

CHAPTER 2.

PROPOSED ACTION AND ALTERNATIVES

2.1 OVERVIEW

The proposed action evaluated in this Volume 2 of the Guam and Commonwealth of Northern Mariana Islands (CNMI) Military Relocation Environmental Impact Statement/Overseas Environmental Impact Statement (EIS/OEIS) is to establish a permanent Marine Corps base on Guam to support the mission and training requirements of Marine Corps units and personnel that will be relocated from Okinawa. The rationale for selecting Guam as the focal point of the proposed relocation is discussed in Chapter 1 of this volume and Volume 1 of the EIS/OEIS, and is therefore not repeated in this chapter. For purposes of the National Environmental Policy Act (NEPA) analysis in this volume of the EIS/OEIS, this Chapter focuses only on the functions, facilities, personnel, operations, and training that would be constructed, stationed, and implemented on Guam in order to accomplish the mission requirements of the proposed relocation. The NEPA analysis for training that would be implemented on Tinian (CNMI) supporting the relocation is in Volume 3.

This chapter of Volume 2 describes the key components of the proposed action, including the facility construction and operational requirements for a Marine Corps Base on Guam, as well as the development of a reasonable set of alternatives for implementing the proposed action and the no-action alternative.

2.1.1 Summary of Proposed Action: Establish a Marine Corps Base on Guam

The proposed action involves constructing and utilizing all required facilities, infrastructure, and training assets necessary to establish a Marine Corps base of operations on Guam. The Marine Corps would relocate approximately 8,600 Marines and their 9,000 dependents from Okinawa to Guam. The proposed action for the approximately 8,600 Marines includes personnel from the units being relocated and the associated base support personnel that must also be present at an installation to support the military mission.

There would be four relocating military elements:

- Command Element, III Marine Expeditionary Force (MEF). III MEF is the Marine Corps' forward-deployed Marine Air-Ground Task Force (MAGTF); it has the ability to deploy rapidly and conduct operations ranging from humanitarian assistance and disaster relief to amphibious assault and high intensity combat. The MAGTF command element consists primarily of headquarters (HQ) and supporting organizations. Collocation and communications connectivity is a primary facility siting requirement. Estimated personnel: 3,046.
- Ground Combat Element (GCE), 3rd Marine Division Units. The GCE has the mission of locating, closing with and destroying the enemy with fire, maneuver, and close combat. It provides infantry, armor, artillery, reconnaissance, anti-tank and other combat arms. It consists of Division HQ and subordinate organizations. Ground combat and combat support

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organizations require proximity to ranges and training areas as well as traditional base support facilities. Estimated personnel: 1,100.

- Air Combat Element (ACE), 1st Aircraft Wing and subsidiary units. The ACE operates from a variety of sea- and shore-based facilities to support Marine Air Ground Task Force (MAGTF) expeditionary operations. The focus of the ACE is to support the MAGTF during assault landings and subsequent operations ashore. The ACE includes the Marine Aircraft Wing (MAW) HQ, expeditionary, and garrison supporting organizations. Unlike aircraft squadrons, aviation command and general supporting elements can be located close to the airfield and higher commands, and do not necessarily need to be located at the airfield. Estimated personnel: 1,856.
- Logistics Combat Element (LCE), 3rd Marine Logistics Group (MLG). The LCE provides all support functions beyond the capabilities of the GCE and ACE units. Functions include: communications, engineering support, motor transport, medical, supply, maintenance, air delivery, and landing support. The LCE consists of MLG HQ and supporting organizations that provide a variety of direct logistics support to the rest of the MEF. The MLG HQ element would be sited in proximity to Command HQ and other HQs. Indirect and industrial support facilities of the LCE would be located in proximity to support activities and maximize efficiency, with efficient access to roads, ports and airfields. Estimated personnel: 2,550.

