequent Outer Apra Harbor. The harbor bottom and nearshore areas include degraded dredged areas and relatively pristine, well-developed coral reefs.

Overview of training impacts. This section addresses potentially significant impacts of continuing actions caused to varying degrees by reduced or maximized training. Significance criteria were listed in Table 4-2. Impacts from training land use alternatives are summarized in Table 2-6. Potential impacts and mitigation measures for the Preferred Alternative are summarized in Table 2-13.

- Underwater shock waves from deepwater mine countermeasures (MCM) training by EOD MU-5 may injure or kill fish, endangered marine species, or fracture coral within a certain radius of the detonation (significant).
- Amphibious vehicles may crush or break coral on reefs (significant), compress sand over turtle nests (significant), generate turbidity and salt spray (not significant).
- Detonation of small, shallow water MCM charges by NSWU-1 will not injure civilians, endangered marine species, or fish (not significant).
- Floating mine neutralization training conducted by EOD MU-5 involves the use of a 10-pound charge at 10-ft depth at an observed area. The activity will not injure civilians, endangered marine species, or fish.
- Riverine training at the selected Atantano River site will not disturb or otherwise harm endangered Mariana moorhens.

4.3.1.1 Deepwater MCM

Existing conditions at Apra Harbor site. Bottom composition at this 125-feet-deep (38-m) site consists of very fine calcareous silt with abundant patches of calcareous algae (*Halimeda*). No fish or corals were observed during an August 1996 site survey.[46] Figure 4-5 identifies known dive sites, which correspond to areas with well-developed coral habitat. Fish aggregate at wrecks and other underwater structures, which are shown as well. Turtles and marine mammals are known to be present in waters surrounding the proposed sites, but do not aggregate at certain points as do reef fish.

The use of 10-lb. plastic explosives at this site has been approved by Guam EPA (GEPA) and NMFS, as long as the established protocol is observed.[47] The protocol was published in COMNAVMARIANAS INSTR 5090.7 of April 5, 1994, and includes requirements for notification, agency coordination, area surveillance and security, and post-operation reporting (Appendix I). GEPA has observed this training. To date, there are no records of any sea turtle kills resulting from detonating charges at this site.

Existing conditions at Dadi Beach offshore site. This site was proposed for use of up to 20-lb. charges in waters ranging from 108-to 114-feet (33- to 35-m) deep. A marine survey of the deepwater demolition site was conducted in September 1997 (Appendix C).[48] The substrate

[46] Letter from Steve Dollar, Marine Research Consultants dated August 16, 1996.

[47] Impacts of charges of up to 10 pounds have been studied by Guam EPA and are within the 100-foot fish kill radius compliance. (A list of fish species killed during four underwater mine detonations in Apra Harbor, between September 1995 and March 1996, is included as Appendix I). The use of these charges is ongoing. EOD training complies with current agreements. [Source: Personal communication with Mel Borja, Guam EPA, August 22, 1996.]

[48] The location of the proposed site is 13°24'25'N, 144°39'1'E.

consists of about 85 percent white sand flat intersected by low limestone reefs that are about 1.5 to 3 feet (0.1 to 1 meter) above the sandy flat. The marine surveys from September 1996 and 1997 stated that virtually no other epibenthic biota was observed on the expansive sand flats. Most of the limestone reef surface is covered with a short algal turf and several species of sea urchins. Biotic composition of the reef surfaces consists of low cover of small encrusting reef corals (primarily *Porites* spp.) that comprise less than 1 percent of the solid bottom cover. The sand flats are extensive, extending at least 490 feet (150 meters) to the northwest and 650 feet (200 meters) to the southeast within this depth range. No significant aggregations of fishes were observed or are known to exist in the area within the range of effect. Based on the limited biota in this area, the report concluded that EOD exercises in this area would have minimal to no environmental impact if the zone of effect from detonation could be limited to the sand flats.

Upon review of the 1997 report, GEPA responded that a prominent dolphin, giant stingray and grass eel population exists at the proposed training site. None are endangered or threatened species. Spotted dolphin, bottlenose dolphin and spinner dolphins are resident species and although not endangered or threatened, are protected by the Marine Mammal Protection Act (MMPA). Dolphins generate much tourist interest and a pod of spinner dolphin is known to frequent Agat Bay. [49] GEPA remarked that on all of their visits to the area they have seen dolphin-watching tourist vessels. In addition, they note that the grass eels retract into their holes when approached and that locating rays that are buried in the sand can be difficult. [50] Other marine mammal species transit Guam. Migrating pilot whales are known to frequent Agat Bay at night.[51]

General effects of underwater demolitions. Underwater demolitions create damage through direct explosive effect (shattering) on substrate or other structures to which explosive material is attached. These explosives also create a pressure wave that acts like a shock wave, with peak overpressure and impulse. The strength of an impulse is a function of the pressure and the time of its duration. The amplitude of a shock wave traveling through water diminishes as the distance increases from its source. Impulse propagates irregularly because of wave reflection and, in general, increases with depth of the detonation and depth of the recipient organism.

The shock wave can affect marine life, humans in the water, and structures by subjecting them to extreme pressure gradients. The pressure acts primarily on voids (such as the swim bladder of a fish or the lungs of a mammal or reptile). Marine organisms without voids, such as crustaceans and mollusks, appear quite resistant to blast overpressure and are typically unaffected beyond distances of 50 to 82 feet (15 to 25 meters) from the blast, depending on charge size. Fish mortality generally occurs with overpressures of 40 to 70 psi, depending on fish size (smaller fish being more susceptible). Criteria for human safety for swimmers are overpressure of 50 psi and impulse of 2 psi-ms (psi per meter per second).[52]

[49] The Marine Mammal Protection Act of 1972, as Amended. September 1994

[50] Guam Environmental Protection Agency letter to Pacific Division, Naval Facilities Engineering Command, Pearl Harbor Hawaii dated September 28, 1998.

[51] Personal communication with Gerry Davis, Guam DAWR, May 26, 1999.

[52] NAVSEA SW061-AA-MMA-010, Technical Manual "Use of Explosives in Underwater Salvage," January 1994.

Explosions on the seabed cause cratering and disturb bottom sediments over an area estimated to be roughly twice the diameter of the crater.[53] A 20-pound charge exploded on mixed sand and clay in relatively deep water (greater than about 30 m) is estimated to result in a crater about three meters in diameter, with bottom disturbance over an area no more than 10 meters wide. Not all of the training shots are on the bottom, as charge placement varies with the target simulation.

Potentially significant impacts. The proposed action is detonation of 10- and 20-lb. charges at depths of 40 to 125 ft (12 to 13 to 38 m).

- Detonations could harm or kill marine animals and human swimmers and divers within the "safe swimmer" radius
- Detonations will not impact coral, as there is no coral at either deepwater MCM site.

Table 4-9 provides the radius of effect of various size charges at depth on fish and human swimmers.

TABLE 4-9: UNDERWATER DEMOLITION–RANGE OF EFFECTS

Charge	Charge Depth	Effect Criterion	Value of Criteria	Range of Effect
1 lb.	3 m	Fish 10% mortality.	40 to 70 psi (depending on fish size).	103 m for 1 oz fish 55 m for 1 lb. fish 27 m for 30 lb. fish
		Non-injury range for swimmer.	Impulse and peak over pressure of 2 psi-ms & 100 psi.	(note 2)
10 lb.	38 m	Fish 10% mortality.	40 to 70 psi (depending on fish size).	200 m for 1 oz fish 129 m for 1 lb. fish 79 m for 30 lb. fish
		Non-injury range for swimmer.	Impulse and peak over pressure of 2 psi-ms & 100 psi.	272 m (@ surface) 2,174 m (@ 28 m deep)
20 lb.	19 m	Fish 10% mortality.	40 to 70 psi (depending on fish size).	261 m for 1 oz fish 169 m for 1 lb. fish 106 m for 30 lb. fish
		Non-injury range for swimmer.	Impulse and peak over pressure of 2 psi-ms & 100 psi.	247 m (@ surface) 1,691 m (@ 19 m deep)
20 lb.	38 m	Fish 10% mortality.	40-70 psi (depending on fish size).	283 m for 1 oz fish 182 m for 1 lb. fish 111 m for 30 lb. fish
		Non-injury range for swimmer.	Impulse and peak over pressure of 2 psi-ms & 100 psi.	343 m (surface) 2739 (@ 28 m deep)
		Small risk injury range for swimmer.	Impulse and peak overpressure of 10 psi-ms.	972 m (@ 28 m deep)

Notes:
1. NAVSEA SWO61-AA-MMA-010; Technical Manual; "Use of Explosives in Underwater Salvage," January 1994.
2. N/A. Shallow water detonations are not covered in safety distance tables. Energy is lost to the atmosphere so reduced proportions of blast energy are propagated into underwater shock waves.

Neither the 10- or 20-lb. charge would affect fish at the mapped aggregation points, although some fish are likely to be found within the area of effect as recorded in Appendix I (fish kill

[53] NAVSEA SW061-AA-MMA-010, Technical Manual "Use of Explosives in Underwater Salvage," January 1994.

tabulations from prior exercises). Both marine mammals and reptiles could be affected at distances out to the "safe swimmer" radius, depending on depth. While human water activities conducted at the surface would be safe beyond 300 meters from the detonation, divers would experience unsafe impulses out to approximately 2,700 meters, depending on depth.

Fish kill data provided by GEPA observations of four of the deepwater demolition training exercises indicated that a total of 3, 4, 765, and 103 fish were killed, respectively. As the exercises occur no more than once per month, the numbers recorded equated to a maximum of about 4 fish per day—well below the number caught daily by fishermen.

With one exception (a single fish that was around 20 inches [51 centimeters] long) the largest dead fish were less than 12 inches (30 centimeters) long. Mortality of fishes and other marine life following these exercises is relatively low, in part because these activities are not conducted in areas where the marine fauna are abundant.

Detonation cord is required to initiate the underwater charge. Detonation cord is a high explosive but contains only 0.006 pounds of net explosive weight per foot of detonation cord. When used with a ten-pound charge, the destructive explosive effects from the cord are either within the destructive radius of the main charge, or due to the minute amount of explosive contained per foot, or produce a very small destructive radius. Therefore, no appreciable contribution to fish/marine mammal kill can be attributed to the use of detonating cord.

Proposed mitigation. Continue to follow existing protocol for protection of sea turtles, marine animals, and civilians. Conduct training when the training area can be visually surveyed, Check the surface, the area of the water column, and benthic substrate for a radius of 1,000 meters around demolition sites for presence of marine animals. If protected species are encountered during the pre-detonation surveys, halt training activities until the animal(s) leave the location. Giant stingrays camouflaged in the sand can be scared away from the site during visual surveys.

Reduce the frequency of deepwater demolitions in Apra Harbor and the potential to harm sea turtles by using the alternate deepwater training site off Dadi Beach whenever weather and sea conditions permit.

Limit the size of an explosive charge used at either deepwater MCM sites to no more than 10 pounds to reduce the potential area of impact without degrading the effects of training. Continue to provide advance notice to responsible regulatory agencies and the affected commercial water firms (dive shop operators tour guide boaters), and publish Notice to Mariners (NOTMAR) to advise of training dates and times.

The Navy will conduct post-exercise surveys to determine the number of fish kills as a result of the detonations. After two years, the results will be evaluated by the Navy, Guam EPA, and NMFS to determine whether the existing protocol should be modified. The Navy will continue to work with the above agencies to determine additional suitable demolition sites to further minimize training impacts.

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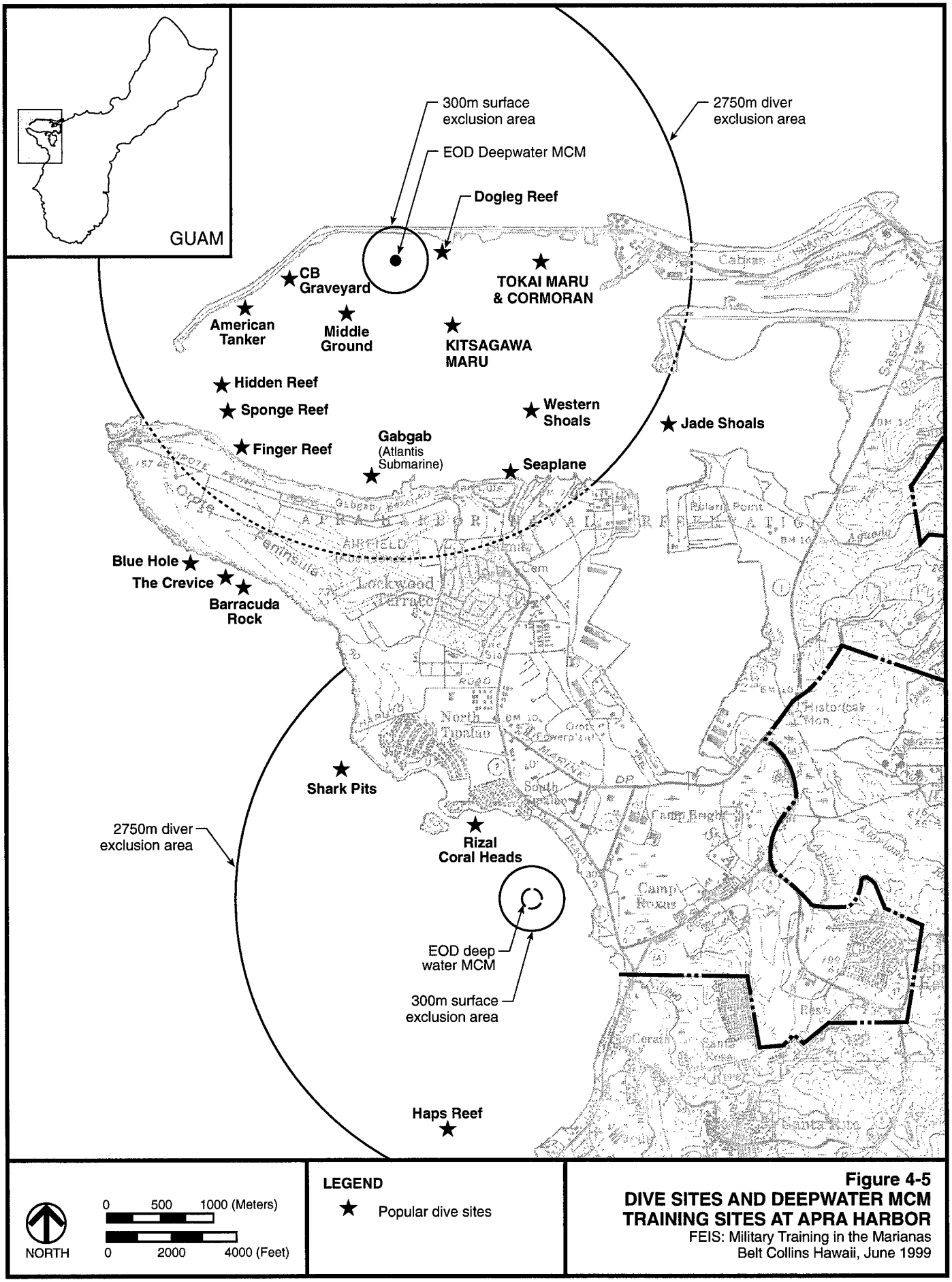


Figure 4-5
DIVE SITES AND DEEPWATER MCM TRAINING SITES AT APRA HARBOR
FEIS: Military Training in the Marianas
Belt Collins Hawaii, June 1999

4.3.1.2 Shallow Water MCM Training

Seven sites were proposed for SEAL training: five in Outer Apra Harbor (Dry Dock Island, Polaris Point, Breakwater Beach, Spanish Steps, and Gabgab Beach) and one each offshore of Tipalao Beach and Dadi Beach. The sites were surveyed by a marine biologist accompanied by a representative of NSWU-1, the primary training unit. Shallow water MCM training is conducted in less than 20 feet depth using 1-lb charges and is often conducted at night.

Existing conditions. The marine surveys found that corals at some sites are nonexistent, marginal or widely spaced. The sites that are not preferred alternatives for shallow water demolition training include the following:

- Gabgab Beach and Dadi Beach are not preferred due to well-developed coral reefs in shallow inshore waters. (Gabgab Beach is also closed to all activities whenever an ammunition ship is berthed at Kilo Wharf restricting beach availability for training and recreation.)
- Spanish Steps located close to the mouth of Apra Harbor (and Kilo Wharf and its restrictions), is exposed to long-period swells, has 10-20 percent coral cover in isolated colonies in 4-10 feet depth, and increasing coral coverage to the east. Underwater charges would require careful placement to avoid damage to coral. More suitable sites exist elsewhere.
- Dry Dock Island and Polaris Point have acceptable subsurface layers, no coral at the proposed demolition sites, but are adjacent to other activities. More suitable and remote demolition training sites exist. (NSWU-1 infrequently may use these sites for training with inert devices only, which eliminates potential conflicts with adjacent activities.)
- The remaining sites proposed for training with live shallow water demolition charges, Breakwater and Tipalao beaches, do not have high densities of biota susceptible to harm.
- Breakwater Beach has scattered small encrusting coral colonies on some of the breakwater boulders, but no coral or other macrobiota on the sandy bottom at the base of the boulder walls.
- Tipalao Beach has essentially no macrobiota on either the reef flat or the hard, scoured substrate beyond the rubble flat. The beachrock bench in the Tipalao Beach intertidal zone is barren of macro-organisms other than short algal turfs. The sand zone, within which coral are virtually absent, extends to approximately 65 feet (20 meters) offshore and does not exceed three feet (one meter) in depth. The only macrobiota in this area are scattered clumps of algae, primarily of the genera *Liagora* and *Sargassum*. Throughout Tipalao Bay benthic biota are extremely uncommon; living corals comprise less than one percent bottom cover, and benthic macrofauna, such as sea urchins and starfish, are essentially absent. Reef fish were present but not abundant during the survey. It appears that the area is commonly subjected to the destructive force of storm waves.

Potentially significant impacts. No significant impacts will occur at the training sites selected as preferred alternatives. The reef could be slightly damaged by small blasts at sites where live ammunition (strings of up to 20 1-lb. charges of C-4) will be used. These impacts would not be significant, since the preferred demolition sites lack macrofauna and have less than one-percent

live coral coverage. Impacts on the small number of fish that occur in the area will not be significant.

Proposed mitigation. The training unit will secure the training site and conduct a pre-training protocol and pre-demolition survey to ensure that the area is clear of persons not involved in the training. The Navy will conduct post-exercise surveys to determine the number of fish kills as a result of the detonations.

4.3.1.3 Floating Mine Neutralization Outside Apra Harbor

Existing conditions. There are two sites used for this training. The first is approximately 2 miles (3.2 kilometers) north of Apra Harbor in waters over 1,900 feet (600 meters) deep. The second is at the Agat Bay water Drop Zone (DZ) located at 13-23N/144-35E or 4.5 nautical miles southwest of Orote Point and 4 nautical miles west of Agat Beach. The latter site is outside of shipping lanes and far from recreation dive sites. The explosive device that is used to neutralize the training mine is a 10-lb. charge detonated within 10 feet (3 meters) of the surface. The divers are operating from a helicopter and supported by a safety boat.

Potentially significant impacts. No significant impacts on biota are expected by this open ocean training in locations that facilitate surveys by boat and helicopter for marine mammals being present.

Proposed mitigation. None required beyond standard demolition training protocol.

4.3.1.4 LCAC Landings

Existing conditions. Resources vulnerable to LCAC landings are coral reefs, green sea turtle nests and hatchlings, and terrestrial vegetation.

- Dadi Beach has a shallow nearshore reef, with algae, small reef fish, starfish, and sea cucumbers. Corals in this zone are rare but present. Green sea turtles have not nested on Dadi Beach for at least 20 years.[54] Low, spreading mats of vegetation (beach morning glory and various grasses) cover some areas of sand. None of the plants in the area are threatened or endangered.[55]
- Tipalao Beach has essentially no macrobiota on either the reef flat or the hard, scoured substrate beyond the rubble flat. Green sea turtles are not known to nest on this beach. The beach sand is covered with boulders and is backed by a grassy lawn leading to a softball field.
- Dry Dock Island and Polaris Point beaches are both narrow sand beaches backed by cut grass. Bottom composition at both sites is composed of very fine-grained calcareous sediment (silt/mud). No corals or other benthic macrobiota occur on the sediment surface at these locations. The shoreline region of Polaris Point is lined with concrete riprap, which

[54] Personal communication with Gerry Davis, Guam DAWR, January 8, 1997.

[55] Helbert Hastert & Fee, Planners (March 1995) *Environmental Assessment for the Navy Lodge, Waterfront Annex, U.S. Naval Activities, Guam.* Prepared for Navy Exchange Service Command.

supports coral colonies. Large parts of the coral colonies are dead possibly due to high levels of suspended sediment.

- Toyland Beach has no live coral, nor is it a known turtle nesting area.[56] Some bitterns roost in the mangrove immediately north of the proposed landing area. The shoreline is crushed coral with mown grass; offshore substrate is sand and rock.

Potentially significant impacts.

Contrary to reports of extensive damage to coral by an LCAC landing at Dadi Beach, the marine survey conducted at Unai Chulu, Tinian, in March 1999 involved fourteen crossings of a shallow reef by LCACs. There was no disturbance to coral except on the shoreline caused when the craft would come off cushion with a small portion of the stern still in the water. When departing the beach, the craft turned partially on the beach and over the shallow shoreline. The result was rubber scrapings on a few underwater coral boulders. The landings were conducted beginning at high tide and extended over a four-hour period.

The damage along the shoreline at Dadi Beach may be the result of the craft coming off-cushion prematurely and coming to rest partially in the water. When going back on cushion and turning, the craft, its skirt and escaping air at the edges disturbed loose or exposed coral and rock.

Normal operations call for the craft to remain fully on cushion while crossing the reef with sufficient forward momentum to clear the shoreline, overcoming beach gradient and coming off-cushion when clear of the water's edge and fully over dry land.[57] If an LCAC is moving relatively slowly with a full load or only partly on cushion while in the water, it may create a surge wave that moves large (1 m^3 diameter) rocks at or near the surface and breaks off exposed coral heads. Until it reaches speeds of 18 knots or more, an LCAC may create a wake and cause minor turbidity and portions of the rubber skirt of the craft will contact the water's surface. (The actual hard bottom of the LCAC is suspended at least a meter above the water surface; a guide wire holds the bottom of the skirt in place.) See the illustration in Appendix C-5 that clearly shows the skirt rather than below the surface and the spilling air at the edge as the craft departs the beach.

Once on land, the weight of an LCAC compresses the sand and leaves a footprint 2 to 10 cm deep. Green sea turtle nests are not likely at the proposed LCAC landing spots; therefore, no impacts are expected. Any turtle eggs present, buried approximately 1 m underneath the sand, are not likely to be damaged, but compaction of the sand may make exit from the nests difficult for hatchlings. Offloaded vehicles may crush turtle nests or leave deep tire track ruts that serve as physical barriers to hatchlings crossing the beach.

Upon departing the beach, the LCAC propulsion fans on the stern blow salt spray and sand that could affect any person standing too close to the craft.

[56] Personal communication with Lesley Morton, COMNAVMARIANAS, April 23, 1998.

[57] If an LCAC were to come off cushion while waterborne, the craft has a draft of 0.76 m.

Proposed mitigation.

- Landing beaches with a slope slightly greater than 6 degrees can be used if the beach dimensions will allow the craft to approach the beach at higher speeds to ensure fully crossing the high-water line. Personnel qualified to conduct hydrographic surveys or surf observations (e.g., SEALs and Marine Reconnaissance) will survey the landing beach no more than one week in advance of a planned landing. The survey will ascertain that beach conditions would allow a fully on-cushion landing, sufficient room to come off-cushion clear of the water's edge and sufficient room to turn the craft when going back on cushion to return seaward.
- When practicable, a preliminary beach reconnaissance will be conducted by the LCAC crew to assist in determining the appropriate approach speeds and beach center.
- Upon approaching the beach, the LCAC will be kept on full cushion while over shallow reefs and ledges. If the landing beach has extremely shallow coral near shore, landings will be timed to take advantage of the period immediately before and after high tide to have as much water over the coral as possible.
- The Navy will be notified by DAWR if turtles return to any of these beaches. Beaches will be surveyed by a Navy biologist for possible sea turtle nests no more than 24 hours prior to a landing. If turtle-nesting activity is confirmed, the areas free of nests will be flagged, and offloaded vehicles and personnel will be directed to remain within flagged areas.[58] If turtles are known to be in the area, no training may occur until all nests have been located and adult turtles have left the area.
- Communication will be established between exercise personnel on the beach and the LCAC crew.
- Personnel and vehicles will be kept at safe distances from landing and launching LCACs eliminating any potential harm to them by salt and sand spray. (Those required to remain close to the beach will wear hearing and sight protective equipment.)
- Prior to approving Dadi Beach for LCAC operations, a sufficient CLZ will be cleared. A pre-during and post-landing marine survey will be conducted. The protocol for the survey will be provided in advance to DAWR and GEPA for approval. Representatives of both regulatory agencies will be invited to participate in the survey.

4.3.1.5 AAV Landings

Existing conditions. Existing natural resources, which could be impacted by AAVs, are coral reef, green sea turtle nests, and sensitive habitat.

- Tipalao Beach has essentially no macrobiota on either the reef flat or the hard, scoured substrate beyond the rubble flat. Green sea turtles are not known to nest on this beach. The beach sand is covered with boulders and is backed by a grassy lawn leading to a softball field.

[58] Actual nests will not be flagged, as this may direct poachers to nests.

- Dry Dock Island does not support corals on the benthic sediment surface. No turtles were observed at this site during the September 1996 marine survey. The beach leads to a mowed grass lawn.
- Toyland Beach has no live coral, nor is it a known turtle nesting area.[59] Some bitterns roost in the mangrove immediately north of the proposed landing area. The shoreline is crushed coral with mown grass; offshore substrate is sand and rock
- The former World War II Fuel Pier shoreline consists of riprap and broken concrete. It accesses a poorly paved road bordering a wetland.

Potentially significant impacts.

- The 23- to 27-metric ton, tracked AAV contacts the bottom in water less than about 5.5 to six feet (1.8 meters) deep, and would crush or disturb coral that it contacts. If landing in an area of abundant coral, the multiple landings could reduce or eliminate a reef's natural functions and usefulness as a natural resource attraction.
- AAVs arriving on a beach would disturb the upper sand layer above possible green sea turtle nests, compacting sand and creating tracks that might be difficult for hatchlings to navigate. AAVs could damage strand vegetation, which is functional in preventing beach sand erosion. (Impacts would be the same for the proposed AAAV, due to be in the inventory in several years.)
- An AAV wake in a confined inland waterway such as Sumay Cove could cause a surge that could disturb turtle nests on nearby banks.

Proposed mitigation.

- Prior to AAV landings, beaches will be surveyed for the presence of sea turtle nests. Beaches will be flagged to restrict vehicles from areas suspected of containing nests, and vehicles will be directed to remain within flagged areas. No engineered modifications of the beach, such as regrading, will be permitted prior to landings. After exercises are completed, beaches will be restored to their approximate original topography.
- Exit lanes from beaches to connecting roadways will be identified to eliminate trampling sensitive strand vegetation.
- AAV operations within Sumay will obey the "no-wake" rule in effect for boating activities to protect possible hawksbill turtle nesting sites on a small sandy beach across from the marina.

4.3.1.6 LCU Landings

LCUs travel into shallow water and bottom out as close to the shoreline as possible prior to lowering its bow ramp to offload or embark vehicles and personnel. To offset the effects of strong crosscurrents when beached, the LCU may use its stern anchor to stabilize the craft and keep it perpendicular to the beach.

[59] Personal Communication with Lesley Morton, COMNAVMARIANAS, April 23, 1998.

Existing conditions. No proposed or existing LCU landing location in the Waterfront Annex has a shallow reef or nearshore coral that could be impacted by the craft. Dry Dock Island and Polaris Point have narrow beaches on which turtles could theoretically nest. Toyland Beach is crushed coral and grass with no turtle nesting areas, and the World War II refueling pier area would be modified to clear away rubble for a clean bottom leading to a suitable concrete boat ramp to facilitate offloading vehicles. All of the proposed LCU landing sites have access to gravel or paved roadways. The Sumay Cove Marina's concrete boat ramp was proposed for LCU landings, but the cove itself is too narrow for an LCU to enter and then turn at the ramp.)

Potentially significant impacts. An LCU may compress or dent shallow substrate. The proposed LCU landings affect no coral beds, but clearing away riprap and other debris at the old refueling pier will be necessary to eliminate damage to the craft. No significant environmental impacts are expected.

Proposed mitigation. No mitigation is required beyond the aforementioned landing area riprap cleanup and ramp area preparation.

4.3.1.7 River Insertion Training

Riverine training at the Atantano River mouth (see Figure 2-2a) consists of small groups traveling the river in raiding craft, walking or wading in certain areas of the associated marshland, and firing blanks. No vegetation clearing is planned.

Existing conditions. The training location is in brackish marsh areas at the mouth of the Atantano River. Mangrove swamps (a protected habitat) occur near the river mouth. Although the endangered Mariana moorhen could be present at the training site, it tends not to nest in brackish water that is under tidal influence.[60] Moorhens inhabit freshwater areas of the adjacent complex of marshes and ponds, referred to collectively as the Naval Station Marsh and known as one of the primary moorhen habitats on Guam.[61] They are also known to inhabit the inland Shell Guam wetlands.

Potentially significant impacts. Hiking activities will not significantly impact the mangrove swamps; existing cleared areas on the bank between the mangrove swamp and the Maine Drive bridge allow sufficient areas for hiking ashore without trampling mangrove roots. The presence of personnel or the sound of blank fire might disturb any moorhens present during training.

Proposed mitigation. Personnel will be informed about the endangered moorhens and instructed not to fire blanks near any birds observed or to disturb any nests that may be seen in the area (see Figure 2-8).

[60] No formal surveys have taken place in this area. (Personal communication with Bob Anderson and Bob Beck, Guam DAWR, December 10, 1996.)

[61] USFWS(September 1992) *Recovery Plan, Mariana Common Moorhen.*

4.3.2 Cultural Resources at the Waterfront Annex

Information presented in this section is based on a review of existing documentation, consultations with archaeological contractors, and data gathered during several site visits in 1996 (Appendix J).

There is a potential for deepwater MCM training and LCAC landings to impact resources listed in the National Register of Historic Places. The two training areas of concern are Outer Apra Harbor and Dadi Beach.

4.3.2.1 Deepwater MCM Training in Outer Apra Harbor

Existing conditions. The deepwater MCM site in Outer Apra Harbor is within one kilometer of several sunken vessels, including at least four of historical significance: the KITSUGAWA MARU, TOKAI MARU, NICHIYO MARU (all World War II Japanese vessels), and the S.M.S. CORMORAN (a World War I German vessel). See Figure 3-7. The TOKAI MARU and S.M.S. CORMORAN are listed on both the National and Guam Historic Registers. The TOKAI MARU has several possibly armed depth charges in a main deck space near the stern.

The Apra Harbor MCM site is approximately 125-feet (38-m) deep and more than one kilometer from the nearest known historically significant submerged ship. No impacts on the sunken historic ships have been reported from past demolition exercises with 10- and 20-lb charges.

Potential impacts. Significance criteria are in Table 4-3. The effects of underwater explosives are described in Section 4.3.1.1 and Table 4-10. The underwater detonations at the Outer Apra Harbor site have the potential to impact the sunken ships by subjecting them to pressure gradients associated with the shock wave. Peak overpressures have been estimated to be 3.3 to 4.4 psi at the TOKAI MARU and 8.3 to 10.5 psi at the nearest sunken vessel. These peak pressures are all less than one atmosphere. It is not known exactly what effect these pressure waves would have on any particular structure or on the TOKAI MARU depth charges, although no impacts of past detonations have been reported. However, if a structure has no void (air) spaces, it is not particularly vulnerable to structural deformation and resultant damage.

TABLE 4-10: UNDERWATER DEMOLITION EFFECTS ON SUBMERGED RESOURCES

Submerged Resources	Distance to Apra Harbor Deepwater MCM Site	Effect
TOKAI MARU	4850 ft (1511 m)	Minor peak overpressure
Nearest shipwrecks	2067 ft (630 m)	Unsafe for swimmers; no fish effects
Dive site "bomber"	3116 ft (950 m)	Unsafe for swimmers; no fish effects
Dive site "junk yard"	5988 ft (1825 m)	Unsafe for swimmers, no fish effects
Middle ground	±3116 ft (±950 m)	Unsafe for swimmers, no fish effects

Deepwater MCM training in Outer Apra Harbor may generate a cumulative impact on sunken vessels from the repetitive structural stress. There is no way to determine whether or not

cumulative stress is occurring. However, the low frequency of events and the low pressure exerted on the vessels' metal structures is likely not to be significant.

Proposed mitigation. Although calculations of pressure waves seem to indicate that both 10 and 20-lb. charges can be used without impact, there is no discernible gain in training value by using the larger charge. To provide a greater margin of safety, mitigation will include restricting the deepwater demolition charge used for training to 10-lbs. or less. When feasible, mitigation also addresses reducing the monthly use of the Outer Harbor site by initiating training at the proposed Dadi Beach/Agat Bay deepwater site also.

4.3.2.2 LCAC Landings at Dadi Beach

Existing conditions. Ten significant sites are located along the Dadi Beach coastline. These sites include prehistoric rock shelters, Japanese World War II defensive caves, Japanese bunkers, and the remains of Camp Bright, an American World War II camp.

Potential impacts. LCACs and primarily offloaded wheeled or tracked vehicles have the potential to damage significant cultural resources upon exiting the beach area if they wander off established beach roads. Numerous resources are located inside and in front of caves and rock shelters inland of the beach. Cumulative impacts could result from the repetitive nature of training activities and frequent visits by residents and tourists. Therefore, training activities associated with proposed beach landings have the potential to significantly impact cultural resources at Dadi Beach.

Proposed mitigation. If Dadi Beach is approved for LCAC landings and offloading personnel and equipment for inland movement, culturally sensitive areas such as the historic caves and rock shelters will be taped off and designated as "off-limits" to exercise personnel.

4.3.3 Range Safety at the Waterfront Annex

The Waterfront Annex includes small arms ranges, a shooting house, and several underwater demolition areas. Although there is little potential for harm to civilians due to routine implementation of range safety regulations, the issue of public safety is significant and the impacts are evaluated below. Significance criteria are in Table 4-6.

4.3.3.1 Existing Conditions

The small arms KD range and the fire-and-maneuver range being developed closer to Orote Point take advantage of the backdrop hillside along Orote Peninsula's ocean side that rises up to 20 meters (about 60 ft). This is an effective backstop for projectiles after they cross the target line and before they would impact in the ocean. The SDZs for each range extend out over federally controlled open-ocean immediately southwest of Orote Point. The SDZs represent the theoretical ricochet and overshoot areas for any bullets that would miss the 20 meters high backstop (a rare but theoretically possible event). The ocean areas within the SDZs remain accessible to civilian boaters and divers with a very low possibility for injury. Large signs warning of the presence of

the ranges are posted facing seaward to warn recreational and commercial water vessels to avoid the over-water SDZs.

The existing and proposed firing ranges are adjacent to the Orote Peninsula Historic Trail that is accessible to base visitors. When the ranges are in use, their access roadways are blocked and marked to keep unauthorized personnel clear of range activities.

A shooting house is positioned on Orote Peninsula beyond the 500 yard line of the KD range, alongside a former taxiway that is also one of the many roads that can be traveled by visitors on the historic trail. The safety zone for the Shooting House (75-feet [23-meter] diameter) is within a cleared, easily observed area, and fenced area.

Shallow water MCM sites. The sites proposed by NSWU-1 for SEAL Team shallow water demolition training are immediately offshore from Tipalao Beach and near Glass Breakwater at the mouth of Outer Apra Harbor.

Deepwater MCM in the Outer Apra Harbor. The existing site used by EODMU-5 for its deepwater MCM site is in Outer Apra Harbor at a depth of about 125 feet (38 meters). After demolition at the site, the training mine is then hauled to Dry Dock Island for dismantling and "neutralization."

Various sunken ships commonly used as civilian dive locations are within 1.2 miles (2 kilometers) of the site in shallower waters (see Figure 4-5). Four depth charges dating to World War II are located on the sunken TOKAI MARU approximately 4,000 feet (1,200 meters) from the site. It is not known whether the depth charges are armed (i.e., able to be exploded). The MCM site is an area of the harbor traveled by civilian and military watercraft.

Proposed deepwater MCM offshore of Dadi Beach. This site is approximately 400 meters offshore from Dadi Beach, in 108 to 115 feet (33 to 35 meters) of water. The area is generally accessible to civilian boaters and divers. The nearest areas frequented by recreational divers are Haps Reef (2 km distant) and "Blue Hole" 2.1 miles (3.5 km) distant (see Figure 4-6). The non-injury ranges for swimmers are provided in Table 4-9.

Floating mine neutralization sites. Both sites are located in the open ocean in areas under observation by boat and helicopter during the training event. Training at these sites does not interfere with commercial diving activities at popular sites.

4.3.3.2 Potentially Significant Impacts

Small arms ranges. The SDZ for the proposed fire-and-maneuver range (site of a former small arms range) extends along the shore of Orote Point as far south as Tipalao Bay and includes several popular dive sites. The range is proposed for use approximately 10 days per month (see Table 1-1). The SDZ is wider than that of the former small arms range because personnel may fire at various angles on the range (instead of straight forward). However, the possibility of bullets impacting within a larger ocean area is no greater than previous range use. The cliff behind the range functions as an effective backstop across the wider arc of firing lines. Civilian aircraft overflights of firing ranges are possible if aircraft disregard published warnings and no-

fly zones. One standard approach lane to Guam International Airport is south of Tipalao Bay. Regardless of warning signs and local knowledge of range presence, civilian boaters and divers do encroach the over-water SDZs. Due to the existing topography, disregard of the SDZs and flight restrictions would not necessarily mean that a significant impact would occur. The potential for significant impact rides on the possibility that range operating and safety procedures would not be followed.

No impacts are expected to civilians on the Orote Peninsula Historic Trail, since trail access is restricted during active range use.

Shooting house. It is possible for civilian visitors to leave the historic trail and inadvertently enter the vicinity of the shooting house. However, no significant impacts are expected since the roadway toward the shooting house is barricaded and range observers are posted when training is conducted. The fence around the site also ensures that persons cannot enter the facility unobserved from the rear.

Shallow water MCM sites. No significant impacts are expected since pre-training inspections are conducted, and the areas remain under observation during training.

- Deepwater MCM sites. Existing and proposed deepwater MCM training generates shock waves with the potential to affect civilian and military swimmers (see Section 4.3.1.1 and Table 4-9). Certain dive locations are less than the safe swimming distance from the existing and proposed sites (see Figure 4-5).

Floating Mine Neutralization sites. No significant impacts are expected since pre-training inspections are conducted, and the areas remain under observation during training.

4.3.3.3 Proposed Mitigation

Small arms ranges. Range control orders and procedures will be observed, including public notifications. Prior to new ranges being activated, they will be inspected and certified by range planners assigned to Commander, U.S. Naval Facilities Command, Washington, D.C. (NAVFAC).

Shooting house. Range control orders and procedures will be observed, including closing access to civilians prior to exercises.

Shallow water MCM. Prior to demolitions, training sites will be surveyed and confirmed as clear of civilian activity.

Deepwater MCM. Commercial dive shops and tour boat companies will be given a one-week notice of training. NOTMARs will be published 24 hours in advance of detonations through the USCG. A notification of training activities will be published in the *Pacific Daily News* one day prior to the event identifying the area that will be closed to boaters and divers for the duration of the exercise (about 4 hours). The USCG will monitor the exercise safety zone, which is patrolled

by EOD before and during the exercise (see Figure 4-5). Guam EPA will be invited to observe and evaluate the training.

Floating Mine Neutralization. Prior to demolitions, training sites will be surveyed and confirmed as clear of civilian activity.

4.3.4 Aviation Safety at Waterfront Annex

Existing conditions. One fixed-wing aircraft runway at Orote Peninsula is used infrequently by the SEALs for special operations. The runway has also been used for air mobility exercises as part of tactical lifts and Noncombatant Evacuation Operations (NEO). Helicopter landings are conducted for training and logistic support missions. The FAA is notified of these activities, and communications are established with the tower at Guam International Airport. When not in use for training, portions of the airfield's paved services are accessible as part of the peninsula's historic trail.

Potentially significant impacts. Significance criteria are in Table 4-7. No significant impacts on Guam civilian aviation are expected, owing to well-established communication and compliance with existing FAA and military regulations and compliance with orders from air traffic control personnel. No significant impacts on civilian tourists are expected; potential impacts of aviation training will continue to be managed by military training orders, SOPs and area-specific constraints to prohibit civilian access to the Orote Point runway during aviation operations.

Proposed mitigation. No mitigation is required. Training management procedures include notification requirements and area security precautions.

4.3.5 Socioeconomic Impacts at the Waterfront Annex

Existing conditions. During deepwater demolition training by EODMU-5, portions of Apra Harbor are closed to other activities for up to four hours about once per month. The harbor is home to various commercial boating operations and marinas that conduct ecological tours, SCUBA and snorkeling trips, commercial submarine rides, and fishing expeditions (see Appendix K). Numerous reefs and shipwrecks inside the harbor and southwest of Orote Point are popular dive sites. Atlantis Submarine and SS Neptune are commercial submarines which transport tourists to offshore reefs (see Figure 4-5). Recreational businesses operate 12 to 14 hours per day, seven days a week. Business is much better on weekends than weekdays.

Potential impacts of deepwater MCM. Significance criteria are in Table 4-8. Surface vessel traffic is prohibited within 300 meters of the training site once a month, and large portions of the outer harbor are closed to subsurface activity, temporarily curtailing commercial boating and diving inside this area. (The ship channel remains open and most tour vessel activities are not affected.) Up to 15 of the 17 dive sites within Apra Harbor are thereby closed for one four-hour period per month, or about one percent of commercially useful hours. Closures are always on weekdays, when business is slower than on weekends. The two commercial submarine operators do not cease operations but must relocate operations from the Gabgab Reef to Jade Shoals during

MCM training. Multiple small boat and dive operators must avoid the area closed for MCM training and relocate temporarily. If operators did not relocate, the approximate dollar value of lost business opportunity (assuming 100 percent capacity filled with adults paying full fares) would be a maximum of $35,500 per event (i.e., once per month).

Use of the Dadi Beach site for deepwater demolitions would have little negative socioeconomic effect; only three official dive sites are within the safe swimmer exclusion zone, and many alternative dive sites will be available for use. Agat Bay Marina is not affected. The marina is south of the training site and beyond the 1,000-feet (300-meter) surface traffic exclusion zone.

Mitigation. Use the Dadi Beach MCM site to decrease the frequency of temporary closures to ensure public safety within a portion of the harbor. When scheduling use of the Apra Harbor site, provide at least 30-days notice to commercial operators.

4.4 IMPACTS ON ORDNANCE ANNEX

4.4.1 Biological Resources on Ordnance Annex

Protected faunal species in the Ordnance Annex include migratory shorebirds and waterbirds at Fena Reservoir, the Mariana common moorhen at Fena Reservoir and at three small wetland areas to the east and northwest, and the island swiftlet along the Talofofo River and in the Mahlac Cave and Fachi Cave (near the north end of Fena Reservoir). There are a few individual Mariana fruit bats in the limestone forest areas between Mount Almagosa and East Tower and also in the western part of the Annex to include the area being developed as a sniper range. There are three species of tree snail recently proposed for listing as federally endangered species known to exist in the Ordnance Annex. Surveys of the snails have been initiated.

Two reptiles (the Pacific slender-toed gecko and the moth skink), two tree snails (the Pacific tree snail and the Mariana Islands fragile tree snail listed as endangered on Guam), and several rare and sensitive invertebrates were identified during USFWS faunal inventory surveys.[62] The skink occurs annex-wide, the gecko occurs only on the southern portion of the annex, and the two tree snails are restricted to the riparian areas along the Bonya River (just northeast of Fena Reservoir). Several of the rare and sensitive species, including the Marianas eightspot butterfly and the Almagosa Cave isopod and amphipod, are in the *Merilliodendron* forest and subterranean karst system associated with Almagosa Pit.

Two botanical species listed as endangered on Guam are present: the tree fern (*Cyanthea lunulata*) and the ufa tree (*Heritiera longipetiolata*). The tree fern is found mostly along riverbanks in areas such as the Imong River, south of Fena Reservoir, and the ufa tree is found in the *Merilliodendron* forest. A previously unknown tree species was also discovered recently in the Ordnance Annex. Other species of concern include several types of orchid.[63]

[62] USFWS (December 1996) *Faunal Survey for the Ordnance Annex, Naval Activities, Guam.* Prepared for Department of the Navy.

[63] Orchids of concern include *Eria rostriflora, Coelogyne guamensis, Rhynchophretia micrantha,* and an unnamed *Bulbophyllum* sp. [Source: M&E Pacific, Inc. (March 1997) *Draft Flora Report for the Ordnance Annex, Guam*].

Overview of training impacts. Significance criteria are in Table 4-2. No significant impacts on protected species or habitats are expected from training in the Ordnance Annex. No newly proposed training will occur in the Fena Reservoir, the three small wetland areas, near the swiftlet caves, or along the Bonya River. Ongoing bivouacs may affect tree snails. Proposed training activities include construction and use of a sniper range and jungle trail range, construction and use of a breaching house, and creation of a parachute drop zone, all of which occur in areas that are already disturbed. Simulated CAS in support of TRAP is proposed in the vicinity of existing LZs.

This section reviews impacts of the ranges, bivouacs, pyrotechnics, land navigation training, and air support to ground training activities. No significant impacts are anticipated.

4.4.1.1 Sniper Range and Jungle Trail

Existing conditions. The proposed sniper range location is on the west side of the Ordnance Annex; the firing points would be on a small hill, site of the former West Lookout Tower (Figure 4-6). The topography consists of hilltops, ridges, gentle to steep slopes, and a ravine that leads down into the lower elevations of the Ordnance Annex. According to a March 1996 flora survey (Appendix L), virtually all of the area is disturbed, most of it by periodic fires that ravage the hillsides, eliminating tree species and allowing the sword grass and mission grass to dominate.[64] Fruit bats are known by DAWR to occur in low numbers in the proposed sniper range, but no endangered birds or bats were found during a May 1996 faunal survey (Appendix M). The extreme end of the safety fan will overlap the southern end of Fena Reservoir, which is moorhen habitat (see Figure 4-7). Although not a protected species, wild carabao roam the annex and area threatened by poachers.

Potentially significant impacts. Vegetation clearing could harm important habitat, tracer rounds could ignite fires, and projectiles could theoretically harm protected species or carabao.

- No significant impacts to habitat will result from the emplacement of targets or from hand-clearing the jungle trail because the area is already disturbed. Minimum range "construction" is required. The sniper range would employ a firing point that retains a natural setting and concealment for the sniper. Cardboard or plastic silhouette targets would be individually placed down range at varying distances about 300 to 900 meters from firing points, in an area where no road access exists. Targets would be mounted on plastic stakes, which would be hand-carried and hammered into position. Installation of the jungle trail would involve limited hand-clearing to delineate a path. Backstops designed for the caliber round being fired will be constructed at each target area.
- Tracer rounds, which could ignite brush fires, are not used since the visible flight of the rounds would reveal the sniper's location.
- The potential for any wild carabao being hit by a sniper projectile is remote. The persons using the range and trail would be expert marksmen maintaining existing skills first learned

[64] The majority of these fires are thought to have been deliberately set by deer poachers to increase deer habitat. (Personal communication with Gary Wiles, Guam DAWR, May 16, 1996.)

on KD ranges; their marksmanship is expected to be consistently excellent. Snipers are trained individually or in small groups, employing single shots at the targets. Since the sniper rifles are scoped, the snipers are training to select the target, avoid movement and detection, to determine range and to shoot accurately. Targets and target backstops will be located on forward slopes.

- The terrain would protect moorhens at Fena Reservoir and within the SDZ from projectile impacts. (The SDZ is a two-dimensional model drawn without consideration for hills that would mask fire.)
- Proposed mitigation. No significant impacts to habitat or protected species will result from clearing the range or direct projectile impact, and no mitigation is proposed. The potential for a field fire will be mitigated by ensuring no use of tracer rounds, curtailing range training during drought conditions, and strict adherence to a fire prevention and response plan which will be finalized for the Ordnance Annex, based on the fire plan for Tinian (see Appendix F). A helicopter with water-hauling capabilities will be on call during training sessions at the sniper range; nearby Fena Reservoir is the immediate water source.

4.4.1.2 Breacher Trainer

An area of about 9,800 square feet (900 square meters) has been cleared for construction of the proposed two-story 2,100 square feet (196 square meters) breacher trainer (or breaching house).

Existing conditions. The area selected for the breacher trainer is entirely disturbed (there is no sensitive vegetation) and dominated by swordgrass savanna.

Potentially significant impacts. No significant impacts to vegetation are expected from construction of the breacher trainer, as the area is already disturbed. No significant impacts to endangered reptile populations are anticipated from clearing the site because these species occur in substantial numbers. Construction impacts will be minimal and will be mitigated by standard erosion control procedures. Tree snails are not expected to occur in this location. If tree snails become listed as endangered and if they are found to exist in areas to be cleared, clearing trees could significantly impact the snails.

No significant impacts are expected during breaching training. The potential for impacts from a 6-ounce shape-charge is minimal since the explosive is designed to blast doors or barricaded windows inward as a means of forcible entry. Once inside, the raiding force will use stimulated small arms ammunition made of plastic (SIMUNITIONS) rather than live ordnance, eliminating the chance of fatal or injury-producing projectile impacts. The breacher trainer will be constructed of fire-resistant materials to reduce any potential for structure fire.

Proposed mitigation. No mitigation is proposed. Should tree snails be found in this area and listed as endangered, mitigation measures will be negotiated with USFWS if trees must be cleared.

4.4.1.3 Parachute Drop Zone

Existing conditions. The proposed DZ is in an existing helicopter LZ, a disturbed area with no limestone forest and no endangered species observed in the immediate vicinity.

Potentially significant impacts. Creation of this DZ might involve limited clearing of nonnative brush species. No significant impacts are expected. If tree snails become listed as endangered and if they are found to exist in areas to be cleared, clearing trees could significantly impact the snails.

Proposed mitigation. No mitigation is proposed. Should tree snails be found in this area and listed as endangered, mitigation measures will be negotiated with USFWS if trees are proposed for clearing.

4.4.1.4 Bivouacs

Existing conditions. Two bivouac areas are proposed for continued use. Both of these are locations with disturbed vegetation, such as swordgrass savanna that forms a dense cover and burns easily.

Potentially significant impacts. No significant impacts to protected species are expected from bivouac activities. If tree snails become listed as endangered and if they are found to exist in areas to be cleared, clearing trees could significantly impact the snails. Large groups moving about in the jungle could also knock snails off trees onto the ground, where they would be more vulnerable to predation. There is a high potential for brush fires, especially during the dry season (approximately January through May).[65]

Proposed mitigation. Bivouac activities have ongoing mitigation; i.e., a fire prevention plan is in place and helicopter water-drop assistance is available. Tents are set up with fire lanes for easy access, and a fire watch is set at night. A Fire Prevention and Response Plan (similar to that used for the Tandem Thrust 1999 exercise) will be finalized by COMNAVMARIANAS for use at the Ordnance Annex (see Appendix F). If snails are detected in the bivouac areas and if they are listed, bivouac activities will be restricted to avoid snail-populated areas.

4.4.1.5 Land Navigation and Reconnaissance Patrols

Land navigation and patrols are conducted both in the northeastern corner and in the southern end of the Ordnance Annex. Both are small-unit stealth activities.

Existing conditions. The northeastern corner of the annex is an already disturbed area, lacking native vegetation. The southern area contains Almagosa Spring, which supports a *Merrilliodendron* forest known to harbor three rare but not officially protected species: the Marianas eightspot butterfly, the Almagosa Cave isopod, and the Almagosa Cave amphipod. This site is also a potential area for the reintroduction and maintenance of native tree snails, some

[65] Personal communication with Leslie Morton of COMNAVMARIANAS N456, September 24, 1997.

of which are listed as endangered by the Territory of Guam. Another limestone sinkhole south of Almagosa Pit contains similar rare plant and animal species.

Potentially significant impacts. No significant impacts are expected from land navigation training in the northeastern corner of the annex. Rare species and tree snails in the southern portion of the annex are unlikely to be disturbed, as training is limited to small numbers of people moving by foot through these areas under stealth conditions, firing blanks only.

Proposed mitigation. As a precautionary measure, the Almagosa spring and nearby limestone sinkhole area have been designated as NWD areas.

4.4.1.6 Simulated TRAP with CAS

AH-1 Cobra helicopters and AV-8B Harriers would provide close air support as security forces are inserted by helicopter at an existing LZ to "rescue a downed air crew in enemy territory."

Existing conditions. No endangered bird or bat species nest around existing LZs.

Potentially significant impact. Helicopters and fixed-wing aircraft are relatively noisy and could disturb any endangered birds or bats present in areas overflown at low altitudes.

Proposed mitigation. Harriers will remain above 2,067-feet (630-meters) AGL, and the Cobra helicopter gunships will remain above 1,033-feet (315-meters) AGL, except in the immediate vicinity of LZs already used by the CH-46 or CH-53 troop transport helicopters.

4.4.1.7 Firebucket/Drone Training at Fena Reservoir

HC-5 is responsible to conduct aerial firefighting and drone recovery. These missions require initial qualification and periodic refresher training for helicopter aircrews. The training site is the north end of Fena Reservoir. The reservoir is a primary source of potable water for southern Guam and a source for water to use to fight fire in the Ordnance Annex. The aerial firefighting requires practice in hovering to fill an externally carried fire bucket. The drone training involves hovering to retrieve a target drone that is floating in the water. A wood and metal drone simulator is used rather than an actual fueled drone to eliminate potential contamination of the reservoir's fresh water. [66]

Existing Conditions. The fringes of the southern two-thirds of the reservoir support stands of emergent vegetation that are occupied by the federally listed Mariana common moorhen (*Gallinula chloropus guami*) year round. Firebucket training has been accomplished in the reservoir since 1993. Drone training was successfully demonstrated to personnel from the Guam National Wildlife Refuge (GNWR) and the Guam Environmental Protection Agency (GEPA) in August 1998. Informal Section 7 of the ESA was completed with USFWS in October 1998. [67]

[66] HC-5 Drone/Firebucket Program Manager memorandum dated 1 Oct 98 to COMNAVMARIANAS Environmental Section.

[67] US Dept of the Interior, Fish and Wildlife Service letter ELG dated October 30, 1998, "Informal Consultation under Section 7 of Endangered Species Act for Firebucket and Drone Training Exercises at Fena Lake, Guam, by Helicopter Combat Support Squadron Five."

Potential impacts. The moorhen population is estimated between 25 to 40 moorhens during the dry season. Moorhens are wary birds that would seek the emergent vegetation or leave the site if disturbed during the training exercise.

The helicopters and the equipment used for training could degrade water quality.

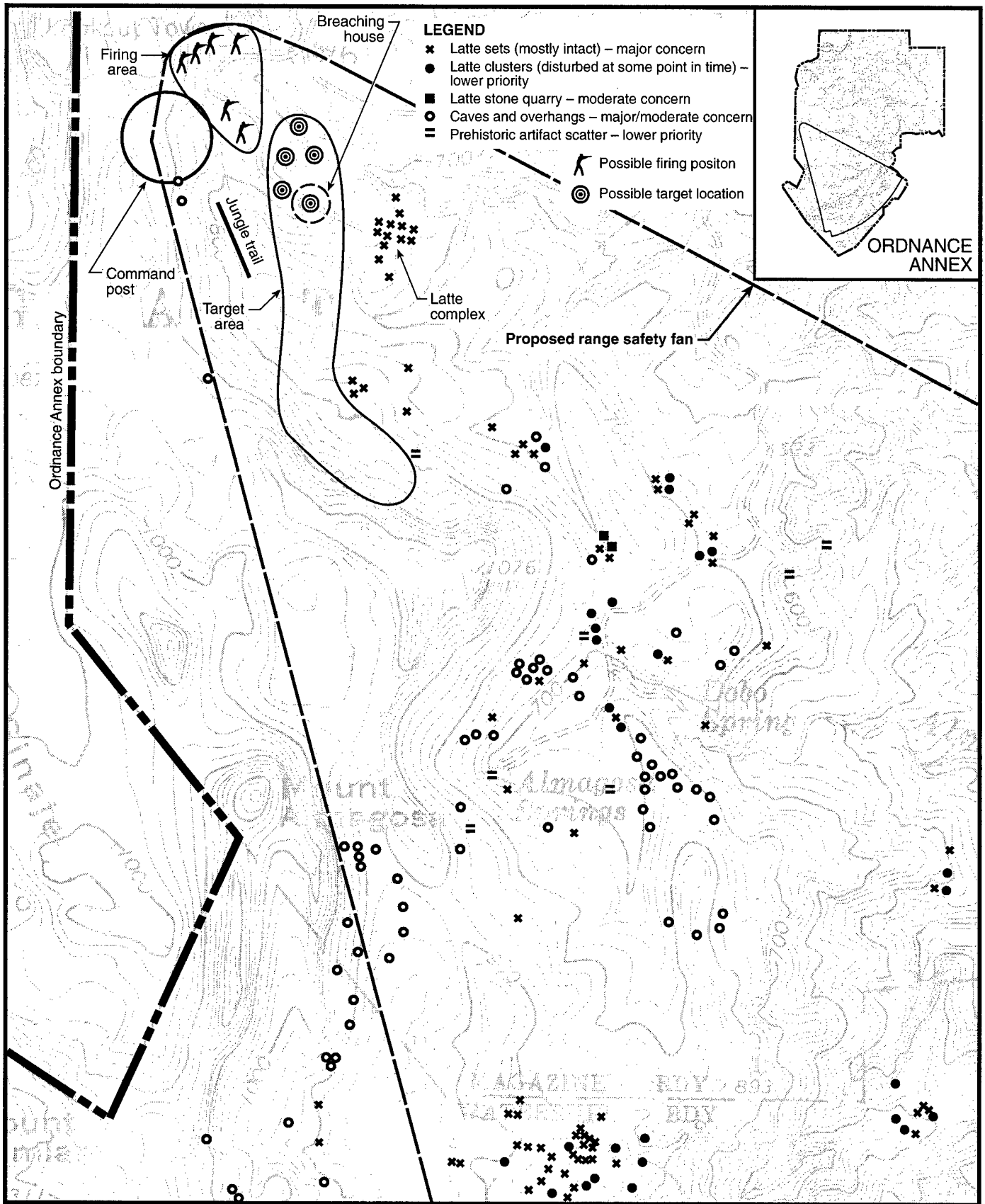
Mitigation established with USFWS. The Navy favors conducting training during the wet season whenever possible to qualify its helicopter aircrews and limits the filling and dumping activity to the northern third of the lake between the boat ramp and spillway in open water areas. The buckets and the practice drone are cleaned and helicopters are inspected for leaks prior to training. Flight patterns for firebucket and drone training and training frequencies are similar and Division of Aquatic and Wildlife (DAWR) and the GNWR are contacted in advance of the training activities.

4.4.2 Cultural Resources in the Ordnance Annex

Existing archaeological/historic resources in the Ordnance Annex include multiple ancient Chamorro latte sites and World War II Navy structures (see Appendix J). Construction and use of the proposed sniper range and jungle trail may impact cultural resources by disturbance or direct impact, respectively (see Figures 2-3 and 4-6). Activities in the proposed breaching house will not impact significant cultural resources because SIMUNITIONS will be used rather than live munitions. Programmatic significance criteria are in Table 4-3. A large portion of the annex has been designated NCRD to protect cultural resources from the effects of bivouacs and excavation. Troops will be briefed on the significance of Chamorro artifacts prior to exercises and will be instructed not to litter or otherwise deface any sites. The briefing will include a description of cultural resource indicators (e.g., charcoal-stained soil, pottery fragments, and bones). Training personnel will be instructed to stop any digging if such materials are found and to immediately notify the COMNAVMARIANAS Cultural Resources Manager to determine whether digging may be resumed.

4.4.2.1 Sniper Range

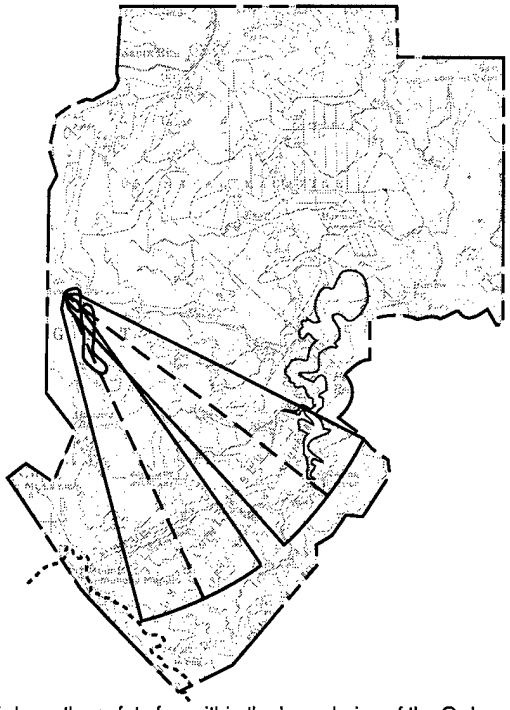
The proposed sniper range may be used daily by small groups (two to six snipers), each firing up to 20 rounds of ammunition. Each team will be brought in by vehicle and dropped off on the road about 4,000 meters northeast of West Tower. They will be directed to patrol along the road to a specific firing position within the general firing area. As a team, the snipers will determine the direction of fire using a compass, the distance between themselves and the target (using a laser range finder), and the difference in elevation between their position and the target (using a climbing altimeter). After setting their equipment, they will relay this information to the Range Safety Officer (RSO). The RSO will then check the firing position-to-target information, to ensure that firing will remain within the designated SDZ and avoid cultural resources. If all criteria are met, the RSO will clear the team to shoot; otherwise, the team will move to a different firing position (see Figure 4-7).



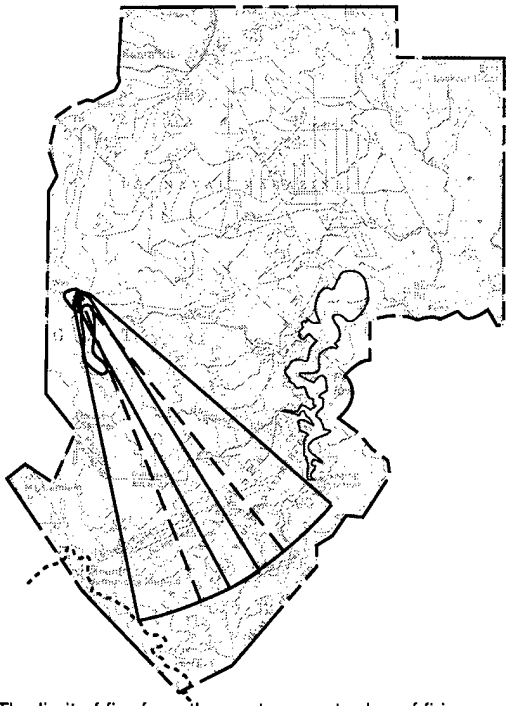
Source: Compiled by IARII from Paul H. Rosendahl, Ph.D., Inc. (1996) *Prefinal Report: Phase I Archaeological Survey and Subsurface Testing, U.S. Naval Activities Ordnance Annex, Guam*

Figure 4-6
PROPOSED SNIPER RANGE DETAILS

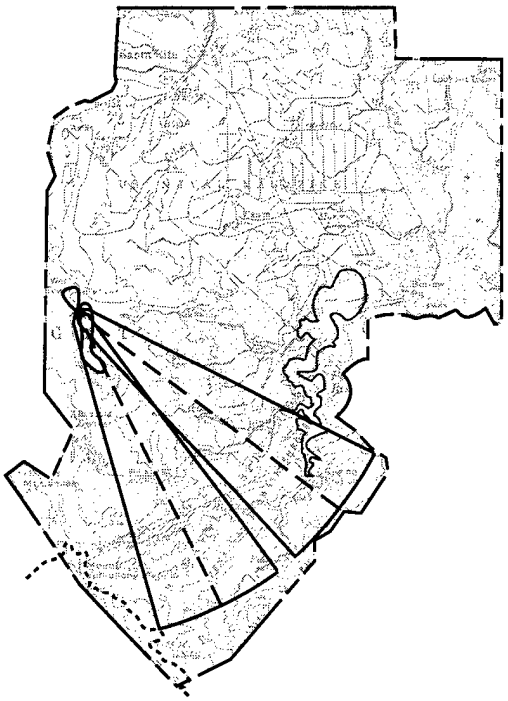
FEIS: Military Training in the Marianas
Belt Collins Hawaii, June 1999



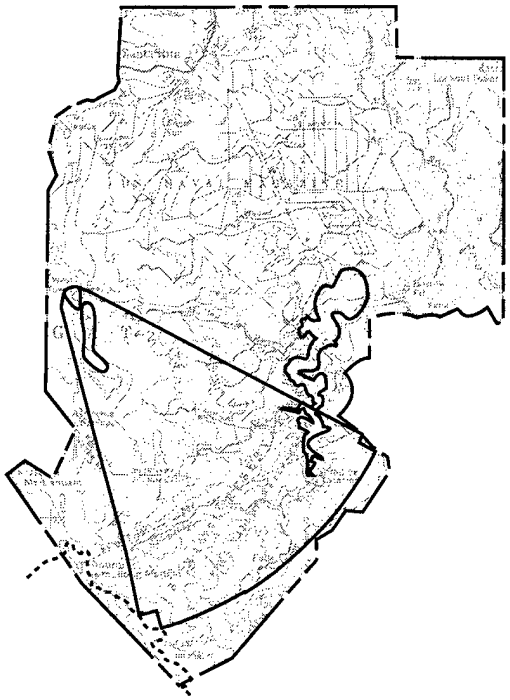
A. To keep the safety fan within the boundaries of the Ordnance Annex and off the hiking trail, the limit of fire from the westernmost edge of the firing area is restricted to an approximate direction of 128° to 156° east of north.



B. The limit of fire from the easternmost edge of firing area is restricted to an approximate direction of 142° to 169° east of north.



C. The limit of fire from the southernmost edge of the firing area is restricted to an approximate direction of 129° to 156° east of north.



D. This is a composite of all the safety fans.

Source: Marianas Training Plan Briefing Booklet

NORTH

0 1000 2000 (Meters)

0 4000 8000 (Feet)

LEGEND

- Safety fan boundary
- Limit of fire
- Hiking trail

Figure 4-7
SAFETY FAN LIMITS

FEIS: Military Training in the Marianas
Belt Collins Hawaii, June 1999

After training is completed, the snipers will retrieve all expended brass and gear and move to the extraction point via the road. Several sniper teams might use the range at any one time.[68]

Existing conditions. A recently discovered latte village within the SDZ of the proposed sniper range consists of more than 40 latte sets and may be the largest and best preserved of such sites on Guam. A second latte complex also within the SDZ consists of 12 latte sets and is in the vicinity of the proposed breaching house. Both latte sites are determined to be historically significant under the NHPA.

Potential impacts. Without adequate backstops, projectiles missing targets on the sniper range could theoretically damage the latte village and latte complex within the proposed SDZ. The two sites are within the 15,850 feet (4,800 meters) maximum range of the weapons.[69] Target locations and construction are planned to take advantage of intervening topography as well as providing target backstops to stop the flight of rounds. In addition, no significant impacts to the latte complexes are expected since the lattes are situated in areas below bullet trajectories.[70]

Proposed mitigation. Potentially significant impacts on cultural resources will be avoided by selecting the firing positions, target areas, and firing directions to meet the following conditions:

- Provide target areas approximately 0.7 mile (1 kilometer) m or closer to firing positions and at about the same elevation as the firing position (training requirement).
- Site target areas to avoid the potential for projectiles to impact and damage cultural resources (mitigation). Targets will be located so that the topography will protect significant cultural resources. The horizontal and/or vertical distance between the target and firing position would be close enough that the likelihood of a missed shot damaging a historically significant resource is minimized to nonsignificance.

Final firing positions, target locations, and weapons selection will be determined so that latte sets will be avoided and the SDZ will remain within the Ordnance Annex boundaries without intersecting the hiking trail (see Section 4.4.3). The final SDZ will be reviewed and approved by a Navy archaeologist as well as Naval Facilities Command (NAVFAC) and the Naval Ordnance Center (NOC).

4.4.2.2 Jungle Trail with Pop-up Targets

Training at the proposed jungle trail involves a single person walking on a designated path and shooting at radio-activated pop-up targets located at short distances. A sandbagged berm will be

[68] Written communication with NSWU-ONE (September 19, 1997).

[69] The latte village is at least 2,400 m from the firing points at approximately the same elevation; it is about 1,500 m behind the targets on the back side of a ridge, overlooking an inland wetlands area. The smaller latte complex is on a gradually sloping area about 200 m southeast of the breaching house location and is within 1,000 m of, and about 30 m lower in elevation from, all proposed firing positions.

[70] Weapons would be fired straight down the range at a fixed target positioned clear of any latte complex. Each projectile follows a ballistic trajectory that arcs downward increasingly with distance and loss of velocity; 1,000 m is the maximum effective range. The bullet trajectory, in case of a miss, would intersect terrain directly behind a target or could continue over a valley and impact terrain well beyond.

set up behind each cardboard or plastic target as a bullet stop. A limited amount of vegetation clearing will be necessary to delineate the jungle path and clearing will be conducted by hand. The targets will be mounted on plastic stakes, hand-carried and hammered into position.

Existing conditions. Many latte sets have been recently identified in the vicinity of this trail, which will be near the sniper range and within its SDZ.

Potential impacts. This activity has the potential to damage archaeological/historic resources in the line of fire by direct impact of the projectile, should targets and berms be missed.

Proposed mitigation. A Navy archaeologist will review and inspect the range to ensure that the targets are placed so that no significant cultural resources are in a line of fire and susceptible to be hit. No excavation will be permitted along the trail.

4.4.3 Range Safety at Ordnance Annex

Existing conditions. The Ordnance Annex is not officially accessible to the public. However, a commonly used hiking trail enters the southwest boundary of the annex and connects Mount Lamlam, Mount Jumullong Manglo, and Imong (Figure 4-7). This trail is recognized by COMNAVMARIANAS as a well-publicized hiking trail that has been open to the public for decades. The SDZ of the proposed sniper range flanks but does not cross a portion of the trail. In addition, poachers are believed to illegally enter the Ordnance Annex in search of game.

Potentially significant impacts. Significance criteria are in Table 4-6. Prior to development, the range designs for sniper training and the jungle trail will be reviewed and approved by NAVFAC and NOC. The SDZ will remain within government property. NAVFAC will review the orientation of the sniper firing positions to the targets, the design of the targets and backstops, and the SDZ dimensions to determine the weapons that will be approved for the sniper range. The jungle trail range within the same SDZ will be developed for 9mm and 5.56 caliber small arms.

No impacts are expected to hikers who remain on the trail, as the firing directions and resulting SDZ for the proposed sniper range were adjusted to keep the trail clear of required safety buffer areas (see Figure 4-7). The SDZ for the jungle trail range is also clear of the trail.

Occasionally, representatives of GovGuam agencies or private contractors are invited to perform natural or cultural resource studies within the Ordnance Annex. The studies may be safely conducted after approval by the activity commander and coordination with security and natural resource staff, which will ensure the safety of civilians on or near the ranges.

Proposed mitigation. When the range is opened, COMNAVMARIANAS will publish a notice in local newspapers warning civilians not to stray from the hiking trail and reiterating the risks by and penalties for illicitly entering the Ordnance Annex to poach game.

4.5 IMPACTS ON AAFB AND COMMUNICATIONS ANNEX

4.5.1 Biological Resources on AAFB and Communications Annexes

Protected species at AAFB include the Mariana crow, Mariana fruit bat, green sea turtle, and native tree snails. As of April 1998, fewer than 12 endangered Mariana crows remained on Guam, all of them at AAFB. Four of these were captive crows that were released recently at AAFB.[71] In the past, crows were observed at Northwest Field, the Tarague cliffline, and the MSA. No crows currently nest on the south runway at Northwest Field; due to attrition the crow distribution is limited to the MSA and east to Pati Point. It is recognized that the crows could theoretically disperse throughout their former range if recovery efforts were successful.[72] Crow nesting season is estimated to be approximately October 1–April 30.

An endangered Mariana fruit bat colony of approximately 300 individuals roosts at Pati Point west of the main airfield, and a few isolated individuals occur at Ritidian Point. Fruit bats forage at night along the limestone cliffs between these two points, as well as at other areas in Tarague Basin, the MSA, and Northwest Field. Threatened green sea turtles are known to nest on sand beaches at AAFB. Threatened and endangered native tree snails occur in the Haputo ERA at the Communications Annex (Finegayan).

All military operations at AAFB are reviewed for environmental compliance through the 36th ABW Risk Analysis program.[73] Ground training exercises are not authorized at the Pati Point area in order to avoid adverse impacts to the endangered Mariana fruit bats, or at locations that might adversely affect Mariana crows. Training-related activity in the MSA is restricted to foot travel from Northwest Field to Main Base by small teams of SEALs.

Overview of training impacts. The only potentially significant impact of training at AAFB and the Communications Annex is the impact of aviation noise and visual disturbance on Mariana crows and Mariana fruit bats. Noise of RRR training will not occur in known crow nesting areas, and personnel walking on established trails at the Haputo ERA and Tarague Beach will not significantly impact protected species. Significance criteria are in Table 4-2.

4.5.1.1 Overflights

Fleet Carrier Landing Practice (FCLP) training is infrequent, occurring only two to four times per year.[74] NVG training occurs approximately three nights per week, commencing after sunset for a duration of up to three hours. Unlike fixed-wing aircraft runways, helicopter landings in confined areas (CAL) and simulating groups of helicopters landing on a confined amphibious

[71] Personal communication with Robert Anderson, Guam DAWR, April 27, 1998.

[72] Personal communication with Heidi Hirsch of AAFB, August 1997.

[73] The Air Force allocates staff and financial resources to natural resources management and environmental education and awareness programs at AAFB.

[74] Personal communication with Byrnes Yamashita, NAVFAC EFDPAC, January 13, 1997.

ship deck (such as the LHA) involve small designated LZs, which restrict the number of helicopters that can be landed simultaneously. Each of these exercises has a designated flight track and approach and departure altitude, confining aircraft to certain areas agreed upon in consultation with USFWS and Guam DAWR.

Existing conditions. Aviation training does not occur in a known crow nesting area (the MSA), but occurs at Northwest Field and at Main Base, which are separated by and within 1 km of the MSA.

Potential impacts. Noise and visual disturbance from FCLP, NVG flight crew training, CAL, and simulated LHA landings may directly or cumulatively impact Mariana crows and Mariana fruit bats, but there is no conclusive evidence that these activities cause disturbance constituting a "taking."

USFWS conducted a three-year study between 1992 and 1995 to determine the effects of FCLPs and other aircraft overflights (including HC-5 helicopters used at night for NVG training) on the Mariana crows and Mariana fruit bats at Main Base.[75] The study found that crows responded to some low-altitude aircraft overflights with distress and flight, but there was no evidence that overflights contributed directly to nest abandonment or nest failure during this study. In fact, Mariana crows have been known to tolerate relatively high volumes of air traffic at 300-meters above ground level (AGL) altitudes.[76] Although the USFWS study also identified the potential for nocturnal FCLPs to disturb foraging bats under the FCLP track, it concluded that current air traffic volumes were tolerable to the Mariana fruit bat colony at Pati Point.

Proposed mitigation. Overflight conditions were negotiated with USFWS in May 1997. There will be no overflights below 1,600-feet (488-meters) MSL[77] over MSA 1 at any time. Overflights conducted below 1,600-feet MSL will be allowed between June and August (the Mariana crow non- breeding season). From September through May, there will be no overflights of crow territories below 1,600 feet MSL. Crow nesting territories will be identified by DAWR and updates provided to the AAFB environmental (36 CEV) and air operations (36 OSS) staffs. This information will be briefed to all air crews and air traffic controllers. Helicopters will remain one-half mile (0.9 km) from the perimeter of the fruit bat colony at Pati Point, with the exception of flights originating from the end of the runways.[78]

[75] USFWS (July 1996) *Final Report: The Effects of Aircraft Overflights on Endangered Mariana Crows and Mariana Fruit Bats at Andersen Air Force Base, Guam.* Prepared for the Department of the Navy, Pacific Division, Naval Facilities Engineering Command.

[76] During the peak of the Tandem Thrust exercises, a pair of Mariana crows (the "pipeline pair") constructed a nest within approximately 3,000 feet (915 meters) of the active runway.

[77] Equivalent to 1,000 feet (305 meters) above ground level (AGL).

[78] 35 CES/CC Memorandum for 36OSS/CC and HDB dated May 22, 1997. The 36th ABWI 13-202, Dec 12, 1996, will be revised to incorporate these changes.

4.5.1.2 Rapid Runway Repair

Existing conditions. No crows nest at Northwest Field or in proximity to the proposed training site.

Potentially significant impacts. No impacts are anticipated. No crows nest in the area.

Proposed mitigation. None is required.

4.5.1.3 Parachute Drops

Airborne operations by small (4 to 12 people per helicopter) and large groups (90 or more people per aircraft) are ongoing at Main Base and Northwest Field. Pilots fly a pattern at no less than 1,000 feet (305 meters) AGL during crow breeding season[79] and may fly as low as 500 feet (150 meters) AGL in non-breeding season.

Existing conditions. No crows nest at either location.

Potentially significant impacts. There are no impacts present since no crows nest at either location.

Proposed mitigation. None is required. Based on previous decisions at AAFB, the presence of crows' nests would rule out conducting airborne operations in their vicinity.

4.5.1.4 Bivouacs

Field exercises at Main Base and Northwest Field that require bivouac for medical, communication, security, or other skills training have been conducted at the areas indicated on Figure 2-4 for over 15 years. Groups of 100 or more have not caused known disturbance to Mariana crows. Troops are not permitted to light open fires, clear vegetation, or dig other than limited defensive positions (foxholes). AAFB personnel closely monitor the area for indications of cumulative effects.

Existing conditions. Crows are not known to have nested in the bivouac area in recent years. The MSA is not used for bivouacs.

Potentially significant impacts. None are anticipated. No open fires (that could spread to habitat areas) are allowed at bivouac sites. Tents are set up with established fire lanes, an adequate number of fire extinguishers are present, and a fire watch is maintained.

Proposed mitigation. None is required, and no additional training management measures are proposed.

[79] 36th Operations Support Squadron (36 OSS) and Helicopter Combat Support Squadron (HC-5)(undated) Letter of Agreement: Air Traffic Control (ATC) Procedures for HC-5 Operations at Northwest Field, Guam.

