

**FINAL
COMMONWEALTH OF THE NORTHERN MARIANA
ISLANDS JOINT MILITARY TRAINING
REQUIREMENTS
AND SITING STUDY**



**Department of the Navy
Naval Facilities Engineering Command, Pacific
258 Makalapa Drive, Suite 100
JBPHH HI 96860-3134**

January 2013, Revised March 2013

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January 2013, Revised March 2013

N62742-11-D-1801 Amd 01 Contract Task Order 02

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ABSTRACT

The purpose of the Commonwealth of the Northern Mariana Islands (CNMI) Joint Military Training (CJMT) Requirements and Siting Study (Siting Study) is to identify potential locations for meeting United States (U.S.) Pacific Command (PACOM) Service Components' known and anticipated military training deficiencies (i.e., unfilled training requirements) within the CNMI. Previous studies and assessments have been prepared by or in accordance with the Department of Defense (DoD) to analyze U.S. military training capabilities in the western Pacific. These studies identified unfilled training requirements for units deployed to or transiting through the Mariana Archipelago, specifically CNMI. This Siting Study develops and applies operational siting criteria to determine potential locations within the CNMI where the unfilled requirements could be met.

Operational siting criteria were developed based on characteristics needed in a candidate land area to support unit-level and combined-level ranges and training areas. These criteria were applied first to the three DoD-controlled lands in the CNMI before acquiring (leasing) additional lands for potential military training use. Of these three areas, only the DoD-controlled area on Tinian met operational siting criteria to support unit-level training requirements. Since only unit-level unfilled training requirements could be met on DoD-controlled land on Tinian, combined-level operational siting criteria were applied to the remaining islands in the CNMI. Inhabited islands and those islands specified by the CNMI Constitution for preservation and protection of natural resources were not considered for combined-level training. Of the remaining CNMI islands, only Pagan provided candidate land areas that met operational siting criteria to support combined-level training.

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**Commonwealth of the Northern Mariana Islands Joint Military Training
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LIST OF ACRONYMS AND ABBREVIATIONS

| | |
|-----------------|--|
| % | percent |
| AAV | Amphibious assault vehicle |
| AOR | Area of Responsibility |
| ATCAA | Air Traffic Control Assigned Airspace |
| CAS | close air support |
| CBR | counter battery radar |
| CCN | Category Code Number |
| CJMT | Commonwealth of the Northern Mariana Islands Joint Military Training |
| CNMI | Commonwealth of the Northern Mariana Islands |
| DoD | Department of Defense |
| DZ | drop zone |
| EIS | Environmental Impact Statement |
| EMUA | Exclusive Military Use Area |
| FAA | Federal Aviation Administration |
| FCC | Facility Category Code |
| FDM | Farallon de Medinilla |
| FL | Flight Level |
| ft | foot or feet |
| IBB | International Broadcasting Bureau |
| IDA | Institute for Defense Analyses |
| IDF | indirect fire |
| IER | Information Exchange Requirements |
| km | kilometers |
| km ² | square kilometer |
| LAW/HEAT | Light Anti-armor Weapon/High Explosive Anti-Tank |
| LBA | Lease Back Area |
| LCAC | Landing Craft Air Cushion |
| LZ | landing zone |
| MARFORPAC | Marine Corps Forces, Pacific |
| MCRP | Marine Corps Reference Publication |
| MCWP | Marine Corps Warfighting Publication |
| mi ² | square mile |
| MIRC | Mariana Islands Range Complex |
| MLA | Military Lease Area |
| m | meter |
| mm | millimeter |
| MOA | Military Operating Area |
| NEPA | National Environmental Policy Act |
| NM | nautical mile |
| OP | observation point |
| PACAF | U.S. Air Forces Pacific |
| PACFLT | U.S. Pacific Fleet |
| PACOM | U.S. Pacific Command |

| | |
|---------|-----------------------------|
| PCS | Permanent change of station |
| QDR | Quadrennial Defense Review |
| RTA | Range and Training Area |
| SDZ | surface danger zone |
| SUA | Special Use Airspace |
| TNA | Training Needs Assessment |
| UAS | Unmanned Aircraft System |
| UDP | Unit Deployment Program |
| UFC | Unified Facilities Criteria |
| U.S. | United States |
| USARPAC | U.S. Army Pacific |
| USGS | U.S. Geological Survey |
| yd | yard |

CHAPTER 1

Introduction

1.1 PURPOSE

The purpose of the Commonwealth of the Northern Mariana Islands (CNMI) Joint Military Training (CJMT) Requirements and Siting Study (Siting Study) is to identify potential locations for meeting United States (U.S.) Pacific Command (PACOM) Service Components' known and anticipated military training deficiencies (i.e., unfilled training requirements) within the CNMI. This Siting Study develops and applies criteria to determine potential locations within the CNMI where the unfilled training requirements could be met.

1.2 BACKGROUND

PACOM and the PACOM Service Components. PACOM is one of six geographic Unified Combatant Commands of the U.S. Armed Forces. The Commander of PACOM is the senior U.S. military authority in the Pacific Command Area of Responsibility (AOR), reports to the President of the United States through the Secretary of Defense, and is supported by four Service Component commands: U.S. Pacific Fleet (PACFLT), U.S. Pacific Air Forces (PACAF), U.S. Army Pacific (USARPAC), and U.S. Marine Forces, Pacific (MARFORPAC). These commands are headquartered in Hawaii and have forces stationed and deployed throughout the region. The PACOM AOR includes approximately one-fifth of the U.S. military's strength and extends from the west coast of the U.S. to the western border of India and from Antarctica to the North Pole. The Department of Defense (DoD) is required by law under Title 10 U.S.C. to provide trained forces that can carry out assigned missions to include military and humanitarian operations, foreign military training, and logistics. The U.S. military has several facilities in the PACOM AOR that house, serve as deployment points for, and provide critical training to permanently forward and rotationally deployed forces.

PACOM's Posture in the Pacific. In 2009, the Institute for Defense Analyses (IDA) conducted the DoD Training in the Pacific Study (IDA Study) to assess the DoD's training needs, capacities, and options to mitigate gaps and exploit training opportunities in the PACOM AOR. The IDA Study examined training capabilities at ranges used by the DoD in the PACOM AOR and concluded that current training deficiencies exist, particularly in the Western Pacific. The IDA Study examined several potential solutions and concluded that the Mariana Archipelagos' strategic location in the PACOM AOR makes it a prime location to support forces throughout the AOR, particularly those forces on the Western Pacific rim who are most reliant on access to foreign nations' training ranges and areas. The Mariana Archipelago includes both U.S. territories, Guam and CNMI. To meet Service Component identified deficiencies, the IDA Study recommended that an Environmental Impact Statement (EIS) be prepared to analyze the environmental impact of constructing new or expanding existing training ranges and support facilities within the Mariana Archipelago. DoD's 2010 Quadrennial Defense Review (QDR) reiterated the important role of forward stationed and forward-deployed U.S. presence in the Pacific due to the vast distances and low density of U.S. basing and infrastructure in the region. Consequently, the QDR stated "the U.S. should seek to augment and adapt its Pacific presence" (DoD 2010). Based on the geographical

areas identified in the IDA Study, and supported in the QDR, the Office of the Secretary of Defense directed the Commander PACOM to conduct a study and subsequent National Environmental Policy Act (NEPA, Executive Order 12114) analysis to address training deficiencies in the PACOM AOR.

PACOM Training Needs Assessment. In August 2010, the Commander PACOM appointed the Commanding General MARFORPAC as the Executive Agent to assess training deficiencies and opportunities in the PACOM AOR.

To determine the unfilled training requirements for the PACOM Service Components, MARFORPAC met with each of the Service Components (PACFLT, PACAF, USARPAC) from November to December 2011. Each service component discussed current conditions of RTAs and facilities used by U.S. forces within the PACOM AOR based on established range design criteria. To document training shortcomings of RTAs and facilities in all of the regions, a Training Needs Assessment (TNA) was prepared (AECOM 2012). To best identify and validate unfilled training requirements in the expansive PACOM AOR, four independent geographic areas representing the largest concentrations of U.S. forces and their associated training areas were identified. These four independent geographic areas, classified as “hubs” for the purpose of the study, were defined as a location with a concentration of units that meet or exceed battalion or squadron size. In addition to a concentration of units, a hub includes the associated Local Training Areas (LTAs) and Major Training Areas (MTAs) that are routinely used by the military stationed within these hub locations. An LTA is defined as a training area located in close proximity to the resident military personnel that supports frequent training for individual and small unit proficiency. In contrast, an MTA is used when combined live-fire training and maneuver training occurs and is typically separated from the LTA and the home station/base of the training unit. MTA training occurs less frequently than individual skills and small unit proficiency training in LTAs. The assessment then reviewed the existing ranges and facilities in each hub to determine the obstacles to meeting the 62 unfilled requirements. The assessment established that the greatest need and potential opportunity for increased training capacity and capability within the PACOM AOR is in the Mariana Archipelago. Based on this assessment, the Commander PACOM in May 2012, decided to initially focus on potential future RTA development in the Mariana Archipelago, specifically the CNMI. With this focus on the CNMI, the project evolved from the Pacific-wide DTP to the "CNMI Joint Military Training (CJMT)" effort.

The purpose of the CJMT effort is to establish RTAs within the CNMI to meet the PACOM Service Components’ unfilled training requirements in this part of the PACOM AOR. This effort and the RTAs are needed to enable PACOM forces to meet their Title 10 responsibilities. The RTAs would allow for assured access by U.S. forces to needed training, proper force protection, prompt contingency response, and the ability to conduct multilateral (i.e., many nations) training events without the challenges present when U.S. forces and our allies seek to conduct such training events on foreign soil.

Potential users of this series of ranges could be single-Service units or, Joint, bi-lateral (i.e., two nations), or multilateral entities participating in combined exercises. Examples span from Marine Expeditionary Unit (MEU) training on an island that has multiple ranges, to a partner-nation participating in a combined training session, to land exercises with supporting naval units operating from the surrounding sea and airspaces. The overall goal for the CJMT effort is to develop RTAs that meet PACOM Service Components’ unfilled training requirements within the CNMI.

Existing Mariana Archipelago Range and Training Areas. The U.S. military currently uses RTAs available in the Mariana Archipelago, collectively in the Mariana Islands Range Complex (MIRC). The MIRC consists of three primary components: land training areas, ocean surface and undersea areas, and Special Use Airspace (SUA), with an emphasis on sea-based training. Within the MIRC, existing limited live-fire small arms ranges are available. The MIRC includes training areas and facilities on Guam and four CNMI islands (i.e., Rota, Tinian, Saipan, and Farallon de Medinilla [FDM]). The ocean surface and undersea areas of the MIRC extends from waters south of Guam to north of the CNMI island Pagan; and from the Pacific Ocean east of the Mariana Archipelago to the middle of the Philippine Sea to the west. SUA consists of a warning area and restricted airspace over FDM as well as Air Traffic Control Assigned Airspace (ATCAA) surrounding Guam. The MIRC provides training venues, at varying levels of sufficiency noted in the TNA, for the following warfare functional areas: (1) air warfare; (2) amphibious warfare; (3) surface warfare; (4) anti-submarine warfare; (5) mine warfare; (6) strike warfare; (7) electronic combat; and (8) naval special warfare. These eight primary warfare areas encompass Joint (more than one military Service Component) and Service-level roles, missions, and tactical tasks. The MIRC provides training venues that support many, but not all training requirements of Navy, Marine Corps, Air Force, Guam Army National Guard, Guam Air National Guard, Army Reserves Marianas, U.S. Coast Guard, and other users based and deployed in the Western Pacific.

Further Range and Training Area Development in the Mariana Archipelago. The Mariana Archipelago, consisting of Guam and the CNMI, are central and critical locations for U.S. military installations in the Western Pacific. Current and planned land use for U.S. military training in the Mariana Archipelago has maximized the land on Guam available for land-based training. Existing and proposed training on Guam is discussed within the 2010 Guam and CNMI Relocation EIS; the May 2012 Technical Report; and the November 2012 Guam and CNMI Relocation SEIS scoping documents (Navy 2012b). These documents evidence that Guam training opportunities are limited to existing capability plus future individual skills training for USMC forces and there is no additional capacity to address the PACOM AOR training deficiencies. As such, land, sea, and airspace on and around Guam will be excluded from further consideration in meeting the identified unfilled training requirements (described in the TNA). The current effort will explore siting (establishment) of RTAs on land, sea, and airspace on and around islands within the CNMI (part of the Mariana Archipelago). The CNMI's importance to providing a stabilizing influence in the PACOM AOR was confirmed as recently as the May 2012 Joint Statement of the U.S.-Japan Security Consultative Committee where both nations expressed a keen desire to improve training in the CNMI (U.S.-Japan 2012).

1.3 STUDY AREA

This CJMT Siting Study effort includes the analysis of the creation of RTAs within the Mariana Archipelago, excluding Guam and inclusive of the islands of the CNMI, to meet the unfilled training requirements identified by the PACOM Service Components.

The Mariana Archipelago lies midway between Japan and Indonesia - Papua New Guinea, and three-quarters of the way from Hawaii to the Philippines as depicted in Figure 1-1. The Archipelago consists of both Guam and the CNMI. CNMI refers to the commonwealth area of the U.S. in the Western Pacific and geographically consists of 14 islands and territorial waters, immediately north of, but not including, Guam

(Figure 1-2). U.S. territorial sea areas extend outward to 12 nautical miles (NM) (22 kilometers [km]) and exclusive economic zones extend outward to 200 NM (370 km), from each island.

Characteristics of the CNMI. The 14 island chain, oriented north-south, spans nearly 400 NM (740 km), from the northernmost island of Uracus, to the southernmost island of Rota. The islands vary in size, from an area of less than 1 square mile (mi^2) (2.6 square kilometers [km^2]), to the largest island of Saipan, with a land area just over 45 mi^2 (117 km^2). The total land area of all islands is approximately 180 mi^2 (466 km^2). The 2010 Census indicated a total population over 53,000, with only Saipan, Tinian, and Rota as inhabited islands. These three islands have the only ports, harbors, and airports within the CNMI.

The southern CNMI islands of Rota, Aguijan, Tinian, Saipan, and FDM are geologically level, limestone-terraced land areas with fringing coral reefs. The northern CNMI islands of Anatahan, Sarigan, Guguan, Alamagan, Pagan, Agrihan, Asuncion, Maug, and Uracus are the exposed portions of ocean volcanoes, most with steep slopes rising directly from the ocean. Under the CNMI Constitution, the islands of Guguan, Asuncion, Maug, and Uracus are to be maintained as uninhabited places and used only for the preservation and protection of natural resources. Table 1-1 provides a synopsis of pertinent CNMI island characteristics.

Table 1-1. Commonwealth of the Northern Mariana Islands Characteristics

| <i>Island</i> | <i>Area</i> | | | <i>Population¹</i> | <i>Distance from Guam</i> | |
|---------------|-----------------------|-----------------------|--------------|-------------------------------|---------------------------|-----------|
| | <i>mi²</i> | <i>km²</i> | <i>acres</i> | | <i>NM</i> | <i>km</i> |
| Rota | 33.0 | 85.5 | 21,120 | 2,527 | 35 | 65 |
| Aguijan | 2.7 | 7.1 | 1,728 | 0 | 84 | 155 |
| Tinian | 39.2 | 101.5 | 25,087 | 3,136 | 90 | 167 |
| Saipan | 46.5 | 120.4 | 29,760 | 48,220 | 100 | 185 |
| FDM | 0.3 | 0.7 | 182 | 0 | 157 | 291 |
| Anatahan | 12.0 | 31.2 | 7,711 | 0 | 169 | 313 |
| Sarigan | 1.9 | 4.9 | 1,216 | 0 | 190 | 352 |
| Guguan | 1.5 | 3.9 | 960 | 0 | 225 | 417 |
| Alamagan | 4.3 | 11.1 | 2,752 | 0 | 243 | 450 |
| Pagan | 18.0 | 47 | 11,614 | 0 | 285 | 528 |
| Agrihan | 16.8 | 43.5 | 10,752 | 0 | 319 | 590 |
| Asuncion | 2.8 | 7.31 | 1,792 | 0 | 374 | 692 |
| Maug Islands | 0.8 | 2.1 | 517 | 0 | 394 | 729 |
| Uracus | 1.0 | 2.6 | 640 | 0 | 428 | 793 |

Note: 1. 2010 U.S. Census



Figure 1-1. Pacific Rim

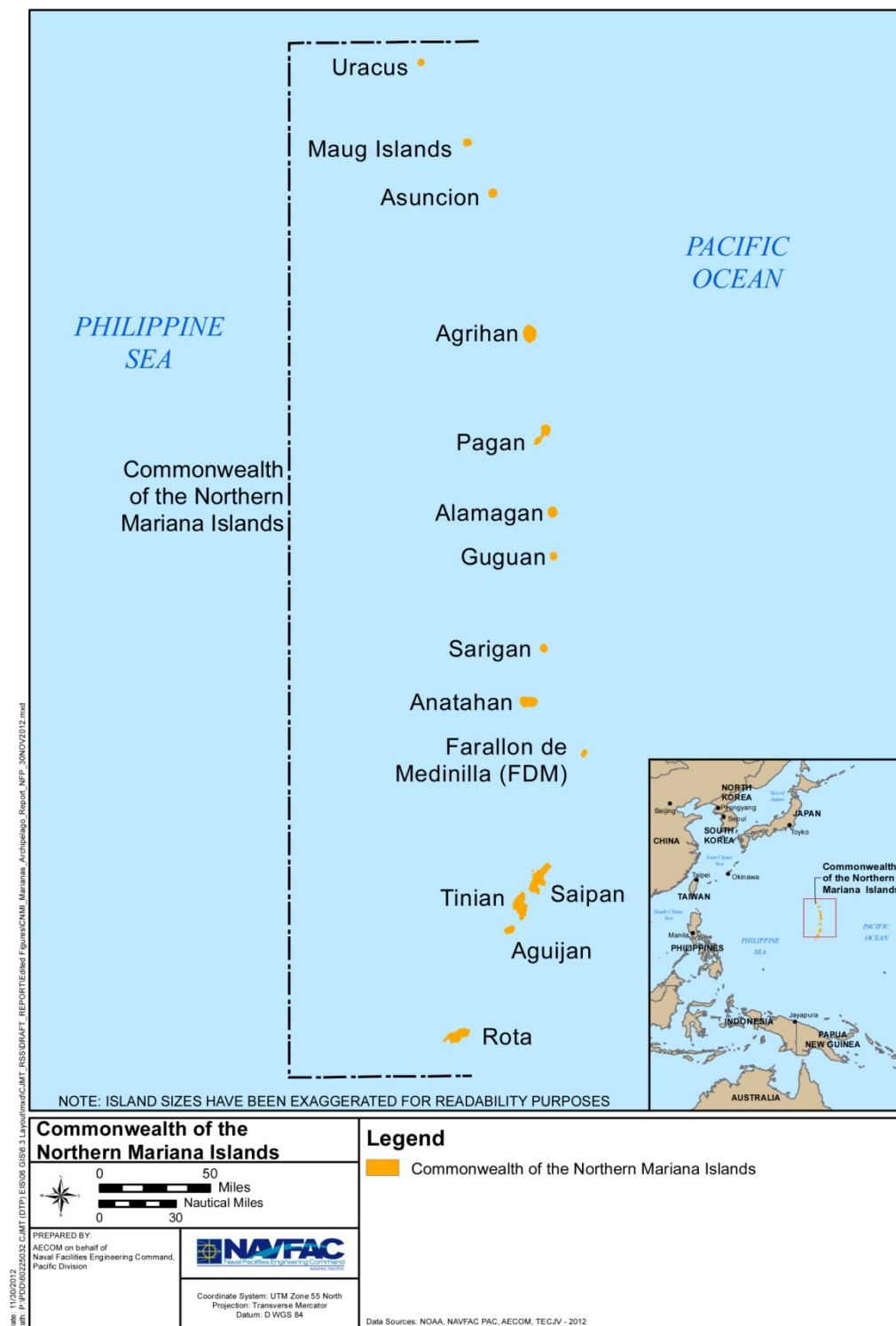


Figure 1-2. Commonwealth of the Northern Mariana Islands

1.4 COVENANT TO ESTABLISH A COMMONWEALTH OF NORTHERN MARIANA ISLANDS IN POLITICAL UNION WITH THE UNITED STATES OF AMERICA

In 1976, the U.S. Congress approved the mutually negotiated *Covenant to Establish a Commonwealth of the Northern Mariana Islands (CNMI) in Political Union with the United States of America* (referred to as the “Covenant”). The CNMI Government adopted its own constitution in 1977, and the constitutional government took office in January 1978. The Covenant defines the relationship between the CNMI and the U.S., recognizing U.S. sovereignty and applicability of U.S. federal law.

Article VIII of the Covenant specifies certain property rights, with sections that address property leases with the U.S. Government. Certain sections of the Covenant make the following areas available to the U.S., via lease, in order to carry out its defense responsibilities:

- Tinian, approximately 27.8 mi² (72 km², 17,799 acres) and the waters immediately adjacent
- Saipan, approximately 0.3 mi² (0.7 km², 177 acres) at Tanapag Harbor
- FDM, approximately 0.3 mi² (0.8 km², 206 acres) encompassing the entire island, and the waters immediately adjacent

Signed in 1983 for an initial term of fifty years, the U.S. retains the option of renewing this lease for all or part of such property for an additional term of fifty years.

Tinian. The northern two-thirds (approximately 15,353 acres, vice the original 17,799 acres due to the return of land parcels from the original lease) of Tinian is leased to the DoD and is known as the Military Lease Area (MLA). The MLA is further subdivided into two sections: the Exclusive Military Use Area (EMUA) and the Lease Back Area (LBA). The EMUA was set aside for military use and is the primary military training area on Tinian. A separate Technical Agreement contains terms relating to the leaseback of property (from the U.S., back to the CNMI), to the joint use arrangements for harbor and airport on Tinian, and to the principles which govern the social structure relations between the U.S. military and the CNMI authorities. The sublet of land back to the CNMI within the LBA is for uses compatible with military missions. These subleases have primarily been agricultural leases for cattle grazing or small farming. Currently, military activities in the LBA are normally confined to troop movements and maneuvers.

Saipan. On Saipan, DoD has access to Commonwealth Port Authority areas, including wharf space, which support various training activities.

FDM. FDM, a wholly DoD-controlled area, is currently used for live-fire naval surface fire (naval gunfire) support training and aviation ordnance delivery training.

The leased and joint use areas noted above provide RTAs and support facilities within the MIRC for current U.S. military land training in the CNMI.