There would also be a large transient component that includes the following units and approximate personnel numbers:

- Infantry battalion (800 people)
- Artillery battery (150 people)
- Aviation unit (250 people)
- Other (800 people)

For the purpose of clearly defining what amounts to a very complex endeavor, this chapter describes the proposed action and reasonable alternatives in terms of four major functional components of the Marine Corps relocation to Guam. These components represent core capabilities and support functions within the context of the overall Marine Corps mission. The mission capabilities of the units to be stationed in Guam are part of a larger mission capability supporting the overall national defense objectives of the U.S. in the western Pacific. The four functional components of the proposed action are:

1. *Main Cantonment Area functions.* Main cantonment military support functions (also known as base operations and support) include headquarters and administrative support, bachelor housing, family housing, supply, maintenance, open storage, community support (e.g., retail, education, recreation, medical, day care, etc.), some site-specific training functions, and open space (e.g. parade grounds, open training areas, open green space in communities, etc), as well as the utilities and infrastructure required to support the cantonment area.
2. *Training functions.* There are three subclasses of training support functions required by Marine Corps units that would be stationed on Guam:
 - *Firing ranges* are required for live and inert munitions practice, which generates the need for safety buffers called Surface Danger Zones (SDZs), and special use airspace (SUA) for certain weapons.
 - *Non-fire maneuver ranges* are required for vehicle and foot maneuver training, including urban warfare training. Urban warfare training is conducted in buildings that simulate a

city or town. These buildings would be arranged close together so that Marines can practice entering and maneuvering in tight spaces.

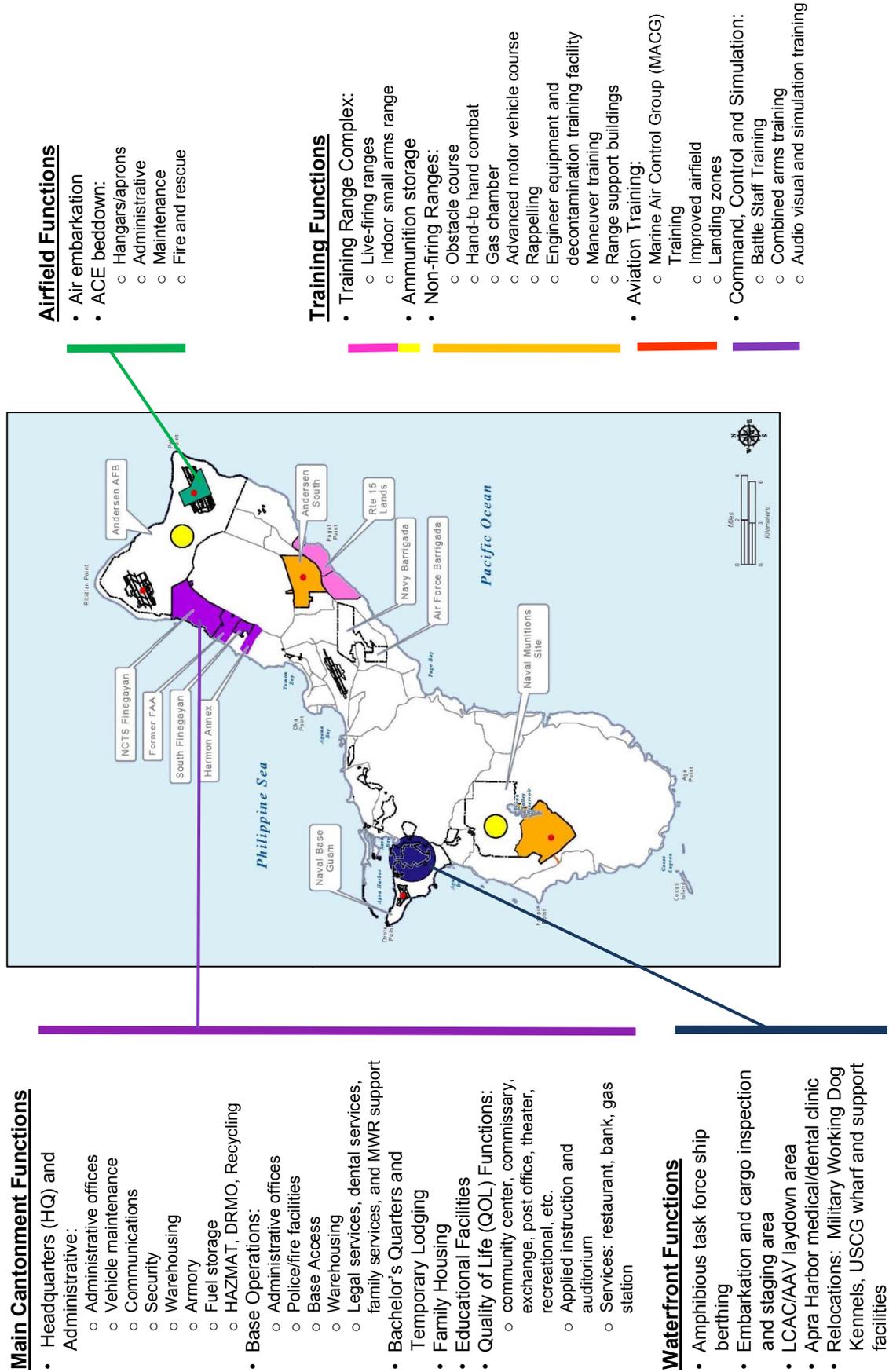
- *Aviation training areas* are either improved (paved runway) or unimproved (unpaved landing sites) used to practice landing/takeoff and air field support (including loading/unloading of fuel, munitions, cargo, and personnel). Aviation training includes use of both international airspace and U.S. controlled airspace within the Mariana Islands Range Complex (MIRC).
3. *Airfield functions.* The proposed Marine Corps relocation would include aviation units and aviation support units that require runway and hangar space and maintenance, supply and administrative facilities. There is also a need for air embarkation operations that are comparable to, compatible with, and co-located with, existing Andersen Air Force Base (AFB) operations. Air embarkation operations refer to loading and unloading cargo and passengers to and from aircraft, comparable to a civilian airport terminal.
 4. *Waterfront functions.* The ships and assault craft associated with the proposed Marine Corps relocation are transient (visiting). The transient vessels support Marine Corps operations and transient forces that presently train on Guam and in the CNMI. These ships would continue to support Marine Corps requirements in the western Pacific after the proposed relocation, and would continue to require transient vessel support facilities on Guam. The planning criteria for harbors, regardless of usage, differ from those for land-based facilities. Therefore, the proposed waterfront facilities required, although training-related, are being discussed in this EIS/OEIS as distinct from other training actions.