4.5.1.5 Over-the-Beach Training

Small special operations groups may use CRRCs to land (or swim ashore) Haputo and Double Reef beaches in the Haputo ERA. The beaches are on the coastline of Communications Annex at Finegayan. Similar exercises could be conducted at Tarague Beach (AAFB), weather and sea conditions permitting. At Haputo Beach (NCTAMS Finegayan), the teams hike up the established trail and steps to the top of the cliff and proceed on foot out of the ERA and Communications Annex to train in Northwest Field. SEAL teams that land at Tarague Beach may use the AAFB small arms range or could proceed on foot through the main base and MSA to reach Northwest Field.

Existing conditions. No endangered terrestrial species occur on the Haputo Beach trail and the firebreak trail through the annex.

Potentially significant impacts. No significant impacts to native tree snails are expected from this activity because no tree cutting will occur and personnel will remain on the established trail.

Proposed mitigation. No mitigation is proposed.

4.5.2 Cultural Resources at AAFB and Communications Annex

4.5.2.1 AAFB

Field maneuvers and bivouac training are conducted throughout Northwest Field. Northwest Field is the site of ongoing aviation and special operations training, field maneuvers and bivouacs, and various Air Force combat support squadron training exercises Runway One supports helicopter training and Runway Two is used by fixed-wing aircraft. A RRR training site has been proposed for development on a parking apron at Northwest Field.

Existing conditions. Northwest Field is another of the bomber airfields developed after the invasion of Guam. The National Park Service issued a determination in November 1998 that finds Northwest Field eligible for listing on the National Register of Historic Places. A proposed boundary for National Historic Register listing is under review by NRHP and the Guam HPO. No historically significant cultural resources have been identified at the proposed RRR and existing bivouac sites.

Potential impacts. Military training can have an adverse effect on historic resources. The significance criteria are in Table 4-3. Guam HPO has suggested that RRR training be conducted elsewhere. Use of another military base for RRR was considered and is not warranted since any potential impact caused by USAF RRR training can be mitigated. The RRR training exercise is conducted in conjunction with other field exercises that are staged at Northwest Field. Consolidation of the total exercise is required for training readiness, particularly for the USAF engineer support squadrons, and facilitates remaining within budget. There are numerous paved aviation surfaces that will be available outside of the landmark area boundary.

Proposed mitigation. A Memorandum of Agreement will be developed for use of the historic area and will include the mitigation measures and training constraints necessary to allow training to continue without an adverse cultural effect.

The NCRD training constraint is already in effect for training on Northwest Field.

4.5.2.2 Communications Annex Finegayan

Haputo and Double Reef beaches are used for swimmer insertion (from small boats) and access to Communications Annex Finegayan and Northwest Field.

Existing conditions. Haputo Beach is the site of a latte complex that is listed on the National and Guam Historic Registers. Also in this area are the Pugua Point rock shelters and Tweed's Cave, both of which are potentially eligible to be listed on the National Register.

Potential impacts. Once personnel are ashore, overland training maneuvers are not expected to have significant impacts on cultural resources because personnel will be restricted to designated/established paths to exit Haputo Beach prior to commencing tactical maneuvering through the Communications Annex and Northwest Field.

Mitigation. The coastal area and cliff face at the annex will be designated NCRD.

4.5.3 Range Safety at AAFB and Communications Annexes

Existing conditions. The existing small arms ranges at AAFB and Finegayan are within areas isolated from civilian traffic, with cliffline backstops to control projectiles beyond range boundaries. Signs and flags delineate the site of the range and SDZ widths for boaters below the cliffs at Finegayan. Pedestrian access along the flanks of either range is controlled. Range safety SOPs are published and implemented for both ranges.

Potentially significant impacts. Significant impacts to civilians are not expected at the AAFB and Finegayan ranges, as SOPs and all routine safety measures are in place.

Proposed mitigation. No additional mitigation is required.

4.5.4 Aviation Safety at AAFB and Communications Annex

Existing conditions. There are two airfields at AAFB. The south runway (Runway Two) at Northwest Field is used for fixed-wing aviation training. Helicopter LZs have been developed on or near both runways for various types of helicopter training. Main Base has Class B runways capable of supporting all aircraft in the DoD inventory. All flights are controlled by air traffic control personnel, coordinated with the FAA, and coordinated with activities at Guam International Airport. USAF Security personnel control access to either airfield.

Potentially significant impacts. No significant impacts are expected, as both public notification procedures and established airfield operating procedures are in place and well established at AAFB.

Proposed mitigation. No additional mitigation is required.

4.6 IMPACTS ON FARALLON DE MEDINILLA

4.6.1 Biological Resources on FDM

Overview of training impacts. FDM (Navy Range 7201) is used for naval gunfire and aerial bombardment training. Principal users are U.S. Seventh Fleet and the USAF Air Combat Command (ACC). Potentially significant impacts to birds and their habitat are anticipated from the training activities conducted on this island range. Birds may be impacted directly by explosive force or fragmentation, or indirectly from alteration of habitat and food source. Noise disturbance has also been observed to cause some species of birds to fly off the island. The most serious potential impact would be an introduction of the BTS to FDM from Guam in target vehicles, which would have devastating effects on the island's bird population. Weedy species could be introduced on personal clothing or military equipment if range training was modified to allow more individuals on the island to fire artillery, mortars, or wire-guided anti-tank missiles.

Twenty-four surveys, reports, and biological opinions regarding activities and impacts to FDM have been attached to the EIS as Appendix D.

4.6.1.1 Existing Conditions

As most of the existing conditions on FDM are directly relevant to potential impacts, detailed information is provided here as well as in Chapter Three.

The following is a summary of the geology, botany, bird life, marine life, and marine conditions on FDM based on past studies dating to 1902 and ten surveys, many conducted by helicopter, at the island over the last year.[80] Agencies participating in these surveys included USFWS, NMFS, and CNMI DFW. Detailed summaries of these and previous surveys performed on FDM and a synthesis of conclusions based on this information are found in Appendix D-1: *Historical Overview of Farallon de Medinilla: 1543 to 1997.*

Physical description. The geology of the island has not been studied in detail, although it is obvious the emergent portion of the island is primarily limestone. FDM is tectonically related to Saipan and more southerly islands, as it is on the same ocean ridge; therefore, its geology can be extrapolated from Saipan's with some confidence. The island probably has a volcanic core overlain by reef limestone mixed with varying amounts of volcanic sediment. The island is likely to be highly faulted and is observably subject to caves and sinkholes, as the limestone is easily weakened by a combination of rainwater solution along faults, wave action undercutting cliffs,

[80] Half-day avifaunal, botanical, and marine surveys were conducted in November 1996. A follow up survey was conducted in December 1996. A series of seven bird surveys were conducted by helicopter in conjunction with requirements from USFWS "Biological Opinions" between February and August 1997. A three-day marine survey was conducted in July 1997. The Navy will permit no more on-island surveys due in part to the November 1996 identification of extremely hazardous cluster bomblets scattered over the island.

and small crustaceans that bore into the limestone near the waterline. These islands are subject to frequent earthquakes ranging from 5 to 8 on the Richter scale.

The surface is an irregular plateau, dropping 33 to 320 feet (10 to 100 meters) to the ocean on all sides. Substantial erosion, owing to the friable nature of the limestone, has been observed. Certain areas, primarily the clifflines along the central isthmus, are regions of mass-wasting where large sections of deteriorated rock slid into the ocean. On the windward side, products of these slides are distinguishable to water depths of up to 66 feet (20 meters). Clear evidence has been noted of ordnance impacts on cliff tops and cliff faces on certain portions of the island that contribute to erosion, runoff, and sediment pluming.

Terrestrial flora. Various vegetation surveys of FDM over time demonstrate that the species present on the island may not have been significantly altered over the last hundred years. It should be noted that no qualified botanist may have visited the islands before 1974, and no exhaustive inventory has ever been conducted. Very early records of island visits (1543-1876) invariably record FDM as difficult to find, small and uninhabited, meriting no action at all. Although use of the island as a range severely limits the ability to conduct extensive on-site surveys, the first recorded visit to the island in 1902 listed species still present today. A German administrator in the Marianas named Fritz recorded, among other entries, bushes about 13 feet (4 meters) high and a savanna of low grass and lilies. Fritz also planted coconuts, casuarines, beans, and grasses during his short visit. This early survey does not allow comparisons in regard to relative abundance or vertical structure or provide an adequate basis for determining whether some species present but not recorded in 1902 have since been lost.

The structure of the plant community has apparently undergone changes over this period. Shrub-like trees 11-feet (3.5-meters) in height were reported on the island as recently as 1975, but in 1996 no vegetation over 6-feet (1.8-meters) high was observed. Current vegetation structure on the island appears heavily impacted by surface disturbance; the vegetation is not homogenous but rather a mosaic of several types, lacking clear boundaries. Despite this fact, the island supports a dense cover of low vegetation suitable for bird nesting, primarily in the northern portion of the island. Vegetation is less dense in the southern portion.

Both native and weedy species occur on the island, most of them littoral. No threatened or endangered plant species were observed in 1996. Of the small number of native species that occur, seaside cotton (*Gossypium hirsutum*) and the bunch grass (*Digitaria gaudichaudii*) are considered rare or uncommon. The rest of the species observed are widespread plants.

Terrestrial fauna. Early surveys in the Marianas that included entries for FDM include a 1903 survey that listed masked, red-footed, and brown boobies. Additional checklists developed between 1914 and 1944 (Japanese-mandate) did not contribute to specific entries for FDM. The Navy's Final Environmental Impact Statement for FDM military training published in 1975 represents the first list of substance for FDM with eleven species listed. Nine species of seabirds, five species of migratory birds, and three species of resident land birds were inventoried during the November 1996 avifaunal survey (Appendix D-2). The seabirds include three species of boobies (red-footed, brown, and masked), great frigatebirds, red-tailed tropicbirds, noddies, and terns. Many of these species, including the three species of booby birds, have been documented

consistently on the island since the Navy began its studies of FDM as a bombing range. Two species of boobies (red-footed and brown) have been present since 1903.

The Micronesian megapode, the only endangered bird noted in the surveys, was spotted in the central portion of the island and on the eastern edge during two surveys. It is estimated by the USFWS that no more than ten individual megapodes occur on the island, representing between 0.7 percent and 1.0 percent of the total population of the Marianas archipelago.[81]

Several bird species utilize the shrubby vegetation, bare/grassy areas, or caves for nesting on the island. Nests of all three species of booby, the brown noddy, black noddy, white tern, and great frigatebirds have been observed. Masked booby nesting is restricted to only four Mariana islands, and FDM appears to have the largest nesting population of these. Most of the masked boobies breed along the eastern edge of the island, along with the brown boobies, which are ground nesters (see Figure 3-3). The great frigatebird is thought to have only two small breeding colonies in the Marianas, one of which is on FDM. Great frigatebirds and red-footed boobies were observed to breed along the western edge of the island. Great frigatebirds and masked boobies are not listed as threatened or endangered, but both are protected under the Migratory Bird Treaty Act of 1918. Birds for which nesting has not been observed, but which are thought likely to nest on FDM, include the Micronesian megapode, sooty tern, white-tailed tropic bird, and red-tailed tropic bird.

Estimates of the booby population on FDM have a large variance. The most recent (November 1996 and March 1997) surveys estimated between 400 and 750 masked boobies, between 500 and 5,000 red-footed boobies, and approximately 200 brown boobies. Surveys conducted between 1979 and 1988 characterized the maximum booby population as between 750 and 2,200 individuals.[82] The earliest documented survey providing an estimate of the booby population on FDM, the 1975 EIS, used extrapolation to estimate a population of up to 50,000 individuals, after the island had been bombed with 22 tons of ammunition per month for the preceding four years. This estimate is disputed by a biologist who visited the island at the time of the 1975 EIS preparation.[83] He recalls that the 1974 booby population was approximately the same as or possibly smaller than the population videotaped on FDM by USFWS in 1996. The wide discrepancies between the 1975 estimate and all of the subsequent survey results suggest either that very large changes occurred in the local bird populations in the time interval between these surveys, or that the earlier extrapolated estimate was inaccurate. Because the observational methodology for the 1975 EIS was not documented, and because the findings of a limited observation were extrapolated to the entire island surface, there is some question as to the accuracy of the population estimate.

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[81] USFWS (May 16, 1997) Biological Opinion of the U.S. Fish and Wildlife Service for Gunnery and Aerial Bombardment Practice at Farallon de Medinilla, CNMI.

[82] Two other bird surveys published shortly afterwards characterize the maximum population of boobies (between the years of 1979-1988) as between 750-2200 individuals on FDM, or a total of 1,380 to 3,800 individuals in the whole Mariana Islands. (J. Reichel (1991) "Status of Conservation of Seabirds in the Mariana Islands," in *Seabird Status and Conservation: A Supplement, ICBP Technical Publication No. 11* edited by J.B. Croxall and USFWS (1985) *Job Progress Report Research Project Segment: Seabird Survey and Inventories for October 1, 1984 through September 30, 1985.)*

[83] Personal communication between Michael Lusk (USFWS) and Bob Moncrieff, July 8, 1998.

Two Mariana fruit bats were observed on the island in December 1996; these animals are not protected federally but are listed on the CNMI Endangered Species List and are protected from hunting throughout the CNMI. Three small coconut crabs (*Birgus latro*) and two species of lizard, the snake-eyed skink (*Cryptoblepharus poecilopleurus*) and the blue-tailed skink (*Emoia caeruleocauda*) were observed on the island in November 1996. Rats (*Rattus* spp.) were also observed in November 1996 and may be preying on bird eggs.

Marine environment. Humpback whales are known to appear between Saipan and FDM, but no whales or any other type of marine mammal were observed during the ten recent biological surveys of FDM. One green sea turtle was observed on the surface off the leeward side of the island during the November 1996 marine survey. Two green sea turtles were observed during the three-day marine survey in July 1997; one was observed on the water surface on the eastern (windward) side of the island, and one was underwater near the shoreline cliff on the western (leeward) side. Two small beaches exist on FDM. They appear to be wave-washed and neither appears to be suitable for green sea turtle nesting. Water clarity off these beaches is limited due to turbidity plumes; the emergent portion of the beach consists of rubble/cobbles with little sand and no vegetation.

The overall fish community contained numerous species and diversity in July 1997. However, low numbers of commercially desirable reef fish and evidence of fouled bottom fishing gear indicate there is a degree of fishing pressure being exerted on the nearshore fishery resources surrounding FDM.[84] The greatest abundance and diversity of reef fishes were associated with the complex and rugged substrate mainly on the leeward side, particularly in the areas offshore from the central and northern portion of FDM. At the extreme southern end of the island, an assemblage of 80 to 100 juvenile gray reef sharks (*Carcharhinus amblyrhynchos*) was observed. They were not present the following day, suggesting that the site is not a permanent point of aggregation. Appendix D-17 contains a complete survey list of the conspicuous and dominant fish species, including those important for commercial or subsistence use.

Certain bottom areas are scoured and devoid of coral development. The reef terrace near the cliff edge has a coral cover of less that one percent of bottom cover. Farther from shore, coral cover increases to 10 and 20 percent. Coral cover on the tops of boulders that appear to have originated from mass wasting of the cliff face is 25 to 30 percent. The predominant benthic organism is green calcareous alga (*Halimeda* spp), covering substantial areas (50 to 60 percent) of the boulder and reef platform surfaces.

Strong tradewinds in fully developed seas and large surf breaking on the windward shorelines and offshore terrace create hydrological stress and mechanical scouring inhospitable to coral formation. The result is a major difference in coral development on elevated sections of the reef platform on the windward and leeward sides. There was 50 to 70 percent coral-cover on some areas of the leeward side and about 25 to 30 percent cover on the windward side.

There was little visible evidence of impacts from explosives on the marine community and reef. A single explosive scar was recorded on the slope of a shallow reef on the south end of the

[84] John J. Naughton, National Marine Fisheries Service (July 8-10, 1997) Farallon de Medinilla Survey.

island. UXO was observed in waters around the entire island, but was concentrated offshore of the middle portions. Few, if any, fragments of exploded ordnance were noted on the reef surface. Most of the intact bombs on the reef were not filled with explosives, but rather had inert fillers and were armed with smoke tracers. Once lodged in the substrate, coral and algae similar to other hard surfaces have colonized the UXO.

Sediment plumes stemming from surface runoff can degrade coral growth. It is unclear to what degree military bombardment has aggravated the rate of mass wasting that has led to sediment plumes and to what extent this type of erosion may be impacting coral growth. There was no apparent correlation between coral development and areas of presumed exposure to terragenous sediment plumes.

4.6.1.2 Potential Impacts of FDM Aerial Bombardment and Naval Gunfire and Proposed Mitigation Measures

FDM has been used as a bombardment range since at least October 1971 with training event frequency and duration varying over the years. The range includes the island as well as the area within a three-mile radius (see Figure 2-5 inset), which has been entered on navigational charts. UXO is present throughout the island and includes small cluster bombs. Types of ammunition and delivery methods have produced different effects. Point-detonating fuses explode upon impact, variable-time or mechanical-fuses explode above the ground, and illumination shells (parachute-retarded magnesium flares) are fired above the island at night to allow the strike of explosive rounds to be adjusted on target. The illumination rounds could land on the island while still burning. Other pyrotechnic rounds include those with smoke-marking fuses. Variable-time-fused bombs produce casualties by spreading shrapnel over a larger area than a point-detonating bomb, which craters the target area. Delay fuses are no longer allowed since they cause deep cratering.

There are no known BTS on FDM. There are 19 older targets along the length of the island, some of which are old car bodies. These cannot be relocated due to the presence of cluster bombs. There was concern that these old car bodies could have harbored BTS when moved to FDM from Guam. Newer target materials include old trash dumpsters or metal containers such as CONEX boxes and MILVANS. These simple containers were cleaned, inspected and placed in snake-free areas prior to transportation to FDM.

A No Bomb Line has been established as the range limit line to the north(see Figure 2-5) but all areas on the island are susceptible to UXO being present on or below the surface. Unexploded cluster bombs (small scattered sub-munitions) that are present on the island heighten safety concerns for anyone who may be required to land and walk about the island.

The Navy has consulted with USFWS in accordance with Section 7 of the Endangered Species Act (16 USC 1531-1544, Statute 884), as amended, for aerial bombardment and naval gunfire training on FDM. As a result USFWS has provided a biological opinion and conference report on five occasions since January 1997 (see Appendices D-7, 9, 15, 21, and 23). The report dated April 6, 1998, is the programmatic agreement for naval gunfire and aerial bombardment of FDM to be conducted between May 1, 1998, and May 1, 2001. A more recent biological opinion dated

January 4, 1999 (Appendix D-24), notes that the proposed action for FDM has not changed. The proposed action as described by the Navy estimates the quantities of explosives that will be expended during each training year. (The proposal to introduce crew-served ground weapons to the island for live-fire training has not been submitted to USFWS for an opinion since it is not a preferred use for this range.)

- Strategic bombing. The USAF may involve sorties dropping between 5 to 612 live and/or inert bombs per month. The Air Force estimates that training may be conducted on about 160 days per year.
- Close air support. CAS missions by Navy and Marine fighter/attack aircraft may expend up to 80 air-to-surface missiles, 840 air-to-surface rockets (400 2.75-inch, 400-5-inch), and 4,020 conventional and high explosive bombs (1,400 250 to 500-pound bombs and 1,240 1,000 to 2,000 pound bombs). The anticipated training frequency is three, three-week USMC exercises per year, four, five-day exercises in support of aircraft carriers, and five annual seven to fourteen day combined force exercises.
- Naval gunfire. Ships may expend about 1,040 5-inch shells and 400 76mm shells each year, with monthly exercises lasting several days each.
- Raiding craft fire. NSWU using RHIBS may expend 50,000 7.62mm machinegun rounds, 600 .50 caliber machine or sniper rounds, 2,600 40-mm grenades, and 40 AT-4 shoulder-launched, anti-tank missiles. The AT-4 will be replaced in the near term by the Carl Gustav shoulder-launched M3 missile. The M3 will have greater range than the AT-4 and a variety of shells to include a training projectile.

Potential impacts.

The most serious impact that could result would be establishing a BTS population on FDM by using targets that have not been thoroughly inspected for BTS. The dense shrub vegetation, presence of two species of lizards as intermediate prey, and abundance of seabird eggs, hatchlings, and adult birds would facilitate successful colonization. The ground-nesting birds, including the Micronesian megapode, would be particularly vulnerable. The cave-nesting swiflets would also be vulnerable to BTS.

Harming, harassing, or mortality (taking) of individuals of an endangered bird or turtle species would be a significant impact. A taking could be caused by bomb explosion (upon impact or by detonating UXO on the ground), fire, or change in vegetative structure and resulting loss of habitat as a result of fire.

The potential for a take is directly related to proximity of the animal to targeted areas, although all parts of the island are susceptible to being hit, as accuracy differs among weapon types. Therefore, the location of a target should affect which bird species is most likely to be impacted. Targeting the western cliff edges would impact breeding great frigatebirds and red-footed boobies. Targeting the eastern cliffs would impact breeding masked and brown boobies. Placement in the interior portion of the island would impact fewer breeding seabirds but could impact the megapode. Known past and/or potential future impacts are as follows:

- Mortality. Some individual moralities have been observed as a direct result of range use. In seven aerial surveys (February-August 1997) a total of two or three dead seabirds were observed on the ground near new bomb craters.[85] However, there remains a diverse avifauna utilizing the island, and no significant changes in the number of ground-nesting birds was found between pre- and post-bombardment surveys conducted twice in 1997. The survey results fail to demonstrate significant short-term direct impacts on the seabird population or on the endangered megapode from military operations over the last year.

The cumulative effects of military use on the net long-term change in species abundance and absolute abundance of birds using the island are not possible to determine. Present-day counts may represent a condition different from what existed earlier, but no studies were conducted on which to base an estimate of the change or to attribute cause(s) of such changes. Natural factors such as weather and oceanic conditions may have as profound effects on bird distribution and abundance as do man-made causes.

- **Habitat destruction**. Several burn areas, including the vegetated northern portion of the island, were noted during the August 1997 post-impact survey. Fire is one of the factors that has apparently altered the vegetation structure over time; shrubby vegetation and bare areas have replaced former stands of trees reportedly up to 4 m in height. Other factors that may have caused periodic changes in vegetation structure include typhoon-related storm damage to plants through wind pruning and scouring and salt damage by wind-blown sea spray. These natural forces affecting vegetation structure have been constant over time. It is likely that fire and ground disturbance from use of ordnance have been the primary factors in altering vegetation distribution from its natural state. This may have correspondingly affected the population distribution of bird species making use of the island, by favoring ground and scrub roosters and nesters over those preferring greater vertical structure.
- **Invasive weedy species**. If large numbers of personnel were allowed on the island for training there would be potential for the introduction of other invasive species to the island such as unwanted seeds on clothing and equipment. COMNAVMARIANAS range safety policy restricts persons on the island to military members DoD explosive-certified.
- **Erosion**. UXO will continue to accumulate on the island as a result of training activities, making foot access (for the purpose of moving targets, conducting surveys, or performing on-the-ground training) dangerous. It is likely that impacts from ordnance on the margins of the island contribute in some degree to the natural process of fracturing and erosion.
- **Coral**. There is little evidence of coral destruction as a result of bombing. Because corals are relatively slow to regenerate, direct effects of bombing over time should be discernible if they were occurring. The dominant force limiting coral development appears to be wave energy and scouring. (See the marine survey reports for FDM in Appendix D.)
- **Protected marine animals**. There is a possibility for incidental takes of protected sea turtles and marine mammals, if these animals were present, by direct impact or from the concussion from bombs hitting the water. Since no marine mammals have been spotted during the ten

[85] (On two separate occasions, a red-footed booby flew into the rotors of the survey helicopter and was killed.

surveys conducted over the last year, and green sea turtles (three in total) were spotted in only two of the ten surveys, the potential for harm to these species is minimal.

Proposed mitigation measures.

- **Target Selection**. Junked car and truck bodies will no longer be used as target material due to the difficulty in cleaning and inspecting for BTS. Target materials will be constructed or selected to facilitate inspection and cleaning. The BTS Plan for transporting training materials from Guam to other islands will be followed. USDA Wildlife Services personnel will be requested to support the military's target cleaning, inspection, and staging (in a snake-free environment) process prior to target being shipped or flown to FDM.
- **Target Placement**. Targets will be placed with the assistance of a biologist so that the majority of ordnance delivered will avoid the most sensitive areas for nesting and roosting birds (see Figure 2-11 for possible target sites). Fighter and attack aircraft will target inland portions of the northern and southern portions, avoiding the isthmus and the area north of the range limit line. Aircraft dropping a series of bombs will avoid targeting the eastern cliff face. Because surface-delivered ordnance (i.e., naval gunfire) is of flat trajectory, projectiles fired under the target line would impact the cliff, and those fired above it would fly over the island and impact in the ocean. Surface fire will be delivered from firing positions west of the island only, thereby reducing effects on the extensive eastern sea cliffs.
- **Training frequency and ammunition expenditures** will remain within the proposed action as described in the most recent biological opinion (presently the April 1998 USFWS Biological Opinion at Appendix D-23).
- **USFWS guidelines** for reasonable and prudent measures for proposed species. The Navy will comply with the terms and conditions listed in the January 1999 biological opinion. The Navy will report within one month of completion of training on FDM the amount or extent of take of megapodes and fruit bats. When possible, the NMFS will be notified by the Navy of missed bombs and missiles entering marine waters, and the Pacific Islands Protected Species Program will be notified within 24 hours of protected species takes.
- **Marine surveys**. According to the terms and conditions imposed upon the Department of Defense by the National Marine Fisheries Service for using FDM, annual surveys of marine resources are required for the next three years. The main purpose of the surveys is to collect data on describing the effects of military exercises on turtle habitat, whale and fisheries observations, and coral reefs. The first of these surveys is planned for July 1999. Detection of significant impacts would initiate a reassessment of training activities and mitigation measures.

Additional compensatory mitigation measures may be negotiated in consultation with the USFWS and NMFS. The Navy has agreed to fund megapode conservation and recovery projects in the Mariana Islands to address long-term survival of the species. Such efforts are underway on Sarigan Island.

4.6.2 Public Safety on FDM

During exercises, aircraft make multiple bombing runs on the island, and ships armed with MK45 five-inch .54 caliber guns fire from up to 24 km (13 nautical miles) away (see Appendix B-17).

Existing conditions. UXO is found throughout the island, consisting of various iron bombs, naval gunfire projectiles, and small, hard-to-detect cluster bombs. The latter are highly sensitive to disturbance and are considered extremely dangerous. Their recent discovery on the island reaffirms the decision to restrict civilian and military personnel access to the island, except for military personnel who are DoD explosive-certified involved in range operations and maintenance.

A three-mile restricted area has been formally established around and above the island and is in effect at all times. The nearby ocean areas are used by commercial and sports fishermen, and local fishermen have stated that persons have gone on the island or anchored on its lee side as protection during storms. Whenever use of the range is to occur, public safety announcements are made including publication and marine band broadcasting a Notice to Mariners (NOTMAR) warning of the restricted water space within a three-mile (5 kilometer) radius around the island. The airspace is also restricted to civilian aircraft for a radius of three miles and published by Notices to Airmen (NOTAMS).

Regardless of advance notification of range use, CNMI officials expressed concern that many of the fishing crews are non-English speakers and may not be informed of the potential danger.

Potential impacts.

- UXO on land and to a lesser extent along the shoreline and in the water may harm anyone attempting to go on the island.
- Boats or aircraft could enter Restricted Area 7201 regardless of NOTAM and NOTMAR publications and broadcasts.

Proposed mitigation.

The Navy and Air Force will continue to provide full media coverage in advance for bombing, strafing, and naval gunfire exercises at FDM. COMNAVMARIANAS and 36th ABW will ensure that the CNMI Emergency Management Office is on routing for NOTAM and NOTMAR publications originating from Guam.

Prior to commencing a bombing or strafing run, or naval gunfire on the island, a visual sweep will be conducted to ensure that no commercial or recreational boats are within the three-mile radius.

CNMI presently sponsors turtle nesting awareness programs for the public and posts "turtle nesting activity" signs at certain beaches. The Navy has discussed with CNMI their sponsoring a FDM Range Awareness Program for Saipan's fishing community. The information would be included in boating safety schools conducted at local marinas, and would be reinforced by

posting multi-lingual signs at the marinas to identify FDM as Navy Range 7201 used throughout the year for Aerial Bombardment and Naval Gunfire. The sign would indicate that the three-mile standoff restriction is in effect at all times and indicate local news sources and marine radio broadcasting bands used to disseminate NOTMARs. The sign would also warn of UXO and the safety requirement to remain off the island and to avoid net fishing close to shore.

4.7 NON-DOD LOCATIONS

4.7.1 Parachute and Riverine Training on Guam

Existing conditions. Two small parachute drop zones have been surveyed by the Air Force on private property in Dandan near NASA Road. The terrain is described as suitable for precision drops conducted by small units and is primarily used by the Guam Army National Guard on weekends.

The MTP proposed riverine training on private land on the Talofofo and Ylig rivers but this activity is no longer included in the Preferred Alternative and environmental impacts were not evaluated in detail. The requesting unit completed its feasibility analysis and withdrew the proposed training requirement.

Potential impacts. No impacts are anticipated. Training is coordinated in advance with the landowner and the FAA is notified of the activity to ensure no interference to or by commercial aviation.

Proposed mitigation. None is required.

4.7.2 NVG Training on Rota

Night vision goggle training on Rota is no longer included in the Preferred Alternative. HC-5, the Navy's combat support helicopter squadron stationed at AAFB proposed the use of the Rota airport. Approaching aircraft are requested to contact the terminal via the common terminal area frequency to verify weather, visibility, and traffic conditions. Rota provides air service to Guam and Saipan; most traffic occurs during daylight hours, with the last regular flight at 7:30 PM.[86] The Rota International Airport operates under visual flight rules (VFR), has navigational lights and a radio beacon, but does not have a control tower. In an emergency, field lights can be turned of via radio signal. The airport provided a relatively remote site with little ambient light that would be suitable for NVG training on moonless nights.

Suitable NVG training sites are now available at Northwest Field. Regardless, the following discussion has been retained in the FEIS to identify the potential impacts that were identified when analyzing night flight training activities at Rota and potential impacts to protected species and habitat

[86] Personal communication with Willis Cannon, Saipan FAA, May 16, 1996.

Existing conditions. The largest remaining population of the endangered Mariana crow in the Mariana Islands is on Rota (approximately 600 crows according to a 1996 survey),[87] and the eastern end of the island is considered the best crow habitat on Rota. Mariana crow locations of known nests and population densities (high, medium, low, and none) are depicted in Figure 4-8.[88] An aggressive Mariana crow-banding study was initiated by the USFWS in October 1996 and will provide further information on location of active crow nests; recently USFWS has found an active crow nest within 0.5 km of the northwest corner of the Rota airport boundary.[89]

Endangered Mariana fruit bats roost primarily in the Sabana Heights Wildlife Conservation Area, located approximately three miles (5 km) southwest of the Rota International Airport (see Figure 3-4). At night they forage over nearly the entire island, wherever food is available.

Potential impacts. With the elimination of the proposed training activity from the preferred alternative there are no potentially significant impacts. Prior to eliminating the activity the potential impacts identified included the introduction of BTS from Guam (particularly since the HC-5 helicopters are parked at AAFB) and impacts of nighttime noise from helicopter activity significantly disturbing Mariana crows nesting in the vicinity of Rota International Airport. At present, no statistically based data on peak sound level effects on Mariana crows are available, although some incidental observations have been recorded.[90] See Figure 4-8 for an initial estimate of aircraft noise in relation to Mariana crow locations.

Without further study, it could not be determined if the nighttime helicopter flights would disturb Mariana crows nesting and/or foraging in woodlands adjacent to the airport. A peak NVG sound level at the nearest known crow nest approximately one mile (1.6 km) was estimated to be 84 dBA; possibly reduced by the shielding effect of intervening vegetation (Appendix N). For nests in the high-crow density areas further away from the airport, noise attenuation due to vegetation would be significant, greatly reducing the peak sound levels experienced.

Noise impacts to crows from NVG training were considered to be similar to those indicated for low-altitude aircraft overflights at AAFB,[91] where NVG training has been allowed by the USFWS. Noise impacts to Mariana fruit bats, which may forage over the area at night, was also considered to be a potentially significant. (Visual impacts were considered to be nonsignificant.)

Proposed mitigation. None is required since this proposal is no longer a preferred alternative. During development of the EIS, CAL and LHA helicopter landing sites were developed on Northwest Field and are used by HC-5. The training can be conducted as desired in an unlit, remote location without any extensive flight time and additional costs.

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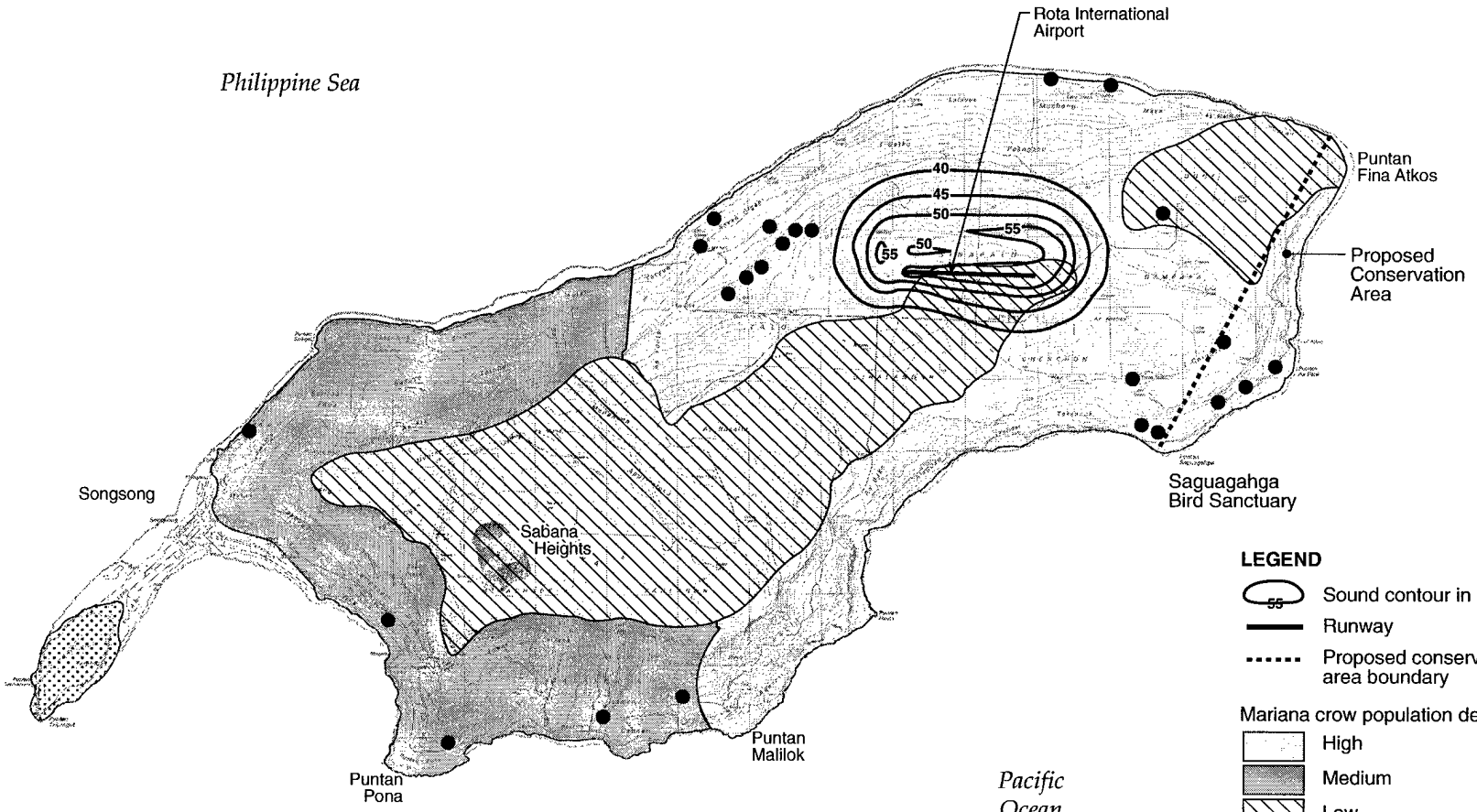
[87] Daniel J. Grout, Michael Lusk, and Steven Fancy (FWS) (June 1996) Results of the 1996 Mariana Crow Survey on Rota.

[88] Densities were determined by a 1982 study and identified in the Physical and Economic Master Plan for Rota, prepared by Juan C. Tenorio & Associates, Inc.

[89] Personal communication with J.M. Morton, Ph.D., USFWS, December 24, 1996.

[90] Anecdotal evidence of disturbance of Mariana crows from HC-5 helicopters was documented in 1980 (personal communication with Bob Beck, Guam DAWR, May 16, 1996). Nest defense and the attack of female crows by outside male crows were among the types of behavior displayed.

[91] Impacts on the Mariana crow from low-altitude aircraft overflights at AAFB include distress and flight, which may disrupt nest construction, incubation, and nest attendance during breeding season. (USFWS, July 1996).



Source: Darby & Associates (1996), *HC-5 Helicopter Noise Study for Night Vision Goggle Training at Rota Airport, Rota, Mariana Islands*; Atlas of the Reefs and Beaches of Saipan, Tinian, and Rota; Personal communication with Michael Lusk, USFWS, November 1996

NORTH

0 1000 2000 (Meters)

0 4000 8000 (Feet)

Figure 4-8
DAILY AVERAGE DNL CONTOURS FOR NVG TRAINING
FEIS: Military Training in the Marianas
Belt Collins Hawaii, June 1999

4.7.3 Logistic Support to NSWU-1 on Rota

Existing conditions. NSWU-1 uses the RHIB to move SEAL teams between Guam, Tinian and FDM for training. To accomplish this, the unit contracts for raiding craft maintenance and refueling services on Saipan, Tinian and Rota. In addition, the Rota municipality provides bivouac space to the SEALS that they may use as a forward staging base in preparation for training at sea or on other islands. Angyuta Island in West Harbor is adjacent to the area used for boat maintenance and refueling. It is provided to the SEALs as their bivouac site. It does not interfere with civilian use of the rest of the harbor and nearby recreation area.

Potential Impacts.

- Introduction of BTS in the boats or equipment would be a significant impact.
- Fuel or lubricant leaks during boat maintenance could be a significant impact.

Proposed mitigation. No mitigation measures beyond standing operating procedures are necessary. The teams will continue their practice of thoroughly inspecting the RHIBs, embarked cargo and personal equipment prior to departing Guam. NSWU-1 will continue to stage spill containment booms on Rota for use during refueling, and pull out any boats requiring maintenance activities with potential for lubricant leak or spill.

4.8 SUMMARY OF ENVIRONMENTAL CONSEQUENCES

A variety of potential impacts, some of which could be significant without mitigation, have been identified in association with the proposed action and all alternatives leading to the selection of a Preferred Training Land Use Alternative for the Mariana Islands. The potentially significant issues and associated mitigation or training constraints have been discussed in detail in this chapter. The nonsignificant issues and their associated environmental protective measures were also analyzed. All potential impacts and all proposed mitigation measures for the preferred alternative are listed in table 2-13. The preferred alternative (a mitigated set of training activities) incorporates portions of the other reasonable alternatives as appropriate by designating no training or reduced training as necessary, revalidating ongoing training while improving mitigation measures as needed, and identifying the new initiatives that are environmentally suitable.

4.8.1 Summary of Issues

The analysis of issues and mitigation measures has led to the following conclusions regarding the Preferred Training Land Use Alternative. With one exception all potentially significant impacts can be mitigated to levels of nonsignificance. The exception is potential impacts to biological resources at FDM due to naval gunfire and aerial bombardment disturbing or taking Micronesian megapodes. The enhancement of megapode habitat on the island of Sarigan will be conducted as compensatory mitigation.

For all other potential impacts from the preferred alternative, the conclusions are as follows:

Biological resources:

The potential for BTS introduction from Guam to other locations will be mitigated by compliance with strict control and interdiction actions in concert with the USDA WS.

The potential to damage coral at landing beaches and underwater demolition sites has been offset by appropriate selection of training sites and the equipment to be used at each site.

Compliance with established training constraints (NT and NWD overlays) and other training management measures by the training units will continue to mitigate other potential disturbances to endangered species.

All of the direct impacts to biological resources are potentially cumulative. The Navy and USAF will continue to monitor training, taking corrective action whenever direct, indirect or cumulative impacts become evident.

Cultural resources:

Compliance with established training constraints (NT and NCRD overlays) and other training management measures by training units will mitigate potential disturbances to known and potential cultural resource sites.

A potentially adverse effect by proposed RRR activities within an area eligible for listing in the National Register of Historic Places will be mitigated by constraints identified in the MOA and placement of the training site with the Guam HPO.

Wastewater disposal on Tinian: No impacts are anticipated. The construction and activation of the Navy's septic tank and field has resolved potentially overloading any municipal system during major military exercises conducted over extended periods of time.

Disposal of SW and HW generated on Tinian: The analysis indicates that no significant impacts are expected under any alternative since SW and HW generated during exercises on Tinian will continue to be removed to Guam for appropriate disposal.

Aviation training and public safety: No impacts are expected under any alternative, due to compliance with FAA and military airfield regulations and orders and temporary closure of training areas to anyone that is not involved in training.

Firing ranges and public safety: No significant impacts are expected for the Preferred Alternative, with routine notifications, observance of range safety SOPs, and safety sweeps of over-water SDZs prior to range use. The proposals to develop small arms and mortar ranges, and permanently constructed shooting house and breacher trainer on Tinian, are no longer preferred alternatives. The former Tinian small-arms range has been fenced and marked, and will be managed by the Navy as an inactive range.

Economic conditions: Short-term temporary impacts to tourist-related businesses will be minimized by providing advance information to those concerned and by closing off the EMUA and Apra Harbor demolition areas only when absolutely necessary to ensure public safety. The potential for cumulative impacts on civilian air and water traffic on Tinian will require periodic reassessment if the new casino industry is successful and the number of visitors greatly increases.

Favorable economic impacts are anticipated by military presence for training which has increased ship visits to CNMI and requires contracted support services to in-port vessels and units training in the field.

4.8.2 Cumulative Impacts

Cumulative impacts due to repetitive training in a given land area have been addressed in the foregoing sections as direct impacts, because the nature of the proposed action is defined as repetitive use of a land area. Cumulative impacts caused by training are normally defined as a "wear and tear" variety consisting primarily of the increased likelihood of a resource being damaged over time, such as repeated heavy use of a roadway leading to erosion and runoff. Cumulative impacts could also be less obvious. For example, a single aircraft over endangered species habitat may cause a bird to temporarily leave its nest but would have no permanent effect. Repeated overflights might cause the bird to abandon its nest site altogether, possible resulting in failure to brood and raise its young.

The primary mitigation is training unit compliance with NT, NWD, and NCRD constraints and environmental staff monitoring during major exercises. The second measure is to conduct frequent training area monitoring and evaluations focused on potential cumulative impacts. The information provided by monitoring may come from military observers and regulatory agency representatives. Based on their input, the commander may suspend or constrain the damaging activity until corrective action is completed and the environment restored.

Existing or known future projects with potential to generate impacts that could be cumulative with the preferred alternative are as follows:

Tinian hotel and casino development. Casino resort development will have impacts on the island's infrastructure, which could be cumulative along with similar impacts caused by training. The impacts would be primarily occur during infrequent large-scale exercises periods on Tinian and would be common to all alternatives except No Land Use.

- Utilities will be in demand by the casinos at a much greater level than by the military, due to the large number of employees and visitors involved. Tinian officials have indicated that small amounts of potable water and electricity are available to the military for short periods of time without adverse local impacts. However, if more hotels and casinos are constructed and operated in the future to draw on the full capacity of the local utility supplies, significant impacts to such utilities could result. Because the impacts of these developments alone would be significant, it is expected that local authorities would need to develop a solution regardless of the small impact of occasional military training.
- Wastewater disposal is an unresolved issue on Tinian, which has no wastewater treatment plant and no plans to construct a municipal WWTP (see Section 4.2.3). The first large casino

to open currently has a package treatment plant and leachfield. Military impacts on the two existing municipal septic systems has been evaluated for present conditions and determined to be no longer potentially significant since the Navy has constructed a septic system in the MLA large enough to support major exercises.

- Airport and harbor traffic will be intensified if the visitor population to Tinian increases and if casino ships are introduced to Tinian. The infrequent military use of both facilities has the potential to interfere with tourist traffic if not mitigated by advance planning with local authorities.
- While touring, visitors may accidentally or intentionally harm cultural or natural resources, particularly on Tinian where there is no control over area access. Tourist impacts would therefore be cumulative with training impacts on such resources. These impacts and proposed mitigation measures are discussed throughout this chapter in the sections on cultural and natural resources.

Commercial fishing. The proposed action has the potential to harm or destroy fish and other marine animals in the vicinity of Apra Harbor and the vicinity of FDM. Both areas are subject to commercial fishing pressures, possibly to the detriment of the species fished. The impacts of over-fishing would be cumulative with the impacts of underwater demolition and, to a lesser extent, aerial bombardment and naval gunfire. No impacts to Tinian fishing activities are anticipated.

Commercial shipping and BTS interdiction. The proposed action involves transport of cargo between Guam and various locations currently believed to be free of brown tree snakes. Commercial and private shipping from Guam is subject to less rigorous inspection standards than military shipments and has a clear potential to introduce BTS to other islands or to the continental U.S. The USDA has no enforcement authority on Guam but is working diligently to implement a cooperative civilian inspection program.

Solid waste disposal on Guam. Disposal of military waste from Tinian at the PWC landfill on Guam will slightly reduce (less than one percent) its capacity to accept waste from other military sources. It will not affect the civilian landfill situation, as PWC does not and will not in the future accept civilian waste for disposal.

Release and/or reuse of military lands on Guam. Various military properties on Guam are scheduled for turnover to the local government reuse authorities, primarily as part of BRAC action. Impacts are not expected to be cumulative with the proposed action, which has very different effects.

Shared use of Apra Harbor. Most of the ongoing and proposed training land uses occur in separate portions of the Waterfront Annex and will not generate overlapping or cumulative effects with one another. To ensure that there are no cumulative impacts result from incompatible military and civilian recreational and commercial use of Outer Apra Harbor and nearshore waters southwest of Orote Peninsula, protocols have been developed to ensure public safety, which will temporarily restrict access to the active training areas.

Decreasing bird population and habitat on FDM. Past records of seabirds and vegetation on FDM were evaluated to the extent that records exist, and are summarized in Appendix D-1 to the FEIS. Of those early records, a German colonial administrator named Fritz provides the earliest modern delineation of species and abundance on the island, although qualitative observations are made as far back as the 16th Century. These records and historic photos indicate that the standing vegetation on the island has been substantially altered in relative abundance among species, specifically indicating a reduction in standing woody trees, but not in type and number of species represented in the community. No evidence was found indicating that the population of seabirds has been substantially altered in relative or absolute abundance, although it can be hypothesized that the change in standing vegetation would be to the disadvantage of tree roosting species. In evaluating long-term population changes and their causes, numerous confounding factors may also be present, including changes in oceanic conditions that affect prey species on which one or more species of seabirds depend. These regional conditions could act cumulatively with other stresses to impact bird populations on FDM.

Much remains to be learned about seabird populations on FDM, and the Navy will continue to monitor those populations as limited by UXO danger, for long-term trends. To reduce impacts on cliff nesting and roosting birds, the eastern escarpment of the island will remain off-limits for targeting and firing, and discrete target areas will be established to otherwise reduce the potential for concentrations of seabirds to be harmed.

4.8.3 Unavoidable Adverse Impacts and Unresolved Issues

Bombardment of FDM is likely to harm, harass, or kill individual endangered or migratory birds, which is an unavoidable adverse impacts that will require compensatory mitigation. Other potentially adverse impacts to sensitive resources or public safety concerns have been resolved by the elimination of a few environmentally unacceptable proposed activities.

4.8.4 The Relationship of Short-Term Uses and Long-Term Productivity

Use of existing military sites for proposed training activities is not generally expected to detract from long-term productivity, given the precautions in place to prevent contamination of soil or groundwater at any location. No large-scale construction is proposed which would pave over potentially arable or otherwise useful undeveloped land. In the event that any of the existing military-controlled land areas were to be declared excess, such areas would not be rendered unproductive as a result of the proposed action. In fact, the military need for large, undeveloped training areas has tended to result in long-term protection of natural and cultural resources from the effects of commercial development.

4.8.5 Irreversible and Irretrievable Commitments of Resources

The proposed action will involve periodic commitment of resources for individual exercises and for the few proposed construction projects.

If the proposed Tinian mortar range were constructed and used, resulting UXO contamination would very likely irreversibly commit the impact area to permanent fencing and restricted access. However, the mortar range is not included in the Preferred Alternative.

4.9 EXECUTIVE ORDER 12898—ENVIRONMENTAL JUSTICE

Under Executive Order 12898, dated February 11, 1994, federal agencies are required to address the potential for disproportionately high and adverse environmental effects of their actions on minority and low-income populations. Agencies are required to ensure that their programs and activities that affect human health or the environment do not directly or indirectly use criteria, methods, or practices that discriminate on the basis of race, color, or national origin. NEPA documents are specifically required to analyze effects of federal actions on minority and low-income populations and, whenever feasible, to develop mitigation measures to address significant and adverse effects on such communities. In addition, the Executive Order requires provision of opportunities for community input in the NEPA process. It states that the public, including minority groups and those with low-incomes, should have adequate access to public information relating to human health or environmental planning, regulation, and enforcement.

The inhabited locations of the proposed action on the islands of Guam, Tinian, and Rota have a very complex and dynamic ethnic history, which even today is in flux because of non-resident workers. Section 3.6 summarizes the ethnic composition and basic economic conditions of these islands. Given this rich diversity, it would be arbitrary and perhaps misleading to label one or another group as a "minority," when perhaps all could be considered minorities either nationally or regionally. The highest proportional element of the population on each island is Micronesian, although only on Rota do persons of Chamorro ancestry comprise a majority of the population. In evaluating the potential for the proposed action to cause disproportionate impacts to minority or disadvantaged populations, it first must be questioned whether there are any such impacts, and secondly whether these impacts are allocated in a manner that disproportionately affects any minority. As the proposed activities are primarily on lands or waters owned, controlled, or leased by the military, and there is no clear pattern of differential residential or economic use among various ethnic populations associated with the affected parcels, disproportionate impacts would not result from the proposed action.

Anticipated impacts of the proposed actions–training on military-controlled lands in the Marianas–are expected primarily upon military personnel working and living on the affected bases, with the exception of the civilian population of Tinian. The population of those working and living on military bases does not comprise any particular minority, since the Navy must comply with U.S. Equal Employment Opportunity Commission regulations designed to implement Public Law 88-352. With regard to impacts on low-income populations, it is reasonable to assume that the populations of Guam military installations are not "low-income" (below the poverty line, as defined by the U.S. Government). In general, Navy and Air Force bases provide a source of highly technical jobs, which in turn command better-than-average salaries.

The socioeconomic study performed for the EIS (Appendix H) determined that the population of Tinian is not economically disadvantaged or low-income on the average. Periodic closure of the EMUA may stop or limit the scope of historic site tours. Tour operators do not represent a particular minority group that will be disproportionately affected.

Closure of the EMUA will also require subsistence and recreational fishers to use alternative sites for fishing. Fishing occurs virtually anywhere there is reef. Figure 4-4 shows fishing locations identified in a study of the MLA.[92] At least six identified fishing areas (and undoubtedly many privately known fishing sites) are available along the west coast south of the EMUA. Therefore, closure of the EMUA will not restrict subsistence fishing and will not thereby discriminate against low-income populations.

4.10 EXECUTIVE ORDER 13089—CORAL REEF PROTECTION

This executive order directs federal agencies to identify actions that may affect U.S. coral ecosystems and to utilize programs and authorities to protect and enhance the condition of such ecosystems. In compliance with the executive order, avoiding damage to coral is one criterion that was used to select suitable amphibious training landing sites for specific landing craft and amphibian vehicles

The Mariana training requirement includes amphibious landings on Tinian and Guam. Amphibious landings on Tinian have been limited to LCAC operations at Unai Chulu, inflatable rubber raiding craft at numerous beaches, and use of Tinian's harbor for LCU support. Marine surveys have validated the potential for low impact to biological resources by the LCAC and as a result an additional site is now preferred for amphibious training in the MLA. The potential to damage coral continues to constrain landings at other than the Tinian harbor by the AAV.

After watching a demonstration LCAC landing at Dadi Beach, Guam, GEPA and DAWR issued concerns regarding impacts to shallow coral reefs. Although repeated LCAC landings and launches across the shallow reef at Tinian indicate that the LCAC does not damage shallow coral, the experience at Dadi Beach seems to reflect the lack of an appropriate CLZ that would have allowed the LCAC to get completely ashore before coming off cushion. Instead the craft landed at the shoreline, and when departing the beach did its turn over shallow water, dislodging exposed coral at shallow depths. As a result, the Navy has determined that LCAC landings at Dadi Beach will not be conducted until a suitable CLZ is available to conduct another test run at Dadi Beach for observation by GEPA and DAWR. (Both agencies will be invited to send representatives to Tinian to observe the proposed landing and marine survey at Unai Dankulo.) Alternative LCAC landing sites in Apra Harbor will be used instead. If another demonstration landing is scheduled, the beach will be prepared to provide sufficient space for the LCAC to get completely ashore before coming off-cushion.

[92] Personal communication June 1998, Henry Cabrera, Tinian Division of Fish and Wildlife.

Although AAV and LCU landings on Tinian will remain limited to the harbor, alternative landing sites free of coral have been identified on Guam for the AAV and the LCU.

4.11 EXECUTIVE ORDER 11990—PROTECTION OF WETLANDS

This executive order was issued to avoid long-term and short-term adverse impacts associated with the destruction or modification of wetlands and to avoid direct or indirect impacts caused by new construction. The wetland area of Lake Hagoi on Tinian is off limits to training. The wetland adjacent to the former World War II fueling pier in Waterfront Annex would not be impacted by LCU landings and offloaded wheeled vehicle travel. It could be affected if AAVs frequently landed at this site and contributed to area erosion that could also affect the wetland. AAV landings at the fueling pier area are not in the preferred alternative for Waterfront Annex training land use.

4.12 EXECUTIVE ORDER 13045—PROTECTION OF CHILDREN FROM ENVIRONMENTAL HEALTH RISKS AND SAFETY RISKS

This executive order requires federal agencies to identify and assess environmental health risks and safety risks that may disproportionately affect children. No disproportionate effects would stem from the proposed action and alternatives. Public safety criteria have been considered whenever training activities would be conducted in or near housing or community activities. Most of the proposed action occurs on military property. The major exception is training on Tinian that often involves logistic support activities at San Jose harbor. The activities themselves and routes to be traveled between the harbor and the training areas have been designed to minimize or avoid any interference with the day-to-day activities on San Jose citizens.

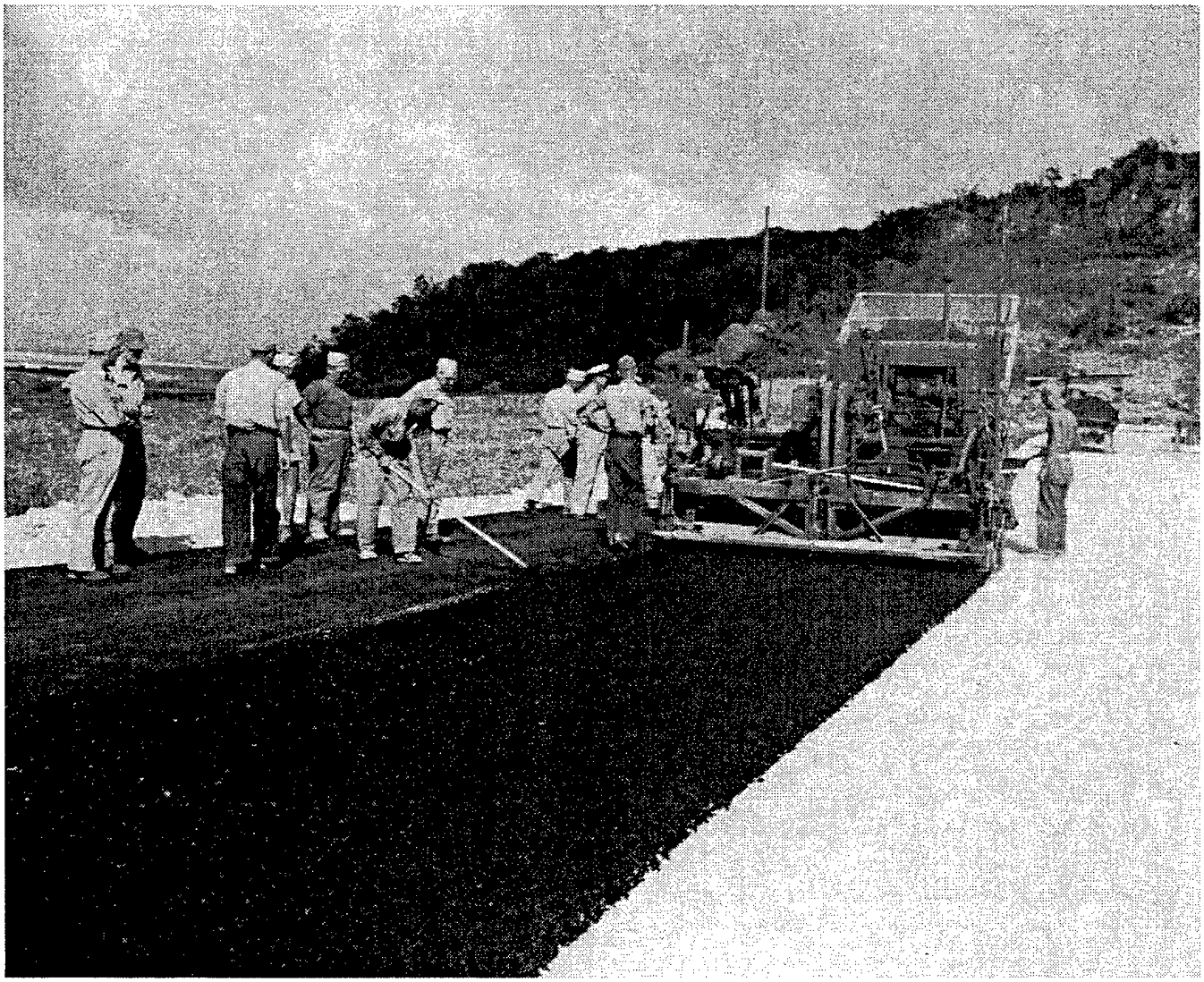
4.13 EXECUTIVE ORDER 13112—INVASIVE SPECIES

The executive order, signed on February 3, 1999, addresses the need to prevent the introduction of invasive species and provide for their control and to minimize the economic, ecological, and human health impacts that invasive species cause. The need to curb or eliminate the distribution of weedy species is recognized and combated by military units training in the Pacific, particularly due to inter-island training. Agricultural inspection protocols for embarking units are practiced as a standing operating procedure.

This FEIS stresses control and interdiction of brown tree snakes (BTS), an invasive species with devastating effects on Guam, to ensure no introduction via military shipments from Guam during training. Section 4.1 describes the present impacts experienced on Guam and the potential impacts to other locations should the BTS be introduced. Appendix E contains three related documents. Appendix E-1 is the baseline control and interdiction plan developed in 1996 by a working group comprised of military commands on Guam, the scientific community, and government regulatory agencies. The plan has been reviewed and approved by the Department of

Interior, the Department of Defense, the Department of Agriculture, the Government of Guam, the Commonwealth of the Northern Marianas, and the State of Hawaii.

Since 1996, the BTS control and interdiction plan has been updated based on improved technology and techniques, many spearheaded by the Department of Agriculture's Wildlife Services staff on Guam. The revised procedures have been published in major training plans. Environmental monitoring of equipment and cargo transfer from Guam to other training sites for both major and minor exercise is the responsibility of COMNAVMARIANAS and Commander, 36th Air Base Wing. The next publication of the updated BTS Control and Interdiction Plan is anticipated in 1999.



Seabee road construction on Tinian (National Archives at College Park)

CHAPTER FIVE

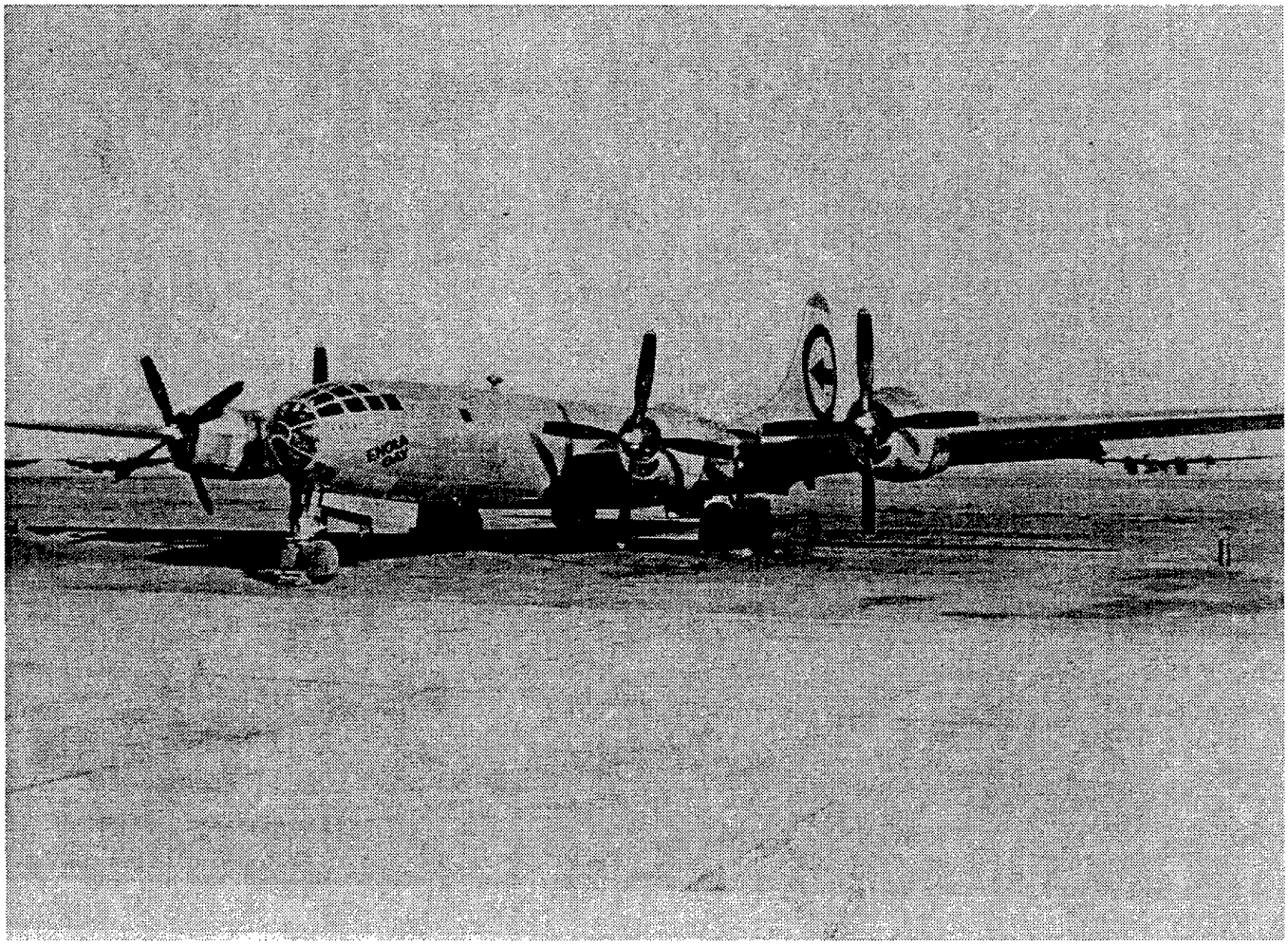
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Belt Collins Hawaii, 1999

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Enola Gay B-29, which dropped an atomic bomb on Hiroshima (National Archives at College Park)

CHAPTER SIX

REFERENCES

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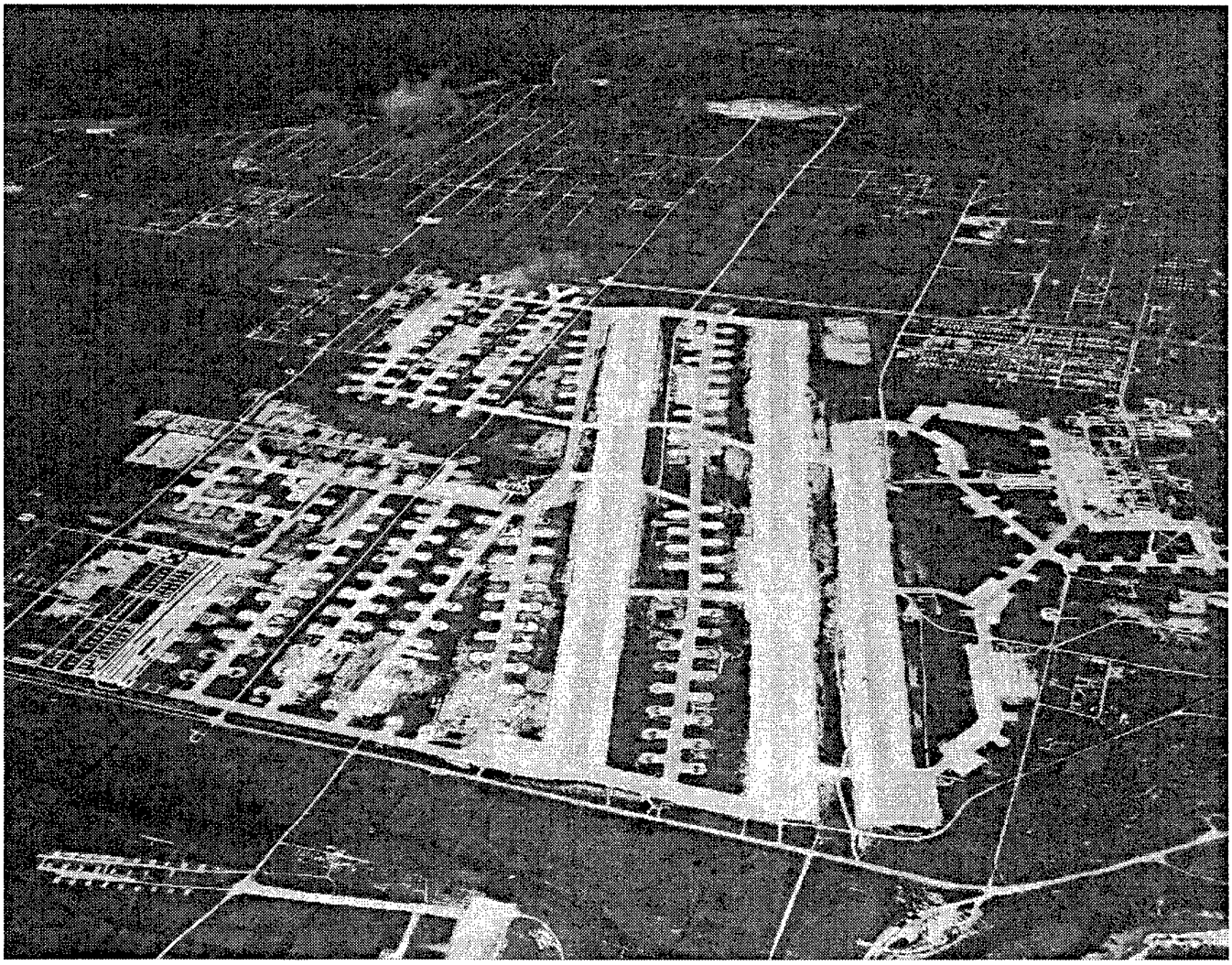
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Tinian West Field looking east (National Archives at College Park)

CHAPTER SEVEN

CORRESPONDENCE

FEIS: Military Training in the Marianas
Belt Collins Hawaii, 1999

CHAPTER SEVEN: CORRESPONDENCE

This chapter contains copies of correspondence commenting on the Draft Environmental Impact Statement published in June 1998 and the Navy's responses. Table 7-1 lists the correspondence in the order that it was received.

Table 7-1 DEIS Correspondence

No.	Date of Agency Letter	From	Agency	Date of Navy Response
1	9/15/98, 9/28/98	Joe T. San Augustin,	BRAC GovGuam Steering Committee	5/17/99
2	9/16/98	Daniel S. Matsumoto	Federal Aviation Administration	5/21/99
3	9/21/98	Ricardo S. Unpingco	Guam Power Authority	1/25/99
4	9/25/98	Ignacio V. Cabrera, Director	CNMI Division of Environmental Quality	5/21/99
5	9/25/98	Peter J. Barlas, Acting Director	CNMI Coastal Resources Management	5/27/99
6	9/25/98	Joaquin Tenorio	CNMI Dept of Land and Natural Resources	5/27/99
7	9/27/98	Robert Stephens	Marianas Audubon Society	5/27/99
8	9/28/98	Charles Karnella	National Marine Fisheries Service	5/21/99
9	9/28/98	Kitty M. Simonds	Western Pacific Regional Fishery Management Council	5/21/99
10	9/28/98	Dennis R Larsen	Guam Scuba Co.	5/27/99
11	9/28/98	David Farrel	U.S. EPA, Region IX	5/27/99
12	9/28/98, 10/13/98	Clifford A. Guzman, Director	Guam Bureau of Planning	5/17/99
13	9/28/98	Jesus T. Salas, Administrator	Guam Environmental. Protection Agency	5/20/99
14	9/28/98	John Bent, President	Guam Diving Industry Association	5/27/99
15	9/29/98	A. J. Sonny Shelton	Guam Department of Parks and Recreation	5/27/99
16	10/01/98, 10/06/98	Patricia Sanderson Port	U.S. Department of the Interior	5/27/99
17	10/03/98 email	Rocky and Pam Hartley		5/20/99 email
18	10/05/98	Francisco P. San Nicolas, Director	Guam Dept. of Agriculture	5/27/99
19	10/16/98	Carl J.C. Aguon, Director	Guam Department of Land Management	2/18/99
20	10/14/98	Mayor Benjamin T. Manglona	Rota, Office of the Mayor	2/16/99
21	10/23/98	Carlos H. Salas, Executive Director	Commonwealth Ports Authority	5/25/99
22	9/28/98	Carl T. Gutierrez, Governor of Guam	Territorial Government Letter to Department of Defense, answered by COMNAVMARIANAS	11/20/98

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1. BRAC Government of Guam Steering Committee

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Carl T.C. Gutierrez, Governor of Guam
Joaine Z. Bordallo, Lt. Governor of Guam
Joe T. San Agustin, Administrator
Mike Cruz, Project Director

September 15, 1998

Commander, Attention (Code 231FM)
PACNAVFACENGCOM
Bldg. 258
Makalapa, Pearl Harbor, Hawaii 96860-7300

To Whom it may Concern:

I am deeply concerned with the significant changes reflected in the June 1998 Draft Environmental Impact Statement for Military Training in the Marianas versus the original draft made available in January 1997. Significant changes include:

1.) 1997 draft has the following alternatives:
- a.) No Action
- b.) Augmented Set of Training Activities
- c.) Mitigated Set of Training Activities,

versus the June 1998 edition:

- a.) No Land Use
- b.) Reduced Land Use
- c.) No New Action
- d.) Not-preferred Action Alternatives

One could draw the conclusion that the Navy has changed the alternatives in order to achieve their desires, particulary with respect to the Waterfront Annex. Please provide an explanation as to why the alternatives were changed.

2.) While the January 1997 draft addresses as a "Potentially Significant Issue," the potential impacts on Tinian's economy from military training and the June 1998 draft addresses the "Potentially Significant Issue" of Apra Harbor commercial boating and diving operations, neither draft reflects the "Potentially Significant Issue" of interim reuse and ultimate transfer of inner Apra Harbor properties Victor Wharf (which includes the Toyland area) and Uniform Wharf (see attachment Finding of Suitability to Lease (FOSL) to the Guam Economic Development Authority (GEDA). GEDA is the Local Redevelopment Authority (LRA) for Base Realignment and Closure (BRAC)

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Joe T. San Agustin, Administrator
Mike Cruz, Project Director

issues on Guam.

3.) Much time, effort and taxpayer money has gone into the drafting of the FOSL with anticipation of ultimate transfer from the Navy to the Government of Guam through GEDA. The potential economic impact on short and long term civilian reuse as a result of use restrictions or outright revocation of Navy's commitment to the Government of Guam for the use and later transfer of Victor and Uniform Wharves is totally absent from your review of the **"IMPACTS"** associated with the Marianas Training Plan in the recent June 1998 draft and reflects a **complete lack of sensitivity to local economic impacts**, which is totally disappointing to an island of devoted and dedicated citizens of the United States.

4.) In our opinion, the January 1997 draft of the Marianas Training Plan and the reuse activities within the Inner Apra Harbor planned by the Government of Guam through GEDA could co-exist very well. Please note that the January 1997 draft Marianas Training Plan did not propose that additional training activities occur within the NAVACTS Waterfront Annex (see attachment, Figure 2-8).

5.) However, with the addition in the June 1998 draft Marianas Training Plan of Assault amphibian vehicles (AAV) at Toyland, Inflatable assault craft (CRRC/RHIB), Air Cushion Landing Craft (LCAC) at Toyland, Displaced Hull Landing Craft (LCU) at Toyland, **the impacts of these additional activities on the Government of Guam's proposed reuse plan should have been addressed but it was totally ignored as if Guam is indeed a foreign territory and not a part of the United States.** If any conflict arose, relocation of the proposed training activities, and not the sorely needed economic activities associated with the reuse activities planned for Victor and Uniform Wharves should have been considered.

6.) Earlier indications from the Navy stated that Dry Dock Island could be transferred if LCAC training was relocated to Dadi Beach. The DEIS now shows both areas to be used but does not provide any explanation consistent with the Navy's earlier indications. This explanation should be provided even though Navy apparently feels it is under no obligation to do so.

7.)Given the Navy's changes to the draft Marianas Training Plan and its potentially adverse economic impacts to Guam, I would like to officially request that a public hearing on this version of the DEIS be conducted in Guam.

8.) The above stated concerns are prominent areas of deep concern which warrant a public hearing. I will also be asking our delegate to Congress, Congressman Underwood, to request the General Accounting Office to review Navy's training needs and land retention activities. It is indeed unfortunate that relations between the Navy and the local community is at an adversarial state.

RECEIVED TIME SEP.24. 2:47PM PRINT TIME SEP.24. 2:52PM

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Isidoro Z. Bordallo
Lt. Governor of Guam

Joe T. San Agustin
Administrator

Mike Cruz
Project Director

I respectfully request that we should not continue with this pattern of insensitivity to local economic impacts and recovery which is in direct conflict with the President's Five Point Plan and Assistant Secretary Pirie's policy of releasing as much property for economic redevelopment as possible.

Sincerely,

JOE T. SAN AGUSTIN
Administrator

Enclosures

cc: Governor Gutierrez
Lieutenant Governor
Speaker, Bente Kuattro Na Lehislaturan Guahan
Congressman Underwood
Secretary of Defense
Secretary of the Navy
DASN Cassidy
Mr. Steve Dong
Lt. Commander Bruener

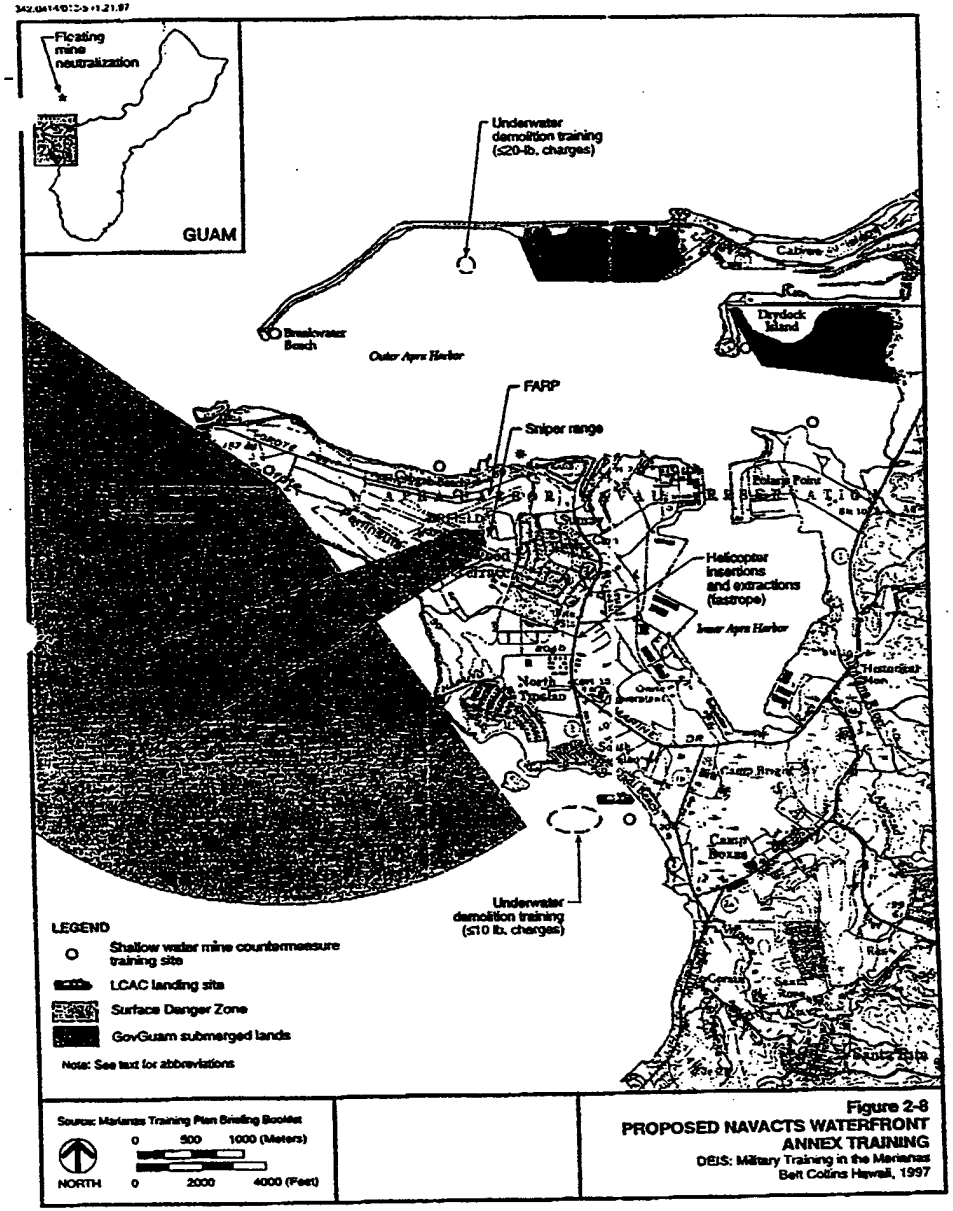


Figure 2-8
PROPOSED NAVACTS WATERFRONT ANNEX TRAINING
DEIS: Military Training in the Marianas
Bert Collins Hawaii, 1997

SECTION 1
INTRODUCTION

The purpose of this Finding of Suitability to Lease (FOSL) is to document environmentally related findings regarding the potential lease of portions of four Naval Activities (NAVACTS) properties located within the Apra Harbor Naval Complex on Guam. This property is scheduled to be leased to the Local Redevelopment Authority (LRA), which is the Guam Economic Development Authority (GEDA). This FOSL serves as an attachment to that leasing agreement.