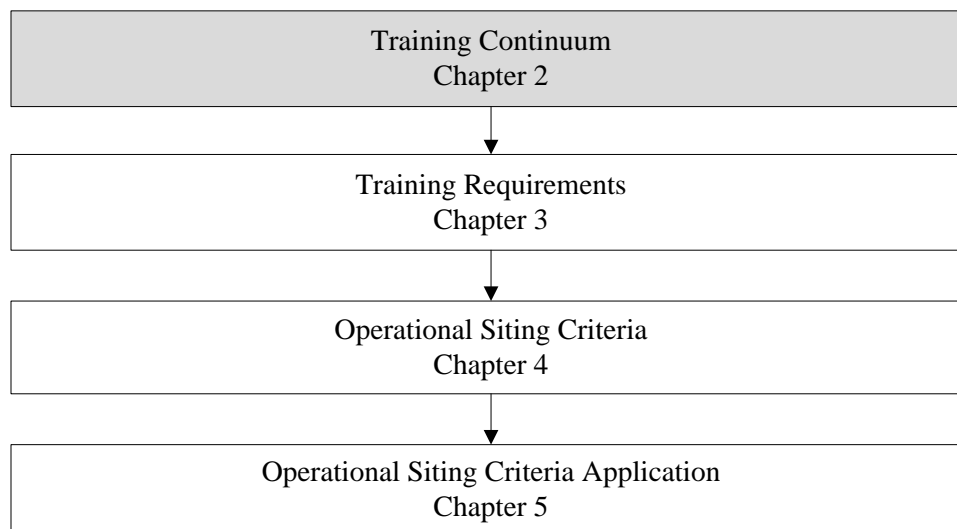
CNMI Covenant, Section 806. By this section, the U.S. Government, in recognizing and respecting the scarcity and special importance of land in the CNMI, agreed to first seek to satisfy requirements by acquiring an interest in public real property before pursuing any private real property interest. In the context of this CJMT effort, maximizing the use of DoD-controlled lands in the CNMI before acquiring (leasing) additional public or private lands for potential military training use in the CNMI is intended.

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CHAPTER 2

TRAINING CONTINUUM

The purpose of this chapter is to describe the training continuum, or sequence, as it applies to U.S. military training in the Mariana Archipelago.



2.1 TITLE 10 TRAINING MANDATE

Title 10 U.S. Code (U.S.C.) directs each of the Services (Army, Navy, Marine Corps, and the Air Force) to organize, train, and equip forces for combat. The training of individuals to perform as an integrated unit in combat lies at the heart of the Service Component training references (e.g., manuals, guidance documents). The training references are the primary tool for planning, conducting, and evaluating training and assessing training readiness and contain the individual to combined training requirements to prepare units to accomplish their combat mission. Among other facets, training for combat requires RTAs that allow for development and maintenance of military skills as described in the training references. These skills can range from individual marksmanship to the coordination of multi-unit operations employing complex weapon systems over a wide area. RTAs need to support this broad range of military training, providing realistic land, sea, and airspace that supports operational and tactical maneuvering. While simulation can offer a certain level of skill proficiency, the complexity inherent in current weapons systems and military missions requires hands-on, live-fire training.

Some military units are permanently stationed in the Mariana Archipelago, manned with individuals who rotate in and out of these units based on specific length of tour directives. Other units deploy to forward areas such as the Mariana Archipelago on a rotational basis and are combat ready when they depart their home bases. In both instances, the retention of military skills diminishes over time. RTAs must be available to refresh those skills in appropriate time intervals and offer venues for units to train with other U.S. and foreign military units in the exercise of PACOM contingency support plans.

Range and Training Areas (RTAs). Military training is accomplished in what is commonly referred to as an RTA. RTAs vary in size, terrain, and development determined by the geographical location where specific military training occurs and the type of training that is to occur. An RTA includes the physical terrain (land), sea, and/or airspaces as well as support facilities that enable the planned training. It is a designated land, airspace and/or sea space set aside, managed, and used to train military personnel. A range can include firing lines and positions, maneuver areas, firing lanes, impact areas, sea and airspace and buffer/safety zones which may include restricted access areas. RTAs typically denote a large geographic area wherein potentially non-contiguous (separate) ranges or training areas, sea and airspace are established for military training.

RTAs are a key component of military readiness. They enable individuals and units to achieve and maintain skills required for success in combat by providing controlled and safe environments for realistic combat-like training.

2.2 DOD TRAINING CONTINUUM APPROACH

The Services commonly structure training using a “building block” approach. The essential tasks for each unit (“mission-essential tasks”) are linked to an expected combat mission. Specific training events are developed in order to plan, execute, and evaluate a unit’s mission “readiness” to fulfill the unit’s mission-essential tasks. These training events are categorized as to the level of skill and complexity required to complete the training. Generally, three broad levels exist: individual, unit, and combined.

- Individual-level training focuses on the individual Soldier, Sailor, Marine, or Airman, and consists of activities such as basic weapon marksmanship, physical fitness training, and other similar events. While the focus of training is on the individual, this type of training could occur together, in small groups such as a 43-man platoon. Training at this level supports individual operation of aircraft, tank, artillery, amphibious and armored vehicle, and other crew-served equipment. Some individual-level RTAs support other levels of training (unit, combined). This Siting Study does not address RTAs whose primary purpose is to support individual-level training. Generally, individual training within the Mariana Archipelago is, addressed by the current and proposed RTAs proximate to troops' cantonment on Guam, such as the proposed live-fire training range complex, identified in the recent Notice of Intent for the Supplemental EIS for Relocation of Marines from Okinawa to Guam (Federal Register 2012).
- Unit-level training consists of focused mission-essential tasks. Training at this level supports “readiness” to meet a unit’s mission-essential tasks. These units could include an aviation squadron; an infantry company (approximately 180-person unit); tank, amphibious vehicle, light armored vehicle, engineer, and maintenance platoons; an artillery battery; and communications, transportation support, landing support, maintenance, health services, and military police detachments. Examples include an infantry company’s execution of an ambush, or a helicopter squadron’s execution of a logistical resupply mission.
- Combined-level training combines the efforts of various units into the synchronized accomplishment of a broad task, greater in complexity than that of the unit-level training. Within the context of Marine Corps organizational structure and training, this is MEU-level

training (approximately 2,200-person multi-unit task force). At a minimum, training at this Marine Expeditionary Unit (MEU)-level includes an aviation combat element (ACE) (helicopter squadron with aviation attachments); an infantry battalion (approximately 1,000-person unit); artillery battery, tank, light armored vehicle, amphibious vehicle, armored vehicle, and combat engineer platoons; and transportation support, landing support, engineer, maintenance, military police, communications, and health services detachments.

Range and Training Area Design Concept. RTAs vary in size based on the capability or activity the individual or unit is training to accomplish. Optimum RTA dimensions are provided for some, but not all RTAs in Service Component training references, such as the USMC Training and Readiness Manual. Ideally, all levels of training (individual, unit, and combined) would be situated in one location (“co-location”) with the optimum dimensions (if identified) in the Service Component training references. Locating all required RTAs in a single area would provide for the greatest efficiency for training events in terms of time and logistics. Siting all RTAs in one location reduces travel times for individuals and units and minimizes logistical support (e.g., housing, infrastructure, food, medical services, and transportation), and costs. However, because the land area required to co-locate all RTAs is very large and typically exceeds the amount of available contiguous (connected) land, sea, and airspaces needed to accommodate all levels of training, co-location of all individual, unit, and combined RTAs is impracticable, even at mainland DoD training areas, including the largest Marine Corps training area Twentynine Palms, which is approximately 940mi² or 600,000 acres.

Unit-Level RTAs. In addressing PACOM’s unfilled training requirements, the initial step is planning for development of unit-level RTAs in the CNMI. Generally, unit-level RTAs would be used more frequently than combined-level RTAs because unit-level training sustainment intervals are of a shorter time span. A training sustainment interval is the period of time, expressed in number of months, between evaluation or retraining requirements for a specific training event. Skills and capabilities acquired through the accomplishment of training events are refreshed at these pre-determined sustainment intervals in order to maintain combat readiness proficiency. Units usually reach a certain training readiness level as a whole entity, rather than as individuals; therefore, having the unit-level RTAs together and maximizing the number of unit-level requirements that could be met there would facilitate the entire unit’s ability to progress in training.

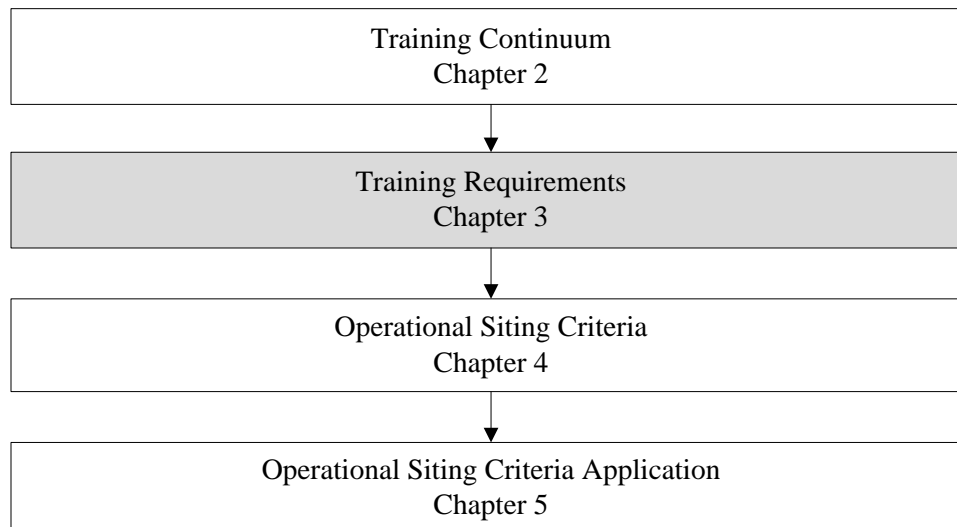
Combined-Level RTAs. Combined-level RTAs are generally larger than unit-level RTAs as combined level training involves multiple units in the training scenario. While some combined-level RTAs are similar in type to unit-level RTAs (and thus could arguably also provide some unit-level training), the volume (capability or throughput) of both unit- and combined-level training requires that separate RTAs be established for each level of training. Thus, if combined training requirements exceed the capacity of the land area proposed for “siting” (establishing) the unit-level RTAs, the next step is to find other suitable areas within the CNMI to establish RTAs to meet the unfilled combined-level training requirements. As with the unit-level, combined-level RTAs should be co-located to the maximum extent possible for the greatest training efficiency.

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CHAPTER 3

TRAINING REQUIREMENTS

The purpose of this chapter is to present the identified unfilled training requirements.



3.1 REFINEMENT OF THE INITIAL UNFILLED TRAINING REQUIREMENTS

MARFORPAC, with the other PACOM Service Components, developed an initial list of 62 unfilled training requirements in the PACOM AOR based on the training needs of the Service Components (Table 3-1). As discussed in Chapter 1, the Training Needs Assessment established that the greatest need and potential opportunity for increased training capacity and capability within the PACOM AOR resides in the Mariana Archipelago. As a result, in May 2012, PACOM and MARFORPAC (as Executive Agent) proposed RTA development in the Mariana Archipelago, specifically the CNMI.

To further develop the CNMI training proposed action, MARFORPAC met with each of the Service Components and worked collaboratively to review the previously identified Pacific-wide unfilled training requirements for those that could potentially be filled in the CNMI. This resulted in reducing the number of unfilled training requirements carried forward into this Siting Study from 62 to 42. Requirements were removed from further consideration if they were:

- Addressed in other ongoing planning actions.
- Not required in the CNMI.
- Currently existing in Guam or the CNMI.
- Removed by any Service Component.

The 62 pre-May 2012 PACOM Service Components' unfilled training requirements in the PACOM AOR are listed in the first and second columns of Table 3-1, and the third and fourth columns provide the subsequent decision history that leads to the current 42 unfilled training requirements addressed in this Siting Study.

Table 3-1.
Decision History
Pacific Command Service Components' Unfilled Training Requirements in the
Commonwealth of the Northern Mariana Islands

| <i>No.</i> | <i>Name</i> | <i>Decision History</i> | <i>"New" No.</i> |
|------------|---|--|------------------|
| 1 | Impact Area Dudded | | 1 |
| 2 | Combat Pistol Range (Automated) | | 2 |
| 3 | Pistol Known Distance Range | Range addressed in other planning actions. | |
| 4 | Rifle Known Distance Qualification Range (500 yd) | Range addressed in other planning actions. | |
| 5 | Multipurpose Automated Unknown Distance Range and Tower | MARFORPAC re-named, and added tower from original requirement #38. | 3 |
| 6 | Live Hand Grenade Range – (qualification course) | Range addressed in other planning actions. | |
| 7 | Live Hand Grenade Range – (as part of a multipurpose range) | | 4 |
| 8 | Field Artillery Indirect Fire Range | | 5 |
| 9 | Mortar Range (60 mm, 81 mm, 120 mm) | | 6 |
| 10 | Field Fire Range (Automated) | | 7 |
| 11 | Anti-Armor Tracking Range (Automated) | | 8 |
| 12 | Field Artillery Direct Fire Range | | 9 |
| 13 | Tank/Fighting Stationary Target Range | | 10 |
| 14 | Light Anti-Armor Weapon Range Live | | 11 |
| 15 | Grenade Launcher Range | | 12 |
| 16 | 40 mm (Grenade) Machine Gun Qualification Range | Range addressed in other planning actions. | |
| 17 | Battle Sight Zero Range (built to 100 yard Non Standard Small Arms Range) | | 13 |
| 18 | 100 yard Non Standard Small Arms Range – (separate from Battle Sight Zero Range) | Range addressed in other planning actions. | |
| 19 | Infantry Platoon Battle Course (Automated) | | 14 |
| 20 | Multi-Purpose Training Range/ Multi-Purpose Training Range (Automated) | | 15 |
| 21 | Modified Record of Fire Range | Range addressed in other planning actions. | |
| 22 | Tank/Fighting Vehicle Multi-Purpose Range Complex/Multi-Purpose Range Complex | | 16 |
| 23 | Multi-Purpose Machine Gun Range (Automated) | Range addressed in other planning actions. | |
| 24 | Combined Arms Training Range to support Close Air Support and Naval Gun Fire Support training (must have instrumentation capability—lease and installation) | | 17 |
| 25 | Company Combined Arms Live-Fire and Maneuver Range/Battle Area Complex | | 18 |

| <i>No.</i> | <i>Name</i> | <i>Decision History</i> | <i>"New" No.</i> |
|------------|--|--|------------------|
| 26 | Combined Arms Live-Fire Amphibious Beaches with Maneuver Area | | 19 |
| 27 | Urban Assault Course/Military Operations on Urban Terrain Urban Assault Course | | 20 |
| 28 | 360 Day/Night Live-fire Exercise Shoot House (vented-live ammo and gas [CS and CN]) | Range addressed in other planning actions. | |
| 29 | Live-fire Exercise Breach Facility (Breach House) | Range addressed in other planning actions. | |
| 30 | Force-on-Force Military Operations on Urban Terrain Training Site (simulation ammunition) Combined Arms Collective Training Facility | Requirement deleted from this effort by MARFORPAC. Training capability addressed by separate action on Guam. | |
| 31 | Home Station Training Lanes (Counter Improved Explosive Device facility) | Requirement deleted from this effort by MARFORPAC. Training capability addressed by separate action on Guam. | |
| 32 | Convoy Live-Fire Range | | 21 |
| 33 | Tracked Vehicle Driver's Course | | 22 |
| 34 | Tactical Amphibious Landing Beaches | | 23 |
| 35 | Maneuver Area, Heavy Forces | | 24 |
| 36 | Maneuver Area, Light Forces | | 25 |
| 37 | Maneuver Area, Amphibious Forces | | 26 |
| 38 | Rappelling Training Area (Sniper/Rappel Tower) | Partially combined with original #5 by MARFORPAC. | |
| 39 | Sniper/Jungle Range | Requirement deleted from this effort by MARFORPAC. Partially combined within other unfilled requirements. | |
| 40 | Infantry Immersion Trainer | Requirement deleted from this effort by MARFORPAC. Training capability being met within the PACOM AOR. | |
| 41 | Mine Warfare Range | Requirement deleted from this effort by PACFLT. Addressed by a separate action. | |
| 42 | Offensive Air Support Range (Aerial Gunnery and/or Aerial Bombing Range) | Current capability is inadequate to support full spectrum combined-level training | 27 |
| 43 | Close Air Support Range (Air-to-Ground Range) | | 28 |
| 44 | Electronic Warfare Training Range (Integrated Air Defense System/Counter Integrated Air Defense System) | | 29 |
| 45 | Rotary Wing Aviation Landing Practice | Requirement deleted from this effort by MARFORPAC. Addressed by other capabilities within the PACOM AOR. | |
| 46 | Fixed-Wing Aviation Landing Practice | Requirement deleted from this effort by PACFLT. Addressed by other capabilities within the PACOM AOR. | |
| 47a | Landing Zones | | 30 |
| 47b | Drop Zones | Requirement separated from original #47 by MARFORPAC in order to gain greater specificity. | 31 |
| 48 | Unmanned Aircraft Systems Operating Areas | | 32 |

| <i>No.</i> | <i>Name</i> | <i>Decision History</i> | <i>"New" No.</i> |
|------------|---|--|------------------|
| 49 | Anti-Air Warfare Range (in support of a combined arms complex) | | 33 |
| 50 | Low Altitude Tactics Route/Range (Fixed Wing) | Requirement deleted from this effort by MARFORPAC. Requirement cannot be met within Marianas hub due to terrain limitations. | |
| 51 | Terrain Flight Maneuver Area/Route (Rotary Wing/Tilt Rotor) | | 34 |
| 52 | Forward Arming and Refueling Point (FARP) | MARFORPAC renamed in order to capture aviation ground support requirements. | 35 |
| 53 | Live Air-to-Air Gunnery Range | Requirement deleted from this effort by MARFORPAC. Addressed by a separate action. | |
| 54 | Base Camp and associated facilities and infrastructure | | 36 |
| 55 | Range Control | | 37 |
| 56 | Data Transfer Infrastructure | | 38 |
| 57 | Aerial Target Support Facility | Requirement deleted from this effort by MARFORPAC. Addressed by other capabilities within the PACOM AOR. | |
| 58 | Ammunition Storage | | 39 |
| 59 | Staging Areas (administrative and tactical) | | 40 |
| 60 | Special Use Airspace and Warning Areas | SUA has not been categorically dropped from this effort, but is retained within each separate requirement, where it is a part of that range or area. | |
| 61 | Adequate waterfront piers, harbor, and infrastructure (existing or new construction) | | 41 |
| 62 | Adequate roads, utilities, and infrastructure for training areas, ranges, and facilities (existing or new construction) | | 42 |

Legend: mm = millimeter; yd = yard;

Source: MARFORPAC

3.2 REMAINING UNFILLED TRAINING REQUIREMENTS

The 42 unfilled training requirements that have been carried forward into this Siting Study are presented in Table 3-2. Descriptions are provided in Appendix A. A Service Component's statement of an unfilled training requirement, for that Service Component, in the CNMI is indicated by an "X" in the appropriate column on the table. An "X" within a colored cell indicates that the Service Component is primary among other Service Components in defining the unfilled training requirement. The PACOM Service Components depicted are MARFORPAC, PACAF, USARPAC, and PACFLT.

The training level primarily associated with each listed unfilled training requirement is presented in the last column of Table 3-2 with "U" corresponding to unit-level and "C" corresponding to combined-level. Some are denoted with both levels of training. An example includes #23 ("Tactical Amphibious Landing Beaches"). At the unit-level, an amphibious assault vehicle platoon requires such an area for training at the small unit-level, such as a platoon beach assault. This same type of area is also required for larger combined-level training where the amphibious assault vehicle platoon employment could only be a

portion of an overall training exercise scenario. This similar concept remains true throughout the training continuum.

Units with Unfilled Training Requirements. Appendix B lists those military units based within the Joint Region Marianas, which includes CNMI and Guam, with a high potential for training within the CNMI. Some of the units in Appendix B are dependent on their movement from Okinawa, Japan to Guam, as specified in the 26 April 2012 Joint Statement of the U.S.-Japan Security Consultative Committee. A significant portion of the ground units listed (i.e., Marine Rotational Force-Guam) are intended to be deployed to the Mariana Archipelago on a rotational basis, traveling from their home bases to Guam for 6-month-long deployment periods. These rotational units are intended to be from various military sources located throughout the world.