Each of these project components is characterized by unique facility and operational requirements that together comprise one proposed action. Figure 2.1-1 lists, for each of the four components, the types of facilities that would be constructed and operated under the proposed action. These proposed facilities and operations are described further in Sections 2.2.1, 2.3.1, 2.4.1, and 2.5.1, respectively, for each of the four functions.

The process and criteria used to develop and evaluate a set of reasonable alternatives for implementing the proposed action are described generally in Section 2.1.2 below. Results of the alternatives screening process for each of the four functional components of the action are described in Sections 2.2.2, 2.3.2, 2.4.2, and 2.5.2, respectively. Alternatives were identified for each of the following:

- *Main Cantonment Area functions:* eight alternatives representing different site-specific planning alignments for the required Main Cantonment functions (and selected training functions) were identified and evaluated, with four of these (Alternatives 1, 2, 3, and 8) being carried forward for detailed analysis in the EIS/OEIS.
- *Live-fire Training Range Complex:* Firing ranges would be collocated on land to be acquired east of Andersen AFB South (Andersen South). Two alternatives (Alternative A and B), representing different site-specific planning alignments of various range facilities required to conduct live-fire training, were identified and are carried forward for analysis in the EIS/OEIS.
- *Access Road for Large Scale Maneuver Training Area:* two alternatives representing different levels of improvement for a single location are carried forward for analysis in the EIS/OEIS.
- *Munitions Storage Facilities at the existing Naval Munitions Site (NMS):* two alternatives representing different locations and alignments for a proposed set of 10 new munitions storage magazines are carried forward for analysis in the EIS/OEIS.

Figure 2.1-1 Overview of Proposed Facility Construction and Operations on Guam



The alternatives introduced above are functionally independent of each other and could be combined, along with the other project elements listed below, to yield a proposed action that satisfies all of the Marine Corps' requirements for the proposed relocation to Guam (Figure 2.1-2). Table 2.1-1 lists the projects associated with the functional components for the proposed action.