The U.S. Department of Defense (DoD) Component Official can sign a FOSL after completion and review of the Environmental Baseline Survey (EBS) and any appropriate local community reuse plan and after a determination has been made that property is in an acceptable condition to lease based on one of the following criteria provided in the Memorandum - Fast Track Cleanup at Closing Installations, Attachment entitled, "Draft DoD Policy on Environmental Review Process to Reach a Finding of Suitability to Lease," included in Appendix B of the Fall 1995 BCP Guidebook (DoD 1996b):

- Hazardous substance notice need not be given because no hazardous substances or petroleum products were stored for 1 year or more, or were known to have been released, treated, or disposed of on the property.

- Hazardous substance notice will be given of the type and quantity of hazardous substances or petroleum products, and the time at which storage for 1 year or more, release, treatment, or disposal took place, but the property is not now contaminated with hazardous substances or petroleum products (e.g., storage for 1 year or more but no release has occurred, a release has occurred but no response action is required, or a release has occurred and a response action has been completed).

- The property contains some level of contamination by hazardous substances or petroleum products, and hazardous substance notice will be given of the type

and quantity of such hazardous substances or petroleum products; whether storage took place for 1 year or more; and the date release, treatment, or disposal took place. However, this property can be used pursuant to the proposed lease, with the specified use restrictions in the lease, with acceptable risk to human health or the environment provided the lessee does not interfere with the environmental restoration process.

The U.S. Environmental Protection Agency (USEPA) Draft Model FOSL, dated May 20, 1994, was consulted for the structure and content of the FOSL. The July 1996, "Fact Sheet - Field Guide to FOSL" included within the July 1996 document, "Fast Track to FOST" from the Office of the Deputy Under Secretary of Defense (Environmental Security) (DoD 1996b), provided additional guidance upon which this document was based.

This FOSL is a result of a thorough analysis of information contained in the EBS for NAVACTS, Volume II, dated March 1997. The EBS was conducted to satisfy the requirements of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) 42 United States Code (USC) 9620, Section 120 (h), as amended by Sections 331 and 334 of the National Defense Authorization Act of 1997 and 40 Code of Federal Regulations (CFR) Section 373. These sections set forth notification and remediation requirements when the United States enters into any contract for the lease, sale, or other transfer of real property, which is owned by the United States and (1) on which any hazardous substance was stored for 1 year or more, known to have been released or disposed of, or (2) on which no hazardous substances and no petroleum products or their derivatives were known to have been released or disposed of (i.e., uncontaminated property as defined in CERCLA Section 120[h][4][A]).

Information contained in the EBS was gathered through extensive research, including the following elements:

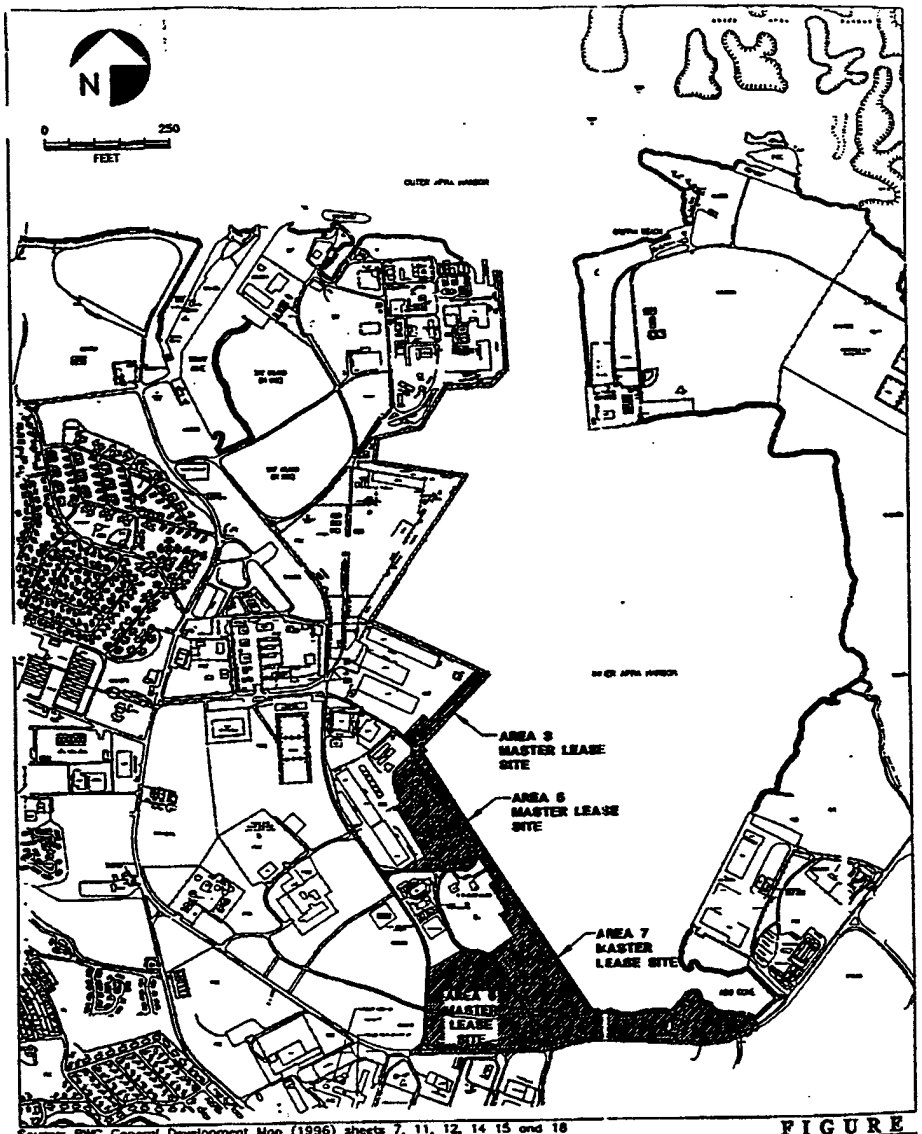
- site inspection during May 1996
- document review
- regulatory agency records review

- personnel interviews
- aerial photography review and analysis
- current and past activity maps
- polychlorinated biphenyl (PCB) survey
- asbestos-containing materials (ACMs) survey
- radon survey
- offsite sources of contamination research

The term "United States" used in this document refers to the U.S. Navy or its authorized representative, as indicated in the lease agreement. The term "lessee" used in this document refers to GEDA.

SECTION 2
PROPERTY DESCRIPTION

This FOSL presents four master lease sites. These sites are portions of the properties identified in the EBS report as Area 3, Area 5, Area 6, and Area 7. The proposed lease property is shown in Figure 2-1. The proposed sites are the Area 3 Master Lease Site, Area 5 Master Lease Site, Area 6 Master Lease Site, and Area 7 Master Lease Site. The locations and historic operations that have occurred on each master lease site are described within the site-specific introductions included in Section 5 of this FOSL. All four master lease sites are located on the Orote Peninsula in the municipality of Santa Rita. The condition of these sites is discussed in detail in Section 4 of the EBS report for NAVACTS, Volume II, dated March 1997 (Ogden 1997). Factors/resources that would pose constraints to the these sites, as well as the site-specific and general lease restrictions associated with these factors/resources, are indicated in the tables presented in Section 5 of this FOSL.



Source: PWC General Development Map (1996) sheets 7, 11, 12, 14 15 and 18

FIGURE

Master Lease Site Location Map
Areas 3, 5, 6, and 7 Master Lease Sites
FOSL - NAVACTS

2-1

SECTION 6
CONCLUSIONS

The NAVACTS property meets the requirements for leasing pursuant to CERCLA Section 120(h). We hereby certify that the information presented herein is correct to the best of our knowledge and the property is suitable for leasing based on the provisions and restrictions contained herein.

9/10/97
DATE

JOHN L. BALL
Acting Commander

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Joe T. San Agustin
Administrator

Mike Cruz
Project Director

5. Navy proposes to use many training sites for the same training purpose in order to minimize environmental impact on any one site. OPNAVINST 5090.1B indicates that there is the potential for significantly greater environmental impact to occur if training is to occur in multiple sites, implying that it may be better environmentally to use one site for one training activity to ensure that other areas remain pristine. The DEIS should address the intent of the Navy instruction in assessing training activities.

6. Earlier indications from Navy were to relocate LCAC landings from Dry Dock Island to Dadi Beach depending upon the results of its environmental study. Since the 1998 MTP now says that multiple sites are suitable for LCAC training (Dry Dock Island, Dadi Beach, Tipalao Beach and Polaris Point), the DEIS should support Navy's earlier policy as authorized in BRAC law and Public Law 96-418 (the Brooks Amendment) of releasing Dry Dock Island.

As indicated earlier, a public hearing on this DEIS must be held in Guam.

Sincerely,

JOE T. SAN AGUSTIN
Administrator

cc: Governor Gutierrez
Lieutenant Governor Bordallo
Speaker, Bente Kuattro Na Lehislaturan Guahan
Congressman Underwood
Secretary of Defense
Secretary of the Navy
DASN Cassidy
Mr. Steve Dong
Lt. Commander Bruner

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Project Director

Commander, Attention (Code 231 FM)
PACNAVFACENGCOM
Bldg. 258
Makalapa, Pearl Harbor, Hawaii 96860-7300

September 28, 1998

To whom it may concern:

On September 15, 1998, I provided comments on the DEIS for Military Training in the Marianas. The comments submitted herein should be considered as a supplement to those earlier comments.

1. While we recognize and support the need for training, Navy's Training Plan conflicts with federal laws and DOD policy as iterated by Assistant Secretary Pirie to the 1995 BRAC Commission in its identification of lands for training that are in the process of being deeded to GovGuam pursuant to BRAC law, DOD policy and PL 103-339. Major areas slated for training purposes include lands already slated for transfer to the Government of Guam under 2 federal laws including the former SRF and Dry Dock Island; Victor and Uniform Wharves; GLUP '94 Navy properties at Radio Barrigada, Sasa Valley, and the Apra Harbor Complex (BRAC Law and DOD policy); and portions of Naval Magazine and Andersen South (U.S. Public Law 103-339 "The Guam Excess Lands Act"). The Marianas Training Plan acknowledged that certain federal properties will be transferred to GovGuam but failed to exclude these areas as training sites. As a result, the DEIS did not assess the impact of military training on future GovGuam reuses activities, even though these uses have already gone through various levels of federal approval.

2. The Plan also proposes training activities for areas proposed for release by the Air Force in the Guam Land Use Plan 1994 at Northwest Field and at Andersen South. While these areas have not been released, the impact of training on the release of these parcels and the potential economic loss resulting from the conversion of the areas from potential civilian economic development to military training must be assessed.

3. Training activities are not proposed for Nimitz Hill even though suitable lands exist in this area presumably because of impacts on the DoDEA School. The DEIS should assess the impact of training on the proposed Northern High School site at Andersen South and the proposed Guam Community College at Radio Barrigada which have already been deeded to GovGuam.

4. Congress, with the assistance of Congressman Underwood, has appropriated funding to relocate the SEALS from Victor Wharf. The DEIS should assess Navy plans for relocation of the SEALS since this project will negate the need to have SEALS training at Victor Wharf.

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5. Navy proposes to use many training sites for the same training purpose in order to minimize environmental impact on any one site. OPNAVINST 5090.1B indicates that there is the potential for significantly greater environmental impact to occur if training is to occur in multiple sites, implying that it may be better environmentally to use one site for one training activity to ensure that other areas remain pristine. The DEIS should address the intent of the Navy instruction in assessing training activities.

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As indicated earlier, a public hearing on this DEIS must be held in Guam.

Sincerely,

JOE T. SAN AGUSTIN
Administrator

cc: Governor Gutierrez
Lieutenant Governor Bordallo
Speaker, Beute Kuattro Na Lehislaturan Guahan
Congressman Underwood
Secretary of Defense
Secretary of the Navy
DASN Cassidy
Mr. Steve Dong
Lt. Commander Bruner

DEPARTMENT OF THE NAVY
PACIFIC DIVISION
NAVAL FACILITIES ENGINEERING COMMAND
258 MAKALAPA DR., STE. 100
PEARL HARBOR, HI 96860-3134

5090P.1G03
Ser PLN231/1719

17 MAY 1999

Mr. Joe T. San Agustin, Administrator
BRAC GovGuam Steering Committee
Office of the Governor
P.O. Box 2950
Hagåtña, GU 96932

Dear Mr. San Agustin:

Subj: REVISED DRAFT ENVIRONMENTAL IMPACT STATEMENT (DEIS)
MILITARY TRAINING IN THE MARIANAS

Thank you for your letters of September 15 and 28, 1998, regarding the subject DEIS. In general, you expressed concern over differences between the original DEIS and the revised DEIS. This letter briefly summarizes your comments and responds to your concerns.

Your Letter of September 15, 1998:

1. Comment: Please explain why the alternatives were changed between the two versions of the DEIS, particularly in regard to the Waterfront Annex.

Response and Revisions: The alternatives were revised in the second DEIS primarily in response to comments from some federal and local Government of Guam (GOVGUAM) and Commonwealth of the Northern Marianas Islands agencies that "No Action," "Mitigative," and "Augmented Training" did not represent a full range of feasible alternatives. To provide more distinguishable alternatives, we then reframed the EIS to use as alternatives a set of land uses for a range of training activities. The FEIS evaluation is based on the following alternatives to meet the proposed action: No Training Land Use, Reduced Training Land Use, No New Action (or Continuing Action), and Maximum Training Land Use (Executive Summary, Section 2.0). The result of the evaluation is the recommended preferred alternative (training activities and mitigation).

It is our understanding that your primary concern is the proposed use of Waterfront Annex locations for amphibious landings, which were not identified in the original DEIS alternatives, though other training activities were identified for the Navy-owned submerged lands in the Waterfront Annex. As a result of comments from federal and local regulators requesting explanation of or to explore a full range of alternative beach landing sites within Navy-controlled lands, potential landing capabilities were evaluated at Toyland Beach, Tipalao Beach, Sumay Cove Marina, the old refueling pier near Sumay Cove, and Dadi Beach.

The additional Waterfront Annex landing sites were reviewed after comments from regulators, including Guam Environmental Protection Agency (EPA), recommending Dry Dock Island be used for Landing Craft Air Cushion (LCAC) landings rather than using Dadi Beach. The U.S.

Marine Corps has requested numerous amphibious landing sites since their amphibious forces in the Western Pacific are increasingly constrained in landing locations. They require environmentally suitable places to land in Guam to make use of Naval support and training facilities.

Table 2-2 of the Revised DEIS (and the Final EIS [FEIS]) summarizes the environmental advantages and disadvantages at each proposed landing site. The FEIS Preferred Alternative includes as AAV landing sites Toyland Beach, Sumay Cove Marina, Dry Dock Island, and Polaris Point. Each site has (1) direct access to roads and highways that the Assault Amphibian Vehicles (AAV) can use to reach maneuver areas, (2) no major environmental constraints, and (3) requires no major engineering (beach preparation) prior to landings. Tipalao Beach is also proposed for AAV landings but would require substantial site clearing such as boulder removal along the shoreline. The former World War II refueling pier is not proposed for AAV landings, as it would need substantial engineering to clear and grade a landing area along the shoreline. Roadway improvements would also be required to offset potential deterioration of connector coral roads and establishing erosion patterns that could affect an adjacent wetland.

Section 1.3.1. of the FEIS provides training site selection criteria. Section 2.3.1 pertains to the Waterfront Annex training lands and resources that were evaluated. More specific information regarding amphibious landing sites is found in Section 2.3.2.3.

2. Comment: The DEIS does not address the potentially significant impacts on the Guam Economic Development Authority (GEDA) of military training on Base Realignment and Closure (BRAC)-related interim reuse and ultimate transfer of inner Apra Harbor properties, specifically Victor Wharf (including Toyland Beach) and Uniform Wharf. (The comment cites the Naval Activities (NAVACTS) Area Finding of Suitability to Lease (FOSL), apparently as an indication of the Navy's future expectations for the Uniform Wharf area.).

Response: The potential economic activities identified by the BRAC Steering Committee are speculative future uses which do not exist at this time, and which could only occur if the parcels were to be excess to military needs. The uses of Victor and Uniform wharves proposed by GEDA are uses which (1) have not been approved by the Navy and (2) would have substantial impacts of their own on sensitive environmental resources, island economic resources, and Navy operations. National Environmental Policy Act (NEPA) does not require analysis of impacts on resources that are only speculative in nature.

Regarding the NAVACTS Area FOSL, please note that the purpose of a FOSL is to identify whether any existing contamination renders a property unsuitable to lease; it is not intended to determine or confirm whether a property is excess to the Navy's needs. Section 1.6.3.3 summarizes the result of an early recommendation to use the old graving dock for underwater demolition training. This site was determined to be unsuitable since the training would be incompatible with activities in the Guam Shipyard.

3. Comment: The DEIS is not sensitive to local economic impacts of military training on short- and long-term civilian reuse. The DEIS does not address impacts of use restrictions or "outright revocation of Navy's commitment to the GOVGUAM for the use and later transfer" of Victor and Uniform Wharves.

Response: Sensitivity to economic impacts on the local economy has been addressed in the DEIS and FEIS. Appendices K is a report pertaining to Apra Harbor. While training on Guam is conducted primarily on military lands, port visits and contract support to the military forces on Guam during and after major exercises are well recognized and are positive economic impacts. The *Pacific Daily News* had several articles on the economic benefits of Tandem Thrust 99. The DEIS and FEIS also address economic impacts on Tinian (Appendix H) primarily due to shared use of the airport, harbor, and the Exclusive Military Use Area itself, which is visited by tourists on a daily basis.

Retention or excess land determinations are outside the scope of this EIS, which studies the impacts of training on potential uses of existing military lands for military training. Waterfront Annex properties, including Victor and Uniform wharves and adjacent areas, are not included in the Guam Land Use Plan (GLUP) 94 study as excess properties, are not part of the closed and leased ship repair facility, and are not excess property as a result of the deactivation of Fleet and Industrial Supply Center and the realignment of NAVACTS Guam.

The Navy investigated Guam's request to consider Victor Wharf as excess property to Navy needs, screened the property pursuant to the Federal Property and Administrative Services Act, and prepared the planning documents needed to effectuate a determination of excess. However, the Navy did not make a final determination of excess because of intervening world events and Commander, U.S. Naval Forces, Marianas (COMNAVMARIANAS) mission requirements. The final determination to "excess" Victor Wharf or other requested non-BRAC assets is a Navy responsibility conducted in accordance with the Federal Property and Administrative Services Act and not driven by redevelopment concerns. Potential effects on a speculative potential reuse area are outside the scope of this document.

FEIS Section 2.6.2 does address the changes occurring at Andersen South. Training requests primarily from Guam National Guard and U.S. Army Reserve units to conduct land navigation, small unit tactics and bivouacs have diminished over the past eighteen months. The units are reacting to ongoing plans for interim leasing to GOVGUAM prior to a final excess properties conveyance.

4. Comment: The proposed action for Apra Harbor in the original DEIS is preferred by the BRAC GOVGUAM Steering Committee over the proposed action in the revised DEIS, as the original DEIS did not propose additional training activities within the Waterfront Annex.

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Response: While this preference has been noted, the Navy has a primary duty to provide adequate logistic support and training to its operating forces, including Amphibious Ready Groups and Marine Expeditionary Units who frequently transit the Marianas during six-seven month deployments. As noted earlier, additional studies were conducted to evaluate all potential training opportunities on DOD lands within the Marianas. Landing sites on Guam and on Tinian (leased for military training purposes) were evaluated. The lands that are required for this purpose are not properties determined to be excess to Navy needs.

5. Comment: Impacts of amphibious vehicle landings at Toyland Beach were not addressed in the Revised DEIS. If there are conflicts between military training and economic activities at Uniform and Victor Wharves, the economic activities should have priority.

Response: Impacts of amphibious vehicle landings at Toyland Beach were addressed. See Sections 4.3.1.4, 4.3.1.5, 4.3.1.6, and Table 2-2 FEIS. NEPA does not require an assessment of impacts on speculative future activities, such as the GEDA proposals to develop Uniform and Victor Wharves.

6. Comment: The Navy previously indicated that Dry Dock Island could be transferred to GOVGUAM if LCAC landings were relocated from Dry Dock Island. LCAC landings are proposed for both Dry Dock and Dadi Beach in the Revised DEIS. Provide explanation of this change from earlier indications.

Response: Originally, Dadi Beach was identified as a possible LCAC landing area and informal comments were made by the Navy that the landings could replace LCAC activities at Dry Dock Island. After conducting a demonstration LCAC landing at Dadi Beach, the Guam EPA and Division of Aquatic and Wildlife Resources (DAWR) expressed concern regarding potential impacts to shallow coral beds. As a result, the Navy has decided to eliminate Dadi Beach as preferred beach landing site pending further evaluation of LCAC landings over shallow coral beds. Therefore, the use of Dry Dock Island for LCAC landings remains a continuing action. The EIS also determined Dry Dock Island to be suitable for Assault Amphibian Vehicle (AAV) and Landing Craft Utility (LCU). Dry Dock Island is also used by EODMU-5 as a training mine neutralization site as part of their Outer Apra Harbor deepwater mine countermeasures training. During the recent port visit by the USS Kitty Hawk, Dry Dock Island was used extensively for logistic and recreational support activities for the ship's crew.

7. and 8. Comment: BRAC Steering Committee requests a public hearing on the Revised DEIS because of the changes from the original DEIS proposed action.

Response: Based upon prior comments from the regulators and the public, the DEIS was revised in order to evaluate a few more alternative amphibious landing sites so that the Navy can make a more informed decision on which beaches would better serve the training scenario while still preserving the environment. The first and revised versions of the DEIS were widely distributed

in Guam, and a Notice of Availability was published for three days in the *Pacific Daily News*. Public hearings were conducted as part of the review of the first DEIS. Numerous comments from federal, territorial and commonwealth agency representatives prompted the changes reflected in the revised DEIS and the FEIS. Detailed response letters were received from more than twenty agencies with direct interest in training and its effects on the environment. These letters have influenced modifications to the Preferred Alternative for Marianas training. Dialogue among the Navy and key agencies such as your committee will continue. The Navy is confident that all parties interested in proposed uses of the Waterfront Annex have had ample opportunity to review and comment on the content of the Revised DEIS. Since there is no substantial change in the proposed training action that may significantly impact the environment, another public hearing is not warranted.

Your Letter of September 28, 1998:

1. Comment: The proposed action conflicts with federal laws and DOD policy, in that it identifies lands for training use which have been "slated" for transfer to GOVGUAM. The DEIS does not assess the impact of military training on future GOVGUAM reuse activities.

Response: NEPA does not require evaluation of impacts on speculative future activities. Any proposed development on Navy lands that are not excess property would be considered speculative in nature.

2. Comment: The DEIS should assess economic impacts of proposed training (instead of release and civilian economic development) at areas of Northwest Field and Andersen South which were proposed for release in GLUP 94.

Response: As stated earlier, the release and civilian development of lands currently controlled by DOD is not a "known future activity" until such time as the parcel is identified as excess to DOD needs and is made available for alternative uses. No evaluation of impacts is required by NEPA.

3. Comment: The DEIS should assess the impact of training at sites deeded to GOVGUAM and proposed for educational institutions, i.e., the proposed Northern High School site at Andersen South and the proposed Guam Community College at COMNAVMARIANAS Communications Annex Barrigada.

Response: The U.S. Air Force requested that Andersen South training be included in the DEIS (and FEIS) for training that would occur up to a change in land ownership. We are aware that a process is pending for Headquarters Pacific Air Force approval to license the dormitories and all of the land at Andersen South on an annual basis, and that training requests for Andersen South have diminished over the past 18 months. See FEIS Section 2.6.2.1.

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The DEIS evaluation of these lands for military training does not obligate a lessee to allow training to continue. However, retaining the maneuver training evaluation for Andersen South in the FEIS may be advantageous. If the FEIS contains the evaluation of Andersen South training characteristics, it would facilitate a future requirement of the lessee or future titleholder to prepare an Environmental Impact Analysis for the federal government or for GOVGUAM to allow training.

Future reuse of Barrigada property is included in the Navy's *Draft Environmental Impact Statement for the Disposal and Reuse of Surplus Navy Property Identified in the 1994 Guam Land Use Plan* (GLUP 94), which may by published and distributed for comment in mid-1999. Some of the Communications Annex Barrigada surplus land is presently leased by the Navy to the Guam Army National Guard (GUARNG) for maneuver training and maintenance facilities; the training land activities' impacts are evaluated as non-significant in the Military Training DEIS. Future use of this land training parcel and GUARNG facilities is now planned as a federal agency to federal agency transfer rather than a conveyance to GOVGUAM.

The FEIS (Section 2.9.4) identifies the pending future land use changes at Andersen South and states that use of parcels and facilities for military training and dormitory support may cease when these training lands and facilities are leased to GOVGUAM. Future military training requests at Andersen South would be negotiated with the future property custodian.

The FEIS (Section 2.9.4) has been amended to indicate that the land leased by the Navy for GUARNG maneuver training lands at Communications Annex Barrigada is now planned for transfer to the National Guard Bureau so that GUARNG training and facility support will continue.

4. Comment: The DEIS should assess Navy plans to relocate the SEALs away from Victor Wharf. [This comment appears to request that the proposed action be revised to reflect future relocation of the SEAL facility.]

Response: The locations that are proposed as SEAL training sites are not directly related to the location of the headquarters facilities assigned to NSWU-1. Any relocation of these facilities would not change the need for training sites with certain physical and security characteristics. Therefore, any future relocation of NSWU-1 headquarters is not within the scope of the training EIS, would not change the proposed action, and would not generate any potential impacts related to training. No revisions to the DEIS are proposed.

5. Comment: The DEIS should address the proposed use of multiple sites for various training activities in relation to OPNAVINST 5090.1B, which indicates there is potential for significantly greater environmental impact to occur if training is to occur in multiple sites. [No citation from OPNAVINST 5090.1B is provided.]

Response: We understand your reference to "greater" impacts to imply that impacts that could result from activities at multiple sites might be cumulative in nature. The DEIS (and FEIS) provides a complete analysis of cumulative impacts of the proposed action in Section 4.8.2. As described in Section 2.3.10 of OPNAVINST 5090.1B, "cumulative impacts can result from individually minor but collectively significant actions taking place *over a period of time* (emphasis added)." Thus, by this definition, cumulative impacts of training would be expected through repetition of actions at the same site. In many instances the availability of multiple sites on Guam and Tinian is advantageous since having a number of suitable training sites may eliminate overuse of any single site over time leading to a cumulative effect.

The main analysis presented throughout Chapter 4 of the DEIS already considers not only the direct impacts of site-specific training activities, but also their potential indirect and regional effects. The analysis of potential effects of actions at specific sites is complemented by the analysis of cumulative impacts presented in Section 4.8.2, which follows the definition given in OPNAVINST 5090.1B. Thus, the analysis presented in the DEIS (and FEIS) provides an adequate evaluation of potential impacts of the proposed action. See Table 2-12 of the FEIS for the identification of all potential training sites suitable for specific activities.

6. Comment: The DEIS should support earlier Navy policy of releasing Dry Dock Island, as multiple sites in the Waterfront Annex are suitable for LCAC landings.

Response: Navy policy on land transfer is not within the scope of the Marianas Training EIS. However, in response to this comment, Dry Dock Island remains an important site for bringing Navy landing craft and Marine AAVs ashore, and as evidenced during Tandem Thrust 99, providing logistics and recreational support to visiting ships' crews. Its training value is not eliminated by the potential to land portions of the Navy/Marine force at other sites. Dadi Beach was initially considered to hold great potential for LCAC landings only, but such landings will not occur until further evaluation can demonstrate whether or not significant impacts to shallow coral beds could result from slow-speed beach approaches and departures.

We trust that these responses adequately address your concerns. Should you have any further questions, point of contact is the undersigned at (808) 471-9338, by facsimile transmittal at (808) 474-5909, or by E-Mail at UeharaSY@efdpac.navfac.navy.mil.

Sincerely,

Stanley Y. Uehara

STANLEY Y. UEHARA
Director
Environmental Planning Division
Acting

2. FEDERAL AVIATION ADMINISTRATION

U.S Department of Transportation
Federal Aviation Administration

Western-Pacific Region
Airports District Office

300 Ala Moana Blvd., Room 7-128
Honolulu, Hawaii 96813
MAIL: Box 50244
Honolulu, Hawaii 96850-0001
Phone: (808) 541-1232
FAX: (808) 541-3462

September 16, 1998

Mr. Melvin N. Kaku, Director
Environmental Planning Division
PACDIVNAVFACENGCOM
Pearl Harbor, Hawaii 96860-7300

Dear Mr. Kaku:

We have reviewed the Draft Environmental Impact Statement (EIS) for Military Training in the Marianas dated June 1998.

We have no comment on the EIS; however, we do note that an Environmental Assessment (EA) and Finding of No Significant Action (FONSI) has been comleted for expansion of the West Tinian Airport. The proposed action includes reconstruction of the abandoned 8,600' runway, conversion of the existing runway to a taxiway, construction of connecting taxiways and parking apron, realignment of 8th Avenue, and construction of a two-story terminal building. A copy of the proposed action and Airport Layout Plan from the EA is enclosed.

If you have any questions, please call David Welhouse at (808)541-1243.

Sincerely,

Daniel S. Matsumoto

Daniel S. Matsumoto
Civil Engineer

Enclosures

- 200 ft. added to existing (abandoned) runway
- required min. 500 ft. wide safety zone strip along new runway
- required min. 1000 ft. safety zone at ends of new runway (beyond threshold)
- taxiway (existing runway) extended to 8,600 ft.
- required min. 214 ft. wide safety strip along new taxiway (existing runway)
- relocation of Broadway Avenue
- relocation of 8th Avenue

Additionally, Alternative 4, which involves construction of a taxiway south of the existing runway, will have negative impacts associated with locating airport operational areas closer to San Jose Village and other potentially sensitive areas: The 65dB LDN project noise contour would be displaced south, hence closer to populated areas. The Tinian Dump would become closer to airport operations areas and compatible land use restrictions may become a requirement for potential areas of development.

3.6 Alternative 5.

The No-Action Alternative. The No-Action alternative would maintain the status quo. The existing and planned tourism industry would be constrained by the lack of transportation infrastructure. Small commuter airplanes would not be able to handle the forecast passenger loads, and flight operations would be restricted to daylight hours by the lack of lighting and other safety aids. While this alternative would have the least impact on the natural environment (vegetation and wildlife) at the airport site, it clearly would not meet the purpose and need to accommodate large aircraft and increased air traffic.

3.7 Alternative 6: Proposed Action.

Alternative 6 (a modified version of Alternative 2), which follows the recommendations of the 1996 review, was prepared by Juan C. Tenorio & Associates in September 1997 and chosen by CPA as the Proposed Action. This alternative is shown on the new Airport Layout Plan (See Figure 1-1) and is described below:

3.7.1 Airside

The new runway will be constructed north of, and parallel to, the existing runway. The runway will be located on the alignment of an abandoned World War II runway. The runway will be 8,700 feet long by 150 feet wide. There will be 35-foot-wide paved shoulders on each side of the runway. The existing 6,000 foot long runway will be converted into a parallel taxiway. This converted taxiway is extended on each end to connect to the ends of the new runway. There are two internal taxiways that connect to the new runway that divides the runway

in three approximate equal segments. The westerly taxiway, of these two internal taxiway, extends southward to the new 1,115-foot long by 575-foot wide apron. The runway, taxiways and apron are lighted and navigation is aided with a PAPI system. All improvements are in conformance with FAA rules and guidelines. Also included is the realignment of 8th Avenue around the west end of the new runway. The relocated road is about 4,500 feet in length with two 10-foot travel lanes and 9-foot shoulders..

Other components of the project include:

- Runway and taxiway lighting marking and signage.
- Runway end identifier lights (REIL)
- Precision approach path indicators (PAPI)

3.7.2 Terminal

A new terminal building, located at approximately the midpoint of the runway will be built. The reason for the selection of this location is that it is at the crest of the low rise in elevation and will afford a view of the ocean and sunsets. Locating the new terminal to the south of the existing terminal decreases the traffic conflicts between terminals.

The Terminal building will be a two-story structure that will have the following amenities: check-in counters for four airlines, departure lounge accommodating 700 passengers, restaurant/coffee shop, Customs and Immigration stations and offices, 'duty free shop', auto rental spaces, VIP lounge, two- passenger loading bridges and other amenities. The Ground Floor will have 70,180 SF and the Second Floor 53,440 SF for a total of 123, 620 gross square feet.

3.7.3 Landside

The Landside improvements consists of the construction of access road, designed as a divided highway, in the concept of Broadway Avenue, a new 500,000-gallon water tank, a new water well, a transmission line from the well to the tank and a transmission line from the tank to the terminal, a water distribution system, waste water disposal system, parking lot for drainage system, etc.

The project will utilize public power with the existing 125 kva backup generator at the airport remaining in service. The Commonwealth Ports Authority now gets its water from a well operated by the MDC lease holder. An existing 40,000 gallon reservoir is located on the airport property and will remain. A new 500,000 gallon reservoir will be constructed near this existing reservoir. Waste water treatment will be by on site septic tank and leaching fields. Following is a summary of the

infrastructure requirements for the project:

3.7.3.1 Water System

Water Use: 119,400 gallons per day of water based on a daily usage of 50 gallons per person per day. Bottled drinking water will also be provided.

CPA now receives water from a well on the Mariana Development Corporation (MDC) leasehold and has its own reservoir. A U.S. Geological Services (USGS) well-located off the east end of the existing runway will be developed. Water will be pumped to a new 500,000-gallon storage tank and chlorinated. The new tank and connecting waterlines will be sized to provide the required fire flow.

3.7.3.2 Waste Water System

Waste water generated: At 80% of water use the volume is 227,040 gallons per day. The sewage will be disposed of through a septic tank and leaching fields.

Waste water will be disposed of on site through a septic tank and leaching field. The storm flow rate presently exiting the site will not be exceeded. Any excess flow rate will be retained on site.

3.7.3.3 Power System

Electrical consumption: Connected load - 1,500 kva; peak power demand 1,200; estimated monthly consumption - 288,000 kwh/month. A 1,500 kw, 3ø standby generator is planned.

The project will utilize 2500 KW of power from the Tinian Commonwealth Utilities Corporation power system. A 2500 KW emergency generator will be located along the terminal access road will provide 100% power backup capacity. The existing 100 kva backup generator, located at the existing airport, will be upgraded to 200 KW.

3.7.3.4 Parking Spaces

The project will provide at least 267 parking spaces and meet all of the requirements of the Americans with Disabilities Act.

3.7.3.5 Additional Facilities

Aircraft fueling facilities are included in the plan. Fuel storage will be located on site in above-ground storage tanks.

3.7.4 Environmental Impacts

Significant clearing and grading of affected areas, and the consequent destruction of habitat would result from these aspects of Alternative 6:

- grading of areas west of abandoned runway
- construction of new 8,700 ft. runway on alignment of abandoned runway
- required min. 500 ft. wide safety zone strip along new runway
- required min. 1000 ft. safety zone at ends of new runway (beyond threshold)
- grading of areas east and west of existing runway
- construction of taxiway portions connecting new runway to existing runway (new taxiway)
- required min. 214 ft. safety zone strip along new taxiway
- relocation of 8th Avenue
- grading of areas south of existing runway relative to terminal and landside improvements

3.8 Applicable Federal and Local Regulations, Permits and Licenses

Except for the No-Action Alternative, all of the proposed alternatives would be required to comply with the same Federal and CNMI laws and regulations.

3.8.1 Federal Regulations, Permits, and Licenses:

Federal regulations are described in FAA Advisory Circular 150/5100-16A "Airport Improvement Program Grant Assurance Number One-General Federal Requirements (FAA 1988)" describes the sponsor's obligations under the various federal laws, regulations, and requirements which they become subject upon acceptance of a Federal grant under the Airport and Airway Improvement Act (AAIA) of 1982 (49 USC 2201 et seq). This document lists and discusses 38 separate requirements, most of which do not involve environmental or natural resource issues. The following requirements are relevant to this Environmental Assessment: (numbers in parentheses following the title refer to the number in FAA AC 150/5100-16A)

- National Historic Preservation Act of 1966.
- Archaeological and Historic Preservation Act of 1974.
- Aviation Safety and Noise Abatement Act of 1979.
- Power Plant and Industrial Fuel Use Act of 1978.
- National Environmental Policy Act of 1969.
- Endangered Species Act of 1969. (23)
- 14 CFR Part 150, Airport Noise Compatibility Planning.

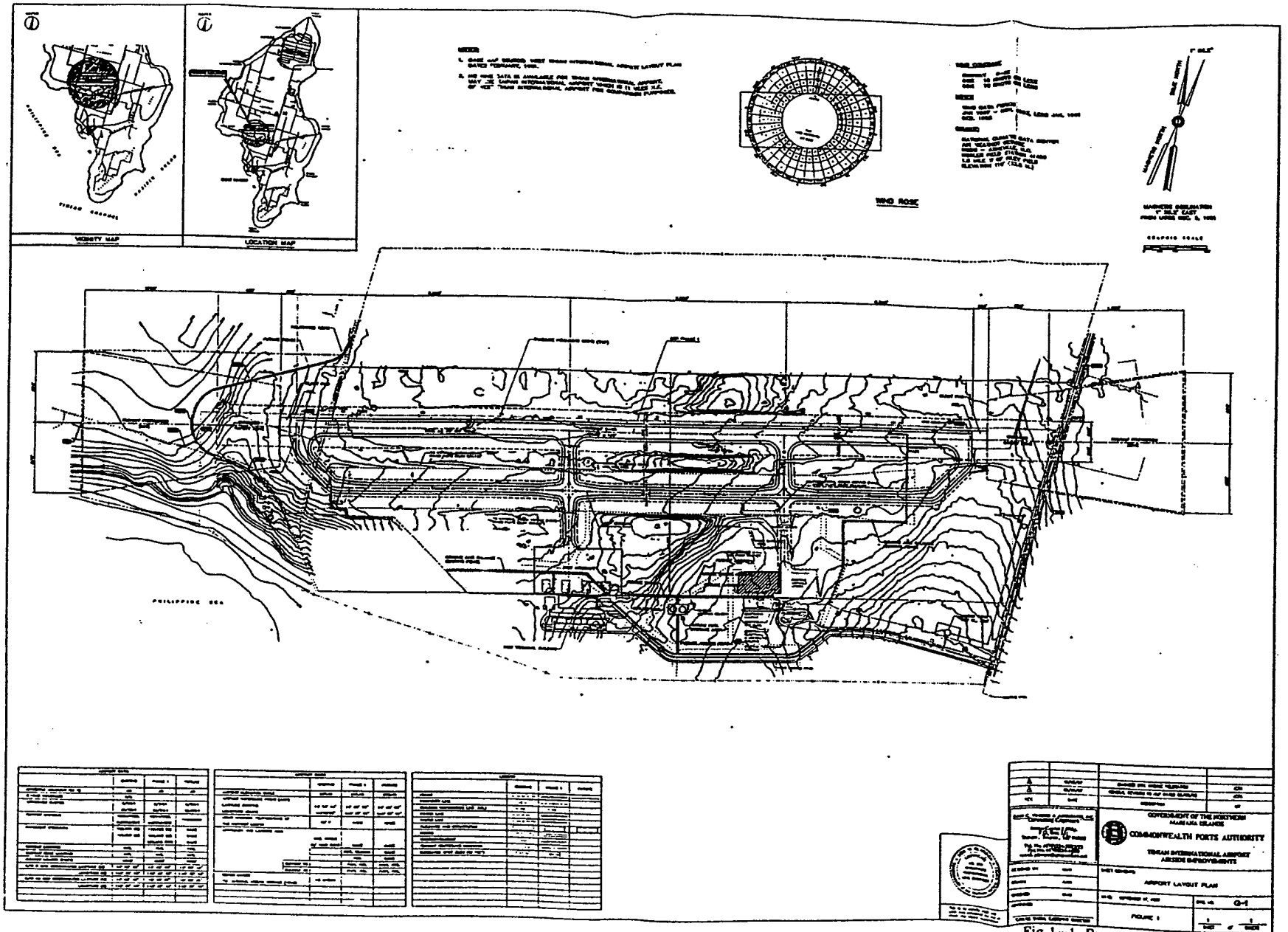


Fig.1-1 Proposed Airport Layout Plan

DEPARTMENT OF THE NAVY
PACIFIC DIVISION
NAVAL FACILITIES ENGINEERING COMMAND
(MAKALAPA, HI)
PEARL HARBOR, HAWAII 96860-7300

5090P.1G03
Ser PLN231/ 1775

21 MAY 1999

Mr. Daniel S. Matsumoto
Civil Engineer
Federal Aviation Administration
P.O. Box 50244
Honolulu, HI 96850-0001

Dear Mr. Matsumoto:

Subj: REVISED DRAFT ENVIRONMENTAL IMPACT STATEMENT (DEIS)
MILITARY TRAINING IN THE MARIANAS

Thank you for your letter of September 16, 1998 concurring with the subject DEIS and providing information regarding expansion of the West Tinian Airport. This information on the future expansion of the airport as described in your letter and attachments, has been incorporated in Section 3.5.1 of the Final EIS (FEIS).

Should you have any further questions, please contact Mr. Stanley Uehara at (808) 471-9338, by facsimile at (808) 474-5909, or by E-Mail at UeharaSY@efdpac.navfac.navy.mil.

Sincerely,

Melvin N. Kaku

MELVIN N. KAKU
Director
Environmental Planning Division

3. GUAM POWER AUTHORITY

GUAM POWER AUTHORITY
ATURIDÅT ILEKTRESEDÅT GUAHAN
P.O. BOX 2977 • AGANA, GUAM U.S.A. 96910-2977

September 21, 1998

Commander, Attn (Code 231 FM)
PACNAVFACENGCOM,
Building 258 Makalapa
Pearl Harbor, Hawaii 96860-7300

Subject: **Review Comments -June 1998 Revised Draft Environmental Impact Statement (DEIS) for Military Training in the Marianas**

Guam Power Authority (GPA) has no comments on the above subject report. Proposed safeguards or mitigation measures, if strictly followed by responsible parties are fairly adequate to minimize any adverse environmental impact caused by the planned military exercise on the island. .

Our other concern, however, is the proposed plan of bringing to Guam hazardous waste materials generated from the military exercise at Tinian and FDM, prior to its final disposal to U.S. mainland disposal companies. If possible, we recommend the direct disposal of these hazardous waste from Tinian and FDM to authorized mainland military disposal companies .

GPA is very appreciative for the opportunity to provide comments on this important issue.

Sincerely,

RICARDO S. UNPINGCO
General Manager

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5090P.1G03
Ser 231/ 307
25 JAN 1999

Mr. Ricardo S. Unpingco
General Manager
Guam Power Authority
P.O. Box 2977
Agana, GU 96910-2977

Dear Mr. Unpingco:

Subj: REVISED DRAFT ENVIRONMENTAL IMPACT STATEMENT (DEIS)
MILITARY TRAINING IN THE MARIANAS

Thank you for your letter of September 21, 1998 indicating "no comment" on the subject DEIS, but expressing concern about the hazardous waste generated on Tinian during military training being transported to mainland disposal companies via Guam.

Hazardous wastes have not been generated on Tinian during any exercises to date. In the unlikely event that this should occur, the DEIS described the method that should be used to ensure that hazardous wastes were not disposed improperly in authorized land fills or dumps. The Department of Defense is aware that disposal of any hazardous wastes in any solid waste landfill on Guam or Tinian is prohibited.

Hazardous waste generated during any military exercise on Guam or Tinian would be transported to facilities managed by the Defense Reutilization and Marketing Office (DRMO) on Guam in accordance with the Resource Conservation and Recovery Act (RCRA). Hazardous wastes would be processed by DRMO and shipped to the U.S. mainland. Selected units training on Tinian may return to amphibious ships and steam elsewhere. These units would be required to remove hazardous wastes from Tinian for disposal by DRMO at the first opportunity. There should be no risk to Guam with the military training units following these procedures and the waste staged in an appropriate containment area prior to shipment to the mainland for disposal.

Should you have any questions, please contact Mr. Fred Minato at (808) 471-9338, by facsimile transmission at (808) 474-5909, or by electronic mail at MinatoFJ@efdpac.navfac.navy.mil.

Sincerely,

MELVIN N. KAKU
Director
Environmental Planning Division

Commonwealth of the Northern Mariana Islands
Division of Environmental Quality
P.O. Box 1304, Saipan, MP 96950
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September 25, 1998

Stanley J. Uehara
Acting Director
Environmental Planning Division
Department of the Navy
Pacific Division
Naval Facilities Engineering Command
(Makalapa, HI)
Pearl Harbor, HI 96860-7300

Re: Comments on Draft EIS for Military Training in the Marianas

Dear Mr. Uehara:

Enclosed please find the Commonwealth of the Northern Marianas Islands (CNMI) Division of Environmental Quality's (DEQ's) comments on the June 1998 Draft environmental Impact Statement (DEIS) on the Military Training in the Marianas.

Thank you for your time and attention to this matter. Should you have any questions or wish to discuss these comments, please feel free to contact our office at the above address or via e-mail at deqdirector@saipan.com.

Sincerely,

Ignacio V. Cabrera
Director

Attachment.

cc: Secretary, DPW
Acting Director, CRM
Director, DFW
U.S.EPA Region IX

Attachment – DEQ Comments

The following represents the Commonwealth of the Northern Mariana Islands (CNMI) Division of Environmental Quality's (DEQ's) comments on the June 1998 Draft Environmental Impact Statement (DEIS) on the Military Training in the Marianas. The comments are organized into 5 main subjects: General Comments, Alternative Locations, Inconsistencies with CNMI Regulations, Landing Operations, and Firing Range/FDM.

1. General Comments:

- 1.1 According to the document, the DEIS is designed to cover "all military training in the Mariana Islands which is likely to be required for some years into the future." To reiterate DEQ's 25 March 1997 comment letter on the original January 1997 DEIS, "...the Divisions cannot support such an open-ended blanket exclusion to environmental review of military activities in the future. The current document[s] (1997 and 1998) contain insufficient information to determine what the potential impacts of the proposed activities [may be]... years into the future when cumulative impacts will have occurred...the Navy is requested to provide a time frame during which the DEIS will be in effect." As it will be necessary to revisit the DEIS over time to assess the cumulative effects of the military training, such an open-ended caveat of applicability is unacceptable and a more realistic timeframe must be proposed in the DEIS.

- 1.2 As with the original DEIS, this entire document lacks consistency. The current DEIS mentions preferred and not preferred exercises, yet in the Tables they may be listed differently. It is not clear what activities have been performed in the past on Tinian and which are being proposed as new activities. The entire document requires a consistency review and revision. Some specific inconsistencies which concern us are as follows:

  - a. 60 mm Mortar Range - Page 4-39 states that "The proposed mortar range is not included in the Preferred Alternative; therefore, no mitigation is required." However, several references to the proposed range exist in the DEIS, including its listing under the preferred option in Table ES-1. Page 4-3 states, *"The proposed 60mm mortar range (which is not part of the Preferred Alternative) would be oriented north to south, parallel to and immediately west of the former range."* These inconsistencies should be corrected, and reference to the mortar range removed from all discussion of the preferred alternative.

  - b. 40 mm Grenades - Table ES-1 (preferred alternative) lists the use of 40 mm grenades at the firing range, however this is not mentioned anywhere else in the text of the DEIS. This concerns us because according to information available to

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us, the use of 40 mm grenades can result in the generation of unexploded ordinance (UXO). However, the DEIS posits that UXO requirements are not needed because mortars are not being used. The DEIS must be revised to either exclude the use of all grenade types, or provide for full UXO procedures at the proposed range.

- c. Landing Beaches Both Table ES-1 and Figure 2-1a list landing beaches under both the existing operations and the preferred alternative that are not mentioned in the narrative of the DEIS. Specifically, AAV landings at Kammer Beach, and LCAC landings at Tachongna and Dankulo beach are referenced. If these are indeed proposed landing sites, then the DEIS must devote the same level of attention and analysis of alternatives to these sites as given for Babui and Chulu beaches. In particular, attention must be paid to the heavy use of these beaches for tourism and recreation, especially with the recent opening of the Tinian Dynasty Hotel and Casino. If these references are in error, then the DEIS must be corrected.

- 1.3 Pg. 3-3 states, *"...five incidents of coliform violations due to fishing boat discharges into the harbor in the past two years...[and] seven incidents of coliform violations [have been] recorded in the past two years."* This section is outdated and in error. DEQ records do not show five incidents of coliform violations in the past two years, nor is there record of seven incidents of coliform violations on Rota. The DEIS must be revised to use the most current data available from the DEQ laboratory.

2. Alternative Locations

- 2.1 As the military exercises described in the DEIS will have a profound effect on the ecosystem of the Mariana Islands, it is unclear why the training exercises must take place on islands with an intact ecosystem and growing economy. These are viable islands with communities and economies founded upon the right of peaceful enjoyment. As there exist many other military-held lands in the Pacific which have been ecologically compromised to the point of unhabitability by military operations, it would appear obvious that unhabitable islands are the only appropriate areas to host such environmentally destructive exercises. The DEIS must be revised to include discussion regarding alternate location options for these exercises.

- 2.2 Abstract: The DEIS must verify that the existing and proposed military training activities do not violate the lease conditions of FDM and Tinian, and that the costs associated with the natural resources damages will not cost more to those areas than the lease compensation. The DEIS must clarify to which non-military properties the abstract refers.

- 2.3 Page ES-2 states that training areas in Hawaii are outside the Western Pacific theater of operations yet no justification is provided for the requirement of being "within the Western Pacific theater of operations." Page ES-3 states "Alternative training locations outside the Marianas do not comprise reasonable alternatives to the DoD lands in the Marianas." As these tactical exercises do not appear to be location dependent, it is unclear why they cannot take place on Hawaii or other military-held lands. For instance, the DEIS should explain why AAV and LCAC landings are being requested for Tinian when they are already proposed for Guam. The DEIS must be revised to better justify the need to have the proposed military exercises in the Northern Mariana Islands.

3. Inconsistencies with Federal and CNMI Regulations

- 3.1 Throughout the document, no mention is made of obtaining earthmoving permits prior to earth-moving activities. The DEIS states that the Seabees will perform erosion control on all construction. The DEQ Earthmoving and Erosion Control regulations require that erosion control plans be submitted for review and approval as part of the permitting process. The DEIS must be revised to state that the required earth-moving permits will be obtained prior to commencement of any land-clearing and excavation activities. The DEIS must be revised to include discussion regarding whether land-clearing and excavation activities will result in any degradation of surface and groundwater resources.

- 3.2 An Individual Wastewater Disposal System (IWDS) permit is required for all septic systems proposed in the DEIS logistics base on Tinian. The septic system shown in Figure 4-3 does not appear to conform to the standards specified in the CNMI IWDS regulations. The DEIS must be revised to correct this and to state that the required IWDS permit will be obtained prior to commencement of any construction.

- 3.3 Pg. 1-24 states, *"Containment berms, pans, or liners will be used during all activities involving POL transfer or replacement."* The DEIS must be revised to include a discussion regarding how these systems will meet DEQ's requirements as delineated in the Underground Storage Tank Regulations, and the associated Revised Interim Criteria for Aboveground Storage Tanks.

- 3.4 Page 2-5 states that a permanent logistical support camp will be constructed for military personnel and that within this area, a gasoline and diesel fuel stand with aboveground fuel storage tanks will be installed. An aboveground storage tank permit in accordance with the abovementioned regulations will be required prior to installation of any aboveground fuel storage tanks. The DEIS must be revised to include provisions for obtaining these permits prior to installation.

- 3.5 Page 2-5 does not describe the method by which the fuel storage tanks will be refilled. The DEIS must be revised to include details regarding any fuel transfer to these tanks.

- 3.6 Page 2-5 did not state whether the fuel storage tank will be removed after the training exercises. The DEIS must be revised to clarify whether the fuel storage tank will remain in place and if so, how the remaining fuel will be removed or disposed.

- 3.7 Page 2-6 states that a pesticide (herbicide) will be used to maintain vegetation around the mortar range fence however information regarding the number, type, volume or storage of herbicides was not provided. The DEIS most be revised to provide this information including a storage and disposal plan for the pesticides (and empty pesticide receptacles). The discussion must make reference to the requirements of the existing CNMI Pesticide regulations.

- 3.8 The DEIS must include a discussion of how the proposes exercises will affect federal and CNMI surface water criteria/water quality standards (particularly lead and copper).

- 3.9 Based on the above concerns, the DEIS must include a table of all federal and Commonwealth regulations, easements and approvals applicable to all the proposed military exercises and how they will be addressed.

4. Landing Operations

- 4.1 Figure ES-1b, Page 2-13, and Page 4-8 depict Unai Babui as a wide sandy beach. This may have been the case when surveys were conducted in 1994, but several typhoons in 1997 have removed the majority of the sand from the beach and only large rocky outcrops remain. Appendix B-7 states that Amphibious Assault Vehicle (AAV) track suspension allows it to climb vertical obstacles of up to 1m. The new natural configuration of Unai Babui may now provide land obstacles that cannot be overcome by the AAVs. The DEIS must be revised to reflect actual conditions and an evaluation of whether the AAVs landings are feasible must be presented.

- 4.2 Page 2-13 states that *"Tinian Harbor has a concrete boat ramp that is wide enough for AAV landings,"* with road access. As the beaches and the coral reefs at Unai Babui and Unai Chulu are prominent tourist attractions, any damage to these areas will impair these ecological and economic resources. The DEIS must be revised to explain why Tinian Harbor is not being considered for both AAV and LCAC landings instead of the other beaches mentioned.

- 4.3 Appendix B shows the preferable beach approach for AAVs, in which tracks contact substrate gradually in water less than 1.8m deep. The DEIS does not however, provide scientific evidence that the underwater topography of the reef at Unai Babui conforms with this preferable gentle slope. The DEIS must be revised to provide documentation that verifies that the underwater topography at Unai Babui can support these landings.

- 4.4 Page 2-12 states that "[t]raining consists of a group of 12 to 15 AAVs approaching a landing area either side by side or one after the other." Page ES-9 states that "AAVs will be required to operate single file within a narrow lane approach over Unai Babui's coral reef." The AAVs must cross the reef in a narrow lane, single file. References to other approach configurations must be removed from all discussion of the preferred alternative in the DEIS.

- 4.5 Figure ES-1b indicates that a 22m (72 ft) swath will be required for the landings on Unai Babui. With respect to the information given in Table B-10, a 22m wide lane seems excessive and unnecessary. Table B-10 which states that the AAV has an approximate 11ft width and the AAAV has a 15ft wide, both producing only an 8ft trench span. Based on these figures the expected swath is five times the width of the vehicles. The DEIS must be revised to more clearly define the reasoning behind the stated lane width.

- 4.6 Page 2-38 and 3-7 state that the coral at Unai Babui is of low and poor quality. This is an erroneous statement. The percent cover of coral at Unai Babui may be low, but the quality of the coral is not low. The DEIS must be revised to eliminate erroneous or subjective statements such as these. Only statements that can be supported with qualitative data should be included.

- 4.7 According to the information presented in the DEIS, the Marine Research Consultants methods were to *"...swim[s]...along the length of the beaches using SCUBA equipment on the outer reef fronts. The reef flats, extending from the shoreline to the reef crests were surveyed using snorkeling gear. No time limits were imposed ....investigators remained in the water until it appeared that all communities had been adequately observed. ....Species were ranked according to abundance into four classes (abundant, common, occasional, and rare)."* The DEIS must be revised to include the criteria for "abundant," "common," "occasional," etc. coral cover determinations.

- 4.8 Page 4-3 states that the *"fundamental evaluation criteria to be used to determine whether the landings pose significant environmental impacts are whether "wetlands, coral reefs, important habitat areas, or culturally or economically important plant or animal communities [are] present at the training site," and whether "the natural function or usefulness of these areas or communities be appreciably*

reduced" by the impacts from the landings." The criteria states that, *"if the answer to either of the above queries is yes, the potential impacts are considered significant."* Echoing President Clinton's 1998 Coral Reef Initiative to preserve this dying resource, any loss to these sensitive areas is considered appreciable. The military's designation of a 1% loss of total island coral reef or 5% loss of substrate as an "allowable loss" is not consistent with this aim therefore the statement should be considered for removal from the DEIS.

- **4.9** Page 2-38 states that "if significant impacts are identified, damaging activities will be suspended while supplemental impacts analysis is performed and procedures are modified." The DEIS must be revised to state clearly that CNMI agencies, including DEQ, will be responsible for determining if significant impacts have occurred, either through direct observation or through review of results of the military's surveys.

- **4.10** Page 4-8 states that "Survey protocols will be proposed by COMNAVMARIANAS and agreed to by CNMI DFW prior to the first survey." Survey protocols must be approved by CNMI DEQ in addition to DFW. The DEIS must be revised to state clearly that the data will be given to DEQ and DFW for review.

- **4.11** Page 4-9 states that "Prior to the first landing, any movable live coral will be hand-picked and carried to a portion of the reef outside the established lane. The lane will be surveyed, defined in training orders, and may be permanently marked with metal stakes installed above the water line." Almost no live coral is movable without hand-tools. As with all other requirements placed on projects in the CNMI that will result in damage to coral, the military must prepare and submit for approval a coral transplant plan that indicates how and where they will transplant the coral. The coral must be reattached to the substrate using a non-toxic substance such as Kaiser cement or epoxy. In addition, the DEIS must clearly state that the approach lane must be marked, at least during the training exercise. The DEIS must be revised to incorporate a coral transplant plan that is subject to approval by DFW and DEQ.

- **4.12** The 28 July 1998 letter to the Director of Fish and Wildlife from the Department of the Navy states that "Should coral damage exceed the degree estimated in this impact assessment, reef enhancement activities at another location will be considered in consultation with CNMI DFW," however no estimate of the degree of coral damage expected is stated in the DEIS. Furthermore, no mention of this consultation is made in the DEIS, nor is there mention of any consultation with DEQ. The DEIS must be revised to state the degree of coral damage expected and to state all involved CNMI agencies will be involved in the consultation process.

- **4.13** The 20 May 1998 letter to the Director of Coastal Resources states that proposed mitigation includes "working together with the Commonwealth of the Mariana Islands, Department of US Fish and Wildlife Service to identify potential coral seed stock for eventual planting at a different location on Tinian." This letter does not identify who will be involved with the identification of the seed stock and when it would take place. Additionally, this method of reef restoration may not be a viable alternative. The DEIS must be revised to include this information and to state that CNMI agencies will be consulted regarding development of alternative compensatory mitigation activities.

- **4.14** According to the DEIS, the LCACs /Hovercrafts do not make contact with the coral however no discussion of vibration impacts are provided. The DEIS must be revised to include a discussion of how vibrations from the intense air pressure may affect the coral and fish resources.

- **4.15** Page 2-12 states that the LCAC has a width of 47ft and *"may create a surge wave capable of breaking coral in shallow water,"* however page 4-7 states that *"an LCAC will not disturb a coral reef if it is fully up on its air cushion while crossing the reef."* As the LCAC may not always be up on its air cushion while crossing, direct coral damage will result in addition to the damage from the created turbidity. The DEIS must be revised to provide a discussion of how increased turbidity levels from the jets can be monitored and mitigated and an analysis of whether one beach could be used for both AAV and LCAC landings, instead of different beaches for each.

5. Firing Range/FDM

- **5.1** The lead bullets must be collected to minimize lead contamination of the wildlife, soil, and water resources. The DEIS must be revised to include a plan for the lead shot collection for DEQ review and approval. Also, the DEIS must discuss whether any resident or migratory bird populations ingest small stones to aid digestion and, if so, what provisions will be proposed to prevent ingestion of lead pellets prior to their collection.

- **5.2** Page 3-2 states that the island of Tinian has *"an aquifer of fresh water in the older limestone unit in the south-central portion of the island and may have a smaller aquifer in the North"* The DEIS must be revised to include verification of the validity of this reference and discussion of how the firing range activities will comply with the CNMI's Water Quality and Drinking Water regulations, specifically how the DoD will insure that both the marine and ground water at this site does not become contaminated with lead or copper.

- **5.3** As per the July 21, 1997 letter from the CNMI Division of Fish and Wildlife (DFW) to Belt Collins, the DFW and DEQ recommended "soil sampling areas and

monitoring wells be established in the area of the firing range and at one or more control points before exercises begin. These site should be periodically tested for indications of contamination." Based on the DEIS it appears that no baseline soil and water sampling has taken place. The DEIS must be revised to include a plan for obtaining baseline samples.

- **5.4** Table 1-3 is used to defend the assumption that there will be no measurable detrimental impact to ground water from the firing range, however baseline levels are necessary to substantiate such claims. As above, the DEIS must be revised to include a plan for obtaining baseline soil and water samples.

- **5.5** Pg. ES-10 refers to "strict range protocols," however the DEIS did not contain the referenced section entitled "Firing Range Protocol," nor the referenced Standard Operating Procedure (SOP) for these activities. The DEIS must be revised to include a summary of these procedures, and relevant excerpts from the references.

- **5.6** Pg. 1-19: According to the DEIS, a discussion of the clean-up activities was not included because, "Both the Air Force and the Navy have site investigation and cleanup programs in place to address and implement cleanup of military facilities." The DEIS must be revised to include detailed site-specific investigation and clean-up plans.

- **5.7** Pg. 2-14: The former Tinian small arms range has been closed for three years. The DEIS must be revised to explain whether the range has been remediated according to the EPA requirements.

- **5.8** Page 2-44: According to the FDM notes, maximum land use on FDM is "...no longer feasible, as submunitions were discovered scattered over the surface of FDM late in 1996." As the closed Tinian arms range and FDM remain contaminated, any reference to an established "clean-up program" appears suspect. As discussed in comment 5.6, the DEIS must be revised to include a full SOP for clean-up activities as required, especially as the DEIS conceded that a *"proportion"* (pg. 4-11) of the waste materials is expected to reach the ocean (and by the same logic be left on land, where it may leach into the soil, groundwater, and into the marine sediment).

- **5.9** Pg. 4-5, Although requested in the previous comments on the first DEIS, no discussion of contamination of soil and water with ammunition was included in the DEIS. The referenced article by Long in Geochim et Cosmo Acta: 41:1183-1191 and Leslie Au's memorandum, suggest that lead pellets encased in copper shells that are left in marine sediment have the potential to cause lead deposition in the benthic zone. Multimedia Environmental Models (Mackay, 1991, pg. 50) suggests that heavy metals left in an ionic state may sorb or dissolve and become a constant source of contamination or transform to an organometallic state and may

bioaccumulate in the benthic zone. Information from the Formerly Used Defense Site (FUDS) program suggests that left over small arm ammunition of the kind being proposed for use in these exercises were found to contribute the greatest source of lead contamination in remediation areas. The DEIS must be revised to include a discussion of this potential contamination vis a vis the above-references.

- **5.10** Page 2-15 states that "the only potentially significant impact of small arms ranges...is public safety hazards, mitigated by strict adherence to long-standing SOPs," however these "long-standing SOPs" are not included in the DEIS. As leftover ammunition and casings remain from previous exercises and represent a continuing threat to wildlife, soil, and surface and groundwater, the advisability of yet another firing range is questionable. As the previous firing ranges have yet to be remediated from exercises over the course of the past several years, the good faith efforts of the military to clean-up these sites after use is called into question. The DEIS must be revised to include an explanation of lack of clean-up of the previously used sites and a discussion regarding the rationale for having an additional firing range on Tinian when one already exists on Guam.

- **5.11** As mentioned in comments 1.2.a and 1.2.b, if the military does indeed propose to use 60 mm, grenades, or any other type of explosive ordinance, a full discussion of UXO procedures must be included in the DEIS.

- **5.12** The DEIS must be revised to incorporate public safety issues of UXO accumulating on the land and in the waters surrounding FDM.

DEPARTMENT OF THE NAVY
PACIFIC DIVISION
NAVAL FACILITIES ENGINEERING COMMAND
(MAKALAPA, HI)
PEARL HARBOR, HAWAII 96860-7300

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21 MAY 1999

Mr. Ignacio V. Cabrera, Director
Division of Environmental Quality
Commonwealth of the Northern Mariana Islands
P.O. Box 1304
Saipan, MP 96950

Dear Mr. Cabrera:

Subj: REVISED DRAFT ENVIRONMENTAL IMPACT STATEMENT (DEIS)
MILITARY TRAINING IN THE MARIANAS

Thank you for your letter of September 25, 1998 commenting on the subject DEIS. This letter provides responses to your comments as numbered in your letter.

1. General Comments

1.1 Comment: The open-ended timeframe of the DEIS is unacceptable to the Division, and a more realistic timeframe must be proposed in the DEIS. It will be necessary to revisit the DEIS over time to assess the cumulative effects of training.

Response: Training activities of the proposed action are primarily continuing actions, that is, essentially those actions that are ongoing and unbounded in time. The National Environmental Policy Act (NEPA) does not require that inherently continuing activities be arbitrarily time-bounded, nor does it establish an expiration period for NEPA evaluations. Military training is a dynamic activity designed to meet mission requirements. It is Department of the Navy policy to evaluate and monitor the effects of new and continuing actions for unanticipated environmental consequences or the discovery of new environmental effects. Should the action be substantially changed with associated major impacts, or if new impacts are found which are potentially significant, then additional training constraints or further NEPA evaluation would be required to resolve the impacts. This is covered in Section 1.1 of the FEIS.

1.2 Comment: The DEIS lacks consistency. Clarify which activities are included in the Preferred Alternative and which are not. In particular, are the mortar range and use of 40mm grenades included? The DEIS must either exclude all grenade use or provide for full UXO procedures at the proposed range. Which beaches are proposed for landings in the Preferred Alternative? Equal levels of analysis must be provided for all proposed landing beaches.

Response: Since the DEIS was published, additional analysis has lead to modifications to the preferred alternative. The FEIS will be reviewed prior to publication to eliminate internal inconsistencies. The training land uses included in the Preferred Alternative are identified in Tables ES-1 and 2-12 in the FEIS. All components of the Preferred Alternative for Tinian are shown graphically on Figures 2-1a and 2-1b and reflect the following changes:

- Landings by Assault Amphibian Vehicles (AAVs) landings are no longer being proposed for Unai Babui in the Exclusive Military Use Area (EMUA), but only at the San Jose Harbor boat ramp.

- Air-cushion landing craft (LCAC) are proposed to land at Unai Chulu and Unai Dankulo.

- No open field live-fire ranges or facilities will be constructed, eliminating the 60mm mortar range, the small arms fire-and-maneuver range, and construction of the shooting house or breacher trainer facility is not preferred as long as the World War II structures remain available for training. There is no proposal to construct a grenade range on Tinian.

- The logistics support camp is proposed for siting within the International Bureau of Broadcasting (IBB) boundary and developed as an austere open storage area consisting of a fenced enclosure with crushed coral base. The logistic support camp will not include constructing or installing permanent fuel tanks, buildings, or restrooms.

- Permanently constructed EMUA security gates is not a preferred alternative. Temporary roadblocks during active training will suffice.

a. There is no inconsistency between the discussions of the 60mm mortar range in the Executive Summary and Chapter Four. The range is proposed in the Maximum Training Land Use Alternative and is discussed appropriately. However, both the executive summary and text state clearly that the mortar range is not part of the Preferred Training Land Use Alternative. Reviewing agencies including your office requested that more details regarding all alternatives be provided, so a description of the conceptual mortar range, its use and potential impacts if constructed was provided in various appropriate sections of the DEIS.

b. No live grenades (rifle or hand) are proposed for use on Tinian. Table ES-1 has been corrected to delete the gray shading for Tinian training areas under "40 mm grenades."

c. LCAC landings were proposed at Unai Chulu, Unai Dankulo, Kammer Beach, and Tachogna Beach and evaluated in Chapter Four. Since the DEIS was published, the Navy and CNMI officials revisited Tinian beaches in March 1999 and conducted a survey to determine if LCACs impacted shallow coral. The results of the beach surveys at Unai Chulu and Unai Dankulo support both beaches as preferred alternatives for LCAC operations. References to

recent legislation to preserve Kammer, Tachogna, and Leprosarium recreation beaches are now included in the FEIS and eliminated these beaches from consideration for landings by LCAC, LCU or AAV. The two latter craft/vehicles are now limited to landings in the Tinian Harbor at the boat ramp.

1.3 Comment: The section on coliform violations on Tinian is outdated and should be corrected.

Response: The text has been revised based on the information provided to us by CNMI DEQ in October 1998.

2. Alternative Locations

2.1 Comment regarding training on other sites: The military holds many uninhabitable islands which have been ecologically compromised and should be used for training instead of the Mariana Islands. The DEIS should include discussions of alternate locations.

Response: Specific lands of the Commonwealth of the Northern Mariana Islands were leased to the U.S. Navy for financial consideration with a full understanding by the Commonwealth government of their intended use. These uses have not caused a significant or pervasive degree of environmental damage, and the leases have provided significant economic benefits to the CNMI. The U.S. Department of Defense holds no alternative locations for such training on other, uninhabited islands in the region.

2.2 Comment on the Abstract: The DEIS should verify that the proposed action does not violate lease conditions for Farallon de Medinilla (FDM) and Tinian. Is the cost of natural resource damage greater than the income realized from the lease? The abstract should identify any non-military lands proposed for training use.

Response: Copies of the present lease and leaseback documents have been added to the FEIS as Appendix O. Article 4 of the lease provides that the United States Government may use the leased premises for any purpose required to carry out its defense responsibilities. (Due to its size, the FEIS will be published as two volumes, with the latter comprised of all supporting appendices.)

Article 8b recognizes that damage may result from these uses, and establishes requirements for both parties to consult to rectify damage at lease termination. While this Article includes removal of UXO on Tinian, it does not include removal of UXO on FDM.

The abstract is a brief summary of matters covered in greater detail elsewhere in the EIS. Private properties at Songsong Harbor, Rota and Dandan, Guam, are identified in figures and in the body of the EIS as non-government parcels used for specific training activities under agreement with property owners.

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2.3 Comment on Executive Summary: Better justify the need for exercises in the CNMI, as the exercises do not appear to be location-dependent. Why are amphibious landings required on Tinian as well as on Guam?

Response: The Executive Summary summarizes the contents of subsequent chapters, and hence some level of detail is deferred to the main text. Refer to Section 1.2 for a more complete discussion of training requirements in the region. Because landing areas on Guam have little or no maneuver area associated with landing beaches, training value is often limited to technical proficiency of the landing craft and assault amphibian vehicle crews. Certain scenarios are suitable at these locations and are conducted on Guam. However, many tactical scenarios require the greater expanse of training lands and integrating beachheads, maneuver areas, and airfields that are available at Tinian and not available on Guam.

3. Inconsistencies with Federal and CNMI Regulations

3.1 and 3.2 Comments on earthmoving and construction: The DEIS should clarify that earthmoving permits will be obtained prior to any earthmoving. The DEIS should discuss impacts of earthmoving on surface and groundwater resources, and revise the septic system in Figure 4-3 to conform to CNMI regulations and state that an IWDS permit will be obtained prior to construction.

Response: Contracted construction work on Tinian would require permitting, but the preferred alternative no longer includes construction of firing ranges or range facilities. The septic field has been constructed during the development phase of the DEIS and an application has been submitted by the Navy for the Individual Wastewater Disposal Permit (IWDP). Figure 4-3 (a conceptual septic tank design) is no longer needed and has been eliminated from the FEIS.

The only earthmoving activity included in the Preferred Alternative is construction in the International Broadcasting Bureau (IBB) transmitting site of an austere logistic support area consisting of a fenced, crushed coral-surfaced open storage yard. Potential impacts on surface and groundwater resources from this activity were evaluated and found to be not significant. Construction of permanent facilities or installation of underground or aboveground fuel storage tanks will not be included in this project.

3.3 Comment on p 1-24: Explain how any petroleum, oils and lubricant (POL) transfer will proceed in accordance with DEQ requirements for underground and aboveground storage tank (UST and AST) regulations.

Response: As noted above there will be no UST or AST construction in the EMUA. If refueling is required, forces may either contract for diesel fuel support in San Jose, or use expeditionary pre-packaged (drummed) fuel. Fuel transfer would be conducted with appropriate

spill control measures in place, in accordance with Navy policies specified in OPNAVINST 5090.1B, Chapters 9 and 10. Expeditionary refueling information are now included in Section 4.2.4.5 of the FEIS.

3.4 and 3.5 Comments on p 2-5: State that appropriate permits will be obtained prior to installing a fuel UST or AST at the proposed base support camp, and detail how the UST(s) or AST(s) will be refilled.

Response: As indicated above, installation of permanent fuel storage facilities will not be included in the preferred alternative in the FEIS.

3.6 Comment on p 2-5: Clarify whether the fuel UST(s) or AST(s) will be removed after the training exercise. If so, describe how remaining fuel will be removed and disposed.

Response: Any packaged fuel that is not used during an exercise will be removed from the island ("backloaded") by training units.

3.7 Comment on p 2-6: Identify the herbicide that will be used at the mortar range. Provide a storage and disposal plan for herbicides and empty herbicide containers.

Response: No ranges will be constructed. Therefore, no herbicide will be needed.

3.8 Comment: How will the proposed action affect federal and CNMI surface water criteria and water quality standards, particularly for lead and copper?

Response: The proposed small arms fire-and-maneuver range will not be included in the preferred alternative. Lead rounds expended during TRUE training inside the former World War II Japanese Command Building are collected from the portable bullet traps and hauled off-island for proper disposal. Although lead and copper contamination of soils has resulted at some firing ranges where backstop material receives high concentrations of projectiles and small fragments, no such effects have been identified for projectiles impacting in open waters.

3.9 Comment: DEIS should include a table of all federal and CNMI regulations, easements, and approvals required and how they will be addressed.

Response: Section 1.7 "Government Permits and Approvals" lists the permits and approvals needed for the proposed action. Others such as the IWTP should be issued prior to the FEIS being published. No major construction projects remain in the preferred alternative for Tinian.

4. Landing Operations

4.1 Comment: The DEIS should reflect actual conditions at Unai Babui, which is currently a rocky beach without much sand. Will AAV landings be feasible at such a beach?

Response: The survey conducted in March 1999 does not hold promise for AAV landings at Unai Babui. Damage to coral is no longer the primary issue. The spur and groove formation at the reef face would make a smooth AAV transition from afloat on water jet propulsion to touching down and tracked propulsion difficult. In addition, the beach erosion remains. The preferred alternative for AAV landings on Tinian is now the existing boat ramp at San Jose harbor.

4.2 Comment on p 2-13: DEIS must explain why AAV and LCAC landings must occur at Unai Chulu and Unai Babui instead of Tinian Harbor boat ramp.

Response: The FEIS describes beach landing alternatives. Ideally, for training purposes, beach landings within the EMUA such as at Unai Chulu, will allow the units to remain tactical, which is not possible when using the Tinian Harbor boat ramp. The lease for training lands authorizes use of Tinian Harbor, but tactical activities must be minimized to avoid disruption to San Jose activities.

As discussed with DEQ and DFW representatives during Tandem Thrust 99, an amphibious landing is only one part of an integrated training requirement, in which vehicle crews find, approach and cross a beach, and continue inland under simulated combat conditions. The best place in the Marianas to conduct this training is the EMUA with its adjacent maneuver area, runway and helicopter landing zones. The beach landing sites at the EMUA have been compressed to the greatest extent possible, while still retaining enough area to meet the training objectives. Mitigation was proposed to limit potential impacts on natural and cultural resources at Unai Babui by AAVs and Unai Chulu by LCACs to levels that are not of significant magnitude. Subsequent evaluation of Unai Babui supports landings by CRRCs only.

However, present conditions at Unai Chulu and Unai Dankulo support LCAC landings. At present the Tinian Harbor boat ramp is too narrow for LCAC and noise and spray through the adjacent harbor area would be a concern. The harbor is suitable for administratively landing personnel and equipment by LCU. The same ramp is suitable for AAVs carrying personnel from ship to shore. There is no intent to conduct tactical exercises in the harbor area and disrupt San Jose's day-to-day routine. Any landing activity and movement through the town to reach the MLA will be coordinated with Tinian municipal authorities to minimize any potential impact.

4.3 Comment: Document the underwater topography at Unai Babui and compare to the preferred gentle slope shown in Appendix B figure.

Response: See Appendix C5 of the FEIS, which includes two pictures of the spur and groove at the reef face. The report for Unai Babui that depicts a gentler slope was developed with CRRC landings as the focal point and provided a slice of the reef rather than a depiction of a wide lane. Regardless, Unai Babui is no longer recommended for AAV landings.

The one beach on Tinian that is similar to the conceptual slope illustrated in Appendix B is Kammer Beach, and it is no longer recommended as an AAV landing site.

4.4 Comment on p 2-12: Clarify which AAV approach configurations will actually be used in the Preferred Alternative, and remove discussion or reference to other configurations.

Response: The issue of AAV landings in single file at Unai Babui is no longer part of the preferred alternative.

4.5 Comment: The DEIS should defend the need for an approach lane (22 m) five times the width of the AAV (11 ft) and AAV (15 ft).

Response: This subject was discussed with your staff in October 1998. The recommended lane width was reduced to 15 meters. The March 1999 survey failed to identify a 15-meter portion of reef face that would guarantee avoiding spurs and grooves when the AAV touches down. It is possible for the vehicle to make contact with only one track, lose positive steering control and potentially broach in the surf zone. Damage to coral on the reef face by impacting the coral at the vertical face of a groove is also possible.

4.6 Comment: DEIS erroneously states that coral at Unai Babui is of poor quality. Eliminate all subjective statements that cannot be supported with qualitative [sic] data.

Response: The FEIS will reflect that coral cover in the area potentially exposed to damage by AAVs is sparse (less than 10 colonies per 100 square meters) vice poor in quality, and that diversity of the species present is low. Survey findings, including quantitative information, are contained in Appendices C-1, C-2 and C-5.

4.7 Comment: Provide criteria for terms "abundant, common, occasional, and rare" in the Marine Research Consultants report on coral cover determinations.

Response: The terms "abundant, common, occasional, and rare" are used in the Marine Research Consultants report to describe relative abundance of individual species of corals, not coral cover. Coral cover is expressed in quantitative (percentage) terms in the report. For this report, the words "sparse" and "rare" describe coral present in less than 10 colonies per 100 square meters; "occasional" refers to a density of approximately 10 to 25 colonies per 100 square meters; "common" refers to a density of 25 to 50 colonies; and "abundant" refers to more than 50 colonies. This definition has been footnoted in Chapter Two when first describing the Unai Babui reef's coral cover as "sparse."