Table 3-2.
Pacific Command Service Components' Unfilled Training Requirements in the
Commonwealth of the Northern Mariana Islands

| <i>No.</i> | <i>Name</i> | <i>MARFORPAC</i> | <i>PACAF</i> | <i>USARPAC</i> | <i>PACFLT</i> | <i>Level¹</i> |
|------------|---|------------------|--------------|----------------|---------------|--------------------------|
| 1 | Impact Area Dudded | X | X | | X | U,C |
| 2 | Combat Pistol Range (Automated) | X | | X | X | U |
| 3 | Multipurpose Automated Unknown Distance Range | X | | | X | U |
| 4 | Live Hand Grenade Range – (as part of a multipurpose range) | X | | | | U |
| 5 | Field Artillery Indirect Fire Range | X | | | | U,C |
| 6 | Mortar Range (60 mm, 81 mm, 120 mm) | X | | | | U |
| 7 | Field Fire Range (Automated) | X | X | | | U |
| 8 | Anti-Armor Tracking Range (Automated) | X | | | | U |
| 9 | Field Artillery Direct Fire Range | X | | | | C |
| 10 | Tank/Fighting Stationary Target Range | X | | | | U |
| 11 | Light Anti-Armor Weapon Range Live | X | | | | U |
| 12 | Grenade Launcher Range | X | | X | | U |
| 13 | Battle Sight Zero Range (built to 100 yd Non Standard Small Arms Range) | X | X | | | U,C |
| 14 | Infantry Platoon Battle Course (Automated) | X | X | | | U |
| 15 | Multi-Purpose Training Range/ Multi-Purpose Training Range (Automated) | X | X | X | | U |
| 16 | Tank/Fighting Vehicle Multi-Purpose Range Complex/Multi-Purpose Range Complex | X | | | | U |
| 17 | Combined Arms Training Range to support Close Air Support and Naval Gun Fire Support training | X | X | | X | C |
| 18 | Company Combined Arms Live-Fire and Maneuver Range | X | X | | | U |
| 19 | Combined Arms Live-Fire Amphibious Beaches with Maneuver Area | X | | | X | C |
| 20 | Urban Assault Course/Military Operations on Urban Terrain Urban Assault Course | X | X | X | | U |
| 21 | Convoy Live-Fire Range | X | X | X | | U |
| 22 | Tracked Vehicle Driver's Course | X | | | | U |
| 23 | Tactical Amphibious Landing Beaches | X | | | X | U,C |
| 24 | Maneuver Area, Heavy Forces | X | | | | C |
| 25 | Maneuver Area, Light Forces | X | | | | U,C |
| 26 | Maneuver Area, Amphibious Forces | X | | | | U,C |
| 27 | Offensive Air Support Range (Aerial Gunnery and/or Aerial Bombing Range) | X | X | | X | U,C |
| 28 | Close Air Support Range (Air-to-Ground Range) | X | X | | X | U,C |
| 29 | Electronic Warfare Training Range (Integrated Air Defense System/Counter Integrated Air Defense System) | X | X | | X | U,C |
| 30 | Landing Zones | X | | | | U,C |
| 31 | Drop Zones | X | X | | | U,C |
| 32 | Unmanned Aircraft Systems Operating Areas | X | X | | X | U,C |
| 33 | Anti-Air Warfare Range (in support of a combined arms complex) | X | X | | X | U,C |
| 34 | Terrain Flight Maneuver Area/Route (Rotary Wing/Tilt Rotor) | X | | | | U,C |
| 35 | Forward Arming and Refueling point (FARP) | X | | | | U,C |
| 36 | Base Camp and associated facilities and infrastructure | X | | | | U,C |

| No. | Name | MARFORPAC | PACAF | USARPAC | PACFLT | Level ¹ |
|-----|---|-----------|-------|---------|--------|--------------------|
| 37 | Range Control | X | | | | U,C |
| 38 | Data Transfer Infrastructure | X | | | | U,C |
| 39 | Ammunition Storage | X | | X | | U,C |
| 40 | Staging Areas (administrative and tactical) | X | | | | U,C |
| 41 | Adequate waterfront piers, harbor, and infrastructure (existing or new construction) | X | | | | U,C |
| 42 | Adequate roads, utilities, and infrastructure for training areas, ranges, and facilities (existing or new construction) | X | | | | U,C |

Notes: 1. Level of training per MARFORPAC. U = Unit-level; C = Combined-level.

Legend: Colored cell (red or blue) = primary Service Component for determining range requirements; mm = millimeter; X = unfilled training requirement in the CNMI; yd = yard; No X = no unfilled training requirement in the CNMI for that Service Component

Source: MARFORPAC.

3.3 UNRESTRICTED LAND REQUIREMENTS

Service Component training references (e.g., manuals, guidance documents) provide space characteristics and/or parameters for some, but not all, RTAs and support facilities. Table 3-3 presents the unconstrained dimensions, where available, of each RTA described in this Siting Study. The total acreage for unfilled training requirements for those that have standard dimensions would be approximately 8,725 mi² (22,600 km², 5,584,600 acres) if each RTA was accounted for separately.

Siting RTAs individually and separately is neither feasible nor practical because of the extensive size requirements described above. Where feasible, multi-purposing ranges (i.e. using a single range to accomplish several training exercises), and overlapping SDZs as much as possible, is proposed to reduce overall land requirements. For example, maneuver areas and aviation ranges could be combined or grouped based on the availability of land, sea, and airspace. Some of the RTAs that primarily support aviation training could be sited over sea spaces, but would require a portion of land for training in target acquisition and weapons delivery. Some of the existing RTAs have incompatible prior usage and cannot be considered for multi-purpose use; for example, FDM naval gunfire and air to ground range is not compatible for other training that would involve troops on the ground due to inaccessibility and unexploded ordnance. Overlapping of ranges could result in better land area utilization, maximizing training throughput, and may minimize future impacts on environmental resources. The ability of a land area to support unfilled training requirements and grouped RTAs is not based strictly on size; rather, it is based on operational criteria, physical characteristics, safety and other constraints that are needed to provide for training that meets mission needs. These operational criteria are discussed in Chapter 4.

Table 3-3.
Unconstrained Dimensions of the Unfilled Training Requirements

| <i>No.</i> | <i>Name</i> | <i>RTA Dimension</i> | <i>Area (km²)</i> |
|------------|---|----------------------|------------------------------|
| 1 | Impact Area Dudded | no set standard | — |
| 2 | Combat Pistol Range (Automated) | 135 x 30 m | <1 |
| 3 | Multipurpose Automated Unknown Distance Range | 91 x 960 m | <1 |
| 4 | Live Hand Grenade Range – (as part of a multipurpose range) | no set standard | — |
| 5 | Field Artillery Indirect Fire Range | 12.5 x 25 km | 312.5 |
| 6 | Mortar Range (60 mm, 81 mm, 120 mm) | 2 x 6 km | 12 |
| 7 | Field Fire Range (Automated) | 320 x 300 m | <1 |
| 8 | Anti-Armor Tracking Range (Automated) | 1 x 5 km | 5 |
| 9 | Field Artillery Direct Fire Range | 1 x 5 km | 5 |
| 10 | Tank/Fighting Stationary Target Range | 1 x 4 km | 4 |
| 11 | Light Anti-Armor Weapon Range Live | 200 x 600 m | <1 |
| 12 | Grenade Launcher Range | 30 x 500 m | <1 |
| 13 | Battle Sight Zero Range (built to 100 yd Non Standard Small Arms Range) | 100 x 25 m | <1 |
| 14 | Infantry Platoon Battle Course (Automated) | 1.5 x 5 km | 7.5 |
| 15 | Multi-Purpose Training Range/ Multi-Purpose Training Range (Automated) | 1 x 4 km | 4 |
| 16 | Tank/Fighting Vehicle Multi-Purpose Range Complex/Multi-Purpose Range Complex | 1.5 x 5 km | 7.5 |
| 17 | Combined Arms Training Range to support Close Air Support and Naval Gun Fire Support training | 9.3 km ² | 9.3 |
| 18 | Company Combined Arms Live-Fire and Maneuver Range | 2.4 x 4 km | 9.6 |
| 19 | Combined Arms Live-Fire Amphibious Beaches with Maneuver Area | 388 km ² | 388 |
| 20 | Urban Assault Course/Military Operations on Urban Terrain Urban Assault Course | 300 x 200 m | <1 |
| 21 | Convoy Live-Fire Range | 16 km (length) | — |
| 22 | Tracked Vehicle Driver's Course | no set standard | — |
| 23 | Tactical Amphibious Landing Beaches | no set standard | — |
| 24 | Maneuver Area, Heavy Forces | 673 km ² | 673 |
| 25 | Maneuver Area, Light Forces | 673 km ² | 673 |
| 26 | Maneuver Area, Amphibious Forces | 673 km ² | 673 |
| 27 | Offensive Air Support Range (Aerial Gunnery and/or Aerial Bombing Range) | 46 x 92 km | 4232 |
| 28 | Close Air Support Range (Air-to-Ground Range) | 30 x 37 km | 1110 |
| 29 | Electronic Warfare Training Range (Integrated Air Defense System/Counter Integrated Air Defense System) | 55 x 111 km | 6105 |
| 30 | Landing Zones | no set standard | — |
| 31 | Drop Zones | no set standard | — |
| 32 | Unmanned Aircraft Systems Operating Areas | no set standard | — |
| 33 | Anti-Air Warfare Range | 74 x 111 km | 8214 |
| 34 | Terrain Flight Maneuver Area/Route (Rotary Wing/Tilt Rotor) | no set standard | — |

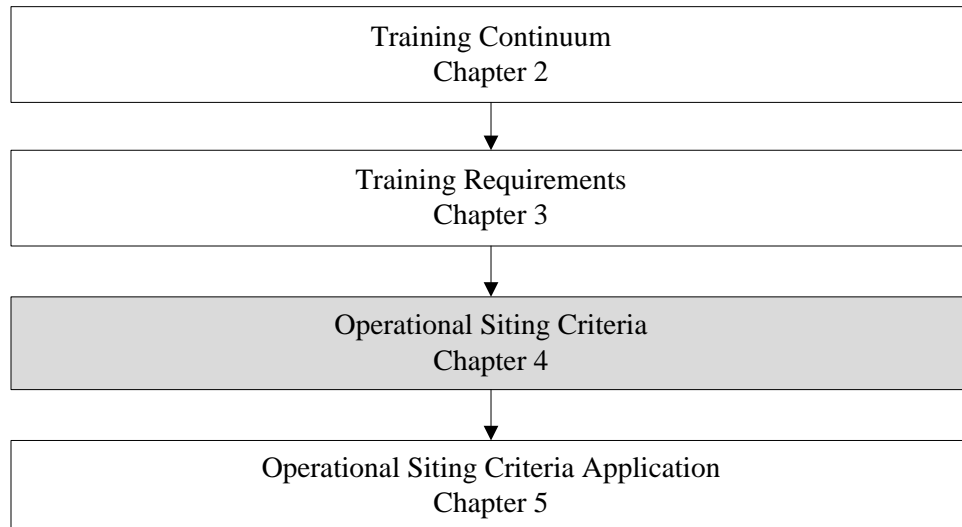
| <i>No.</i> | <i>Name</i> | <i>RTA Dimension</i> | <i>Area (km²)</i> |
|-------------------------|---|----------------------|------------------------------|
| 35 | Forward Arming and Refueling point (FARP) | no set standard | — |
| 36 | Base Camp and associated facilities and infrastructure | no set standard | — |
| 37 | Range Control | no set standard | — |
| 38 | Data Transfer Infrastructure | no set standard | — |
| 39 | Ammunition Storage | no set standard | — |
| 40 | Staging Areas (administrative and tactical) | no set standard | — |
| 41 | Adequate waterfront piers, harbor, and infrastructure (existing or new construction) | no set standard | — |
| 42 | Adequate roads, utilities, and infrastructure for training areas, ranges, and facilities (existing or new construction) | no set standard | — |
| Approximate Total Area: | | | 22,600 km ² |

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CHAPTER 4

OPERATIONAL SITING CRITERIA

The purpose of this chapter is to develop the operational siting criteria to be used in this Siting Study.



4.1 OPERATIONAL SITING CRITERIA

The land area required for an RTA (i.e., dimension of an RTA) can vary from that described in Service Component training references depending on mission, type of units supported, the “throughput” (i.e., number of personnel and/or units requiring training in a given period of time), and the capacity and capabilities of the available land area. Additionally, training references do not provide required land area sizes for all RTAs. Therefore, as a starting point in determining RTA design, the first step is to break out ranges based on the 3 general types of training: individual skills, unit, and combined. Within the Mariana Archipelago, individual skill training will be conducted proximate to troop cantonment. For Marine Forces relocating to Guam, individual skill training will be conducted on Guam. However, as noted previously, there is insufficient compatible land available for unit or combined training on Guam. Ideally, unit-level and combined-level RTAs would be co-located together at a single location, as described in Chapter 2.2. If not feasible, unit-level RTAs should be within a single location, and combined-level RTAs should be within a single location, in order to minimize the land needed for training and to maximize training efficiencies within the CNMI as described within Chapter 2.2.

In order to reduce the RTAs footprint and minimize impacts to the environment and cost, the next step in the design concept is to establish multi-purpose ranges where possible based on similar weapon systems and/or types of training (e.g., live-fire or maneuver). This concept plans for the use of various weapon systems (e.g., mortars, artillery shells) and unit types on the same range, at different times, to conduct training with their specific weapon system. Also, establishing overlapping impact areas (i.e., areas where ordnance explodes) of weapon systems and their surface danger zones (SDZs) reduces the total acreage required. An SDZ is the ground and airspace designated (to include associated safety areas) for vertical and lateral containment of projectiles, fragments, debris, and components resulting from the firing,

launching, or detonation of weapon systems to include explosives and demolitions. Not all training types can be overlapped within an RTA; for example, maneuver areas cannot be combined with weapon impact areas due to the danger of possible unexploded ordnance in areas intended for vehicle and personnel movement.

The final step involves adapting these RTAs to the physical geography of a land area. Developing an RTA design concept recognizes that even if overlapping training ranges, further modifications may be necessary to ensure the requisite training can be accomplished within the physical limitations posed by the area. Rather than rely on an acreage-based design, planners identify those key physical characteristics that must be present in a candidate land area in order to accomplish requisite training. These key characteristics are criteria that must be met by a potential land area in order for training to meet the essential training requirements set forth in the training references, and independent of any size dimensions that may or may not be provided in such references. These minimum requirements vary between unit-level and combined-level training. Accordingly, RTA planners must balance the various needs of the RTA users (“training audience”) as well as the physical characteristics and surrounding area use of the available land when establishing the actual size of an RTA or group of overlapping RTAs. The following sections provide the operational siting criteria for unit-level and combined-level RTAs. Operational siting criteria were developed based on the significant RTA characteristics of the 42 unfilled training requirements relative to their siting within the CNMI.

4.2 MINIMUM OPERATIONAL SITING CRITERIA FOR UNIT-LEVEL RANGES AND TRAINING AREAS

Unit-level training in its most basic form is the training of a group which comprises a specific type of unit and focuses on bringing diverse activities and skills together to form a cohesive operating entity. Unit-level training relies on the grouping of fixed ranges and controlled firing locations within defined ranges and RTAs to support the unit’s assigned tasks. A candidate land area must be capable of supporting various unit-level tasks simultaneously. As indicated in Chapter 2, the essence of unit training is to learn the basic combination and coordination of the multiple tasks that make up a modern battlefield. Unit training provides for learning how to execute the cooperative deployment of multiple tasks usually using controlled firing points and targets, or within defined ranges. The unit-level RTA is designed to provide a controlled environment within which multiple tasks can be executed to enhance the unit’s level of proficiency as a unit. Unit-level RTAs are primarily intended for live-fire weapons training and operations having fixed firing points and fixed target areas. Unit-level RTAs have well defined safety areas designed around distinct firing points or from defined ranges.

A candidate land area must meet all of the following operational siting criteria to support the proposed unit-level training:

- **Land Use Compatibility.** Unit-level RTAs are primarily used for live-fire weapons training and operations and while no absolute minimum acreage is defined, RTAs must have sufficient impact and safety areas. To allow for the necessary training and to minimize impacts to civilian population, prospective land areas must maintain sufficient distance from population centers. Locations must allow at least 3,280 ft (1,000 m) of buffer area between live-fire areas, to include SDZs, and any proposed RTA boundary. Safety areas are well

defined as fixed areas within the ranges. This criterion is needed to satisfy Unfilled Training Requirements 1 through 26 (see Table 3-2).

- **Topographic Compatibility.** A candidate land area must provide contiguous land area with terrain of less than 30% slope.
 - **Slope.** Slope is generally defined as the change in (vertical) elevation over a (horizontal) distance. The topography or slope of the land affects RTA construction and usability. Maneuver ranges should generally present varying degrees of terrain slopes, but should not exceed 30% slope due to training unit mobility, logistical support of training operations and range maintenance (i.e., vegetation clearance). Terrain with slope greater than 30% constrains unit mobility required for training and the logistical support of that training. In addition, direct fire ranges require an unobstructed line of sight and should generally slope downward from the firing points to the target area at no more than a 2% grade. Terrain with a slope greater than 30% is deemed impracticable for siting of land area RTAs. This slope threshold is derived from FM 34-130, *Intelligence Preparation of the Battlefield*, as topography relates to unit mobility restrictions.
 - **Contiguity.** RTAs must also be within close proximity to each other. Contiguous land area (i.e., areas that are connected to each other) is required in order to establish ranges that need uninterrupted land segments to fulfill their training purpose and for units to conduct maneuver training without impeding terrain breaks that would degrade overall training effectiveness. This is important in the siting of fire ranges and maneuver areas; these RTAs should not be segmented for continuity of training reasons.

This criterion is needed to satisfy Unfilled Training Requirements 1 through 26, 30, 31, and 35 through 42 (see Table 3-2).

- **Beachfront and Transition to Land.** A candidate land area must provide a beachfront area with nearshore submerged lands that allows for amphibious vehicle (amphibious assault vehicle, light armored vehicle, and air cushioned landing craft) training operations. The beachfront should have a slope (gradient) less than 7%, no obstacles (such as boulders) greater than 3 ft (1 m), and have a width of at least 1,640 ft. There must be an ability for amphibious vehicles to maneuver from a contiguous sea area, come ashore, and then transit to a follow-on, live-fire, training venue. For example, a beach that ends at a base of a cliff with no access to land ranges does not meet minimum criteria. A minimum transit lane width is generally 20 ft (6 m) based on vehicle width to ensure safe operations. The minimum depth of water over reefs depends on sea state but generally requires 3 ft (1 m) from keel or bottom of vehicle during sea state 1 to 3 with low to moderate sea swell based on vehicle capabilities. This criterion is required to satisfy Unfilled Training Requirements 23 and 26 (see Table 3-2).
- **Airspace.** There must be airspace contiguous to potential training land areas and available for the establishment of SUA that restricts civilian access during times of military training use. This criterion is required to satisfy Unfilled Training Requirements 1 through 29, 32, 33, 34 (see Table 3-2).

4.3 OPERATIONAL SITING CRITERIA FOR COMBINED-LEVEL RANGES AND TRAINING AREAS

Combined-level training is different from unit-level in that combined-level training combines different units or unit types to train simultaneously towards a single training objective within the parameters of the RTA. Rather than different units training towards different objectives on different RTAs as in unit-level training, combined-level training brings these units together on the same RTA to train towards the same objective or objectives. Each unit works towards accomplishing a similar task as in unit-level training, however units are also working in coordination with one another. Therefore, similar operational criteria are needed for combined-level training as unit-level training. As such, a candidate land area must be capable of supporting multiple unit-level tasks simultaneously combined into a broader task.

As indicated in Chapter 2, the essence of combined-level training is to learn to adjust and be flexible in the execution of the broader task in the multi-faceted, ever changing battlefield. Combined-level training provides for learning how to execute a battle plan in a flexible manner, and provides training in the decision making process needed to execute a broader task within the three dimensional modern battlefield. The combined-level RTA is designed to replicate, to the extent possible, the fluid nature of a battlefield with multiple land, sea, or air-based units doing a series of activities simultaneously. Combined-level RTAs are primarily intended for live-fire weapons training and operations that are not contained within traditional ranges having fixed firing points and fixed target areas. Ranges and firing points are designated within general parameters rather than exact locations relying on the discretion of the on-scene commander to assure mission accomplishment. Combined RTAs must have safety areas to account for the multiple firing points of large caliber weapons and fluid nature of the combined-level training.

- **Required Candidate Land Area Characteristics.** In general, combined-level training utilizes the skills developed during unit-level training, but also includes the coordination of several different units within less defined ranges. Combined-level training provides for multiple tasks to be conducted simultaneously by several units, and provides for a continuous flow of tasks from one objective to another. As such, combined-level RTAs must, at a minimum meet the operational siting criteria for live-fire and maneuver areas for unit-level RTAs. These criteria include land use compatibility, topographic compatibility, and beachfront with transition to land. Therefore, a candidate land area must meet unit-level operational criteria to support the proposed combined-level training.

In addition to land use compatibility, topographic compatibility, and beachfront with transition to land, a candidate land area must also meet the following operational criteria to support the proposed combined-level training:

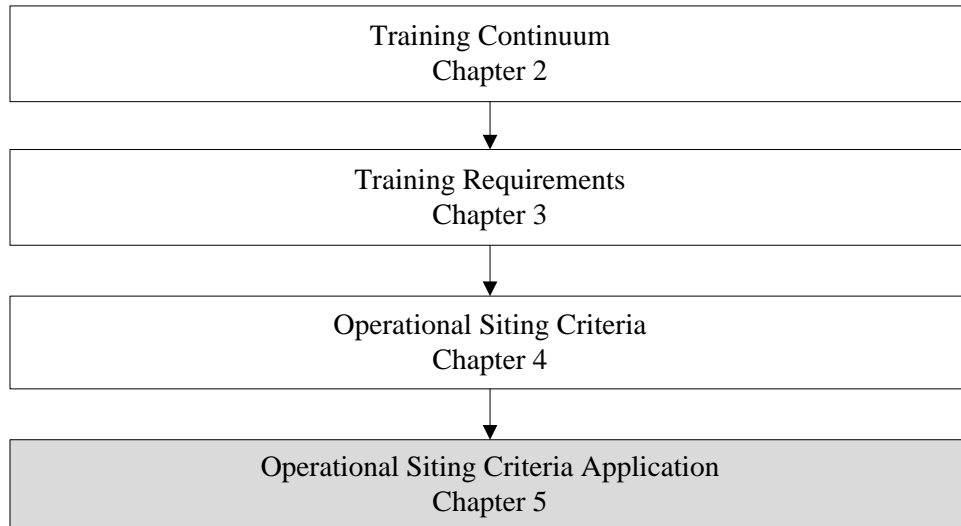
- **Mobility corridor.** A candidate land area must provide mobility corridors, which serve as pathways to move personnel, vehicles, and other mission-essential equipment through an RTA towards an objective. For combined land maneuver training, an area must provide for the flexibility of movement of multiple units toward multiple objects in support of the broader task. Nominally 1,640 ft (500 m) width is required for company-level, (approximately 180-person unit) movement over terrain with less than 30% slope, so multiple units would require an area large enough for either multiple corridors or a single area exceeding the width for a single unit. This criterion satisfies Unfilled Training Requirements 19, and 23-26 (see Table 3-2).
- **Full spectrum weapons employment.** A candidate area must provide sufficient land, sea, and airspace for simultaneous execution of combined arms, live-fire and amphibious maneuver training scenarios incorporating naval surface fire support (ship-to-shore bombardment) training, air delivered, indirect and direct fire weapons employment (artillery), and duded impact areas to accommodate all envisioned weapons envelopes for systems used by the training audience. This includes, but is not limited to, such weapons systems as long range artillery, tanks, mechanized vehicles, air-delivered ordnance such as laser and inertial guided bombs, and man-portable weapons such as mortars and machine guns. The area must be large enough to provide for separate impact areas and maneuver areas, such that live-fire and maneuver training can be safely conducted simultaneously. The nature of this type of live-fire and maneuver training increases the SDZs for these ranges. This criterion satisfies Unfilled Training Requirements 1, 5, 17, 19, and 23-33 (see Table 3-2).

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CHAPTER 5

OPERATIONAL SITING CRITERIA APPLICATION

The purpose of this chapter is to apply the operational siting criteria to determine which of the CNMI islands contain candidate land areas that meet the operational siting criteria to support RTAs to satisfy the 42 unfilled training requirements listed in Table 3-2.