The following are elements of the proposed action where no reasonable alternatives have been identified:

- Air Traffic Control Detachment Training Site: sites to support this component of Aviation Training are Northwest Field [NWF] and North Ramp at Andersen AFB.
- Tactical Air Operations Center: sites to support this component of Aviation Training are NWF and North Ramp at Andersen AFB.
- Demolition Range: the existing range at NWF would be used by the Marine Corps.
- Pistol Range: the existing pistol range at Naval Computer and Telecommunications Station (NCTS) does not meet the requirements for Marine Corps pistol qualification training and would be relocated as a component of the proposed live-fire Training Range Complex.
- Airfield facilities and operations would be implemented and integrated into existing Andersen AFB airfield operations and base support requirements.
- Ammunition storage facilities and related support facilities would be constructed at the existing Andersen AFB Munitions Storage Area and at the High 12 Group area at the NMS.
- Waterfront facilities and operations would be implemented and integrated into existing Naval Base Guam operations at Inner Apra Harbor.
- Aviation training would be integrated into existing training venues where possible. Aviation training would be conducted at existing paved runways at Andersen AFB, NWF, and Orote Point Airfield. Specific training requirements, including, air-to-air, and air-to-surface training, would be conducted at other existing aviation training areas in CNMI and international airspace (as addressed in the MIRC EIS/OEIS [Navy 2009]). New unimproved vertical lift landing zones (LZ's) would be developed at Andersen South and NMS.
- Non-firing company-level maneuver training would occur at Andersen South and NMS. New access to NMS would be required and two access road alternatives were identified as introduced above.

Some additional training requirements would be met by using training areas on the Island of Tinian in the CNMI. These proposed training activities are distinct from the proposed action on Guam and are addressed in Volume 3 of this EIS/OEIS.

LEGEND

Preferred Alternative

PROPOSED ACTION

All decisions also include relocation of 8,600 Marines and 9,000 dependents to Guam

Main Cantonment Area/Housing

- Main Cantonment Area

Training Functions

- Construct High Explosive ECM at NMS High 12 Group Area
- Construct 12 Standard ECM's and Support Facilities at Andersen AFB MSAI
- Air Traffic Control Detachment Training at NWF and North Ramp
- Tactical Air Operations Center at NWF and North Ramp
- Improved Airfield Training at NWF and North Ramp
- Training Range Complex
- NMS Maneuver Area Access Road
- NMS Ammunition Storage
- Construct 12 New Landing Zones at NWF Orote Airfield, Andersen South, and NMS
- Use demolition range at NWF
- Establish Restricted Area Airspace for Machine Gun Range Component of Training Range Complex

Airfield Functions

- Beddown Marine Corps Air Combat Element (ACE) Squadron and Construct Associated Facilities at Andersen AFB North Ramp
- Construct Air Embarkation Facilities at Andersen AFB South Ramp
- Construct North Gate and Access Road, Andersen AFB

Waterfront Functions

- Construct or Improve Required Ship Berths and Embarkation/ Staging Areas at Naval Base Guam
- Relocate Coast Guard Berthing and Crew Support Building at Oscar/Papa Wharves
- Relocate Military Working Dog Kennels, Naval Base Guam
- Construct Apra Medical/Dental Clinic at Naval Base Guam
- Mechanical Dredging in Apra Harbor*
- Dredged Material Management

ALTERNATIVES CARRIED FORWARD
(excludes no-action alternative)

Main Cantonment Area

- One contiguous location from NCTS Finegayan to Harmon Annex, includes South Finegayan; acquire non-DoD lands at the Former FAA parcel and Harmon Annex.
- One contiguous location from NCTS Finegayan to South Finegayan; acquire non-DoD lands at the Former FAA parcel.
- Four non-contiguous areas on DoD properties: cantonment at NCTS Finegayan and South Finegayan; housing at Navy Barrigada and Air Force Barrigada.
- Three non-contiguous areas requiring non-DoD land acquisition. Main Cantonment at NCTS Finegayan; housing at the Former FAA parcel, South Finegayan, and Air Force Barrigada

Training Range Complex

- East coast of Guam with land acquisition of 921 acres; all ranges would be located east of Andersen South on non-DoD land to the east of Route 15. Requires realignment of 1.7 miles of Route 15.
- East coast of Guam with land acquisition of 1,129 acres; no realignment of Route 15.