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4.8 Comment on p 4-3: Definition of significant impacts to coral reef is inconsistent with the Executive Order (EO) on Coral Reefs. Consider removing statement that loss of 1% of total island coral reef or 5% of substrate is "allowable loss."

Response: The significance criterion will be revised in view of the EO, which was published as the DEIS was going to press. The revised criterion will be based on the potential for the action to degrade the condition of the coral reef ecosystem, with regard to NEPA significance considerations such as scale of the effect relative to the resource affected, detriment to natural functioning of the ecosystem, and detriment to human uses of the natural resource. Table 4-1 will reflect a short version of this criterion.

By eliminating Unai Babui from consideration, and after observing LCAC operations at Unai Chulu, the potential for damage to Tinian's beach coral is remote.

4.9 Comment on p 2-38: State that CNMI agencies will be responsible for determining whether significant impacts have occurred, either by direct observation or by review of military's survey reports.

Response: The Navy has the responsibility for managing natural resources on lands and waters within its control, and thus is the responsible agency for making determinations of significance. However, the Navy fully recognizes the interests of CNMI, as well as those of other federal agencies, in the management of natural resources. Participation by qualified representatives of DEQ in the process of evaluating the effects and significance of military activities on natural resources did occur during Tandem Thrust 99 and is welcomed. When a similar coral survey is conducted at Unai Dankulo, CNMI representatives will again be asked to participate in the pre-, during, and post survey evaluations. In that regard, natural resource managers from COMNAVMARIANAS will initiate a planning dialog with counterparts at CNMI to develop long-term monitoring and evaluation protocols, as well as to discuss potential funding for resource protection activities in mitigation of potential impacts.

4.10 Comment on p 4-8: Beach survey protocols must be approved by DEQ as well as by DFW.

Response: The beach survey protocols for Unai Chulu and Unai Babui were provided to CNMI for comment and both DEQ and DLNR participated in the survey. If a protocol is developed for Unai Dankulo, it too will be forwarded to DEQ and DFW for review, comment, and participation.

4.11 Comment on p 4-9: Prior to removing any "movable live coral," the military must submit a coral transplant plan for approval by DEQ and DFW; the transplant plan should be incorporated in the FEIS. Clearly state that the AAV approach lane must be marked during an exercise.

Response: The Navy is pleased to receive input from concerned CNMI agencies regarding the development of a coral transplantation plan. However, as the agency with responsibility for

the natural resources on lands and waters under its management, ultimate decisions regarding such plans remain with the Navy. With Unai Babui no longer preferred, the proposal to move live coral is no longer necessary.

4.12 Comment: In reference to our letter to the Director of Fish and Wildlife, dated 28 July 1998, and the comment and response therein pertaining to potential damage to corals at Unai Babui due to AAV landings, revise the DEIS to state the degree of coral damage expected and to state that all involved CNMI agencies will be involved in the consultation process.

Response: This issue no longer remains since AAV landings will not be recommended at Unai Babui.

4.13 Comment: In reference to our letter to the Director of Coastal Resources, dated 20 May 1998, and the comment and response therein pertaining to mitigation for potential impacts of AAV landings at Unai Babui, the DEIS should include information on who would identify potential coral seed stock, when transplantation would occur, and whether this is a viable alternative. State that CNMI agencies will be consulted regarding development of alternative compensatory mitigation activities.

Response: Coral transplantation has been shown to be a viable procedure for re-growing coral under favorable conditions. The Navy would work together with CNMI and USFWS to identify potential coral seed stock for eventual planting at agreed-upon locations on Tinian. Following our collective evaluation of the impacts of landings under the preferred alternative, should we agree that this mitigation measure is appropriate, the Navy would cooperate with qualified scientists at the responsible agencies in developing a viable plan for coral transplantation. The immediate need to compensate for impacts to Unai Babui no longer exists.

4.14 Comment: Discuss impacts of LCAC vibration and intense air pressure on coral and fish resources.

Response: The Navy study to evaluate the impacts of LCAC operations at Unai Chulu will be included in the FEIS as Appendix C-5. A comparison of pressure impacts by LCAC operations, ocean conditions and human presence on reefs is included. In addition, CNMI officials have now had an opportunity to observe LCAC landings and to draw their own conclusions regarding impacts.

4.15 Comment: Discuss how increased turbidity from LCAC jets can be monitored and mitigated. Analyze whether a single beach could be used for both LCAC and AAV landings, rather than different beaches.

Response: LCACs do not use water jets for propulsion. Lift fans beneath the craft provide the lift off of the water's surface. Large enclosed propellers on the craft's rear deck provide

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forward momentum The turbidity generated by LCACs landing or departing is a short-term, temporary effect. Observers from DEQ and DFW had an opportunity to observe LCAC operations during Tandem Thrust 99. Typically, these beaches are subject to strong, periodic wave action, which generates comparable or greater turbidity under natural conditions. Repeated landings across shallow coral beds in Kaneohe Bay, Hawaii that experiences much calmer tidal action have not caused significant impacts to coral. It is not anticipated that the turbidity generated during LCAC landings at Unai Chulu is likely to have any noticeable impact on corals and no monitoring or mitigation is required.

It would be ideal to have a single beach that could support LCAC, LCU and AAV landings and each proposed beach site was evaluated with this goal in mind. Unai Chulu was selected for LCAC operations as it has the necessary beach characteristics for air-cushion craft, but its offshore reef platform would impede an LCU from reaching the beach and AAVs would damage the coral from the reef to shore. Unai Babui was considered for use by tracked landing vehicles. In comparison to other EMUA beaches, it has a low density and diversity of coral and is less susceptible to damage from the tracks on the reef flat. However, Unai Babui is not suitable for LCAC operations because of inadequate beach width and depth to allow the craft to come fully on shore before coming off cushion. Unai Dankulo has ideal slope and beach dimensions for LCAC landings and its protective reef is now devoid of once abundant coral. LCACs can cross the reef without damage but would block an LCU from beaching and would be impacted by AAVs. Only Kammer Beach has the characteristics that could support all types of craft and the AAVs, but this beach is no longer considered to be a viable site for military training. See Figures 4-1 and 4-2 for a comparison of the coral substrate present at Unai Babui and Unai Chulu.

5. Firing Range on Tinian and FDM

5.1 Comment: DEIS should include plan for lead shot collection (on Tinian) for review and approval by DEQ. Discuss whether birds ingest small stones and what would prevent them from eating lead pellets.

Response: The small arms fire-and-maneuver range will not be constructed. No lead shot collection at outdoor target sites will be necessary. The lead shot stopped by bullet traps is collected and hauled away with the expended brass by the training unit. See Section 4.2.2.4.

5.2, 5.3, and 5.4 Comments on p 3-2 and Table 1-3: Verify reference on groundwater aquifers on Tinian. Discuss how firing range will comply with CNMI water quality regulations and will ensure that seawater and groundwater do not become contaminated with lead or copper. The DEIS should include a plan for obtaining baseline samples of soil and water quality at the vicinity of the firing range.

Response: The ranges will not be constructed; there will be no effects on groundwater from lead shot and copper. Groundwater aquifers on Tinian have not been definitively mapped. Prior to determination that the proposed ranges would not be built, the source for groundwater aquifer information was the 1960 publication *Military Geology of Tinian* (Doan et al.) This reference indicates that the northern section of Tinian (North Field south to Sabenetan Mahgpan) may support a second Ghyben-Herzberg aquifer distinct from the aquifer in the southern portion of the island. Lake Hagoi was believed to intersect the horizontal boundary between the thin freshwater lens and underlying brackish water.

Recently, the US Geological Survey has indicated that the two aquifers may be hydraulically connected (Yeatts, 1996). Mr. Yeatts was contacted and has confirmed that there is no documentation of groundwater patterns in northern Tinian. The lack of groundwater flow models precludes a definitive assessment of the impact of contaminants in the northern aquifer upon the central aquifer, and vice versa.

5.6 Comment on p 1-19: DEIS should include detailed site-specific investigation and cleanup plans of military facilities.

Response: Investigation and cleanup of possible contamination resulting from World War II activities or from other non-training-related activities are not within the scope of this EIS with one exception: existing contamination that may impact training personnel or have cumulative effects with any contamination resulting from training. The DEIS analysis shows that contamination is not expected to result from the proposed action.

Our source of information is the Environmental Baseline Survey (EBS) for Tinian published in February, 1997, which provides a comprehensive environmental survey of areas that are or were recently leased by the United States for military training. Site reconnaissance, interviews, and documents searches performed for the EBS identified 76 sites for investigation. Of these, 46 sites were recommended for additional remedial action or evaluation, eleven of which are sites associated with World War II ordnance. The source of other contamination is primarily World War II activities or agricultural practices (e.g., pesticide soil contamination by civilians). The EBS documents site locations in the EMUA, Leaseback Area (LBA), released and surrounding areas. Some remedial action or removal has occurred, but the process is not complete. A list of ordnance items removed from Tinian since 1988 is included as Appendix E to the EBS.

5.7 Comment on p 2-14: Explain whether the former small arms range has been remediated in accordance with EPA requirements.

Response: The former weapons range north of Unai Chiget has been fenced and posted to prevent exposure to potentially dangerous unexploded ordnance. Management of this former range will continue in accordance with Navy policy for inactive weapons ranges.

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5.8 Comment on p 2-44: DEIS must include a full SOP for cleanup of FDM.

Response: FDM is an active range. There is no requirement to prescribe a clean-up plan for FDM at this time.

5.9 Comment on p 4-5: DEIS must include a fuller discussion of potential contamination from small arms ammunition, in reference to articles by Mackay 1991 and the Formerly Used Defense Site program literature.

Response: The proposed fire and maneuver range is no longer in the Preferred Alternative for Tinian training.

5.10 Comment on p 2-15: DEIS should explain lack of cleanup of previous range and rationale for additional range on Tinian when a similar range exists on Guam.

Response: The former weapons range north of Unai Chiget has been fenced and posted to prevent exposure to potentially dangerous unexploded ordnance. Management of this former range will be in accordance with Navy policy for inactive weapons ranges. The proposed new fire and maneuver range (and mortar range) is not preferred. A fire and maneuver range is being developed on Guam.

5.11 Comment: If any explosive ordnance is planned for use on Tinian, provide a full discussion of UXO procedures in the DEIS.

Response: No explosive ordnance is planned for use on Tinian. Removing the mortar range as a component of the Preferred Alternative has eliminated the potential for 60mm dud rounds.

5.12 Comment: Add discussion of public safety issues from UXO accumulating in land and waters of FDM.

Response: The FEIS will expand the discussion of public safety issues, with additional information gathered during the October 1998 visit with your staff as one source. The accumulation of UXO on FDM presents significant hazard to anyone who goes onto the island. The fact that FDM is relatively difficult to visit by virtue of its distance from populated islands and its rugged, cliff-lined coast mitigates this hazard. However, some history of unauthorized visitation does exist regardless of the dangers. The waters immediately adjacent to the island are known to contain UXO that could pose a hazard to fishermen, especially from net fishing. This area is not open for fishing, and repeated notification of its closure is required within the fishing community.

After reviewing this safety issue with your staff and the possibility of using multilingual warning signs, we do not support posting such signage on FDM proper. The signs could draw fishing

boats in even closer, and would be difficult to maintain. Instead we suggest the CNMI consider posting multilingual warning signs at Saipan's marinas advising that (1) Danger: FDM is a Naval Weapons Range used for Aircraft Bombardment and Naval Gunnery. (2) A 3-mile exclusion zone for your protection surrounds the island. (3) Notice to Mariners (NOTMARs) are printed in newspapers and broadcast on marine radio frequencies to announce the specific days when the range will be in use by the Navy or Air Force. The best way to ensure that this precaution is accomplished may be sponsorship by the Emergency Management Office and Saipan's boating community.

We appreciate the time and effort by your staff to assist in the development of the FEIS. Should you have any questions regarding our responses to your letter, please contact the undersigned at (808) 471-9338, by facsimile at (808) 474-5909, or by E-Mail at UeharaSY@efdpac.navfac.navy.mil.

Sincerely,

Stanley Uehara

STANLEY UEHARA
Director
Environmental Planning Division
Acting

5. CNMI Coastal Resources Management

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Department of Lands & Natural Resources
Coastal Resources Management
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COASTAL RESOURCES MANAGEMENT
TELS:(670) 2344623/7239
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September 25, 1998

Mr. Stanley Y. Uehara, Acting Director
Environmental Planning Division
Pacific Division
Naval Facilities Engineering Command
(Makalapa, HI)
Department of the Navy
Pearl Harbor, HI 96860-7300

Dear Mr. Uehara:

Please refer to 5090P.1603 Ser 231/.2972 11Aug. 1998, Draft Environmental Impact Statement (DEIS), Military Training in the Marianas, U. S. Pacific Command, June 1998.

As a Division of the Department of Lands and Natural Resources, we have coordinated with that Department in the preparation of comments on the above referenced DEIS.

We are enclosing a copy of these comments for your review. We look forward to working with the Navy in the resolution of these concerns and in the preparation of your final DEIS.

If we can be of further assistance, please do not hesitate to contact this office.

Sincerely yours,

PETER J. BARLAS
Acting Director

cc: DLNR Secretary

The Commonwealth of the Northern Mariana Islands (CNMI) Department of Natural Resources appreciates the opportunity to comment on the Draft Environmental Impact Statement for Military Training in the Marianas. The Department has the following general and specific comments on the document.

General Comments

The Preferred Alternative of the DEIS proposes landing LCACs at Tachogna beach (Figure 2-1a). The CNMI Legislature has recently drafted legislation designating the areas between Puntan Diablo and Southwest Carolinas Point as a marine reserve (see attached legislation). This area includes both Kammer Beach and Tachogna Beach. The Act designating this reserve prohibits activities which are destructive to the marine and historic resources in the area. The DEIS states that LCACs may create a surge wave capable of breaking coral in shallow water. This wave has the potential to impact both reefs and archeological resources. In addition, LCACs offload wheeled and track vehicles onto the beach. The Department of Natural Resources, which is authorized to implement the marine reserve legislation, has determined that landing of LCACs at Tachogna Beach is incompatible with the intent of the legislation designating these areas as a marine reserve. Therefore, use of landing craft at Tachogna Beach is prohibited.

The section on the Purpose and Need for training in the DEIS is significantly improved over the January 1997 draft. However, it is still lacking in several areas. This section states that Tinian is the only area suitable for maneuver training of a MEU, and it indicates that such training is essential for combat readiness. Since AAVs have not been previously used during training activities on Tinian, this essential training must currently be conducted elsewhere. The DEIS contains no discussion of why areas where this training is currently being conducted are no longer viable. Such discussion is crucial for a justification of why this activity, which will have permanent environmental impacts, should be allowed on Tinian.

The CNMI is very concerned that proposed increases in type and frequency of training activities on Tinian are the result of Base Realignment and Closure (BRAC) decisions made regarding other military training lands. The CNMI does not believe that the purpose of BRAC is to transfer military activities from lands that the military owns and for which it has management and environmental protection responsibilities, to lands which the military only leases and therefore does not have responsibility for managing and protecting. In the final Natural Resources Management Plan, Military Lease Area, Tinian (June 1997), the Navy recognizes that the land ownership situation in the Military Lease Area (MLA) on Tinian creates difficulties regarding the management of natural resources. As a result, this document does not identify the specific responsibilities of the Navy for natural resource management in the MLA. Instead, it suggests identifying shared management responsibilities for Navy, CNMI and other Federal

agencies. The CNMI is concerned that the Navy is using the fact that the land on Tinian is only leased, rather than owned, by the military as a way to circumvent responsibility for adequately protecting the resources of the MLA at the same level that it would be required to protect resources on property that the Navy owns

Reinforcing this concern is the fact that the DEIS does not include pre- and post-exercise surveys to assess the impacts of the exercises on the environment. The one exception to this is the proposed survey to assess the impacts of AAV landings on coral and marine health. These surveys were included only because they were specifically required by the CNMI Division of Fish & Wildlife and Division of Environmental Quality in meetings held to discuss agency comments on the January 1997 DEIS. Notably absent from the current DEIS is a proposal to continue conducting bird surveys on FDM, or to initiate regular marine surveys on the reef surrounding FDM. The DEIS acknowledges that lack of historic and long-term data on both seabird populations and coral reef status make it difficult to determine whether the bombing has had an impact, however, it does not suggest gathering this information to determine trends in the future. In addition, although both the CNMI Division of Fish & Wildlife and the Division of Environmental Quality have requested that the Navy monitor the impact of the proposed new small-arms firing range, the Navy has refused to even consider this request.

The existing inactive firing range on Tinian, which the Navy originally considered re-opening and then decided to close because it is contaminated with UXO and is not safe personnel use, was until recently neither fenced nor marked by warning signs of any kind. It is adjacent to a blow-hole which is visited by both tourists and residents, and, as the DEIS points out, local residents currently go onto the range to collect medicinal plants (page 4-30). It is unlikely that a UXO contaminated firing range would have been allowed to exist unmarked and unfenced for three years or more on a military installation. Prior to considering the opening of a new firing range in the EMUA, the Navy should present its plans for addressing the contamination on this existing range.

Finally, the DEIS does not contain a discussion of the cumulative impacts from use of the MLA for live weapon firing activities. NEPA defines cumulative impact as "the impact on the environment which results from incremental impacts of the action when added to other past, present and foreseeable future actions" (40CFR1508.7). The DEIS indicates that there is an existing firing range in the EMUA that is not being re-opened due to "design concerns." This range has not been officially closed by the Navy, nor has it been investigated for remediation. The DEIS proposes to open a new small-arms fire and maneuver range adjacent to the existing range. This would appear to be an area where cumulative impacts from past use of the existing range in combination with present and future use of the proposed new firing range are likely to be significant and therefore should be discussed in the DEIS. Mitigation should address both the proposed new firing range, and impacts from past use of the existing range, since the latter issue has not been addressed in previous environmental documents prepared by the Navy.

Specific Comments:

Executive Summary; Section 2.0 Proposed Action and Alternatives

"The Preferred Alternative excludes the security gates, mortar range, and *one* of the AAV landing beaches" (page ES-4). According to Figure 2-1a and the text, both Unai Lamlam and Unai Chulu have been excluded from the preferred alternative as options for AAV landings

"On Tinian, the Preferred Alternative is essentially the No New Action alternative with the addition of AAV landings.." (page ES-6). In fact, the DEIS Preferred Alternative includes several new actions for Tinian in addition to AAV landings, including: configuration of a fire and maneuver range, construction of one or more shooting houses, addition of an LCAC landing site (Tachogna Beach), and construction of a permanent field camp facility. In addition, the DEIS dramatically increases the frequency of training that will take place in the EMUA. This latter issue is not directly discussed anywhere in the text with regard to its potential impacts

Table ES-1

Table ES-1 Preferred Alternative Training Land Use indicates that LCUs are planned for use in the EMUA on Tinian. Neither the text nor Figure 2-1a indicates this proposal. This table also indicates that use of 40mm grenades in the EMUA is included in the Preferred Alternative. This latter item should be clarified to indicate that only training projectiles will be allowed in the EMUA as stated in the text.

Section 1.2.3 Purpose and Need for Specific Training

"Tinian is the only training area in the region suitable for maneuver training of a MEU." If this is the case, and since this training has not been previously conducted on Tinian, one must assume that a) the training is not being conducted elsewhere, and therefore is not actually essential, or b) the training is currently being conducted elsewhere, in which case a justification should be made for why the current location is no longer viable.

Section 1.2.4.2 Alternative Training Locations Outside the Region

"Movement of forward-deployed forces back to Hawaii for training is estimated to double fuel costs for U.S. Seventh Fleet organizations." It then stands to reason that it would reduce costs for CONUS based and Hawaii/Alaska based forces because of the lower transit time. Section 1.2.1 indicates that I MEF and the U.S. Third Fleet, which provide the Amphibious Ready Groups, are both CONUS based. These forces must pass Hawaii on their way to the Marianas. This section does not provide sufficient justification for why new AAV landing areas must be provided on Tinian for these forces, especially when landing sites exist or are proposed for Guam.

1.3.2 DoD Lands in the Marianas

"The BRAC release affects but does not eliminate training conducted at the Waterfront Annex and Ordnance Annex." The DEIS should address all military activities that are being affected by BRAC decisions and discuss how these decisions influence proposed increases and changes in training activities in the Marianas. The DEIS should specifically discuss situations in which BRAC decisions are influencing decisions to transfer training activites from one area to another, or where specific military lands have been removed from consideration for training.

Section 1.5.1.3 Screening Process and Issues Discarded from Detailed Consideration

"All military lands proposed for training are currently under investigation for potential contamination and/or undergoing site remediation." According to information available from the CNMI Division of Environmental Quality, there are no investigations or remediation activities being conducted or proposed for Tinian or FDM. Past contamination that is not being investigated or proposed for remediation should be included in the discussion of the cumulative impacts of the proposed actions. This should include, for example, the existing contamination on

the inactive firing range in the EMUA which has not been addressed in previous environmental documents prepared by the Navy.

Section 2.1.2 Range of Alternatives
"Reduced Land Use is, in effect, the preferred action alternative proposed." This statement makes no sense. The DEIS presents the No Land Use/Reduced Land Use and Preferred Alternative as two distinct alternatives. If this is not the case, they should not be stated as such. NEPA requires assessment of all viable alternatives. It is not the intent of this requirement that an agency create unrealistic or overlapping alternatives that cannot be compared and evaluated on their respective merits.

The range of alternatives in this section is different than that in Section 2.8 Comparison of Alternatives. Why?

Section 2.2 Proposed Alternative
"The Preferred Alternative for Tinian is to allow all activities except the mortar range and certain amphibious vehicle landings." Compare this with statements made on pages ES-4 and ES-6, with page 1 and 2 of Table ES-1, and with Figure 2.1a. Which of these pages accurately describes the Preferred Alternative?

Section 2.2.3.1 Description of Amphibious Landing Training
"Mitigation of impacts to coral consists of.....limiting AAV landings to a single approach lane at a single beach." Appendix B indicates that the AAV is only 3.25m wide, however, the proposed approach lane is 22m wide. Appendix C-1 indicates that Unai Babui is only 25m long. It is not clear how limiting landing to an area almost seven times the width of a AAV, and almost the entire width of the beach, qualifies as mitigation. In order to be considered as mitigation, the proposed landing corridor should be no more than twice the width of the AAV, or 6.5m wide.

Section 2.2.3.2 Possible Amphibious Landing Training Sites
Tables 2-1 and 2-2 present information used to evaluate beaches for amphibious vehicle landings on Tinian and Guam, respectively. Kammer Beach, on Tinian, is recommended for landing of all amphibious vehicles. Table 2-1 indicates that Kammer Beach is approximately 10 km from the EMUA or maneuver area. It does not indicate that the roads used to reach the EMUA transit residential areas in San Jose. Table 2-2, by contrast, indicates that Tipalao Beach on Guam is adjacent to military family housing. No proposal is made to transit this area with AAVs. The Navy should give equal consideration to residential areas both within its bases and outside.

Use of LCACs is planned for Unai Chulu, Unai Dankulo and Tachogna Beach. The DEIS states that there is potential damage to the coral reefs at these beaches if the LCAC creates a surge if caused to move slowly. This action can displace large rocks and break off coral heads. It has been documented by the CNMI Division of Fish & Wildlife that these three beaches harbor the highest densities of sea cucumbers on Tinian, and are composed of significant coral reef growth. The presence of spatial heterogeneity is essential to the existence of diverse faunal assemblages. Mitigation for any significant damage to these areas has not been adequately addressed.

Section 2.2.4 Live Fire Ranges on Tinian
"Both ground and aviation units.....use blank ammunition during field exercises, and use live ammunition on known distance and fire and maneuver ranges located on military installations" (page 2-14) The MLA is under long-term lease to the U.S. Navy, however it is not a military

installation. Since this section indicates that use of fire and maneuver ranges is not part of field exercises, and since existing fire and maneuver ranges are located on military installations on Guam (e.g. Waterfront Annex), the DEIS has not provided adequate justification for development of a new fire and maneuver range on Tinian.

Section 2.6.1 Bombardment of FDM (Navy Range 7201)
Under the Impacts and Mitigation portion of this section, no mention is made of the potential impacts to marine resources. A single, qualitative, survey of the marine environment surrounding FDM was conducted in July 1997. The September 1997 report from the National Marine Fisheries Service (Appendix D-16) and the November 1997 report from the CNMI Division of Fish & Wildlife (Appendix D-19) both indicate that it was not possible from this single survey to determine whether loose boulders and scarring of the reef around FDM were a result of aerial bombing (see pages 7 and 6 respectively). In addition, the marine survey of FDM represents a single data point from which it would be impossible to determine trends or long term impacts to fish and abundance and coral cover. Time series data must be collected before conclusions regarding the impacts of bombing exercises can be made. A yearly marine survey of the nearshore waters of FDM must be undertake to determine trends in fish abundance and coral cover, and to assess whether these trends can be linked to impacts from Naval bombing events.

Section 2.6.3 Cumulative Impacts on FDM
See comments under 2.6.1.

Section 2.8.1 Comparison of Tinian Alternatives
This section states that battalion-sized maneuvers are "not feasible on Guam because of insufficient land area available for training" (page 2-38). Table 2-1 indicates that there is a total of 36.92 km^2 of land within the EMUA on Tinian, of which 60 percent, or 14.77 km^2 is available for full training use (Table 2-4). In contrast, Anderson Air Force Base (including the two communications annexes) on Guam contains 44.16 km^2 of "largely undeveloped land" (page 2-29) available for full training use, the Ordnance Annex on Guam contains 17.89 km^2 of "mostly undeveloped land" (page 2-25) available for full training use, and the Waterfront Annex on Guam contains 14.5 km^2 of land available for full training use. It is not clear how the Navy reached the conclusion that Guam does not contain sufficient land for training.

"This alternative would allow destruction of some coral by AAV's landing at a single beach with approximately one percent of live coral coverage on its reef flat" (page 2-38). This statement does not adequately reflect the actual damage that the AAVs will cause to the reef at Unai Babui. In previous sections of the DEIS, the AAVs are described as coming into contact with the substrate at a depth of 1.8 (page 2-11) to 2 (page 1-8) meters (5.9 to 6.6 feet). The qualitative evaluation of the reef at Unai Babui prepared by Marine Research Consultants in September 1996 states that "(c)oral cover is ten percent or less on the reef margin, which extends approximately ten meters beyond the reef flat. Water depth at the reef-flat margin is approximately three to six feet deep." This report goes on to say that "(a)s at Chulu, coral growth at the spur and groove transition zone (at three to six feet deep) is considerable and would be impacted by tracked landing vehicles" (Appendix C-2). The degree of damage will depend on the oceanographic conditions at the time of landing. This beach is subject to high energy wave action throughout the year save for brief periods of calm. If significant swell is evident at the time of landing, reef margin damage can be expected to be significant. The DEIS should address this with respect to proposed mitigation.

"The environmentally preferred alternative is the Preferred Alternative, as it does not generate any significant impacts which cannot be mitigated" (page 2-38). Compare this to Section 1.2.3 which states that "(c)ertain training land uses have significant impacts which cannot be fully mitigated to nonsignificant..... These training land uses include: Amphibious assault vehicle landings at a beach within Tinian's Exclusive Military Use Area" (page 1-8). Compare this also to Table 2-11.

2.8.7 Preferred Alternative: Impacts and Mitigation

"The Preferred Alternative provides land areas to meet all the units' basic training requirements except.....Moving target ranges for LAV, AAV, and M1A1 tanks....These requirements must be met on the U.S. mainland or in Hawaii...." (page 2-45). This would appear to contradict the statements made in Section 1.2.4.2 which argue for addition of specific training activities in the Marianas because training areas in CONUS and Hawaii are not suitable. If moving target range training for AAVs can be conducted on the U.S. mainland or Hawaii, why can't all AAV training be conducted there? The statements in the DEIS are contradictory and do not allow for evaluation of the proposed actions.

"The Preferred Alternative will have one significant impact which can only be mitigated by compensatory mitigation: Bombardment of FDM is likely to harm, harass, or kill individual endangered or migratory birds" (page 2-46). The CNMI has requested, and is still requiring, compensatory mitigation for the permanent destruction of the coral reef at Unai Babui. The DEIS's proposed mitigation which limits AAV approach to a single lane, will not eliminate the destruction of the reef, even if this approach lane is reduced to a more reasonable width as specified in comment 2.2.3.1 above. Compensatory mitigation is appropriate in this situation where permanent, irreversible damage will occur.

Section 4.1 Impacts of Brown Tree Snake

From a review of this section, it appears that the Navy will do all that is possible to greatly reduce the risk of the transfer of Brown Tree Snakes from Guam to the CNMI. This includes storage of cargo in snake-free zones on Guam, sniffer dog inspection of cargo, and cargo quarantine in containment areas with snake-proof barriers on Tinian. While there is always a risk of snake introduction when any cargo is shipped out of Guam, the Navy is utilizing the most current technology with Wildlife Services of USDA to interdict snakes before cargo is released for use on Tinian and FDM.

Section 4.2.1.4 AAV Landings: Proposed Mitigation

Footnote 18 states that the coral cover at Unai Babui is 10 percent or less on the reef margin "approximately 10 percent of which is at a depth of 1.8 m or less" (page 4-9). It is not clear where this information came from, as it is not included in the report prepared by Marine Research Consultants included in Appendix C-2.

"The designated lane will be 15 to 22 m wide and 70 m long" (page 4-9). The lane for AAV landings should be no more that twice the width of the AAVs, or 6.5m wide. Any wider lane cannot be accepted as mitigation for impacts.

Section 4.2.1.6 Small Arms Range

"Proposed mitigation is to replant approximately 4 ha of tangantangan..."(page 4-11). The preferred habitat of the Tinian Monarch (*Monarcha takatsukasae*) is native limestone forest. Since Tangantangan is an introduced species, the CNMI is opposed to replanting of

Tangantangan as mitigation for any Tinian Monarch take. The Navy should mitigate by enhancing native limestone forest in an amount sufficient to compensate for the take at a 2:1 ratio.

Section 4.2.5.1 Existing Conditions at Existing and Proposed Range Area

The DEIS defines the Preferred Alternative as "continuing land uses plus several new training land uses" (page 2-2). Continuing land uses include the existing firing range which has never been officially closed by the Navy. Section 1.4 of the DEIS states that the "intent of this EIS is to evaluate currently ongoing environmental effects that have not previously been evaluated" (page 1-17). The existing firing range falls into this category. The Navy's plans for the existing firing range should be discussed with a description of the proposed mitigation for the adverse impacts resulting from the use of this range. These impacts also should be addressed in Section 4.2.5.2 Potentially Significant Impacts, since according to the Table 4-5 risk of injury from UXO is one of the Navy's criteria for significance. Finally, the existing firing range should also be addressed in a discussion of the cumulative impacts of the activities which caused the contamination of the existing range, and the proposal to open a new fire and maneuver range adjacent to the existing range.

Section 4.2.7.3 Proposed Mitigation

"The EMUA will not be closed for more than a total of 36 days (10 percent) of any calendar year" (page 4-40). This statement does not agree with statements made elsewhere in the DEIS. For example page 2-16 states "The range would be used .... by very large groups (150-500) for three weeks several times a year." Similarly, Table 1-1 indicates that two to three Amphibious Assaults of three-week duration will be conducted yearly in the EMUA. If closure of the EMUA is to be limited to 36 days, only five total weeks of time would be available for these activities. Even of training is conducted concurrently, this is not enough time for more than one three-week training activity.

Section 4.6.1.2 Potential Impacts of FDM Aerial Bombardment and Naval Gunfire and Proposed Mitigation

"UXO is found throughout the island" (page 4-68). Because of the danger presented by unexploded ordnance, particularly cluster bombs, the CNMI feels that it would be appropriate for the Navy to post warning signs on the island. There have been several instances of people going ashore and camping. Clearing marking the island as off-limits with signs posted at the most likely landing areas would help prevent injury or death.

"Several bird species utilize the shrubby vegetation, bare/grassy areas, or caves for nesting on the island." Because of the potential impact from bombing activities on nesting birds, the Department proposes that the Navy use the area for bombing only during the non-nesting season.

"There is little evidence of coral destruction as a result of bombing activities" (page 4-70). This statement is not supported by the single marine survey conducted in November 1997. This survey provided a single data point from which it is impossible to extrapolate any trend in coral abundance or decline as a result of bombing activities.

"There was no apparent correlation between coral development and areas of presumed exposure to terrageneous sediment plumes." The marine survey conducted in November 1997 was a "qualitative" survey. No data from which to evaluate a correlation were collected, and the Department is not aware that any correlation analysis was conducted. Therefore, it is not

surprising that correlation was not found. This does not, however, mean that a correlation does not exist.

This section does not indicate that the Navy intends to continue to conduct avifaunal and marine surveys for the purposes of determining the impacts of proposed bombing activities. It is not clear how the Navy intends to evaluate the impacts of its actions without such surveys.

This section does not address compensatory mitigation for seabird mortality caused by the bombings. The CNMI Division of Fish & Wildlife has responsibility for protection of these natural resources. Section 2.8.7 indicates that bombardment of FDM which is likely to "harm, harass, or kill individual endangered or migratory birds" can only be mitigated through compensatory mitigation (page 2-46). The DEIS should indicate the Navy's intention to discussion compensatory mitigation for seabird takes with the CNMI Division of Fish & Wildlife.

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27 MAY 1999

Mr. Peter J. Barlas
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Dear Mr. Barlas:

Subj: REVISED DRAFT ENVIRONMENTAL IMPACT STATEMENT (DEIS)
MILITARY TRAINING IN THE MARIANAS

Thank you for your letter of September 25, 1998, forwarding the comments provided by Dr. Joaquin Tenorio and the Department of Lands and Natural Resources concerning the subject DEIS. This letter provides responses to the comments and concerns addressed in your letter.

General Comments. (The references are to the numbered paragraphs of your letter.)

a. Comment: *Paragraph 1*: The use of landing craft at Tachogna Beach is prohibited, as the area is likely to be made a marine reserve and as Landing Craft Air Cushion (LCAC) may disturb coral and may offload wheeled and tracked vehicles.

Response: The analysis regarding the *proposal* to land LCACs at Tachogna Beach will remain in the Final EIS (FEIS), but the document will clarify that such landings are no longer *preferred* since the beach has been designated for preservation as a recreation beach. The same decision will be noted in the FEIS regarding Kammer Beach initially proposed for Assault Amphibian Vehicle (AAV), Landing Craft Utility (LCU) and LCAC landings, but also designated for preservation as a recreation beach.

b. Comment: *Paragraph 2*: Enhance the purpose and need to further clarify why areas currently used for Marine Expeditionary Unit (MEU) maneuver training and AAV landings are no longer viable. It is clear that such training must have occurred elsewhere, as it is described as essential but has not occurred on Tinian in the past.

Response: The purpose and need for MEU tactical maneuver training in conjunction with amphibious landings is documented in Chapter 1. Marine Corps forces assigned to U.S. Pacific Command, to include Navy and Marine amphibious forces, have been using the Military Lease Area (MLA) for training on Tinian for many years, including participation in Tandem Thrust exercises in 1993, 1995, and 1999. Therefore, the training requirements and most of the training sites are not new.

c. Comment: *Paragraphs 3 and 4*: The CNMI is concerned that, as a result of Base Realignment and Closure (BRAC), training is being moved from lands owned by the military to lands only leased by the military, where their responsibility for long term care-taking is less well defined and perhaps less enforceable. The DEIS does not provide for any pre- and post-exercise surveys, with the exception of amphibious landing beaches.

The DEIS fails to propose continued bird surveys of FDM or regular marine surveys for FDM, although it acknowledges a general lack of baseline data.

Response: BRAC decisions have not diverted significant training burdens from Guam bases to non-federal lands in CNMI. The Navy's responsibilities for management of natural resources on leased lands is not less than that on lands owned in fee. Tandem Thrust 99 was a good example of the extent of environmental monitoring that is conducted for all phases of the exercise from force buildup to force departure and area cleanup. The final EIS (FEIS) Section 4.6.1.2 will include the annual marine surveys for impacts to coral to be conducted at FDM. Bird surveys will continue on FDM under present protocols, as constrained by the presence of dangerous unexploded ordnance (UXO), which prevents military personnel who are not DoD explosive certified from landing on the island.

d. Comment: *Paragraph 5*: Prior to considering opening a new range, the DEIS should present plans for addressing existing UXO on the old range, which was only recently fenced and marked with warning signs.

Response: The Preferred Alternative has been revised to eliminate small arms and mortar range development on Tinian. The inactive small arms, mortar and rifle grenade range north of Unai Chiget will be managed in accordance with Navy policies to protect human health and the environment.

e. Comment: *Paragraph 6*: The DEIS should discuss cumulative impacts of the old and proposed new firing ranges. Mitigation should address both ranges, as the old range has not been addressed in previous environmental documentation.

Response: The proposed new firing range and mortar range is not included in the Preferred Alternative in the FEIS. Cumulative UXO impacts of the old range with the proposed ranges will therefore not occur.

Specific Comments: (References to paragraphs in the revised DEIS)

a. Comment: *Exec Summary Section 2, first comment*: Correct EIS to state that two (versus one) AAV landing beaches are excluded from Preferred Alternative.

Response: The FEIS will identify the beaches that were considered for AAV landings in the EMUA, and that Unai Babui is no longer preferred for AAV tactical landings in the MLA. The use of the boat ramp in San Jose's harbor is the preferred alternative for getting AAVs from ship to shore.

b. Comment: *Exec Summary Section 2, second comment*: It is not correct to state that the Preferred Alternative is "essentially the No New Action alternative with the addition of AAV landings." The Preferred Alternative includes new facilities and dramatically increased training frequency in the EMUA.

Response: Descriptions of the preferred alternatives have been edited for clarification. Any changes in frequency of training from the ongoing situation will be identified in Chapter One and Table 1-1. The preferred alternative does not dramatically increase training frequency but does clarify mitigation by establishing constraints such as No Training, No Cultural Resource Disturbance, and No Wildlife Disturbance. Reduced maneuver training is also proposed during Tinian Monarch nesting seasons.

c. Comment: *Table ES-1*: Fix inconsistencies with text regarding LCU landings in the EMUA. Clarify that 40 mm grenades in the EMUA will be training projectiles only.

Response: Table ES-1 has been edited and corrected to accurately portray the Preferred Alternative for Marianas training.

d. Comment: *Section 1.2.3*: Justify why AAV training areas used until this time are no longer viable and why Tinian is now needed for this training which was apparently not necessary on Tinian in the past.

Response: Unai Lamlam, Unai Babui, and Unai Chulu were invasion beaches in 1944 used by that era's amphibious tracked vehicle, the LVT. From the early 1950s, Tinian has been used for military training, and it is assumed that the earlier invasion beaches were available for use during training. Until the early 1980s, Kammer Beach was used for amphibious assault landings. The beach has the necessary width, lack of underwater obstructions, and suitable gradient for waves of displacement-hull landing craft (LCVPs, LCMs and LCUs) and LVTs. This is the beach that was heavily defended by the Japanese, expecting the U.S. invasion to occur in the south and not on the narrow beaches in the northwest.)

Today, military training is primarily confined to the MLA, with cross-country force-on-force maneuvers planned for the EMUA. The present day constraints to the use of Kammer and Tachogna Beach are recognized in the FEIS, and there is no desire to create socioeconomic impacts to San Jose by burdening its harbor as a tactical landing site. Minimizing damage to coral reefs eliminated some of the beaches in the MLA. None of the beaches were deemed

appropriate for the LCU, which is a large displacement-hull landing craft. Only Unai Babui and its sparse coral reef was proposed for use by the tracked amphibious assault vehicles (the AAV) used by the Marines for ship-to-shore movement and maneuver ashore. However, a recent site survey held out little promise that Unai Babui could be used without risk to the AAV and possible damage to the reef face. AAV landings at Unai Babui are no longer preferred.

The LCAC is an air-cushioned vehicle that does not cause direct impact to submerged coral. Unai Chulu has been used successfully and Unai Dankulo is recommended as sites where the craft's use is appropriate without significant impact to coral.

As a balanced air-ground-logistics team, the MEUs must train with all assets, using its helicopters, landing craft and AAVs for ship-to-shore movement of the assault waves, and relying on the AAVs for cross-country mobility. To conduct more realistic training at the EMUA, the AAVs must get ashore. After a thorough environmental evaluation of all beaches, the FEIS identifies the Tinian Harbor as the only alternative available to LCUs and AAVs. LCAC landings are preferred at two beaches [Unai Chulu and Dankulo (with vehicle offload and beach exit at Long Beach One)].

e. Comment: *Section 1.2.4.2*: If cost of fuel is truly a consideration, then it should be more cost effective for CONUS-based groups (I MEF and US Third Fleet) to train in Hawaii than in the Marianas. Justify why these forces need Tinian for AAV landings, especially when sites exist or are proposed on Guam.

Response: CONUS-based units have been scheduled to train in Hawaii as well as in the Marianas during their transit to and from the Western Pacific and Indian oceans. The exception to training while transiting is the Tandem Thrust exercises with organizations that deploy to and from Alaska and Hawaii to train as part of a Pacific Command joint/combined task force. Section 1.2 of the EIS explains the requirement for training in the Marianas Islands, including the advantage of being able to conduct proficiency training and remain within adequate response sailing times to possible contingency areas. Section 1.3 of the FEIS describes training area characteristics and alternative training locations in this region. Training on Tinian does not eliminate maximizing training opportunities on Guam in training areas that provide their own unique characteristics. The ultimate requirement for training in the EMUA is to land an amphibious force and conduct subsequent maneuver training in the vicinity of the landing area. While Guam has areas suitable for landing individual AAVs and LCACs, providing a certain level of training for individual crews, these areas do not afford the opportunity for subsequent maneuvers ashore. Guam does provide live fire training ranges, and serves as an alternative for range development on Tinian.

f. Comment: *Section 1.3.2*: Address impacts of specific BRAC decisions which require increased or additional training activities in the Marianas, particularly those requiring transfer of

training to the Marianas from elsewhere or those eliminating military lands as training areas.

Response: See the response in the General Comments section above regarding the relationship between BRAC decisions and military training.

g. Comment: *Section 1.5.1.3*: Contrary to the DEIS, CNMI DEQ indicates there are no investigations or remediation conducted or proposed for Tinian or FDM. Past contamination (especially UXO) should be addressed in cumulative impacts sections.

Response: An Environmental Baseline Survey (EBS) for Tinian was published in February, 1997, providing a comprehensive environmental survey of areas that are or were recently leased by the United States. Site reconnaissance, interviews, and documents searches performed for the EBS resulted in 76 sites for analysis. Of these, 46 sites have been identified for additional remedial action or evaluation, eleven of which are sites associated with World War II ordnance. The EBS documents UXO locations in the EMUA, LBA, released and surrounding areas. Some remedial action or removal has occurred, but the process is not complete. A list of ordnance items removed from Tinian since 1988 is included as Appendix E to the EBS. There is no cumulative UXO impact since the development of new ranges on Tinian is no longer a Preferred Alternative.

The former weapons range north of Unai Chiget has been fenced and posted to prevent exposure to potentially dangerous unexploded ordnance. Management of this area range will be in accordance with Navy policy for inactive weapons ranges.

h. Comment: *Section 2.1.2*: Statement that reduced land use is equivalent to the preferred alternative suggests alternatives are overlapping rather than distinct. Range of alternatives in this section is different from Section 2.8.

Response: The alternatives range from No Training through reduced levels, continuing as before, or maximizing training land use by adopting new initiatives. Although the No Training and Reduced Training alternatives are not preferred for any large training area, the concepts of identifying specific areas as "off-limits" or reducing training tempo during certain periods have been incorporated as constraints in the preferred alternative. The FEIS has been edited to clarify the description of alternatives and their suitability for training on Tinian, FDM, Guam and a few parcels of non DoD land authorized by the landowners for specific training activities.

i. Comment: *Section 2.2 Comment*: Consistently describe the Preferred Alternative in this section, the Executive Summary, Table ES-1, and Figure 2.1a.

Response: The text and figures throughout the FEIS will be made internally consistent. The Preferred Alternative for Tinian will include all ongoing activities and recommend Unai

Dankulo as an additional LCAC landing site. Other proposed new activities will not be recommended: the installation of permanent security gates; the construction of a shooting house or breacher trainer facility; development of a fire and maneuver range or a 60 mm mortar range; conducting AAV landings at Unai Dankulo, Unai Chulu, Unai Lamlam and Unai Babui. Tachnogna Beach and Kammer Beach are no longer preferred for amphibious landings by LCU, LCAC or AAV in recognition of their designation as major recreational areas.

j. Comment: *Section 2.2.3.1*: Given that Unai Babui is 25 m long and an AAV is 3.25 m wide, how does limiting the lane width to 22 m (almost 7 times the width of an AAV) constitute mitigation? The proposed landing lane should be no more than twice the width of an AAV.

Response: Given the authority to cross the beaches into the EMUA by lease agreement, and the requirement to find a site for AAV landings that would minimize environmental impacts, a decision made was to limit AAV training to one beach. Evaluating the possible landing points at Unai Babui determined that an area of about 22-25 meters at beach center would be suitable for landings without the vehicles crossing the nearshore reef in areas with abundant coral. A revisit to the beach confirmed that the landing width could be constrained to 15 meters recommending landings and launches at beach center in single file. However, another survey of the reef failed to identify a portion 15 meters wide at the point of touchdown due to extensive spur and groove formations. The beach is no longer preferred for AAV landings. See Appendix C-5 of the FEIS and Section 4.2.1.4.

k. Comment: *Section 2.2.3.2, first comment*: The Navy should give equal consideration to the impacts of AAV travel on roads in San Jose and in the Waterfront Annex. The road from Kammer Beach to the EMUA is all public.

Response: The Navy does give equal consideration to impacts of training on civilian activities. Using Unai Babui for AAV landings for EMUA entry would keep activities away from San Jose. Two decades ago, Kammer Beach was a routine training beach. Presently, the harbor is used for logistic support requirements. The traffic route from the harbor to the MLA will be along the island's west coast, avoiding most of San Jose proper. The majority of equipment brought ashore is rubber-tired trucks and Light Armored Vehicles (LAV). If the harbor was used to bring Marines ashore by AAV, the tracked vehicles could road march to the MLA. The tracked vehicles are equipped with rubber track pads so that they can travel on hard surface roads without digging into the road surface.

l. Comment: *Section 2.2.3.2, second comment*: Address impacts of LCAC landings on sea cucumbers and coral reef at Unai Chulu, Unai Dankulo, and Tachogna Beach. Further mitigation is required.

Response: Tachogna Beach is not included in the Preferred Alternative. See Section 4.2.1.3 and Appendix C-5 for the report of LCAC landings at Unai Chulu. Although sea cucumbers are not protected as threatened or endangered species under U.S. federal or CNMI law, there is a requirement on Tinian to obtain proper permits for commercial harvesting. However, a moratorium has been imposed on commercial harvesting.

LCAC landings will not cause significant damage to the sea cucumber population, since they will operate on an air cushion, and will thus avoid contact with these bottom-dwelling organisms. The experience at Unai Chulu seems to indicate that if the vehicle comes off cushion on the water line, or turns at the water line, some sea cucumbers will be displaced. The observed impacts to the Unai Chulu sea cucumbers during Tandem Thrust 99 were insignificant.

The Navy's marine survey conducted before, during, and after 14 reef crossing by LCAC during Tandem Thrust 99 is included in Volume Two, Appendix C-5 of the FEIS.

m. Comment: *Section 2.2.4*: Provide better justification for a new fire and maneuver range on Tinian, given that one exists on Guam.

Response: The proposed fire and maneuver range on Tinian has been excluded from the Preferred Alternative in the FEIS. Alternative ranges on Guam will be used.

n. Comment: *Section 2.6.1 and 2.6.3*: To adequately evaluate the effects of bombing on marine resources around FDM, an annual marine survey must be undertaken.

Response: National Marine Fisheries Service representatives have also recommended that annual marine surveys will be appropriate for monitoring the effects of bombing on marine resources at FDM, and such a protocol will be included as a mitigation measure in the FEIS (see Section 4.6.1.2).

o. Comment: *Section 2.8.1 first comment*: Explain why Guam does not contain sufficient land for maneuver training, given its large military holdings.

Response: Guam's military lands are used for a variety of purposes. COMNAVMARIANAS Waterfront Annex is designed to support the fleet and has very little open area suitable for maneuver. The Ordnance Annex is primarily designed for ordnance storage, which for obvious safety reasons restricts maneuver training. The two Communications Annexes are primarily antenna farms for receiving and transmitting stations. Andersen Air Force Base is designed for strategic and tactical aircraft support. The Northwest Field area has been made available for small unit maneuvers and flight operations. Andersen South is now excess property. All of these areas are constrained by natural and cultural resources, and no training

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areas due to safety concerns. Training is maximized on Guam's military lands, while remaining compatible with other designated uses and environmental constraints.

p. Comment: *Section 2.8.1 second comment*: More adequately explain potential impacts of AAVs on reef at Unai Babui, taking into account tide and swell conditions which may be present. Proposed mitigation must address these impacts.

Response: The impacts of AAVs on the reef at Unai Babui would result from the direct contact of the vehicles' tracks with organisms living on the reef. The potential for oceanographic conditions to influence this effect is due to the fact that navigational precision of the AAVs could be impaired by more severe sea conditions, reducing their ability to stay within the approved corridor. To mitigate potential impacts, landings under such severe conditions would not be conducted. The spur and groove reef face is of concern and AAV landings are no longer recommended at Unai Babui due to possible damage to the vehicle as well as potential damage to coral on a groove reef face.

q. Comment: *Section 2.8.1 third comment*: The DEIS is inconsistent regarding whether the Preferred Alternative will have significant impacts which cannot be mitigated on Tinian.

Response: Final decisions regarding the preferred alternative eliminated Unai Babui and potentially significant impacts to coral. All other potentially significant impacts from training activities are capable of and will be mitigated to nonsignificant levels.

r. Comment: *Section 2.8.7 first comment*: DEIS is inconsistent about whether various types of AAV training may be fulfilled in Hawaii or not. If AAV moving target training must and can be conducted in Hawaii, why can't all AAV landing training also be conducted there?

Response: The purpose and need for training in the Marianas supplements and sustains training levels already acquired before arriving in the Mariana Islands. The AAV units assigned to the Marine Expeditionary Units train at Camp Pendleton, California, Marine Corps Base Hawaii, Kaneohe Bay, or Okinawa Japan in preparation for their deployments. There is no proposal to develop a moving target range for tracked vehicle crews on any of the Mariana Islands.

s. Comment: *Section 2.8.7 second comment*: Compensatory mitigation must be proposed for permanent destruction of coral at Unai Babui by AAVs. Limiting approach to a single lane, even if the lane is much narrower, will not eliminate destruction of the reef.

Response: AAV landings at Unai Babui are no longer preferred.

t. Comment: Section 4.1: Navy is doing all that is possible to greatly reduce the risk of brown tree snake transfer to CNMI from Guam.

Response: The Navy will continue to work closely with the various federal, territorial and CNMI agencies that have been involved in improving brown tree snake interdiction and control measures.

u. Comment: *Section 4.2.1.4 first comment*: Where did the information in footnote 18 come from ("10 percent of which is at a depth of 1.8 m or less")? It is not in the Marine Research Consultants report.

Response: The wording of the first sentence of the footnote was unclear. The footnote has been deleted and description of the coral included in the text of Section 4.2.1.4.

v. Comment: *Section 4.2.1.4 second comment*: AAV lane at Unai Babui should be no more than twice the width of an AAV.

Response: A section of reef face about 15 meters wide would have been sufficient to land the vehicles in most sea conditions. Unfortunately, a suitable reef section was not found.

w. Comment: *Section 4.2.1.6*: Mitigation for cutting vegetation should be enhancing native limestone forest to compensate for the take at a 2:1 ratio.

Response: No vegetation cutting is anticipated for the revised Preferred Alternative, which no longer includes range development. The area that has been proposed for the fenced logistic support base is grassy and would involve no tree clearing.

x. Comment: *Section 4.2.5.1*: Navy's management plans for existing firing range should be discussed here an in 4.2.5.2, including proposed mitigation for existing UXO contamination. UXO contamination should also be addressed as cumulative impact from past use and proposed future use of new range.

Response: See previous comments regarding Navy management of the inactive range in accordance with Navy regulations. New ranges have been eliminated from the Preferred Alternative on Tinian.

y. Comment: *Section 4.2.7.3*: Maximum proposed EMUA closure (no more than 36 days per year) appears to be inconsistent with proposed use of EMUA.

Response: This estimate was made when live-fire ranges were proposed for development in the EMUA. Without these ranges the actual closure may be much less. Tandem Thrust 99

never closed off the entire EMUA to visitors even when North Field Runway One was used for landings, and Runway Two used for cargo drops. Tourists were still allowed access around the active aviation areas. Tandem Thrust 95 was a larger exercise involving up to 2,500 persons on Tinian over a 45-day period. Seldom was the entire EMUA closed, and a concerted effort was made to accommodate the tourists desiring to see cultural resources in the training areas. The FEIS will identify the need for the planning process to include coordination with the Tinian Mayor's office and affected commercial activities in order to reduce negative economic impacts caused by closing the EMUA to ensure public safety.

z. Comment: Section 4.6.1.2 first comment: FDM should be posted with warning signs, as people have gone ashore and camped on the island.

Response: After reviewing this safety issue with your staff and the possibility of using multilingual warning signs, we do not support posting such signage on FDM proper. The three-mile standoff distance is in effect at all times. The signs could draw fishing boats in even closer, and would be difficult and dangerous to maintain. Instead we suggest that CNMI consider posting multilingual warning signs at Saipan's marinas advising that: (1) Danger: FDM is a Naval Weapons Range used for Aircraft Bombardment and Naval Gunnery. (2) The island is surrounded by a three-mile exclusion zone for your protection. (3) Notice To Mariners (NOTMARs) are printed in newspapers and broadcast on marine radio frequencies informing the public of the specific days when the range will be in use by the Navy or Air Force. The best way to ensure that this precaution be accomplished may be sponsorship by the Emergency Management Office and Saipan's boating community.

aa. Comment: *Section 4.6.1.2 second comment*: FDM should be used for bombing only during non-nesting seasons.

Response: Birds of different species are known to nest on FDM throughout the year. It is not feasible to restrict exercises or operational use of FDM to avoid nesting periods.

bb. Comment: *Section 4.6.1.2 third comment*: It is inaccurate to state that there is little evidence of coral destruction from bombing, when only a single survey has been performed.

Response: The recent marine survey of FDM covered the entire perimeter of the island. Since corals regenerate slowly (estimates of the time required to regenerate coral heads vary, but can be as much as 50 years or more), damage from past bombing would be cumulative, and evidence of coral damage that occurred several years ago would still be visible today. Hence, frequent or repeated surveys are not needed to accurately evaluate coral damage. If such damage had occurred, it would have been evident to the survey team. However, the Navy has agreed to conduct an annual survey for the next three years.

cc. Comment: *Section 4.6.1.2 fourth comment*: Similar to previous comment, there is inadequate data to determine whether coral has been affected by presumed terrigenous sediment plumes.

Response: That is partially correct. Although photographic evidence indicates that the cliffs of FDM were eroding prior to military use through natural geological forces, it is not clear the extent to which that erosion is impacting coral reefs, and the extent to which that erosion is accelerated by military use. It is abundantly clear that the sediment plumes observed are of terrigenous origin.

dd. Comment: *Section 4.6.1.2 fifth comment*: How will the Navy evaluate impacts of bombing without avifaunal and marine surveys?

Response: Surveys will continue as agreed under Section 7, Endangered Species Act consultations between the Navy and the U.S. Fish and Wildlife Service. See also Appendix D of the EIS, and response to comments for Sections 2.6.1 and 2.6.2.

ee. Comment: *Section 4.6.1.2 sixth comment*: The DEIS should indicate that the Navy will discuss compensatory mitigation for "seabird takes" with CNMI DFW.

Response: The Navy is taking reasonable measures to reduce the potential for taking of migratory seabirds on FDM. The Navy is undertaking a long-term program of seabird surveys and photo documentation by helicopter that will detect changes over time in the populations of larger nesting seabirds, such as red-footed, brown, and masked boobies. However, compensatory mitigation for taking of seabirds not otherwise listed as rare or endangered is not required.

Should you have any questions, please contact Mr. Stanley Uehara at (808) 471-9338, by facsimile transmission at (808) 474-5909, or by E-Mail at UeharaSY@efdpac.navfac.navy.mil.

Sincerely,

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6. CNMI DEPT OF LAND AND NATURAL RESOURCES

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Attn: Code 231FM

The Commonwealth of the Northern Mariana Islands (CNMI) Department of Lands and Natural Resources appreciates the opportunity to comment on the Draft Environmental Impact Statement for Military Training in the Marianas. The Department has the following general and specific comments on the document.

General Comments

The Preferred Alternative of the DEIS proposes landing LCACs at Tachogna beach (Figure 2-1a). The CNMI Legislature has recently drafted legislation designating the areas between Puntan Diablo and Southwest Carolinas Point as a marine reserve (see attached legislation). This area includes both Kammer Beach and Tachogna Beach. The Act designating this reserve prohibits activities which are destructive to the marine and historic resources in the area. The DEIS states that LCACs may create a surge wave capable of breaking coral in shallow water. This wave has the potential to impact both reefs and archeological resources. In addition, LCACs offload wheeled and track vehicles onto the beach. The Department of Lands and Natural Resources, which is authorized to implement the marine reserve legislation, has determined that landing of LCACs at Tachogna Beach is incompatible with the intent of the legislation designating these areas as a marine reserve. Therefore, use of landing craft at Tachogna Beach is prohibited.

The section on the Purpose and Need for training in the DEIS is significantly improved over the January 1997 draft. However, it is still lacking in several areas. This section states that Tinian is the only area suitable for maneuver training of a MEU, and it indicates that such training is essential for combat readiness. Since AAVs have not been previously used during training activities on Tinian, this essential training must currently be conducted elsewhere. The DEIS contains no discussion of why areas where this training is currently being conducted are no longer viable. Such discussion is crucial for a justification of why this activity, which will have permanent environmental impacts, should be allowed on Tinian.

The CNMI is very concerned that proposed increases in type and frequency of training activities on Tinian are the result of Base Realignment and Closure (BRAC) decisions made regarding other military training lands. The CNMI does not believe that the purpose of BRAC is to transfer military activities from lands that the military owns and for which it has management and environmental protection responsibilities, to lands which the military only leases and therefore does not have responsibility for managing and protecting.

In the final Natural Resources Management Plan, Military Lease Area, Tinian (June 1997), the Navy recognizes that the land ownership situation in the Military Lease Area (MLA) on Tinian creates difficulties regarding the management of natural resources. As a result, this document does not identify the specific responsibilities of the Navy for natural resource management in the MLA. Instead, it suggests identifying shared management responsibilities for Navy, CNMI and other Federal agencies. The CNMI is concerned that the Navy is using the fact that the land on Tinian is only leased, rather than owned, by the military as a way to circumvent responsibility for adequately protecting the resources of the MLA at the same level that it would be required to protect resources on property that the Navy owns.

Reinforcing this concern is the fact that the DEIS does not include pre- and post-exercise surveys to assess the impacts of the exercises on the environment. The one exception to this is the proposed survey to assess the impacts of AAV landings on coral and marine health. These surveys were included only because they were specifically required by the CNMI Division of Fish & Wildlife and Division of Environmental Quality in meetings held to discuss agency comments on the January 1997 DEIS. Notably absent from the current DEIS is a proposal to continue conducting bird surveys on FDM, or to initiate regular marine surveys on the reef surrounding FDM. The DEIS acknowledges that lack of historic and long-term data on both seabird populations and coral reef status make it difficult to determine whether the bombing has had an impact, however, it does not suggest gathering this information to determine trends in the future. In addition, although both the CNMI Division of Fish & Wildlife and the Division of Environmental Quality have requested that the Navy monitor the impact of the proposed new small-arms firing range, the Navy has refused to even consider this request.

The existing inactive firing range on Tinian, which the Navy originally considered re-opening and then decided to close because it is contaminated with UXO and is not safe for personnel use, was until recently neither fenced nor marked by warning signs of any kind. It is adjacent to a blow-hole which is visited by both tourists and residents, and, as the DEIS points out, local residents currently go onto the range to collect medicinal plants (page 4-30). It is unlikely that a UXO contaminated firing range would have been allowed to exist unmarked and unfenced for three years or more on a military installation. Prior to considering the opening of a new firing range in the EMUA, the Navy should present its plans for addressing the contamination on this existing range.

Finally, the DEIS does not contain a discussion of the cumulative impacts from use of the MLA for live weapon firing activities. NEPA defines cumulative impact as "the impact on the environment which results from incremental impacts of the action when added to other past, present and foreseeable future actions" (40CFR1508.7). The DEIS indicates that there is an existing firing range in the EMUA that is not being re-opened due to "design concerns." This range has not been officially closed by the Navy, nor has it been investigated for remediation. The DEIS proposes to open a new small-arms fire and maneuver range adjacent to the existing range. This would appear to be an area where cumulative impacts from past use of the existing range in combination with present and future use of the proposed new firing range are likely to be significant and therefore should be discussed in the DEIS. Mitigation should address both the proposed new firing range, and impacts from past use of the existing range, since the latter issue has not been addressed in previous environmental documents prepared by the Navy or its consultants.

Specific Comments:

Executive Summary: Section 2.0 Proposed Action and Alternatives
"The Preferred Alternative excludes the security gates, mortar range, and *one* of the AAV landing beaches" (page ES-4). According to Figure 2-1a and the text, both Unai Lamlam and Unai Chulu have been excluded from the preferred alternative as options for AAV landings.

"On Tinian, the Preferred Alternative is essentially the No New Action alternative with the addition of AAV landings..." (page ES-6). In fact, the DEIS Preferred Alternative includes several new actions for Tinian in addition to AAV landings, including: configuration of a fire and maneuver range, construction of one or more shooting houses, addition of an LCAC landing site (Tachogna Beach), and construction of a permanent field camp facility. In addition, the DEIS dramatically increases the frequency of training that will take place in the EMUA. This latter issue is not directly discussed anywhere in the text with regard to its potential impacts.

Table ES-1
Table ES-1 Preferred Alternative Training Land Use indicates that LCUs are planned for use in the EMUA on Tinian. Neither the text nor Figure 2-1a indicates this proposal. This table also indicates that use of 40mm grenades in the EMUA is included in the Preferred Alternative. This latter item should be clarified to indicate that only training projectiles will be allowed in the EMUA as stated in the text.

Section 1.2.3 Purpose and Need for Specific Training
"Tinian is the only training area in the region suitable for maneuver training of a MEU." If this is the case, and since this training has not been previously conducted on Tinian, one must assume that a) the training is not being conducted elsewhere, and therefore is not actually essential, or b) the training is currently being conducted elsewhere, in which case a justification should be made for why the current location is no longer viable.

Section 1.2.4.2 Alternative Training Locations Outside the Region
"Movement of forward-deployed forces back to Hawaii for training is estimated to double fuel costs for U.S. Seventh Fleet organizations." It then stands to reason that it would reduce costs for CONUS based and Hawaii/Alaska based forces because of the lower transit time. Section 1.2.1 indicates that 1 MEF and the U.S. Third Fleet, which provide the Amphibious Ready Groups, are both CONUS based. These forces must pass Hawaii on their way to the Marianas. This section does not provide sufficient justification for why new AAV landing areas must be provided on Tinian for these forces, especially when landing sites exist or are proposed for Guam.

1.3.2 DoD Lands in the Marianas
"The BRAC release affects but does not eliminate training conducted at the Waterfront Annex and Ordnance Annex." The DEIS should address all military activities that are being affected by BRAC decisions and discuss how these decisions influence proposed increases and changes in training activities in the Marianas. The DEIS should specifically discuss situations in which BRAC decisions are influencing decisions to transfer training activities from one area to another, or where specific military lands have been removed from consideration for training.

Section 1.5.1.3 Screening Process and Issues Discarded from Detailed Consideration

"All military lands proposed for training are currently under investigation for potential contamination and/or undergoing site remediation." According to information available from the CNMI Division of Environmental Quality, there are no investigations or remediation activities being conducted or proposed for Tinian or FDM. Past contamination that is not being investigated or proposed for remediation should be included in the discussion of the cumulative impacts of the proposed actions. This should include, for example, the existing contamination on the inactive firing range in the EMUA which has not been addressed in previous environmental documents prepared by the Navy.

Section 2.1.2 Range of Alternatives
"Reduced Land Use is, in effect, the preferred action alternative proposed." This statement makes no sense. The DEIS presents the No Land Use/Reduced Land Use and Preferred Alternative as two distinct alternatives. If this is not the case, they should not be stated as such. NEPA requires assessment of all viable alternatives. It is not the intent of this requirement that an agency create unrealistic or overlapping alternatives that cannot be compared and evaluated on their respective merits.

The range of alternatives in this section is different than that in Section 2.8 Comparison of Alternatives. Why?

Section 2.2 Proposed Alternative
"The Preferred Alternative for Tinian is to allow all activities except the mortar range and certain amphibious vehicle landings." Compare this with statements made on pages ES-4 and ES-6, with page 1 and 2 of Table ES-1, and with Figure 2.1a. Which of these pages accurately describes the Preferred Alternative?

Section 2.2.3.1 Description of Amphibious Landing Training
"Mitigation of impacts to coral consists of.....limiting AAV landings to a single approach lane at a single beach." Appendix B indicates that the AAV is only 3.25m wide, however, the proposed approach lane is 22m wide. Appendix C-1 indicates that Unai Babui is only 25m long. It is not clear how limiting landing to an area almost seven times the width of a AAV, and almost the entire width of the beach, qualifies as mitigation. In order to be considered as mitigation, the proposed landing corridor should be no more than twice the width of the AAV, or 6.5m wide.

Section 2.2.3.2 Feasible Amphibious Landing Training Sites
Tables 2-1 and 2-2 present information used to evaluate beaches for amphibious vehicle landings on Tinian and Guam, respectively. Kammer Beach, on Tinian, is recommended for landing of all amphibious vehicles. Table 2-1 indicates that Kammer Beach is approximately 10 km from the EMUA or maneuver area. It does not indicate that the roads used to reach the EMUA transit residential areas in San Jose. Table 2-2, by contrast, indicates that Tipalao Beach on Guam is adjacent to military family housing. No proposal is made to transit this area with AAVs. The Navy should give equal consideration to residential areas both within its bases and outside.

Use of LCACs is planned for Unai Chulu, Unai Dankulo and Tachogna Beach. The DEIS states that there is potential damage to the coral reefs at these beaches if the LCAC creates a surge if caused to move slowly. This action can displace large rocks and break off coral heads. It has been documented by the CNMI Division of Fish & Wildlife that these three beaches harbor the highest densities of sea cucumbers on Tinian, and are composed of significant coral reef growth.

The presence of spatial heterogeneity is essential to the existence of diverse faunal assemblages. Mitigation for any significant damage to these areas has not been adequately addressed.

Section 2.2.4 Live Fire Ranges on Tinian

"Both ground and aviation units.....use blank ammunition during field exercises, and use live ammunition on known distance and fire and maneuver ranges located on military installations" (page 2-14). The MLA is under long-term lease to the U.S. Navy, however it is not a military installation. Since this section indicates that use of fire and maneuver ranges is not part of field exercises, and since existing fire and maneuver ranges are located on military installations on Guam (e.g. Waterfront Annex), the DEIS has not provided adequate justification for development of a new fire and maneuver range on Tinian.

Section 2.6.1 Bombardment of FDM (Navy Range 7201)

Under the Impacts and Mitigation portion of this section, no mention is made of the potential impacts to marine resources. A single, qualitative, survey of the marine environment surrounding FDM was conducted in July 1997. The September 1997 report from the National Marine Fisheries Service (Appendix D-16) and the November 1997 report from the CNMI Division of Fish & Wildlife (Appendix D-19) both indicate that it was not possible from this single survey to determine whether loose boulders and scarring of the reef around FDM were a result of aerial bombing (see pages 7 and 6 respectively). In addition, the marine survey of FDM represents a single data point from which it would be impossible to determine trends or long term impacts to fish and abundance and coral cover. Time series data must be collected before conclusions regarding the impacts of bombing exercises can be made. A yearly marine survey of the nearshore waters of FDM must be undertake to determine trends in fish abundance and coral cover, and to assess whether these trends can be linked to impacts from Naval bombing events.

Section 2.6.3 Cumulative Impacts on FDM

See comments under 2.6.1.

Section 2.8.1 Comparison of Tinian Alternatives

This section states that battalion-sized maneuvers are "not feasible on Guam because of insufficient land area available for training" (page 2-38). Table 2-1 indicates that there is a total of 36.92 km^2 of land within the EMUA on Tinian, of which 60 percent, or 14.77 km^2 is available for full training use (Table 2-4). In contrast, Anderson Air Force Base (including the two communications annexes) on Guam contains 44.16 km^2 of "largely undeveloped land" (page 2-29) available for full training use, the Ordnance Annex on Guam contains 17.89 km^2 of "mostly undeveloped land" (page 2-25) available for full training use, and the Waterfront Annex on Guam contains 14.5 km^2 of land available for full training use. It is not clear how the Navy reached the conclusion that Guam does not contain sufficient land for training.

"This alternative would allow destruction of some coral by AAV's landing at a single beach with approximately one percent of live coral coverage on its reef flat" (page 2-38). This statement does not adequately reflect the actual damage that the AAVs will cause to the reef at Unai Babui. In previous sections of the DEIS, the AAVs are described as coming into contact with the substrate at a depth of 1.8 (page 2-11) to 2 (page 1-8) meters (5.9 to 6.6 feet). The qualitative evaluation of the reef at Unai Babui prepared by Marine Research Consultants in September 1996 states that "(c)oral cover is ten percent or less on the reef margin, which extends approximately ten meters beyond the reef flat. Water depth at the reef-flat margin is approximately three to six feet deep." This report goes on to say that "(a)s at Chulu, coral growth

at the spur and groove transition zone (at three to six feet deep) is considerable and would be impacted by tracked landing vehicles" (Appendix C-2). The degree of damage will depend on the oceanographic conditions at the time of landing. This beach is subject to high energy wave action throughout the year save for brief periods of calm. If significant swell is evident at the time of landing, reef margin damage can be expected to be significant. The DEIS should address this with respect to proposed mitigation.

"The environmentally preferred alternative is the Preferred Alternative, as it does not generate any significant impacts which cannot be mitigated" (page 2-38). Compare this to Section 1.2.3 which states that "(c)ertain training land uses have significant impacts which cannot be fully mitigated to nonsignificant..... These training land uses include: Amphibious assault vehicle landings at a beach within Tinian's Exclusive Military Use Area" (page 1-8). Compare this also to Table 2-11.

2.8.7 Preferred Alternative: Impacts and Mitigation

"The Preferred Alternative provides land areas to meet all the units' basic training requirements except.....Moving target ranges for LAV, AAV, and M1A1 tanks....These requirements must be met on the U.S. mainland or in Hawaii...." (page 2-45). This would appear to contradict the statements made in Section 1.2.4.2 which argue for addition of specific training activities in the Marianas because training areas in CONUS and Hawaii are not suitable. If moving target range training for AAVs can be conducted on the U.S. mainland or Hawaii, why can't all AAV training be conducted there? The statements in the DEIS are contradictory and do not allow for evaluation of the proposed actions.

"The Preferred Alternative will have one significant impact which can only be mitigated by compensatory mitigation: Bombardment of FDM is likely to harm, harass, or kill individual endangered or migratory birds" (page 2-46). The CNMI has requested, and is still requiring, compensatory mitigation for the permanent destruction of the coral reef at Unai Babui. The DEIS's proposed mitigation which limits AAV approach to a single lane, will not eliminate the destruction of the reef, even if this approach lane is reduced to a more reasonable width as specified in comment 2.2.3.1 above. Compensatory mitigation is appropriate in this situation where permanent, irreversible damage will occur.

Section 4.1 Impacts of Brown Tree Snake

From a review of this section, it appears that the Navy will do all that is possible to greatly reduce the risk of the transfer of Brown Tree Snakes from Guam to the CNMI. This includes storage of cargo in snake-free zones on Guam, sniffer dog inspection of cargo, and cargo quarantine in containment areas with snake-proof barriers on Tinian. While there is always a risk of snake introduction when any cargo is shipper out of Guam, the Navy is utilizing the most current technology with Wildlife Services of USDA to interdict snakes before cargo is released for use on Tinian and FDM.

Section 4.2.1.4 AAV Landings: Proposed Mitigation

Footnote 18 states that the coral cover at Unai Babui is 10 percent or less on the reef margin "approximately 10 percent of which is at a depth of 1.8 m or less" (page 4-9). It is not clear where this information came from, as it is not included in the report prepared by Marine Research Consultants included in Appendix C-2.

"The designated lane will be 15 to 22 m wide and 70 m long" (page 4-9). The lane for AAV landings should be no more that twice the width of the AAVs, or 6.5m wide. Any wider lane cannot be accepted as mitigation for impacts.

Section 4.2.1.6 Small Arms Range

"Proposed mitigation is to replant approximately 4 ha of tangantangan..."(page 4-11). The preferred habitat of the Tinian Monarch (*Monarcha takatsukasae*) is native limestone forest. Since Tangantangan is an introduced species, the CNMI is opposed to replanting of Tangantangan as mitigation for any Tinian Monarch take. The Navy should mitigate by enhancing native limestone forest in an amount sufficient to compensate for the take at a 2:1 ratio.

Section 4.2.5.1 Existing Conditions at Existing and Proposed Range Area

The DEIS defines the Preferred Alternative as "continuing land uses plus several new training land uses" (page 2-2). Continuing land uses include the existing firing range which has never been officially closed by the Navy. Section 1.4 of the DEIS states that the "intent of this EIS is to evaluate currently ongoing environmental effects that have not previously been evaluated" (page 1-17). The existing firing range falls into this category. The Navy's plans for the existing firing range should be discussed with a description of the proposed mitigation for the adverse impacts resulting from the use of this range. These impacts also should be addressed in Section 4.2.5.2 Potentially Significant Impacts, since according to the Table 4-5 risk of injury from UXO is one of the Navy's criteria for significance. Finally, the existing firing range should also be addressed in a discussion of the cumulative impacts of the activities which caused the contamination of the existing range, and the proposal to open a new fire and maneuver range adjacent to the existing range.

Section 4.2.7.3 Proposed Mitigation

"The EMUA will not be closed for more than a total of 36 days (10 percent) of any calendar year" (page 4-40). This statement does not agree with statements made elsewhere in the DEIS. For example page 2-16 states "The range would be used .... by very large groups (150-500) for three weeks several times a year." Similarly, Table 1-1 indicates that two to three Amphibious Assaults of three-week duration will be conducted yearly in the EMUA. If closure of the EMUA is to be limited to 36 days, only five total weeks of time would be available for these activities. Even of training is conducted concurrently, this is not enough time for more than one three-week training activity.

Section 4.6.1.2 Potential Impacts of FDM Aerial Bombardment and Naval Gunfire and Proposed Mitigation

"UXO is found throughout the island" (page 4-68). Because of the danger presented by unexploded ordnance, particularly cluster bombs, the CNMI feels that it would be appropriate for the Navy to post warning signs on the island. There have been several instances of people going ashore and camping. Clearing marking the island as off-limits with signs posted at the most likely landing areas would help prevent injury or death.

"Several bird species utilize the shrubby vegetation, bare/grassy areas, or caves for nesting on the island." Because of the potential impact from bombing activities on nesting birds, the Department proposes that the Navy use the area for bombing only during the non-nesting season.

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"There is little evidence of coral destruction as a result of bombing activities" (page 4-70). This statement is not supported by the single marine survey conducted in November 1997. This survey provided a single data point from which it is impossible to extrapolate any trend in coral abundance or decline as a result of bombing activities.

"There was no apparent correlation between coral development and areas of presumed exposure to terragenous sediment plumes." The marine survey conducted in November 1997 was a "qualitative" survey. No data from which to evaluate a correlation were collected, and the Department is not aware that any correlation analysis was conducted. Therefore, it is not surprising that correlation was not found. This does not, however, mean that a correlation does not exist.

This section does not indicate that the Navy intends to continue to conduct avifaunal and marine surveys for the purposes of determining the impacts of proposed bombing activities. It is not clear how the Navy intends to evaluate the impacts of its actions without such surveys.

This section does not address compensatory mitigation for seabird mortality caused by the bombings. The CNMI Division of Fish & Wildlife has responsibility for protection of these natural resources. Section 2.8.7 indicates that bombardment of FDM which is likely to "harm, harass, or kill individual endangered or migratory birds" can only be mitigated through compensatory mitigation (page 2-46). The DEIS should indicate the Navy's intention to discussion compensatory mitigation for seabird takes with the CNMI Division of Fish & Wildlife.

If you have any questions regarding these comments, please contact Katharine Miller, Natural Resources Planner.

Sincerely,

Joaquin Tenorio, Ph.D.
Secretary

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27 MAY 1999

Joaquin Tenorio, Ph.D.
Secretary
Department of Lands and Natural Resources
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Lower Base, Caller Box 10007
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Dear Dr. Tenorio:

Subj: REVISED DRAFT ENVIRONMENTAL IMPACT STATEMENT (DEIS)
MILITARY TRAINING IN THE MARIANAS

Thank you for your letter of September 25, 1998, commenting on the subject DEIS. This letter provides responses to the comments and concerns addressed in your letter. A similar response was provided to Mr. Peter J. Barlas of the Coastal Resources Management office.

General Comments

a. Comment: *Paragraph 1*: The use of landing craft at Tachogna Beach is prohibited, as the area is likely to be made a marine reserve and as LCACs may disturb coral and may offload wheeled and tracked vehicles.

Response: The analysis regarding the *proposal* to land LCACs at Tachogna Beach will remain in the Final EIS (FEIS), but the document will clarify that such landings are no longer *preferred* since the beach has been designated for preservation as a recreation beach. The same decision will be noted in the FEIS regarding Kammer Beach initially proposed for AAV, LCU and LCAC landings, but also designated for preservation as a recreation beach.

b. Comment: *Paragraph 2*: Enhance the purpose and need to further clarify why areas currently used for MEU maneuver training and AAV landings are no longer viable. It is clear that such training must have occurred elsewhere, as it is described as essential but has not occurred on Tinian in the past.

Response: The purpose and need for MEU tactical maneuver training in conjunction with amphibious landings is documented in Chapter 1. Marine Corps forces assigned to the Commander in Chief, U.S. Pacific Command, to include Navy and Marine amphibious forces, have been using the Military Lease Area (MLA) for training on Tinian for many years, including participation in Tandem Thrust exercises in 1993, 1995, and 1999. Therefore, the training requirements and most of the training sites are not new.

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c. Comment: *Paragraphs 3 and 4*: The CNMI is concerned that, as a result of BRAC, training is being moved from lands owned by the military to lands only leased by the military, where their responsibility for long term care-taking is less well defined and perhaps less enforceable. The DEIS does not provide for any pre- and post-exercise surveys, with the exception of amphibious landing beaches. The DEIS fails to propose continued bird surveys of FDM or regular marine surveys for FDM, although it acknowledges a general lack of baseline data.