By Section 806 of the CNMI Covenant, the U.S. Government, in recognizing and respecting the scarcity and special importance of land in the CNMI, agreed to first seek to satisfy requirements by acquiring an interest in public real property before pursuing any private real property interest. In the context of this CJMT effort, maximizing the use of DoD-controlled lands in the CNMI before acquiring (leasing) additional public or private lands for potential military training use in the CNMI is intended. In accordance with the Covenant and for the purposes of this Siting Study, the operational siting criteria will be applied first to DoD-controlled land areas (Chapter 5.1) to determine whether unit-level and/or combined-level training could be accomplished on DoD-controlled land; and if not, identify other public land areas that could support such training (Chapter 5.2). For the purpose of this study, private land would only be considered if there was insufficient available DoD-controlled or public lands.

5.1 DEPARTMENT OF DEFENSE-CONTROLLED LAND AREAS

Currently the DoD-controlled land in the CNMI is limited to the following: (1) approximately 177 acres at the commercial port on the island of Saipan; (2) the entire island of FDM (182 acres); and (3) approximately 15,353 acres on the island of Tinian. The operational siting criteria were applied to DoD-controlled land areas in two parts – unit-level and combined-level.

The application of unit-level and combined-level operational siting criteria for the DoD-controlled lands on Saipan, FDM, and Tinian follows. A summary is presented at the end of this section. Because a land area being considered for combined-level training requires greater mobility corridors, full spectrum weapons employment, and generally more acreage, if an area is determined to be insufficient for unit-level training, it is also presumed to be insufficient for combined-level training.

5.1.1 Saipan (DoD-controlled area)

Saipan is 100 NM (185 km) from Guam, and with a land mass of 46.5 mi² (120.4 km², 29,760 acres), is the largest island of the CNMI. Saipan has a population of over 48,000, which is predominately located along the western coastline. Saipan is the seat of the CNMI government and is a significant tourist destination with accommodations and facilities spread throughout the island, mainly along the western shoreline. Over 14 miles of Saipan's 47 mile coastline are tourist beaches. Saipan International Airport located on the southern portion of the island, has an 8,700 ft runway, accommodates wide-bodied aircraft such as the Boeing 747, and is a regional hub for many major airlines. The port of Saipan, located on the western side of the island, provides a large berthing space and can accommodate medium to deep draft vessels.

The 177 acres of CNMI land leased to the U.S. comprise the following areas within Saipan's Tanapag Harbor (Figure 5-1):

- 133 acres, leased back from the U.S. to the CNMI in 1983, for the creation of the American Memorial Park. Managed by the CNMI in cooperation with the U.S. National Park Service, it honors the American and Marianas people who perished during the World War II Marianas Campaign. Within the Park boundaries are a memorial honor court, public beaches, athletic fields, picnic sites, playgrounds, walkways, and a protected wetland and mangrove forest.
- 39 acres, leased back to the CNMI in 1998, returned by the U.S. in 1996, for use by the CNMI for harbor related activities.
- 5 acres, provided in 1987 to the U.S. Department of the Army, for the Saipan Army Reserve Center which hosts an armory, classrooms, administrative areas, maintenance facilities, and other facilities supporting headquarters activities.

Figure 5-2 depicts Saipan's land cover map; this map shows the locations of the developed urban areas which are spread throughout the island, as well as the airport, conservation areas, and other land cover components (e.g., forested areas, wetlands, agricultural lands).

Unit-Level Screen

- **Land Use Compatibility.** The DoD-leased area on Saipan is located within the commercial port region and has been developed for use as a World War II memorial and an Army Reserve Center. Use of these areas for live-fire RTA development would be impractical given the established status of the current land uses and their location within the populated area of Saipan. Its small size limits the development of contiguous unit-level RTAs. Therefore, the DoD-leased area on Saipan does not meet this screening criterion.
- **Topographic Compatibility.** The 177-acre DoD-leased area on Saipan is located within the commercial port with a slope of less than 30% (Appendix C, Figure C-1). Therefore, the DoD-leased area on Saipan does meet this screening criterion.
- **Beachfront.** Saipan's port provides minimal use as an amphibious operations training area due to its developed commercial nature. There are no other DoD-controlled areas on Saipan that would afford a follow-on training range capability. Therefore, the DoD-leased area on Saipan does not meet this screening criterion.
- **Airspace.** Airspace is available for use in supporting unit-level training.

Combined-Level Screen

Because the DoD-controlled area on Saipan does not meet unit-level criteria, this land also does not meet the combined-level operational siting criteria and will not be evaluated further.



Figure 5-1. Tanapag Harbor, Saipan

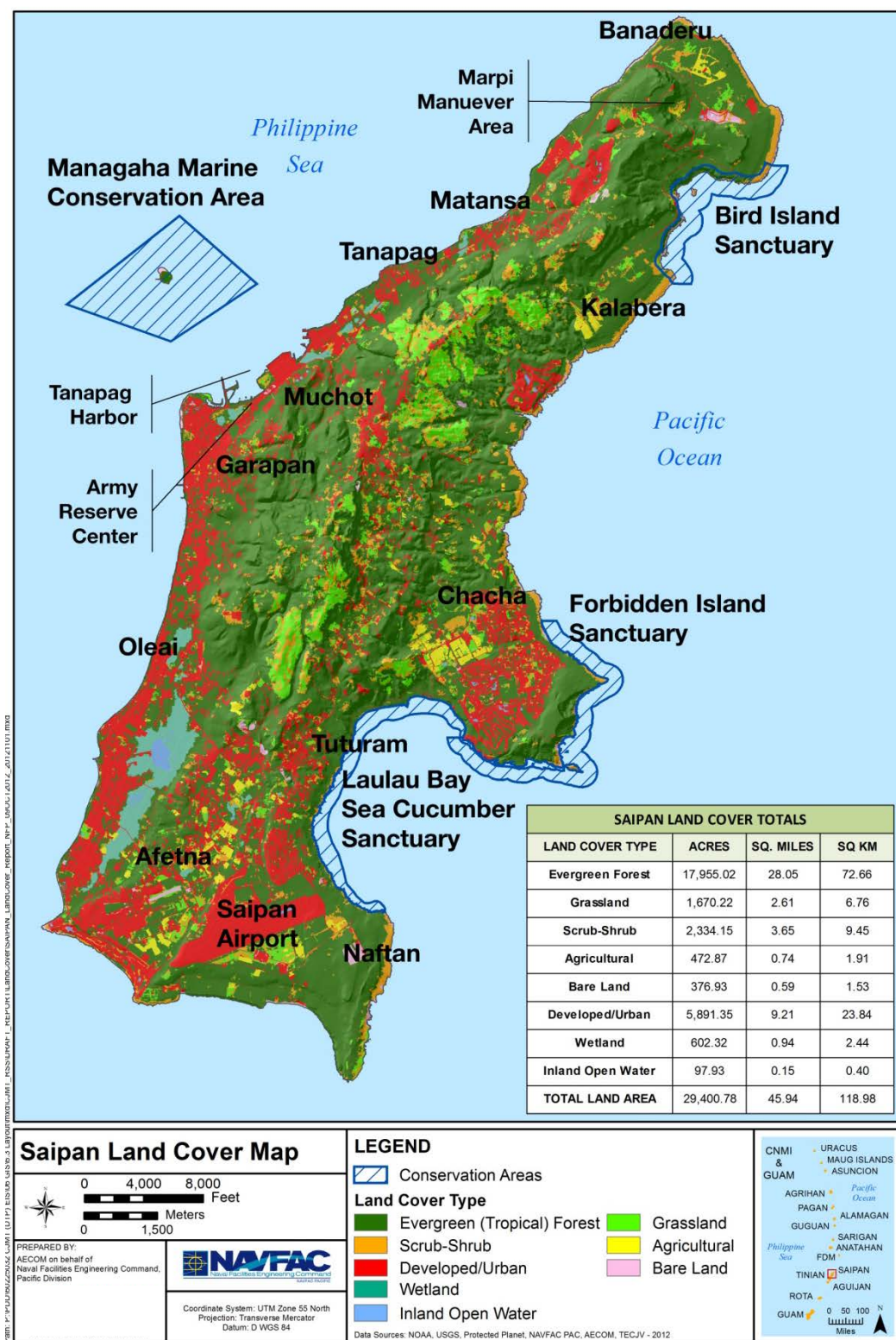


Figure 5-2. Saipan Land Cover Map

5.1.2 Farallon de Medinilla

Farallon de Medinilla is 157 NM (291 km) from Guam, with a land mass of 0.3 mi² (0.7 km², 182 acres), and is uninhabited. The island consists of a flat-topped area, surrounded by sheer cliffs, as shown in Figure 5-3, and has numerous protected bird species. FDM has under 0.2 mi² (0.5 km², 128 acres) of non-contiguous land with slope less than 30%. (Appendix C, Figure C-2). There are no urban areas, airports, or port facilities on FDM.

FDM is leased by the DoD from the CNMI Government and supports an uninstrumented live and inert bombing, shore bombardment, missile strike, and strafing range complex. FDM has been a bombing range for more than 30 years and contains unexploded ordnance.



Figure 5-3. Farallon de Medinilla

Unit-Level Screen

- **Land Use Compatibility.** FDM, a wholly DoD-controlled, unpopulated area, is currently used for live-fire naval surface fire support training and aviation ordnance delivery training. Access to FDM is restricted to specially-trained explosive ordnance personnel for safety reasons and no ground force or maneuver training is allowed. Therefore, FDM does not meet this screening criterion.
- **Topographic Compatibility.** Even if FDM were not used for live-fire naval surface fire support training and aviation ordnance delivery training, its steep cliffs (greater than 30% slope) surrounding the entire island prevents individuals and vehicles from safely transiting the steep slopes. Additionally, FDM is currently used as the only land target area in the Mariana Archipelago for aviation units on deployment to the AOR, and as such, re-purposing FDM to allow for any type of ground training because of unexploded ordnance is impracticable and unreasonable. Therefore, FDM does not meet this screening criterion.
- **Beachfront.** With surrounding cliffs, FDM has no beachfront areas for amphibious operations training. Therefore, FDM does not meet this screening criterion.
- **Airspace.** Airspace is available for use in supporting unit-level training.

Combined-Level Screen

Because the DoD-controlled area, FDM does not meet unit-level criteria, this land also does not meet the combined-level operational siting criteria and will not be evaluated further.

5.1.3 Tinian (DoD-controlled area)

Tinian is 90 NM (167 km) from Guam, with a land mass of 39.2 mi² (101.5 km², 25,087 acres) and a population over 3,000 centered within non-DoD controlled land. As depicted in Appendix C (Figure C-3), the island consists of limestone terraces that are relatively flat and surrounded by steep cliffs, which make up more than half of Tinian's coastline. Remnants of native limestone forest exist along the cliff lines and escarpments around the southeast side of the island and in a corridor on the central escarpment. Tinian has

over 37 mi² (98 km², 23,680 acres) of non-contiguous land with slope less than 30%, which equates to nearly 97% of its total land area. Small populations of protected bird species exist on Tinian. Recently renovated, the Tinian International Airport has an 8,600 ft runway and is located in the center of Tinian. Tinian harbor has three piers, only one of which is usable, and a small boat ramp. Both Tinian's airport and harbor are operated by the Commonwealth Ports Authority. Figure 5-6 depicts Tinian's urban areas, airport, conservation areas, and other land cover attributes.

The northern two-thirds of the island is leased to the DoD and is known as the MLA. As part of the Covenant described in Section 1.3, the MLA is leased to the DoD for military training. Within the MLA is an International Broadcast Bureau (IBB) site, a small wetland known as Lake Hagoi, a National Historic Landmark known as North Field, which includes World War II-era airfield and landing beaches, a current Munitions Response Program site, and an FAA mitigation/conservation area.

The MLA is further subdivided into two sections: the Exclusive Military Use Area (EMUA) and the Lease Back Area (LBA).

- The EMUA was set aside for military use and is the primary military training area on Tinian. Civilian activity, which includes hunting, fishing, plant collection, recreation, and tourism, is permitted in the EMUA except during military training exercises.
- The LBA is a sublet back to CNMI Department of Lands and Natural Resources for uses compatible with military missions. The sublease has primarily been used by CNMI to develop agricultural businesses in the form of small cattle grazing or small farming operations. Currently, military activities in the LBA are normally confined to troop movements and maneuvers toward the north and the EMUA. The lease back can be terminated with one year's advance notice.

The EMUA has two DoD-controlled sandy beaches, Unai Chulu and Unai Dankulo and one non-DoD-controlled joint use beach, Unai Masalog. Figure 5-4 depicts Tinian's Unai Chulu Beach, and Figure 5-5 depicts Tinian's Unai Dankulo Beach.

Unit-Level Screen

- **Land Use Compatibility.** The DoD-controlled area of Tinian is largely unoccupied except for limited agricultural uses within the LBA and therefore provides a compatible land use for RTAs. Therefore, the DoD-controlled land on Tinian meets this screening criterion.
- **Topographic Compatibility.** As depicted in Appendix C (Figure C-4), Tinian's DoD-controlled area is relatively flat with some topographic features such as a limestone ridge and a wetland area, and represents approximately 15,353 acres of contiguous land area. Therefore, the DoD-controlled land on Tinian meets this screening criterion.



Figure 5-4. Unai Chulu

- **Beachfront.** Four beachfront areas are currently identified as training venues within the MIRC. These sites provide the necessary terrain attributes for amphibious vehicle training operations (slope and obstacle clearance) with exit lanes allowing for movement inland. The widest of the three beaches is 660 ft (200 m), nearly half the ideal beachfront width of 1,640 to 3,280 ft (500 to 1,000 m). Although not as wide as desired, these beaches present viable areas to conduct amphibious training operations on Tinian, albeit at a lesser beachfront width. Unai Chulu and Unai Dankulo (Figure 5-4 and Figure 5-5) in the EMUA are capable of supporting Landing Craft Air Cushioned (LCAC) training at high tides. Only Unai Chulu has been used for LCAC training. Unai Babui is a rocky beach capable of supporting narrow single-lane AAV landings. Unai Masalog supports small boat raider craft landings. Therefore, the DoD-controlled land on Tinian meets this screening criterion.
- **Airspace.** Airspace is available for use in supporting unit-level training.

Combined-Level Screen

- **Required Candidate Land Area Characteristics.** Tinian met all "unit-level" operational siting criteria, noting the beachfront width caveat.
- **Mobility Corridors.** Tinian's terrain is relatively flat and undeveloped within the MLA and contains sufficient acreage to offer suitable mobility corridors in the DoD-controlled area. Therefore, the DoD-controlled land on Tinian does meet this screening criterion.



Figure 5-5. Unai Dankulo

- **Full Spectrum Weapons Employment.** Tinian cannot support an impact area for naval gunfire support training due to the proximity of population on the island and commercial and sport fishing conducted in the sea areas surrounding Tinian. However, with this exception, it otherwise allows for weapons employment and thus could meet this screening criterion.

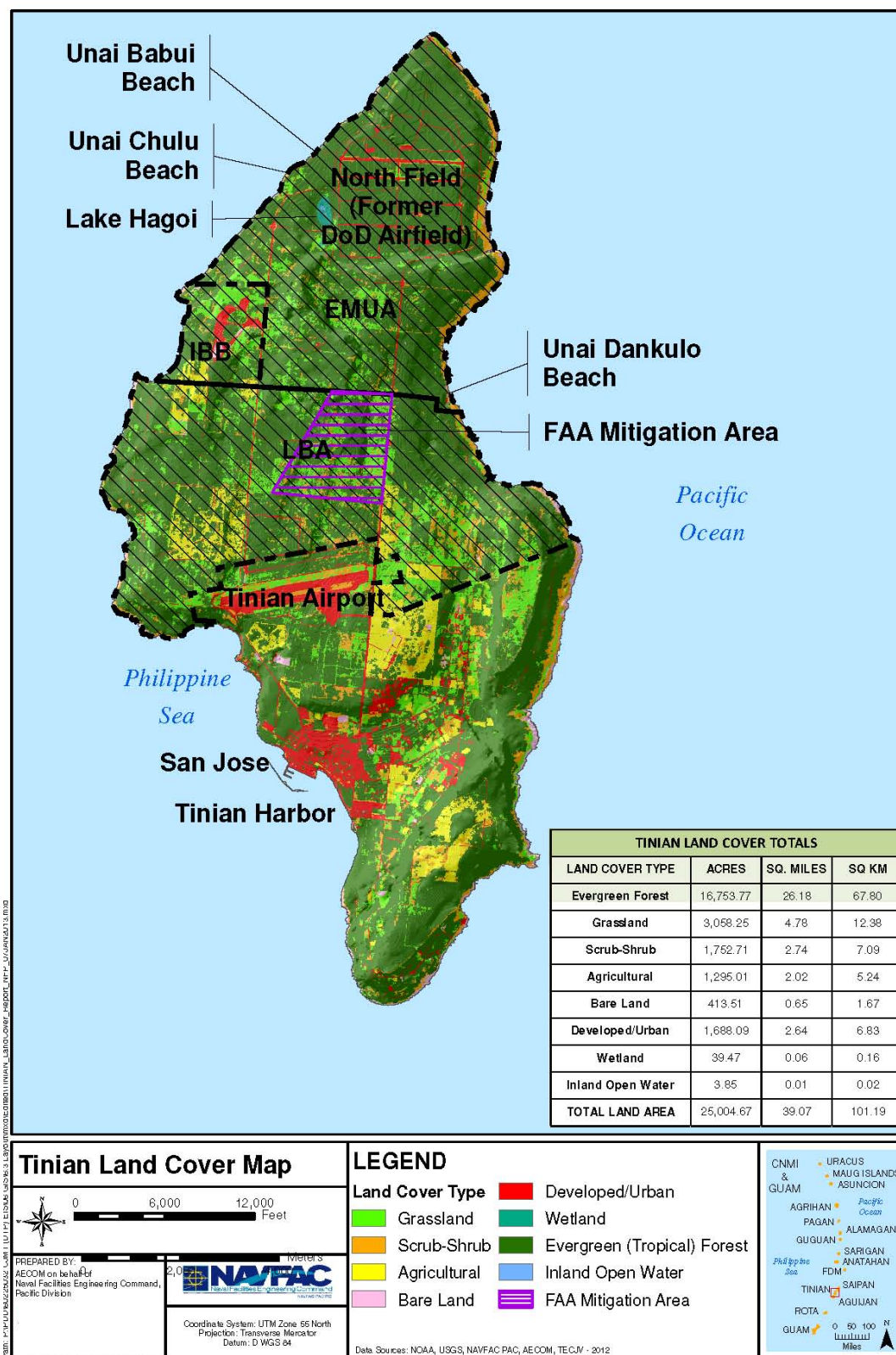


Figure 5-6. Tinian Land Cover Map

5.1.4 Summary of DoD-Controlled Area Screening

Table 5-1 and Table 5-2 summarize the application of unit-level and combined-level operational siting criteria, respectively, to the DoD-controlled land areas of Saipan, FDM, and Tinian. Of the three, only the DoD-controlled land on Tinian meets the unit-level operational siting criteria. Saipan and FDM do not provide the necessary attributes for consideration as potential unit-level or combined-level RTAs for planning purposes.

Table 5-1. Unit-Level Screen, DoD-Controlled Areas

| | <i>Saipan (DoD-controlled area)</i> | <i>FDM</i> | <i>Tinian (DoD-controlled area)</i> |
|---------------------------|-------------------------------------|------------|-------------------------------------|
| Land Use Compatibility | No | No | Yes |
| Topographic Compatibility | Yes | No | Yes |
| Beachfront | No | No | Yes |
| Airspace | Yes | Yes | Yes |

Table 5-2. Combined-Level Screen, DoD-Controlled Areas

| | <i>Saipan (DoD-controlled area)</i> | <i>FDM</i> | <i>Tinian (DoD-controlled area)</i> |
|--|-------------------------------------|------------|-------------------------------------|
| Required Candidate Land Area Characteristics | No | No | Yes |
| Mobility Corridors | No | No | Yes |
| Full Spectrum Weapons Employment | No | No | No |

5.1.5 Potential Laydown on Tinian

Based on the operational criteria screening, the report presents a possible RTA grouping suitable for unit-level RTAs on Tinian's DoD-controlled land area. Overlapping the unit-level RTAs to the maximum extent possible, the MLA on Tinian could support all of the unit-level RTA development. While the available land area does not meet the published Service range dimensions, the indirect fire range, maneuver areas, and CAS range requirements can be satisfied within the existing acreage. Figure 5-7 provides a notional laydown of unit-level RTAs on the DoD-controlled area of Tinian to confirm that unit-level RTA development on Tinian is feasible. This laydown is notional and only provided to demonstrate that the physical characteristics of the MLA on Tinian could potentially support unit-level training. The laydown overlaps and includes use of the area currently occupied by the IBB. As noted previously, use of Tinian for unit-level training would preclude its use for combined-level training.

Indirect Fire points (IDF) indicate approximate firing locations for such weapons as mortars and howitzers. Counter Battery Radar (CBR) equipment and operations are also generally located near these positions. IDF groups are depicted to show various firing point options. Observation Posts (OP) provide for weapon impact spotting, both manned and remote. A duded impact area provides the target location for those high explosive munitions that may produce duds. Mortars, artillery, and close air support are intended to use this area. A Light Anti-Armor Weapon (LAW)/High Explosive Anti-Tank (HEAT) Range would also use the duded-impact area. A base camp, depicted near the Tinian Airport, would support the training audience during their training period on Tinian. A Forward Arming and Refueling Point (FARP), landing zone (LZ), and drop zone (DZ) are depicted on North Field, indicating where rotary-wing ground operations would occur.