NMS Access Road

- Improve existing Hiking Trail
- Use existing Hiking Trail

NMS Ammunition Storage

- Parson's Road
- High Road Area

Dredged Material Management

- Beneficial Reuse (Priority)
- Ocean Disposal
- Upland Placement

Choose One

Choose One

Choose One

Choose One

Choose Any or All

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*Note: Analysis assumed dredging by mechanical means as an environmental maximum potential adverse affect method and is the method historically used at Apra Harbor. Hydraulic dredge may be used in final design and permitting.

Figure 2.1-2
Summary of Proposed Action and Alternatives Carried Forward for the Marine Corps Relocation, Guam

Table 2.1-1. Projects Associated with the Relocation of Marines to Guam

<i>Component</i>	<i>Project Title</i>			<i>Con</i>	<i>Op</i>	<i>Location</i>
2.2/2.2-4	Main Cantonment	Headquarters and Administrative facilities, Base Operations, Temporary Lodging, Family Housing, Educational facilities, Quality of Life, Commercial Gate, Main Gate, and Residential Gate,	Main Cantonment: Alternative 1	X	X	North: NCTS Finegayan (Cantonment), Potts Junction (utilities), Former FAA, South. Finegayan, and Harmon Annex (Housing)
2.2/2.2-5	Main Cantonment	Headquarters and Administrative facilities, Base Operations, Temporary Lodging, Family Housing, Educational facilities, Quality of Life, Commercial Gate, Main Gate, and Residential Gate,	Main Cantonment: Alternative 2	X	X	North: NCTS Finegayan (Cantonment), Potts Junction (utilities), Former FAA and South Finegayan (Housing)
2.2/2.2-6	Main Cantonment	Headquarters and Administrative facilities, Base Operations, Temporary Lodging, Family Housing, Educational facilities, Quality of Life, Commercial Gate, Main Gate, and Residential Gate,	Main Cantonment: Alternative 3	X	X	North: NCTS Finegayan (Cantonment), Potts Junction (utilities), South Finegayan, Central: Navy Barrigada, AF Barrigada (Housing)
2.2/2.2-7	Main Cantonment	Headquarters and Administrative facilities, Base Operations, Temporary Lodging, Family Housing, Educational facilities, Quality of Life, Commercial Gate, Main Gate, and Residential Gate,	Main Cantonment: Alternative 8	X	X	North: NCTS Finegayan (Cantonment), Potts Junction (utilities), Former FAA, S. Finegayan, Central: AF Barrigada (Housing)
2.3/ 2.3-5	Training	Non-Firing/Maneuver	Access Roadway, Alternative A	X	X	South: NMS
2.3/ 2.3-5	Training	Non-Firing/Maneuver	Access Roadway, Alternative B		X	South: NMS
2.3/2.3-11	Training	Aviation Training	Improved airfield, ATC, TAOC		X	North: NWF, North Ramp, Andersen AFB
2.3/2.3-11	Training	Aviation Training	Landing Zone (4)		X	North: Andersen AFB - NWF
2.3/2.3-11	Training	Aviation Training	Landing Zone (2) (new)	X	X	Central: Andersen South
2.3/2.3-11	Training	Aviation Training	Landing Zone (1)		X	Apra Harbor: Orote
2.3/2.3-11	Training	Aviation Training	Landing Zone (5) (new)	X	X	South: NMS
2.3	Training	Aviation Training	Airfield Training		X	North: AAFB
2.3/NA	Training	Firing Ranges	Demolition Range		X	North: NWF