Response: Base Realignment and Closure decisions have not diverted significant training burdens from Guam bases to non-federal lands in CNMI. The Navy's responsibilities for management of natural resources on leased lands is not less than that on lands owned in fee. Tandem Thrust 99 was a good example of the extent of environmental monitoring that is conducted for all phases of the exercise from force buildup to force departure and area cleanup. The final EIS (FEIS) Section 4.6.1.2 will include the annual marine surveys for impacts to coral to be conducted at FDM. Bird surveys will continue on FDM under present protocols, as constrained by the presence of dangerous unexploded ordnance, which prevents military personnel who are not DoD explosive certified from landing on the island.

d. Comment: *Paragraph 5*: Prior to considering opening a new range, the DEIS should present plans for addressing existing UXO on the old range, which was only recently fenced and marked with warning signs.

Response: The Preferred Alternative has been revised to eliminate small arms and mortar range development on Tinian. The inactive small arms, mortar and rifle grenade range north of Unai Chiget will be managed in accordance with Navy policies to protect human health and the environment.

e. Comment: *Paragraph 6*: The DEIS should discuss cumulative impacts of the old and proposed new firing ranges. Mitigation should address both ranges, as the old range has not been addressed in previous environmental documentation.

Response: The proposed new firing range and mortar range is not included in the Preferred Alternative in the FEIS. Cumulative UXO impacts of the old range with the proposed ranges will therefore not occur.

Specific Comments: (References to paragraphs in the revised DEIS)

a. Comment: *Exec Summary Section 2, first comment*: Correct EIS to state that two (versus one) AAV landing beaches are excluded from Preferred Alternative.

Response: The FEIS will identify the beaches that were considered for AAV landings in the EMUA, and that Unai Babui is no longer preferred for AAV tactical landings in the MLA. The use of the boat ramp in San Jose's harbor is the preferred alternative for getting AAVs from ship to shore.

b. Comment: *Exec Summary Section 2, second comment*: It is not correct to state that the Preferred Alternative is "essentially the No New Action alternative with the addition of AAV landings." The Preferred Alternative includes new facilities and dramatically increased training frequency in the EMUA.

Response: Descriptions of the preferred alternatives have been edited for clarification. Any changes in frequency of training from the ongoing situation will be identified in Chapter One and Table 1-1. The preferred alternative does not dramatically increase training frequency but does clarify mitigation by establishing constraints such as No Training, No Cultural Resource Disturbance, and No Wildlife Disturbance. Reduced maneuver training is also proposed during Tinian Monarch nesting seasons.

c. Comment: *Table ES-1*: Fix inconsistencies with text regarding LCU landings in the EMUA. Clarify that 40 mm grenades in the EMUA will be training projectiles only.

Response: Table ES-1 has been edited and corrected to accurately portray the Preferred Alternative for Marianas training.

d. Comment: *Section 1.2.3*: Justify why AAV training areas used until this time are no longer viable and why Tinian is now needed for this training which was apparently not necessary on Tinian in the past.

Response: Unai Lamlam, Unai Babui, and Unai Chulu were invasion beaches in 1944 used by that era's amphibious tracked vehicle, the LVT. From the early 1950s, Tinian has been used for military training, and it is assumed that the earlier invasion beaches were available for use during training. Until the early 1980s, Kammer Beach was used for amphibious assault landings. The beach has the necessary width, lack of underwater obstructions, and suitable gradient for waves of displacement-hull landing craft (LCVPs, LCMs and LCUs) and LVTs. This is the beach that was heavily defended by the Japanese, expecting the U.S. invasion to occur in the south and not on the narrow beaches in the northwest.)

Today, military training is primarily confined to the MLA, with cross-country force-on-force maneuvers planned for the EMUA. The present day constraints to the use of Kammer and Tachogna Beach are recognized in the FEIS, and there is no desire to create socioeconomic impacts to San Jose by burdening its harbor as a tactical landing site. Minimizing damage to coral reefs eliminated some of the beaches in the MLA. None of the beaches were deemed

appropriate for the LCU, which is a large displacement-hull landing craft. Only Unai Babui and its sparse coral reef was proposed for use by the tracked amphibious assault vehicles (the AAV) used by the Marines for ship-to-shore movement and maneuver ashore. However, a recent site survey held out little promise that Unai Babui could be used without risk to the AAV and possible damage to the reef face. AAV landings at Unai Babui are no longer preferred.

The LCAC is an air-cushioned vehicle that does not cause direct impact to submerged coral. Unai Chulu has been used successfully and Unai Dankulo is recommended as sites where the craft's use is appropriate without significant impact to coral.

As a balanced air-ground-logistics team, the Marine Expeditionary Units (MEU) must train with all assets, using its helicopters, landing craft and AAVs for ship-to-shore movement of the assault waves, and relying on the AAVs for cross-country mobility. To conduct more realistic training at the EMUA, the AAVs must get ashore. After a thorough environmental evaluation of all beaches, the FEIS identifies the Tinian Harbor as the only alternative available to LCUs and AAVs. LCAC landings are preferred at two beaches (Unai Chulu and Dankulo [with vehicle offload and beach exit at Long Beach One]).

e. Comment: *Section 1.2.4.2*: If cost of fuel is truly a consideration, then it should be more cost effective for CONUS-based groups (I MEF and U.S. Third Fleet) to train in Hawaii than in the Marianas. Justify why these forces need Tinian for AAV landings, especially when sites exist or are proposed on Guam.

Response: CONUS-based units have been scheduled to train in Hawaii as well as in the Marianas during their transit to and from the Western Pacific and Indian oceans. The exception to training while transiting is the Tandem Thrust exercises with organizations that deploy to and from Alaska and Hawaii to train as part of a Pacific Command joint/combined task force. Section 1.2 of the EIS explains the requirement for training in the Marianas Islands, including the advantage of being able to conduct proficiency training and remain within adequate response sailing times to possible contingency areas. Section 1.3 of the FEIS describes training area characteristics and alternative training locations in this region. Training on Tinian does not eliminate maximizing training opportunities on Guam in training areas that provide their own unique characteristics. The ultimate requirement for training in the EMUA is to land an amphibious force and conduct subsequent maneuver training in the vicinity of the landing area. While Guam has areas suitable for landing individual AAVs and LCACs, providing a certain level of training for individual crews, these areas do not afford the opportunity for subsequent maneuvers ashore. Guam does provide live fire training ranges, and serves as an alternative for range development on Tinian.

f. Comment: *Section 1.3.2*: Address impacts of specific BRAC decisions which require increased or additional training activities in the Marianas, particularly those requiring transfer of

training to the Marianas from elsewhere or those eliminating military lands as training areas.

Response: See the response in the General Comments section above regarding the relationship between BRAC decisions and military training.

g. Comment: *Section 1.5.1.3*: Contrary to the DEIS, CNMI DEQ indicates there are no investigations or remediation conducted or proposed for Tinian or FDM. Past contamination [especially unexploded ordnance (UXO)] should be addressed in cumulative impacts sections.

Response: An Environmental Baseline Survey (EBS) for Tinian was published in February, 1997, providing a comprehensive environmental survey of areas that are or were recently leased by the United States. Site reconnaissance, interviews, and documents searches performed for the EBS resulted in 76 sites for analysis. Of these, 46 sites have been identified for additional remedial action or evaluation, eleven of which are sites associated with World War II ordnance. The EBS documents UXO locations in the EMUA, LBA, released and surrounding areas. Some remedial action or removal has occurred, but the process is not complete. A list of ordnance items removed from Tinian since 1988 is included as Appendix E to the EBS. There is no cumulative UXO impact since the development of new ranges on Tinian is no longer a Preferred Alternative.

The former weapons range north of Unai Chiget has been fenced and posted to prevent exposure to potentially dangerous unexploded ordnance. Management of this area range will be in accordance with Navy policy for inactive weapons ranges.

h. Comment: *Section 2.1.2*: Statement that reduced land use is equivalent to the preferred alternative suggests alternatives are overlapping rather than distinct. Range of alternatives in this section is different from Section 2.8.

Response: The alternatives range from No Training through reduced levels, continuing as before, or maximizing training land use by adopting new initiatives. Although the No Training and Reduced Training alternatives are not preferred for any large training area, the concepts of identifying specific areas as "off-limits" or reducing training tempo during certain periods have been incorporated as constraints in the preferred alternative. The FEIS has been edited to clarify the description of alternatives and their suitability for training on Tinian, FDM, Guam and a few parcels of non DoD land authorized by the landowners for specific training activities.

i. Comment: *Section 2.2 Comment*: Consistently describe the Preferred Alternative in this section, the Executive Summary, Table ES-1, and Figure 2.1a.

Response: The text and figures throughout the FEIS will be made internally consistent. The Preferred Alternative for Tinian will include all ongoing activities and recommend Unai

Dankulo as an additional LCAC landing site. Other proposed new activities will not be recommended: the installation of permanent security gates; the construction of a shooting house or breacher trainer facility; development of a fire and maneuver range or a 60 mm mortar range; conducting AAV landings at Unai Dankulo, Unai Chulu, Unai Lamlam and Unai Babui. Tachnogna Beach and Kammer Beach are no longer preferred for amphibious landings by LCU, LCAC or AAV in recognition of their designation as major recreational areas.

j. Comment: *Section 2.2.3.1*: Given that Unai Babui is 25 m long and an AAV is 3.25 m wide, how does limiting the lane width to 22 m (almost 7 times the width of an AAV) constitute mitigation? The proposed landing lane should be no more than twice the width of an AAV.

Response: Given the authority to cross the beaches into the EMUA by lease agreement, and the requirement to find a site for AAV landings that would minimize environmental impacts, a decision made was to limit AAV training to one beach. Evaluating the possible landing points at Unai Babui determined that an area of about 22-25 meters at beach center would be suitable for landings without the vehicles crossing the nearshore reef in areas with abundant coral. A revisit to the beach confirmed that the landing width could be constrained to 15 meters recommending landings and launches at beach center in single file. However, another survey of the reef failed to identify a portion 15 meters wide at the point of touchdown due to extensive spur and groove formations. The beach is no longer preferred for AAV landings. See Appendix C-5 of the FEIS and Section 4.2.1.4.

k. Comment: *Section 2.2.3.2, first comment*: The Navy should give equal consideration to the impacts of AAV travel on roads in San Jose and in the Waterfront Annex. The road from Kammer Beach to the EMUA is all public.

Response: The Navy does give equal consideration to impacts of training on civilian activities. Using Unai Babui for AAV landings for EMUA entry would keep activities away from San Jose. Two decades ago, Kammer Beach was a routine training beach. Presently, the harbor is used for logistic support requirements. The traffic route from the harbor to the MLA will be along the island's west coast, avoiding most of San Jose proper. The majority of equipment brought ashore is rubber-tired trucks and Light Armored Vehicles (LAV). If the harbor was used to bring Marines ashore by AAV, the tracked vehicles could road march to the MLA. The tracked vehicles are equipped with rubber track pads so that they can travel on hard surface roads without digging into the road surface.

l. Comment: *Section 2.2.3.2, second comment*: Address impacts of LCAC landings on sea cucumbers and coral reef at Unai Chulu, Unai Dankulo, and Tachogna Beach. Further mitigation is required.

Response: Tachogna Beach is not included in the Preferred Alternative. See Section 4.2.1.3 and Appendix C-5 for the report of LCAC landings at Unai Chulu. Although sea cucumbers are not protected as threatened or endangered species under U.S. federal or CNMI law, there is a requirement on Tinian to obtain proper permits for commercial harvesting. However, a moratorium has been imposed on commercial harvesting.

LCAC landings will not cause significant damage to the sea cucumber population, since they will operate on an air cushion, and will thus avoid contact with these bottom-dwelling organisms. The experience at Unai Chulu seems to indicate that if the vehicle comes off cushion on the water line, or turns at the water line, some sea cucumbers will be displaced. The observed impacts to the Unai Chulu sea cucumbers during Tandem Thrust 99 were insignificant.

The Navy's marine survey conducted before, during, and after 14 reef crossing by LCAC during Tandem Thrust 99 is included in Volume Two, Appendix C-5 of the FEIS.

m. Comment: *Section 2.2.4*: Provide better justification for a new fire and maneuver range on Tinian, given that one exists on Guam.

Response: The proposed fire and maneuver range on Tinian has been excluded from the Preferred Alternative in the FEIS. Alternative ranges on Guam will be used.

n. Comment: *Section 2.6.1 and 2.6.3*: To adequately evaluate the effects of bombing on marine resources around FDM, an annual marine survey must be undertaken.

Response: National Marine Fisheries Service representatives have also recommended that annual marine surveys will be appropriate for monitoring the effects of bombing on marine resources at FDM, and such a protocol will be included as a mitigation measure in the FEIS (see Section 4.6.1.2).

o. Comment: *Section 2.8.1 first comment*: Explain why Guam does not contain sufficient land for maneuver training, given its large military holdings.

Response: Guam's military lands are used for a variety of purposes. COMNAVMARIANAS Waterfront Annex is designed to support the fleet and has very little open area suitable for maneuver. The Ordnance Annex is primarily designed for ordnance storage, which for obvious safety reasons restricts maneuver training. The two Communications Annexes are primarily antenna farms for receiving and transmitting stations. Andersen Air Force Base is designed for strategic and tactical aircraft support. The Northwest Field area has been made available for small unit maneuvers and flight operations. Andersen South is now excess property. All of these areas are constrained by natural and cultural resources, and no training

areas due to safety concerns. Training is maximized on Guam's military lands, while remaining compatible with other designated uses and environmental constraints.

p. Comment: *Section 2.8.1 second comment*: More adequately explain potential impacts of AAVs on reef at Unai Babui, taking into account tide and swell conditions which may be present. Proposed mitigation must address these impacts.

Response: The impacts of AAVs on the reef at Unai Babui would result from the direct contact of the vehicles' tracks with organisms living on the reef. The potential for oceanographic conditions to influence this effect is due to the fact that navigational precision of the AAVs could be impaired by more severe sea conditions, reducing their ability to stay within the approved corridor. To mitigate potential impacts, landings under such severe conditions would not be conducted. The spur and groove reef face is of concern and AAV landings are no longer recommended at Unai Babui due to possible damage to the vehicle as well as potential damage to coral on a groove reef face.

q. Comment: *Section 2.8.1 third comment*: The DEIS is inconsistent regarding whether the Preferred Alternative will have significant impacts which cannot be mitigated on Tinian.

Response: Final decisions regarding the preferred alternative eliminated Unai Babui and potentially significant impacts to coral. All other potentially significant impacts from training activities are capable of and will be mitigated to nonsignificant levels.

r. Comment: *Section 2.8.7 first comment*: DEIS is inconsistent about whether various types of AAV training may be fulfilled in Hawaii or not. If AAV moving target training must and can be conducted in Hawaii, why can't all AAV landing training also be conducted there?

Response: The purpose and need for training in the Marianas supplements and sustains training levels already acquired before arriving in the Mariana Islands. The AAV units assigned to the Marine Expeditionary Units train at Camp Pendleton, California, Marine Corps Base Hawaii, Kaneohe Bay, or Okinawa Japan in preparation for their deployments. There is no proposal to develop a moving target range for tracked vehicle crews on any of the Mariana Islands.

s. Comment: *Section 2.8.7 second comment*: Compensatory mitigation must be proposed for permanent destruction of coral at Unai Babui by AAVs. Limiting approach to a single lane, even if the lane is much narrower, will not eliminate destruction of the reef.

Response: AAV landings at Unai Babui are no longer preferred.

t. Comment: Section 4.1: Navy is doing all that is possible to greatly reduce the risk of brown tree snake transfer to CNMI from Guam.

Response: The Navy will continue to work closely with the various federal, territorial and CNMI agencies that have been involved in improving brown tree snake interdiction and control measures.

u. Comment: *Section 4.2.1.4 first comment*: Where did the information in footnote 18 come from ("10 percent of which is at a depth of 1.8 m or less")? It is not in the Marine Research Consultants report.

Response: The wording of the first sentence of the footnote was unclear. The footnote has been deleted and description of the coral included in the text of Section 4.2.1.4

v. Comment: *Section 4.2.1.4 second comment*: AAV lane at Unai Babui should be no more than twice the width of an AAV.

Response: A section of reef face about 15 meters wide would have been sufficient to land the vehicles in most sea conditions. Unfortunately, a suitable reef section was not found.

w. Comment: *Section 4.2.1.6*: Mitigation for cutting vegetation should be enhancing native limestone forest to compensate for the take at a 2:1 ratio.

Response: No vegetation cutting is anticipated for the revised Preferred Alternative, which no longer includes range development. The area that has been proposed for the fenced logistic support base is grassy and would involve no tree clearing.

x. Comment: *Section 4.2.5.1*: Navy's management plans for existing firing range should be discussed here an in 4.2.5.2, including proposed mitigation for existing UXO contamination. UXO contamination should also be addressed as cumulative impact from past use and proposed future use of new range.

Response: See previous comments regarding Navy management of the inactive range in accordance with Navy regulations. New ranges have been eliminated from the Preferred Alternative on Tinian.

y. Comment: *Section 4.2.7.3*: Maximum proposed EMUA closure (no more than 36 days per year) appears to be inconsistent with proposed use of EMUA.

Response: This estimate was made when live-fire ranges were proposed for development in the EMUA. Without these ranges the actual closure may be much less. Tandem Thrust 99

never closed off the entire EMUA to visitors even when North Field Runway One was used for landings, and Runway Two used for cargo drops. Tourists were still allowed access around the active aviation areas. Tandem Thrust 95 was a larger exercise involving up to 2,500 persons on Tinian over a 45-day period. Seldom was the entire EMUA closed, and a concerted effort was made to accommodate the tourists desiring to see cultural resources in the training areas. The FEIS will identify the need for the planning process to include coordination with the Tinian Mayor's office and affected commercial activities in order to reduce negative economic impacts caused by closing the EMUA to ensure public safety.

z. Comment: Section 4.6.1.2 first comment: FDM should be posted with warning signs, as people have gone ashore and camped on the island.

Response: After reviewing this safety issue with your staff and the possibility of using multilingual warning signs, we do not support posting such signage on FDM proper. The three-mile standoff distance is in effect at all times. The signs could draw fishing boats in even closer, and would be difficult and dangerous to maintain. Instead we suggest that CNMI consider posting multilingual warning signs at Saipan's marinas advising that: (1) Danger: FDM is a Naval Weapons Range used for Aircraft Bombardment and Naval Gunnery. (2) The island is surrounded by a three-mile exclusion zone for your protection. (3) Notice To Mariners (NOTMARs) are printed in newspapers and broadcast on marine radio frequencies informing the public of the specific days when the range will be in use by the Navy or Air Force. The best way to ensure that this precaution be accomplished may be sponsorship by the Emergency Management Office and Saipan's boating community.

aa. Comment: *Section 4.6.1.2 second comment*: FDM should be used for bombing only during non-nesting seasons.

Response: Birds of different species are known to nest on FDM throughout the year. It is not feasible to restrict exercises or operational use of FDM to avoid nesting periods.

bb. Comment: *Section 4.6.1.2 third comment*: It is inaccurate to state that there is little evidence of coral destruction from bombing, when only a single survey has been performed.

Response: The recent marine survey of FDM covered the entire perimeter of the island. Since corals regenerate slowly (estimates of the time required to regenerate coral heads vary, but can be as much as 50 years or more), damage from past bombing would be cumulative, and evidence of coral damage that occurred several years ago would still be visible today. Hence, frequent or repeated surveys are not needed to accurately evaluate coral damage. If such damage had occurred, it would have been evident to the survey team. However, the Navy has agreed to conduct an annual survey for the next three years.

cc. Comment: *Section 4.6.1.2 fourth comment*: Similar to previous comment, there is inadequate data to determine whether coral has been affected by presumed terrigenous sediment plumes.

Response: That is partially correct. Although photographic evidence indicates that the cliffs of FDM were eroding prior to military use through natural geological forces, it is not clear the extent to which that erosion is impacting coral reefs, and the extent to which that erosion is accelerated by military use. It is abundantly clear that the sediment plumes observed are of terrigenous origin.

dd. Comment: *Section 4.6.1.2 fifth comment*: How will the Navy evaluate impacts of bombing without avifaunal and marine surveys?

Response: Surveys will continue as agreed under Section 7, Endangered Species Act consultations between the Navy and the U.S. Fish and Wildlife Service. See also Appendix D of the EIS, and response to comments for Sections 2.6.1 and 2.6.2.

ee. Comment: *Section 4.6.1.2 sixth comment*: The DEIS should indicate that the Navy will discuss compensatory mitigation for "seabird takes" with CNMI DFW.

Response: The Navy is taking reasonable measures to reduce the potential for taking of migratory seabirds on FDM. The Navy is undertaking a long-term program of seabird surveys and photo documentation by helicopter that will detect changes over time in the populations of larger nesting seabirds, such as red-footed, brown, and masked boobies. However, compensatory mitigation for taking of seabirds not otherwise listed as rare or endangered is not required.

Should you have any questions, please contact Mr. Stanley Uehara at (808) 471-9338, by facsimile transmission at (808) 474-5909, or by E-Mail at UeharaSY@efdpac.navfac.navy.mil.

Sincerely,

Melvin N. Kaku

MELVIN N. KAKU
Director
Environmental Planning Division

5090P.1G03
Ser PLN231/1870

Copy to:
Mr. Peter J. Barlas
Coastal Resources Management
Commonwealth of the Northern Marianas Islands
AAA 2852 Box 10001
Morgen Building
San Jose, Saipan, MP 96950

7. MARIANAS AUDUBON SOCIETY

Marianas Audubon Society
P.O. 4425
Hagatna, Guam 96932

September 27, 1998

Commander
Attn: (Code 231FM)
PACNAVFACENGCOM
Building 258 Makalapa
Pearl Harbor, HI 96860-7300

Dear Sir:

The Marianas Audubon Society has reviewed the revised *Draft Environmental Impact Statement, Military Training in the Marianas* (DEIS), which was sent to our organization on August 11, 1998. We find this version of the DEIS to be much improved over the original draft. In particular, the environmental impacts of the military's proposed training exercises are better described than previously, which allows for easier review of the document. We are also pleased to see that some exercises have been altered to reduce their effects or downgraded to non-preferred alternative status.

The military's continued use of Farallon de Medinilla (FDM) as a bombing target remains our primary concern and we continue to oppose the use of the island for this purpose. FDM is one of the most important seabird nesting sites in Micronesia, with the large numbers of Masked Boobies being of special interest. We have no doubt that if the bombing was ended and some habitat recovery was allowed to occur, that even greater numbers of seabirds would occupy the island. The DEIS seems to place greater emphasis on the impacts to endangered species, such as megapodes, fruit bats, and sea turtles, than it does on seabirds (e.g., see pages 4-74 and 4-75). Because of the small numbers of endangered species that occur on FDM, it is apparent that the island's seabird populations are its most important natural resource and the one most deserving of protection. It can certainly be argued that the probable disturbance to nesting seabirds during regular bombing exercises reduces nesting productivity and that this qualifies as a significant impact because of the large numbers of birds involved. It is also likely that greater numbers of birds are directly killed by the bombing than is currently known. The Navy's aerial surveys to determine mortality are inadequate and should be replaced with ground surveys to evaluate this problem. Both problems (i.e., reduced nesting productivity and direct mortality) will likely increase if bombing exercises are conducted more frequently, as called for in the preferred alternative of the DEIS.

The preferred alternative for FDM states that specific areas of the island will not be targeted in order to provide some protection for nesting seabirds. However, the DEIS gives evidence that bombs occasionally go off-target and hit non-targeted areas (see Appendix D-13). Fires resulting from bombing are another threat to non-targeted areas (see Appendices

D-13 and D-15), causing both the loss of nesting and roosting habitat and killing nestling birds. Despite the military's best intentions, we would expect both off-target bombing and fires to recur during future exercises.

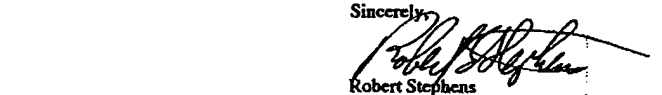
The preferred alternative indicates that the islands's western cliffs and central plateau will be targeted during future bombing exercises. Although this may partially protect some birds, it places the island's colony of Great Frigatebirds, which occurs on the west-central cliffside, directly in the line of fire. This colony represents one of only two nesting colonies of frigatebirds in the Marianas.

The MAS remains concerned over the possiblity of accidentally introducing brown tree snakes to FDM via target materials transported from Guam. We think the best solution to this problem is to discontinue the use of junk automobiles (which have many hiding spaces for snakes) as targets and to use only constructed targets. This suggestion is listed in the DEIS as a possible mitigative measure (page 4-71). Constructed targets such as welded heavy steel boxes would seemingly function as well as automobiles and could be built with virtually no hiding spaces available for snakes. A target of this type could be easily inspected prior to transport to FDM. All targets should of course be staged in snake-free areas prior to transport.

The use of rodenticides on FDM as a mitigative measure is an interesting suggestion, but whether it would have any beneficial effects on bird and other wildlife populations is unknown. We recommend that the military sponsor two additional programs for mitigative purposes. First, it should initiate a program to census seabird populations on FDM on a frequent basis to collect accurate baseline data on abundance. The use of helicopters for this activity is inappropriate for a variety of reasons and another technique should be used that results in better data collection. Secondly, the military should fund a Marianas-wide survey of resident seabird populations. This would allow an evaluation of the importance of FDM's seabird populations in terms of overall seabird numbers in the Marianas region.

Thank you for allowing us to review to the DEIS.

Sincerely,



Robert Stephens
President

DEPARTMENT OF THE NAVY
PACIFIC DIVISION
NAVAL FACILITIES ENGINEERING COMMAND
258 MAKALAPA DR., STE. 100
PEARL HARBOR, HI 96860-3134

5090P.1G03
Ser PLN231/ 1868
27 MAY 1999

Mr. Robert Stephens
President
Marianas Audubon Society
P.O. Box 4425
Hagåtña, GU 96932

Dear Mr. Stephens:

Subj: REVISED DRAFT ENVIRONMENTAL IMPACT STATEMENT (DEIS)
MILITARY TRAINING IN THE MARIANAS

Thank you for your letter of September 27, 1998 commenting on the subject DEIS. This letter briefly summarizes your comments and responds to your concerns.

a. Page 1, para 2 Comment 1: Marianas Audubon Society (MAS) is concerned about the continuing use of Farallon de Medinilla (FDM) as a bombing target, and is opposed to the use of the island for this purpose. FDM is an important seabird nesting site, especially for the large numbers of Masked Boobies that utilize the island. The DEIS places greater emphasis on potential impacts to endangered species (megapodes, fruit bats, sea turtles) than on seabirds, which as the island's most important resource, are deserving of the greatest protection.

Response: FDM has been used as a bombardment range by the Navy, Marines and Air Force since 1971. National Environmental Policy Act (NEPA) documentation was completed in 1975 and numerous surveys and biological opinions have been published up to the present time. The Navy has a legal obligation to apply more stringent protective measures to listed species under the Endangered Species Act, than to unlisted species, including seabirds. Although the United States abides by the Migratory Bird Treaty Act (MBTA), the Navy is not required to provide compensatory mitigation for the incidental taking of migratory seabirds, which generally include the seabirds found at FDM. Nonetheless, the Navy is implementing several measures that will help mitigate and compensate for losses of any bird species that may occur as a result of bombing exercises at FDM. Among these measures are long-term aerial monitoring of seabird populations on FDM, and cooperating with the U.S. Fish and Wildlife Service (USFWS) and Commonwealth of the Northern Mariana Islands Division of Fish and Wildlife to enhance megapode populations on Sarigan (possibly to include feral animal control and habitat improvements), which would also improve conditions on Sarigan for ground-nesting seabirds.

It is expected that implementation of these measures will have direct and collateral benefits for seabird populations in the Northern Marianas. From survey information recorded prior to and after recent training events, it appears that seabird populations have remained relatively stable with the existing levels of military activity even without the mitigation measures established for

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FDM. The future surveys that can be accomplished within the limits imposed by the presence of unexploded ordnance (UXO) on the island, should determine whether long-term changes are occurring in the seabird populations and habitat at FDM as a result of military operations there.

b. Page 1, para 2, Comment 2: Aerial surveys of FDM are inadequate to determine bird mortality and should be replaced with ground surveys.

Response: The Navy agrees that ground surveys would provide additional information. However, the dangers imposed by the presence of substantial amounts of sensitive, UXO on FDM, and the risk of serious injury associated with conducting ground surveys on the island far exceed the possible benefits of increased survey acuity. The Navy will continue to conduct seabird surveys from helicopter, which will enable the detection of long-term changes in populations of larger nesting seabirds, such as red-footed, brown, and masked boobies, while insuring personnel safety. Photo documentation during the surveys will be used by comparison to detect significant changes that may occur in vegetation or bird habitat.

c. Page 1, para 2, Comment 3: The preferred alternative calls for increased frequency of bombing exercises, which will likely cause further reductions in nesting productivity and increases in direct mortality.

Response: The preferred alternative does not identify "increased frequency" as a characteristic of the proposed action but has attempted to accurately identity all of the ongoing training activities at this range by the Air Force, Navy and Marines ships and aircraft. The frequency of use is expected to remain relatively constant, based on normal deployment schedules and relatively constant training budgets. However, a temporary increase in the frequency of use could occur if increased military readiness in the region were required and additional units were staged or transiting Guam enroute to the western Pacific and Indian oceans operating areas. "Frequency" is controlled by establishing the amounts of ordnance that can be expended on the range. The Navy consulted with USFWS in 1998 to determine the ordnance limits for a three-year period. For example, the USAF annual sorties are limited to 320 and 5 to 612 live or inert bombs drops each year. Navy/Marine Corps close air support is constrained by their conducting three, three-week exercises per year, four, five-day exercises by carrier aircraft, and five, seven to fourteen day combined force exercises. The amount of missiles, rockets, and conventional high explosives and inert bombs is also dictated on an annual basis. Incendiary ordnance and cluster bombs are prohibited. Naval gunfire training is permitted monthly, each training event lasting several days. Post-strategic bombing surveys are also required as one means to determine potential cumulative effects.

d. Page 1, para 3, Comment 1: Bombs go off-target and hit non-target areas, and can start fires. These impacts can cause the loss of nesting and roosting habitats, and kill nestling birds.

Response: Measures have been taken to minimize bombs that hit off-target. Suitable target locations have been identified to reduce the potential for bombs missing the target areas and striking adjacent roosting or nesting concentrations of seabirds. The probability of fires and loss of habitat is minimized by prohibiting the use of any incendiary ordnance.

e. Page 2, para 2, Comment 1: The preferred alternative identifies the western cliffs and central plateau as the target area, which places the island's great frigatebird nesting colony (one of only two such colonies in the Marianas) in the direct line of fire.

Response: As shown in Figure 1, Appendix D-2 of the Draft EIS (DEIS), the nesting Great frigatebird colony is located outside the bombing target area (see Figures 2-5 and 2-11 of the DEIS). Figures 2-5 and 2-11 have been refined for the FEIS to indicate target areas more clearly and to ensure that the great frigatebird nesting colony is not targeted. Please cross reference the preferred land use alternative with Figure 3-3, the FDM bird and bat sighting illustration.

f. Page 2, para 3, Comment 1: Due to the concern about introducing Brown Tree Snake (BTS) to FDM via target materials (junk automobiles) transported from Guam, MAS recommends using instead constructed targets which can be more easily checked for presence of BTS. This suggestion is listed in the DEIS as a possible mitigation measure. All targets should be staged in snake-free areas prior to transport.

Response: The Navy will not use junked autos as FDM targets and has switched to old metal containers or fabricated targets that can be easily inspected for BTS. Regardless of the point of origin targets must be cleaned and inspected in accordance with the BTS interdiction and control protocol prior to shipment.

g. Page 2, para 4, Comment 1: The use of rodenticides on FDM as a mitigative measure is of interest, but its potential beneficial effects are unknown.

Response: Rats are known to occur on FDM and were observed during surveys conducted in November 1996. It is considered likely that rats living on the island may prey on bird eggs and therefore exert predation pressure on the natural populations of birds using the island. However, we agree with your concern that there is inadequate information available at the present time to support a recommendation for this mitigation measure. To conduct such a program would require having an accurate census of the rodent population, determining to what extent rodents on the island may rely on bird eggs or chicks as a food source, assessing the potential adverse effects of using rodenticides (versus other possible means of rodent control), and knowing the legalities of broadcasting pelleted rodenticides from helicopters (according to

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the Environmental Protection Agency and other agency guidelines). Given the dangers of moving about on FDM, it is not possible to conduct the desired studies at this time. Since the information needed to support this recommendation is lacking, this mitigation measure has been eliminated from the FEIS.

h. Page 2, para 4, Comment 2: The military should sponsor a program of frequent census-taking of seabird populations on FDM, by a means other than helicopter surveys. The military should also fund a Marianas-wide survey of resident seabird populations.

Response: As stated earlier, personal safety issues strongly influence the means taken to conduct a seabird census. Operating within these constraints, the Navy will continue to conduct surveys that should prove adequate to detect general changes in the population of larger seabirds such as red-footed and masked boobies on FDM. Under the MBTA, the Navy is not required to mitigate for the incidental taking of migratory seabirds. However, in terms of meeting its obligations to monitor a continuing action under NEPA where significant impacts are anticipated, the Navy agrees that a continuing program of study should be implemented. While a study of seabirds throughout the Marianas would be excessive, a more focused study, within that part of the chain proximate to FDM, and including FDM, would be appropriate. This will be included in the FEIS discussion of proposed mitigation measures.

Should you have any questions, please contact Mr. Stanley Uehara at (808) 471-9338, by facsimile transmission at (808) 474-5909, or by E-Mail at UeharaSY@efdpac.navfac.navy.mil.

Sincerely,

Melvin N. Kaku

MELVIN N. KAKU
Director
Environmental Planning Division

UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
Southwest Region
501 West Ocean Boulevard, Suite 4200
Long Beach, California 90802-4213

September 28, 1998

Commander, Attn: (Code 231FM)
PACNAVFACENGCOM
Building 258 Makalapa
Pearl Harbor, Hawaii 96860-7300

Dear Sir:

The National Marine Fisheries Service (NMFS) has reviewed the revised Draft Environmental Impact Statement (DEIS) for Military Training in the Marianas, prepared by the Pacific Division of the US Navy. The following comments, prepared under the National Environmental Policy Act (NEPA), are presented for your consideration in preparing the Final EIS.

NMFS reviewed the original DEIS and found the document to be inadequate under NEPA. By letter dated April 15, 1997 we recommended that a revised or supplemental DEIS be prepared and circulated. Our primary concern was the lack of information on the impact of military training activities in the Mariana Islands, particularly in the waters surrounding the uninhabited target island of Farallon de Medinilla (FDM).

During our review of the revised DEIS, we were pleased to see considerable additional information included on the marine environment. Appendix D in particular contains much of the requested information, including copies of recent survey reports from underwater observations in waters off FDM. These include the NMFS report on the nearshore survey of FDM conducted in conjunction with the other resource agencies and the Navy in July 1997. This additional information now allows us to fully assess the existing conditions of the marine habitat and associated biota in waters surrounding the FDM target island.

A remaining concern to NMFS is the question of mitigation for unavoidable impacts to the marine environment, and monitoring of potential impacts from implementation of all preferred alternatives. In Chapter Four (page 4-70) of the DEIS under "Proposed mitigation", a general statement is made that "additional compensatory mitigation measures may be negotiated with the USFWS and NMFS". NMFS believes that these measures and a specific monitoring program for potential impacts within the marine environment, both around FDM and other appropriate sites (ie, amphibious landing zones on Tinian and Guam), should be developed as soon as possible. All mitigation and monitoring programs should be detailed in the Final EIS.

NMFS appreciates the opportunity to continue working closely with the Navy on this important activity, including the review of the project EIS. Should you have any questions concerning these comments, please contact John Naughton (808/973-2940) at our Pacific Islands Area Office in Honolulu.

Sincerely,

Charles Karnella, Ph.D.
Administrator

cc: F/SW, Long Beach, CA
FWS, Honolulu
USEPA, Region 9
DFW, Saipan
DAWR, Guam
WPRFMC, Honolulu

DEPARTMENT OF THE NAVY
PACIFIC DIVISION
NAVAL FACILITIES ENGINEERING COMMAND
(MAKALAPA, HI)
PEARL HARBOR, HAWAII 96860-7300

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Ser PLN231/ 1778

21 MAY 1999

Charles Karnella, PhD
National Marine Fisheries Service
Southwest Region
501 West Ocean Boulevard, Suite 4200
Long Beach, CA 90802-4213

Dear Dr. Karnella:

Subj: REVISED DRAFT ENVIRONMENTAL IMPACT STATEMENT (DEIS)
MILITARY TRAINING IN THE MARIANAS

Thank you for your letter of September 28, 1998 commenting on the subject DEIS. This letter briefly summarizes your comments and responds to your concerns.

Comment: NMFS is concerned about mitigation of unavoidable impacts in the marine environment, and monitoring of potential impacts of actions proposed under the preferred alternative. NMFS believes that compensatory mitigation measures and a specific monitoring program should be developed as soon as possible for activities in the marine environment around Ferallon de Medinilla (FDM) and other appropriate sites (i.e., amphibious landing zones on Guam and Tinian).

Response: The Navy is committed to working together with NMFS and other affected government agencies to develop specific mitigation plans and protocols for FDM, as well as other sites that contain marine resources that could be subjected to adverse environmental impacts from ongoing or proposed training activities. In an effort to further understand the impacts that may occur to marine resources as a result of training activities at FDM, and to minimize any such impacts in the future, a regular long-term program of annual in-water surveys of the marine environment will be implemented at FDM. The frequency and level of detail of the surveys should be sufficient to detect any impacts that may be occurring to marine life in the area as a result of training activities. Detection of significant impacts would initiate a reassessment of training activities and mitigation measures. Section 4.6.1.2 of the Final EIS (FEIS) has been revised to reflect that such a program has been initiated.

Mitigation measures pertaining to marine resources that could be affected by military training activities at other sites are already in place. Beach surveys for sea turtle nesting are being conducted on a monthly basis by Navy biologists in coordination with the Tinian Division of Fish and Game. The beaches that are recommended for LCAC landings are Unai Chulu and Unai Dankulo. Unai Babui was but is no longer recommended for AAV landings. Tachogna and Kammer beaches are no longer available for landings by any large landing craft or AAV. These beaches are popular picnic, camping, and fishing beaches.

During an eighteen-month sea turtle study, funded by the Navy and conducted by the USFWS, only one possible nest was found at Tachogna, and two possible nests were reported from Chulu Beach. Chulu Beach is large enough that, should nesting activity be detected, travel lanes to exit or return to the beach for vehicles and personnel will be marked to avoid the areas. There are two well-traveled access roads to Unai Chulu beach. Should a nest be located in an area where it cannot be avoided, the beach will not be used and the landing activity will be postponed, cancelled or may occur at an alternate beach site that has no nesting.

Should you have any further questions, please contact Mr. Stanley Uehara at (808) 471-9338, by facsimile at (808) 474-5909, or by E-Mail at UeharaSY@efdpac.navfac.navy.mil.

Sincerely,

Melvin N. Kaku

MELVIN N. KAKU
Director
Environmental Planning Division

9. Western Pacific Regional Fisheries Management Council

WESTERN
PACIFIC
REGIONAL
FISHERY
MANAGEMENT
COUNCIL

28 September 1998

OPTIONAL FORM 99 (7-90)

FAX TRANSMITTAL

# of pages ▶

To Amy Sheridan | From Fred M Iwata

Dept/Agency | Phone #

Fax # | Fax #

NSN 7540-01-317-7368 5099-101 GENERAL SERVICES ADMINISTRATION

Commander, Attn: (Code 231FM)
PACNAVFACENGCOM
Building 258 Makalapa
Pearl Harbor, Hawaii 96860-7300

Dear Sir:

Thank you for providing us with an opportunity to review and comment on the revised "DEIS for Military Training in the Marianas". Our primary concerns focus on the bombing activities at Farallon de Mendinilla (FDM). The reefs surrounding FDM comprise the largest coral reef area under federal jurisdiction in the U.S. Western Pacific Region, outside of the Hawaiian archipelago. Several commercial fishing operations are currently using the area. While conclusions of your DEIS suggest that the nearshore environment is in good condition, it remains to be known whether there are any significant impacts due to bombing, considering the brief and qualitative nature of the marine survey. Some fishermen believe that resources in these waters are being impacted by the bombing. The Council is most apprehensive about impacts on the productive marine resources and the coral reefs surrounding the island. We are also concerned about the safety of fishermen in the area who may not have been adequately warned of a pending strike. Cliffside erosion could be accelerated from repeated hits combined with the harsh natural forces, contributing to sedimentation which could be detrimental to coral reefs as essential fish habitat.

The Council recognizes the necessity and importance of the U.S. military continuing to use this area for target practice. Considering that other options may be even less feasible, such as clean-up of unexploded ordnance at FMD and the possible use of alternative sites, in addition to the fact that numerous birds have coexisted with the bombing activity for over two decades, the preferred alternative seems plausible. The activity does not appear to be jeopardizing any population of marine or terrestrial species and USFWS has authorized the incidental killing of birds on the island. As the DEIS does not address plans for continued marine surveys, we strongly recommend that a quantitative marine impact assessment of the reef habitat and commercial marine resources be repeated at about 1-2 year intervals in all areas where bombs have landed within the three-mile radius bombing range surrounding FDM. Bombing should be restricted to localized terrestrial sites or as close to the shoreline as possible. If any significant impacts become apparent bombing should cease until improved mitigation measures are implemented. Military training activity in all other areas of the Marianas should also minimize and mitigate impacts on reefs and marine resources.

Mahalo!

Sincerely,

Kitty M. Simonds

Kitty M. Simonds
Executive Director

c: Council Members

A Council Authorized by the Magnuson Fishery Conservation and Management Act of 1976
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DEPARTMENT OF THE NAVY
PACIFIC DIVISION
NAVAL FACILITIES ENGINEERING COMMAND
(MAKALAPA, HI)
PEARL HARBOR, HAWAII 96860-7300

5090P.1G03
Ser PLN231/ 1776
21 MAY 1999

Ms. Kitty N. Simonds
Executive Director
Western Pacific Regional Fishery Management Council
1164 Bishop Street, Suite 1405
Honolulu, HI 96813

Dear Ms. Simonds:

Subj: REVISED DRAFT ENVIRONMENTAL IMPACT STATEMENT (DEIS)
MILITARY TRAINING IN THE MARIANAS

Thank you for your letter of September 28, 1998, commenting on the subject DEIS. This letter briefly summarizes your comments and responds to your concerns.

Comment: Recognizing the fact that the reefs surrounding Farallon de Medinilla (FDM) comprise the largest coral reef area under federal jurisdiction in the Western Pacific area, the Western Pacific Regional Fishery Management Council (WESPAC) is concerned about the potential impacts of bombing exercises on the productive marine resources and corals present. Also, cliffside erosion could be accelerated due to bombing, resulting in sedimentation that could further impact coral reefs considered essential fish habitat.

Response: The marine survey of FDM conducted in 1997 found limited fringing coral reef surrounding the island (see Appendix D of the Final EIS for the survey report). WESPAC was briefed on the results of this survey, which was conducted by a team of marine biologists that included National Marine Fisheries Service (NMFS), U.S. Fish and Wildlife Service (USFWS), and Commonwealth of the Northern Mariana Islands (CNMI). The marine waters immediately surrounding FDM are the most likely areas to experience impacts from training, and those potential impacts would diminish with distance from the island. The Navy is aware that banks in the vicinity of FDM, including those north of the island, support important commercial fisheries. The Navy is taking reasonable measures to assure that during training exercises at FDM, impacts to marine resources immediately adjacent to the island are kept to a minimum. The 1997 survey shows little evidence of coral damage due to bombing, despite many years of bombing practice at FDM, since 1971. Since corals regenerate slowly (estimates of the time required to regenerate coral heads vary, but can be as much as 50 years or more), damage from past bombing would be cumulative, and evidence of coral damage that occurred several years ago would still be visible today if it were occurring. The nearest adjacent shoals are located approximately 1000 meters north of FDM and therefore, not likely to be affected by training on the island.

Photographic evidence indicates that the cliffs of FDM were eroding prior to military use through natural geological forces. It is not clear the extent to which that erosion is impacting coral reefs, or the extent to which erosion is accelerated by military use.

In an effort to further understand the impacts that may occur to marine resources as a result of training activities at FDM, and to minimize any such impacts in the future, a regular long-term program of annual in-water surveys of the marine environment is being implemented. The frequency and level of detail of the surveys should be sufficient to detect any impacts that may be occurring to marine life in the area. Section 4.6.1.2 includes an annual marine survey at FDM as one means to monitor the impacts of training.

Comment: WESPAC is concerned about the safety of fishermen using the area.

Response: The Navy follows a set of standard operating procedures to ensure public safety before, during, and after bombing training events at FDM. All training activities are confined to the island, centered within a formally restricted area comprising a three-mile radius circle around FDM. Forty-eight to 72 hours prior to activating the range, a Notice to Airmen (NOTAM) and a Notice to Mariners (NOTMAR) are formally published and broadcasted on marine channels. The CNMI Emergency Management Office also repeats the announcement on marine radio bands. The restricted area is checked before training activities begin to ensure that no civilian vessels are within the restricted zone.

The safety of Saipan fishermen has been discussed with CNMI officials. Section 4.6.2 of the FEIS proposes that multilingual signs be posted at marinas rather than on the island. (There is no desire to encourage anyone to come on or near the island, and sign maintenance would be difficult and dangerous.) The signs would warn of Range 7201(FDM) and its three-mile surface danger zone, and indicate that NOTMAR and marine radio broadcasts announce dates and times of training.

Comment: The DEIS does not address plans for continued marine surveys; WESPAC recommends a program of quantitative surveys to assess impacts on reef habitat and commercial marine resources at 1-2 year intervals. If significant impacts are discovered, bombing should cease until adequate mitigation measures are implemented.

Response: As indicated in the response above, an annual marine survey will be implemented at FDM and reflected in the FEIS (Section 4.6.1.2). Detection of significant impacts would require cessation of training activities until adequate mitigation measures are in place to remedy the situation.

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Should you have any questions, please contact Mr. Stanley Uehara at (808) 471-9338, by facsimile at (808) 474-5909, or by electronic mail at UeharaSY@efdpac.navfac.navy.mil.

Sincerely,

Melvin N. Kaku

MELVIN N. KAKU
Director
Environmental Planning Division

10. GUAM SCUBA COMPANY

GUAM
SCUBA CO
"DIVING SCHOOL"

Attn: Environmental Planing Division

September 28, 1998

From: Dennis R Larsen :Dive Operations Manager

Re: Draft Environmental Impact Statement for Military Training in the Marianas

Dear Sir or Madamn,

It has come to my attention, through local and government agencies that the Navy plans to use certain sites in or around areas that are frequently used by my diving and dolphin watching customers for training purposes. I would at this time like to request that these activities be put on hold for a period of one (1) week until we can review the (DEIS).

I would also like to request a complete copy of the (DEIS) so that I may properly educate myself and my constituents on this matter. Please feel free to contact me should you have any questions.

Thank You

Dennis R Larsen

P.O. Box 11901 • Tamuning, Guam 96931 • Tel: (671) 649-3369 / 646-4674 - 5 • Fax. (671) 649-3370

DEPARTMENT OF THE NAVY
PACIFIC DIVISION
NAVAL FACILITIES ENGINEERING COMMAND
(MAKALAPA, HI)
PEARL HARBOR, HAWAII 96860-7300

5090P.1G03
Ser PLN231/ 1753
20 MAY 999

Mr. Dennis R. Larsen
Guam Scuba Company
P.O. Box 11901
Tamuning, GU 96931

Dear Mr. Larsen:

Subj: REVISED DRAFT ENVIRONMENTAL IMPACT STATEMENT (DEIS)
MILITARY TRAINING IN THE MARIANAS

Thank you for your letter of September 28, 1998 requesting that you be provided a copy of the DEIS. You commented about hearing of the Navy's plans to use sites for training that are also used for commercial diving and dolphin watching. A copy of the revised DEIS was mailed to you on the 19th of October.

Several Guam agencies noted the economic impact on dive operations from temporary harbor closures associated with underwater demolitions in Outer Apra Harbor. As a result, the revised DEIS published in the summer of 1998 included an assessment of economic impacts on dive operators, and explored the potential for additional dive sites away from the harbor. The assessment concluded that there was no significant impact on dive operations based on the harbor being closed for no more than four hours once per month and Jade Shoals (inside the harbor) and other desirable dive sites being available.

The Navy remains sensitive to the requirements of commercial dive tour operators on Guam, and will continue to coordinate its activities to minimize economic impacts caused by its required training activities. The protocol for planning underwater demolition training includes advance notification by Explosive Ordnance Disposal Mobile Unit Five (EODMU-5) to more than twenty firms affiliated with the Guam Diving Association. By regulation, the notifications are to be conducted 48 hours in advance; in practice, the dive shops are typically notified one week in advance. In addition, a Notice to Mariners (NOTAM) is published and broadcasted on marine U.S. Coast Guard channels between 48 to 72 hours in advance of the event. This advance notification is provided to enable dive tour operators adequate time to schedule dive tour activities outside the affected training areas, thus ensuring minimal disruption of normal dive tour operations, and protecting recreational divers from the hazards associated with the training activities. In addition, training exercises are not conducted if dolphins are observed in the training area.

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The Navy continues to work with regulatory agencies such as the Guam Environmental Protection Agency (EPA) and National Marine Fisheries Service to identify additional demolition sites that might reduce the frequency of demolition training in Apra Harbor. The FEIS (Section 4.3.1.1) proposes that a deepwater demolition site near Dadi Beach be used as an alternate deepwater training site for EODMU-5.

Should you have any further questions, please contact Mr. Stanley Uehara at (808) 471-9338, by facsimile at (808) 474-5909, or by E-Mail at UeharaSY@efdpac.navfac.navy.mil.

Sincerely,

Melvin N. Kaku

MELVIN N. KAKU
Director
Environmental Planning Division

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION IX
75 Hawthorne Street
San Francisco, CA 94105

SEP 2 8 1998

Mr. Fred Minato (Code 231FM)
Naval Facilities Engineering Command, Pacific Division
Pearl Harbor, Hawaii 96860-7300

Dear Mr. Minato:

The U.S. Environmental Protection Agency (EPA) has reviewed the U.S. Navy's Draft Environmental Impact Statement (DEIS) for ***Military Training in the Marianas, Mariana Islands.*** Comments are provided under the National Environmental Policy Act (NEPA), Section 309 of the Clean Air Act and the Council on Environmental Quality's (CEQ) NEPA Implementing Regulations (40 CFR 1500-1508). This document supersedes a previous DEIS issued in early 1997. We commend the Navy for its responsiveness to EPA's comments on the January 1997 DEIS.

The DEIS evaluates ongoing and proposed new uses of several sites. These lands include the Military Lease Area on Tinian where roughly 67 km² of mostly undeveloped area would be used. Active military bases on Guam such as the Ordnance Annex (undescribed size) and the Waterfront Annex (36 km² of mostly undeveloped land)would also be included. Other Guam bases such as the Communications Annex and parts of Anderson Air Force Base, together comprising about 92 km² of largely undeveloped land, would be used. The Navy-leased island of Farallon de Medinilla, upward of 1,120 km² of undeveloped and uninhabited land would be another affected area. Undescribed acreages of non-DOD lands in Guam at Dandan, on the Talofofo and Ylig Rivers, in Rota's main harbor, and at Rota's National Airport would also be affected by the proposed action.

The proposed activities are weapons certification, tactical exercises, combined arms training for large groups, joint-service exercises involving 2,000 or more personnel on land, aerial bombardment, training, paradrop activities, naval gunfire training, basic military occupational skills, amphibious assault, and logistics training, and various other training activities.

EPA has rated the preferred alternative and the NEPA document ***EC-2, Insufficient Information.*** For additional information concerning our rating system, please refer to the rating summary, attached. This rating reflects our conclusion that the Final Environmental Impact Statement (FEIS) should contain additional information. That information includes a more detailed analysis of the non-preferred alternatives, additional mitigations for sea turtle nesting impacts, analysis of impacts to coral reef spawning, contingency plans for oil spills from training or support vessels, analysis of depleted uranium impacts (if applicable), and more. Detailed comments are attached.

Please send two copies of the FEIS to David Farrel, Chief, Federal Activities Office (code: CMD-2) at the letterhead address at the same time that it is sent to EPA's Washington, D.C. office for filing. Please contact me or Rosalyn Johnson of my staff at (415) 744-1574 if you have questions regarding our comments. For specific questions regarding our hazardous materials and toxics comments please contact Ramon Mendoza of the Pacific Insular Area Program at (415) 744-1591.

Sincerely,

David Farrel, Chief
Federal Activities Office

cc: Pacific Insular Area Program EPA Region IX
Kitti Jensen USFWS
Dr. Bob Richmond University of Guam

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Attachments (2): Summary of EPA ratings
Detailed comments

SUMMARY OF EPA RATING DEFINITIONS

This rating system was developed as a means to summarize EPA's level of concern with a proposed action. The ratings are a combination of alphabetical categories for evaluation of the environmental impacts of the proposal and numerical categories for evaluation of the adequacy of the EIS.

ENVIRONMENTAL IMPACT OF THE ACTION

"LO" (Lack of Objections)

The EPA review has not identified any potential environmental impacts requiring substantive changes to the proposal. The review may have disclosed opportunities for application of mitigation measures that could be accomplished with no more than minor changes to the proposal.

"EC" (Environmental Concerns)

The EPA review has identified environmental impacts that should be avoided in order to fully protect the environment. Corrective measures may require changes to the preferred alternative or application of mitigation measures that can reduce the environmental impact. EPA would like to work with the lead agency to reduce these impacts.

"EO" (Environmental Objections)

The EPA review has identified significant environmental impacts that must be avoided in order to provide adequate protection for the environment. Corrective measures may require substantial changes to the preferred alternative or consideration of some other project alternative (including the no action alternative or a new alternative). EPA intends to work with the lead agency to reduce these impacts.

"EU" (Environmentally Unsatisfactory)

The EPA review has identified adverse environmental impacts that are of sufficient magnitude that they are unsatisfactory from the standpoint of public health or welfare or environmental quality. EPA intends to work with the lead agency to reduce these impacts. If the potentially unsatisfactory impacts are not corrected at the final EIS stage, this proposal will be recommended for referral to the CEQ.

ADEQUACY OF THE IMPACT STATEMENT

Category 1" (Adequate)

EPA believes the draft EIS adequately sets forth the environmental impact(s) of the preferred alternative and those of the alternatives reasonably available to the project or action. No further analysis or data collection is necessary, but the reviewer may suggest the addition of clarifying language or information.

"Category 2" (Insufficient Information)

The draft EIS does not contain sufficient information for EPA to fully assess environmental impacts that should be avoided in order to fully protect the environment, or the EPA reviewer has identified new reasonably available alternatives that are within the spectrum of alternatives analysed in the draft EIS, which could reduce the environmental impacts of the action. The identified additional information, data, analyses, or discussion should be included in the final EIS.

"Category 3" (Inadequate)

EPA does not believe that the draft EIS adequately assesses potentially significant environmental impacts of the action, or the EPA reviewer has identified new, reasonably available alternatives that are outside of the spectrum of alternatives analysed in the draft EIS, which should be analysed in order to reduce the potentially significant environmental impacts. EPA believes that the identified additional information, data, analyses, or discussions are of such a magnitude that they should have full public review at a draft stage. EPA does not believe that the draft EIS is adequate for the purposes of the NEPA and/or Section 309 review, and thus should be formally revised and made available for public comment in a supplemental or revised draft EIS. On the basis of the potential significant impacts involved, this proposal could be a candidate for referral to the CEQ.

*From EPA Manual 1640, "Policy and Procedures for the Review of Federal Actions Impacting the Environment."

Purpose and Need

When EPA commented on the previous version of the DEIS (comment letter date 3/24/97), we stated that "a direct justification for increasing the training that is currently conducted in the Marianas" was needed. Although the overall purpose and need for training has been elaborated in the document, the addition to the FEIS of a more detailed description of the losses in training opportunities in Japan, Korea, and the Philippines, and how those losses correspond to the proposed action, would help readers to understand why the specific actions are being proposed. This additional description should be included in the FEIS.

Proposed Action and Alternatives

The Executive Summary states both that "the purpose of this DEIS is to evaluate environmental impacts for continuing use of...DOD-controlled lands for military training," and that "both ongoing and proposed new use of DOD lands" are evaluated in the DEIS. 40 CFR 1502.14 states that in the Alternatives "section agencies shall: "(a) Rigorously explore and objectively evaluate all reasonable alternatives.... (b) Devote substantial treatment to each alternative considered in detail including the proposed action so that reviewers may evaluate their comparative merits...." In Section 2.8.1, the Comparison of Alternatives, the two apparently less damaging alternatives presented by the Navy are evaluated mainly in terms of how poorly they satisfy the purpose and need for military training, which is certainly relevant, but does not address the impact that they have on human health and the environment.

It does not appear to be the Navy's intent to eliminate the non-preferred alternatives from consideration, so these three alternatives should be more rigorously explored. To facilitate the comparison of alternatives and to be consistent with the stated purpose of the document, we strongly encourage the Navy to expand Table ES-2 to include the potential impacts of each of the alternatives on each resource area in the FEIS. According to 40 CFR 1502.16, the environmental consequences section "discussion will include the environmental impacts of the alternatives including the proposed action." So, the analysis of impacts and appropriate mitigations for the No New (Continuing) Action alternative (essentially the no action alternative as defined in the answer to Question Three of CEQ's 40 Most Asked Questions About NEPA) and the Maximum Land Use Alternative should appear in the environmental consequences section of the FEIS. The No Training Land Use alternative would also be an interesting point of comparison for readers if its analysis were expanded in the FEIS.

Biological Resources

It is not clear if potential negative impacts on coral spawning from training activities at Unai Chulu, Unai Dankulo, Kammer Beach, and Tachagna Beach (as shown on Figure 2-1a) have been considered in the DEIS. Please describe how training activities in areas where coral spawning is taking place would or would not be likely to affect spawning success. The Navy should work with USFWS and other natural resource agencies to determine levels of possible impact and appropriate mitigations. We also suggest that you contact Dr. Bob Richmond, a coral specialist at the University of Guam. We would be happy to put you in touch with him.

Compensatory mitigations for impacts on biological resources at Farallon de Medinilla should be fully described in the FEIS.

We agree with the US Fish and Wildlife Service (USFWS) May 6, 1997 comment letter statement that "AAV and LCAC landings [should] be restricted to outside the normal breeding season for sea turtles." Section 4.2.1.3 does not include this mitigation strategy and no response to that particular

comment from USFWS was made in Appendix A. A discussion with the USFWS reviewer confirmed that that agency still believes that the mitigation should be included in the FEIS. If for some reason training during the nesting season cannot be avoided at this time, we strongly suggest that additional mitigations be included in the FEIS, including, 1) a method of monitoring turtle use of the area over time to find out if training activity is related to a decline in nesting, 2) a contingency plan to decrease or cease training activity during the nesting season if a decline is observed, and 3) mitigation for nests that are known to have been destroyed as a result of the training. The Navy should contact USFWS turtle specialist, Kitti Jensen, to discuss this issue in greater detail.

The Navy should consider initiating plantings of native forest (rather than tangantangan which is an introduced species). Also plantings should be initiated before clearing existing habitat, so that usable alternative habitat is available for the species that are displaced.

The Navy's response to EPA's 3/24/97 comment regarding detonation of 20-pound charges in Apra Harbor indicates that the DEIS recommends that these detonations occur at the Dadi Beach site rather than the harbor site. The Dadi Beach site appears to be a better choice for avoiding impacts to biological resources, however, it may not be approved for demolition of 20-pound charges. EPA recommends that the Navy describe in the FEIS an additional alternative site rather than relying on the fall back position of using Outer Apra Harbor. This option would increase the chances that the training activities could be conducted where they do not pose a risk to endangered species.

Hazardous Materials/Toxics

It was not clear if contingency plans are in place to address potential oil spills from any of the vessels being used for the training exercise. An accidental vessel collision resulting in an oil spill during landing exercise could have a significant adverse impact on beaches and the marine environment. We recommend that a contingency plan to address an incidental release of oil be included in the FEIS as mitigation for the impact of potential collision.

Regarding anti-tank missile fire on FDM, it was not specified if the ammunition being used contains depleted uranium. The use of such ammunition could release radioactive materials into the environment. If depleted uranium is used in munitions, impacts on the environment and human health should be discussed in the FEIS with appropriate mitigations identified.

Several Solid Waste Management Units and other sites in Andersen Air Force Base and Apra Harbor Naval Complex in Guam are undergoing investigation and cleanup for hazardous constituent releases. See the Navy Pacific Division's 1994 "Current Conditions Report for Apra Harbor Naval Complex." Disturbance of theses areas from training exercise may spread the contamination in the environment and/or expose troops to hazardous materials. Some sites are potentially contaminated with PCBs in soil and sediment. The report does not make it clear if these areas will be off limits to personnel and vehicles. Please discuss this set of potential impacts and include mitigations in the FEIS to ensure that these areas will not be disturbed during training exercises.

Environmental Justice

Table ES-2 indicates that a possible Environmental Justice (EJ) impact is a "disproportionate hardship on local minority or economically disadvantaged population," however this possibility is not explored in the EJ section in environmental consequences on pages 4-78 and 4-79. Also, it is unclear from the discussion if people of "Micronesian ancestry," "Chamorro or part-Chamorro," or any other groups were considered minority populations by the Navy in the DEIS. A detailed Environmental Justice section

should be included in the Environmental Setting section of the FEIS that clarifies which groups in the project area are minorities or low-income, and this clarification should be reflected in Section 4.8.6.

DEPARTMENT OF THE NAVY
PACIFIC DIVISION
NAVAL FACILITIES ENGINEERING COMMAND
258 MAKALAPA DR., STE. 100
PEARL HARBOR, HI 96860-3134

5090P.1G03
Ser PLN231/ 1866

27 MAY 1999

Mr. David Farrell, Chief
Federal Activities Office
U.S. Environmental Protection Agency, Region IX
75 Hawthorne Street
San Francisco, CA 94105

Dear Mr. Farrell:

Subj: REVISED DRAFT ENVIRONMENTAL IMPACT STATEMENT (DEIS)
MILITARY TRAINING IN THE MARIANAS

Thank you for your letter of September 28, 1998 commenting on the subject DEIS. This letter summarizes your comments and responds to your concerns.

The land areas that are being proposed in the FEIS for training activities have been modified since publication of the DEIS. Initiatives to conduct riverine training at the Ylig and Talafofo Rivers on Guam, and to conduct helicopter training flights at night at the Rota airport are no longer included as Preferred Alternatives in the FEIS. A marine survey conducted on Tinian in March 1999 supports adding Unai Dankulo as a suitable Landing Craft Air Cushion (LCAC) landing beach, but eliminating Unai Babui from further consideration as a potential Assault Amphibian Vehicle (AAV) landing beach. Please note that the island of Farallon de Medinilla (FDM) is only 0.9 km^2, not "upward of 1,120 km^2" as indicated in your cover letter.

The Environmental Protection Agency (EPA) rated the DEIS as EC-2, "Insufficient Information" and requested that the Final EIS (FEIS) contain a more detailed analysis of the following matters:

Comparison of impacts of non-preferred alternatives.

Additional mitigation for sea turtle nesting impacts.

Analysis of impacts to coral reef spawning.

Contingency plans for oil spills from vessels.

Clarification whether depleted uranium munitions are used on FDM, among other information.

Your letter also provided specific comments on certain text in the DEIS. Our responses follow.

Purpose and Need

Comment: Please add a more detailed description of loss of training lands in Japan, Korea, and the Philippines and how those losses correspond to the proposed action.

Response: The description of training opportunities in other countries of the Western Pacific is provided to document the limited regional training venues now available for use outside the Marianas Islands. Section 1.3.2 of the FEIS summarizes why these areas are no longer available to U.S. forces after decades of extensive training use by U.S. and allied forces.

Proposed Action and Alternatives

a. Comment: *Paragraph 1*: Section 2.8 does not compare the two apparently less damaging alternatives in terms of their environmental impacts but only evaluates them in terms of their failure to satisfy the purpose and need for training.

Response: The comparison of alternatives, impacts and mitigation is now Section 2.9 of the FEIS. The primary negative aspect of the No Training and Reduced Training alternatives is the adverse effect on the purpose and need the requirement to train USCINCPAC forces in the Marianas. Potential impacts to the environment as a result of these alternatives have been added to the discussion. Selection of the No Training and Reduced Training alternatives has been implemented for specific areas of sensitive biological and cultural resources requiring levels of protection. In no instance did the validation of ongoing training and mitigation justify termination of reduction of training on Tinian, FDM, or any of the military bases on Guam.

An abstract discussion of training alternative impacts of land use alternatives has little value without considering effects on specific training areas. The training alternatives to the proposed action represent an escalating scale of land use with no training land use at the bottom end of the spectrum and maximum land use at the other. The latter is defined as the training requirements of the COMNAVMARIANAS Training Plan and other pertinent Navy and USAF training directives. The Preferred Alternative is primarily ongoing training land uses and mitigation and/or training constraints. New training activities at existing and new locations have been proposed and many have been selected as part of the Preferred Alternative. Based on training area suitability and the feasibility of mitigating any significant impact to satisfactory levels, the preferred alternative is a mix of all alternatives considered within a framework or training constraints, restrictions, and requirements designed to negate adverse impacts. The No Training Land Use alternative protects specific sites within larger training areas and now includes night field maneuver in Tinian monarch habitat during nesting seasons. No Training Land Use is also the outcome of the evaluation of night vision goggle (NVG) training at the Rota International Airport. Alternative training sites are available. The Reduced Training alternative was selected to minimize the size of maneuver forces during Tinian monarch nesting season as long as the bird remains a listed threatened species.

b. Comment: *Paragraph 2*: As the DEIS does not eliminate the non-preferred alternatives from consideration, the table summarizing impacts and mitigation measures should be expanded to include the potential impacts of each alternative on each resource area. I.e., add the impacts of

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the No Training Land Use, No New Action, and Maximum Land Use alternatives to Tables ES-2 and 2-11.

Response: The tables developed for the FEIS Executive Summary remains focused on the final results of the analysis and the preferred alternative. Table ES-1 summarizes the training land uses activities that are preferred on the lands that were evaluated. Table ES-2 summarizes the impacts and mitigation measures when conducting the preferred land use alternative.

A series of tables in Chapter Two addresses the deficiency that you have identified. Tables 2-5 through 2-11 compare alternatives and affected resources on Tinian, Waterfront Annex, Ordnance Annex, Andersen Air Force Base and the two Navy Communications Annexes, FDM, and the few parcels on non-DoD properties on Guam and Rota proposed for training. Table 2-11 is a summary of all affected resources at each training site and potential for mitigation to levels of nonsignificance

The impacts of discontinuing training activities by adopting the Reduced Land Use or No Training Land Use alternatives would consist primarily of the following:

• Loss of income to the local economy: If training capability were noticeably reduced on either Guam or Tinian, fewer units would be present to hire contractors and to spend money during liberty periods associated with training exercises. The No Training Land Use alternative would have such drastic economic impacts that it would generate major controversy on Guam.

• Somewhat lessened activity in training areas on Guam. As all lands proposed for training are active military bases, cessation of training would not automatically reduce potentially significant impacts on biological or archaeological resources. In fact, because the mitigation measures associated with the Preferred Alternative have been designed specifically to allow training while reducing impacts to nothing or to nonsignificance, the Reduced Land Alternative would have almost no detectable beneficial impact on the environment of Guam, in comparison to the Preferred Alternative.

• Aggressive development of currently undeveloped land on Tinian: No Training Land Use would mean giving up the government lease on Tinian, where residents are currently supportive of rapid resort development. The Military Lease Area would lose NEPA-related protection of resources by the Navy. Private developers would not be required by federal law to evaluate environmental impacts.

These impacts have been identified in Section 2.9.1 of the FEIS.

Biological Resources

a. Comment: *Paragraph 1*: Consider the impacts of training activities on the success of coral spawning. Navy should work with USFWS, other natural resource agencies, and

Dr. Bob Richmond at the University of Guam to determine levels of possible impact and appropriate mitigation.

Response: According to Dr. Robert Richmond at University of Guam, coral spawning occurs on a lunar cycle, with the predominant period in the Marianas occurring six to 12 days following the June and July full moons. To avoid interference with spawning, water quality and substratum quality should be maintained for the period from 10 days prior to 10 days following the spawning event. However, certain species of coral may spawn during other full moon cycles throughout the year.

Given the nature of coral spawning and recruitment, the only elements of the proposed action with the potential to generate impacts would be amphibious landing by AAVs, or a fuel spill into ocean waters that could be mixed into the water column, coincident with the spawning period. Since amphibious landings will be relatively few and conducted during daytime, the only foreseeable impacts are AAV landings from direct contact on the shallow substrate at Unai Babui. The FEIS no longer has AAV landings at this beach as a preferred alternative. Accordingly, the potential impacts by the vehicle's tracked suspension system to the nearshore reef and its sparse coral will not occur.

Turbidity associated with LCAC landing exercises is a short-term, temporary effect, and is likely to be comparable to or less than the turbidity caused by normal wave action in the area. This lack of impact was recently witnessed by CNMI environmental regulators during landings at Unai Chulu, Tinian during exercise Tandem Thrust 99. The marine survey report is included as Appendix C-5 of the FEIS.

Prevention and response to spills is fully discussed in the EIS, and the measures proposed are believed adequate to effectively minimize potential impacts. Section 3.3.1.2 of the FEIS will include the information provided regarding coral spawning to assist in decision regarding night training activities involving reef crossings.

b. Comment: *Paragraph 2*: Fully describe compensatory mitigation for impacts on biological resources at FDM.

Response: Compensatory mitigation for the loss of biological resources from training on FDM has been developed in conjunction with the U.S. Fish and Wildlife Service (USFWS) and the Commonwealth of the Northern Mariana Islands, Department of Land and Natural Resources (DLNR). The Navy has entered into an agreement with USFWS to assist and provide funding to implement management actions, including on-island surveys, feral animal control and other habitat improvements on Sarigan Island as compensatory mitigation for negative impacts to natural resources on the FDM range. This program, aimed primarily at improving reproductive success of Micronesian megapodes in the Northern Marianas, will also benefit ground-nesting seabirds. Specifics of the management actions being undertaken on Sarigan and other mitigation measures are included in FEIS Section 4.6.1.2.

Aerial seabird surveys are being conducted on FDM monthly, with photo-documentation. The Navy will continue to coordinate with the USFWS and CNMI DLNR to develop appropriate and feasible study protocols for evaluating long term trends in sea bird populations on FDM, which may include possible evaluation of other nearby locations for comparison and control.

Marine surveys will be conducted on an annual basis to document changes in the benthic environment around FDM. Marine biologists will perform the surveys in nearshore waters to characterize and inventory coral and fish species present, and record the condition of these resources. Standard transect methods are normally not possible due to weather and sea conditions.

c. Comment: *Paragraph 3*: Please respond to the earlier request by USFWS to restrict amphibious landings to months other than turtle-breeding season. If landings cannot be so restricted, suggested additional mitigation includes: (1) monitoring turtle nesting success over time on affected beaches; (2) prepare contingency plan to cease training during nesting season if a decline is observed; and (3) mitigation for nests destroyed by training. This should be discussed with Ms. Kitti Jensen at USFWS.

Response: The Section 7 consultation under the Endangered Species Act for the Marianas Training EIS has been completed and will be appended to the Final EIS. The military will take steps to protect sea turtles from training impacts, but cannot control civilian activity (including poaching) that occurs on both landing beaches throughout the year.

Amphibious landings would be conducted when the Navy's Amphibious Ready Group is scheduled to train in the Marianas. The ARG's operational schedule is based on the scheduled presence of forces assigned to the Western Pacific and Indian Ocean operating areas. The frequency of Marianas training opportunities has been two to three times annually. The FEIS protocol for amphibious landings includes a pre-landing survey by a knowledgeable biologist to find any indications of turtle nesting activity. Possible nest sites would be protected from harm by routing landing activities well clear of the nest site. If the nest site location made this impossible, the presence of the nest would serve to postpone or cancel the landing exercise. Upon completion of landings, beach topography will be restored, primarily to remove any deep wheel ruts running parallel to the high water line.

d. Comment: *Paragraph 4*: If vegetation is cleared on Tinian for training reasons, consider replanting with native vegetation rather than tangantangan.

Response: Earlier versions of the EIS considered the possibility that significant amounts of vegetation clearing would be necessary on Tinian to develop mortar and small arms ranges.

The suggested sites were covered in brush and tangantangan, and compensatory replanting would not be warranted. The preferred alternative for Tinian no longer includes range

development and extensive vegetation clearing. The removal of vegetation for tactical reasons during tactical maneuver training is equivalent to pruning and does not require mitigation.

e. Comment: *Paragraph 5*: Although the Dadi Beach underwater demolition site appears preferable to the Outer Apra Harbor underwater demolition site, the Dadi Beach site may not be approved for 20-pound charges. EPA recommends identifying a 3rd alternative site to increase the chance that demolitions will not occur in the harbor.

Response: Underwater demolitions exceeding 10 pounds charges will not be in the Preferred Alternative in the FEIS at either the proposed Dadi Beach or established Outer Harbor demolition sites. Because of the need to have a training area useable in most sea and weather conditions, the proposal is not to replace the Apra Harbor site, but to supplement it so that the frequency of use at each site may be reduced. The Navy in coordination with regulatory agencies continues to evaluate additional sites for both deep- and shallow-water demolition training.

Hazardous and Toxic Materials

a. Comment: *Paragraph 1*: EPA recommends a contingency plan for potential oil spills from vessels participating in exercises.

Response: All Navy vessels have contingency plans in place for oil spills, in accordance with Chapter 10 (Oil and Hazardous Substance Contingency Planning) of OPNAVINST 5090.1b (Environmental and Natural Resources Program Manual). (Please note, however, that activities of marine vessels away from shore are excluded from the scope of this EIS, which is limited to for use of land areas for training.) COMNAVMARIANAS training directives presently include this requirement for ships operating in the Mariana Islands.

b. Comment: *Paragraph 2*: DEIS does not specify whether anti-tank missile fire on FDM would use ammunition containing depleted uranium.

Response: Depleted uranium projectiles are associated with high-velocity, kinetic energy munitions with discarding sabots. These projectiles are fired from surface deployed anti-tank weapons and Main Battle Tanks. These weapon systems will not be employed at FDM. The AT-4 is a shoulder-launched, short-range anti-tank missile that may be fired by SEALs operating from small craft offshore. The AT-4 missile is not constructed of deployed uranium.

c. Comment: *Paragraph 3*: Various sites at Andersen AFB and Apra Harbor have been identified as hazardous constituent release sites and are undergoing investigation and/or cleanup. The EIS should clarify whether these sites will be off limits to troops or whether troop movements could spread hazardous constituents around the bases.

Response: We are not aware of any designated training area that contains an Installation Restoration or Solid Waste Management Unit site. However, a statement will be added to

Section 3.5.2 of the FEIS that all IR, SWMU and other sites undergoing investigation or remediation for hazardous materials are off limits to training personnel and vehicles until such time as the sites have been cleaned up and properly closed.

Environmental Justice

Comment: Analysis in Chapter Four does not indicate whether a disproportionate hardship on local minority or economically disadvantaged populations will occur as a result of the proposed action. It is unclear whether persons of Micronesian ancestry or Chamorro or part-Chamorro persons were considered minority populations in the analysis. Chapter Three should include a detailed clarification as to the latter point, and this should be reflected in Section 4.8.6.

Response: The following information has been added to Section 4.9 of the FEIS. The inhabited locations of the proposed action, on the islands of Guam, Tinian, and Rota, have a very complex and dynamic ethnic history, which even today is in flux because of non-resident workers. Section 3.6 summarizes the ethnic composition and basic economic conditions of these islands. Given this rich diversity, it would be arbitrary and perhaps misleading to label one or another group as a "minority", when perhaps all could be considered minorities either nationally or regionally. The highest proportional element of the population on each island is Micronesian; although only on Rota do persons of Chamorro ancestry comprise a majority of the population. In evaluating the potential for the proposed action to cause disproportionate impacts to minority or disadvantaged populations, it first must be questioned whether there are any such impacts, and secondly whether these impacts are allocated in a manner that disproportionately affects any minority. As the proposed activities are primarily on existing lands or waters owned, controlled, or leased by the military, and there is no clear pattern of differential residential or economic use among various ethnic populations associated with the affected parcels, disproportionate impacts will not result from the proposed action.

Should you have any further questions, please contact Mr. Stanley Uehara at (808) 471-9338, by facsimile transmission at (808) 474-5909, or by E-mail at UeharaSY@efdpac.navfac.navy.mil.

Sincerely,

MELVIN N. KAKU
Director
Environmental Planning Division

12. GUAM BUREAU OF PLANNING

BUREAU OF PLANNING
SETBISION MAMPLANEHA
Government of Guam

Carl T.C. Gutierrez
Governor of Guam

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Clifford A. Guzman
Director

SEP 28 1998

Commander
Attn: (Code 231FM)
PACNAVFACENGCOM
Building 258 Makalapa
Pearl Harbor, Hawaii 96860-7300

Hafa Adai Commander:

This is to inform you that the Bureau of Planning's Guam Coastal Management Program is requesting additional information and is also requesting an extension to the Public Comment period for the Draft Environmental Impact Statement (DEIS) for Military Training in the Marianas.

The August 1998 Draft Environmental Impact Statement (DEIS) does not address the requirements of the Executive Order on Coral Reef Protection signed by President Willam J. Clinton on June 11, 1998. These requirements are applicable to "U.S. coral reef ecosystems: species, habitats, and other natural resources associated with coral reefs in all maritime areas and zones subject to the jurisdiction or control of the United States (e.g., Federal, State, territorial, or commonwealth waters), including reef systems in the south Atlantic, Caribbean, Gulf of Mexico, and Pacific Ocean."

Until the requirements have been met, it is impossible for us to evaluate the DEIS. Therefore, we are requesting that the Navy address those requirements and furnish the Bureau of Planning with the assessment within 60 days from the date of this letter. Because the requirement of the Executive Order is a Federal mandate, the Guam Coastal Management Program (GCMP) is stopping the clock on the Federal Consistency determination until the information is provided.

Si Yúos Másé,

CLIFFORD A. GUZMAN
Director

cc: GEPA
DoAG
DPR
DLM
BRACC
OCRM

OPTIONAL FORM 99 (7-90)
FAX TRANSMITTAL
# of pages ▸
To: John Goody / Eric Kish
From: Mel Falan
Dept./Agency: BCIT
Phone #: 477-9338
Fax #: 828-7819
Fax #: 474-5909
NSN 7540-01-317-7368 5099-101 GENERAL SERVICES ADMINISTRATION

Guam RECEIVED TIME 28-OCT. 2.81 8:00AM Guam ◆ Socio-Econ PRINT TIME 28-OCT. 2.81 8:09AM Guam

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Director

OCT 13 1998

Commander
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Pearl Harbor, HI 96860-7300

Hafa Adai Commander:

This is to clarify the letter we sent you, dated 28 September, 1998, regarding the need for more information regarding the Draft Environmental Impact Statement (DEIS) for Military Training in the Marianas.