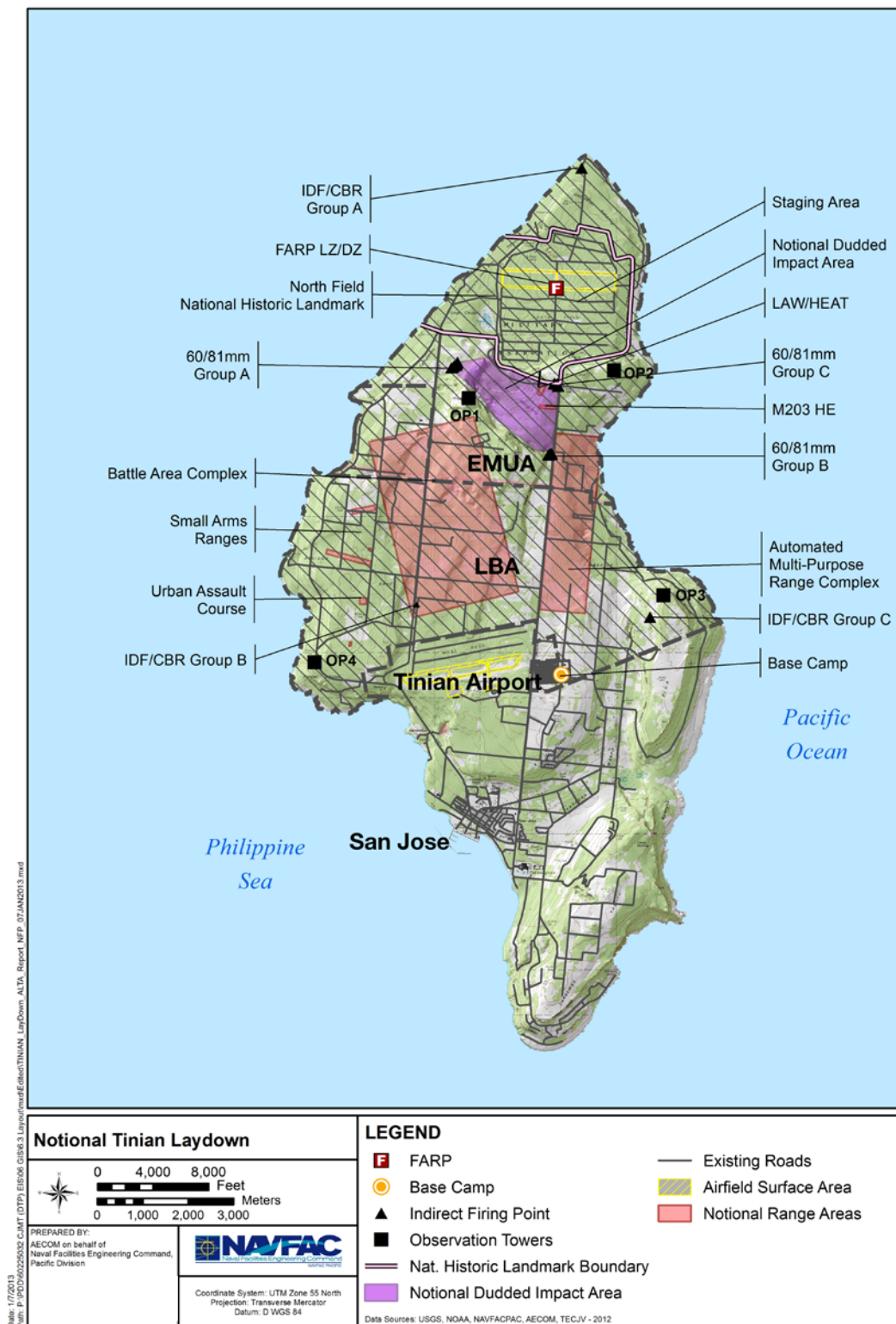


Figure 5-7. Notional Tinian Laydown

5.2 NON-DEPARTMENT OF DEFENSE-CONTROLLED LANDS

While unit-level unfilled training requirements can potentially be met on DoD-controlled land on Tinian, both unit- and combined-level operational siting criteria will be applied to the remaining islands of the CNMI to identify candidate land areas that could potentially support combined-level RTAs.

- **Inhabited Islands.** The islands of Rota and Saipan were considered and dismissed for RTA siting because there is insufficient public lands compatible with establishment of live-fire RTAs [with full spectrum weapons employment such as live naval gunfire training (i.e., the islands support scattered but substantial civilian populations)].
- **Constitutionally-Protected Islands.** The islands of Guguan, Asuncion, Maug, and Uracus were considered and dismissed because they are protected from development pursuant to Article XIV of the CNMI Constitution, mandating these islands be maintained as uninhabited and used only for the preservation and protection of natural resources, including but not limited to bird, wildlife, and plant species.

Remaining CNMI Land Areas Available for Combined-Level Screening. Aguijan, Anatahan, Sarigan, Alamagan, Pagan, and Agrihan were screened for combined-level operational siting criteria.

5.2.1 Aguijan

Aguijan is 84 NM (155 km) from Guam, with a land mass of 2.7 mi² (7.1 km², 1,728 acres) and is uninhabited. Also known as Goat Island due to the large number of feral goats present, it is located 4.3 NM (8 km) south of Tinian. As depicted in Figure 5-8 the coastline is composed of sheer steep terraces or cliffs, limiting access. Aguijan has 1.5 mi² (3.9 km², 960 acres) of non-contiguous land with slope less than 30% (Appendix C, Figure C-5). There are no urban areas, airport or port facilities on Aguijan.



Figure 5-8. Aguijan

- **Required Candidate Land Area Characteristics.** This land area has no beachfront area to support amphibious operations training. Its entire coastline is composed of sheer steep terraces or cliffs. In addition, it has a limited land area with slope of less than 30%. Since Aguijan does not meet the minimum land characteristic criteria, it therefore does not meet combined-level training criterion.
- **Mobility Corridors.** With only 1.5 mi² (3.9 km², 960 acres) of non-contiguous land with slope less than 30%, Aguijan provides an inadequate land area to support maneuver training and therefore, Aguijan does not meet the mobility corridors criterion.
- **Full Spectrum Weapons Employment.** As an uninhabited land area, Aguijan could support full spectrum weapons employment. However, its proximity to Tinian could preclude some aspects of full weapon delivery because of lack of sea and airspace between the two islands for simultaneous execution of combined arms, naval surface fire support (ship-to-shore bombardment) training, and air delivered, indirect and direct fire weapons employment (artillery). Additionally, the lack of maneuver space on land precludes Aguijan from meeting the full spectrum weapons employment criterion.

5.2.2 Anatahan

Anatahan is 169 NM (313 km) from Guam, with a land mass of 12 mi² (31.2 km², 7,711 acres). Formerly inhabited, it now has no population due to the present danger of volcanic eruptions as it hosts one of the most active volcanoes in the CNMI (U.S. Fish and Wildlife Service 1999). The island was formerly designated as an offsite mitigation/conservation location for DoD activities on FDM until an eruption in April 2005 disrupted natural resource recovery plans being conducted in the MIRC. The island has a mountainous terrain composed of two coalescing volcanoes with steeply sloping flanks (Figure 5-9). Anatahan has 2.7 mi² (7.0 km², 1,727 acres) of non-contiguous land with slope less than 30% (Appendix C, Figure C-6). A large percentage of that land resides within the volcano's cone. Figure 5-10 depicts a portion of Anatahan's rugged shoreline. There are no urban areas, airports, or port facilities on Anatahan.



Figure 5-9. Anatahan Shoreline



Figure 5-10. Anatahan

- **Required Candidate Land Area Characteristics.** This land area has no beachfront area capable of supporting amphibious operations training. In addition, the island has a limited land area with slope of 30% or less. Since Anatahan does not meet the minimum land characteristic criteria, it therefore does not meet combined-level training criterion.
- **Mobility Corridors.** Of the 2.7 mi² (7.0 km², 1,727 acres) of non-contiguous land with slope less than 30% present on Anatahan, most of that land resides within the island's volcanic cone. Accessing this area is unfeasible due to the terrain. The island's terrain configuration does not provide suitable maneuver space for training, and therefore, Anatahan does not meet the mobility corridors criterion.
- **Full Spectrum Weapons Employment.** As an uninhabited area, this island could support naval gunfire training and aviation ordnance delivery training. However, as noted above, maneuver is severely restricted on Anatahan, precluding it from meeting the full spectrum weapons employment criterion.

5.2.3 Sarigan

Sarigan is 190 NM (352 km) from Guam, with a land mass of 1.9 mi² (4.9 km², 1,216 acres), and is uninhabited. Sarigan emerges abruptly from the ocean with perpendicular cliffs surrounding the island. The island was formerly designated as an offsite mitigation/conservation location for DoD activities on FDM (U.S. Fish and Wildlife Service 1999). The endangered Micronesian megapode (bird) population is very large on Sarigan with between 1,200-3,200 birds on the island. As part of a mitigation package for the use of FDM, the U.S. Navy funded the eradication of all feral animals and subsequent follow up recovery monitoring. The habitat and ecosystem on Sarigan has recovered and there is now dense vegetation and the large, endangered Micronesian megapode population.



Figure 5-11. Sarigan

There are no urban areas, airports, or port facilities on Sarigan.

- **Required Candidate Land Area Characteristics.** Sarigan emerges abruptly from the ocean with perpendicular cliffs surrounding the island, providing no beachfront support for amphibious operations training. The island has less than 0.4 mi² (1.0 km², 256 acres) of non-contiguous land with slope less than 30% (Figure 5-11 and Appendix C, Figure C-7). Since Sarigan does not meet the minimum land characteristic criteria, it therefore does not meet combined-level training criterion.
- **Mobility Corridors.** As noted above, Sarigan has less than 0.4 mi² (1.0 km², 256 acres) of non-contiguous land with slope less than 30%. The island's volcanic terrain profile does not provide suitable maneuver space for training, and therefore, Sarigan does not meet mobility corridors criterion.
- **Full Spectrum Weapons Employment.** As an uninhabited area, this island could support naval gunfire training and aviation ordnance delivery training. However, the lack of maneuver space precludes it from meeting the full spectrum weapons employment criterion.

5.2.4 Alamagan

Alamagan is 243 NM (450 km) from Guam, with a land mass of 4.3 mi² (11.1 km², 2,752 acres), and is currently uninhabited. It is a volcanic peak emerging abruptly from the ocean floor. There are no beaches on Alamagan, only rocky, steep cliffs (Figure 5-12). There are no urban areas, airports, or port facilities on Alamagan.



Figure 5-12. Alamagan

- **Required Candidate Land Area Characteristics.** Similar in nature to Sarigan, Alamagan also emerges abruptly from the ocean with perpendicular cliffs surrounding the island. There are no beaches on Alamagan, only rocky, steep cliffs, and therefore this island provides no beachfront support for amphibious operations training. In addition, the island has 1.5 mi² (3.9 km², 960 acres) of non-contiguous land with slope less than 30% (Appendix C, Figure C-8). Since Alamagan does not meet the minimum land characteristic criterion, it therefore does not meet combined-level training criterion.
- **Mobility Corridors.** The island has 1.5 mi² (3.9 km², 960 acres) of non-contiguous land with slope less than 30%. The island's volcanic terrain profile, with deep gorges radiating from the central peak, does not provide suitable maneuver space for training and, therefore, Alamagan does not meet the mobility corridors criterion.
- **Full Spectrum Weapons Employment.** As an uninhabited area, this island could support naval gunfire training and aviation ordnance delivery training. However, the lack of maneuver space precludes it from meeting the full spectrum weapons employment criterion.

5.2.5 Pagan

Pagan is 285 NM (528 km) from Guam, with a land mass of 18 mi² (47 km², 11,614 acres), and has no permanent inhabitants. Pagan consists of two stratovolcanoes that are connected to each other by a narrow isthmus. Approximately 20 to 30% of the island is relatively flat and adjacent to beaches; the remainder is mountainous (Figure 5-13). The island has 10.7 mi² (27.7 km², 6,848 acres) of non-contiguous land with slope less than 30% (Appendix C, Figure C-9). There are no urban areas, airports, or port facilities on Pagan.

Pagan has four significant beach areas labeled Red, Gold, Blue, and Green, for identification in this Siting Study. They are described in the following paragraphs.

Red Beach is approximately 227 ft (69 m) wide and 1198 ft (365 m) long (Figure 5-14). This beach is the site of a former pier that was destroyed by typhoons. While the smallest of the beaches on the western side of the island, it is the best protected from ocean wave action.

Gold Beach is located on the east side of the island and is approximately 138 ft (42 meters) wide and 1116 ft (340 meters) long (Figure 5-15).

Blue Beach, the northern most and largest of the western beaches, is approximately 115 ft (35 meters) wide and over 3474 ft (1059 meters) long (Figure 5-16).

Green Beach, located in a small, relatively sheltered bay just to the west of Pagan's grass airfield, is approximately 89 ft (27 m) wide and 1224 ft (373 m) long (Figure 5-17). The beach and bay are susceptible to offshore wave actions and during an August 2009 site survey to Pagan small boat access to the beach was limited due to wave action at the bay entrance.



Figure 5-13. Pagan



Figure 5-14. Pagan Red Beach



Figure 5-15. Pagan Gold Beach

Unit-Level Criteria. Pagan has many beaches that could support amphibious operations training.

Red Beach is smallest available beaches on the western side of the island, but is the best protected from ocean wave action. Red Beach would support landing by all amphibious craft to include LCACs, but egress off the beach is currently limited by the heavy vegetation behind the beach.

Gold Beach's exposure to prevailing wind and wave actions and the presence of rock outcrops and ledges in the beach approaches limits its training utility. Additionally, the presence of a high ledge that fringes the entire beach limits egress to a single dismounted route up a steep drainage draw. The ledge that fringes this beach is approximately 40 ft (12 m) high. Once off the beach, rough terrain and heavy vegetation, plus the existence of lava fields, limits the training potential of this beach even during the periods when suitable sea conditions exist for amphibious operations training.



Figure 5-16. Pagan Blue Beach

Blue Beach is suitable for all amphibious craft but it is the most exposed of the western beaches to wave action. The utility of this beach is also diminished by the brackish lake, which lies just behind the beach and constricts exit off the beach. Vegetation could be cleared to improve beach egress and allow better access to the northwest corner of the island.



Figure 5-17. Pagan Green Beach

Green Beach's large fringing ledge restricts access to LCACs. Green Beach allows direct access to the corridor that contains an existing grass air strip and which represents the best currently available maneuver terrain on the island.

In addition, approximately 20 to 30% of the island is relatively flat and adjacent to beaches affording the potential to conduct an amphibious landing and move to a live-fire training venue. The airspace surrounding Pagan is unencumbered by flight restrictions, offering the potential for designation as restricted airspace in order to conduct military flight operations. Therefore, because of these characteristics, Pagan does meet the land characteristic criterion in support of combined-level training.

- **Mobility Corridors.** About 20 to 30% of the island is flat and adjacent to beaches. The remainder is mountainous. The island has 10.7 mi² (27.7 km², 6,848 acres) of non-contiguous land with slope less than 30%. These characteristics meet the mobility corridors criterion.
- **Full Spectrum Weapons Employment.** With no permanent residents, this island could support naval gunfire training and aviation ordnance delivery training. In addition, maneuver space exists, predominately throughout the middle section of Pagan, which is accessible from the beaches. Therefore, these characteristics meet the full spectrum weapons employment criterion.

5.2.6 Agrihan

Agrihan is 319 NM (590 km) from Guam, with a land mass of 16.8 mi² (43.5 km², 10,752 acres), and is uninhabited. It is a massive volcano that rises over 13,120 ft (4,000 m) from the ocean floor. The island consists of steep terrain and ravines, with a predominantly steep and rocky coastline. There are no beaches on Agrihan, only rocky, steep cliffs (Figure 5-18). There are no urban areas, airports, or port facilities on Agrihan.



Figure 5-18. Agrihan

- Required Candidate Land Area Characteristics.** There are no beaches on Agrihan, only rocky, steep cliffs, precluding this island's support of amphibious operations training. In addition, the island has 5.9 mi² (15.3 km², 3776 acres) of non-contiguous land with slope less than 30% (Appendix C, Figure C-10). Since Agrihan does not meet the minimum land characteristic criteria, it therefore does not meet combined-level training criterion.
- Mobility Corridors.** The island consists of steep terrain and ravines. It is a massive volcano that rises over 13,120 ft (4,000 m) from the ocean floor. As mentioned above, the island has 5.9 mi² (15.3 km², 3776 acres) of non-contiguous land with slope less than 30%. However, the island's volcanic terrain profile, with deep gorges radiating from the central peak, does not provide suitable maneuver space for training, and therefore, Agrihan does not meet the mobility corridors criterion.
- Full Spectrum Weapons Employment.** As an uninhabited area, this island could support naval gunfire training and aviation ordnance delivery training. However, the lack of maneuver space precludes it from meeting the full spectrum weapons employment criterion.

5.2.7 Summary of Non-DoD-Controlled Area Screening

Table 5-3 summarizes application of the combined-level operational siting criteria to the non-DoD-controlled land areas of the CNMI that were assessed. Only Pagan, with its beachfront characteristics and maneuver potential meets the combined-level RTA criterion.

Table 5-3. Combined-Level Screen, Non-DoD-Controlled Areas

| | <i>Aguijan</i> | <i>Anatahan</i> | <i>Sarigan</i> | <i>Alamagan</i> | <i>Pagan</i> | <i>Agrihan</i> |
|--|----------------|-----------------|----------------|-----------------|--------------|----------------|
| Required Candidate Land Area Characteristics | No | No | No | No | Yes | No |
| Mobility Corridors | No | No | No | No | Yes | No |
| Full Spectrum Weapons Employment | No | No | No | No | Yes | No |

5.2.8. Potential Laydown on Pagan

Similar to the notional example of unit-level training on Tinian, the report portrays a notional laydown of the combined-level RTAs designed to confirm that combined-level RTA development on Pagan is feasible (Figure 5-19). This notional laydown is only to demonstrate that the physical characteristics of Pagan could potentially support combined-level training. This laydown is illustrative only and is not intended to represent the only potential for combined-level level RTA development on Pagan. It offers areas for ground maneuver (maneuver corridors depicted in blue), and orients the duded impact area on the steep terrain surrounding Mount Pagan to support surface and air delivered ordnance. A Joint High Speed Vessel (JHSV) pier and breakwater would support transportation of personnel and equipment via sea.

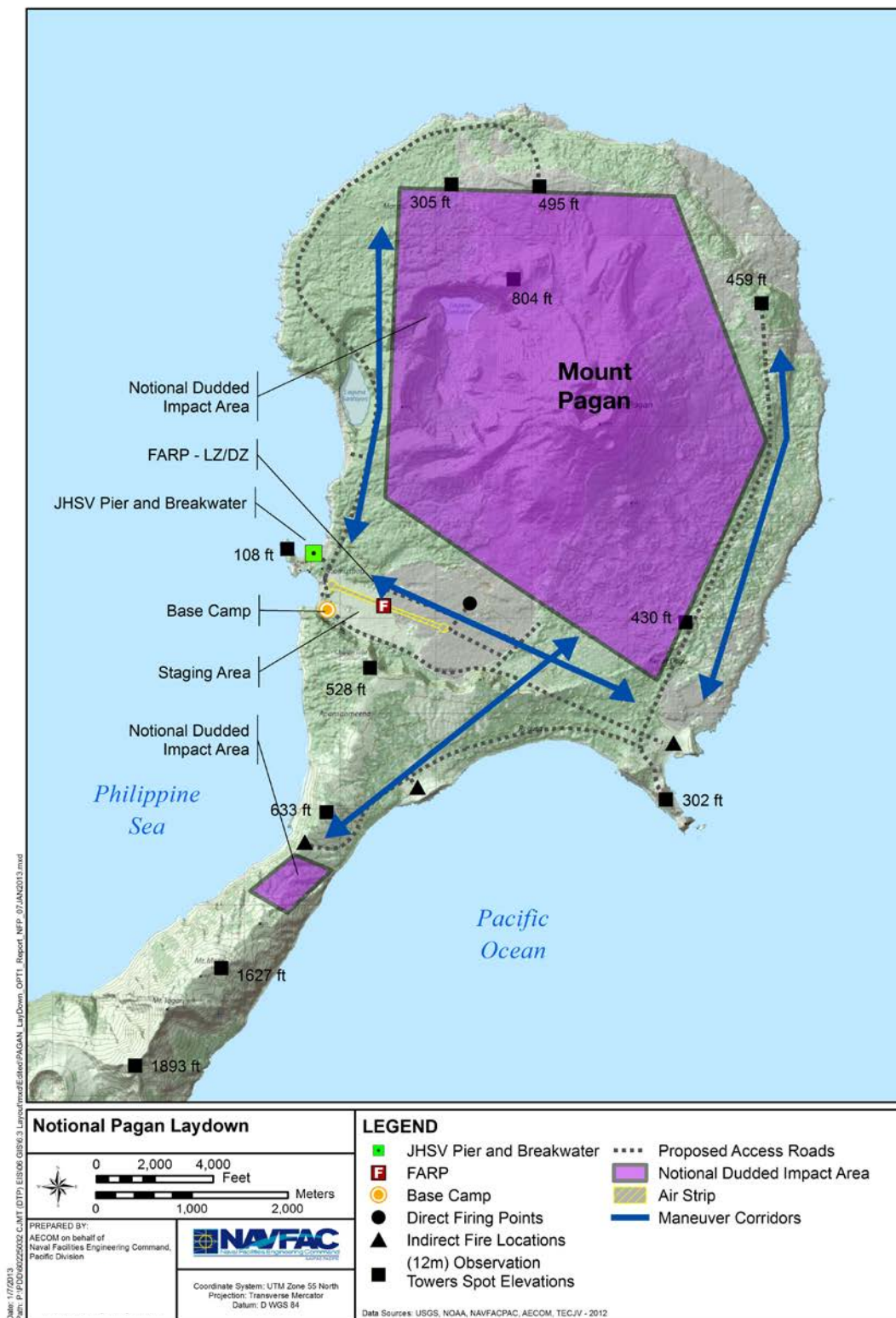


Figure 5-19. Notional Pagan Laydown

5.3 COMPARISON OF LAND AREAS FOR RANGE AND TRAINING AREA DEVELOPMENT PLANNING

Of the 14 CNMI islands, only a combination of Tinian and Pagan meet unit-level and combined-level screening criteria, and could satisfy virtually all 42 unfilled training requirements. Maneuver area requirements specified in Service training documents could be met on both Tinian and Pagan although with less acreage than specified in training references. Both the DoD-controlled lands on Tinian and the island of Pagan provide usable terrain with a relative lack of human population. Tinian has infrastructure that would facilitate development and sustainment of envisioned unit-level RTAs and training. Pagan would require some infrastructure development to support recurring training.

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CHAPTER 6

References

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Appendix A
Unfilled Training Requirements within the Commonwealth of the
Northern Mariana Islands

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UNFILLED TRAINING REQUIREMENTS CARRIED FORWARD TO THIS SITING STUDY

1. Impact Area Dudded

An Impact Area Dudded (Category Code Number [CCN] 17430) is defined as having designated boundaries within which all ordnance would detonate or impact. This area includes all impact areas that do not contain automated targets or targets classified as real property. Vehicle bodies are sometimes placed in the area to act as targets for artillery direct and indirect fire. The primary function of the impact area is to contain weapons effects as much as possible using earthen berms or natural terrain features. It is assumed that the impact areas contain unexploded ordnance and may not be used for maneuver. This area is typically managed and scheduled by a range name or code through the installation training or range control manager, and is accounted for with a separate facility number and individual real property record. To support the largest Dudded Impact Area for live-fire ranges identified in Marine Corps Reference Publication (MCRP) 3-0C/TC (Training Circular) 25-8, the Field Artillery Indirect Fire Range, an area 7.7 miles (mi) × 15.5 mi (12.5 kilometers [km] × 25 km or 77,220 acres) is specified to fully support this requirement (Marine Corps 2009, Army 2010).

2. Combat Pistol Range, Automated

An Automated Combat Pistol/Military Police Firearms Qualification Course (CCN 17572) is a range designed to meet training and qualification requirements with combat pistols and revolvers. This range is used to train and test personnel on the skills necessary to identify, engage, and hit stationary infantry targets. All targets are fully automated and the event specific target scenario is computer driven and scored from the range operations center. Weapons trained on this range may include 9 mm and 45 caliber pistols, M-4 carbines, and shotguns. TC 25-8 lists Automated Combat Pistol/Military Police Firearms Qualification Course (Facilities Category Code [FCC] 17822). MCRP 3-0C and TC 25-8 call for a 131 yard [yd] × 33 yd (135 meter [m] × 30 m) area to fully support this requirement (Marine Corps 2009, Army 2010).

3. Multipurpose Automated Unknown Distance Range

A Multipurpose Automated Unknown Distance Range (1,000 yd [914 m]), is designed to support combat marksmanship training and qualification requirements. The purpose of this range is to train and qualify personnel on the skills necessary to detect, identify and engage stationary and moving infantry targets in a tactical array at unknown distances out to 1,000 yd. Additionally, the range would support multi-service marksmanship training and certification requirements. The proposed range would have a width of 100 yd (91 m) and a length of 1,000 yd (914 m). Firing line berms and back-stop berms are proposed, along with support facilities. The range area is subject to grading to establish clear line of sight to the targets. The total distance of ground disturbing activities is approximately 1,050 yd (960 m) by 100 yd (91 m), or 22 acres, to fully meet this requirement.

4. Live Hand Grenade Range (Support for Multi-Purpose Range)

A Live Hand Grenade Range (CCN 17810) is designed to satisfy the training requirement of throwing live fragmentation grenades. This range familiarizes soldiers with the effects of live fragmentation grenades. No automation is required for this facility. This range should be located in close proximity to other ranges and Multi-Purpose Range Complex (MPRCs) that support live-fire grenade training. This allows units to conduct qualification and/or refresher training before moving to more complex training evolutions with live hand grenades on other ranges.

5. Field Artillery Indirect Fire Range

A Field Artillery Indirect Fire Range (CCN 17671) is designed to meet the training and qualification requirements of field artillery units. This range is used to train field artillery crews on the skills necessary to apply fire mission data, engage, and hit stationary targets in a tactical array with indirect fire. No automation is required for this facility. The Engagement Area is defined as the range area to support up to one battery of artillery. TC 25-8 lists this range as a Field Artillery Indirect Range (FCC 17856). MCRP 3-0C and TC 25-8 call for a 7.7 mi × 15.5 mi (12.5 km × 25 km area or 77,220 acres) to fully meet this requirement (Marine Corps 2009).

6. Mortar Range (60 mm, 81 mm, 120 mm)

A Mortar Range (CCN 17670) is designed to meet the training requirements of mortar crewmen. This range is used to train mortar crews on the skills necessary to apply fire mission data, engage, and hit stationary targets in a tactical array using live-fire mortars. No automation is required for this facility. The Engagement Area is defined as the range area to support up to the mortar section (two mortar teams). MCRP 3-0C and TC 25-8 call for a 1.2 mi × 3.7 mi (2 km × 6 km area or 2,965 acres) to fully meet this requirement (Marine Corps 2009).

7. Field Fire Range (Automated)

An Automated Field Fire Range (CCN 17520) is designed for training target engagement techniques with rifles. This range is used to train and familiarize personnel on the skills necessary to identify, engage, and hit stationary infantry targets. All targets are fully automated and the event specific target scenario is computer driven and scored from the range operations center. TC 25-8 lists this requirement as an Automated Field Fire Range (FCC 17803) with 96 stationary infantry targets and 32 foxhole positions. MCRP 3-0C and TC 25-8 call for a 349 yd × 328 yd (320 m × 300 m) area to fully meet this requirement (Marine Corps 2009).

8. Anti-Armor Tracking Range (Automated)

An Automated Anti-Armor Tracking and Live-Fire Range (CCN 17641) is a complex designed to meet training and qualification requirements with medium and heavy anti-armor weapons systems (e.g., Javelin, Tube-fired, Optically-tracked, Wire-Guided Missile, Shoulder Launched Multi-Purpose Assault Weapon). This complex is used to train and test personnel on the skills necessary to employ the weapon, identify, track, engage, and defeat stationary and moving armor targets presented individually or as part of a tactical array. All targets within this range are fully automated, computer driven, and scored from the range operations center. One lane is designed to accommodate up to 10 gunners/weapons. MCRP 3-0C and TC 25-8 call for a 1,093 yd × 5,468 yd (1,000 m × 5,000 m) area to fully meet this requirement (Marine Corps 2009).

9. Field Artillery Direct Fire Range

A Field Artillery Direct Fire Range (CCN 17650) is designed to meet training requirements of field artillery crews. This range is used to train field artillery crews on the skills necessary to employ direct fire gunnery techniques with indirect fire equipment against stationary targets in a tactical array using live direct fire artillery. No automation is required for this facility. The Engagement Area is defined as the range area to support up to one battery of artillery. MCRP 3-0C and TC 25-8 call for a 0.6 mi × 3.1 mi (1 km × 5 km) area to fully meet this requirement (Marine Corps 2009).

10. Tank/Fighting Vehicle Stationary Target Range

A Tank/Fighting Vehicle Stationary Gunnery Range (CCN 17650) is designed for conducting weapons system bore sighting, screening, zeroing, and/or harmonization. Armor, infantry, and aviation crews use this range. Within this range, targets may be fully automated and/or scored from the range operations center. The Engagement Area is defined as the range area to support up to 15 guns. TC 25-8 lists Tank/Fighting Vehicle Stationary Gunnery Range (FCC 17863). MCRP 3-0C and TC 25-8 call for a 0.6 mi × 2.5 mi (1 km × 4 km) area to fully meet this requirement (Marine Corps 2009, Army 2010).

11. Light Anti-Armor Weapon (LAW) Range Live

A LAW Range Live (CCN 17631) is designed for training target engagement techniques with LAW (e.g., LAW/anti-tank (AT)-4). This range is used to train personnel on the skills necessary to employ the weapon and hit stationary and moving targets using live rockets or a sub-caliber training device. Targets are not fully automated and/or the scenarios are not computer driven or scored. Ranges used for both live and sub-caliber firing are carried under this category code. MCRP 3-0C does not identify size requirements for this range. TC 25-8 lists LAW/AT-4 Range (FCC 17842). TC 25-8 calls for a 218 yd × 656 yd (200 m × 600 m) area to fully meet the requirement (Army 2010).

12. Grenade Launcher Range

A Grenade Launcher Range (CCN 17610) is designed to meet training and qualification requirements for the M203 Grenade Launcher (40 mm). This range is used to train and test personnel on the skills necessary to engage and defeat stationary emplacements with the 40 mm grenade launcher. No automation is required for this facility. Each Firing Point is counted as a collection of points or lanes that allows completion of all training objectives. MCRP 3-0C does not identify size requirements for this range. TC 25-8 lists Grenade Launcher Range (FCC 17884). TC-25-8 calls for a 33 yd × 564 yd (30 m × 500 m) area to fully meet this requirement (Army 2010).

13. Battle Sight Zero (BZO) Range Built to 100 yd Non-Standard Small Arms Range

A BZO Firing Range (CCN 17510) is designed for training shot-grouping and zeroing exercises with rifles and machine guns. This range is used to train individual personnel on the skills necessary to align the sights and practice basic marksmanship techniques against stationary targets. This range requires no automation. TC 25-8 lists Basic 10-Meter/25-Meter Firing Range (Zero) (FCC 17801). MCRP 3-0C and TC 25-8 call for a 109 yd × 27 yd (100 m × 25 m) area to support a standard BZO range. The non-standard caveat extends the length of the range from 27 yd to 109 yd (25 m to 100 m) to fully meet this requirement (Army 2010).

14. Infantry Platoon Battle Course (Automated)

An Infantry Platoon Battle Course (CCN 17753) is designed for the training and qualification requirements of infantry platoons on movement techniques and operations, either mounted or dismounted. This complex is used to train and test platoons on the skills necessary to conduct tactical movement techniques, detect, identify, engage, and defeat stationary and moving armor and infantry targets in a tactical array. All targets are fully automated and the event specific target scenario is computer driven and scored from the range operations center. The Engagement Area is defined as a range area to support training of squad and platoon sized units. MCRP 3-0C and TC 25-8 call for a 1,640 yd × 5,468 yd (1,500 m × 5,000 m) area to fully meet this requirement (Marine Corps 2009, Army 2010).

15. Multi-Purpose Training Range (MPTR)/MPTR (Automated)

An Automated MPTR (CCN 17710) is specifically designed to satisfy the training and qualification requirements for the crews, teams, and sections of combat units. This range supports dismounted infantry squad tactical live-fire operations either independently of, or simultaneously with supporting vehicles. This range is used to train and test armor, infantry, and aviation teams, crews and sections on the skills necessary to detect, identify, engage, and defeat stationary and moving armor and infantry targets in a tactical array. All targets are fully automated and the event specific target scenario is computer driven and scored from the range operations center. Each range lane is defined as a range to support training for two vehicles. TC 25-8 lists the MPTR (FCC 17865). MCRP 3-0C and TC 25-8 call for a 1,093 yd × 4,374 yd (1,000 m × 4,000 m) area to fully meet this requirement (Marine Corps 2009, Army 2010).

16. Tank/Fighting Vehicle MPRC/MPRC

A Tank/Fighting Vehicle MPRC, Heavy, Automated (CCN 17722), is a complex specifically designed to satisfy the training and qualification requirements for the crews and platoons of armor, infantry and aviation units. This complex supports dismounted infantry squad tactical live-fire operations either independently of, or simultaneously with supporting vehicles. This range is used to train and test armor, infantry, and aviation platoons, sections, teams and crews on the skills necessary to detect, identify, engage, and defeat stationary and moving armor and infantry targets in a tactical array. All targets are fully automated and the event specific targets scenario is computer driven and scored from the range operations center. When the range can be used for both heavy and light purposes, it would be classified under this Category Code. The Engagement Area is defined as a range area to support training of platoon-sized units up to six vehicles. TC 25-8 lists MPRC (FCC 17868). MCRP 3-0C and TC 25-8 call for a 1,640 yd × 5,468 yd (1,500 m × 5,000 m) area to fully meet this requirement (Marine Corps 2008, Army 2010).

17. Combined Arms Training Range to Support Close Air Support (CAS) and Naval Gunfire Support (NGFS) Training

The requirement for a co-located (both CAS and NGFS) Combined Arms Training range to support both CAS and NGFS training is not specifically addressed in published Service Components' requirements documents. The CAS range (CCN 17936) requirement is specifically addressed in unfilled requirement 28 (Close Air Support Range) below. The NGFS, also termed Naval Surface Fire Support (NSFS), requirement, is delineated in both the Amphibious Warfare (AMW) and strike warfare (STW) range functions.

The AMW range function specifies an area 5 square nautical miles (NM²) (9.3 square kilometers [km²]) that should be cleared for the use of live NSFS ordnance. The STW range function should provide sufficient airspace to allow the use of stand-off air-to-ground weapons, NSFS, and land attack cruise missiles. Proximity of the NSFS target area to suitable contiguous operating sea space for ships to maneuver is not specified, but is an assumed requirement.

18. Company Combined Arms Live-Fire and Maneuver Range

There is no CCN that describes this requirement. The Army's TC 25-8 describes the Battle Area Complex (FCC 17880) as used to train and test the Stryker Brigade Combat Team and Infantry Brigade Combat Team crews, sections, platoons, companies, and dismounted infantry squads on the skills necessary to detect, identify, engage, and defeat stationary and moving infantry and armor targets in a tactical array in both open and urban terrain environments (Army 2010). This complex also supports tactical live-fire operations independently of, or simultaneously with, supporting vehicles in free maneuver. Company Combined Arms Live-Fire Exercises may also be conducted on this facility. This complex accommodates training with sub caliber and/or training devices. A Convoy Live-Fire (CLF) route may be included with use of qualification/tactical trails. MCRP 3-0C does not identify size requirements for this range (Marine Corps 2009). TC 25-8 calls for a 2,624 yd X 4,374 yd (2,400 m × 4,000 m) area to fully meet this requirement (Army 2010).

19. Combined Arms Live-Fire Amphibious Beaches with Maneuver Area

There is no CCN that describes this requirement. Marine Corps Marine Expeditionary Unit (MEU) level training supports personnel and platforms of a MEU-sized Marine Air Ground Task Force or its individual elements and Training and Readiness Requirements for each element of the MEU. Accordingly, MEU-level training supports the training associated with Air Combat Element (ACE), Ground Combat Element, and Logistics Combat Element units. MCRP 3-0C describes the following space dimensions to support MEU level live-fire training as: airspace 50 × 80 NM (93 km × 148 km); sea space 7,500 NM² (19,425 km²); land space 150 square miles (mi²) (388 km² or 96,000 acres), to fully meet this requirement.

20. Urban/Military Operations on Urban Terrain (MOUT) Assault Course (UAC)

There is no CCN that describes this requirement. TC 25-8 (FCC 17878) describes the UAC as a facility that is used to train individuals, squads, and platoons on the tasks necessary to operate within a built-up/urban area. TC 25-8 calls for an approximately 328 yd × 219 yd (300 m × 200 m) area to support the structures within this facility and to fully meet this requirement (Army 2010).

21. Convoy Live-Fire (CLF) Range

There is no CCN that describes this requirement. TC 25-8 (FCC 17901) describes this complex as used to train and test convoy crews, platoons, and companies on the skills necessary to detect, identify, engage, and defeat stationary and moving vehicle and infantry targets from a stationary or moving platform using all assigned weapons and weapon systems (Army 2010). It is also designed to satisfy the training and qualification requirements for the crews and sections of unstabilized platforms. The targets may be presented individually or as part of a tactical array in an open or urban environment. This complex is also used to train and test Soldiers to engage and defeat vehicle and infantry targets from multiple firing points as part of an Entry Control Point. Marine Corps Forces Pacific (MARFORPAC) has established the threshold length for the course at 5 mi (8 km) and the objective length at 10 mi (16 km) length with the range capable of supporting a tactically dispersed 10-vehicle convoy, to fully meet this requirement.

22. Tracked Vehicle Driver's Course

A Tracked Vehicle Driver's Course (CCN 17907) is an area to teach the basic driving skills of steering and gear shifting of a tracked vehicle on a level course. The facility may also contain a hilly course for developing advanced tracked vehicle driving skills such as turning on slopes and negotiating steep grades. MCRP 3-0C does not provide criteria for this course.

23. Tactical Amphibious Landing Beaches

There are no CCNs or FCCs that describe this requirement. Amphibious beaches are typically located in other training venues.

24. Maneuver Area, Heavy Forces

This category (CCN 17420) includes all space for ground and air combat forces to practice movements and tactics. Different types of units may support one another (combined arms), or may operate independently. The "heavy" designation refers to areas where maneuver is unrestricted and can consist of all types of vehicles and equipment, including tracked vehicles. "Heavy" maneuver/training areas can be used by "light" forces. This category includes bivouac sites, base camps, and other miscellaneous training areas. This area is typically managed and scheduled by a range name or code through the installation training or range control manager, and is accounted for with a separate facility number and individual real property record. Maneuver/training areas may be used for multiple purposes. To avoid inventory duplication, the priority of assignment for CCNs is Maneuver/Training Area, Amphibious (CCN 17411); Maneuver/Training Area, Heavy (CCN 17420); and Maneuver/Training Area, Light (CCN 17410). MCRP 3-0C describes the following space dimensions to support an infantry company with organic weapons with supporting tank platoon, Amphibious Assault Vehicle (AAV) platoon, Light Armored Vehicle Platoon, Artillery Battery, and Engineer Platoon as: non-live-fire – 144 mi² (373 km² or 92,160 acres) and live-fire – 260 mi² (673 km² or 166,400 acres), to fully meet this requirement (Marine Corps 2010).

25. Maneuver Area, Light Forces

This category (CCN 17410) includes all space for ground and air combat forces to practice movements and tactics. Different types of units may support one another (combined arms), or may operate independently. The "light" designation refers to areas where maneuver is restricted to only small units or units having only wheeled vehicles. "Light" maneuver/training areas are not typically used by "heavy" or mechanized forces, other than in assembly areas where movement is restricted to roads or trails. This category includes bivouac sites, base camps, and other miscellaneous training areas. This area is typically managed and scheduled by a range name or code through the installation training or range control manager, and is accounted for with a separate facility number and individual real property record. Maneuver/training areas may be used for multiple purposes. To avoid inventory duplication, the priority of assignment for CCNs is Maneuver/Training Area, Amphibious (CCN 17411); Maneuver/Training Area, Heavy (CCN 17420); and Maneuver/Training Area, Light (CCN 17410). MCRP 3-0C describes the following space dimensions to support an infantry company with organic weapons with supporting tank platoon, AAV platoon, Light Armored Vehicle Platoon, Artillery Battery, and Engineer Platoon as: non-live-fire – 144 mi² (373 km² or 92,160 acres) and live-fire – 260 mi² (673 km² or 166,400 acres), to fully meet this requirement (Marine Corps 2010).

26. Maneuver Area, Amphibious Forces

A Maneuver Area, Amphibious Forces (CCN 17411) includes all space for ground and air combat forces to practice movements and tactics during amphibious (ship-to-shore) operations. Different types of units may work in support of one another (combined arms), or the units may operate independently. Tasks can include both combat and logistics (especially Logistics Over-the-Shore). This category also includes areas with bivouac sites, base camps, and other miscellaneous training areas. Each area is typically managed and scheduled by a range name or code through the installation training or range control manager, with a separate facility number and individual real property record. Maneuver/training areas may be used for multiple purposes. To avoid inventory duplication, the priority of assignment for CCNs is Maneuver/Training Area, Amphibious (CCN 17411); Maneuver/Training Area, Heavy (CCN 17420); and Maneuver/Training Area, Light (CCN 17410). MCRP 3-0C has set a 144 mi² (373 km² or 92,160 acres) as the threshold to support company sized non-live amphibious training and 260 mi² (673 km² or 166,400 acres) as the threshold to support live-fire training by the same force, and fully meet this requirement (Marine Corps 2010).

27. Offensive Air Support Range (Aerial Gunnery and/or Aerial Bombing Range)

Aircraft Gunnery, Bombing and Rocket Ranges (Aircraft Weapons Ranges) (CCN 17910) provide aircrews with operating areas for the development of proficiency in gunnery, bombing, rocketry, missile delivery, strafing, and mine laying. Ranges should generally be within 100 miles (185 km) of the supporting air installation.

The Offensive Air Support targets require at least one range complex with at least two separate live/inert weapons target sites composed of raked and strafe ranges, structural targets, mobile targets, and targets located in revetments. Some of the structural targets should replicate congested urban areas, requiring event participants to discriminate between valid and invalid targets in order to practice minimizing collateral damage. Tactical target complexes should provide a minimum of four targets with four Desired Mean Points of Impacts per target, as well as present target identification and discrimination challenges to the aircrew. This does not apply to raked and strafe ranges. Tactical targets should possess visual, radar, and spectral signatures representing threat systems. Building structures, revetted targets, and moving targets must replicate, to the greatest degree practical, the physical characteristics and spectral signatures of the type of targets expected to be encountered in the projected area of operations. At least one target site must allow the use of inert weapons up to 2,000 pounds (lbs) (907 kilograms [kg]) and live weapons (including cluster munitions) up to 1,000 lbs (454 kg). At least some of the targets should allow the use of laser designators.

MCRP 3-0C calls for an Offensive Air Support range that requires a 30-minute period on a 25 NM × 50 NM (46 km × 92 km) range with airspace that extends from the surface to 40,000 feet (ft) (12,192 m) to fully meet this requirement. The area should be cleared for use of air-to-ground gunnery, free-fall and guided air-to-ground munitions, laser-designating devices, and the expenditure of chaff and flares.

28. Close Air Support (CAS) Range (Air-to-Ground Range)

CAS is air action by fixed-wing and rotary-wing aircraft against hostile targets that are in close proximity to friendly forces, and requires detailed integration of each air mission with the fire and movement of those forces. Various definitions of a CAS range exist within the Service Components' training requirements publications.

The CAS Range (CCN 17936) is designed to support the training and qualification requirements of CAS aircraft. This range is used to train and test aircraft crews on the skills necessary to provide air support to ground forces under varying conditions. This range does not require automation but does require surveillance of the target area. CCN Table 17910-1 specifies that a CAS and combat training area minimum surface impact area is 16 NM \times 20 NM (30 km \times 37 km), with minimum restricted airspace radius of 25 NM (46 km), with maximum restricted airspace that extends vertically to the maximum altitude required by the using aircraft (nominally surface to 50,000 ft [15,240 m]) to fully meet this requirement. One control tower and two spotting towers at each designated target site and target illumination for night operations are required.

TC 25-8 specifies two complexes/facilities that support CAS training among other training requirements. Digital Air/Ground Integration Range complex (FCC 17721) is designed to train and test Army Aviation crews, teams, platoons, companies/troops along with Army ground units on skills necessary to detect, identify and effectively engage stationary and moving infantry and/or armor targets in a tactical array. The Digital Air/Ground Integration Range would enable critical air-ground integration tactics, techniques, and procedures training to ensure the optimum teaming of ground and air, Army and joint platforms. A 4 NM \times 6.5 NM (8 \times 12 km) area (Objective Area B) with static targets to support indirect fire/CAS engagements is required by TC 25-8 (Army 2010).

The Aerial Gunnery Range (FCC 17912) is a baseline facility with requirements similar to FCC 17721, but intended for training at less than a medium combat aviation brigade level. A 3.2 NM \times 4.9 NM (6 km \times 9 km) area (alternate) with static targets to support indirect fire/CAS engagements is specified by TC 25-8 (Army 2010).

29. Electronic Warfare Training Range (Integrated Air Defense System/Counter Integrated Air Defense System)

Criteria for the Electronic Warfare Training Range (FCC 17971) are not currently available in the Unified Facilities Criteria (UFC).