We understand the U.S. Fish and Wildlife Service had the same concerns we did, in that the lack of adherence to the requirements of the Executive Order on Coral Reef Protection, signed by President Clinton on June 11, 1998, makes review of the projects impossible. The completion of the requirements and subsequent inclusion of that information into the proposed actions will require significant amendments to the DEIS. For that reason, we would assume and hope that you will withdraw the federal consistency statement in the DEIS. The missing information is necessary before such a determination can be made.

If, on the other hand, you do not wish to withdraw the determination, the Guam Coastal Management Program would have no option other than to issue a finding of non-consistency based on a lack of information, as the fulfillment of the requirements of the Executive Order would provide significant information on how many of the activities proposed could be consistent with the enforceable policies of our program.

We would like to work with the military in resolving any questions, and to offer suggestions for alternatives which would allow for training while protecting Guam's environment and development rights.

We are requesting a response to this letter within two weeks in order that we can proceed either with a cooperative review between DOD and GovGuam officials, or the negative findings which would be the only other alternative.

Si Yu'os Ma'ase',

CLIFFORD A. GUZMAN

cc: GEPA
DoAG
DPR
DLM
BRACC
OCRM

DEPARTMENT OF THE NAVY
PACIFIC DIVISION
NAVAL FACILITIES ENGINEERING COMMAND
258 MAKALAPA DR., STE. 100
PEARL HARBOR, HI 96860-3134

5090P.1G03
Ser PLN231/1723

17 MAY 1999

Mr. Clifford A. Guzman
Bureau of Planning
P.O. Box 2950
Agana, GU 96910

Dear Mr. Guzman:

Subj: REVISED DRAFT ENVIRONMENTAL IMPACT STATEMENT (DEIS)
MILITARY TRAINING IN THE MARIANAS

Thank you for your letters of September 28 1998 and October 13, 1998 commenting on the subject DEIS. This letter briefly summarizes your comments and responds to your concerns.

Comment: The DEIS does not address the requirements of the Executive Order (EO) on Coral Reef Protection (CRP) signed on June 11, 1998. Please address those requirements and provide an assessment within 60 days (i.e., November 28, 1998). The Guam Coastal Management Program (CMP) is stopping the clock on the federal Coastal Zone Management (CZM) consistency determination until such information is provided. Meanwhile, please withdraw the federal consistency statement in the DEIS; otherwise, CMP will issue a finding of non-consistency based on a lack of information.

Response: The DEIS was prepared and published in June 1998. The EO on CRP (EO 13089) was signed on June 11, 1998, and was received only after the DEIS was already being finalized. President Clinton issued EO 13089 to establish policies regarding coral reef protection that apply to federal agencies. Although the EO was not issued in time to be included in the DEIS, one of the primary evaluation criteria for water-related exercises analyzed in the DEIS was the prevention of significant impacts to coral.

The preferred alternatives for amphibious landings and underwater demolition training were tailored to ensure that there would be no significant impacts to coral. On Guam, the protection of shallow coral beds is the reason that Dadi Beach is no longer recommended for Landing Craft Air Cushion (LCAC) landings until additional study can be conducted on-site. Certain proposed shallow-water demolition sites in Apra Harbor and Dadi Beach were also eliminated from consideration due to potential damage to the coral by the explosive impacts. On Tinian, Commonwealth of the Northern Mariana Islands the proposed Assault Amphibian Vehicle landings at Unai Babui where a minimum amount of coral impact would have occurred are no longer recommended. A marine survey to determine effects to shallow nearshore and reef coral by air-cushioned landing craft (the LCAC) was conducted at Unai Chulu during Tandem Thrust 99. The study confirmed that LCACs operating on full-cushion do not impact corals in shallow waters and that Unai Chulu is a suitable LCAC landing site.

5090P.1G03
Ser PLN231/1723

The FEIS has incorporated a summary of the policies of EO 13089 in Section 4.10 and evaluates the alternatives in consideration of these policies on Tinian, Guam, and Farallon de Medinilla in Sections 4.2.1, 4.3.1, and 4.6.1, respectively.

While the EO on CRP sets forth the President's policies for federal agencies, it is a matter of federal policy that does not alter existing legal requirements, such as those under the federal CZM Act (16 U.S.C. 1451, *et. seq.*). In addition, it should be noted that the new federal CRP policies are not part of Guam's approved CZM Program.

Under the federal CZM Act and its implementing regulations, it is the federal agency's obligation to determine whether its proposed federal activity directly affecting the coastal zone will be undertaken in a manner consistent to the maximum extent practicable with the applicable approved State or Territorial CZM Program. The Navy properly made and provided this consistency determination to your office by our letter of September 9, 1998, in full compliance with the federal CZM Act. For the foregoing reasons and because the policies of EO 13089 are not part of Guam's CZM Program, the Navy does not plan to withdraw its consistency determination. The Navy believes that its consistency determination is complete and adequate for Guam Bureau of Planning's evaluation and purposes under the CZM Act. Therefore, it is believed that there is no justification for delay in the Bureau of Planning's evaluation of, and response to, the Navy's consistency determination.

Should you have any further questions, point of contact is the undersigned at (808) 471-9338, by facsimile at (808) 474-5909, or by E-Mail at UeharaSY@efdpac.navfac.navy.mil.

Sincerely,

Stanley Y. Uehara
STANLEY Y. UEHARA
Director
Environmental Planning Division
Acting

13. GUAM ENVIRONMENTAL PROTECTION AGENCY

GUAM ENVIRONMENTAL PROTECTION AGENCY

AHENSIAN PRUTEKSION LINA'LA GUAHAN

P.O. BOX 22439 GMF • BARRIGADA, GUAM 96921 • TEL: 475-1658/9 • FAX: 477-9402

SEP 28 1998

Commander
Attn: (Code 231 FM)
PACNAVFACENGCOM
Building 258 Makalapa
Pearl Harbor, HI 96860-7300

RE: MILITARY TRAINING IN THE MARIANAS DEIS

Dear Sir:

Please find enclosed our preliminary draft of comments on the DEIS for Military Training in the Marianas. We require additional time to accomplish an adequate review and provide comments on this latest (June, 1998) Draft Environmental Impact Statement on proposed Military Training in the Marianas. Please allow our final comments to be accepted and addressed at a later date this year.

Sincerely,

JESUS T. SALAS
Administrator

Enclosure

ALL LIVING THINGS OF THE EARTH ARE ONE

DRAFT

Commander
Attn: (Code 231 FM)
PACNAVFACENGCOM
Building 258 Makalapa
Pearl Harbor, HI 96860-7300

Dear Sir:

We have reviewed the revised Draft Environmental Impact Statement (rDEIS) for Military Training in the Marianas, dated June, 1998. Based on our review of this draft and the previous draft, as well as meetings on Guam with Navy representatives and DOD consultants, inspection of proposed training sites and observations of trial Landing Craft, Air Cushion (LCAC) landings on Guam one year ago, we provide the following comments.

We recognize the need for military training as proposed and appreciate DOD's efforts to address possible impacts and to select alternatives that have lesser negative impacts. We encourage continued dialogue and coordination between the DOD and the Government of Guam regarding future military training. We limit our comments to impacts of actions on Guam , but have noted the proposed disposal on Guam of solid waste from Tinian exercises and transfer of hazardous wastes from there through Guam.

In discussion of terrestrial impacts, we note that the rDEIS repeatedly refers to "migratory seabirds" but the seabirds, including the noddy terns recorded in the rDEIS as nesting at Orote Point, should be considered residents, not migrants, and their nesting areas must be protected. These should not be confused with migratory shorebirds, which do not nest in Guam, but also are protected by international treaties. These resident seabirds have very limited nesting areas and are extremely important to Guam fishermen, who use them to locate feeding schools of pelagic fish.

Guam Marine and Shoreline Training

Our main continuing concerns and objections with the proposed military training alternatives and the DEIS are centered on the marine and shoreline training activities on Guam, including Mine Countermeasure (MCM) and Amphibious Landings training. Although the DOD imposes extensive and questionable limitations on the extent of submerged land owned by the Government of Guam, even in areas heavily utilized by the public, the GEPA has clear responsibilities in protecting water quality and related resources in all waters of Guam. Therefore we question particularly the activities of MCM and Amphibious Landings, which have potential to seriously impact our waters and recognized valuable resources. The rDEIS devotes a minimal total of two sentences

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describing the Marine Environment of Guam (Chapter Three, 3.3.2.2). The new Appendix C-3 contributes little to information (total of two pages, minimal data) on the new sites that are preferred over the old Apra Harbor sites for MCM. It doesn't note the prominent dolphins and the garden eels and large sting rays in the sand (not manta rays). Appendix C-2 also fails to describe the biota in the preferred Dadi deepwater site identified to GEPA by Navy EOD staff.

New Sites for Deepwater MCM.

Staff of GEPA, together with Guam Department of Agriculture Division of Aquatic & Wildlife Resources' staff have conducted numerous surveys of the area offshore of Dadi Beach in an attempt to identify a suitable site for MCM training outside of Apra Harbor. Although a suitable sandy area was initially felt to be conducive to DOD's needs, further analysis has revealed problems with this proposed site. On virtually all of the occasions GEPA staff were in the area, dolphins or a dolphin watching tourist vessel were in the immediate area, indicating dolphins are common to this area. In addition a resident school of giant sting rays were observed on almost every dive conducted. Also sand wrasses and a colony of garden eels were observed living in the sandy plain proposed as the explosion area. These biota were not observed or noted in the additional survey and report for the rDEIS (Appendix C-3). It is highly unlikely that these eels and giant sting rays camouflaged in the sand can be scared away from the site during visual surveys before demolition activities, as recommended in Chapter 4 (4.3.1.1). Garden eels simply retract into their holes when approached and it can be very difficult to observe rays buried in the sand. Any attempt to move dolphins from the area, even for a brief period, would probably violate US marine mammal protection laws. As a result of these concerns, GEPA cannot approve the deeper sand flats off Dadi Beach as an alternate site for MCM activities.

In the rDEIS Executive Summary Section 4.3, it should be noted that the proposed monthly underwater demolition using 10 to 20 pound charges in the deeper water off Dadi Beach will endanger numbers of protected marine mammals which appear to be present daily at the proposed site, as well as resident garden eels, wrasses and stingrays. The proposed frequency of such explosions may deter recovery of marine organisms.

Table ES-2 of the rDEIS must include marine mammals as protected species that will be impacted by deepwater MCM on Guam. The risk to dolphins from MCM explosions off Dadi Beach appears much greater than risk to sea turtles.

Apra Harbor MCM

In regards to Apra Harbor, although numerous detonations have been conducted in the past with no documented turtle takings, this activity cannot be described as having no adverse impact on the marine environment. For example, although never addressed by

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GEPA in the past, these detonations in Apra Harbor have created significant silt plumes. SOP is for the GEPA divers to wait as long as one hour while waiting for the visibility to improve enough to perform the post detonation survey. Technically all of the larger detonations have violated Guam's Water Quality Standards. We believe use of 20 pound charges should not be allowed. The most recent MCM exercise conducted on Aug. 26, utilized a smaller 4lb. charge which significantly reduced the silt plume. The larger charges have generated silt plumes that are highly visible on the surface immediately following the detonation. As a result GEPA is very concerned about the push for the use of even larger charges anywhere in near-shore waters. We were pleased to hear from a member of the Navy EOD team that 20 pound charges were not essential for training, but they are still included in the proposed exercises of the rDEIS.

Previous detonations for exercises in Apra Harbor were estimated by EOD staff to be approximately one per quarter-year and 20 pound explosions about one per year. But Table 1-1 of the rDEIS calls for monthly use of 10 to 20 pound charges. Such frequency greatly diminishes ability of marine organisms to recover from impacts.

The EOD team also indicated that MCM would not be pursued at Breakwater Beach because of the normally rough water conditions there and the concentration of boat traffic. We listed this in our previous written comments and the Navy's Melvin Kaku's reply to our comments of July 10, 1998, agreed with our letter's statement #4 confirming this. But text of the rDEIS and Figure 2-2a still shows Breakwater Beach as a new preferred shallow MCM site.

General Statements Regarding MCM Training in Apra Harbor.

The safety of tourists and local fishermen and water recreation participants cannot be positively guaranteed during explosions in Apra Harbor. However,GEPA believes that a majority of the Navy's proposed MCM training can be conducted in Apra with the exception of actually firing a live charge. EOD trainees can locate and identify the object, select the proper simulated charge, properly rig/fuse the selected charge and finally attach the simulated charge to the object. If the real experience of handling live charges is felt to be a mandatory part of the exercise, then a small charge should be sufficient for this training purpose. It is not logical to assume that a Navy diver could not "become accustomed to acting with heightened safety awareness, detailed procedures, and self confidence" when handling a one pound charge at 130 feet depth versus a 4 pound, 10 pound or 20 pound charge. If explosive charges must be detonated underwater by trainees, GEPA's recommends that the deep ocean site for floating mine neutralization be used or that DOD considers constructing a tank or a pool on land as a long term solution to the use of live charges in the marine environment while all other aspects of MCM training can continue to be conducted in Apra Harbor without affecting commerce or biota/water quality. This could avoid the socio-economic impacts of underwater explosions, which may be very detrimental to essential tourism operations of dolphin watching, diving, fishing and other water recreation at the Dadi area and inside Apra Harbor.

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LCAC, AAV and LCU Landings.

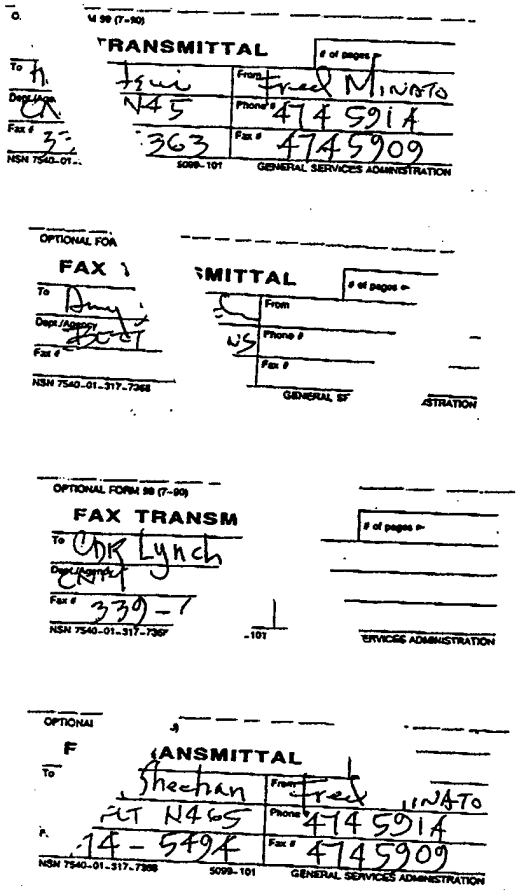
Representatives from GEPA, DAWR and Belt Collins (who arrived shortly after the LCAC landing) were present at Dadi Beach during a test LCAC landing which was conducted September 22,1997. As the two LCACs traversed the reef flat a significant silt plume was generated in the vessels wake that was highly visible from the shore. Approximately one and one half hours after the vessels departure GEPA and DAWR staff attempted a post landing assessment of the corridor traversed by the LCACs. This endeavor proved to be somewhat difficult as the volume of suspended sediments severely limited visibility thus indicating that the amount of turbidity generated as an LCAC transverses a shallow water reef flat is far greater than the "may cause minor turbidity" statement included in the DEIS. In addition, the DEIS seems to indicate that coral damage was caused by either physical contact with coral or by a bow wave generated due to the vessel not being "fully on-cushion" as it crossed the reef flat. Based upon field observations made during the landing and from the post landing reef survey (copy enclosed), it is felt that the majority of the impact was not caused by direct physical contact or by the energy generated by a resulting bow wave. Instead it is believed that a majority of the impact was caused by jets that levitate the vessel penetrating to the substrate churning the bottom sediments, toppling corals and resulting in the fatality of at least one reef fish.

In the "Description of Amphibious Landing Training" (2.2.3.1) the DEIS states, "When at full speed, the LCAC rides above the water surface on an air cushion". It seems highly unlikely that a LCAC will cross the reef margin, reef flat and contact the beach at "full speed". As a direct result of the impacts noted during the test LCAC landing at Dadi Beach, GEPA opposes the use of Dadi Beach for this purpose and strongly suggest the utilization of either Drydock Island or Polaris point for LCAC landing exercises. If reef flat crossings are an important component of DOD training then the preferred alternative would be Tipalao Beach which has "essentially no macrobiota on either the reef flat or the hard scoured substrate beyond the rubble flat" (source rDEIS).

Table ES-1 of the rDEIS does not list Dadi Beach as an alternative site for LCAC, AAV, LCU or other amphibious craft landings but does highlight Tipalao for LCAC and AAV landings. Table ES-2, on the other hand, refers to Dadi Beach as the LCAC landing site on Guam. We request that DOD select the alternative of Tipalao versus Dadi Beach as the Guam LCAC exercise site, if reef crossings are required as part of the exercise. We recommend that AAV landings be held at Apra Harbor sites, not Tipalao, and definitely not at Dadi Beach. As noted in the rDEIS, LCU landings are not to be conducted at Dadi or Tipalao.

We thank you for this opportunity to provide our concerns over the anticipated impacts of the proposed military training on Guam.

Sincerely yours,


TRANSMITTAL
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To CDR Lynch
Dept./Agency CNRH
Fax # 339-7
GENERAL SERVICES ADMINISTRATION
OPTIONAL
TRANSMITTAL
To Sheehan
Dept./Agency PLT N465
Fax # 14-5494
From Fred MINATO
Phone # 474 5914
Fax # 4745909
GENERAL SERVICES ADMINISTRATION

DEPARTMENT OF THE NAVY
PACIFIC DIVISION
NAVAL FACILITIES ENGINEERING COMMAND
(MAKALAPA, HI)
PEARL HARBOR, HAWAII 96860-7300

5090P.1G03
Ser PLN231/ 1754

20 MAY 1999

Mr. Jesus T. Salas
Administrator
Guam Environmental Protection Agency
P O Box 22439 GMF
Barrigada, GU 96921

Dear Mr. Salas:

Subj: REVISED DRAFT ENVIRONMENTAL IMPACT STATEMENT (DEIS)
MILITARY TRAINING IN THE MARIANAS

Thank you for your letter of September 28, 1998 commenting on the subject DEIS. This letter briefly summarizes your comments and responds to your concerns.

Guam Marine and Shoreline Training:

Comment: GEPA has responsibility for protecting water quality and related resources in all waters of Guam, regardless of jurisdiction over submerged lands. The DEIS devotes only two sentences (Section 3.3.2.2) to describing the environment. Appendix C-3 contributes little additional information and fails to note presence of dolphins in the area and of garden eels and large stingrays in the sand.

Response: The potential effects to the marine environment by the proposed deep and shallow water mine demolition training and LCAC/AAV landings are discussed in Section 4.3 and in Appendices C-2 and C-3. Sufficient information is available to evaluate the proposed training and mitigation measures.

At the time of the marine survey of the proposed deepwater MCM site offshore of Dadi Beach, dolphins were not observed in the vicinity, although spinner dolphins are known to use waters offshore from Dadi Beach. Garden eels were not observed in the areas proposed for MCM training. (We assume garden eels are the same as grass eels per the FEIS). Potential for their presence has been noted in Section 4.3.1.1 of the FEIS.

New Sites for Deepwater MCM

Comment: On all GEPA surveys of proposed new deepwater MCM site offshore of Dadi Beach, dolphins or dolphin-watching tourist vessels were in the immediate area. Resident school of stingrays were observed on almost every dive, and sand wrasses and a colony of garden eels were observed living in the sandy plain proposed as the training site. It is unlikely these animals

will leave the area in response to a pre-detonation scare attempt. Dolphins must be added to the table of impacts and mitigation as protected species that would be impacted; they are probably at much greater risk than sea turtles. The proposed monthly 10- to 20-pound demolition at the proposed Dadi Beach site will endanger numbers of protected marine mammals present daily at the site, as well as the eels, wrasses, and stingrays. The proposed frequency may deter recovery of marine organisms. Therefore, GEPA cannot approve the site for deepwater MCM.

Response: Although not a protected species, the Navy is sensitive to the preservation of dolphins, which is certainly a species of interest. In both Guam and Hawaii, dolphin-watching tours have recently increased in number and popularity, and the Navy includes these commercial operators within the fold of enterprises with which to coordinate potentially conflicting training activities. Advance information allows tour operators to select alternative sites. Prior to all MCM training exercises, the training site is surveyed to make sure that no recreational vessels or dolphins are in the area. MCM training is suspended if dolphins are observed swimming in the training area. The FEIS reflects the measures employed to avoid impacts to dolphins that may be present in areas where planned training activities are about to occur.

The FEIS provides an explanation (in Section 4.3.1.1) of the general effects of underwater demolition exercises. Underwater demolitions create shock waves that can injure or kill fish or other organisms with lungs or swim bladders that are living or swimming in close proximity to the site of demolition. GEPA provided us fish kill data from four demolitions training exercises: a total of 3, 4, 765 and 103 fish were killed, respectively. As the exercises occur no more than once per month the numbers recorded equated to a maximum of about four fish kills per day, which is well below the number caught daily by fishermen. In addition, with one exception (i.e., a single fish around 51 cm [about 20 inches] long) the largest dead fish were less than 30 centimeters (about 12 inches) long. Mortality of fishes and other marine life following these exercises is relatively low, in part because these activities are not conducted in areas where the marine fauna are abundant.

The use of 20-pound charges for MCM training exercises has been removed as an option under the preferred alternative, and the FEIS reflects that deepwater MCM exercises will not exceed the use of one 10-pound charge per exercise.

Apra Harbor MCM

Comment: Past underwater MCM in Apra Harbor has created silt plumes which are highly visible on the surface and which technically violate Guam's water quality standards. Therefore, use of 20-pound charges should not be allowed.

Response: As stated above, underwater demolition of 20-pound charges has been removed from the Preferred Alternative in the FEIS.

General Statements Regarding MCM Training in Apra Harbor

Comment: As the safety of tourists, fishermen, and other recreational users in the harbor cannot be positively guaranteed during a deepwater MCM exercise, EOD trainees could conduct all training without a live charge, and a one-pound charge would adequately accustom the diver to acting with heightened safety awareness, etc. GEPA does not see why detonation of a 10- to 20-pound charge inside the harbor is necessary. If explosive charges must be detonated underwater, GEPA recommends this occur at the deep ocean site for floating mine neutralization [i.e., 3 miles outside the harbor]. This would also avoid socioeconomic impacts of detonations in the harbor and at the Dadi area.

Response: The effects of the continued use of the MCM training site in Apra Harbor have been thoroughly evaluated with regard to public safety, environmental impact, and socioeconomic impact, and found to be not significant with application of proven mitigation measures. The training value of various sizes of charges has also been reviewed and the use of a 10-pound charge will not be exceeded during deepwater MCM.

LCAC, AAV, and LCU Landings

Comment: During a test Landing Craft Air Cushioned (LCAC) landing at Dadi Beach in September 1997, the turbidity generated was far greater than the "minor turbidity" described in the DEIS as a possible effect of LCAC landing. Also, contrary to the indication in the DEIS that coral damage was caused by either physical contact or by a bow wave, it is believed that most of the impact was caused by penetration of water jets (used to levitate the LCAC) reaching to the substrate, toppling corals, and resulting in the mortality of at least one fish. GEPA opposes the use of Dadi Beach for LCAC landing exercises, and strongly suggests the use of Dry Dock Island or Polaris Point instead. If reef flat crossing is a required part of the exercise, this should be performed at Tipalao Beach, in view of its relative lack of biota. There are inconsistencies in the DEIS with respect to the description of selection of alternative landing sites on Guam.

Response: Your concerns regarding LCAC operations at Dadi Beach have resulted in the Navy postponing any LCAC landings until an additional study can be conducted. Marine biology evaluations of shallow and abundant beds of coral that have been crossed by LCACs at Fort Hase Beach; Marine Corps Base Hawaii, Kaneohe Bay and more recently at Unai Chulu, Tinian, disclose no evidence of physical damage by the craft or by temporary turbidity caused by the craft's movement. Results of the study conducted during Tandem Thrust 99 and observed by the Commonwealth of the Northern Mariana Islands (CNMI) Department of Land and Natural Resources (DLNR) Division of Fish and Wildlife (DFW) and Division of Environmental Quality (DEQ) at Unai Chulu are included in Appendix C-5 of the FEIS.

The LCAC does not use water jets for propulsion. (An Amphibian Assault Vehicle (AAV) does use two water jets for propulsion and steering that discharge at the water line). The LCAC has large lift fans that create a cushion of air beneath the craft and this air spills (escapes) around each edge of the vehicle's inflatable skirt. At slow speeds, the craft creates a bow wave and the

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skirt can come into contact with near and above surface rocks, ledges, etc. LCAC propulsion and steering is created by two aircraft style propellers mounted high on the aft decking, and two directional gas turbine engine exhaust vents high on the craft behind the cockpit. The air from the propeller and the water disturbance beneath the craft combine to cause turbidity, increasing with craft speed and dissipated by tide and wave action.

If the LCAC that landed at Dadi Beach did not get completely on the beach away from the shoreline prior to coming off cushion; some degree of impact can be anticipated by a craft that has its stern in the water and then comes back on cushion and turns while in very shallow water. If landings are attempted at Dadi Beach in the future, preparation of a sufficiently sized clearing as the craft landing zone (CLZ) will ensure that all turns are conducted over land, while the craft is fully on-cushion.

Dry Dock Island will continue to be used for LCAC landings. Tipalao Beach has also been proposed along with Toyland Beach and Polaris Point. Tipalao Beach will require some degree of cleanup to provide an unobstructed CLZ.

Should you have any further questions, please contact Mr. Stanley Uehara at (808) 471-9338, by facsimile at (808) 474-5909, or by E-Mail at UeharaSY@efdpac.navfac.navy.mil.

Sincerely,

Melvin N. Kaku

MELVIN N. KAKU
Director
Environmental Planning Division

14. GUAM DIVING INDUSTRY ASSOCIATION

GDIA
Guam Diving Industry Association
275-G FAURENHOLT AVENUE SUITE 163
TUMUNING, GUAM 96911
TEL: (671) 477-2774 FAX: (671) 477-2775

To,
Stanley Y. Uehara
Director
Environmental Planning Division
September 28, 1998

Dear Sir,

On behalf of the above named organization I would like to forward our comments on your draught Environmental Impact Statement for Military Training in the Marianas.

Although we are a relatively new organization we now represent over 80% of the scuba diving industry on Guam. Prior to our incorporation in Feb 1998 several individuals now within the organization had voiced their opinion against underwater ordinance being exploded inside Apra Harbor.

While I except those public meetings were conducted in Guam this organization was not contacted nor to my knowledge was any individuals that are now members.

The Guam Diving Industry Association request a moratorium on underwater detonations on Guam until we have the opportunity to have input into the DEIS as it has a major effect on our livelihood and our own environmental concerns.

Sincerely

John Bent
President

Contact: President: John Bent Secretary: Brian McDermott Treasurer: Simon Pridmore

DEPARTMENT OF THE NAVY
PACIFIC DIVISION
NAVAL FACILITIES ENGINEERING COMMAND
258 MAKALAPA DR., STE. 100
PEARL HARBOR, HI 96860-3134

5090P.1G03
Ser PLN231/ 1864

27 MAY 1999

Mr. John Bent
President
Guam Diving Industry Association
275-G Faurenholt Avenue, Suite 163
Tamuning, GU 96911

Dear Mr. Bent:

Subj: REVISED DRAFT ENVIRONMENTAL IMPACT STATEMENT (DEIS)
MILITARY TRAINING IN THE MARIANAS

Thank you for your letter of September 28, 1998 commenting on the subject DEIS. This letter briefly summarizes your comment and responds to your concern.

Comment: Underwater demolitions impact GDIA members' livelihood as well as their environmental concerns. GDIA requests a moratorium on underwater demolitions on Guam until it has had an opportunity to provide input. The organization (incorporated in February 1998) and its members were not notified of any public hearings on the DEIS.

Response: Public hearings (afternoon and evening sessions) on the original DEIS were held on Guam in March 1997. A notice of the hearings was published for 3 days in the Pacific Daily News, and radio announcements were made on and before the day of the hearings. Accordingly, the hearings occurred before your organization was established in February 1998. Based on comments received during the public comment period, we revised the DEIS and gave the public a second opportunity to review the revised DEIS. Individual copies were mailed directly to those who participated or submitted comments during the public hearing 45-days review period.

Several Guam agencies shared your concern and noted the potential economic impact on dive operations from temporary closure of areas affected by underwater demolitions in Outer Apra Harbor. The Navy is evaluating other sites for underwater demolition training with two goals being to minimize environmental and economic impacts. Consequently, the revised DEIS published in the summer of 1998 included an assessment of economic impacts on dive operators that concluded that Apra Harbor closure for a maximum of four hours once per month coupled with the availability of alternative dive sites did not seriously cause a significant impact on dive operations.

The Navy remains sensitive to the requirements of dive tour operators and over the years has successfully coordinated its activities to minimize impacts of its training operations on the dive tour industry. The protocol for planning underwater demolition training includes advance notification by Explosive Ordnance Disposal Mobile Unit Five (EODMU-5) to more than twenty

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firms affiliated with the Guam Diving Association. By regulation, the notifications are to be conducted 48 hours in advance; in practice, the dive shops are typically notified one week in advance. In addition, a Notice to Mariners (NOTAM) is published and broadcasted on marine U.S. Coast Guard channels between 48 to 72 hours in advance of the event. This advance notification is provided to enable dive tour operators adequate time to schedule dive tour activities outside the affected training areas, thus ensuring minimal disruption of normal dive tour operations, and protecting recreational divers from the hazards associated with the training activities.

The Navy continues to work with Guam Environmental Protection Agency (GEPA), National Marine Fisheries Service (NMFS) and Guam Division of Aquatics and Wildlife Resources (DAWR) to identify alternative underwater demolition training sites to reduce the frequency of Apra Harbor demolition training. Section 4.3.1.1 of the FEIS includes two sites for EOD's deepwater EOD training (including the harbor site), two NSWU-1 shallow water demolition sites, and two EOD floating mine neutralization sites. A criterion for selecting alternative sites has been mitigating potential economic impacts on commercial dive and boating activities.

Should you have any further questions, please contact Mr. Stanley Uehara at (808) 471-9338, by facsimile transmission at (808) 474-5909, or by E-Mail at UeharaSY@efdpac.navfac.navy.mil.

Sincerely,

Melvin N. Kaku

MELVIN N. KAKU
Director
Environmental Planning Division

15. GUAM DEPARTMENT OF PARKS AND RECREATION

Carl T.C. Gutierrez
Governor

Madeleine Z. Bordallo
Lt. Governor

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GOVERNMENT OF GUAM
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A.J. Sonny Shelton
Director

Franklin J. Gutierrez
Deputy Director

SEP 29 1998

Frederick J. Minato
Acting Director
Environmental Planning Division
Department of the Navy
Pacific Division
Naval Facilities Engineering Command
(MAKALAP, HI)
Pearl Harbor, Hawaii 96860-7300

Dear Mr. Minato:

I request an extension of time to respond to the draft Environmental Impact Statement regarding military training exercises in the Marianas. It is a complex document and there are some unresolved issues, including a request from Andersen Air Force Base to the National Register for a determination of eligibility regarding Northwest Field. Responses from the National Park Service could be relevant to the plan to blow holes in the asphalt adjacent to the runways at this site. I request an additional 45 days in order to provide a thorough and adequate review of the DEIS.

Sincerely,

A. J. SONNY SHELTON
Director

The Way Forward!

RECEIVED TIME OCT. 6. 9:38AM PRINT TIME OCT. 6. 9:39AM

DEPARTMENT OF THE NAVY
PACIFIC DIVISION
NAVAL FACILITIES ENGINEERING COMMAND
258 MAKALAPA DR., STE. 100
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Ser PLN231/ 1863

27 MAY 1999

Mr. A. J. Sonny Shelton
Director
Department of Parks and Recreation
P.O. Box 2950
Agana, GU 96932

Dear Mr. Shelton:

Subj: REVISED DRAFT ENVIRONMENTAL IMPACT STATEMENT (DEIS)
MILITARY TRAINING IN THE MARIANAS

Thank you for your letter of September 29, 1998 referencing the subject DEIS.

Comment: Your letter references proposed rapid runway repair (RRR) training at Northwest Field (Andersen Air Force Base), which has been nominated for listing on the National Register of Historic Places, and indicates concern about the impacts of RRR training at a potentially historically significant site.

Response: As described in Section 4.5.2.1 of the DEIS (and FEIS), the area proposed for RRR is not on the potentially historic runway, but is on a parking apron near the runway. The proposed training will not include "blowing holes" in this area; instead, it will involve a single detonation and excavation of 3 holes, which will be backfilled and re-excavated (without further demolitions) for each training event. (The purpose of the training is to fill the holes properly.) The selection of the site for the proposed RRR training has already been the subject of a Section 106 review process and the exact location will be determined in consultation with the Guam Historic Preservation Officer.

Should you have any questions, please contact Mr. Stanley Uehara at (808) 471-9338, by facsimile transmission at (808) 474-5909, or by E-Mail at UeharaSY@efdpac.navfac.navy.mil.

Sincerely,

MELVIN N. KAKU
Director
Environmental Planning Division

United States Department of the Interior

OFFICE OF THE SECRETARY
Office of Environmental Policy and Compliance
600 Harrison Street, Suite 515
San Francisco, C[illegible]

October 1, 1998

ER 98/0521

Commander, Naval Forces Marianas
Pacific Division
Naval Facilities Engineering Command, Code 231 FM
258 Makalapa Drive, Suite 100
Honolulu, Hawaii 96860-7300

Dear Commander:

The Department of the Interior (Department) has reviewed the June 1998 Revised Draft Environmental Impact Statement for Military Training in the Marianas (RDEIS). The lead agency for the proposed training, which encompasses numerous activities in the Territory of Guam and on the islands of Rota, Tinian, and Farallon de Medinilla (FDM) in the Commonwealth of the Northern Mariana Islands (CNMI), is the U.S. Navy (Navy) acting on behalf of the U.S. Department of Defense (DOD).

On February 28, 1996, the Department's Fish and Wildlife Service (FWS) provided comments on the DOD's Notice of Intent to prepare a DEIS. On May 6, 1997, the Department provided comments on the DEIS, which recommended that a RDEIS be prepared due to the numerous deficiencies associated with the DEIS. The following comments on the RDEIS are provided for your consideration when preparing the Final Environmental Impact Statement (FEIS).

GENERAL COMMENTS

The RDEIS represents an improvement over the previous document for the proposed action. For the most part, the RDEIS adequately identifies the types of training activities and natural resources at the proposed training sites. Many of our concerns with the DEIS were addressed in the RDEIS. We are particularly supportive of the elimination of Night Vision Goggle training on Rota and the restriction of activities in the Ordnance Annex on Guam since both areas contain some of the best remaining native forest habitat in the Marianas. Despite the improvements, however, the RDEIS is deficient in its analysis of fish and wildlife impacts anticipated to result from the proposed action.

The proposed action is complex, involving large numbers of personnel and equipment over a potentially long, open-ended period of time. Details on the intensiveness of the training activities, such as the number of participating personnel; frequency of conducting various activities; duration of various activities; whether the various activities are expected to increase, decrease, or remain the same; and other information are lacking. Nevertheless, based on what is presented in the RDEIS, we believe it is reasonable to anticipate that the unavoidable cumulative impacts from the proposed action will be significant, including cumulative impacts to Federal trust resources.

The Department recommends that a comprehensive program of monitoring and adaptive management be implemented. Monitoring impacts will provide a means to identify the need for modifying (increasing or decreasing) mitigation, and an adaptive management approach will provide flexibility for implementing these changes as needed. Due to the complexity of the proposed action, the long period of time over which the proposed action will take place, and the significant impacts expected from some of the training activities, the Department believes that the activities should be monitored for impacts to Federal trust resources, including cumulative impacts. The results of monitoring should be reviewed at least annually and used to validate the nonsignificant impacts anticipated in the RDEIS for some of the activities and to support appropriate adjustments to mitigation for significant adverse impacts anticipated from other activities. This approach should be described in the FEIS.

The Brown Treesnake Control/Interdiction Plan for Military Training Exercises (BTS Plan) and the U.S. Department of Agriculture, Wildlife Services (USDA-WS), Brown Tree Snake Control Procedures In Support of Scheduled Military Training Exercises, are located in Appendices E-1 and E-2 of the RDEIS, respectively. These documents describe various proposed measures to prevent the export of the BTS from Guam to other Mariana and Pacific islands and the U.S. Mainland. However, the plans are several years old and some of their protocols are outdated. Concerns regarding these plans are reflected in the comments received from the U.S. Geological Survey, the Department's bureau engaged in research on this issue. Specific concerns to be considered in revising the protocols are included in Appendix A of this document.

The Department recommends that the BTS Plan be updated by consolidating the most effective protocols regarding prevention and control of the brown treesnake to avoid any confusion by those carrying out the measures. Comments regarding the design and implementation of the revised BTS Plan should be solicited from USDA-WS, CNMI Division of Fish and Wildlife (DFW), the Biological Resources Division of the U.S. Geological Survey (BRD), and the FWS. The final BTS Plan that will be implemented as part of the proposed action should be included in the FEIS.

The effectiveness of the BTS Plan should be assessed periodically by involving external expertise on snake control techniques and strategies. As new information and techniques become available, the BTS Plan should be updated. The RDEIS does not provide the language for review and updating of the BTS Plan. The Department recommends that the FEIS specifically state that the

Navy and USDA-WS will work cooperatively to implement new BTS control methods and technologies as they become available, and will incorporate such new procedures into the BTS Plan as appropriate throughout the life of the proposed action.

The RDEIS does not address Executive Order No. 13089 on Coral Reef Protection (E.O.), signed by the President on June 11, 1998. The E.O. applies to all coral reefs under the jurisdiction of the United States and directs all Federal agencies to: (1) utilize their programs and authorities to protect and enhance coral reef ecosystems, and (2) to the extent permitted by law, ensure that any actions they authorize, fund, or carry out will not degrade those ecosystems. The E.O. also directs Federal agencies to "provide for the implementation of measures needed to research, monitor, manage and restore affected [coral-reef] ecosystems." The Department recommends that the provisions of the E.O. be addressed in the FEIS.

The RDEIS contains several statements regarding proposed mitigation that are inconsistent with proposed management measures provided in the Natural Resources Management Plan for Military Lease Area, Tinian (NRMP). For example, the NRMP states that native forest tree species should be replanted not only to mitigate for lost Tinian monarch habitat, as recommended by the FWS, but also to provide habitat for the protected Mariana fruit bat and Micronesian megapode. Despite this, the reforestation guidelines in the RDEIS do not specify where areas of tangantangan (*Leucaena leucocephala*) should be replaced with native forest. Furthermore, the RDEIS states that proposed mitigation for impacts to Tinian monarch habitat would be to replant removed tangantangan with more tangantangan. The Navy should consult with the DFW regarding which species of native trees should be used for the replanting. The FEIS should include updated reforestation guidelines that are consistent with the NRMP and illustrate the primary areas where tangantangan will be replanted with native trees.

In the spirit of interagency coordination, the RDEIS should acknowledge the intent and purpose of the existing Cooperative Agreements between the FWS and the U.S. Air Force and the FWS and the Navy for cooperative management of natural resources on the portion of the Guam National Wildlife Refuge (GNWR) that overlays DOD property. While the existence of the GNWR is mentioned (*e.g.*, page 8, section 3.3.2), the importance of coordinating project review and technical assistance between the DOD and GNWR is not addressed. The FEIS should acknowledge the cooperative relationship between the FWS and the DOD, particularly with regard to listed species and habitat concerns on the overlay refuge.

Several figures and tables in the RDEIS are incorrect, mislabeled, and misleading, including the very important Table 2-11. The figures derived from U.S. Geological Survey maps (*i.e.*, figures 2-4, 2-10, 3-9) need to be updated to indicate that Ritidian Point near the northern end of Guam is now a unit of the GNWR, rather than the location of a U.S. Naval Communications Facility. The same figures should show the boundaries of the Ritidian unit as well as the tracts of coastal private property between the unit and Tarague Beach (adjacent to Andersen Air Force Base) and

between the unit and Haputo Beach (adjacent to the U.S. Naval Communications Station). We recommend that the figures and tables be updated for use in the FEIS.

SPECIFIC COMMENTS

Executive Summary: Page 21. Table ES-2. Natural Resources. Vegetation. Possible Impact. This section of the table includes a subheading for Tinian and Guam, but not for FDM. Impacts to FDM may include destruction of the few remaining shrubby trees on the island, eliminating all nesting/roosting habitat for some migratory seabird species. An FDM subheading should be included in this section of the table in the FEIS.

Executive Summary: Page 27. Table ES-2. Environmental Quality. Geologic features. Possible Impact. This section of the table includes a subheading for Tinian, but not for FDM. Sloughing of sea cliffs and incremental collapse of the isthmus connecting the northern and southern sections of FDM appear to be at least partially the result of ship and aerial training bombardment. Since this bombardment represents the most significant training-related physical impact to any of the islands, it should be addressed under a FDM subheading in this section of the table in the FEIS.

Page 1-8. 1.2.3 Purpose of and Need for Specific Training Activities. The end of the second paragraph states that "Tinian is the only training area in the region suitable for maneuver training of a MEU [Marine Expeditionary Unit]." This statement appears to conflict with information provided in Chapter 2 (Proposed Action and Alternatives), which describes the proposed use of Waterfront Annex, Guam, and areas of Tinian for amphibious landings. This potential conflict should be eliminated in the FEIS.

Page 2-3. 2.2 Proposed Use of Military Lease Area, Tinian. The fourth paragraph states "Tinian is the only location in the Marianas suitable for large-scale amphibious assaults and joint training exercises." This statement also appears to conflict with the information provided in Chapter 2, and this potential conflict should be eliminated in the FEIS.

Page 2-5. 2.2.1.1 Description of Field Maneuver Training Proposed for Tinian. The second paragraph states that some site development will be needed for field maneuvers and that "...selectively cutting vegetation for camouflage..." would be required. It is unknown what type of vegetation will be cut. The FWS recommends that no vegetation cutting be allowed in native limestone forest and that the general type and amount of vegetation to be cleared be identified in the FEIS.

Page 2-5. 2.2.1.1 Description of Field Maneuver Training Proposed for Tinian. Paragraph five describes the construction of a small, permanent logistic support camp within the site assigned to the Voice of America (VOA). It is unclear whether any tangantangan or secondary forest will be cleared to construct the support camp. The FEIS should indicate whether vegetation clearing will

be required for this camp and, if so, identify the general type and amount of vegetation to be cleared.

Page 2-12. 2.2.3.1 Description of Amphibious Landing Training. The last paragraph states that Assault Amphibious Vehicle (AAV) landings will be limited to "...a single beach with the least good coral." This statement is inconsistent with the last paragraph on page 2-13 which identifies two potential sites (*i.e.* Tinian Harbor and Unai Babui) for AAV landings and Figure 2-1a which illustrates two new AAV landing sites (*i.e.* Kammer Beach and Unai Babui) for the proposed action. We recommend that the number and location of sites for AAV landings be clarified and this inconsistency be eliminated in the FEIS.

Page 2-13. 2.2.3.2 Feasible Amphibious Landing Training Sites on Tinian. The section on Landing Craft, Air Cushioned (LCAC) landing sites states "Tachogna Beach is also suitable and once was remote. However, nearby casino development could increase tourist use of Tachogna and impair convoy movement from the beach to the Exclusive Military Use Area (EMUA) along public roads." It is unclear if Tachogna Beach is being proposed as a new LCAC landing site or if the information provided is meant to indicate that the site is unfeasible. The FEIS should specifically state if Tachogna is being proposed as a new LCAC landing site.

Page 2-13. 2.2.3.2 Feasible Amphibious Landing Training Sites on Tinian. The last paragraph indicates that Unai Babui is the only suitable beach for AAV landings because it will result in the least amount of damage to coral. Yet, the first sentence of this paragraph suggests that the AAV landing site at Tinian Harbor does not have corals present, which indicates it would be the most feasible site. Also, the report in Appendix C-1 indicates that an area off Kammer Beach was the first choice for beach landing exercises and Figure 2-1a indicates that Kammer Beach is part of the preferred alternative. This site was described as lacking a reef flat and crest, which results in deep water right up to the beach face, making it possible for a landing craft to reach the beach with minimal impact to the environment. The text of the FEIS should clearly identify Kammer Beach as a feasible site for AAV landings on Tinian.

Page 2-15. 2.2.4.2 Feasible Firing Range and Shooting House Sites on Tinian. The RDEIS proposes to build a small arms fire and maneuver range while an existing small arms range will not be reopened due to design concerns. As previously stated in past comments regarding these actions, the need for this new facility or the inadequacy of the existing range is not identified. The FEIS should state why the new facility is needed and why the existing facility is not adequate to develop a small arms fire and maneuver range.

Page 2-16. 2.2.4.2 Feasible Firing Range and Shooting House Sites on Tinian. In the first paragraph, the RDEIS indicated that tangantangan will be removed to construct the proposed fire and maneuver range. Insufficient information is provided regarding the amount of tangantangan to be removed. Tangantangan provides habitat for the federally endangered Tinian monarch (*Monarcha takatsukasae*) and consultation with the FWS under section 7 of the Endangered

Species Act (Act) should be initiated for the proposed action. The FEIS should contain the results of this consultation.

Page 2-32. 2.6. Farallon de Medinilla. The section on land resources states "It [FDM] is home to several migratory seabird colonies, and individual endangered Micronesian megapodes have been observed..." There is more than one megapode on FDM. The word "individual" should be deleted from this sentence in the FEIS.

Page 2-34. 2.6.2. Bombardment of FDM (Navy Range 7201). The section on impacts and mitigation states that restricting naval gunfire to the west cliff line is a beneficial way to minimize impacts to the east cliff line from bombardment. While a large portion of an important masked booby colony does occur along the east cliff line, a very restricted great frigatebird colony occurs only on the west cliff line. The FEIS should offer mitigation that would restrict impacts to the west cliff line beyond 100 meters north and south of the great frigatebird colony. Additionally, the naval artillery targets on the sea cliffs should be recognized and discussed in the FEIS for their impacts to tropic birds, noddies, and terns that use sea cliffs as roosting/nesting areas.

Page 2-34. 2.6.2. Bombardment of FDM (Navy Range 7201). The section on impacts and mitigation does not mention limiting bombing to low periods in the seabird breeding season. This is one of the easiest and most effective actions the military could take to reduce impacts on seabird populations. This same comment was included in our review of the DEIS in 1997. We strongly recommend that the FEIS include a thorough literature review of the breeding seasons of the seabirds that nest at FDM and include a minimization measure that would restrict military training to months during which the fewest species would be impacted.

Page 2-34. 2.6.2. Bombardment of FDM (Navy Range 7201). The section on impacts and mitigation indicates that mitigation will include quarterly monitoring of the effects of training activities on cliffs, habitats, and bird populations. The FWS will work with the Navy, DFW, and other agencies in developing protocols for the quarterly monitoring as part of a comprehensive program of monitoring and adaptive management. The FEIS should describe how this quarterly monitoring will be accomplished, who will do the monitoring, what data will be compiled, how the data will be analyzed, to whom the data will be made available, and how the results of monitoring will be used to minimize the training-related impacts to fish and wildlife.

Page 2-34. 2.6.2. Bombardment of FDM (Navy Range 7201). Although the RDEIS states that personnel not trained in Explosive Ordnance Disposal (EOD) will no longer be allowed to visit the island due to the presence of large amounts of unexploded ordnance (UXO), the Navy should reconsider this policy for the sake of more accurate monitoring. The perimeter of FDM is generally clear of vegetation, thereby making it relatively easy to spot UXO. In addition, there are times when large areas of vegetation burn, thereby exposing hidden UXO. When this happens, the opportunity to survey the island in a safer condition should be seized. Although some evidence of the presence of cluster bombs was found on the main body of the island, the

majority of this evidence was found on the southern peninsula, which is the part of the island of least concern for surveying the bird populations. On-the-ground population counts and monitoring are the only ways to realistically determine the degree of impacts resulting from the training and we recommend that these monitoring activities be part of a comprehensive program of monitoring and adaptive management outlined in the FEIS.

Page 2-34, 2.6.3, Cumulative Impacts on FDM. This section states that "Repeated bombing has not destroyed the seabird population..." However, it is not clear if the repeated bombings are destroying the bird populations or not. It could be that seabird populations at FDM are slowly declining with continued disturbance and are in the process of being "destroyed.". In the FEIS, the word "destroyed" in the above sentence should be replaced with the words "yet eliminated" and the cumulative impacts to FDM vegetation, which has been altered due to long-term bombing, should be discussed.

Page 2-43, 2.8.5, FDM, Preferred Alternative. Protection of the great frigatebird colony on the west cliff is not considered within the scope of the preferred alternative. This alternative should be rewritten in the FEIS to reflect this consideration. In addition, this section briefly identifies two mitigation measures that were not mentioned in section 2.6.2 as part of the discussion on impacts and mitigation. Specifically, these measures are: (1) eradicating rats on FDM, and (2) enhancing megapode habitat on another island, but no details on how the military intends to implement these measures are presented. Given the current and anticipated levels of bombing at FDM, rat eradication at FDM prior to cessation of bombardment training is not viewed as a very productive use of time and funds. The Department recommends that the FEIS indicate that the Navy will work with the FWS and other Federal and Territorial resource agencies to develop appropriate mitigation for the preferred alternative within a comprehensive program of monitoring and adaptive management.

Page 3-7, 3.3.1.3 Rare, Threatened, and Endangered Species. Reference is made in the first paragraph to the Mariana fruit bat (*Pteropus mariannus*) as being "...a candidate for federal listing." The status of this species has changed, and it is no longer a "candidate." This species is now "proposed" for Federal listing, and this correction should be reflected in the FEIS.

Page 3-8, 3.3.1.3 Rare, Threatened, and Endangered Species. The second paragraph states that the Mariana fruit bat is "..proposed for listing as an endangered species on Tinian." This information is incorrect. The Guam population of the Mariana fruit bat is currently federally listed as endangered. This species is now being proposed for Federal listing as threatened throughout the Mariana archipelago, including Guam. This information should be reflected in the FEIS.

Page 3-10, 3.3.2.3, Rare, Threatened, and Endangered Species. The federally proposed endangered plant species *Tabernaemontana rotensis* was recently rediscovered on Andersen Air Force Base (AAFB) on Guam, but this information is not included in this section. The FEIS should include this information as part of the second paragraph of this section.

Page 3-11, 3.3.2.3, Rare, Threatened, and Endangered Species. Paragraph three discusses three species of Marianas tree snails that are currently listed as endangered by the Government of Guam. These three species are currently proposed by the FWS to be federally listed as endangered. The RDEIS describes a long-term training plan. Therefore, potential impacts to these species from military training must be defined in the FEIS. Mitigation for possible negative impacts must also be addressed. A major impediment to this assessment is that the locations and population sizes of tree snails on military training lands need to be better defined, especially in the aftermath of Typhoon Paka. The FEIS should include population location maps and an assessment of how or if training activities are anticipated to impact those areas that harbor populations of tree snails.

Page 3-13, 3.3.3.1, Habitat. It is stated that FDM "...has historically been used as a bombing site." However, this sentence should be rewritten in the FEIS to state that the island has been used since 1971 by the military as a bombing site.

Page 3-14, 3.3.3.3, Rare, Threatened, and Endangered Species. The bird information in this section is incomplete. If the species listed in the 1975 Navy EIS for FDM are combined with species observed since that time, a total of 23 avian species are confirmed from FDM. There may be some question as to the accuracy of the seabird estimates from the 1975 EIS, but the species list should be considered reliable. The Philippine Turtle-dove (*Streptopelia bitorquata*) is mentioned in the 1975 EIS, which means there are two non-native birds recorded from FDM. This section in the FEIS should be modified to reflect the complete avian species list for FDM.

Page 3-15, 3.3.3.3, Rare, Threatened, and Endangered Species. The last paragraph mentions the "common fairy tern, " which should be changed in the FEIS to the more accurate "white tern (*Gygis alba*)." The description of tern and noddy nesting habitat should be revised in the FEIS to indicate that both of these types of bird use the seacliffs for roosting and nesting. Also, the FEIS should list all species of the seabirds, including tropic birds, known from FDM with descriptions of their habitats.

Page 4-2, 4.1 Impacts of Brown Tree Snake. The second paragraph states that USDA-WS "ensures that military personnel steam clean all heavy equipment and vehicles prior to their entry into USDA-WS-controlled areas..." USDA-WS's responsibility is to assure that such equipment does not enter controlled areas unless the equipment has been steam cleaned. But it is responsibility of the Navy, and not USDA-WS, to assure that equipment is steam cleaned. The Department recommends that the FEIS clarify these distinct responsibilities to avoid confusion as has occurred during past training exercises.

Page 4-2, 4.1 Impacts of Brown Tree Snake. The first paragraph in the section on proposed mitigation section states "Any person sighting a BTS should attempt to kill or trap the snake and report the incident immediately to USDA-WS officials." This statement is inconsistent with the BTS Plan located in Appendix E-1, which advises personnel not to attempt to catch or disturb a

brown treesnake sighted during military operations. This inconsistency should be resolved after consultation between the Navy and USDA-WS and the resolution should be reported in the FEIS in order to avoid any confusion by military personnel.

Page 4-2. 4.1 Impacts of Brown Tree Snake. The second paragraph in the section on proposed mitigation section states in part that "no material will be transported to Tinian from Guam without a label indicating that it has been inspected." During past exercises, labels have inadvertently been left on materials for many months, and after they were shipped back to Guam from other locations. This has caused confusion and the risk of labeled materials subsequently being shipped from Guam when no inspection has actually occurred. The Department recommends that the Navy and USDA-WS cooperatively develop a method that will ensure inspections are conducted and that previously inspected and labeled materials do not inadvertently re-enter the shipping network on Guam without a current inspection and label. This method should be outlined in the FEIS.

Page 4-3. 4.2.1 Protected Species and Habitat on Tinian. The last paragraph states "Training activities with potentially significant side effects could result in individual takes..." Side effects of a training activity do not have to be considered significant to result in the take of a federally listed species. For example, clearing of occupied Tinian monarch habitat will cause the displacement of adults or juveniles that are foraging and/or nesting in the area. If such displacement does not occur during critical breeding periods, some birds may be able to locate suitable adjacent habitat and only suffer a temporary displacement that will not result in harm or harassment (as defined under the Endangered Species Act). However, it is anticipated that a portion of these birds may be unable to successfully relocate and may die (harm). In addition, some birds may not immediately establish territories and/or breeding pairs. This may result in reduced breeding activity and a temporary loss in potential reproduction (harassment). The FEIS should make it clear that even if a side effect is not considered significant, it may adversely affect a federally listed species.

Page 4-4. 4.2.1 Protected Species and Habitat on Tinian. Table 4-1 appears in this section but does not appear to be specific to Tinian since it contains two references to Mariana crows, which do not occur on Tinian. The table should be either edited to be specific to Tinian or moved to a more appropriate location in the FEIS.

Page 4-4. 4.2.1 Protected Species and Habitat on Tinian. Table 4-1 states that clearing vegetation is considered significant if "more than 10% of the population is affected." The species population that will be affected is not identified. If any amount of vegetation clearing will result in any loss of habitat for a federally listed species under the jurisdiction of the FWS, such as the Tinian monarch, consultation with the FWS under section 7 of the Endangered Species Act should be initiated. The FEIS should report the results of the consultation, including the identity of any Federal trust species that will be affected by the vegetation clearing.

Page 4-4. 4.2.1 Protected Species and Habitat on Tinian. Table 4-1 states that the side effects of projectile impact and explosion will be considered significant when "Takes of listed species or habitat modification are likely." The listed species to which this statement is meant to apply is not identified. The FEIS should identify the Federal trust species that will be taken or have its habitat modified by projectile impacts and explosions.

Page 4-6. 4.2.1.2 Logistics Support Training: Brown Tree Snake. The proposed mitigation calls for inspection of all cargo, vehicles, and personal equipment by snake detector dogs on Guam and re-inspection upon arrival on Tinian. However, no provision is made for transporting dogs to Tinian. If dogs prove to be an effective tool, their use on Tinian would be justified. A resident dog team would probably be needed to provide constant coverage. Airlifting a dog from Guam to a distant island in the event of a snake sighting is probably a futile action. Response is needed within seconds or minutes.

Page 4-7. 4.2.1.3 LCAC Landings. In the section on potentially significant impacts, adverse effects of LCAC landings on coral-reef and sea turtle-nesting habitats appear to be underestimated. For example, adverse impacts may be significant if the LCACs do not (a) land only at high tide, (b) use surveyed corridors similar to that proposed for AAV landings at Unai Babui, (c) maintain full cushion until they reach the *top* of the beach (off the sand), and (d) complete the initial 180 degree turn prior to coming off full cushion. Therefore, to reduce the negative impacts of LCACs on Federal trust resources, the FEIS should incorporate the above guidelines into training activities and require that an impartial observer monitor landings from a safe distance visually and with video tape.

Page 4-8. 4.2.1.3. LCAC Landings. The section on proposed mitigation indicates that among four sites slated for LCAC training, only one, Unai Chulu, will be surveyed prior to and after LCAC landings (or at least two times per year) for percent coral cover, turbidity, fish assemblage, sedimentation rates, and topography. The beach will be surveyed for sea turtles and nests prior to all exercises and during nocturnal landings. However, Table 2-1 indicates that among the other sites slated for LCAC training, Unai Dankulo has "excellent coral development" and "turtle nesting" and that Tochagna Beach has a "well developed reef." Therefore, survey protocols developed for Unai Chulu should also be applied to Unai Dankulo and Tochagna Beach in the FEIS to ensure adequate protection of Federal trust resources.

Page 4-8. 4.2.1.3. LCAC Landings. The section on proposed mitigation indicates that pre- and post-exercise survey protocols will be proposed by the Navy and agreed to by the DFW prior to the first survey. We support this course of action, but recommend that the Navy hire an independent, qualified biologist (approved by the FWS and DFW) to help conduct pre- and post-exercise surveys and monitor impacts of the landings. The biologist should provide an impartial assessment of exercise-related impacts, including beach erosion and beach regrading, and provide an unbiased recommendation to the Navy as to whether the presence of sea turtles or sea turtle

nests would require temporary cessation of landing exercises at any given time. This arrangement should be described in the FEIS.

Page 4-9, 4.2.1.4, AAV Landings. In the section on proposed mitigation, it is stated that AAVs will approach "...only in single file and only during high tide." However, paragraph two on page 2-12 states that "Training consists of a group of 12 to 15 AAVs approaching a landing area either side by side or one after the other." This inconsistency should be eliminated in the FEIS by clearly indicating that as part of the proposed action, AAVs will approach only in single file and only during high tide.

Page 4-9, 4.2.1.4, AAV Landings. The section on proposed mitigation also indicates that the Navy plans to further mitigate potential coral-reef impacts from AAVs by hand-picking "movable" corals from the approach lane prior to the first landing exercise at Unai Babui. The FWS suggests that coral translocation at Unai Babui will be a process more complex than merely carrying corals that have been "hand-picked" from the lane to another portion of the reef. The FEIS should indicate that the Navy will contract experienced, local coral biologists to investigate the feasibility and potential effectiveness of coral translocation as a way to reduce AAV impacts, and that any recommendations for coral translocation will be approved by the DFW prior to being implemented.

Page 4-11, 4.2.1.6 Small Arms Range. The section on potentially significant impacts states that "A fraction of the projectiles may miss the backstops and continue on into the ocean. The proportion of bullets reaching the ocean will not pose a significant risk to green sea turtles, which are not common in the immediate area of the SDZ [Surface Danger Zone]." Seagrass beds that provide potential feeding areas for sea turtles are located near Unai Chiget, which is within the SDZ. Although sea turtles are not expected to ingest bullets found lying on the ocean floor, it is possible that projectiles missing the backstops could hit sea turtles in the ocean. The FEIS should include a more thorough discussion of the potential impacts to sea turtles and the marine community in general from the specific fraction of projectiles expected to miss the backstops and hit the ocean, including the potential for long-term, localized contamination.

Page 4-11, 4.2.1.6 Small Arms Range. The section on proposed mitigation indicates that approximately 4 hectares of tangantangan, which is approximately 60 percent of the amount proposed for removal, will be replanted. The FWS recommends that native forest species be used to replace the removed tangantangan, especially since native forests support (a) greater Tinian monarch nesting success and (b) monarch densities four to five times higher than either secondary or tangantangan forest. The FEIS should indicate that in cooperation with the DFW, an area adjacent to native forest will be selected and cleared of non-native vegetation and be replanted with native species.

Page 4-41, 4.3.1.1, Deepwater MCM. The section on existing conditions at the proposed detonation site near Dadi Beach is described as being an "expansive sand flat." However, Table

2-3 on page T-16 indicates that the site is a "shallow reef with abundant coral." The detonation site is actually a deep, expansive sand flat that is adjacent to areas of relatively low coral cover, and this informational inconsistency should be eliminated in the FEIS.

Page 4-45, 4.3.1.4, LCAC Landings. The section on existing conditions provides some information on the proposed LCAC landing site at Dadi Beach but does not include details such as the depth of the reef flat and the percentage of the reef substrate that is covered by coral. The FEIS should provide these data and propose a LCAC approach lane, similar to that proposed for Unai Bubai on Tinian, to minimize potential damage to corals at Dadi Beach.

Page 4-46, 4.3.1.4, LCAC Landings. The section on proposed mitigation does not include pre-exercise and post-exercise surveys for possible coral reef damage at Dadi Beach. The FEIS should include the requirement that these surveys will be conducted unless it can be shown that coral cover in the landing zone is less than 1% and/or a specific LCAC approach lane that avoids areas with high coral cover has been established.

Page 4-48, 4.3.1.7, River Insertion Training. The section on proposed mitigation indicates that personnel will be instructed to not shoot any endangered Mariana moorhen or disturb their nests that may be seen. Since river insertion training may cause moorhen to abandon nests and leave the vicinity, the Navy needs to address direct and indirect impacts to moorhen through consultation with the FWS under section 7 of the Act. The FEIS should include the results of this consultation.

Page 4-65, 4.6.1, Protected Species and Habitat at FDM. The section on the overview of training impacts mentions the threat of BTS introduction through the placement of target vehicles from Guam on FDM. The potential placement of these target vehicles should have been described section 2.6 as part of the proposed action and alternatives for FDM. The potential impacts and mitigation associated with this action should have been assessed in section 2.6.2 on the impacts of and mitigation for bombardment of FDM (Navy Range 7201), and in section 2.6.3 on cumulative impacts on FDM. It is also important to note that since the placement of targets from Guam on FDM was not part of the project description, it was not considered in the FWS's April 6, 1998, Biological Opinion (BO)/Conference Report for programmatic aerial bombardment, naval gunfire, and small arms gunfire at FDM. If the Navy intends to modify the project considered under this BO by including the transportation of targets from Guam to FDM, this would be a major project modification that would require re-initiation of consultation with the FWS under section 7 of the Act. The FEIS should either exclude this option or more fully discuss, evaluate, and mitigate for the potential adverse consequences of this action.

Page 4-66, 4.6.1.1, Existing Conditions. It is stated that the species composition of FDM's flora has not been altered significantly over the past 100 years. However, before 1974, no qualified botanists visited FDM and since that time there has not been an exhaustive inventory of the island's flora. The FWS agrees that some of the dominant species may not have changed

historically, but there is simply not enough reliable evidence on which to conclude that no significant changes in species composition have occurred over the past 100 years. The FEIS should either limit the statement to the past 25 years or reword the statement to indicate that some of the dominant herbaceous species at FDM have been reported consistently to occur there over the past 100 years.

Page 4-65. 4.6.1.1. Existing Conditions. This section states that many bird species, especially three species of boobies, have been consistently documented on FDM for 95 years. According to the FWS, seabird presence on FDM was documented as long ago as 1902, although species identifications of the birds observed were not made. In fact, the first record of bird species on FDM comes from Yamashina's (1932) collections, and he only identified masked and brown boobies. While 17 different investigations have documented the presence of seabirds at FDM over the past 95 years, most of the observations were made from ships or aircraft and are considered to be much less reliable than on-the-ground surveys. The FEIS should clarify the types and reliability of the vast majority of observations made over the past 95 years and state that most bird species on FDM have been consistently documented to occur there since 1971, with at least two species of boobies having been present for at least 66 years.

Page 4-69. 4.6.1.2. Potential Impacts of FDM Aerial Bombardment and Naval Gunfire and Proposed Mitigation. The section on potential impacts suggests that bats in the CNMI are federally protected. Currently, the Mariana fruit bat is proposed for Federal listing as threatened throughout the Mariana archipelago (*i.e.*, Guam and the CNMI) and is on the CNMI's list of Threatened and Endangered Wildlife for the CNMI islands south of FDM. Since the bat is not yet federally listed in the CNMI and the proposed action should not jeopardize its continued existence, the word "bat" should be removed from first bullet in this section in the FEIS.

Page 4-69. 4.6.1.2. Potential Impacts of FDM Aerial Bombardment and Naval Gunfire and Proposed Mitigation. The section on mortality states that "...no significant changes in the number of ground-nesting birds was found between pre- and post-bombardment surveys conducted twice in 1997." Tree-nesting birds, such as red-footed boobies are not addressed. In the FEIS, either the statement should be reworded by replacing the words "ground-nesting" with the word "seabirds" or tree-nesting birds should be addressed separately.

Page 4-69. 4.6.1.2. Potential Impacts of FDM Aerial Bombardment and Naval Gunfire and Proposed Mitigation. The section on mortality states that "...survey results fail to demonstrate significant short-term direct impacts on the seabird population or on the endangered megapode from military operations over the past year." The FWS points out that the referenced surveys were made from a helicopter and the observers onboard could not detect any impacts to seabirds or megapodes short of identifying corpses on the ground that happened to be in plain view. Furthermore, any megapode corpses that might have been present would most likely have been hidden in brush and not observable from the air, and there was no way to determine at the time of the survey whether the bombing resulted in nest abandonment or nest failure by seabirds. The

FEIS should state only that the survey results demonstrate that a similar number of adult seabirds were in the area when pre- and post-bombardment surveys were conducted.

Page 4-70. 4.6.1.2. Potential Impacts of FDM Aerial Bombardment and Naval Gunfire and Proposed Mitigation. The section on potential impacts does not mention the use of targets transported to FDM from Guam or discuss the potential for BTS to be introduced to FDM in those targets. Also, it is stated in the section on proposed mitigation that targets will be placed on FDM, but mitigation to prevent or reduce the potential introduction of BTS in targets transported from Guam is not mentioned. These sections in the FEIS should identify this potential impact and proposed mitigation measures to eliminate or minimize it, and refer readers to the BTS-specific sections in the document for further discussion.

Page 4-70. 4.6.1.2. Potential Impacts of FDM Aerial Bombardment and Naval Gunfire and Proposed Mitigation. The section on proposed mitigation suggests focusing gunfire away from the east cliff line even though a very restricted great frigatebird colony occurs only on the west cliff line. The FEIS should offer mitigation that would not only restrict impacts away from the east cliff line but also to areas greater than 100 meters north and south of the great frigatebird colony. Additionally, the naval artillery targets on the sea cliffs should be recognized and discussed in the FEIS for their impacts to tropic birds, noddies, and terns that use sea cliffs as roosting/nesting areas.

Page 4-70. 4.6.1.2. Potential Impacts of FDM Aerial Bombardment and Naval Gunfire and Proposed Mitigation. The second paragraph in the section on proposed mitigation states that "USFWS guidelines will be followed for permitted takings of bird and turtle species." In the programmatic Biological Opinion for the bombardment of FDM from 1998 to 2001, the FWS did not issue a take statement for endangered or threatened sea turtles because the two beaches on FDM are were not considered to be viable turtle nesting habitat. In the FEIS, the words "and turtle" should be deleted from the statement.

Page 4-70. 4.6.1.2. Potential Impacts of FDM Aerial Bombardment and Naval Gunfire and Proposed Mitigation. The third paragraph in the section on proposed mitigation indicates that "other" mitigation measures will include broadcasting rodenticide pellets and "additional compensatory mitigation measures" to be negotiated in consultation with the FWS and National Marine Fisheries Service. The Department recommends that the Navy work cooperatively with the Federal and Territorial resource agencies to address compensatory mitigation needs within the scope of a comprehensive program of monitoring and adaptive management, and the FEIS should either disclose what the other measures are or establish clear guidelines for when and how these measures are to be developed.

Page 4-71. 4.6.1.3 Brown Tree Snake. The Navy proposes bringing old car bodies, dumpsters, and Conex boxes from Guam (or Saipan) for targets. The FEIS needs to justify the risks of

transporting snakes from Guam when items such as old car bodies, dumpsters, and Conex boxes can be obtained more safely and free of snakes from Tinian, Saipan, or Rota.

Page 4-71, 4.6.1.3, Brown Tree Snake. In the section on proposed mitigation, steam cleaning of potential targets is proposed as a measure to prevent the introduction of BTS into FDM from Guam. However, steam cleaning is of little value in removing snakes from potential targets. The FEIS should include a method of snake control that is more thorough than steam cleaning, such as fumigation, and provide greater detail on proposed control methods and roles of various agencies and personnel in implementing a consolidated BTS plan for the proposed action.

Figure 3-3, Bird and Bat sightings, FDM. The figure uses gray shading to show "important migratory bird nesting areas." Since these nesting areas overlap with the seabird distribution polygons, the gray shading should be deleted from the figure in the FEIS.

Page T-13, Table 2-1 Tinian Sites for Amphibious Vehicle Landings. This table indicates that Unai Chulu, Unai Dankulo, Tochagna Beach, and Kammer Beach will be used for LCAC training on Tinian. Excluding Kammer Beach, each of these sites supports high coral cover in shallow water and/or has been documented as a location for sea turtle nesting. The FEIS should assess potential impacts to these resources at each site as a result of the proposed action and propose sequential mitigation measures to avoid unnecessary impacts, minimize unavoidable impacts, and compensate for significant, unavoidable impacts.

Page T-18, Table 2-5 Comparison of Tinian Alternatives. Table 2-5 states that none of the proposed alternatives will result in the take of endangered species. The FWS disagrees with this statement and believes that there is potential for take of federally listed species associated with all of the alternatives. For example, if any Tinian monarch habitat will be cleared for any of the alternatives, take may occur. The proposed mitigation measures provided in Chapter 4 may help minimize the take of Tinian monarchs but do not relieve the Navy from consulting with the FWS under section 7 of the Act relative to potential impacts to federally listed species. The FEIS should include the results of this consultation.

Page T-25, Table 2-11 Potential Impacts and Proposed Mitigation. Some of the proposed mitigation measures provided in Table 2-11 are not clearly described in Chapter 4 on Environmental Consequences. For example, under the impact category "deplete vegetation by clearing for tactical exercises and bivouacs," there are several mitigation measures (*e.g.*, restrict seasons of major clearing events in designated areas, avoid physical disturbance to nests, cut no vegetation larger than wrist size, and minimize degree of vegetation clearing when preparing fighting positions and firing lanes) included in Table 2-11 but not described in Chapter 4 for activities on Tinian. In the FEIS, this table should include all the proposed mitigation measures, which should also be described in greater detail in the appropriate sections within Chapter 4.

Page T-25, Table 2-11 Potential Impacts and Proposed Mitigation. Table 2-11 identifies "cut no vegetation larger than wrist size" as a proposed mitigation measure for the impact category "depletion of vegetation by clearing for tactical exercises and bivouacs." It is not indicated where on the plant this measurement is to be made and the type of vegetation that will be allowed to be cut. The FWS recommends that there be no cutting at all of the remaining four percent of Tinian's original native forest and that the military consult with the FWS under section 7 of the Act for potential impacts to listed species from the proposed vegetation cutting.

Appendix D, FDM Surveys, Reports, and Biological Opinions. The most recent BO completed for FDM on April 6, 1998, (*i.e.*, the BO/Conference Report for programmatic aerial bombardment, naval gunfire, and small arms gunfire at FDM) is not appended to the RDEIS. This BO should be appended to the FEIS. The rest of our comments on Appendix are relevant to appendix report D-1 as follows:

Appendix D - Report D-1: Historical overview of FDM: 1543 to 1997; Page 5. In the FEIS, this report should mention that Baker also noted that according to Yamashina, 12 brown booby eggs were taken from FDM in 1931.

Appendix D - Report D-1: Historical overview of FDM: 1543 to 1997; Page 11. In the FEIS, this report should indicate that roosting adult and juvenile great frigatebirds as well as three nestlings/fledglings have been reported from the island of Maug (Derek Stinson, personal communication, 1998).

Appendix D - Report D-1: Historical overview of FDM: 1543 to 1997; Page 22. Although the 1975 EIS identified the dominate tree vegetation on the island to be Indian mulberry, Whistler (1996) believed this species had been misidentified in the EIS and was in all probability *Pisonia grandis*. This clarification should be made to this report in the FEIS.

Appendix D - Report D-1: Historical overview of FDM: 1543 to 1997; Page 23. Micronesian starlings have not been consistently found on the island since 1975. They are mentioned in the 1975 EIS, but that is the only definite record of this species on the island. The Micronesian megapode has not been observed on the island since 1991. The first observation since then was made in 1996. Previously, the species was identified in bird lists by island only as hypothetically present at FDM. This information should be included in this report in the FEIS.

SUMMARY

Although the RDEIS represents an improvement over the DEIS for the proposed action, the RDEIS remains deficient in its analysis of anticipated fish and wildlife impacts. The Department recommends that a comprehensive program of monitoring and adaptive management be implemented and used to validate nonsignificant impacts and to support appropriate adjustments to mitigation, including compensation for significant adverse impacts. Based on what is presented

in the RDEIS, we believe it is reasonable to anticipate that the unavoidable cumulative impacts from the proposed action will be significant, including cumulative impacts to Federal trust resources.

The Department is concerned that the currently proposed measures to control the spread of BTS are deficient. The BTS Plan in the RDEIS is several years old and has become somewhat outdated. The Department recommends that the Navy work cooperatively with USDA-WS, BRD, and the FWS to update the BTS Plan by consolidating the most effective protocols regarding prevention and control of BTS, and by periodically improving the plan as new information and techniques become available.

We recommend that the Navy consider initiating programmatic interagency consultation with the FWS under section 7 of the Act relative to the effects of training-related actions on federally listed species, including the Mariana crow, Mariana fruit bat, Mariana common moorhen, Tinian monarch, Micronesian megapode, and green sea turtle. We also recommend that the provisions of E.O. 13089 for the protection of coral reefs be addressed within the scope of the proposed action. Finally, we recommend that several inconsistencies, errors, mislabelings, and misleading information presented in the RDEIS text, figures, and tables be corrected in the FEIS.

The Department supports the Navy's efforts to implement long-range planning for military training activities in the Mariana Islands. Concurrently, we encourage the Navy to provide similar effort and support for long-term planning and implementation of mitigation measures that result in avoidance of unnecessary impacts, minimization of unavoidable impacts, and compensation for significant, unavoidable impacts to Federal trust resources from the proposed action.

Sincerely,

Patricia Sanderson Port
Regional Environmental Officer

Enclosure (Appendix A)

cc: Director, OEPC, w/original incoming
Regional Director, FWS, Portland, OR
Director, USGS, Reston, VA

Specific Concerns Regarding Brown Tree Snake Introduction

The DEIS states that "Introduction of a BTS (Brown Treesnake) population is the most significant impact that could result from training activities on Tinian" and "to Tinian, Rota, and other Pacific islands or the U.S. mainland." However, the proposed mitigation for the proposed Military Training in the Marianas falls short of the project provisions needed to prevent BTS dispersal into areas where they do not presently occur for the following reasons:

1. The document calls for temporary barriers instead of permanent structures. Permanent structures are more effective; less vulnerable to damage by rats, machinery, winds, or mowing; provide long term sanitation of areas, rather than the short interval during a major exercise; and provide protection during most training activities, rather than only some of them.

2. Mitigation proposals rely on voluntary compliance with Wildlife Services personnel who have no inspection authority but rather are assigned the task of capturing any snakes encountered. The report appears to confuse search responsibilities with inspection authority. Whether adequate responses can be expected from military authorities in the heat of a training exercise is questionable. The BTS Plan is not specific on containment details, nor on quarterly coordination between COMNAVMAR and Wildlife Services regarding "lessons learned and problem solving techniques." Reliance on container labels certifying a prior inspection, may give a false sense of security. Adequate measures must be taken to protect the material from snake intrusion following previous inspections or searches.

Not all military training exercises can be grouped into the category of large-scale training (Page 2-4) since the report notes that large scale training may occur several times a year, while training for individuals or small units may occur on a daily, weekly, or monthly basis (see Table 1-1). Furthermore, the full application of containment efforts has not been invoked except on three occasions over a 4-5 year period, e.g., Tandem Thrust scale exercises to Tinian and Australia. All other training activities are accomplished with only partial containment capabilities, if any at all. Such a restriction of control efforts and the failure of groups -- such as Navy Seals or other special and transient training groups -- to adequately consult, cooperate, or solicit snake control, places islands other than Guam at significant risk of snake infestations. The failure to employ barriers and full alert screening on materials returned from Tinian to Hawaii, via Guam in 1994, resulted in a BTS being transported to Schofield Barracks in central Oahu. Tens, if not hundreds, of other training activities are staged every year without benefit of snake barriers or significant modification of dispatch areas to exclude snakes from equipment in transit through or from Guam. Training exercises may originate from remote locations of Andersen Air Force Base or from Naval Activities/COMNAVMAR without benefit of snake barriers to facilitate snake-free areas. Secondarily, but no less important is the increased use of Guam for training of military personnel from the mainland and other U.S. islands. These operations move equipment, personnel, and material without benefit of a true snake-free area because no area with snake barriers is

maintained from which cargo may be dispatched, except for temporary barriers deployed during the highly visible exercises mentioned above. With an excess of more than 300 military flights from or through Guam to Hawaii each year, the lack of a full-time snake-free dispatch area is a serious threat to the environmental security of Hawaii and other island groups. Until the DEIS addresses the daily risk of transporting snakes, containment efforts will be only partially effective at best.

The lack of any permanent military structures on Tinian increases the need to transport all facilities for each exercise and hence magnifies the transportation risks. The diversity and number of aircraft and service vessels used to transport and train also constitutes a dispersal risk in the absence of barriers to prevent snake dispersal onto flight-line and tarmac areas. A distinction should be made between a line of traps or area trapping, as opposed to a barrier that is much more effective at excluding snakes.