The Electronic Combat range function, which is a subset of Command and Control Warfare, supports the set of friendly force offensive and defensive tactics and operations associated with Electronic Attack and Electronic Protection activities. The Electronic Combat range function supports identifying, degrading, or denying hostile forces the effective use of their battlefield surveillance, targeting radar and electro-optical systems, communications, counter fire equipment, and electronically fused munitions.

Electronic Attack consists of active offensive tactics, designed to confuse the enemy or deny the enemy the use of its electronically-targeted weapons systems. The Suppression of Enemy Air Defenses and active jamming against hostile aircraft and surface combatant radars are examples of the application of Electronic Attack. Electronic Protection consists of active and passive defense tactics, designed to intercept, identify, categorize, and defeat threat weapons systems that are already targeting friendly platforms. Friendly aircraft hazard warning systems are designed, for example, to recognize land-based, sea-based, and airborne radar, laser, and microwave transmissions and correlate those transmissions with known weapons systems.

The Navy Ranges Required Capabilities Document specifies Basic Electronic Combat training as requiring an area 30 NM \times 60 NM (55.5 km \times 111 km), from surface to 30,000 ft (9,144 m), allowing for the use of chaff and flares and supporting two concurrent training events, to fully meet this requirement.

Electronic Combat Threat levels 1 through 4, describe in general terms the complexity and degree of integration or sophistication exhibited by threat systems.

MCRP 3-0C specifies that MEU training requires combat threat level 2 with sufficient electronic combat emitters to provide multiple coordinated threats with accurate threat replication (Marine Corps 2009).

30. Landing Zones (LZs)

Air Force Instruction (AFI) 13-217, *Drop Zone and Landing Zone Operations*, specifies Air Force requirements for both LZs and Drop Zones (DZs) (Air Force 2007a). Some of the variables used to calculate safe DZ operations include type and number of delivery aircraft, delivery system, altitude, number of parachutist, cultural and natural environment, and weather conditions. LZ suitability factors include type of aircraft, runway dimensions, and runway category (prepared or semi-prepared).

31. Drop Zones

CCN 17440, personnel/equipment DZ is defined as a large, flat, cleared area for personnel and equipment to land following a parachute jump. No dimensions are specified.

TC 25-1, *Training Land* (Army 2004), specifies a 0.3 NM² (1 km²) maneuver area requirement for the conduct of tactical operations by a quartermaster airdrop equipment support company.

AFI 13-217, *Drop Zone and Landing Zone Operations*, specifies Air Force requirements for both LZs and DZs (Air Force 2007a). Some of the variables used to calculate safe DZ operations include type and number of delivery aircraft, delivery system, altitude, number of parachutist, cultural and natural environment, and weather conditions. LZ suitability factors include type of aircraft, runway dimensions, and runway category (prepared or semi-prepared).

32. Unmanned Aircraft System (UAS) Operating Areas

There are no specific UAS training range requirements within current requirements publications. The use of Unmanned Air Vehicles (UAVs) is articulated in sections of the STW and Anti-Air Warfare (AAW) range functions.

UAVs generally operate in airspace where they are segregated from other airspace users (restricted airspace). Federal Aviation Administration approval of UAV operations conducted wholly within an active Restricted, Prohibited or Warning Area airspace is not required when operating with permission from the appropriate authority or using agency of that airspace. There are two acceptable means of operating UAS in the National Airspace outside of restricted airspace: a Special Airworthiness Certificate – Experimental Category or a Certificate of Waiver or Authorization. The International Civil Aviation Organization is addressing UAS operations within international airspace.

33. AAW Range (in support of a combined arms range)

Specific AAW range dimensional characteristics are not published within current open source Air Force training requirements documents.

AFI 13-212, section 1.4, specifies that the land or sea encompassed within the Danger Area or underlying an air-to-air range used for actual weapon employment must be protected by purchase, lease, or other means to ensure the safety of personnel, structures, and the public from expended weapons, laser and electromagnetic emissions, and target debris (Air Force 2007b).

MCRP 3-0C specifies an ACE level AAW range as a 40 NM × 60 NM (74 km × 111 km) range with airspace that extends from the surface to 50,000 ft (15,240 m) to fully support this requirement. The range must support supersonic operations. Some portion of the airspace should overlay land area with significant topography. AAW targets require gunnery banners or darts, which are subsonic and supersonic UASs that can operate from surface to 50,000 ft (15,240 m). These UASs should be capable of being augmented to replicate the radar and spectral signature of anticipated threat aircraft and anti-ship and/or air-to-ground missiles.

34. Terrain Flight Maneuver Area/Route (Rotary Wing/Tilt Rotor)

Specific Terrain Flight (TERF) Maneuver Area/Route (Rotary Wing/Tilt Rotor) requirement characteristics are not within current open source publications. Marine Aircraft Wing Orders dealing with Standard Operating Procedures for Flight Operations articulate TERF policy for rotary wing and tilt wing aircraft, to include certification procedures of unpublished routes. These Orders specify that TERF training shall be conducted in restricted airspace, MOAs or published IR/VR/Slow Routes (SRs) or other training areas so designated by the respective Wing Commanding General.

35. Forward Arming and Refueling Point (FARP)

Forward arming and refueling points allow aircraft to rapidly rearm and refuel close to a battle or training area to reduce response time. Helicopter Expedient Refueling Systems can provide four refueling points, with a capacity of up to 18,000 gallons of fuel. No set area requirements are published.

36. Base Camp and Associated Facilities and Infrastructure

A Base Camp contains expeditionary facilities that support deployed forces and provide troop housing, food services, electricity, water, sanitation, maintenance, and storage facilities when deployed to a major training area. The type and standard of construction would depend on the projected lifespan of the facilities.

37. Range Control

Range Operations Buildings (CCN 17310) are designed for the direct support to range operations. Such buildings can support a variety of operations for a firing range such as: range operations, administrative support, target storage and issue, equipment storage and maintenance, and ammunition breakdown and distribution, but not ammunition storage. This category includes buildings associated with range operations such as range operations centers and operations/storage buildings. Range control provides real time monitoring and control of on-range events and the range resources that support those events.

38. Data Transfer Infrastructure

There is no CCN to define this requirement. MCRP 3-0C defines Information Exchange Requirements (IERs) as a common attribute of Marine Corps Ranges. An IER characterizes the information exchanges to be performed by and with a proposed system of systems. The Data Transfer Infrastructure should be capable of supporting the transfer of information between all of the following: the Officer Conducting Exercise, participants, Range Control, Range Scheduling, Range Tracking, Range Electronic Warfare, Range Targets, Range Data Collection and Processing Systems, Range Simulation, and Range Debriefing.

39. Ammunition Storage

High explosive magazines (CCN 42122) are used for storage of mass-detonating explosives. Some examples of munitions generally stored in high explosive magazines include bombs, warheads, naval mines, and demolition charges. The type and amount of material that may be stored in any magazine is dependent on the safety quantity-distance requirements, permissible storage limits, and ammunition compatibility relationships as established by the DoD Explosives Safety Board and as approved by Naval Sea Systems Command (Navy 2007). Sufficient ammunition storage will be required at MTAs to support deployed unit training evolutions.

40. Staging Areas (Administrative and Tactical)

Joint Publication 1.02, *DoD Dictionary of Military and Associated Terms*, defines a staging area as a general locality established for the concentration of troop units and transient personnel between movements over the lines of communications (DoD 2011). The staging area would typically be located at or near an air or sea point of embarkation at the hub and would support movement to the main training area. The staging area would support the debarkation of training units and their eventual re-embarkation at the completion of training. Staging areas may include bio-security and/or quarantine facilities to prevent the inadvertent spread of biological contaminants between geographic areas.

41. Adequate Waterfront Piers, Harbor, and Infrastructure

UFC 4-150-06, *Military Harbors and Coastal Facilities*, provides harbor and dredging project criteria, design and maintenance guidance, and relevant lessons learned with respect to shore infrastructure (DoD 2001).

42. Adequate Roads, Utilities, and Infrastructure for Training Area (existing or possible construction)

Infrastructure guidance for facilities to support training areas can be found in the following documents: UFC 3-230-19N, *Water Supply Systems*; UFC 3-240-02N, *Wastewater Treatment Systems Augmenting Handbook*; UFC 3-240-04A, *Wastewater Collection*; UFC 3-250-01FA, *Pavement Design for Roads, Streets, Walks, and Open Storage Areas* (DoD 2005, 2004c,b,a).

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Appendix B
Pacific Command Units within the Joint Region Marianas

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Table B-1: Pacific Command Units within the Joint Region Marianas

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| USARPAC |
| 322nd Civil Affairs Brigade (Army Reserve) |
| 4960th Multifunctional Training Brigade (Army Reserve) |
| Theater Support Group (Army Reserve) |
| Echo Company 100th Infantry; 797th Engineer Company; 302nd Quartermaster Company; 368th Military Police Company (Army Reserve) |
| 1st Battalion, 294th Infantry (Guam Army National Guard) |
| 105th Troop Command (Guam Army National Guard) |
| PACFLT |
| USS Chicago |
| USS Frank Cable |
| USS Key West |
| USS Oklahoma City |
| Explosive Ordnance Disposal Mobile Unit 5 |
| Helicopter Sea Combat Squadron 25 |
| Maritime Expeditionary Security Group (MESG) 1 detachment |
| PACAF |
| Rotational deployment unit (F-22, B-52, B-1, B-2, squadron or detachment) |
| 12th Reconnaissance Squadron Detachment (Global Hawk) |
| 36th Communications Squadron |
| 36th Civil Engineer Squadron |
| 36th Contracting Squadron |
| 36th Force Support Squadron |
| 36th Logistics Readiness Squadron |
| 36th Security Forces Squadron |
| 36th Medical Operations Squadron |
| 36th Medical Support Squadron |
| 36th Maintenance Squadron |
| 36th Munitions Squadron |
| 736th Security Forces Squadron |
| 36th Mobility Response Squadron |
| 554th Rapid Engineer Deployable Heavy Operations Repair Squadron Engineers |
| 644th Combat Communications Squadron |
| 44th Aerial Port Squadron (Air Force Reserve) |
| 724th Aeromedical Staging Flight (Air Force Reserve) |
| 254th Civil Engineer Squadron (Guam Air National Guard) |
| 254th Security Forces Squadron (Guam Air National Guard) |
| MARFORPAC |
| 3d Marine Expeditionary Brigade, Command Element (PCS) |
| Law Enforcement Company (PCS) |
| Marine Expeditionary Brigade Command Element Enablers (PCS) |
| 4th Marine Regiment, Headquarters (PCS) |
| Infantry Battalion (UDP) |
| Battalion Landing Team (UDP) |
| Composite Marine Medium Tiltrotor Squadron (PCS and UDP) |
| 9th Engineer Support Battalion (-) (PCS and UDP) |
| Combat Logistics Battalion 4 (PCS) |
| Supporting Establishment Unit (Guam) (PCS) |
| SOC PAC |
| Naval Special Warfare Unit One |

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Appendix C

Supporting Figures

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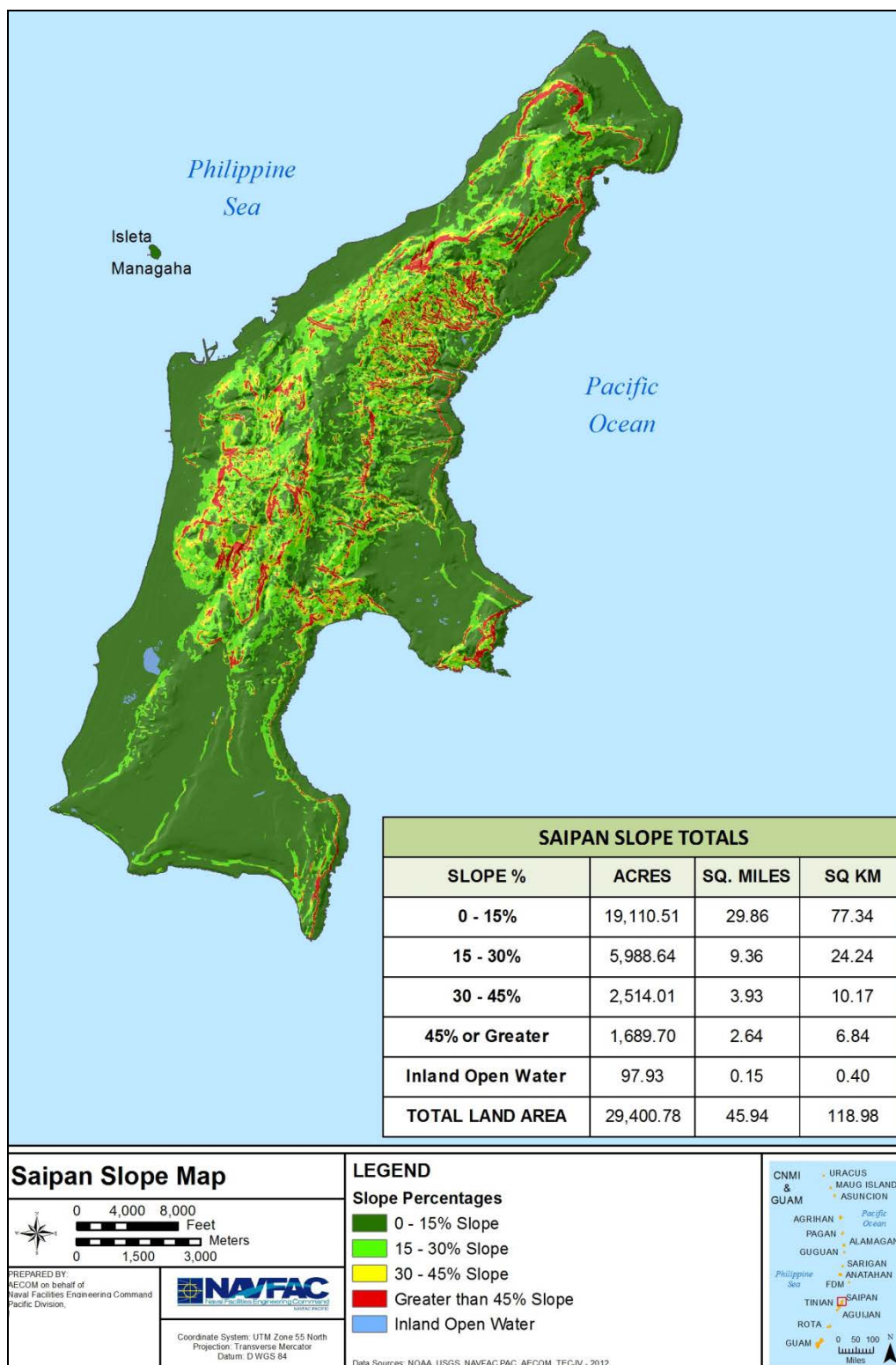


Figure C-1. Saipan Slope Map

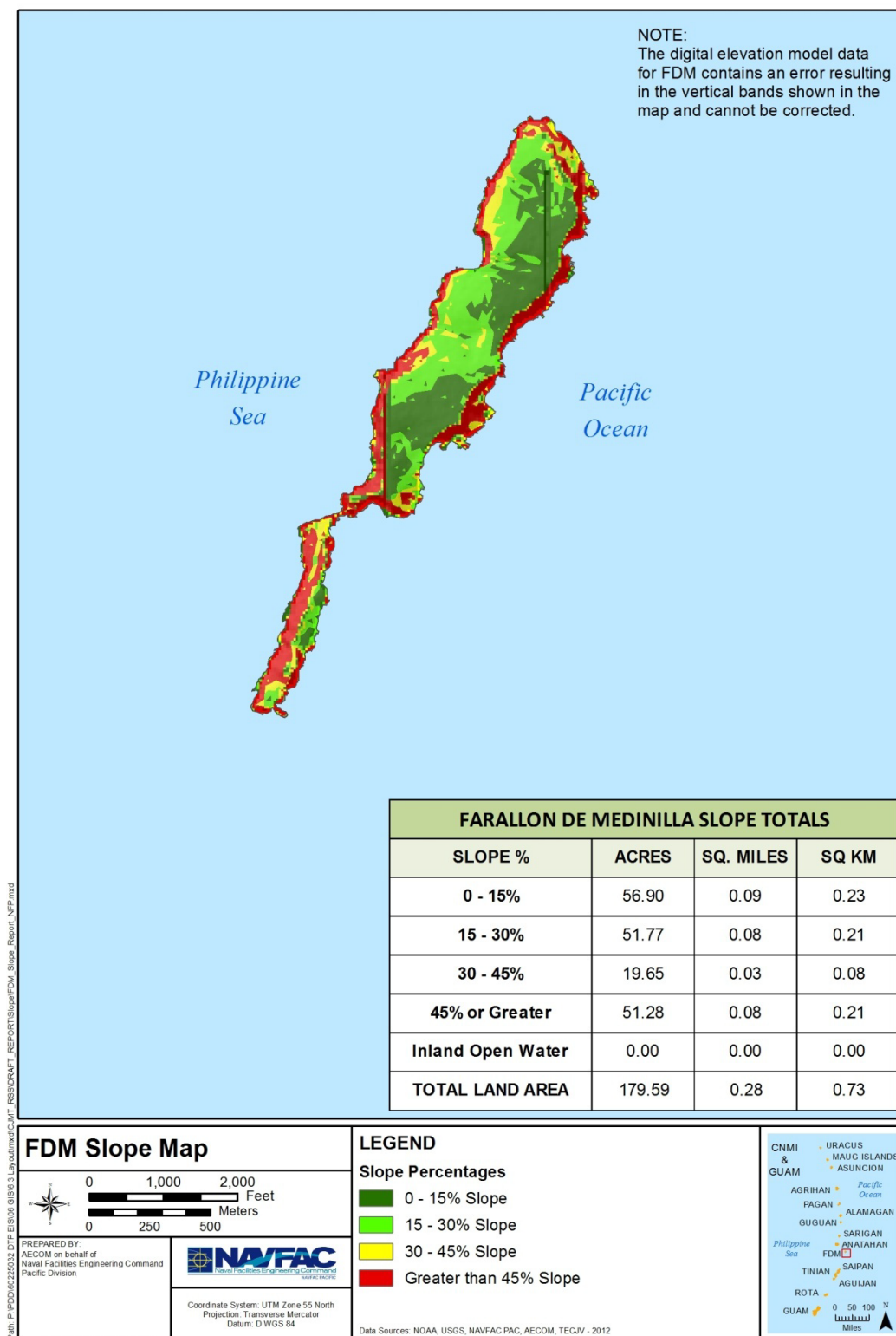


Figure C-2. Farallon de Medinilla Slope Map

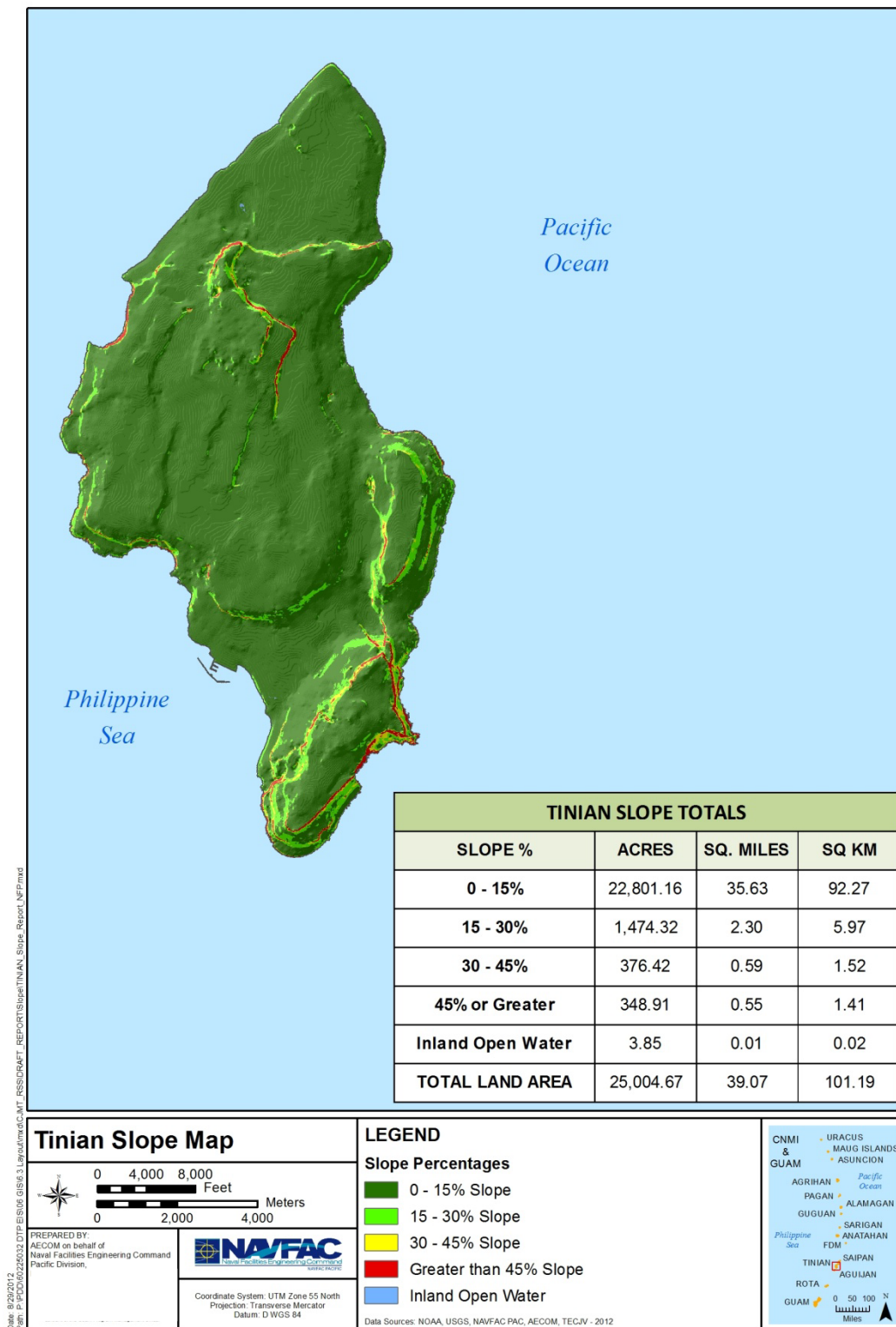


Figure C-3. Tinian Slope Map

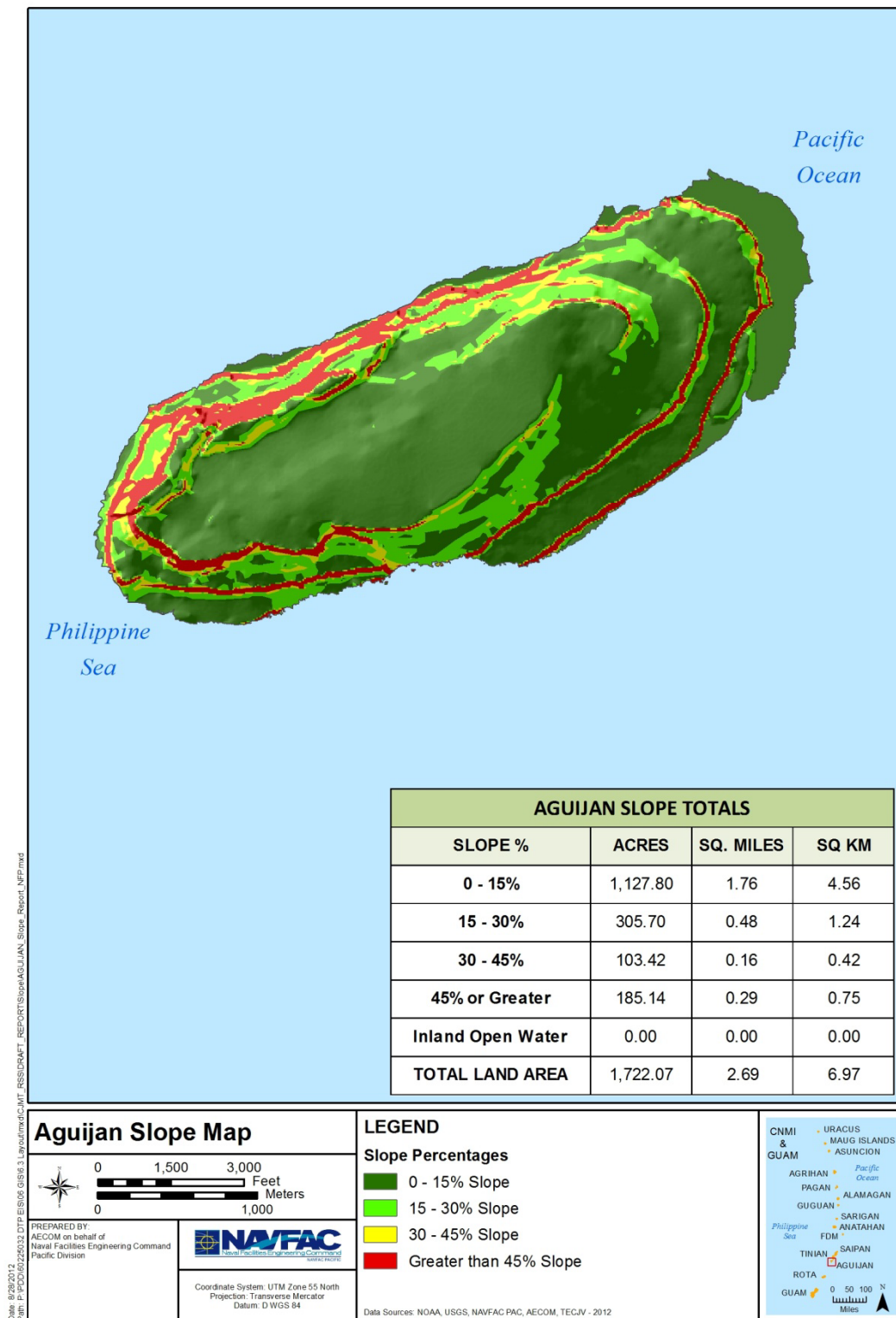


Figure C-4. Aguijan Slope Map

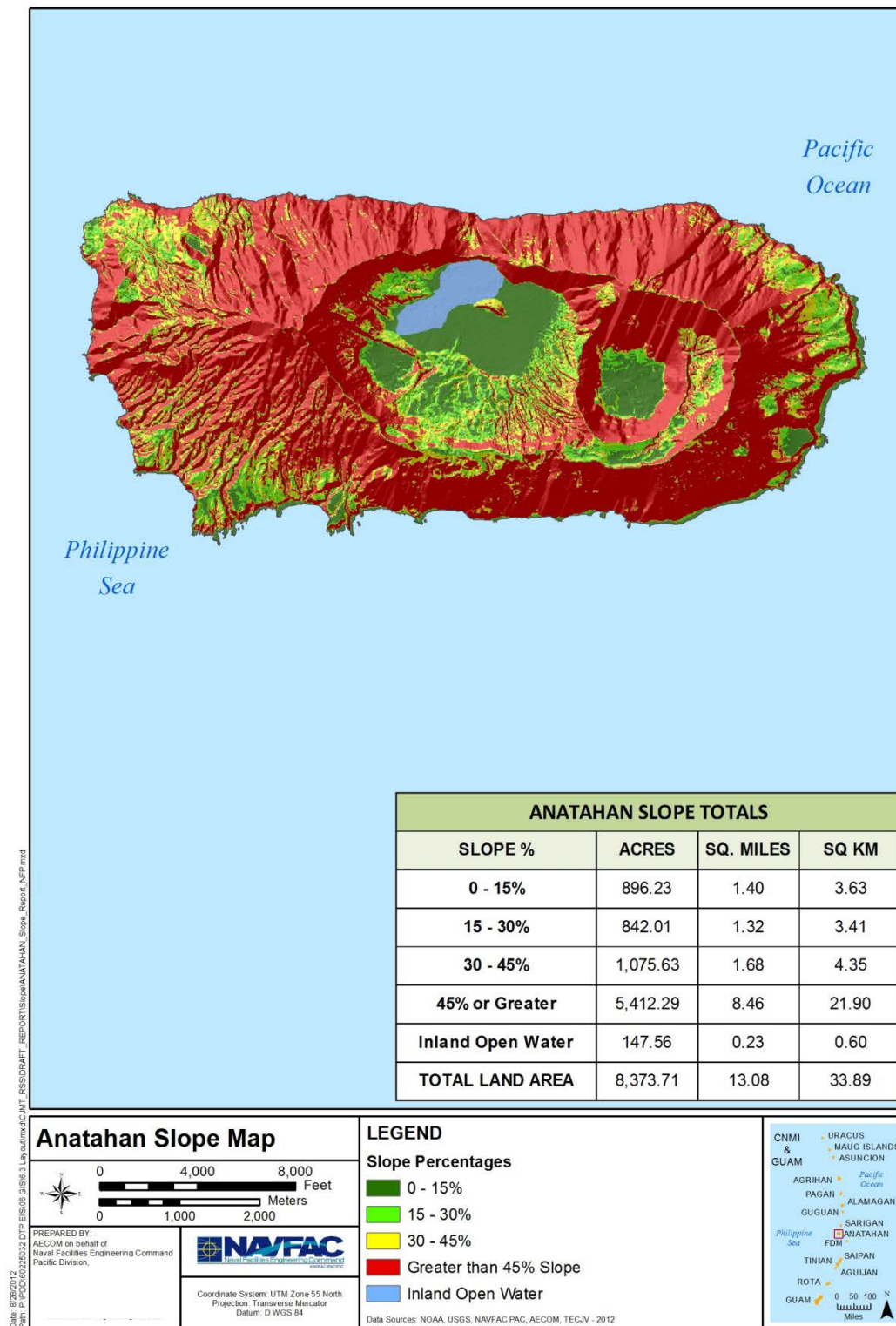


Figure C-5. Anatahan Slope Map

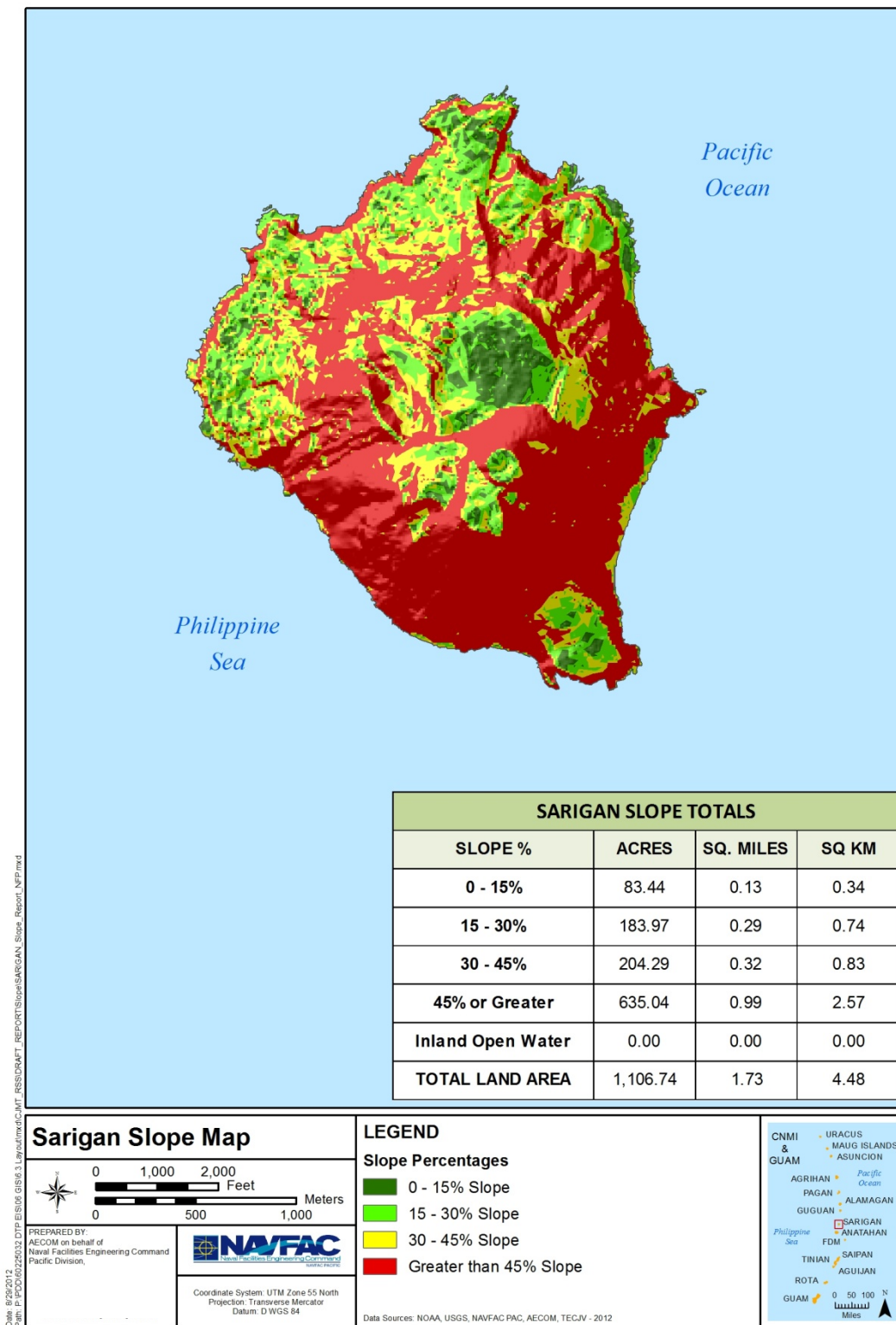


Figure C-6. Sarigan Slope Map

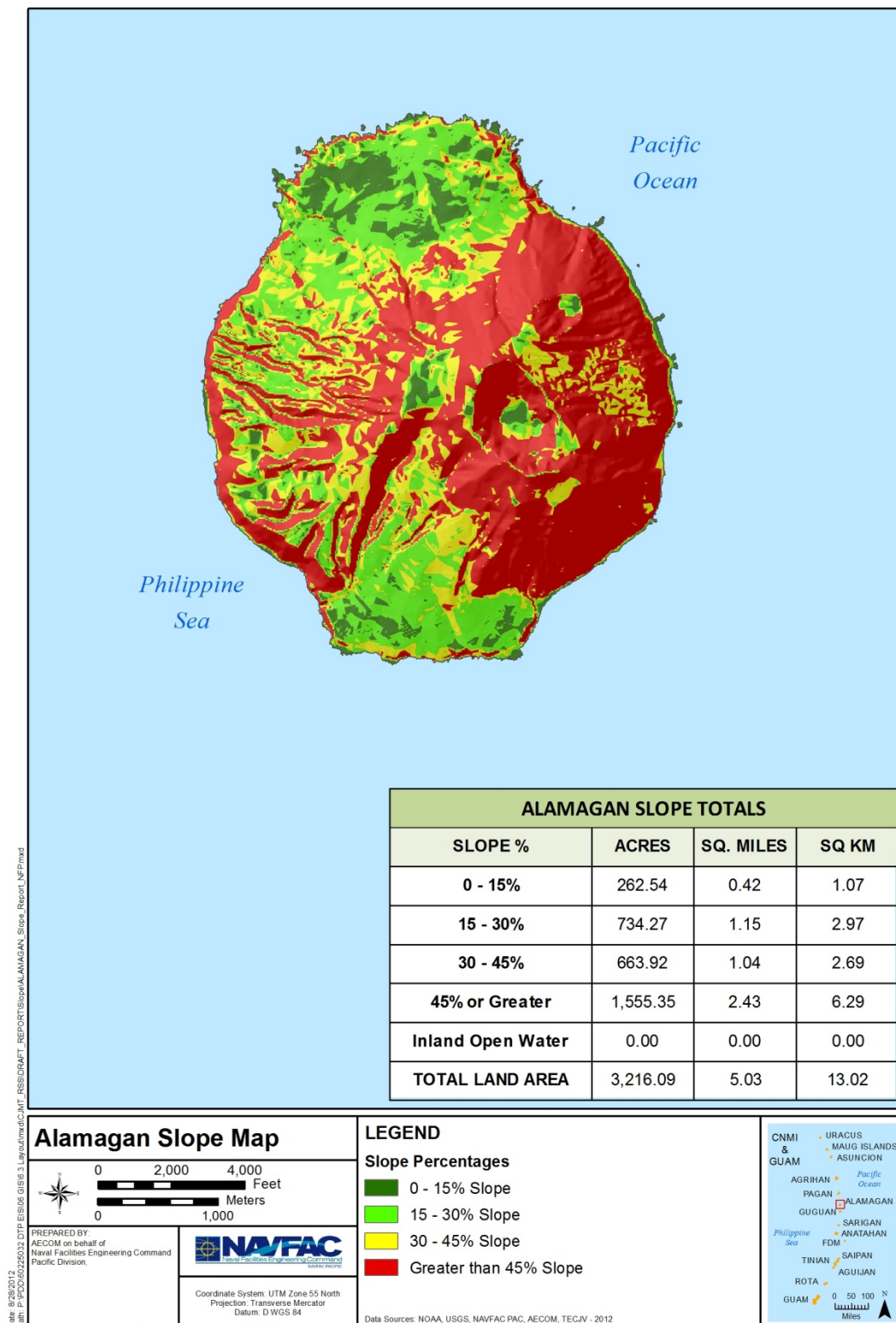


Figure C-7. Alamagan Slope Map

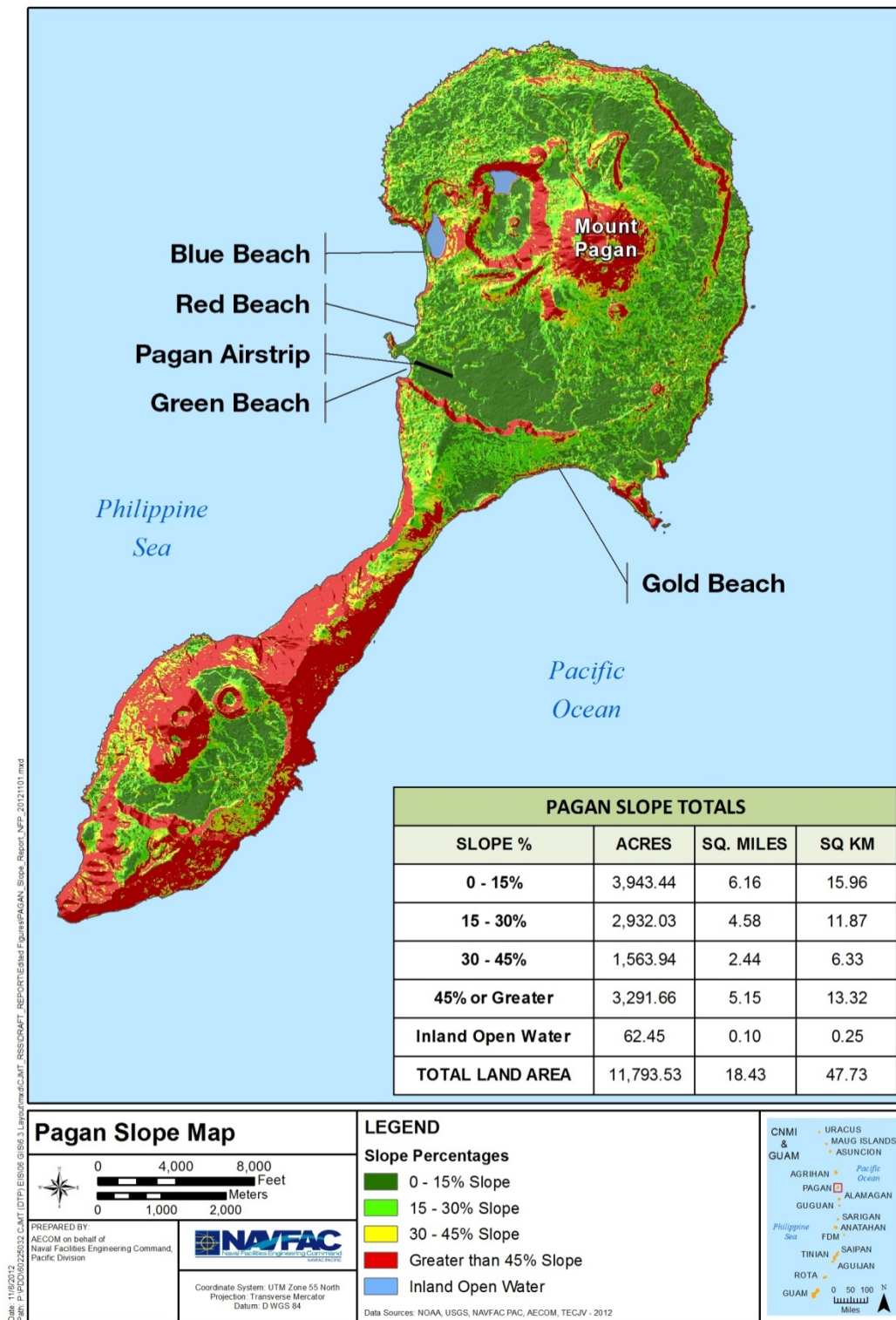


Figure C-8. Pagan Slope Map

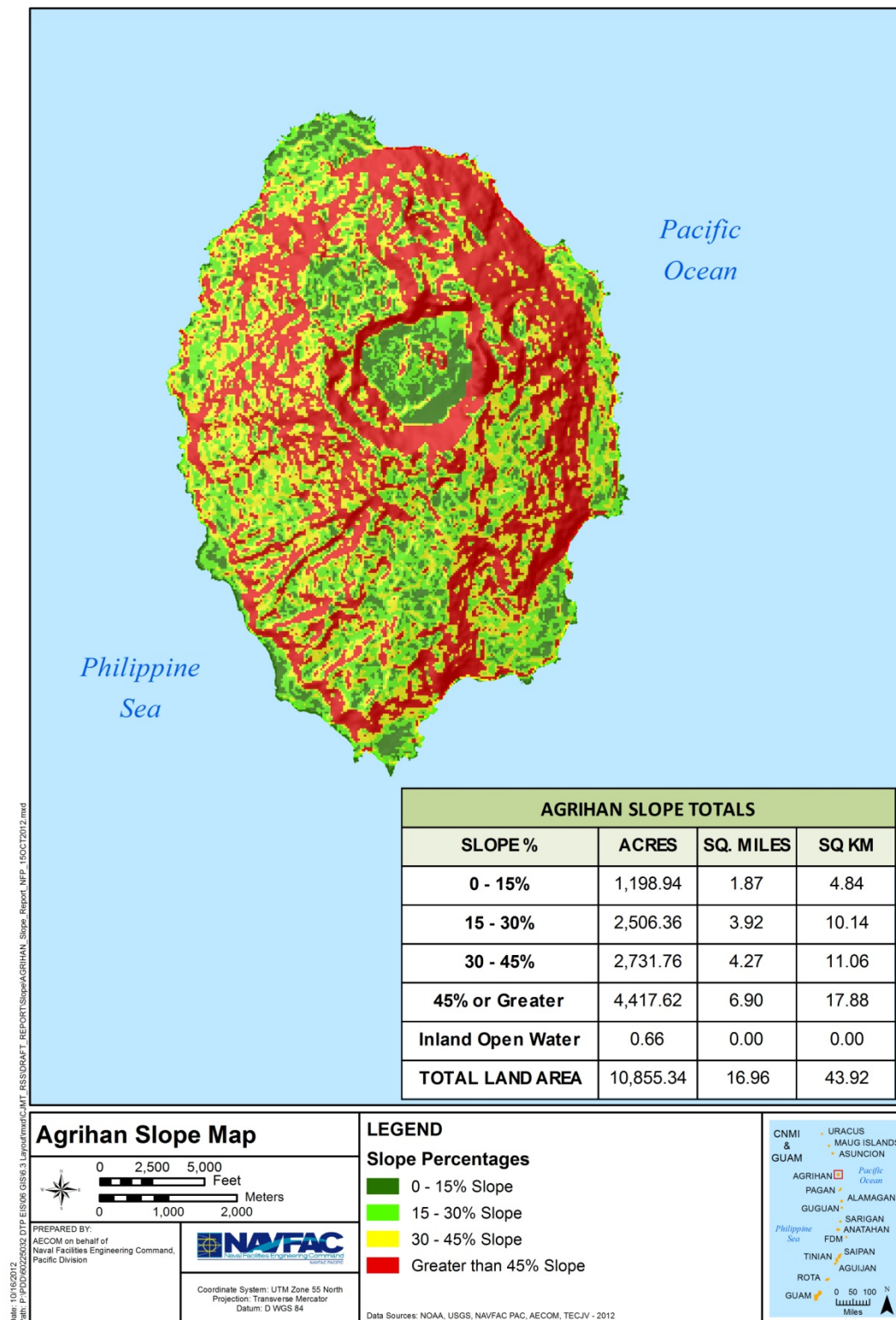


Figure C-9. Agrihan Slope Map

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