The military BTS protocol is cited in the DEIS as the directive providing protection against the BTS. Instead of calling for capturing or killing any BTS located, the protocol directs military personnel to call the local Animal Damage Control office (Wildlife Services). In addition to placing the responsibility for capturing snakes on Wildlife Services employees, the BTS protocol delays control action and reduces the number of personnel responding to situations where snakes may escape. As an immediate response is needed, the FEIS should authorize specific military personnel to capture or kill snakes on site rather than risk having the BTS escape.

In brief, the amount of detail given in the RDEIS for actions to prevent introduction of brown tree snakes is minimal, relative to the acknowledged importance of the dispersal of the BTS as the primary environmental risk.

DEPARTMENT OF THE NAVY
PACIFIC DIVISION
NAVAL FACILITIES ENGINEERING COMMAND
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27 MAY 1999

Ms. Patricia Sanderson Port
Regional Environmental Officer
Office of the Secretary
Office of Environmental Policy and Compliance
U.S. Department of the Interior
600 Harrison Street, Suite 515
San Francisco, CA 94107-1376

Dear Ms. Port:

Subj: REVISED DRAFT ENVIRONMENTAL IMPACT STATEMENT (DEIS)
MILITARY TRAINING IN THE MARIANAS

Thank you for your letters of October 1 and 6, 1998 commenting on the subject DEIS. This letter briefly summarizes your comments and responds to your concerns.

GENERAL COMMENTS:

a. Comment: The Revised DEIS is deficient in its analysis of fish and wildlife impacts anticipated to result from the proposed action.

Response: The Final EIS will incorporate analysis of fish and wildlife impacts identified by specific comments

b. Comment: The proposed action is complex, involving large numbers of personnel and equipment over a potentially long, open-ended period of time. Details on training intensity, numbers of participants, training frequency, training duration, anticipated increases, decreases, or status quo, and other information are lacking.

Response: We are in complete agreement regarding the complexity of training alternatives that have been compiled in a single NEPA document. The proposed action, the various types of required training, the range of potential alternative training land uses, the variety of training units of varying sizes using Marianas training sites, and the flexibility within each units' training schedules combine to form a myriad of combinations. The proposed action for the EIS is defined in the Marianas Training Plan (MTP), which proposes maximizing the use of all available training lands in the Marianas. Table 1-2 of the DEIS summarizes the input to the MTP by the units that train in the Marianas at some time during each year. Each unit identified their training requirements, typical-sized training units, and the period of time that is normally devoted to each training activity. Table 1-2 does not infer that all units are training simultaneously throughout

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the calendar year, but instead provides a description of the range of possible activities that are desired to be conducted in the Marianas.

Previous NEPA documentation for Mariana training activities was normally developed on a major event basis. Regulatory agencies were often being asked to expeditiously conduct reviews of similar activities on multiple occasions throughout each year. The ambitious scope of the training EIS is based in part on requests from the regulatory agencies for the Navy to provide them a comprehensive, programmatic document that would cover the majority of ongoing training events and identify any new initiatives. Most of the training activities that have been evaluated are continuing, ongoing actions conducted on federal lands to fulfill military training readiness missions and functions. The EIS has revalidated the effectiveness of mitigation and training management measures that are in effect for these ongoing activities, and has evaluated proposed activities, their potentially significant effects and required mitigation measures. The result of the evaluation is identification of a preferred training land use alternative for the Mariana Islands, a comprehensive list of mitigation and training management measures, and identification of cooperation and review that will continue among military, federal, territorial and commonwealth government representatives.

The EIS is open-ended only in the sense that NEPA does not provide for a specific time period or duration for the validity of an EIS. As training is a continuing action, the Navy and Air Force are responsible for monitoring the training actions on lands that they manage to ensure that unanticipated significant impacts are not occurring, and that the actions themselves remain within the parameters of those evaluated in the EIS. Publication of the final EIS (FEIS) will not eliminate coordination with local government and should facilitate resource management roles by providing recognizable limits within which training can be accomplished without substantial and unique governmental review. To this end, Navy and USAF training and environmental staffs will continue to provide timely, advance notification of upcoming training events to Commonwealth of the Northern Mariana Islands (CNMI) and Government of Guam authorities. COMNAVMARIANAS and 36th Air Base Wing reviews of training requests will continue to ensure that training will remain within the scope of activities approved for any given training area. The military will continue to invite agencies that desire to participate with the Navy in monitoring and evaluating training activities. The military will continue to conduct annual reviews of its training directives to identify those that require modifications.

Additional NEPA documentation for training will be required by Navy and Air Force commands when proposed activities meet either of the two conditions noted in the FEIS (and page 1-1 of the DEIS):

- The environmental effects of an ongoing activity are significantly and qualitatively different or more severe than predicted in the FEIS.

- There is a substantial change in a continuing activity (e.g., operational tempo, the area of use, or in methodology and equipment) which has the potential for significant environmental impacts, which should be considered as a proposal for a new action and be documented accordingly.

c. Comment: The Department recommends that a comprehensive program of monitoring and adaptive management be implemented, particularly for Federal trust resources. The results of monitoring should be reviewed at least annually and used to revalidate impact levels and to adjust mitigation as needed.

Response: The Navy appreciates the importance of monitoring training areas over time, and evaluating documented impacts to natural and biological resources which may occur as a result of its training activities. The Navy will continue to work cooperatively with U.S. Fish and Wildlife Service, National Marine Fisheries Service, and various affected agencies of the governments of Guam and CNMI to develop and maintain appropriate monitoring programs and mitigation measures and training constraints. The requirements for monitoring programs will be described in the FEIS, although development of specific plans of study, suitable frequencies, and related protocols are deferred to development by assigned study teams.

d. Comment: The Brown Tree Snake Control/Interdiction Plan and the U.S. Dept. of Agriculture's Wildlife Management Services BTS Control Procedures (Appendices E-1 and E-2) are several years old, and some of the protocols are outdated. See Appendix A of our letter for specific considerations. We recommend updating the BTS Plan and soliciting review comments from USDA-WS, CNMI DLNR, Biological Resources Division of the U.S. Geological Survey, and FWS. Incorporate the updated BTS in the FEIS.

Response: The Brown Tree Snake Control/Interdiction Plan is a dynamic document that reflects continued improvements as a result of practical application. The 1996 plan was validated and updated by USDA, Animal and Plant Health Inspection Services, Wildlife Service (WS) and military representatives who attended the Tandem Thrust 99 Middle Planning Conference in October 1998. The Guam WS has assisted in updating the plan that was initially developed by a group of interested regulating agencies and DOD representatives. The revised plan will be included in Appendix E to the FEIS and used by COMNAVMARIANAS to update the 1996 BTS Control/Interdiction Plan. The information from Appendix A of your October 1, 1998 letter has been incorporated in the FEIS.

e. Comment: The revised DEIS does not explain how the revised BTS Plan will be reviewed and updated. The FEIS should specifically state that the Navy and USDA-WS will work cooperatively to implement new BTS control methods and technologies as they become

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available, and to incorporate new procedures into the BTS Plan as appropriate throughout the life of the proposed action.

Response: See our response to comment d above. Responsible offices continue to be proactive in regard to what is considered a most significant potential environmental impact. The BTS control and interdiction process is integrated within the normal duties of Navy and Air Force environmental staffs who work closely with the WS staff on Guam. We are in favor of participating in annual BTS meetings to continually improve the BTS procedures. Also, by rotating the annual meetings between Guam, Hawaii and CNMI, it would benefit other interested parties that would like to participate in these meetings.

Mitigation and training constraints are published by the military services in training orders and directives. Each service is responsible to formally review orders and directives and to publish page changes or complete revisions as necessary. This administrative procedure ensures that the measures that have been identified in the FEIS (NEPA documentation) is published in military directives for use by the affected organizations.

f. Comment: The revised DEIS does not address Executive Order No. 13089 on Coral Reef Protection. The EO directs Federal agencies to provide for the implementation of measures needed to research, monitor, manage and restore affected (coral reef) ecosystems. The Department recommends that the provisions of the EO be addressed in the FEIS.

Response: Section 4.10 of the FEIS deals with Executive Order 13089.

The DEIS was prepared and published in June 1998. The Executive Order on Coral Reef Protection (Executive Order 13089) was signed on June 11, 1998 and received after the DEIS was finalized. Each major federal agency has been given one year in which to develop implementing methods. While the DEIS could not address the content of an unpublished executive order, the methodology used to select amphibious landing beaches indicates that methods to implement the policy are represented by the substantive evaluation of potential effects of the proposed action and alternatives on coral reefs. I.e., regardless of publication date, the evaluation of impacts to coral reefs and the manner in which the preferred alternative was selected are consistent with the policies set forth in Executive Order 13089.

The lease for the MLA specifically grants the Navy the authority to land across Military Lease Area (MLA) beaches. Avoiding or reducing impacts to coral reefs has resulted in preferring only two beaches in Tinian's MLA for tactical landing exercises for air-cushion landing craft (the LCAC), and selecting no MLA beach for the tracked assault amphibious vehicle (the AAV) to use.

During Tandem Thrust 99 (March-April 1999), the Navy conducted a marine survey at Unai Chulu to determine the extent of impact to coral by the LCAC. Representatives of CNMI DLNR and DEQ participated. The results confirmed that the LCAC does not cause significant impacts to coral in shallow nearshore areas and fringing reefs. An addition survey was conducted at Unai Babui, which has been proposed as the AAV landing site. The configuration of the fringing reef face at the point of vehicle contact was not suitable. Damage to the vehicle and to sparse coral was possible. The results of this survey were to removed Unai Babui from the preferred beach list for AAV landings. The survey report has been added to the FEIS (Volume Two, Appendix C-5).

g. Comment: The RDEIS has several statements of proposed mitigation that are inconsistent with the proposed management measures in the Natural Resource Management Plan (NRMP) for the MLA, Tinian. In dealing with replanting requirements NRMP statements deal with native forest tree species for lost Tinian monarch, protected Mariana fruit bat, and Micronesian megapode habitat; the RDEIS refers to replanting non-native tangantangan for Tinian monarch habitat. The FEIS needs reforestation guidelines that are consistent with the NRMP, illustrate where replanting will occur, and note that Navy consultation with the DFW will be accomplished.

Response: We concur that the NRMP would take precedence if the Preferred Alternative for Tinian training included clearing tangantangan. However, the proposed firing ranges will no longer be considered as a Preferred Alternative and therefore, there will be no clearing of large areas that may affect Tinian monarch habitat. The proposed site for the logistic support camp will require no tree clearing.

h. Comment: The FEIS should acknowledge the intent and purpose of the existing Cooperative Agreements between the FWS and the U.S. Air Force, and the FWS and the Navy for cooperative management of natural resources on the portion of the Guam National Wildlife Refuge (GNWR) that overlays DOD property. While the GNWR is mentioned (page 8, Section 3.3.2) the RDEIS did not address the importance of coordinated project review and technical assistance between the DOD and GNWR, or the cooperation between the FWS and the DOD in regard to listed species and habitat concerns on the overlay refuge.

Response: The FEIS (Section 3.3.2.1) includes a discussion of the intent and purpose of the agreements in place between the DOD and USFWS that establish guidelines for the creation and management of the Guam National Wildlife Refuge (GNWR). Particular attention has been given to the review and technical assistance provisions of the agreement that address listed species and habitat issues. Figure 3-2 identifies the GNWR, Ecological Reserve Areas, and one proposed beach conservation area. The No Wildlife Disturbance constraint has also been established as appropriate within each training area.

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i. Comment: Several figures and tables in the RDEIS are in error, including the important Table 2-11. The figures derived from U.S. Geological Survey maps (Figures 2-4, 2-10, 3-9) need updating to indicate that Ritidian Point is now a unit of the GNWR, rather than the location of a U.S. Naval Communications Facility. The same figures should show the Ritidian boundary, tracts of coastal private property between the unit and Taragüe Beach, and between the unit and Haputo Beach.

Response: The old Naval Communication Station identification for Ritidian Point has been removed from Figures ES-4, 2-4, and 2-10. The boundaries of the USFWS-managed area at Ritidian Point and the two adjacent private parcels have been added to each figure. Figure 3-2 identifies the entire Guam National Wildlife Refuge and has a "Ritidian Point" label.

SPECIFIC COMMENTS (EXECUTIVE SUMMARY)

a. Comment: *Executive Summary, Table ES-2 (page 21) Vegetation Features.* Add another column for FDM. Identify as impacts the destruction of the few remaining shrubby trees, eliminating all nesting/roosting habitats for some migratory seabird species.

Response: Table ES-2 in the FEIS focuses on impacts to resource groups rather than island by island mitigation. The list of mitigations to impacts to vegetation by field fires caused by training activities on any island has been expanded. Prohibition to use of incendiary munitions on FDM has been added to Table ES-2. The existing vegetation of FDM has been exposed to fire from training exercises for many years, and the plant community now reflects these impacts in its composition.

b. Comment: *Table ES-2 (Page 27). Geologic Features.* Use the added FDM column to identify as impacts the sloughing of sea cliffs and incremental collapse of the isthmus at least partially as the result of ship and aerial training bombardment.

Response: The above comments have been added under "groundwater and soils" in the FEIS Table ES-2. Section 4.6.1.2 of the FEIS includes a section regarding target selection and avoiding the isthmus as a site of heavy sea cliff sloughing.

COMMENTS ON CHAPTERS ONE AND TWO

a. Comments: *Page 1-8 Section 1.2.3 Purpose and Need.* The end of the second paragraph is in conflict with information provided in Chapter Two. Section 1.2.3 states that Tinian is the only training area in the region suitable for maneuver training of a MEU. The Chapter Two description of alternatives describes the proposed use of Waterfront Annex and Tinian as amphibious landings.

Page 2-3, Section 2.2 Proposed Use of Military Lease Area, Tinian. The conflict continues with the statement that Tinian is the only location suitable for large-scale amphibious assault and joint training exercises. Recommend eliminating these conflicts in the FEIS.

Response: The Purpose and Need section in Chapter One and the proposed action and alternatives for Tinian training in Chapter Two have been rewritten in response to many comments. A Marine Expeditionary Unit (MEU) is a composite tactical organization comprised of many component elements that need to integrate their capabilities by working together under tactical training scenarios. These elements land from the sea to maneuver ashore. To train the entire MEU as a unit requires large areas of training land contiguous with landing beaches and helicopter landing zones. Unlike Guam, Tinian is the only training area in this region that has satisfactorily accommodated this type of combined tactical training scenarios. Tinian's Exclusive Military Use Area (EMUA) collocates landing beaches, maneuver and bivouac areas, a runway and helicopter landing zones, and abandoned structures that can be used to develop a realistic MEU amphibious exercise.

The MEU is also "special operations capable" or SOC-qualified. The SOC training involves small unit to reinforced battalion operations, many of which are suitable for being conducted in more confined spaces and urban environments. Guam has several landing beaches that are preferred for specific landing craft, amphibious vehicles, or inflatable raiding craft to deliver small SOC teams or larger, more heavily equipped units. Many of the smaller unit tactics and special operations are conducted at various sites on Guam simultaneously and these capabilities may supplement but do not substitute for the advantages offered by Tinian's beaches, airheads, and maneuver space.

b. Comment: *Page 2-5 Section 2.2.1.1 Field Maneuver.* This section discusses the need to clear vegetation for maneuvers and camouflage, but provides no identification of the types of vegetation to be cut or if vegetation cutting in the native limestone forest will be prohibited. This section also describes the construction of a small, permanent logistic support camp. Will tangantangan or secondary forest be cleared?

Response: Much of the summarized information pertaining to impacts and mitigation measures has been moved to Section 2-9 and Chapter Four. The description of potential habitat loss by construction is included in Section 4.2.1, but proposals that would have required major vegetation clearing efforts are no longer preferred. Section 4.2.1.1 of the FEIS, include direction to use small branches and deadfall for camouflaging personnel, vehicles or fighting positions. The anticipated reaction is akin to pruning, and by doctrine does not leave apparent damage to natural vegetation. During Tandem Thrust 99, very little camouflaging effort was required since natural vegetation provides sufficient cover. Sections 2.9.1 and 4.2.1.1 include the constraints to all maneuver during Tinian monarch nesting seasons which eliminates the risk of maneuver and

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fighting position camouflage using tangantangan and potentially damaging or destroying nests. The preferred construction site for the logistics support camp is a grassy area within the International Broadcasting Bureau's (Voice of America) compound. No tree clearing will be required. Bivouacs are conducted in the north half of the EMUA and seldom in the limestone forest in the central portion of the MLA. Individual shelter halves are frequently used, and no vegetation clearing is necessary. Very little activity (if any) is ever conducted on the cliff faces where vegetation is considered prime Tinian monarch habitat.

c. Comment: *Page 2-12 Section 2.2.3.1 Amphibious Landings.* The last paragraph regarding a single AAV landing beach is inconsistent with the last paragraph on page 2-13 that identifies two potential sites, and Figure 2-1a illustrating two new sites. Please clarify. Appendix C-1 indicates that Kammer Beach was the first choice for beach landing exercises.

Response: Since the DEIS was published, the use of Unai Babui for AAV landings has been removed from the proposed/preferred alternative for Tinian training. The color coding to designated ongoing, preferred new initiatives, and not preferred initiatives has been edited and corrected as necessary to depict the preferred alternatives.

Kammer Beach, which has excellent nearshore and beach conditions for Landing Craft Air Cushioned (LCAC), Landing Craft Utility (LCU) or Amphibian Assault Vehicle (AAV) landings was used for training until the early 1980s. Presently, the beach is developed for resident and tourist recreation. The CNMI government introduced legislation to formerly designate Kammer, Tachogna, and Leprosarium beaches as areas to be preserved for recreation. Although each beach was proposed for specific amphibious landing activities, the FEIS does not list any action beyond landings by small teams in CRRCs (Zodiacs) as a preferred alternative. To conduct landings by CRRCs on these beaches also requires advance planning and approval by the Tinian municipal government. Such activity was allowed on Kammer Beach during Tandem Thrust 99.

d. Comment: *Page 2-15. Section 2.2.4.2 Firing Range and Shooting House.* The FEIS should state why a new live fire range and shooting house is needed on Tinian, and why existing facilities are inadequate. The RDEIS did not contain sufficient information regarding the need to remove tangantangan for construction.

Response: The FEIS now states why construction of a shooting house and breacher trainer *are not* presently needed on Tinian. The FEIS also identifies certain conditions that would justify proposing these projects in the future. (If revisited, sites exist in North Field that would minimize the amount of tangantangan that would be cleared.) The preferred alternative is use of the shooting house and breacher trainer on Guam and temporary adaptation of the World War II structures on Tinian.

e. Comment: *Page 2-32 Section 2.6 Farallon de Medinilla (FDM).* There is more than one megapode on FDM. Delete the word individual from individual endangered Micronesian megapodes.

Response: FDM training alternatives will be found in Section 2.7 rather than 2.6 in the FEIS. Referral has been corrected to megapodes rather than an individual bird.

f. Comment: *Page 2-34, Section 2.6.2 FDM Bombardment (Target Locations).* Mitigation includes restricting naval gunfire targets to the west cliff line. A very restrictive great frigatebird colony occurs only on the west cliff line. The FEIS should offer mitigation that would restrict impacts to the west cliff line beyond 100 meters north and south of the great frigatebird colony. In addition, the naval artillery targets on the sea cliffs should be recognized and discussed in the FEIS for their impacts to tropic birds, noddies, and terns that use the sea cliffs as roosting/nesting areas.

Response: See FEIS Sections 2.7.2 and 4.6.1.2. Navy regulations for Range 7201 (FDM) will instruct vessels and aircraft to engage the targets that have been established on the island based on input from natural resource managers. Potential target locations have been identified in Figures ES-5 and 2-5. The targets will be located in conjunction with natural resource managers to avoid concentrations of roosting and nesting seabirds, including the great frigatebird colony. The figures also illustrate the modified target areas based on avoiding roosting and nesting areas.

g. Comment: *Page 2-34 Section 2.6.2 FDM Bombardment (Training Dates).* The section on mitigation does not mention limiting bombing to low periods in the seabird breeding season. This same comment was made in our review of the DEIS in 1997. We strongly recommend conducting a thorough literature review of the breeding seasons of the seabirds that nest at FDM and restrict military training to months during which the fewest species would be impacted.

Response: Birds of different species are known to nest on FDM throughout the year. It is not feasible to restrict exercises or operational use of FDM to avoid nesting periods.

h. Comment: *Page 2-34 Section 2.6.2 FDM Bombardment (On-island Visiting).* The Navy should reconsider its restrictive policy for on-island visiting. The perimeter is generally clear of vegetation, making it relatively easy to spot unexploded ordnance (UXO). At other times, large areas of vegetation burn, exposing hidden UXO. The majority of cluster bomb evidence is on the southern peninsula, the area of least concern for bird population surveying. We recommend that on-the-ground population counts and monitoring be part of the monitoring and adaptive management program outlined in the FEIS.

Response: UXO is found on FDM in large amounts and is both surface and sub-surface. The question regarding personal safety and on-island visits and surveys remains an ongoing

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subject among the Navy and certain regulatory agencies. The FEIS reflects the existing restrictive policy that only allows military personnel who are DOD explosive-certified to conduct limited activities on the island in conjunction with its range function. This policy may impede on-the-ground biological surveys but is in place to eliminate harm by UXO to personnel that are not involved in range operations and upkeep.

i. Comment: *Page 2-34 Section 2.6.3. FDM Cumulative Impacts.* The RDEIS states that repeated bombing has not destroyed the seabird population. It is not clear if repeated bombings are destroying, or contributing to a slow decline with continued disturbance, and in the process of being destroyed. In the FEIS the word "destroyed" should be replaced with "yet eliminated", and the cumulative impacts to FDM vegetation, which has been altered due to long-term bombing, should be discussed.

Response: Concur. The RDEIS discussion of cumulative impacts has been revised in the FEIS. Section 4.6.1.1 describes bird status on FDM. In the process of preparing the RDEIS, past records of seabirds and vegetation on FDM were evaluated to the extent that records exist, and are summarized in Appendix D to the FEIS. Of those early records, Fritz provides the earliest modern delineation of species and abundance on the island, although qualitative observations are made as far back as the 16th Century. It seems apparent from those records and historic photos that the standing vegetation on the island has been substantially altered in relative abundance among species, specifically indicating a reduction in standing woody trees, but not in type and number of species represented in the community. No such evidence was found indicating that the population of seabirds has been substantially altered in relative or absolute abundance, although it can be hypothesized that the change in standing vegetation would be to the disadvantage of tree roosting species. In evaluating long-term population changes and their causes, numerous confounding factors may also be present, including changes in oceanic conditions that affect prey species on which one or more species of seabirds depend. These regional conditions could act cumulatively with other stressors to impact bird populations on FDM.

Much remains to be learned about seabird populations on FDM, and the Navy will continue to monitor those populations as limited by UXO danger, for long-term trends. To reduce impacts on cliff nesting and roosting birds, the eastern escarpment of the island will remain off-limits for targeting and firing, and discrete target areas will be established to otherwise reduce the potential for concentrations of seabirds to be harmed. This discussion was added to the FEIS in Section 4.8.2.

j. Comment: *Page 2-43 Section 2.8.5 FDM Preferred Alternative.* Protection of the great frigatebird colony on the west cliff is not considered within the scope of the preferred alternative. The alternative should be rewritten to reflect this consideration. In addition, this section includes two mitigation measures that were not included in Section 2.6.2 (eradicating rats on FDM, and

enhancing megapode habitat on another island), but gives no details on how they would be implemented. Rat eradication prior to cessation of bombardment is not viewed as a productive use of time and funds. The Department recommends that the FEIS indicate that the Navy will work with the USFWS and other federal and territorial resource agencies to develop appropriate mitigation for the preferred alternative within a comprehensive program of monitoring and adaptive management.

Response: Rat eradication as a mitigation measure on FDM has been eliminated from the Preferred Alternative. Mitigation measures for range activity impacts include conducting a long-term monitoring program; establishing target areas to reduce impacts on roosting and nesting concentrations of birds (to include the great frigatebird); avoiding areas of geomorphologic sensitivity; updating existing regulations (COMNAVMARIANASINST 3500) to ensure that only approved target areas are fired upon; and using targets that have been inspected for BTS prior to transport. The training frequency and ammunition expenditure will be based on the April 1998 biological opinion in the near term. Off-island mitigation will include habitat enhancement at Sarigan. Navy natural resource managers are actively cooperating with federal and CNMI resource management agencies in carrying out these measures. The FEIS will be edited as needed to reflect the above.

COMMENTS ON CHAPTER THREE

a. Comment: *Page 3-7, Section 3.3.1.3 Rare, Threatened and Endangered Species.* Correct the FEIS as follows. In the first paragraph, correct the status of the Mariana fruit bat (*Pteropus mariannus*) from a candidate for federal listing to a species proposed for federal listing. In the second paragraph delete reference to the Mariana fruit bat being proposed for listing as an endangered species on Tinian. This species is now proposed for Federal listing as threatened throughout the Mariana archipelago, including Guam.

Response: The changes have been made and are found in Section 3.3.1.3 of the FEIS.

b. Comment: *Page 3-10 Section 3.3.2.3 Rare, Threatened and Endangered Species.* The endangered plant species *Tabernaemontana rotensis* was recently rediscovered on Andersen Air Force Base. It is a current candidate for federal listing under the Endangered Species Act (and is not yet federally proposed as stated in our earlier letter of October 1). Please include this information in the second paragraph of this section.

Response: The plant species has been identified as a "candidate" for federal listing under the ESA in Section 3.3.2.3 of the FEIS.

c. Comment: *Page 3-11 Section 3.3.2.3 Rare, Threatened and Endangered Species.* Potential impacts of military training (and mitigation measures) are required for the three species

of Marianas tree snails that are currently listed as endangered by the Government of Guam. These three species are proposed by the FWS to be federally listed as endangered. A major impediment to the assessment is the lack of population location maps for tree snails on military training lands, especially in the aftermath of Typhoon Paka.

Response: Known tree snail sites have caused certain training areas on the Ordnance Annex to be No Training areas. As additional surveys are completed, COMNAVMARIANAS will amend the training constraint map as needed (Figure 2-9). The FEIS notes that the lack of snail population maps is an impediment. The known snail location on Communications Annex Finegayan does not constrain the limited training activity that is conducted near Haputo Beach.

d. Comment: *Page 3-13 Section 3.3.3.1 Habitat.* Rewrite that FDM has historically been used as a bombing site to "has been used since 1971 by the military as a bombing site."

Response: The text has been changed to reflect that FDM has been used as a bombing site "since at least 1971." During the literature search, there was one reference to targets being dropped on the island by the Air Force in the early 1950s but without any detailed information regarding target use.

e. Comment: *Page 3-14 Section 3.3.3.3 Rare, Threatened and Endangered Species.* This section should be modified to reflect the complete avian species list for FDM. If the species list in the 1975 Navy EIS for FDM is combined with the species observed since then, a total of 23 avian species are confirmed for FDM. The Philippine turtle dove (*Streptopelia bitorquata*) is mentioned in the 1975 EIS, which means there are two non-native birds recorded from FDM.

Correct reference to the common fairy tern to the more accurate white tern (*Gygis alba*). Revise the description of tern and noddy nesting habitat to indicate that both types of birds use the sea cliffs for roosting and nesting. The FEIS should list all species of the seabirds, including tropicbirds, known from FDM with descriptions of their habitat.

Response: Corrections were made to Sections 3.3.3.3 as suggested although our recount was 24 species to include the Philippine turtle dove. Table 2 in Appendix D-1 provide ten bird counts recorded from 1902 to 1997. Table 3 in the same appendix provides bird abundance estimates on seven occasions between 1975 and 1997.

COMMENTS ON CHAPTER FOUR

a. Comment: *Page 4-2 Section 4.1 Impacts of the Brown Tree Snake.* The first paragraph is inconsistent with the BTS Plan (Appendix E) in regard to immediate action when sighting a snake (to kill or trap and report to USDA-WS officials, or to only report). The second paragraph states that USDA-WS ensures that military personnel steam-clean heavy equipment and vehicles

prior to entry into USDA-WS controlled areas. The FEIS should clarify that it is USDA-WS responsibility to assure such equipment does not enter their controlled areas unless it has been steam cleaned. It is the Navy's responsibility, and not USDA-WS, to assure that equipment is steam-cleaned. The second paragraph also discusses the requirement to label as "inspected" cargo being transported from Guam to Tinian. Labels from past exercises could remain affixed to cargo and create confusion. The Department recommends that the Navy and USDA-WS cooperatively develop a method that will ensure inspections are conducted and past labels are not honored. The method should be outlined in the FEIS.

Responses: Section 4.1.5 of the FEIS discusses the significance of BTS introduction. The basic requirements are reiterated in Chapter Four when discussing logistic support training on each island. The FEIS has been edited in these numerous locations to clearly state that training personnel will be briefed on the BTS threat and instructed to kill or capture any BTS that they may sight, and to report the incident as soon as possible to WS or to an environmental monitor. The FEIS also identifies the military's responsibility for thoroughly cleaning and inspecting equipment prior to staging. Methods of labeling have been discussed among military representatives, WS, Guam and CNMI officials to adopt the most current and effective method. The most current compilation of procedures was published for Tandem Thrust 99 and added to the FEIS as Appendix E-3. Lesson learned from the exercise have been recorded by COMNAVMARIANAS for use in updating its directives.

The labeling requirement is noted in the FEIS and was discussed during the TT99 Middle Planning Conference. The technique to be used was updated for Tandem Thrust 99. To eliminate the potential labeling confusion if left on cargo from past exercises, the date of last BTS inspection is now included on the label. (This has been done for TT99). This procedure will be incorporated in the updated COMNAVMARIANAS BTS Control/Interdiction Plan, and published in Navy and Air Force training and logistics support regulations to ensure that the instruction reaches those planning and conducting the training.

b. Comment: *Page 4-3 Section 4.2.1 Protected Species and Habitat on Tinian.* The last paragraph states that "training activities with potentially significant side effects could result in individual takes." The FEIS should make it clear that even if a side effect is not considered significant, it may adversely affect a federally listed species. For example, clearing Tinian monarch habitat will cause displacement of adults or juveniles that are foraging or nesting. Depending on the timing of the clearing in relation to breeding seasons, a portion of these birds may be unable to successfully relocate and may die (harm).

Response: This point has been added to Section 4.2.1 of the FEIS. With regard to Tinian monarch habitat, the proposed actions that could have caused this side effect are no longer preferred alternatives. The USFWS recommendation to constrain field maneuvers during Tinian monarch nesting seasons has also been incorporated. USFWS has informed us that the Service

has submitted a federal delisting package for the Tinian monarch. (News Release dated February 22, 1999). However, since the action could take up to two years, the conservation measures recommended by USFWS for nighttime activities in habitat areas will be incorporated into the FEIS and pertinent training directives.

c. Comment: *Page 4-4 Section 4.2.1 Protected Species and Habitat on Tinian.* Table 4-1 (beginning on page 4-3) contains information about the Mariana crow. The table should be edited to remain oriented on Tinian impact significance indicators or moved to a more appropriate location in the FEIS.

Table 4-1 states that clearing vegetation is considered significant if "more than 10 percent of the population is affected," but does not indicate the species affected. If any amount of vegetation clearing will result in any loss of habitat for a federally listed species under FWS jurisdiction, consultation with FWS is required under Section 7 of the Endangered Species Act. The results should be recorded in the FEIS. Table 4-1 states that the side effects of projectile impact and explosion will be considered significant when "takes of listed species or habitat modification are likely." The FEIS should identify the Federal trust species that will be taken or have its habitat modified by projectile impacts and explosions.

Responses: Table 4-1 will be changed as suggested. The Preferred Alternative for Tinian will no longer pose a threat to loss of habitat due to land clearing for construction.

d. Comment: *Page 4-6 Section 4.2.1.2 Logistic Support Training and BTS.* The proposed mitigation calls for snake detector dogs to inspect on Guam and for WS personnel to again inspect on Tinian. No provisions have been made to transport dogs to Tinian. If inspections by canines would be required, a resident dog team would probably be needed to ensure rapid response to a reported sighting. Flying a dog team from Guam after the fact may be too time consuming to be effective.

Response: As discussed in Section 4.2.1.2, there is potential for introduction of BTS to Tinian not only via military cargo, but also through commercial arrivals at West Tinian Airport or Tinian Harbor. There is presently no routine canine detection program in place on the island and the FEIS no longer suggests that WS dogs and handlers participate on Tinian. We agree that the time taken to transport the dog would not meet the need to immediately detect a BTS on Tinian. This aspect of detection will be the responsibility of the CNMI government. The Navy would cooperate with the establishment by the CNMI resident canine detection program on Tinian, and would support the operations of such a program during military training exercises. Pending the establishment of such a program, the existing protocols will be followed during training exercises.

e. Comment: *Pages 4-7 and 4-8, Section 4.2.1.3 LCAC Landings.* The adverse effects of LCAC landings on coral-reef and sea turtle nesting habitats appear to be underestimated. To reduce the negative impacts of LCACs on Federal trust resources, the FEIS should incorporate the following guidelines to avoid adverse impacts: (a) land only at high tide;(b) use surveyed corridors similar to that proposed for AAV landings at Unai Babui; (c) maintain full cushion until reaching the top of the beach (off the sand); and (d) complete the initial 180-degree turn prior to coming off full cushion.

The FEIS should also state that an impartial observer monitor landings from a safe distance visually and with videotape and that operational guidelines for the craft be incorporated into training activities.

We recommend that LCAC operations be restricted to months outside the normal breeding season for green sea turtles. If the nesting season cannot be avoided additional mitigation should include: (a) a method of monitoring turtle use of the area over time to determine if training activities are related to the decline in nesting activity; (b) a contingency plan to decrease or cease training activity during the nesting season if a decline is observed; and (c) mitigation for nests that are known to have been destroyed as result of training.

Of four sites slated for LCAC training only one, Unai Chulu, will be surveyed prior to and after LCAC landings (or at least two times per year) for percent coral cover, turbidity, fish assemblage, sedimentation rates, and topography. Survey protocols are required for Unai Dangkulo and Tachogna Beach also.

We recommend that the Navy hire an independent, qualified biologist (approved by the USFWS and CNMI DLNR) to help conduct pre- and post-exercise surveys, and monitor impacts of the landing, and provide an unbiased recommendation to the Navy as to whether the presence of sea turtles or sea turtle nests would require cessation of landing exercises.

Responses: Since publication of the DEIS, much progress has been made in determining the actual affects of LCAC landings by conducting a marine survey at Unai Chulu during Tandem Thrust 99. The results validate the conditions that have been observed during LCAC operations in Hawaii and support LCAC landings continuing at Unai Chulu. The surveys were sponsored by the Navy and conducted by independent marine biologists assisted by representatives of CNMI DLNR and DEQ. The findings of the survey are included in the FEIS, Volume Two, Appendix C-5.

The day prior to the landing, personnel from Assault Craft Unit 5 who operate the LCACs conducted a landing beach survey and selected a suitable landing site that would ensure that the

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entire craft would cross the shoreline and come off cushion when fully overland. The initial landing was scheduled for high tide and total operations anticipated to last for about four hours.

Six hours prior to the landing, a Navy biologist inspected for any signs of turtle activity. The marine biologists marked off three transects parallel to the beach for pre-, during, and post-landing comparisons. After the last of fourteen LCAC reef crossing was completed, the post survey was conducted by the marine biologists and CNMI representatives.

Slope of the beach was slightly greater than ideal. Coupled with a relatively shallow open beach, the initial craft runs were made at varying speeds until the correct speed needed to get the craft completely on land was determined. This experimentation proved valuable to the survey, which was primarily concerned with potential damage to coral in shallow waters and along the shallow fringing reef. The craft did not fully clear the shoreline on the initial tries, forcing the craft operator to turn the craft (while still fully loaded) over shallow water for a return to sea and another attempt. Regardless, the results were no significant impacts to coral. A few coral boulders near the shoreline were scraped by the craft's skirt and a few sea cucumbers were disoriented. Illustrations in the survey report show that even at low speeds, the craft is riding on a cushion of air. Resulting pressures beneath the craft are also much less than those experienced by normal surf action or persons walking on the reef). (See Appendix C-5.)

The Unai Chulu survey report also reports on present coral conditions at Unai Dankulo. Once abundant with coral, two major typhoons have destroyed almost all coral on the reef and nearshore. This beach remains a preferred LCAC landing site after completion of a marine survey similar to that conducted at Unai Dankulo.

f. Comment: *Page 4-9 Section 4.2.1.4 AAV Landings.* This section describes single file AAV approaches to the beach and only at high tide. The training description on page 2-12 states AAVs may approach the beach side-by-side or one after the other. The inconsistencies should be corrected regarding formation and time of landing.

A mitigation measure is hand-picking movable corals from the approach lane prior to the first landing exercise at Unai Babui. The FEIS should indicate that the Navy will contract experienced local coral biologists to investigate the feasibility and potential effectiveness of coral transplantation, and that any recommendations for coral translocation be approved by DLNR prior to being implemented.

Responses: The proposal to land AAVs in single file at Unai Babui to minimize damage to its sparse nearshore coral is not a preferred alternative. A revisit to the reef during Tandem Thrust 99 failed to identify a portion of reef face wide enough to allow both tracks of the vehicle to touch down simultaneously. The spur and groove reef face at the surf zone would make landings difficult without the possibility of breaching or damaging the vehicle or coral on the

vertical reef face. The only preferred landing site for AAVs on Tinian is the LCU boat ramp in Tinian Harbor.

g. Comment: *Page 4-11 Section 4.2.1.6 Small Arms Range.* The FEIS should include a more thorough discussion of the potential impacts to sea turtles and the marine community in general from projectiles that miss backstops and impact and settle in ocean water. Regarding the range construction site, the FEIS should indicate that in cooperation with the Department of Land and Natural Resources (DLNR), an area adjacent to native forest will be selected and cleared of non-native vegetation and replanted with native species.

Response: The proposed small arms range on Tinian is no longer a preferred alternative. The existing ranges on Guam are oriented toward the ocean but have extremely high dirt backstops. There are military range facilities in which projectiles impact ocean waters but we have not found any evidence of spent projectiles impacting these waters and adversely affecting marine communities. The projectiles now in use are often copper-clad lead bullets of a size not likely to be ingested by marine organisms, and not readily soluble in seawater. USEPA has expressed concern regarding lead in soil at weapons ranges and potential degradation of groundwater. As a result, DOD has initiated production of a copper-clad tungsten round for 9 mm to .50 caliber weapons.

h. Comment: *Page 4-41 Section 4.3.1.1. Deep water MCM.* Correct the inconsistency between the description of the Dadi Beach deep water detonation site as "expansive sand flat" to the description in Table 2-3 (Page T-16) indicating that the site is a shallow reef with abundant coral. The detonation site is a deep expansive sand flat that is adjacent to areas of relatively low coral cover.

Response: The apparent inconsistency is caused by the fact that two different training uses for Dadi Beach were proposed. Your description above is correct regarding the *deep water* MCM site, which is about 500 meters offshore and used by Navy Explosive Ordnance Detachment (EOD) units. The description in Table 2-3 on T-16 refers to the proposed use of the *shallow* reef flat near the Dadi Beach shoreline for shallow water mine and obstacle counter measures training by Naval Special Warfare Unit (NSWU). The description in the table is correct for the inshore reef flat site. The proposed shallow water demolition training is deemed inappropriate for underwater demolitions within substantial coral.

i. Comment: *Pages 4-45 and 4-46 Section 4.3.1.4 LCAC Landings.* The FEIS should provide additional descriptive information for the nearshore environment at Dadi Beach, propose an LCAC approach lane, and incorporate pre- and post-survey as protocol.

Response: A demonstration landing at Dadi Beach, Guam raised concerns with GEPA and DAWR officials after seeing exposed coral disturbed near shore. The nearshore disturbance

is primarily the result of the lack of a suitable craft landing zone (CLZ) being established prior to the landing. The LCAC did not come fully ashore, and all turns were made over shallow water with exposed coral and rip rap, which was disturbed by the craft's skirt. The FEIS does not list Dadi Beach as a preferred site until such time that a suitable CLZ is developed and another demonstration landing conducted.

Representatives from the Guam regulatory agencies will also be invited to observe the marine survey that has been proposed at Unai Dankulo.

j. Comment: *Page 4-48 Section 4.3.1.7 River Insertion Training.* The section on proposed mitigation indicates that personnel will be instructed to not shoot any endangered Mariana moorhen or disturb any nests that may be seen. The Navy needs to address direct and indirect impacts to moorhen since the training may cause nest abandonment and area departure. The results of the Section 7 consultation should be included in the FEIS.

Response: Section 4.3.1.7 has been corrected in the FEIS to state "not fire blank ammunition" vice "not shoot."

k. Comment: *Page 4-65 Section 4.6.1 Protected Species and Habitat at FDM.* This section addresses potential impacts due to possible introduction of BTS to FDM in target vehicles/structures. These impacts are not identified in Sections 2.6.2 and 2.6.3. Please note that the placement of targets from Guam to FDM was not part of the project description leading to the USFWS April 6, 1998 Biological Opinion (BO) Conference Report for live fire training at FDM. The FEIS should exclude this option or more fully discuss, evaluate, and mitigate for its potentially adverse consequences.

Response: The FEIS indicates that junked auto bodies are no longer being used as targets on FDM. Metal shipping containers such as CONEX boxes and/or MilVans will be used and the latest BTS protocol will be followed. The containers must be cleaned, inspected, and staged in snake-free areas pending transportation to FDM as targets.

l. Comment: *Page 4-66 Section 4.6.1.1 Existing Conditions (FDM).* There is simply not enough reliable evidence to support the statement that species composition of FDM's flora has not been altered significantly over the past 100 years. Before 1974, no qualified botanist visited FDM, and no exhaustive inventory has ever been conducted. The FEIS should either limit the statement to the past 25 years, or reword the statement to indicate that some of the dominant herbaceous species at FDM have been reported consistently to occur there over the past 100 years.

Response: Fritz made the first recorded visit to the island in which a knowledgeable person listed species present, in 1902. The species noted by Fritz, which were apparently those

most readily observable, are present today. Fritz observations do not allow comparisons with regard to relative abundance or vertical structure as are found today. Nor do they provide an adequate basis for determining whether some species present but not recorded by Fritz have since been lost. The text of Section 4.6.1.1 has been clarified to focus on information from 1974.

m. Comment: *Page 4-65 Section 4.6.1.1 Existing Conditions (FDM).* The FEIS should clarify the types and reliability of the vast majority of observations made over the past 95 years and state that most bird species on FDM have been consistently documented to occur there since 1971, with at least two species of boobies having been present for at least 66 years.

Response: The discussion of the occurrence of seabirds on FDM includes the detail as requested, with the specific information provided in your comment incorporated into the FEIS. This includes a discussion regarding the level of reliability of observations made on FDM.

n. Comment: *Page 4-69 Section 4.6.1.2 Potential Impacts of FDM Aerial Bombardment and Naval Gunfire and Proposed Mitigation.* The section on potential impacts suggests that bats in the CNMI are federally protected, but this is not the case. The word "bat" should be removed from the first bullet in this section.

Response: The deletion was made as requested in the FEIS.

o. Comment: *Page 4-69 Section 4.6.1.2 Potential Impacts of FDM Aerial Bombardment and Naval Gunfire and Proposed Mitigation.* For bird mortality surveys being conducted from helicopters, seabird or megapode corpses cannot be accurately sighted, and the extent of nest abandonment or failure cannot be accurately determined. Therefore, the FEIS should state only that the survey results demonstrate that similar numbers of adult seabirds were in the area when pre- and post-bombardment surveys were conducted.

Response: The "potential impacts" statement reports the limited corpses that were observed from a helicopter. The FEIS has been edited to note the limitation as compared to conducting a ground survey. Since aerial imagery is providing the basis for the surveys at specific survey locations, these photos may provide a long-term record of trends in population, based on roosting and nesting birds present.

p. Comment: *Page 4-70 Section 4.6.1.2 Potential Impacts of FDM Aerial Bombardment and Naval Gunfire and Proposed Mitigation.* The FEIS should offer mitigation that would not only restrict impacts away from the east cliff line but also to areas greater than 100 meters north and south of the great frigatebird colony on the west cliff line. Additionally the naval artillery targets on the sea cliffs should be recognized and discussed in the FEIS for their impacts to tropic birds, noddies, and terns using the sea cliffs for roosting and nesting.

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The second paragraph states that "USFWS guidelines will be followed for permitted takings of bird and turtle species." Delete the words, "and turtle" in this statement. In the programmatic BO for the bombardment of FDM from 1998 to 2001, the USFWS did not issue a take statement for endangered or threatened sea turtles because the two beaches on FDM were not considered to be viable turtle nesting habitat.

The third paragraph includes reference to broadcasting of rodenticide pellets on FDM and "additional compensatory mitigation measures." The Department recommends the Navy work cooperatively with the federal and territorial resource agencies to address compensatory mitigation needs within the scope of a comprehensive program of monitoring and adaptive management. The FEIS should either identify the "additional" measures, or establish guidelines for when and how they will be developed.

Response: Please refer to the response to comment f. Chapters 1 and 2 above, which addresses concerns about potential impacts of bombardment and artillery fire on bird colonies along the western cliffs of FDM.

Use of rodenticides as a mitigation measure was mentioned in DEIS. Rats are known to occur on FDM, and were observed during surveys conducted in November 1996. It is considered likely that rats living on the island may prey on eggs of the birds nesting on the island, and therefore exert predation pressure on the natural populations of birds using the island. However, after further consideration, the Navy feels that there is inadequate information to support a recommendation for this mitigation measure. Desirable information would include accurate census of the rodent population; a determination of whether and to what extent rodents on the island may rely on bird eggs as a food source; an assessment of the potential adverse effects of using rodenticides (versus other possible means of rodent control); and the legalities of broadcasting pelleted rodenticides from helicopters (according to EPA and other agency guidelines). Given the dangers of moving about on FDM, it is not possible to conduct the desired studies at this time. Since the information needed to support this recommendation is lacking, this mitigation measure has been dropped from further consideration in the FEIS.

Also in the third paragraph, reference is made to "additional compensatory mitigation measures," including the development of a program to enhance megapode populations on another island within the Marianas. The Navy has entered into an agreement with USFWS to enhance megapode populations on Sarigan (possibly to include feral animal control, rat eradication, and habitat improvements), which would also improve conditions for ground-nesting seabirds. This information will be elaborated within the FEIS. A statement will also be included reflecting the fact that the Navy will work cooperatively with the federal and commonwealth resource agencies to address compensatory mitigation needs within the scope of a comprehensive program of monitoring and adaptive management.

q. Comment: *Page 4-71 4.6.1.3 Brown Tree Snake.* Justify the risk of using old car bodies, dumpsters and CONEX boxes from Guam as targets on FDM, rather than target materials from Tinian, Saipan, or Rota.

Response: As noted earlier, car bodies are no longer being used because of the difficulty in conducting a thorough BTS inspection as compared to using metal shipping containers. Even if containers were selected from Tinian, Saipan or Rota, cleaning and inspection will still be necessary.

OTHER COMMENTS

a. Comment: *Figure 3-3 Bird and Bat Sightings on FDM.* The Figure uses gray shading to show important migratory bird nesting areas. Since these nesting areas overlap with the seabird distribution polygons, the gray shading should be deleted from the Figure.

Response: The gray areas indicate potential nesting habitat and the habitat of birds not included in the legend, while the polygons showing named species are meant to indicate locations of actual observed colonies. Among the areas in the gray shading are cliffs used by terns, noddies and tropicbirds, as well as by other species. These distinctions have been clarified in the text and figure in the FEIS.

b. Comment: *Table 2-1, Page T-13 Tinian AAV Landing Sites.* The FEIS should assess potential impacts to coral and turtle nesting at Unai Chulu, Unai Dangkulo, Tachogna and Kammer beaches.

Response: The table provides a general description of the potential sites that were screened and evaluated in the EIS. The table has been expanded to identify the major constraints to beaches, particularly those not preferred. Potential impacts to coral and turtle nesting by AAVs and LCACs respectively are identified for Unai Babui and Unai Chulu. Mitigation measures have been identified in discussions above.

c. Comment: *Table 2-5, Page T-18 Comparison of Tinian Alternatives.* The FWS disagrees with the statement that none of the proposed alternatives will result in a take of endangered species. There is a potential for take of federally listed species associated with all of the alternatives. Loss of Tinian Monarch habitat through land clearing is one example. Proposed mitigation measures may minimize impacts but do not relieve the Navy from consulting with FWS under Section 7 of the ESA. The FEIS should include the results of the consultation.

Response: Table 2-5 has been revised to reflect the results of the final Section 7 consultations (anticipated take, terms and conditions, etc). The final agency consultation letters are included as Chapter Seven. The proposed delisting of the Tinian monarch has also been

mentioned in the FEIS since it may change constraints established for maneuver in Tinian monarch habitat.

d. Comment: *Table 2-11, Page T-25 Potential Impacts and Mitigation.* Some of the proposed mitigation measures provided in this table are not clearly described in Chapter Four. The reference to "cutting no vegetation larger than wrist size" needs clarification. In addition, the FWS recommends restrictions to cutting native vegetation species as camouflage material.

Response: Minimizing training impacts to vegetation must be defined in terms independent of native or introduced vegetation, since the majority of persons training on the island are not natives of the Marianas. The table and Chapter Four have been compared to ensure no omissions from either. The reference to cutting no vegetation larger than wrist size is not intended to indicate a standard measure of total plant size (as is the case when using diameter at chest height as a standard). This "wrist criterion" is meant as a measure applied at the position of the cut of that part of the plant (primarily branches) being used for camouflage material. These activities will not be allowed in areas with native forest. As discussed in the response to comment b under Chapters 1 and 2 above, all measures to avoid potential impacts to native forest species of vegetation has been described in the FEIS.

e. Comment: *Appendix D, FDM Surveys, Reports and Biological Opinions.* The most recent BO for FDM dated April 6, 1998 is missing from the RDEIS.

Response. This document has been added to the FEIS as Appendix D-23. The biological opinion dated January 4, 1999, has been added as Appendix D-24.

f. Comment: *Appendix D, Report D-1, Historic Overview.* The following corrections or clarifications are required for this report:

- Baker also noted that according to Yamashina, 12 brown booby eggs were taken from FDM in 1931.
- Roosting adult and juvenile great frigatebirds as well as three nestlings/fledglings have been reported from the island of Maug (Derek Stinson, personal communication, 1998).
- Although the 1975 EIS identified the dominate tree vegetation on the island to be Indian mulberry, Whistler (1996) believes it is a misidentification and was in all probability Pisonia grandis. (Please clarify.)
- Micronesian starlings have not been consistently found on the island since 1975 (mentioned in the 1975 EIS). The Micronesian megapode has not been observed on the

island since 1991, and the first observation since then was in 1996. Previously, the species was identified in bird lists by island only as hypothetically present.

Response: The above corrections have been made to Appendix D-1 in the FEIS.

USFWS SUMMARY STATEMENTS

The RDEIS remains deficient in its analysis of anticipated fish and wildlife impacts. The Department recommends that a comprehensive program of monitoring and adaptive management be implemented and used to validate non-significant impacts and to support appropriate adjustment to mitigation, including compensation for significant adverse impacts.

Based on what is presented, we anticipate that the unavoidable cumulative impacts from the proposed action will be significant, including cumulative impacts to Federal trust resources.

The Department is concerned that currently proposed measures to control the spread of BTS are deficient. The Department recommends that the Navy work cooperatively with the USDA-WS, BRD, and the USFWS to update and periodically improve the BTS plan.

The Department recommends the Navy consider initiating programmatic interagency consultation with USFWS under Section 7 of the ESA relative to the effects on training-related actions on federally-listed species.

The Department recommends that the provisions of EO 13089 for the protection of coral reefs be addressed within the scope of the proposed action

The Department recommends that several inconsistencies, error, mislabeling, and misleading information presented in the text, figures, and tables be corrected in the FEIS.

The Department supports the Navy's efforts to implement long-range planning for military training activities in the Mariana Islands.

RESPONSES TO SUMMARY STATEMENTS

The Navy shares the Department of Interior concerns that potentially significant adverse impacts to the environment, including cumulative effects, resulting from military training be identified, avoided to the extent practical, and mitigated. Reviews of the DEIS and RDEIS by regulatory agencies and within the Department of the Navy have led to more accurate assessments of impacts, and revisions to the preferred alternatives on each island. Cooperative efforts with federal, territorial, and commonwealth regulatory agencies will continue as the Navy monitors the effects of training on training lands and updates protective protocols as needed.

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The issues of BTS quarantine measures and EO 13089 (Coral Protection) have been addressed and will be dealt with as stated above in the FEIS. In regard to EO 13112, Invasive Species, the Department of the Navy continues to work cooperatively with USDA, Wildlife Services, USFWS, and appropriate territorial and commonwealth agencies to prevent military operations from introducing the BTS into areas in which it is not now present. The EIS and EAs developed for Tandem Thrust exercises have always approached BTS interdiction and control as a primary requirement to avoid significant environmental impacts. The Department of Interior's letter of consultation under Section 7, ESA, will be appended to the final EIS.

The FEIS is an extensive document covering a complex set of actions with one intent being to ensure that cumulative effects of military training in the Marianas are identified, avoided to the extent compatible with accomplishing a minimum level of military training, and mitigated to the extent practicable.

The Navy appreciates the effort that Department of Interior USFWS personnel have applied to its review of the DEIS and RDEIS. Your comments and corrections has been incorporated into the FEIS as outlined above, and implemented accordingly in military operations on the training lands. The Navy looks forward to continuing to work cooperatively with the USFWS in managing the natural resources under Navy stewardship in the Marianas Islands.

Should you have any questions, please contact Mr. Stanley Uehara at (808) 471-9338, by facsimile transmission at (808) 474-5909, or by E-Mail at UeharaSY@efdpac.navfac.navy.mil.

Sincerely,

Melvin N. Kaku

MELVIN N. KAKU
Director
Environmental Planning Division

Original Text
From: "The Hartleys-Rocky & Pam" <rocky@netpci.com>, on 9/24/98 11:10 PM:
To: Fred Minato@Code 09P@NAVFAC EFDPAC

Sir,

Will this denotation have any effect on the marine life in the harbor? I hope all efforts are being put forth to keep what underwater sea life that is using that area in its naturel habitat.

Rocky

THanks for considering the sea life.

DEPARTMENT OF THE NAVY
PACIFIC DIVISION
NAVAL FACILITIES ENGINEERING COMMAND
(MAKALAPA, HI)
PEARL HARBOR, HAWAII 96860-7300

5090P.1G03
Ser PLN231/ 1752

20 MAY 1999

Mr. Rocky Hartley
rocky@netpci.com

Dear Mr. Hartley:

Subj: REVISED DRAFT ENVIRONMENTAL IMPACT STATEMENT (DEIS)
MILITARY TRAINING IN THE MARIANAS

Thank you for your E-Mail of October 3, 1998 commenting on the subject DEIS. Your letter asked whether the proposed action would have any effect on marine life in the harbor.

The DEIS (and the Final EIS) does evaluate potential impacts caused by training activities to marine life. The activity that receives the most scrutiny is underwater demolition training. Potential effects to marine life as well as to divers and underwater cultural resources have been evaluated and reviewed with regulatory agencies such as the Guam Environmental Protection Agency (GEPA) and National Marine Fisheries Service (NMFS). A copy of the DEIS was provided to the MARC library at University of Guam and at the Nieves M. Flores public library in Hagåtña. Copies of the FEIS will be provided also. The potential effects of training in Apra Harbor and in waters off of Dadi Beach are described in Section 4.3.1 of the FEIS.

The information provided includes potential shock wave effects that can injure or kill fish or sea turtles. Evaluation potential effects to the endangered hawksbill turtle and the threatened sea turtle are of paramount importance. No threatened or endangered sea turtles have been found killed or harmed after a demolition training event, and the number of fish injured or killed has been kept relatively low by selecting relatively few demolition training areas where marine life is not abundant. Underwater demolition training is an ongoing event conducted by two units assigned to Guam who must maintain proficiency in both deep and shallow water demolitions. Their training activities are monitored by such agencies as GEPA, NMFS, and the U.S. Coast Guard.

Should you have any further questions, please contact Mr. Stanley Uehara at (808) 471-9338, by facsimile at (808) 474-5909, or by E-Mail at UeharaSY@efdpac.navfac.navy.mil.

Sincerely,

Melvin N. Kaku

MELVIN N. KAKU
Director
Environmental Planning Division

18. GUAM DEPARTMENT OF AGRICULTURE

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Plant Nursery	734-3949
Plant Protection & Quarantine	472-1651; 477-7822

Carl T. C. Gutierrez
Governor

Madeleine Z. Bordallo
Lt. Governor

Francisco P. San Nicolas
Acting Director

Joseph G. Sablan
Deputy Director

October 5, 1998

Mr. Fred Minato
Attn: (Code 231FM)
PACNAVFACENGCOM
Building 258 Makalapa
Pearl Harbor, Hi. 96860-7300
FAX (808) 474-5909

Dear Mr. Minato:

Agriculture has reviewed the revised *Draft Environmental Impact Statement, Military Training in the Marianas* (rDEIS) that was forwarded to our office on August 11, 1998. We were pleased to note that many of the suggestions from our April 10, 1997 letter that reviewed the initial rDEIS have been incorporated into the rDEIS. We offer the following comments on the rDEIS:

General Comments

Eventual publication of an approved Final EIS should not be construed as blanket approval of all training activities. Some will still require evaluation for impacts on endangered species when the training actually takes place.

Some training activities in the rDEIS still need additional evaluation of their impacts. Mine counter-measure (MCM) training and LCAC activities have not yet been given adequate review under NEPA or Section 7 of the ESA. In addition, while the analysis of the impacts of proposed munitions training on endangered species at Farallon de Medinilla have been evaluated, the impacts on non-listed species that may be protected by the Migratory Bird Treaty Act have not been adequately evaluated under NEPA.

Terrestrial Concerns

The greatly expanded Surface Danger Zone depicted on Figure 2-2a resulting from expanded small arms training at Orote Point is perhaps merely misleading, but continues to

be of great concern if there is any real intent to enforce this zone during small arms exercises. The ocean areas within these zones are heavily utilized by recreational and commercial boaters, fishermen and divers, and it would be unreasonable, and impractical, to attempt to enforce these safety zones when the ranges are in use. Historically, the smaller Surface Danger Zones from Orote Point, NCTAMS, and Tarague (AAFB have not been enforced (or at least not overtly). This may be only a paper concern, because the topography of the Orote Peninsula and the NCTAMS cliffline provides protection to those users of the nearshore areas. Bullets that overtop the range backstops must eventually reach sea level, however, and there is some risk, however slight, to vessels operating at or beyond the limits of the Surface Danger Zones.

The lack of current crow nesting at specific locations, such as the bivouac area or in the vicinity of the south runway at Northwest Field is not necessarily a reflection of the future condition. If on-going crow recovery efforts (which include brown tree snake control) are successful, crows conceivably could forage or nest throughout the area, as they historically have. Likewise, fruit bats may forage, and occasionally roost, throughout this area. Therefore, it is imperative that the EIS process not be construed as granting blanket approval for any activity. Because of the fluid situation with respect to endangered species, the various training activities must necessarily be subject to some level of case-by-case review, and flexibility built into exercise planning.

The proposal to conduct shallow water mine countermeasure (MCM) training exercises at Spanish Steps Beach on the Waterfront Annex should be conducted so as to avoid disturbance to the small brown noddy (*Anous stolidus*) seabird colony nesting on the small offshore rock in front of the beach (about 300 meters east of Orote Point Island). The rarity of noddy nesting sites on Guam makes it important that this colony is preserved.

Page 4-54 - The rDEIS should be corrected to state that although fruit bats were not recorded during faunal surveys of the proposed sniper range, they are indeed known to occur in low numbers in this area, based on DAWR observations. Fruit bats are considered rare throughout the forested portions of the entire Ordnance Annex.

Page 4-60 - Again, the rDEIS should be corrected to state that fruit bats occur throughout Andersen Air Force Base, particularly at night when they range widely while feeding, and are not found only at Pati and Ritidian Points. This section of the rDEIS should also acknowledge that three species of endangered or candidate endangered trees occur on the airbase. These include *Serianthes nelsonii* (federally and locally endangered), *Heritiera longipetiolata* (locally endangered) and *Tabernaemontana rotensis* (candidate federally endangered). *Tabernaemontana rotensis* was discovered on the base in early 1998, with several individuals found at Area 50 of Northwest Field, Ritidian Point, and Tarague basin.

Mr. Fred Minato
Attn: (Code 231FM)
PACNAVFACENGCOM
October 5, 1998

Coastal Concerns

1. Use of Explosives (2.3.5)

Agriculture has met with representatives of the US Navy to discuss concerns regarding the use of explosives in the ocean as part of their training. Based on these discussions there remains a number of significant concerns:

a) The use of explosives in Guam's coastal waters for training remains unjustified from several perspectives.

Agriculture still feels some of these exercises can be conducted in the open ocean to eliminate the risk of taking marine life. The response to this request has been that it increases the risk to divers and that not all scenarios can be performed under deep water conditions. Agriculture maintains the view that alternatives and modification to the proposed explosives training still have not been adequately pursued. There also remains the problem of justifying the size of the charges that are required for certification.

An option which has been suggested, but not accepted, is to conduct every aspect of the training up to the actual detonation in Apra Harbor and then conduct the detonations in a deep pool of water constructed elsewhere specifically for such training. This would still allow all aspects of the training to be conducted with all the same human risks but eliminate the risk to resources. This would provide the potential to work with even larger explosives.

b) The use of explosives for training at the Apra Harbor site has continued with the detonation cord as a fuse. This results in an explosion throughout the water column from the surface to the actual charge. This practice has been a major contributor to increased fish kills and increases the potential for take of sea turtles. In discussing this concept with a variety of individuals involved in other explosives training in the water, it appears the normal procedure would be to use electronic detonation.

c) The analysis of the proposed alternative site at Dadi Beach has not adequately evaluated training activity's impacts on the resident pod of dolphins, stingrays and grass eels that are commonly found at the site.

d) In Apra Harbor there is one sea turtle nesting site which is located at Sumay Marina. This is one of only three hawksbill sea turtle nesting sites on Guam and represents up to 30% of the known nesting population on Guam. Because sea turtles entering or leaving Apra Harbor are likely to pass within the area of risk caused by proposed detonations, there is a reasonable risk of take. The take of any of these animals could jeopardize their continued nesting on Guam. Agriculture feels this situation requires a formal Section 7 consultation with the US Fish and Wildlife Service. Although no turtles are

Mr. Fred Minato
Attn: (Code 231FM)
PACNAVFACENGCOM
October 5, 1998

e) know to have been taken, the fact that it takes 90 to 120 minutes for water visibility to clear sufficiently after a detonation reduces the likelihood of discovering such animals.

f) Agriculture does not have a copy of the Final EIS for Proposed Facilities Development and Relocation of Navy Activities to the Territory of Guam from the Republic of the Philippines as referenced on file and requests it be provided to review the impacts described for the 10 and 20-pound charges.

The impacts from the use of 10 and 20-pound explosives for MCM training have not yet been adequately evaluated and repeated efforts to reduce size of charges and change operation locations and methods have been ignored. The Navy needs to address these concerns to prevent unacceptable takes of sea turtles and other marine life. In general, it seems inappropriate to be conducting explosive MCM training in outer Apra harbor which is the main area that commercial and civilian ships routinely traverse and that the public routinely recreates in.

2. Amphibious Assaults (2.3.3)

The LCAC landings proposed are not suitable for reef flats with coral or rubble substrata. These craft have been observed to cause reef damage and degrade beaches. The Navy response to these concerns indicated that as long as these vessels stayed up on cushion and performed no turns that no damage would result. This is not true. Observation and surveys have more than adequately demonstrated that there are impacts that represent a significant threat to reef flat environments (refer to incident reports from Agriculture and Guam Environmental Protection Agency). Their proposed use at Dadi Beach will damage coral and increase sedimentation. The alternative of using the South Tipalao Beach area is more suitable because it is a degraded reef habitat. This area could be cleaned and it would result in an improved habitat. LCAC's should never be used on sea turtle nesting beaches because of their trenching effects on sand beaches.

The Department supports the military's efforts to evaluate the impacts of training on the Mariana Islands fragile environment. Please contact my office at your earliest convenience to address the remaining natural resource issues we have discussed above.

Thank you for your cooperation.

Sincerely,

FRANCISCO P. SAN NICOLAS
Acting

RECEIVED TIME OCT.10. 12:18PM PRINT TIME OCT.10. 12:20PM

DEPARTMENT OF THE NAVY
PACIFIC DIVISION
NAVAL FACILITIES ENGINEERING COMMAND
258 MAKALAPA DR., STE. 100
PEARL HARBOR, HI 96860-3134

5090P.1G03
Ser PLN231/ 1871

27 MAY 1999

Mr. Francisco P. San Nicolas
Acting Director
Department of Agriculture
192 Dairy Road
Mangilao, GU 96923

Dear Mr. San Nicolas:

Subj: REVISED DRAFT ENVIRONMENTAL IMPACT STATEMENT (DEIS)
MILITARY TRAINING IN THE MARIANAS

Thank you for your letter of October 5, 1998 commenting on the subject DEIS. This letter briefly responds to your comments and concerns.

General Comments

a. Comment: Publication of the Final Environmental Impact Statement (FEIS) should not be construed as blanket approval of all training activities. Some will require evaluation for endangered species impacts, at the time of training.

Response: Concur. As part of the Endangered Species Act Section 7 consultations with U.S. Fish and Wildlife Service (USFWS) and National Marine Fisheries Service (NMFS), the Department of Defense (DoD) has negotiated mitigation actions for all proposed activities which could significantly impact endangered species. The DoD is complying with terms and conditions of the resulting Biological Opinions and is considering all reasonable conservation recommendations. The FEIS identifies the specific mitigation measures that will be conducted at each training site.

b. Comment: Additional evaluation is necessary for impacts from deepwater MCM training and LCAC landings and for impacts on non-listed species protected by the Migratory Bird Treaty Act on Farallon de Medinilla (FDM).

Response: Section 7 consultations with USFWS and NMFS have been concluded. Proposed underwater demolition and Landing Craft Air Cushioned (LCAC) landing sites have been reduced to those areas devoid of coral (demolitions and LCAC landings) and known sea turtle beach nesting activity. Pre-training site surveys will be conducted at all demolition and amphibious landing sites to mitigate potential impacts to biological (and cultural) resources. The Navy continues to work with regulatory agencies to identify potential deepwater demolition sites that could further minimize potential impacts to biological resources. (Additional comments relating to LCAC landings are provided under **Coastal Concerns**, paragraph f below)

Terrestrial Concerns

a. Comment: The larger surface danger zone shown in Figure 2-2a (for the proposed fire and maneuver range) is of great concern if there is intent to enforce this zone during range use; the existing zone has historically not been overtly enforced. This may be a paper concern, due to topography, but what is the risk to vessels in the SDZ?

Response: The risk to vessels in the SDZ west of Orote Peninsula remains unchanged. The SDZs generated by the small arms ranges do not require the areas to sea to be cleared of ocean traffic during range use. The sites were developed to take advantage of the 20-meter hill backdrop that functions as a bullet stop for each of these ranges. The proposed change at the Orote Point range that widens the SDZ is based on adding a circular path with firing positions aimed at fixed centralized targets. Prior to activation, the new range will be inspected and certified by a range planner from the Commander, Naval Facilities Engineering Command.

b. Comment: Because Mariana crows and fruit bats may extend their foraging and nesting areas at Andersen Air Force Base (AAFB), especially if recovery efforts are successful, various training activities must be subject to case by case review.

Response: Concur. The mitigation (flight conditions) agreed to between AAFB and USFWS are, indeed, flexible as they depend on your department's Division of Aquatics and Wildlife Resources (DAWR) to identify crow nesting territories, especially during the nesting season. As part of the Memorandum of Understanding (MOU) established due to the overlay units, daily contact is maintained with Refuge managers. Accordingly, flight patterns and minimum altitudes shall conform to up-to-date reports from DAWR.

Section 4.5.1.1 of the FEIS identifies the working relationship between DAWR and the Andersen environmental and flight operations staffs.

c. Comment: Shallow water MCM training at Spanish Steps should avoid disturbance to the small brown noddy seabird colony nesting on the small offshore rock in front of the beach.

Response: The DEIS Figure 2-2a erroneously showed this activity in green at Spanish Steps. This discrepancy has been corrected in the FEIS Figure 2-2a, which identifies underwater demolition training with live ordnance at Spanish Steps as a not preferred activity due to potential impacts to coral.

d. Comments: Revise page 4-54 to state that fruit bats are known by DAWR to occur in low numbers in the proposed sniper range area at the Ordnance Annex. Revise page 4-60 to state that fruit bats occur throughout AAFB, particularly at night. Also acknowledge the 3 species of listed or candidate trees at AAFB.

Response: Your comments have been incorporated in the FEIS. Section 4.4.1 of the FEIS mentions fruit bats in the sniper range area and Section 4.5.1 mentions the fruit bats at AAFB.

Table 3-1 lists the three listed or candidate trees and Section 3.3.2.3 lists the locations of these three species.

Coastal Concerns

a. Comment: Recommend that deepwater MCM training be conducted in the harbor without live charges, and that live charges only be used in a constructed deep pool of water or in open ocean, to eliminate risks to marine life. Alternatives and/or modification of training have been inadequately pursued.

Response: The Navy has discussed the requirement to train with live rather than inert charges. "To Train as You Fight" is an absolute necessity to effectively prepare for an environment that requires a mine countermeasures response to maintain open sea lanes of communication for non-combat evacuation or other related missions. Protocol has been developed and is followed by Explosive Ordnance Disposal Mobile Unit Five (EODMU-5) to eliminate risks to marine life. The actual training events are subject to observation by regulatory agencies. A concerted effort to find another site that would minimize the danger to any resource and still accomplish all training goals led to the selection of one proposed deepwater site offshore of Dadi Beach. Other conditions permitting, the availability of two deepwater dive sites will reduce training frequencies at either site. The Navy continues to explore the possibilities of finding additional sites that would serve to further minimize risks to resources without degrading training realism.

b. Comment: Recommend replacing detonation cord (used in underwater demolition) with electronic detonation, as detonation cord results in explosion through the water column and is a major contributor to increased fish kills and increased risk to turtles.

Response: Detonation cord is required to be used to initiate underwater charges for mine countermeasures missions. EODMU-5 confirms that there are no procedures that allow the use of an "electronic detonation" system. Detonating cord is a high explosive but contains only 0.006 pounds of net explosive weight per foot of detonation cord. When using a ten-pound main charge in the outer Apra Harbor underwater detonation site, the detonating cord destructive explosive effects are either within the safety radius of the main charge, or due to the minute amount of explosive contained per foot, produce a very small destructive radius. Therefore, no appreciable contribution to fish/marine mammal kill can be attributed to the use of detonating cord. The potential environmental impacts within the safety radius and primarily the direct impacts of the charge itself have been evaluated and found to be not significant.

c. Comment: Proposed deepwater MCM at Dadi Beach site has not been adequately assessed for potential impacts on the resident pod of dolphins, stingrays, and grass eels.

Response: A dialogue regarding underwater demolition training has occurred among COMNAVMARIANAS, EODMU-5 and regulatory agencies regarding means to inspect the

proposed demolition site prior to training. Pre-exercise surveys that indicate potential harm to marine species would suspend or cancel training. The Dadi Beach site was identified after inspection and evaluation by the Navy, EODMU-5 and Guam Environmental Protection Agency (GEPA), and chosen as one means to reduce economic impacts to commercial dive shops temporarily affected whenever portions of Apra Harbor are closed for training. The FEIS has noted that dolphins, stingrays and grass eels were not detected at the site during the marine survey, but information on their presence have been reported to the Navy. The process is ongoing.

d. Comment: Hawksbill sea turtles known to nest in Sumay Marina are likely to pass within the area of risk from proposed deepwater MCM. Take of any of these animals could jeopardize their continued nesting on Guam. A formal Section 7 consultation is required. As it takes 90 to 120 minutes for water to clear after a detonation, lack of observed turtle kills reduces likelihood of discovered dead animals.

Response: No deepwater MCM is proposed at or near Sumay Cove Marina, and no harm to sea turtles has been recorded from underwater demolition training that is conducted at the Outer Apra Harbor site. The only recommended activity at the Sumay Cove Marina is to land AAVs at the boat ramp. The FEIS will identify the "no-wake" rule that is in effect to protect possible hawksbill turtle nesting sites on the cove shoreline.

Section 7 consultation has been concluded with USFWS and NMFS. Conservation recommendations from the agencies will be incorporated in the FEIS. The USFWS Biological Opinion dated January 4, 1999, concludes that the military training activities on Guam, Rota, FDM, and Tinian, are not likely to jeopardize the continued existence of the green sea turtle, hawksbill sea turtle, Mariana fruit bat, Micronesian megapode, or the Tinian monarch. Correspondence from the NMFS to this office dated December 30, 1998 concludes the Section 7 consultation for Mariana Islands Training EIS. The previous NMFS biological opinion and associated incidental take statement for mine warfare training dated August 27, 1993, remains valid.

e. Comment: Navy must address continued concerns regarding inadequate analysis of impacts of using 10-and 20-pound charges. It generally seems inappropriate to conduct deepwater MCM training in the main commercial and civilian harbor, which is also heavily used for recreation.

Response: The evaluation involved discussions with EODMU-5 representatives, who agreed to limit charges to 10 pounds, and to conduct harbor training no more than once a month for a period of about four hours. Discussions with commercial diving firms indicates that the advance notification provided by EODMU-5 has been sufficient for the timely selection of alternative dive sites for the short times that underwater MCM restrictions were required. If the proposed Dadi Beach site is used, interference to commercial firms' harbor activities will be further minimized.

f. Comment: Proposed LCAC landings are not suitable for reef flats with coral or rubble substrates. Navy's claim that no damage would result as long as vehicles remain up on cushion and perform no turns is not true. Recommend landings at South Tipalao Beach instead of Dadi Beach. LCACs should never be used on sea turtle nesting beaches because they trench sand beaches.

Response: LCAC landings at Dadi Beach have been deleted from the Preferred Alternative at this time and until a suitable craft landing zone can be developed on this beach and another landing can be scheduled and studied. The Preferred Alternative in the FEIS will include LCAC landings at Tipalao Beach, Dry Dock Island, Polaris Point, and Toyland Beach west of Abo Cove. No turtle nesting sites are anticipated to be disturbed and pre-landing beach surveys for signs of turtle activities will be conducted at each landing site.

The Navy conducted a pre-, during-, and post-marine survey at Unai Chulu, Tinian during Tandem Thrust 99. The intent was to determine impacts to coral on the shallow nearshore ledge and reef, which were crossed 14 times by the LCACs. The landings began at high tide and continued for about four hours. The only signs of "contact" were on rocks near the shoreline that had been scuffed by the craft's skirt on a few occasions when the craft came off cushion without being fully on the beach. More importantly, none of the delicate coral formations present in deeper waters and on the reef itself were damaged. Representatives from CNMI Division of Fish and Wildlife and Division of Environmental Quality observed the event and participated in the post-landing survey. The study report is included in the FEIS as Appendix C-5. One result is confirming the importance of getting fully on shore before coming off cushion, and on departure conducting turns over land rather than over shallow water.

LCACs do not "trench" a sand beach although the vehicles that they bring ashore will leave ruts in soft sand. As an LCAC goes back on cushion and departs a beach, the combination of lift fans temporarily suspending sand and the craft's skirt skimming the surface as air escapes around the edge serve to level a sand beach's surface. The FEIS proposes smoothing out any remaining vehicle or AAV tracks to eliminate potential obstacles for turtle hatchlings trying to reach the sea. The "impressions" left by the LCAC operations at Unai Chulu were raked by three persons in less than 20 minutes.

Should you have any questions, please contact Mr. Stanley Y. Uehara at (808) 471-9338, by facsimile transmission at (808) 474-5909, or by E-Mail at UeharaSY@efdpac.navfac.navy.mil.

Sincerely,

Melvin N. Kaku

MELVIN N. KAKU
Director
Environmental Planning Division

19. GUAM DEPARTMENT OF LAND MANAGEMENT

DEPARTMENT OF LAND MANAGEMENT
(DIPATTAMENTON TANO')
Government of Guam
P.O. Box 2950
Agana, Guam 96932
Tel: (671) 475-LAND • Fax: (671) 477-0883

CARL T. GUTIERREZ
Governor

MADELEINE Z. BORDALLO
Lieutenant Governor

CARL J. C. AGUON
Director

FRANCISCO P. SAN NICOLAS
Deputy Director

October 16, 1998

Mr. Stanley Y. Uehara
Director, Environmental Planning Division
Department of the Navy
Pacific Division
Naval Facilities Engineering Command
Pearl Harbor, HI 96860-7300

Ref: Draft Environmental Impact Statement (DEIS) for Military Training in the Marianas

Hafa Adai Mr. Uehara!

The Department of Land Management has completed its review of the Document entitled "Draft Environmental Impact Statement for Military Training in the Marianas." Concurrently we compared the areas of operation that training will transpire in relation to the proposed Federal Excess Land Return Matrix and found that no significant impact will be realized. However, please note as previously stated that the Department's concerns are those of the required buffer zones that are normally called for whenever heavy artillery or small-arms fire is employed either alternately or simultaneously. As trivial as it may seem, the wide range of training and simulations of scenarios that have been the trademark of military proficiency are the guiding voices to make our concerns hear through the channels of authority.

The potentially significant issues identified in the outline pretty much cover most of the overall concerns of the Department, and we are confident that the terms of Section 1.6 of Chapter One satisfies future arrangement if the need arises.

Thank you for the opportunity to comment and provide and insight on this very serious issue of land-use and its relationship to the Military.

Senseramente,

CARL J. C. AGUON
Director, Department of Land Management

cc: Director, Bureau of Planning

Commonwealth Now!

RECEIVED TIME OCT.22. 12:45PM PRINT TIME OCT.22. 12:46PM

DEPARTMENT OF THE NAVY
PACIFIC DIVISION
NAVAL FACILITIES ENGINEERING COMMAND
(MAKALAPA, HI)
PEARL HARBOR, HAWAII 96860-7300

5090P.1G03
Ser PLN23T/ 611

18 FEB 1999

Mr. Carl J. C. Aguon
Director
Department of Land Management
P.O. Box 2950
Agana, GU 96932

Dear Mr. Aguon:

Subj: REVISED DRAFT ENVIRONMENTAL IMPACT STATEMENT (DEIS)
MILITARY TRAINING IN THE MARIANAS

Thank you for your letter of October 16, 1998 commenting on the subject DEIS. This letter briefly summarizes your comments and responds to your concerns as follows:

a. Comment: The Department of Land Management is concerned whether buffer zones around heavy artillery and small-arms fire areas will be adequate.

Response: No heavy artillery ranges are proposed for development on Guam. The existing and proposed ranges for Guam are for small arms (pistols, shotguns, rifles and light machine guns) only. Each range has an appropriately dimensioned buffer zone ("surface danger zones" or SDZs). Existing SDZs have been certified according to military range design directives by Commander, Naval Facilities Engineering Command (COMNAVFACENGCOM) in Washington, D.C. These design directives take into account maximum range plus safety buffers to the flanks and beyond. In addition, the sites selected for small arms ranges have high hillsides behind all target lines that stop the projectiles far short of their potential maximum ranges. With all of our ranges certified as meeting COMNAVFACENGCOM range design criteria and generally located within natural hillside barriers, there should be no concerns over safety.

Should you have any questions, please contact Mr. Fred Minato at (808) 471-9338, by facsimile at (808) 474-5909 or by E-Mail at MinatoFJ@efdpac.navfac.navy.mil.

Sincerely,

MELVIN N. KAKU
Director
Environmental Planning Division

COMMONWEALTH OF THE NORTHERN MARIANA ISLANDS

OFFICE OF THE MAYOR

ROTA, MP 96951

BENJAMIN T. MANGLONA
Mayor

TEL. No. 532-9451 /2 /3
FAX No. 532-9454
E-MAIL: molota@gtepacifica.net

October 14, 1998

COMMANDER
Attn: (Code 231FM)
PACNAVFACENGCOM
Building 258 Makalapa
Pearl Harbor, Hawaii 96860-7300

Re: Mayor's Comments – Draft Environmental Impact Statement (DEIS)
Military Training in the Marianas

Thank you for the opportunity to comment. Any constructive criticism should not detract from the fact that, as United States citizens, the people of Rota are proud to support our Country's military preparedness. The U.S. Military has been and remains a great friend of these Islands.

As we understand the scope of military training, we will see Navy SEAL activity on and around Angyuta Island (Rota's West Harbor). Angyuta will be used as a bivouac area and stop-over point for rigid hull, inflatable boat transport North to Tinian and Farallon de Mendinilla and South to Guam. In the past, we have found no significant impacts from this activity. Close coordination with the Commonwealth Ports Authority, the Rota Department of Public Safety, and the local Department of Lands & Natural Resources is requested. We ask that all Brown Tree snake protocols be strictly observed.

The Draft Statement also tells us to look for aviation training at the Rota International Airport. Helicopter pilots, flying CH-46E helicopters, will practice night vision goggle flying. They will hover and fly at approximately 150 meters for a maximum of 19 closed loop patterns. Normally, two helicopters would participate in any given exercise. Exercises would occur only on moonless evenings (approximately 10 evenings per month). Helicopter operations would commence one hour after sunset or after the last commercial flight, whichever is later, and would end by 10:00 PM. Again, we respectfully request close coordination with Commonwealth Ports Authority. Beyond that, concerns here would be with night noise disturbing the Sinapalu residents and noise disturbance of Mariana crow populations.

With regard the crow, we would note that the area of the military exercise is subject to fixed-wing aircraft noise during daylight hours. The crow will most likely not suffer disturbance beyond that to which it has become accustomed. The people might be another matter.

"Ha' Gatbo Luta"

"Keep Rota Beautiful"

To the extent they may do so in a manner compatible with the purpose of the exercise, we ask that helicopter pilots use altitudes, rates of climb/descent, and approach angles that minimize noise disturbance to the residences and farms in the airport area.

Rota is more than happy to cooperate with the Department of the Navy. In turn, we ask for your kind consideration with a hazardous waste problem. In December of 1997, the MV Shogun left 55 metric tons of sludge oil (approximately 12,000 gallons) in two tank trucks at Rota's West Harbor. The tank trucks belong to our resident Department of Public Works. The sludge oil was taken ashore with a view toward assisting in the clean up of Shogun for sinking as an artificial reef. Without notice, the Shogun left CNMI waters. For this reason, the artificial reef did not materialize. Rota is stuck with the sludge oil. Apparently, the oil is a hazardous waste. As the Navy's DEIS correctly points out,[1] Rota has no facilities for doing away with hazardous waste. Perhaps, the Navy might assist as a compensation for some earlier harm done to our environment.

On June 13, 1996, in Rota's Sasanhaya Bay, U.S. Navy divers descended on the pristine preserve of Coral Gardens. Navy divers detonated depth charges of World War II vintage at one of our island's most beautiful dive spots and tourist attractions. Powerful C4 explosive shattered the reef system, killing coral wildlife for a 175 foot radius. Twenty-five percent of the underwater park was lost. Coral heads that had taken centuries to develop were reduced to absolute rubble in a matter of seconds. Others were fractured like a jigsaw puzzle. The multitude of creatures that live in the sandy sea bottom were annihilated. Historic submarine chasers in the area were reduced to bent pieces of metal. The damage is estimated in the hundreds-of-thousands of dollars. We believe a less destructive means of dealing with the old depth charges was in order. This operation had all the earmarks of a Navy field exercise. But that is history. Perhaps the Navy could balance the environmental score card. Please help us with the Shogun's sludge oil and locate and clean up a ship for sinking as an artificial reef. Guam seems to have several vessels in this category. Your kind consideration would be appreciated.

Thank you once again for giving us the opportunity to comment on the DEIS for Military Training in the Marianas.

Sincerely,

BENJAMIN T. MANGLONA

Cc: Rota Commonwealth Ports Authority Director; Resident Director of Public Safety; Resident Director of Lands and Natural Resources

[1] DEIS - Military Training in the Marianas – Chapter 3 – Environmental Setting, Page 3-24

DEPARTMENT OF THE NAVY
PACIFIC DIVISION
NAVAL FACILITIES ENGINEERING COMMAND
(MAKALAPA, HI)
PEARL HARBOR, HAWAII 96860-7300

5090P.1G03
Ser PLN231/ 575

16 FEB 1999

Mayor Benjamin T. Manglona
Island of Rota
Rota, MP 96951

Dear Mayor Manglona:

Subj: REVISED DRAFT ENVIRONMENTAL IMPACT STATEMENT (DEIS)
MILITARY TRAINING IN THE MARIANAS

Thank you for your letter of October 14, 1998 commenting on the subject DEIS. This letter briefly summarizes your comments and responds to your concerns as follows:

a. Comment: Rota has found no significant impacts in the past from Navy SEAL bivouacs at Angyuta Island (West Harbor). Please coordinate closely with the Commonwealth Ports Authority, the Rota Department of Public Safety, and the local officials of the Department of Land and Natural Resources. Brown tree snake (BTS) protocols should continue to be strictly observed.

Response: The Navy appreciates your community's continued support of this training. We continue to work closely with the U.S. Department of Agriculture Animal and Plant Health Inspection Service, (APHIS) Wildlife Services to update and follow the latest BTS protocols. The Final EIS (FEIS) will clarify communication protocols with your local agencies listed above.

FEIS: Section 2.8.2.1 and Section 4.1 will reiterate the BTS requirements for units departing Guam.

b. Comment: Please coordinate all night vision goggle (NVG) training at Rota International Airport with the Commonwealth Ports Authority. Please minimize noise disturbance to residences and farms in the vicinity of the airport.

Response: Although NVG training on Rota was evaluated as a preferred option, the training will not be included in the FEIS as a Preferred Alternative. This means that NVG training by helicopter squadrons will not be pursued on Rota at this time. The reasons for eliminating NVG training on Rota were as follows:

(1) Noise impacts on Mariana crows have not been measured in enough detail to determine an acceptable noise level;

(2) the area is becoming more densely populated and is now not completely dark at night, thereby making the airport a less desirable location for this type of training; and

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Ser PLN231/ 575

(3) suitable training areas at Northwest Field, Andersen Air Force Base, are now available for helicopter NVG training.

FEIS: Section 2.8.2.2 will address the above NVG training on Rota as a Not-preferred alternative.

c. Comment: It would be helpful if the Navy can help dispose of approximately 12,000 gallons of sludge oil originating from the MV Shogun, which was intended to be sunk offshore of Rota as an artificial reef. The ship left Rota waters without notice to the Mayor's Office, which has no means of disposing of the oil. The oil is reputedly a hazardous waste. Rota would particularly appreciate this in light of the damages sustained by coral and submerged historic resources when the Navy detonated a World War II depth charge in 1996. The Mayor's Office believes that the depth charge could have been handled less destructively. The operation "had all the earmarks of a Navy field exercise."

Response: The Department of the Navy will evaluate the request to assist the Government of Rota with their oily waste disposal as a separate and distinct issue from the comments concerning the draft FEIS.

The Department of the Navy responded to an emergency request from Emergency Management Office of the Commonwealth of the Northern Mariana Islands (CNMI EMO) concerning the dangerous situation with an exposed depth charge in an area frequented by recreational divers and tourists. After assessing the situation, CNMI EMO concluded that the depth charge be detonated in place as the only safe way to alleviate the danger. This was based on the fact that the depth charge was considered unstable after being exposed to salt water for over 50 years and there was no sure way of determining its existing condition. Any attempt to disarm or remove the depth charges could easily set it off due to change in water pressure and too risky for explosive trained personnel to handle. The decision to detonate was coordinated with the local and federal agencies and considered necessary to alleviate a real world, real life emergency. Explosive Ordnance Disposal Unit was requested to respond to the unexploded ordnance in accordance with the Memorandum of Understanding concerning Unexploded Ordnance between Department of the Navy and the CNMI government. This underwater detonation operation was not a training exercise, but a real world response to a public safety concern raised by CNMI EMO. The 500-pound World War II depth charge was detonated using a small charge. The heavy damage came from the depth charge explosion itself.

Should you have any questions, please contact Mr. Fred Minato at (808) 471-9338, by facsimile at (808) 474-5909, or by E-Mail at MinatoFJ@efdpac.navfac.navy.mil.

Sincerely,

Melvin N. Kaku

MELVIN N. KAKU
Director
Environmental Planning Division

21. COMMONWEALTH PORT AUTHORITY

COMMONWEALTH PORTS AUTHORITY

Main Office: SAIPAN INTERNATIONAL AIRPORT
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October 23, 1998

Attn: Fred Minato
U.S. Pacific Command, Department of Defense
Pacific Division
Naval Facilities Engineering Command
Pearl Harbor, Hawaii 96860-7300

Dear Mr. Minato:

Subject: Draft Environmental Impact Statement (DEIS) for Military Training in the Marianas

Thank you for providing the Commonwealth Ports Authority (CPA) with a copy of the above-mentioned document. Our review of the DEIS yields several areas of concern which will be discussed in this letter. We request that you consider inclusion of your response to these concerns in the Final EIS. We also request that you respond at your earliest convenience in a separate letter to CPA, as your response is critical to us in our planning for airport and harbor improvements. Please be advised that CPA welcomes the Department of Defense (DoD) and Navy staff to communicate with us at any time, and that we are dedicated to meeting the needs of our DoD customers.

We are concerned that the DEIS does no include important information regarding the current status of airport and harbor facilities, nor does it adequately address mitigation for potentially significant aviation safety and socioeconomic impacts which would result from the proposed action. Development of Tinian as a world-class casino/resort destination is a critical aspect of the CNMI's economic strategy, and CPA is currently planning large-scale improvements to both the airport and harbor facilities. We have made significant investments toward these projects, and anticipate that completed improvements will greatly increase the numbers of tourists visiting Tinian. As discussed in the DEIS, the 400+ room Tinian Dynasty Casino/Hotel represents a private investments of more that $100 million, and is in full operation. Additional resort developments are currently in the planning stages. The success of these business enterprises, and hence, the CNMI's economic strategy, required uninterrupted access to Tinian's airport and harbor.

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We are also very concerned with issues of safety. The prospect of military training exercises taking place on a small island with large-scale resort tourism developments poses a daunting logistical challenge. The need for a complete coordinated effort between the involved agencies cannot be overstated, as there is zero margins for error.

Prior to recent tourism-related developments on Tinian, restricted civilian use of airport and harbor facilities during military training exercises represented an acceptable strategy. However, for present and future considerations, the economic repercussions of such a strategy would be quite damaging, and very difficult to adequately mitigate. We do no believe that a NOTAM published 72 hours in advance of any planned military aviation activities within shared or restricted airspace (refer to Section 4.2.6.3, DEIS) constitutes sufficient mitigation. Please understand that travel tours to Tinian from foreign departure points will be planned months in advance. Likewise, we do not believe that 30 days advance notice of military use of the airport and/or harbor, or planned closure of the EMUA (refer to Section 4.2.7.3, DEIS), constitutes sufficient mitigation. We are concerned that a DEIA for an undertaking of this magnitude would be drafted without consultation with our agency. We would appreciate the opportunity to discuss these issues with you, and to participate in any mitigation proposals that may be included in the Final EIS.

Following is a more detailed examination of airport and harbor facilities on Tinian relative to the DEIS:

Tinian International Airport

The design phase of planned airport improvements at Tinian International Airport (TIA) has been completed, and the Environmental Assessment (EA) for the project was approved by the Federal Aviation Administration (FAA) in September 1998 (see attached EA document). Airport improvements are to be constructed in two phases: the Airside Phase and the Terminal and Landside Phase, at estimated costs of $24 million and $20.2 million, respectively. As noted in the DEIS, CPA is currently in the process of determining sources for funding of the project. In September 1998, the FAA approved a $3.8 million grant to begin the Airside Phase of the project.

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The Airside Phase includes the reconstruction of the abandoned Runway 1 into an 8,600 ft. runway; the realignment of 8th Avenue; the conversion of the existing runway into a taxiway; the construction of connecting taxiways and parking apron; the installation of taxiway and runway lighting; required embankment and excavation; drainage facilities; and the installation of a Precision Approach Path Indicator (PAPI) navigational aid.

The Terminal and Landside Phase includes construction of a two-story, 123,000+ SF terminal structure containing check-in counters and offices for four airlines; customs and immigration stations and offices; a restaurant/coffee shop; a "duty free" shop; car rental offices; a VIP lounge; two passenger loading bridges; and departure and arrivals halls to accommodate up to 700 passengers. Landside improvements will consists of an access road designed as a divided boulevard; a new 50,000 gal. water storage tank; a new water well; new water transmission lines with fire-fighting capabilities; a wastewater disposal system; and parking for 265 vehicles.

The DEIS should include an examination of the TIA project construction process, and potential impacts resulting from the proposed action. This construction process is likely to require 18 to 24 months, and will involve large-scale transport or personnel, materials, and equipment through both the harbor and existing airport. Interruptions due to military activities, should that be required, will be costly. How will potential impacts to construction activities be mitigated?

The DEIS should discuss the 938 acre (379 hectare) conservation area designated as mitigation for the loss of habitat resulting from the TIA project. This mitigation area is located north of the proposed airport expansion property, within the EMUA (see Biological Assessment, Appendix M to attached EA). Currently, negotiations are underway between the U.S. Navy and CNMI Government to finalize this proposed mitigation area.

The DEIS should also discuss the West Tinian terminal expansion project. Currently, design of this project has been completed, and a construction contract will be awarded by the end of the month. The purpose of this expansion is to increase tourism capabilities on Tinian during the interim period, before the new TIA project is completed. The West Tinian terminal expansion project will accommodate aircraft with up to 150 passengers. This project is scheduled to be completed in May of 1999.

<u>Tinian Harbor</u>

1. "The existing condition of the port if outside the scope of this DEIS." (DEIS, p. 1-20)

2. "Use of the harbor, as well as West Field, as ports of entry for troops, vehicles, and equipment provides realistic challenges for logistic support personnel. Military activities must be integrated with ongoing commercial port operations, Staging, maintaining, and inspecting equipment and cargo in transit is critical ensuring that quarantine of brown tree snakes (BTS) and other noxious species is effective." (DEIS, p. 2-5)

The above two statements appear to be contradictory, and we are concerned about their implications. We are concerned because the limited operational capabilities of the harbor could adversely affect your program, and this situation may also present more severe conflicts with other harbor users and vessel scheduling. For example, should your program require use of the limited facilities at the harbor, and should the duration of your use extend into commercial vessel scheduling periods, that the very limited pier space, as well as the limited operational times resulting from the deteriorated breakwater conditions make the hours of usability of the harbor very unpredictable. At present, vessels must often stand off until calm sea conditions can prevail.

We recommend that your DEIS be revised to include information which would help us plan and justify the costs of harbor rehabilitation. We are endeavoring to upgrade our transportation infrastructure on Tinian – including both the airport and the harbor – to support economic development planned by Tinian and the CNMI. A major feature of this development planning is for improvements in Tinian Harbor to support:

a) The two high-speed passenger ferries owned by Tinian Shipping which provide water transport between Saipan and Tinian on a regularly scheduled basis. These two vessels operate several times daily, and must always have a berth available.

b) Development of harbor facilities to support small craft, including commercial and recreation vessels.

c) Shoreside improvements, including haul-out and work areas, vessel storage areas (including hardened typhoon shelters for two passenger ferries).

d) A cultural, educational and visitor center clustered around the House of Taga historic site. Our Tinian Harbor Master Plan includes a dedicated view plan from the site across the harbor looking seaward.

e) Inclusion of Tinian Harbor and other sites on Tinian as part of a larger historic preservation effort – this is a unique plan to integrate a modern, functional harbor with the historic features of the development of Tinian over the years, including waves of occupation (German and Japanese plantations, World War II, U.S. Army atomic staging and features and events). Our planning for Tinian as a visitor destination includes development of this cultural component.

f) Physical design components in Tinian Harbor so that it will become more attractive to visitors arriving via the port – including a community design process for the port facilities, landscaping, color coordination, design themes, signage, recreational facilities and other features.

To achieve these objectives, we have prepared a master plan for Tinian Harbor (copy enclosed for your reference), and are in the process of developing a funding program for the major rehabilitation of this facility which is more that 50 years old. Our vision for this harbor differs somewhat differently from the traditional view of harbors, although it may not be all that difference from plans the Navy has for Pearl Harbor, especially the Ford Island Master Plan.

You can contribute to our master planning effort, and also aid us in planning for harbor management by providing the following information:

1. **Military Vessel Dimensions and Capacity.** Please provide a description of the dimensions (draft, length, beam) and gross tonnage of military vessels which would use Tinian Harbor in the programs described in the DEIS. This information will be used by us and our consultants in design considerations for entrance channel, turning basin and berthing depths; for sizing of the turning basin and entrance channel; and for assessing the capacity of facilities to serve vessels of different types.

2. **Military Vessel Types.** Please provide a description of the type of vessel and the facilities it may require. For example, can all vessels be accommodated at the existing or similar piers, or will they require loading ramps or beaches for their operations? Will there be small craft or are all vessels to use Tinian Harbor of the deep draft variety?

3. **Military Vessel Cargo Loading/Unloading Facilities.** What type of cargo loading and unloading facilities will be required at Tinian Harbor to serve military vessels, and how much pier, dock and shoreside storage space may be required under the programs proposed in the DEIS?

4. **Frequency of Call.** What frequency of calls is projected? Would vessels call several days each month, each year? How many days would they stay in port?

5. **Other Vessel Information.** If there is other information about vessel, pier or cargo handling requirements which would be helpful in our master planning process, please provide it so that we can best meet your needs.

6. **Commodities to be Shipped, Loaded or Unloaded.** It is not possible to identify in the DEIS the specific commodities to be passed through the port. Please provide numbers, quantities, weights, volumes or other measurable units and descriptions and include the approximate frequency (days per month, days per year or other). For example, there is limited POL (petroleum, oil and lubricant) storage capability on Tinian at present, what will be the military requirement. Similarly, passengers unloading facilities are limited, how many passengers (troops?) would be loaded/unloaded? General cargo, what would be the volume and weight of this cargo and in what form? Containers, break-bulk, pallets? How much shoreside storage areas will be required for commodity storage, and for what duration or periods during the year?

7. **Waste and Hazardous Material.** How much solid waste will be shipped through Tinian to Guam after the exercises? Where will the waste be stored while waiting for transshipment? What about hazardous or toxic waste?

8. **Cold Storage Facilities.** Tinian has cold storage facilities. Will these be of use to military operations?

9. **Alien Species.** What measures will be taken to prevent the introduction of alien species to Tinian, specifically the brown tree snake? The DEIS does not discuss measures to be taken at Tinian Harbor – what are they? It may be that a special quarantine zone should be established for military cargo on Tinian.

10. **Use of Tinian Harbor for Force Introductions, Forward Staging Bases, Combat Swimmer Training, and Amphibious Assault Vehicle Landings.** A variety of military activities are discussed or under consideration for Tinian Harbor and for Kammer Beach. Please note that use of Kammer Beach for Amphibious Assault Vehicle Landings may affect the harbor entrance channel and navigation traffic thereto. Our master planning work for Tinian Harbor is in the process of evaluating alternative harbor uses, breakwater configurations, small boar harbor sites, large vessel haul-out facilities and a variety of harbor land uses. If you are proposing facilities or activities in the harbor area, you need to describe these to us to see how we can best accommodate your needs.

11. **Historic and Pre-historic Site.** Tinian Harbor is adjacent to one of the most significant pre0shitorus sites in the Mariana Islands – known as the House of Taga. In fact, portions of the landfill comprising the North Quay shoreside area may overlay features of this important site. There are other historic sites in this area, and the harbor itself is a historic site by virtue of its age and importance in the role as the primary infrastructure making it possible for the staging of the atom bomb facilities on Tinian. We note that many reports have been previously prepared, and are referred to in the subject DEIS and that we do not have these available to us. It would be most helpful if the DEIS should include a more comprehensive discussion of the existing history if the harbor is to play a role in the proposed military activities. In our harbor master planning work, the community has discussed its concerns regarding the preservation and enhancement of the historic and prehistoric features in the area, including the House of Taga, and even through that site is not within the port boundary, it is adjacent to it, and portions of it may underlay the harbor lands. Our planning process is considerate of its significance.

12. **Water Quality in the Harbor.** The DEIS describes water quality in the harbor as being equivalent to that in the entrance channel – in other words, quality is good, resembling that of the open ocean. To some extent this excellent quality is a relatively new occurrence which has taken plane as a result of the nearly complete collapse of the single row of sheet pile extending from the shore to the cells making up the outer breakwater. This has allowed a strong flow of seawater to pass uninhibited through the harbor. Unfortunately, this same condition has worsened harbor conditions from the standpoint of cargo handling by introducing a more severe wave and current regime into the harbor. Rehabilitation planning of the harbor it taking this condition into account and endeavor to maintain an improved water quality condition over the original design as completed in 1945.

13. **Small Craft.** We anticipate a significant increase in the number of small craft in Tinian Harbor. This may affect conditions in areas of the harbor where military planners may not anticipate such activity.

General Issues (Common to airport and harbor)

1. **Resort Hotel and Casino Developments and the impact of military operations.** The DEIS should reflect the present construction status of these facilities. At present, one casino-resort with 400+ room is completed. Planning for others is underway. The DEIS notes that, "If large scale casino resort development activities commence, the military training exercises could have an adverse impact by restricting air and water traffic. However, this situation could be mitigated with advance notice to the civilian population and government agencies."

   It is not clear that advance notice would provide adequate mitigation. For example, two 150-passenger high-speed ferries are presently berthed at Tinian Harbor, they operate between Saipan and Tinian several times daily. Operators of the resort-casino will rely on this mode of transportation for many visitors to the facilities. Our Tinian Harbor facilities will include a dedicated passenger terminal and berthing areas for these vessels. Similarly, major improvements to the Tinian Airport are being planned to accommodate increased visitor traffic.

Coupled with the development of the visitor industry on Tinian will be the preservation and enhancement of historic and prehistoric sites as part of the overall visitor experience. They will also be participants in the wide variety of outdoor recreation and ocean recreation experiences which our climate and ocean waters provide. Witness the recreational and visitor activities surrounding historic sites and water-based recreation on Saipan to get a glimpse of the future on Tinian.

Military operations can be conducted on Tinian, but there will be a need for full coordination by military planners with civilian agencies and businesses.

2. Socio-economic Impacts and Environmental Justice. It appears that there is a potential for significance adverse impacts on Tinian's population from the proposed training activities because of potential conflicts with scheduling of port calls at the harbor with its presently unpredictable sea conditions due to the loss of the sheet-pile breakwater. We are in the process of preparing plans for improvement of the Tinian Airport and Harbor, and both these facilities will provide added capability to support the resort/tourism/casino industry. Because of this, it would be most helpful if the DEIS could be revised in such a way to place the discussions of all impacts and activities related to Tinian, in one section of the document. At present, it is very difficult to sort through all the subject areas and identify key discussion points relevant to our planning for Tinian's development.

Please note that as of 1990 (per U.S. Census date), Tinian's median household income was $18,152, lower that Rota and Saipan. That income gap is likely to be greater today because both Saipan and Rota have had extensive growth of the visitor industry while Tinian has lagged in that regard. Moreover, commercial tuna transshipment basically ended in Tinian in the mid-1990's and is not expected to return and that industry did provide income to Tinian which it does not now enjoy. The DEIS appears to state that the impacts of the proposed military training activities are the most severe and adverse on Tinian. Because of this, and because of economic conditions today, it is very important that the document be updated to reflect current conditions.

3. Mitigation. The DEIS should include discussion of mitigation for adverse socioeconomic impacts to Tinian, with a comprehensive understanding of present conditions and future growth of the tourism industry.

4. Joint Funding. We suggest that the Department of Defense consider participation in funding efforts for the facilities it will be sharing with the civilian population, specifically Tinian's harbor and airport facilities.

We thank you for the opportunity to address our concerns regarding the DEIS for Military Training in the Marianas, and look forward to further discussion of the issues presented herein. Please contact my office should you require additional information.

Sincerely,

COMMONWEALTH PORTS AUTHORITY

CARLOS H. SALAS
Executive Director

CHS:wlp

Enclosures

cc: Staff Engineer
Tinian Ports Manager

DEPARTMENT OF THE NAVY
PACIFIC DIVISION
NAVAL FACILITIES ENGINEERING COMMAND
(MAKALAPA, HI)
PEARL HARBOR, HAWAII 96860-7300

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25 MAY 1999

Mr. Carlos H. Salas
Executive Director
Commonwealth Ports Authority
Saipan International Airport
P.O. Box 1055
Saipan, MP 96950

Dear Mr. Salas:

Subj: REVISED DRAFT ENVIRONMENTAL IMPACT STATEMENT (DEIS)
MILITARY TRAINING IN THE MARIANAS

Thank you for your letter of October 23, 1998 commenting on the subject DEIS. This letter briefly summarizes your comments and responds to your concerns.

In general, your letter describes planned large-scale improvements of Tinian's harbor and airport, related to anticipated increased usage by tourists. Tinian currently has one large casino/hotel in operation and expects additional resort developments in the near future.

The CPA is concerned about impacts to public safety, impacts on the need for uninterrupted service at the two facilities, and socioeconomic impacts on the world class casino and resort business on Tinian.

Opening Comments

a. Comment: *Page 1, paragraph 2*: The EIS should state current status regarding development of airport and harbor facilities. The number of tourists visiting Tinian will greatly increase as a result of the planned expansion of airport and harbor. The success of casinos and resorts, and CNMI's development strategy, require uninterrupted access to Tinian's airport and harbor.

Response: The Navy realizes that CNMI has a major investment in increasing tourism on Tinian and potentially will increase activities in the harbor and airport. DOD will continue to balance these CNMI initiatives with our training needs, which emphasizes the value of our lease agreements with CNMI for National security reasons. Though the threats in the regions have changed, the strategic value of the training areas on Tinian has not diminished. As with CNMI intentions to invest in the future of Tinian, the DOD has a major investment in the Military Lease Area (MLA) on Tinian, which includes use of both facilities. The following sections of the FEIS address development status and potential impacts:

3.5.1 (overview of Tinian infrastructure including the airport and harbor)
3.6.1 (overview of Tinian culture and economy)
4.2.6.1 (existing conditions at the Tinian and Saipan airports)
4.2.7.1 (existing economic conditions on Tinian)

The FEIS has been expanded to describe the future development plans for the harbor and airport facilities and the projected timeframes and potential impacts from the proposed future training.

b. Comment: *Page 2, paragraph 1*: CPA is concerned that public safety hazards may result from combined influxes of tourists and military groups on a relatively small island. Coordination between civilian and military groups must be excellent, with no margin for error.

Response: The EIS includes public safety as an important criterion when evaluating training activities on Tinian. Community activities, and casino and resort development is concentrated in the leaseback area and inland of Kammer and Tachogna Beach. Military training activity is concentrated in the Exclusive Military Use Area (EMUA) at the north end of the island, with some logistic support and transportation of troops occurring at the San Jose Harbor and at West Tinian Airport, which is within the MLA.

A lease agreement between the United States and the Commonwealth dated January 6, 1983 established certain lands for military purposes on Tinian. In anticipation of joint-use agreements, the lease granted the CNMI use of the West Field area and San Jose Harbor for civilian aviation and port-related activities. The lease also identified the requirements to restrict public access during times of military maneuvers, operations, or related activities. Closure would be kept to a minimum consistent with military requirements and in the interest of safety and security. The same conditions are noted for shorelines, keeping them open to fishermen except within those limited areas that must be closed for safety and security considerations.

The 1994 Leaseback and Disposal Agreement returned about 1,245 acres south of West Field (West Tinian Airport) to civilian control except for the reservation of certain rights at San Jose Harbor (identified in Section 1.3.2 of the DEIS and Section 1.4.2 in the FEIS):

- DOD has the right to moor vessels, handle cargo, stage equipment and materiel, and conduct other port-related activities in Tinian Harbor.

- DOD has the right to temporarily secure and use portions of the harbor area on a not-to-interfere basis to conduct military training exercises or to perform activities in support of military training exercises.

- DOD has the right to install, operate, and maintain fuel and utility lines from Tinian harbor over CNMI lands to serve areas in the MLA.

Military groups planning to train on Tinian will work in advance with the CPA and other CNMI agencies to coordinate any required use of the harbor and airport so as to minimize restrictions to tourist-related activities while retaining the negotiated right to use both facilities in support of military training.

As mentioned in Section 4.2.7.2 of the FEIS, positive impacts were evidenced during Tandem Thrust 99: economic benefits were realized from training personnel patronizing the hotels, restaurants, rental cars, local merchants and other services. The Navy also allowed ship visits and shore leave during and after the exercise for the sailors to visit Tinian and Saipan. Civic action programs were implemented on Tinian.

Concerns for safety were specifically addressed by the DEIS (and retained in the FEIS) when evaluating:

- **The development of live-fire training ranges in the EMUA.** Public safety was a major consideration when evaluating the proposed development of two ranges and shooting houses in the EMUA. Since mitigation measures still left some degree of risk to anyone inadvertently entering range areas, the proposed live-fire training initiatives are no longer in the Preferred Training Alternative for Tinian. The only live fire proposed for Tinian occurs within the EMUA and often at night. Urban training activities are conducted at the former Japanese command post northwest of North Field. As described in the DEIS (Section 2.14 and in Section 4.2.5 of the DEIS and FEIS), this training includes careful management of the training area to ensure that no civilians are at risk. The training involves shooting only toward bullet traps temporarily set up inside the building. The training is conducted only by highly skilled marksmen who are special operations qualified.

- **Aviation safety due to increased commercial air traffic.** The DEIS addressed aviation safety in detail in FEIS Section 4.2.6. This section will be reviewed and updated as necessary with data on projected future use of the airport by tourists flying from Saipan and other locations. As stated in the DEIS, the primary mitigation will be through coordination with the CPA and FAA, and compliance with all FAA and DOD aviation regulations. As coordination and compliance with the FAA regulations is a long-standing DOD practice, the Navy does not anticipate any major aviation safety hazards.

- **Traffic safety in San Jose.** Traffic control in San Jose relies on traffic control and speed limit signs and crosswalks. The Navy is confident that CNMI and Tinian agencies have planned all adequate traffic control measures for public roads on Tinian, to address the projected major increase in tourists driving rental cars on Tinian. Pre-exercise planning coordination with Tinian officials will include traffic planning and scheduling to mitigate traffic conflicts in San Jose proper.

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In the event that military use of the harbor or airport would require controls beyond existing signage, military personnel will continue to contact the Tinian Mayor's Military Representative and the Public Safety Office to identify and coordinate any necessary traffic and convoy controllers at the time of the exercise.

- **EMUA Roadway Safety.** Traffic safety in the EMUA is a genuine public safety concern due to the lack of conventional traffic control signage and the absence of any driving conventions on airfield runways and taxiways. The Navy cannot be responsible for any safety hazards resulting exclusively from civilians exercising poor driving judgment in the EMUA.

Section 4.2.7.3 of the FEIS reiterates that the Navy is committed to maintaining tourist access to the portions of the EMUA during exercises at the direct request of CNMI agencies. However, training units may be at personal risk from civilian drivers in the EMUA during an exercise, and may limit access to persons not involved in training to include visitors to nearby cultural sites. All training groups will be responsible for enforcing traffic control in and around their personnel and equipment during exercises. Permanent road barriers were proposed, evaluated, and rejected in favor of establishing temporary road barriers on major arteries manned by military personnel with communications to the training units. Military personnel will direct automobile and pedestrian traffic at the Eighth Avenue and Broadway traffic circles, at access roads to beaches used for amphibious landings, and on access roads to runways that will be used for aviation activities.

c. Comment: *Page 2, paragraph 2*: Economic repercussions from restricting civilian use of the harbor and airport would be quite damaging in the future when tourism increases. CPA does not believe that the following mitigation measures proposed in the DEIS are adequate to cover this concern:

(1) NOTAM to be published 72 hours prior to any planned military aviation within restricted airspace [section 4.2.6.3 of DEIS]. This is inadequate for foreign flights planned months in advance.

(2) 30 days advance notice of military use of harbor and/or airport or for planned closure of the EMUA, also inadequate for tourist activities planned abroad months in advance.

CPA is particularly concerned that it be consulted in drafting proposed mitigation for these situations.

Response: Although the lease for Tinian training calls for a seven day advance notice, and the Tinian Mayor's Military Liaison has requested a two-week notice, the Navy intends to keep the Tinian Mayor's office and CNMI regulatory agencies involved in the exercise planning process as much in advance as practicable. Frequent meetings among CNMI regulators and COMNAVMARIANAS representatives are being conducted regarding Tinian training activities and necessary mitigation measures.

Based on past experiences, small unit training on Tinian has had little or no impact on civilian activities in the harbor and at the airport. Prior to small exercises, COMNAVMARIANAS notifies CNMI agencies of training activities and schedules. Section 4.2.7.3 of the FEIS reiterates that COMNAVMARIANAS will provide this notification as far in advance of a small unit exercise as practicable.

The mitigation measures identified in the EIS become the basic "ground rules" or training management measures published in training directives and exercise plans for Tinian activities. Based on past usage, small unit training on Tinian has had little or no impact on the harbor and airport. A checklist has been developed by COMNAVMARIANAS of the CNMI agencies that must be contacted in advance by small training units for approval of the training activities and schedule. The Tandem Thrust series of exercises have involved the use of the harbor and airport to transport personnel, equipment and supplies to Tinian for maneuver training in the MLA. These major exercises are announced well in advance.

Large exercises, notably the Tandem Thrust series, have involved the use of the harbor and airport to transport personnel, equipment and supplies to Tinian for maneuver training in the MLA. These major exercises have been announced to agencies well in advance. For example, planning for Tandem Thrust 99 (which took place in scheduled to take place on Tinian in late March 1999) began in June 1998, and conversations with CNMI agencies were initiated to discuss concepts and feasibility.

Your concerns are being addressed by ensuring that the Port Authority and FAA are involved in these early coordination efforts. Scheduled commercial flight and harbor ferry schedules are factors that influence military schedules. For example, long-term use of aircraft parking aprons is avoided and use of the harbor has been primarily restricted to the use of the boat ramp by LCUs and AAVs only. No large craft are planned to enter and tie up the use of a dock during an exercise.

Section 4.2.7.3 of the FEIS proposes that at least a 30-day notice coupled with minimum EMUA closure periods be practiced to allow tourist firms to make alternative plans. Considering that the Mariana Islands represent the last American soil available for training forces deployed to the Pacific and Indian Oceans, situations may arise where training is requested on short notice. These requests to use Tinian are submitted to COMNAVMARIANAS who will ensure that coordination with CNMI officials is conducted. The CPA and FAA are included on the agency checklist for any activities that may involve the harbor or West Tinian Airport.

Comments regarding Tinian International Airport

a. Comment: *Pages 2 and 3, (first 4 paragraphs)*: The EIS should include an examination of the Tinian International Airport (TIA) project and the impacts of interference by military training.

Response: We appreciate the information that you provided on time-phasing the TIA development project, and used this information during the Tandem Thrust 99 Final Planning Conference. The Navy realizes that airport and harbor development are major endeavors and will consider these activities as constraints to training whenever necessary.

b. Comment: *Page 3, paragraph 4*: The EIS should discuss the 938 acres (379 hectare) conservation area designated as mitigation for the loss of habitat resulting the TIA project.

Response: We have confirmed that the area in question is not within the EMUA, but in the MLA in an area not used for training. As noted in your letter, negotiation between the Navy and CNMI on this issue is ongoing and separate from EIS issues.

c. Comment: *Page 3, paragraph 5*: The EIS should discuss airport terminal expansion.

Response: Section 3.5.1 of the FEIS briefly describes the TIA project since the phased construction plans may constrain near-term activities in the MLA. Upon completion and the predicted increase in tourist activities on the island, additional constraints to training may emerge.

Comments on Tinian Harbor Development

a. Comment: *Page 4, items 1 and 2*: The DEIS seems to be contradictory in stating that the "condition of the harbor is outside the scope of this DEIS," and the "use of the harbor . . . provides realistic challenges for logistic support personnel." CPA is concerned that the capabilities of the harbor could adversely affect military training, and that military training could conflict with other harbor users and vessel scheduling.

Response: The statements identified are not contradictory but are clarified in Sections 3.5.1, 4.2.7.2 and 4.2.7.3 of the FEIS. Port improvements per se are not within the scope of the EIS, but the condition of the port is a constraint to the types of harbor training that could be conducted. As noted in comments above, the need to use the harbor without interfering with normal civilian activities will be taken into consideration when planning harbor use for military logistics support. COMNAVMARIANAS and CNMI agencies are engaged in discussions regarding future developments and improvements in the harbor area outside of development of the FEIS.

b. Comment: *Pages 5 through 8, Requests for Information*

Response: Many of the questions that you raise are suitable for discussion with the Navy separate from FEIS development, but in some instances, information from the FEIS may contribute some answers:

• Military Vessel Dimensions and Capacity. Landing Craft and Assault Amphibian Vehicle dimensions are found in Appendix B, Technical Information, Table B-10. Of these craft, the military plans to use the LCU and AAV only within the harbor at the boat ramp. The RHIB uses the main dock for refueling.

• Military Vessel Types. The LCU has a ramp fore and aft and has used the Tinian boat ramp in the past. The AAV is a tracked amphibious vehicle that will come ashore at the boat ramp.

• Cargo Loading and Unloading Facilities. The LCU will carry wheeled equipment that will drive off and on the craft. The AAV, unlike a bulldozer with cleated metal track, has rubber-padded tracks so that it may travel on paved surfaces without damaging roadways. The large cleared fields adjacent to the boat ramp are planned as staging areas, and cargo cleaning sites.

• Frequency of Call. The training frequencies identified by the training units are identified in Table 1-2 of the FEIS. Major exercises using the harbor have been conducted every other year. However, the Navy's Amphibious Ready Group could train on Tinian two or three times each year.

• Other Vessel Information. Other potential harbor activity beyond what was provided for EIS development could be addressed to COMNAVMARIANAS during harbor development discussions.

• Commodities to be Shipped, Loaded or Unloaded. This is a question best asked prior to each major exercise. Logistic support requirements will vary for each exercise, and, based on past experience, the majority of personnel, equipment and supplies are air-delivered using North Field as primary and West Tinian Airport as the secondary airport. A constraint to use of the harbor is minimizing impacts to San Jose daily life by keeping the majority of training activity and support to the north in the EMUA. The preferred alternative supports AAV landings at Unai Babui and LCAC landings at Unai Chulu for tactical training as well as minimizing any disruptions to the harbor and town.

• Waste and Hazardous Material. The process for collecting and transporting solid waste and hazardous material is found in FEIS Section 4.2.4.

• Cold Storage Facilities. The FEIS identifies no requirement for these facilities but does note that exercises requiring any San Jose facility support will be the subject of negotiation with Tinian officials.

• Alien Species. See Section 4.1 and Appendix E of the FEIS. These sections will be updated to include the updates to the Brown Tree Snake Interdiction and Control Plan published

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for Tandem Thrust 99. Cargo that originates in Guam to be offloaded at the harbor will be subject to the same levels of scrutiny as cargo destined for West Tinian Airport.

• Use of Tinian Harbor for Force Introduction. Use of the harbor will be limited to logistic support as identified above. Kammer Beach was used for amphibious landings and inshore training until the early 1980s. Beach reuse was proposed, evaluated, and is no longer in the preferred training alternative for amphibious training. Special Operations Teams have requested to cross this beach at night for clandestine training. The training scenario will be reviewed and approved by Tinian officials prior to its being conducted to ensure no interference with community or commercial activities.

• Historic and Pre-historic Sites. The EIS does not address the House of Taga area since no training is conducted in this area. However, any Special Operations scenarios that would involve areas other than the MLA will be reviewed by the CNMI Historic Preservation Officer. Areas adjacent to the House of Taga were provided as temporary camp sites by the municipal government during Tandem Thrust 99.

• Harbor Water Quality. The DEIS information on harbor water quality was updated by DEQ for use in the FEIS. The absence of a breakwater contributes to tidal flushing in and around the pier areas.

• Small Craft. Improvements to small craft anchorages will be another constraint to be considered by the military when planning to use the boat ramp. Improvements to the boat ramp are being discussed by COMNAVMARIANAS separate from development of the FEIS.

General Issues (Common to airport and harbor)

a. Comment: *Page 8, Item 1*: DEIS description of casinos should be updated. It is not clear that advance notice would provide adequate mitigation to avoid conflicts with tourist travel between Saipan and Tinian. Cultural and natural resource sites will be preserved and enhanced as part of the overall visitor experience. Military operations can be conducted on Tinian, but there will be a need for full coordination by military planners with civilian agencies and businesses.

Response: The description of Tinian's casinos has been updated per our discussions in October 1998. The extensive use of the new hotel by exercise participants during Tandem Thrust was also noted as a positive economic occurrence. We agree that cultural and natural resource sites must be preserved, and the Navy has invested substantial effort and funding in such preservation. One of the products developed by the Navy for the benefit of CNMI and tourism, is the "*Self-Guided Tour of Historic North Tinian*" brochure. The Tinian training evaluation heavily weighted potential impacts to cultural and natural resources resulting in land use constraints (No Training, No Wildlife Disturbance, No Cultural Resource Disturbance) that

are published to all units prior to their arrival on the island. The constraints for each of these areas are clearly stated and illustrated in the FEIS. See FEIS Figures 2-7a, b, c, and d for the areas with training limitations. In all, the Navy has voluntarily established these constraints on approximately 40 percent of the EMUA.

b. Comment: *Page 9, item 2, paragraph 1:* There is a potential for significant adverse impacts on Tinian's population if harbor conflicts arise due to unpredictable sea conditions. Can the DEIS be revised to place the discussion of all impacts and mitigations related to Tinian, in one section of the document?

Response: Navy training activity is preceded by hydrographic, surf and weather forecasts and reports which would be used to suspend or cancel training. The FEIS cannot be reformatted without major consequences under NEPA. A second DEIS was published was based on the need to reformat the EIS in compliance with comment from regulatory agencies. FEIS Table 2-5 deals with the potential impacts from all of the compared alternatives on Tinian. A new Table 2-13 in the FEIS will identify all mitigation measures for all preferred training, and although not grouped by island, identifies mitigation measures that will be specific to Tinian.

c. Comment: *Pages 9 and 10, items 2 and 3:* Note that median household income on Tinian in 1990 was lower than for Rota and Saipan. Since 1990, Rota and Saipan have realized increased income from tourism while Tinian has not; therefore, the income gap may have increased. Further, commercial tuna transshipment ended in the mid-1990s on Tinian, income from which has not been replaced by another industry. The document should be updated to reflect current economic conditions. The EIS should discuss mitigation for adverse socioeconomic impacts to Tinian, with a comprehensive understanding of present conditions and future growth of the tourism industry.

Response: Appendix H is the socioeconomic report that was completed for this document with 1995 as the approximate baseline for information. The appendix was revised to delete references to the commercial tuna activities. Because the military's proposed harbor use is not expected to significantly impact the local economy, other modifications to the socioeconomic report will not be conducted for this document.

d. Comment: *Page 10, item 4*: The Department of Defense should consider participation in funding efforts for the facilities it will be sharing with the civilian population, specifically the harbor and airport.

Response: Separate discussions regarding joint improvement projects are being conducted by COMNAVMARIANAS. Potential improvements to the harbor and airport are discussed in the FEIS, primarily how they may constrain future training or affect levels of advance coordination. In the near-term, there are economic advantages due to the port visits to CNMI by U.S. Naval vessels that have been initiated and include trips between Saipan and Tinian for sailors and Marines on liberty. The EIS notes that negotiation is necessary for

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contracted services and that construction projects would require additional locally contracted services. Larger units such as the Navy's Amphibious Ready Group are essentially self-sufficient, bringing ashore only what is required, and taking all wastes and excess supplies off island after the exercise. The smaller units may require more local contracting in order to reduce their transportation requirements.

We appreciate your interest in developing the Final EIS for training in the Mariana Islands. It has been our intent to involve the community at each step, and your input will be used in the FEIS.

Should you have any further questions, please contact Mr. Stanley Uehara at (808) 471-9338, by facsimile at (808) 474-5909, or by e-mail at UeharaSY@efdpac.navfac.navy.mil.

Sincerely,

Melvin N. Kaku

MELVIN N. KAKU
Director
Environmental Planning Division

Government of Guam
Hagåtña, Guam
96932

September 28, 1998

The Honorable John Dalton
Secretary of the Navy
Department of the Navy
The Pentagon
Washington, DC 20350

Dear Mr. Secretary:

Hafa Adai!

We are writing to express our concerns about issues that appear to be in violation of federal law and procedure which are raised by the Draft Environmental Impact Assessment (DEIS) for Military Training in the Marianas (MTP) (June 1998). Principally, at this point we seek your concurrence to extend the time frame for comments to allow a public hearing on the DEIS in Guam, the site of most of the land and citizens effected by this training plan

You should understand that we have only recently received this document, and after a cursory review we find that the effect it has on our island and our citizens is potentially monumental. It is apparent in the past that the leadership and the citizens of Guam have not paid sufficient attention to the environmental, social, economic and legal effects of military activities on our small and environmentally fragile home. Perhaps we had grown accustomed to such devastation, after having been the only American territory to be occupied violently by foreign forces during World War II and then recaptured even more violently by our own friends. Even today we live daily with the reminders of that conflict, and as a result, our island will never be the pristine paradise it was in 1941. Consequently, we must review this document even more carefully than other American communities might, and we know that you, with your unique military and political background, will be sensitive to this need.

Below we have listed just a few of the deficiencies of the DEIS we have discovered thus far:

1. The DEIS mentions, but neither addresses nor accounts for, the conflicting land uses as provided for in other federal laws (e.g. BRAC statutes, U.S. P.L. 103-339) and administrative directives which apply to areas overlaid by the MTP.

2. The DEIS fails to address socioeconomic impacts in relation to BRAC economic redevelopment statutes and the President's Five-Point Plan on economic redevelopment.

3. The Department of Defense and the Department of the Navy have made explicit commitments to Guam and to the BRAC Commission with respect to economic redevelopment of properties that are now incorporated without comment into the 1998 MTP DEIS, indicating an unofficial and economically negative change in position of the Departments (See attached chronologies for DryDock Island and Victor Wharf).

4. Changes in the 1998 MTP DEIS vis-a-vis earlier MTP DEISs indicate substantial and dramatic changes in the scope of the activities and use of areas (See attached overlays). This should, at a minimum, necessitate a thorough public hearing in Guam on the scope of the new activities and training areas, but one does not appear to be planned. If this were not a legal requirement, we believe it should be a moral requirement, given the sacrifice of land, lives and political status our citizens have endured, and continue to endure, to enhance the military posture of the United States.

5. One very important omission appears to be that the DEIS does not address the requirements imposed on federal agencies with respect to the protection of coral reefs, as provided for in the President's Executive Order of June 11, 1998 (Coral Reef Protection). It is true that the Executive Order was issued after the opening of the comment period, but given the Navy's close association with the sea, and its own experiences in Puerto Rico in the 1980s, we believe the Navy should conduct a close examination of the effects of the MTP on the coral reefs.

6. Lastly, we have a list of Federal laws with which these potential training activities must comply. Moreover, we understand that each one of them must be addressed by the Navy during the NEPA process. Unfortunately, only a handful are discussed, and they do not appear to be discussed in sufficient legal depth. Some of these include the ESA, CERCLA. We assume that each one of them will be reviewed and documented before proceeding with any implementation.

Again, given your unique background, you can understand our concern. I believe also that there is no doubting the commitment of the citizens of Guam to the defense of the United States. We have measured that sufficiently with the lives of our young men and women. We are, however, more aware each year of the fragility of our earthly home and we want more than in the past to

insure that the nature of military training is controlled sufficiently so as not to bring more permanent scars and economic deprivation to our island.

Your immediate attention to these issues is appreciated. We look forward to your extension of the comment period on the DEIS for the Marianas Training Plan as it relates to Guam until after such time as a public hearing on the expanded scope of activities and areas contained in the 1998 proposal can be held in Guam, and that there can be sufficient legal review of these dramatically increased activities.

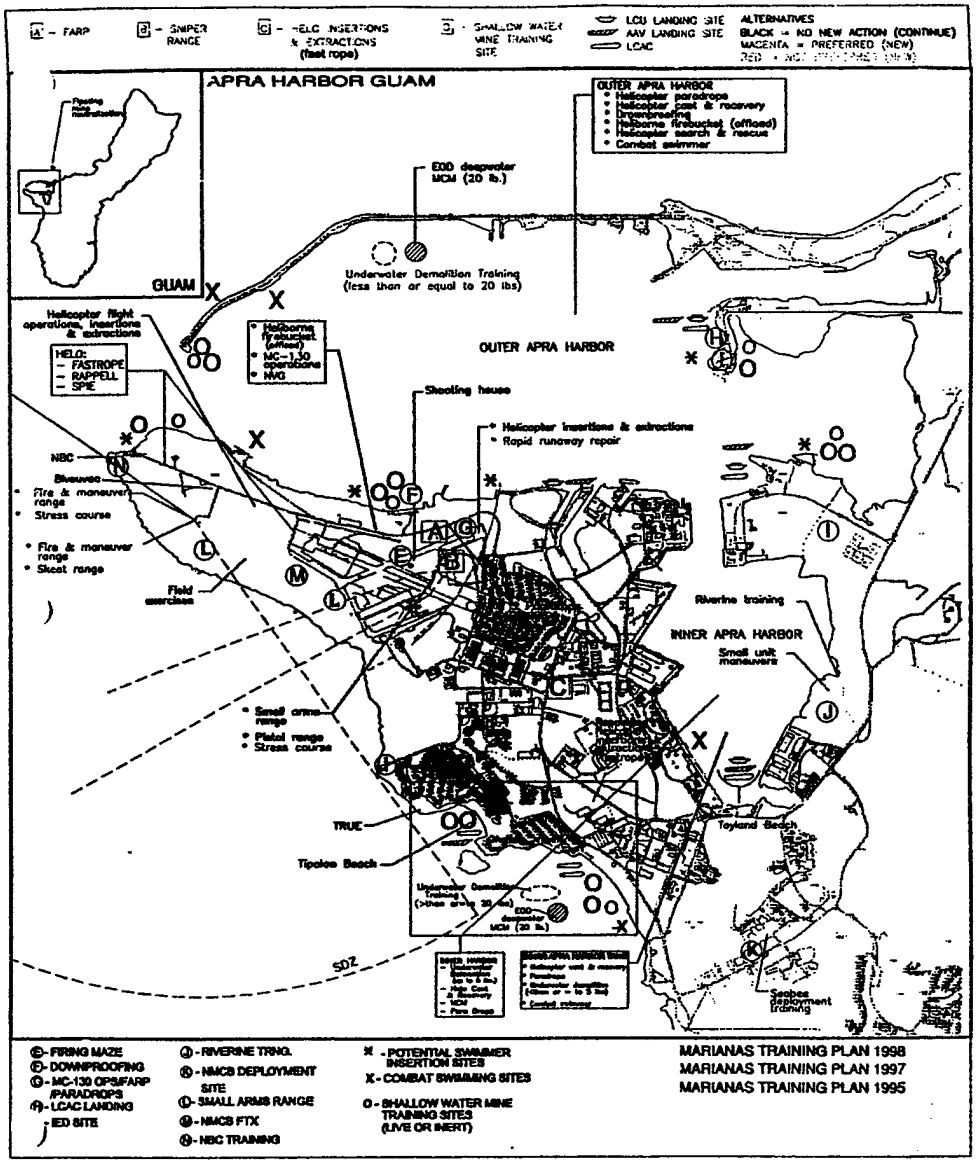
SENATOR CARLOTTA LEON GUERRERO
Speaker's Designee, 24th Guam Legislature

ROBERT A. UNDERWOOD
Member of Congress

CARL T.C. GUTIERREZ
Governor of Guam

Enclosures: As Noted

cc: Secretary of Defense William S. Cohen
Commander, PACNAVFACENGCOM



Victor Wharf Chronology

July 1, 1995	The Defense Base Closure and Realignment Commission issues its report to the President which indicates: "Close the Naval Ship Repair Facility (SRF), Guam, except transfer appropriate assets, including the piers, the floating dry dock, its typhoon basin anchorage, the decompression chamber, and the floating crane, to Naval Activities, Guam." Other recommendations included the realignment of NavActs and PWC; the disestablishment of FISC; the redirect of the NAS BRAC '93 decision; and the release of GLUP '94 properties.
October 5, 1995	Navy issues its official Notice of Availability of Real Property at US Naval Installations in the Territory of Guam. This Notice contains the same information on available properties as included in the Notice of Potential Availability. However, the transmittal letter states "It is anticipated that additional Navy property on Guam will be declared excess at a later date as a result of BRAC-95. When identified the property will be the subject of additional or supplemental notices of availability for transfer."
October 12, 1995	Captain Eloy Bermudes, the Port Authority of Guam General Manager, formally requests Navy for the lease of Victor Wharf.
October 13, 1995	GovGuam issues its "footprint" indicating the Navy areas needed for meaningful reuse.
Nov. 14, 1995	Navy responds to Capt. Bermudes' request for a lease of Victor Wharf indicating that only a license can be issued at this time.
Dec. 4, 1995	Capt. Bermudes requests Navy to issue a license for Victor Wharf.
Dec. 19, 1995	Navy requests Capt. Bermudes for more information on his request for a license for Victor Wharf.
April 2, 1996	At an Executive Staff Oversight Committee meeting, Captain Humphreys-Sprague indicated that SRF would be deeded to the LRA with conditions that it be used for maritime or maritime repair purposes and that Navy is willing to discuss conveyance of Victor and Uniform Wharves. It is also revealed that the AFDM-8 will be sent to Hawaii while the AFDM-5 will be excessed.
Apr. 19,1996	The BRAC '95 GovGuam Steering Committee releases its "Apra Harbor Development Needs Position Paper"
Aug. 9, 1996	Admiral Brewer formally conveys Navy's decision to transfer SRF and Victor and Uniform Wharves to GovGuam. He also states that a decision is not forthcoming on the final disposition of the floating dry docks and that the Navy is awaiting the Secretary of the Navy's response to the Governor's letter dated May 28, 1996, requesting a binding decision be placed on hold until such time as a reuse plan is submitted.
Sept. 18, 1996	The Coast Guard submits its request for additional space at Victor Wharf to ComNavMar. GovGuam requests information on the repair of Uniform Wharf which was damaged by the 1993 earthquake.
Oct. 18, 1996	The BRAC '95 GovGuam Steering Committee (GSC), the GLUP '94 Reuse Planning Committee and the Board of Directors of GEDA convene to consider approval of the Business Reuse Plan for Apra Harbor and the Reuse Plan for GLUP '94 Navy Properties. All three entities adopt both plans which are forwarded to the Governor for approval.
Oct. 21, 1996	GEDA formally submits an application for the lease of Victor and Uniform Wharves after completion of the application by the Transition and Port Redevelopment Working Group.
Nov. 21, 1996	Navy responds to GovGuam's request for information on Uniform Wharf repairs which indicates that "Military action to facilitate reuse and redevelopment of an installation does not contemplate the major repair of facilities deeded excess by the military for the mere purpose of assisting local economic development."
February 12, 1997	Coast Guard transmits a letter to Administrator San Agustin indicating that it has reevaluated its needs and has determined that only 50 additional feet of wharf space (vice 450 earlier requested) was needed. Obtaining title to this property was the preferred approach however, Coast Guard would be amenable to a leaseback from the LRA. Coast Guard also mentioned that "following discussions with GEDA and Navy representatives, we feel we can make alternate arrangements for both of these contingencies."
March 24, 1997	LRA receives draft Finding of Suitability to Lease (FOSL) for the SRF and for Victor Wharf from the Navy.
March 31, 1997	BRAC staff and Navy meet in Honolulu to finalize the lease agreement and FOSL for SRF. Navy agrees to remoor the AFDM-8 to its original typhoon mooring location. GovGuam and Navy also agree to move forward with the interim lease agreement for Victor Wharf.
May 9, 1997	Navy issues its Notice of Availability of Real Property on Guam, to complete the screening process started in 1995, over GovGuam's objections. Notice

included Ship Repair Facility (SRF) Guam, Apra Harbor-Victor Wharf and Vicinity Parcel, BCO/Bldg.4175 Parcel, "Jumbo Quonsets" Parcel, Nimitz Hil Fire Station Parcel, Nimitz Hill COMNAVMARIANAS Bldg. 200 Parcel and GLUP '94 Marine Drive Utility Parcel N4B.

June 9, 1997 — The federal screening process ends. The Coast Guard requests property at Apra Harbor while the Guam Army National Guard requests the ComNavMar headquarters building.

At an ESOC meeting, regarding the Bilge Oily Water Treatment System at Victor Wharf, the Navy wants to cover liability issues associated with short term use, even though the long term position is to transfer the BOWTS to GovGuam.

June 20, 1997 — Victor Wharf Marketing Brochure is completed. This brochure identifies the available assets and facilities located within the Inner Apra Harbor and in particular, Victor and Uniform Wharves.

August 22, 1997 — At a Transition & Port Redevelopment Working Group meeting, members from both the Navy and GovGuam reviewed the Navy's July 31, 1997 draft of the Victor Wharf lease. There was much discussion on what areas at Victor Wharf the Navy intended to release during the interim period. It was at this meeting that the Navy also asked that GovGuam provide funding for fencing along the Coast Guard boundary and Victor 6. This request brought about serious objections from GovGuam and concerns that the Navy was not negotiating in good faith.

November 20, 1997 — During an Executive Staff Oversight Committee Meeting, Navy had indicated that it had resolved the issue with regard to fencing Victor Wharf and is ready to sign the lease agreement pending a determination from PACDIV of its approval.

December 17, 1997 — President Clinton declares state of emergency for Guam due to damages sustained by Super Typhoon Paka on December 16, 1997. Former Naval Ship Repair Facility sustains over $2 million in damages to property and facilities. Approximately $1.5 million in damages to GLUP '94 properties and $2.4 million at Tiyan.

January 27, 1998 — BRAC Caretaker Staff submits Typhoon Paka Damage Assessment Report for Victor Wharf. Estimated restoration cost is $324,500.00.

March 18, 1998 — Legal Counsel for BRAC GovGuam Steering Committee forwards draft copy of Victor Wharf lease to Michael Kilian, PACDIV suggesting new provision be included regarding the mooring of non-Navy vessels at Victor 5 and 6. Phil Carbullido also asked that the Navy obtain all necessary signatures for the lease no later than the end of the month.

March 27, 1998 — PacDiv notifies the BRAC Administrator that only those properties identified as releasable in the Navy's GLUP Update are available for release under PacDiv. Any other property to be released (such as Victor Wharf and submerged lands) must be coordinated with ComNavMar.

April 16, 1998 — BRAC Administrator responds to PacDiv letter concerning GLUP properties and states that the release of any additional property is a BRAC action pursuant to Assistant Secretary Pirie's policy position adopted by the federal BRAC '95 Commission.

April 17, 1998 — During a courtesy visit to the BRAC GovGuam Steering Committee office, Lee Munson, Base Transition Coordinator (BTC), informed the Administrator that no decision had been made by CINCPACFLT on the leasing of Victor Wharf. According to Mr. Munson, this was due to concerns the Navy had with the LRA's Reuse Plan being inconsistent with training requirements identified in the Marianas Training Plan.

May 19, 1998 — Governor forwards letter to RADM Janczak requesting an update status on the Victor Wharf interim lease agreement, reaffirming that GovGuam's efforts to lease Victor Wharf began in 1995 and 3 years later, we still have not leased the property.

June 22, 1998 — One year after our initial comments were submitted on the Marinas Training Plan, PACDIV Environmental Planning Division sends letter indicating that in response to a number of comments and questions on the purpose and need for the proposed action and the range of alternatives considered, they have made extensive revisions and will be publishing a revised Draft Environmental Impact Statement (DEIS) in June 1998.

July 8, 1998 — At a meeting between Admiral Janczak and the BRAC Administrator, the Admiral indicated that the Navy continues to have operational use for Victor Wharf.

August 21, 1998 — A revised copy of the Navy's Draft Environmental Impact Statement for the Marianas Training Plan is delivered to the BRAC office for review. The previous draft EIS for the Marianas Training Plan published in 1997 indicated no training activities proposed for inner Apra Harbor however, the revised document identifies preferred alternative training Land Uses in and around the Waterfront Annex (Victor Wharf) such as Assault Amphibian Vehicle (AAV) Training, Inflatable Assault Craft (CRRC/RHIB)Training, Air Cushion Landing Craft (LCAC) exercises including Underwater Demolition exercises.

DRY DOCK ISLAND
CHRONOLOGY OF EVENTS

1974 The Secretary of Defense directed the Navy to initiate the transfer of excess land to the Government of Guam. In response, the Navy completed the Guam Land Use Plan 1977 which declared most of the Cabras Island and certain parcels at Dry Dock Island to be excess to DoD needs.

1981 Congress followed the Navy study by enacting Section 818(a)(1) of Public Law 96-418 (the Brooks Amendment) authorizing the Secretary of the Navy "to convey, without monetary consideration, to the Government of Guam all right, title, and interest of the United States ... approximately 927 acres of land located on Cabras Island and within the northern portion of the Apra Harbor Naval Complex, Guam ..." This public law included approximately 30 acres of both filled and submerged lands located at Dry Dock Island.

October 1985 At the time the Brooks Amendment property transfer was authorized, the Navy still required the use of Hotel Wharf for its ammunition operations which required a 7,210-foot ESQD (Explosive Safety Quantity Distance) setback, encumbering a large portion of the otherwise transferable excess lands which included parcels 2 and 3 at Dry Dock Island. Subsequently the Navy developed a two phase plan to transfer the parcels. Phase I transferred parcels outside the Hotel Wharf ESQD.

October 1989 Phase II under the Brooks Amendment property transfer process would require the conveyance of the remaining parcels when the Hotel Wharf ESQD arc is removed. The Secretary of the Navy, however, issued a temporary waiver to the Hotel Wharf ESQD arc allowing transfer of all but four remaining parcels (92 acres) through a quitclaim deed which included restrictive terms and conditions on uses based on the arc.

June 21, 1993 Following the completion of Kilo Wharf and the cessation of ammunition activities at Hotel Wharf, the Navy forwarded quitclaim deeds for the remaining 92 acres of excess lands including the 30 acres at Dry Dock Island. The deeds, however, were not signed by then Governor Ada

March 1995 The Department of Defense releases its recommendations to the Base Realignment and Closure Commission on the Naval Bases on Guam. The recommendation included the closure of the U.S. Naval Ship Repair Facility which occupied 29.3 acres at the end of Dry Dock Island (Dry Dock Point/Reserve Craft Beach).

April 1995 Seventeen acres at Dry Dock Point were considered to be potentially releasable under the Draft GLUP '94 report. The Updated GLUP '94 report states that upon further investigation, this land is now recommended for retention for Navy SEALS LCAC vehicle training operations on the west shoreline and for emergency ship repair in the area should the need arise in the future.

July 1, 1995 The Defense Base Closure and Realignment Commission issues its report to the President which indicates: "Close the Naval Ship Repair Facility (SRF), Guam, except transfer appropriate assets, including piers, the floating drydock, its typhoon basin anchorage, the decompression chamber, and the floating crane, to Naval Activities, Guam."

July 20, 1995 President provides the base closure recommendations to Congress. Navy issues its Notice of Potential Availability of Real Property at Closing or Realigning Installations on Guam. List includes U.S. Naval Ship Repair Facility, Guam, Areas as may be designated for release.

Sept 28, 1995 Congress ratifies the BRAC '95 recommendation to close, realign and disestablish bases on Guam.

October 13, 1995 GovGuam issues its "footprint" indicating the Navy areas needed for meaningful reuse. In the document, GovGuam outlines its intent to develop Dry Dock Point under a short and long-term reuse plan, which includes adding a passenger ship facility on the southern point, including one or two deep water piers and a passenger terminal. The north side of the access road would include the expansion area of a net lay-down and repair area for the fishing fleet.

November 27, 1995 The Port Authority of Guam publishes an advertisement which solicits letters of interest from the public to utilize potentially excess military properties within Apra Harbor Complex. Over forty expressions of interest for various properties around Apra Harbor have been received including one proposal from Baldyga Entertainment Group willing to invest over $70 million in the development of Dry Dock Island into a Micronesian Cultural Center, Aviary, Amphitheater, Aquarium and Cruise Terminal.

January 16, 1996 Navy issues its footprint to GovGuam indicating that there will be no deed transfers of property and minimal leasing opportunities for Navy land in Apra Harbor. This footprint results in serious concerns raised by GovGuam.

January 22, 1996 Navy rescinds its footprint and replaces it with an 8 point statement of needs. Statement No. 4 states " Ship Repair = Excess, turnover to GovGuam for Redevelopment of compatible industry = allows voyage repair access, if needed."

February 28, 1996 As a follow-up from 1993, COMNAVMAR forwards to Governor Gutierrez the same Brooks Amendment quitclaim deeds for the remaining 92 acres of excess lands for his consideration. The matter remains under review.

March 01, 1996 Governor's Office forwards copies of Brooks Amendment property quitclaim deeds to GEDA, GEPA, DLM, Office of the Attorney General, and PAG for review.

March 23, 1996 Director of Bureau of Planning and Governor's office conducted meeting with representatives from appropriate agencies to review and discuss quitclaim deeds on Brooks Amendment parcels and report findings and/or recommendations to the Governor for consideration.

Attorney General's Office submits comments and concerns to Governor's Legal Counsel regarding certain liability and/or indemnification clauses and other restrictive languages stated in the quitclaim deeds. Guam EPA also provides comments on environmental issues at the various parcels identified in the deeds.

March 26, 1996 As a result of March 23rd meeting, Administrator of GEDA forwards memo to Guam Environmental Protection Agency requesting that the agency advise the Navy to complete EBS' for all of SRF, FISC, and Dry Dock Island.

April 2, 1996 At an Executive Staff Oversight Committee Meeting, Captain Mary Humphreys-Sprague stated that Navy is willing to negotiate conveyance or joint use of property at Dry Dock Point if LCAC training could be relocated to old wives beach. She stated that she would report back to the committee members.

April 8, 1997 Letter from Chief of Staff, COMNAVMAR to BRAC '95 Project Director summarizing CINCPACFLT's primary BRAC '95 goals: (1) to minimize the infrastructure retained by Navy to that which is essential to support mission requirements; (2) to convey as much property as possible to Guam to stimulate economic growth; and (3) to ensure Navy's access to Guam port facilities to support emergent and contingency requirements.

April 19, 1996 GovGuam releases its "Apra Harbor Development Needs Position Paper" approved by the Guam Steering Committee on April 19, 1996. The document identifies Guam's vision for Apra Harbor and its requirement for facilities and land at Dry Dock Island to allow for the development of a tourist-oriented theme park complex, recreational facilities, and preservation of conservation areas.

April 22, 1996 Governor Gutierrez forwards letter to Admiral Brewer requesting that the Navy conduct Environmental Baseline Surveys (EBS) on all properties identified in the Brooks Amendment quitclaim deeds including the two parcels located at drydock island prior to transfer.

May 17, 1996 Admiral Brewer, COMNAVMAR sends letter to Governor Gutierrez in response to his request for the Navy to conduct EBSs' on the properties. He stated that all previous land transfers under the Brooks Amendment were completed without an EBS and that if GovGuam still desires the Navy to pursue an EBS, the Navy would request that GovGuam provide funding for such an undertaking. He also stated that since all of the activities adjacent to the land are under GovGuam control, it is more likely any environmental clean-up shall be the responsibility of GovGuam.

June 15, 1996 LRA receives Draft Environmental Baseline Survey for SRF Waterfront and Industrial Areas including Dry Dock Point.

August 8, 1996 Task Force meeting conducted at Lt. Governor's office to review and comment on COMNAVMAR's findings of May 17th letter and prepare response from Governor.

August 9, 1996 Letter sent to Governor Gutierrez from Admiral Brewer confirming the Navy's BRAC '95 execution plan. The letter states that the possible excess and title transfer of Drydock Island to Guam is under review. The land will be transferred if Landing Craft Air Cushion (LCAC) exercises can be effectively conducted at Dadi Beach. Delta and Echo Wharves will be retained by the Navy, as will associated lands and the pipelines necessary to refueling and fuel storage operations.

August 13, 1996 At an ESOC meeting Navy indicated that the LRA will not be able to obtain Dadi Beach for reuse due to the retention for LCAC landing exercises.

August 20, 1996 Governor Gutierrez forwards letter to Admiral Brewer requesting that the Navy observe and adhere to the CERCLA requirements along with the military's responsibilities on the environmental clean-up process for BRAC properties. In his letter, Governor Gutierrez also stated that in the spirit of cooperation, the Government of Guam has decided to provide funding for the costs of conducting the EBS'on the excess lands.

August 20, 1996 At an Executive Staff Oversight Committee meeting Navy had indicated that Dry Dock Island is included under federal legislation which transferred 927 acres of fast and submerged lands to GovGuam. Therefore, GovGuam has the option of seeking the transfer of Dry Dock Island under the Brooks Amendment or under the BRAC '95 process.

August 23, 1996 Staff report forward to Governor's management team regarding COMNAVMAR's May 17th letter suggesting that unauthorized construction

of fuel tanks are ongoing on Parcel 1 (REM), Cabras Island located across PAG Administration Bldg. Report concluded that Navy was incorrect in their findings and that PUAG and the Port Authority were constructing a Sewer Pump Station adjacent to the parcel in mention. Navy's representative were present at the site and recommended that EPA would conduct and EBS on the parcel due to some oil contaminants found during the excavation process. Project was put on hold by Navy officials.

September 12, 1996 Letter from Admiral Brewer to Governor Gutierrez responding to GovGuam's agreement to provide funding for Environmental Baseline Surveys for Brooks Amendment properties at Cabras Island and Drydock Island. The Admiral stated that funding would be available from the SRF to conduct the EBS at Dry Dock Island and that GovGuam would only be required to provide funding for the Cabras Island parcel which was not a BRAC site. It was also stated that PWC, Guam estimates the survey, reporting and coordination to cost $11,000 and would be completed within 60 days of PWC's receipt of the funds.

September 15, 1996 LRA receives Final Environmental Baseline Survey (EBS) for Ship Repair Facility Waterfront and Industrial areas (including Dry Dock Island) from the Navy. Summary states "Except for the two electric substations, the SRF Waterfront Drydock Island Area is an ECP Category 1 area because there has been no documented or observed storage, release, or disposal (including migration from adjacent areas) of hazardous substances or petroleum products."

September 30, 1996 GMP Associates completes the Business Reuse Plan for Apra Harbor.

October 1996 Final BRAC Cleanup Plan states in Section 3.4.8 Suitability of SRF Property for Transfer by Deed, "If determined to be excess by the Navy, the SRF Dry Dock Island Area can be transferred in its entirety by deed, because there is no evidence to indicate that hazardous substances or petroleum products have ever been used, stored, released, or disposed of at the site. In addition, there is no documentation indicating that contamination from adjacent areas has migrated to the site."

November 15, 1996 GMP Associates completes the Port Authority of Guam Master Plan Drydock Island Addendum which identifies the recommended reuse of the area.

December 12, 1996 Letter forwarded from General Manager, Port Authority of Guam to COMNAVMAR with enclosed check in the amount of $11,000 to PWC, Guam to conduct EBS on Parcel 1 (REM), Cabras Island.

December 20, 1996 In letter to Admiral Martin Janczak, the Governor makes a formal request for the transfer to the Government of Guam, the remaining parcels under Phase III of the Brooks Amendment Law. The Governor also requested the Fuel Piers and the end of Dry Dock Island, along with a small area for the fuel pump station across from the FISC Fuel Farm.

March 1997 Draft Environmental Baseline Survey completed for Parcel 3 (Brooks Amendment), Dry Dock Island by Navy PWC Environmental Services Department. Survey identifies area as ECP Category 2 with no significant findings.

June 2, 1997 At Executive Staff Oversight Committee (ESOC) meeting, Captain Humphreys-Sprague informs members that there is still no word from the Navy on the transfer of Dry Dock Island to GovGuam. She also stated that Navy is waiting on a final determination on the basing of a carrier group here on Guam.

June 17, 1997 Captain Mary Humphreys-Sprague informs GovGuam officials at an ESOC meeting that the Navy will not be transferring Dry Dock Island to GovGuam

July 3, 1997 Official signing of the SRF lease agreement between the Navy and GEDA as the LRA and the sublease agreement between XenoTechnix, Inc. and GEDA.

July 11, 1997 Captain Patch, CO for SRF forwards letter to Joe T. San Agustin informing BRAC office on transfer of Dry Dock Island from SRF to COMNAVMAR.

July 17, 1997 Governor forwards letter to Chief of Staff Robert Tyrer, Secretary of Defense expressing disappointment upon receiving a copy of communication between CO, SRF and PACDIV regarding the Navy's intention to retain 29.3 acres at Dry Dock Island (Reserve Craft Beach) including all facilities, after operational closure of SRF, Guam and transfer property to COMNAVMAR. In the letter the Governor also requested that the Secretary review this issue and direct the Navy to transfer Drydock Island as originally planned.

September 26, 1997 Assistant Secretary of the Navy, Robert Pirie, Jr. forwards response to Governor Gutierrez's letter of July 17, 1997 concerning Navy's retention of Dry Dock Island as well as other BRAC issues. Regarding Dry Dock Island, Secretary Pirie states that the property is still required for military activities such as support to future visits from Carrier Battle Groups and a training area for Landing Craft Air Cushion (LCAC) vessels.

November 14, 1997 Notice from Commander, Pacific Division, Naval Facilities Engineering Command on reassignment of 29.3 acres of land and three structures (Bldg. No. 6119, 6120 and 6121) located at Reserve Craft Beach (Dry Dock Point) from NAVSHIPREPFAC Guam to COMNAVMARIANAS. Area to be retained by COMNAVMARIANAS after operational closure of the former SRF Guam.

February 9, 1998 Letter from RADM Janczak to Governor Gutierrez concerning the transfer

of Dry Dock Island which states that "The United States Navy's position concerning Dry Dock Island has not changed." and "To release Dry Dock Island would adversely affect the strategic plan for Guam."

February 26, 1998 Governor Gutierrez responds to COMNAVMAR's February 9, 1998 letter regarding the Navy's retention of Dry Dock Island. Governor Gutierrez clarifies that it was the Navy's suggestion that GovGuam decide on the option it desired for the transfer of Dry Dock Island and at the time of this suggestion, the issue was not Navy retention of Dry Dock Island rather the issue was which transfer mechanism would be in the best interest of the Government of Guam. Letter also states "We do not contest the Navy's retention of the property if it is for legitimate defense purposes even though the Navy had previously indicated that the area would be transferred for local economic use. However, given the historical record, we do believe that Navy has the responsibility for truthfully explaining the reasons for retention."

August 21, 1998 A revised copy of the Navy's Draft Environmental Impact Statement for the Marianas Training Plan is delivered to the BRAC office for review. The previous draft EIS for the Marianas Training Plan published in 1997 identified proposed training exercises such as Improvised Explosive Devise (IED) and Landing Craft Air Cushioned (LCAC) training at Dry Dock Island. The revised EIS document identifies preferred alternative training land uses at the Dry Dock Island site including Assault Amphibian Vehicle (AAV) Training, Displacement Hull Landing Craft (LCU) Training, Air Cushion Landing Craft (LCAC) Training, Underwater Demolition training exercises for Navy SEALs shallow water MCM and Insert mine stripping training.

Statutes That Apply for Review and Evaluation under the Draft Environmental Impact Statements.

- American Indian Religious Freedom Act
- Archeological Resources Protection Act of 1979
- Clean Air Act
- Clean Water Act
- Coastal Barrier Resources Act
- Coastal Zone management Act
- Emergency Planning and Community Right-to-Know Act of 1986 and the Pollution Prevention Act of 1990
- Endangered Species Act
- Federal Facilities Compliance Act
- Federal Insecticide, Fungicide and Rodenticide Act
- Marine Mammal Protection Act
- National Environmental Policy Act
- National Historic Preservation Act of 1966
- Native American Graves Protection and Repatriation Act
- Noise Control Act of 1972
- Resource Conservation and Recovery Act
- Rivers and Harbors Acts
- Submerged Lands Act
- Toxic Substances Control Act
- Watershed Protection and Flood Prevention Act

DEPARTMENT OF THE NAVY
U.S. NAVAL FORCES MARIANAS SUPPORT ACTIVITY
PSC 4[illegible], BOX 153
FPO AP 96540-1000

IN REPLY REFER TO:
5860
Ser N00J/ 0331
20 Nov 98

The Honorable Carl T.C. Gutierrez
Governor of Guam
Richard J. Bordallo Governor's Complex
P.O. Box 2950
Agana, Guam 96910

Dear Governor Gutierrez:

Thank you for your letter of September 28, 1998 concerning the Marianas Training Plan (MTP), Draft Environmental Impact Statement (DEIS). As the Department of Defense sponsor of the MTP, I am writing on behalf of the Secretary of the Navy and the Commander in Chief, U.S. Pacific Command.

The purpose of the DEIS is to evaluate the environmental impacts of using Department of Defense controlled lands in the Marianas Islands as training areas. It is imperative that all relevant issues and concerns be adjudicated. Therefore, per your request we are extending the target date for the Final EIS until the Spring of 1999 to allow for proper evaluation of your concerns.

My staff is reviewing the socioeconomic assessment of the DEIS in view of your concerns. A response regarding the specific concerns will be provided to you shortly.

I am sending a similar letter to Congressman Robert A. Underwood and Senator Carlotta Leon Guerrero.

Sincerely,

J. W. GREENERT
Rear Admiral, U.S. Navy

Copy to:
DASN (Environment & Safety)
USCINCPAC (J4)
CINCPACFLT (N46)