Table 2.1-1. Projects Associated with the Relocation of Marines to Guam

<i>Component</i>	<i>Project Title</i>			<i>Con</i>	<i>Op</i>	<i>Location</i>
2.3/2.3-17	Training	Firing Ranges	Hand Grenade Range and grenade house (HG1) (co-located with Firing Range Complex Alternative A)	X	X	Central: Andersen South
2.3/2.3-17	Training	Firing Ranges	Hand Grenade Range and grenade house (HG2) (co-located with Firing Range Complex Alternative B)	X	X	Central: Andersen South
2.3/2.3-16	Training	Live Fire: KD Range, Pistol Range, Square-Bay Range, UD Range, Range Control, Machine Gun Range; range roads, Realignment of Route 15; range towers; Proposed SUA Airspace	Firing Range Complex: Alternative A	X	X	Central: Rt 15 Plateau
2.3/2.3-16	Training	Live Fire: KD Range, Pistol Range, Square-Bay Range, UD Range, Range Control, Machine Gun Range; range roads; range towers; Proposed SUA airspace	Firing Range Complex: Alternative B	X	X	Central: Rt 15 Valley
2.3/2.3-13	Training	Munitions	Munitions Storage: Alternative A	X	X	South: NMS - Parsons Rd
2.3/2.3-13	Training	Munitions	Munitions Storage: Alternative B	X	X	South: NMS-High Rd Area
2.32.3-14	Training	Munitions	Munitions Storage High 12 Group	X	X	South: NMS
2.3/2.3-14	Training	Munitions	MSA1 Storage Improvements	X	X	North: Andersen AFB
2.3/2.3-6	Training	Non-Firing Ranges	Breacher and Shooting House (at MOUT)		X	Central: Andersen South
2.3/2.3-6	Training	Non-Firing Ranges; Pioneer Road	Convoy Course	X	X	Central: Andersen South
2.3/2.3-6	Training	Non-Firing Ranges	AMVOC	X	X	Central: Andersen South
2.3/2.3-6	Training	MOUT, Logistics/Administrative, Perimeter security fencing, gates	MOUT	X	X	Central: Andersen S
2.3/2.3-3	Training	Non-Firing Ranges	Maneuver Area		X	Central: Andersen S
2.3/2.3-3	Training	Non-Firing Ranges	Maneuver Area		X	South: NMS
2.3/2.2-4, 2.2-5, 2.2-6, 2.2-7	Training	Non-Firing Ranges	Engineering Equipment and Decontamination Training	X	X	Main Cantonment

Table 2.1-1. Projects Associated with the Relocation of Marines to Guam

<i>Component</i>	<i>Project Title</i>			<i>Con</i>	<i>Op</i>	<i>Location</i>
2.4/2.4-1	Airfield	ACE	MALS Hangar, Corrosion Hangar, Air Ops Center, AAFB North Ramp Parking, Squadron Aircraft Hangars, armories, fire station, control tower, maintenance shops, POV parking	X	X	North: Andersen AFB - North Ramp
2.4/2.4-3	Airfield	Air Embarkation	South Ramp - Joint w/ AMC	X	X	North: Andersen AFB - South Ramp
2.4/2.4-4, 2.4-5	Airfield	Gate/Access	North Gate and New Access Road.	X	X	North: Andersen AFB

These elements are depicted in Figure 2.1-3 and would be included in any proposed action that would be implemented by the Marine Corps on Guam, regardless of the mix of alternatives implemented for other components of the action.

The most substantial differences between the alternatives carried forward for any of the four functional project components relate to the orientation of main cantonment area functions. Alternatives 1, 2, and 8 include a requirement for obtaining a real estate interest in the former Federal Aviation Administration (FAA) land parcel. Alternative 1 also requires acquisition of a portion of the Harmon parcel of land. The acquisition of access rights and land parcels would be pursued with the appropriate land owners upon completion of the Record of Decision. The alternatives vary in the quantity of non-Department of Defense (DoD) land to be acquired in the vicinity of NCTS Finegayan and the quantity of NCTS Finegayan proposed for development. Two of the four alternatives (3 and 8) would divide the family housing/community support facilities between properties located in the eastern and western sides of Guam. All four action alternatives meet the purpose and need of the proposed action. Figure 2.1-4 illustrates the differences between the four Cantonment Area action alternatives.

2.1.2 Alternatives Analysis Methodology

This section summarizes the methodology and criteria used to identify potential project alternatives on Guam, to screen out alternatives that would not satisfy the purpose and need for the action, and to develop the range of reasonable action alternatives that are carried forward in the EIS/OEIS impact analyses. The alternatives development process that was used to identify a reasonable set of project alternatives for the proposed action on Guam involved the following four steps:

- Step 1. *Identify Requirements*: Identify and evaluate the facility and operational requirements associated with the Marine Corps units moving to Guam within the context of the overall mission of the Marine Corps and DoD in the western Pacific.
- Step 2. *Identify Site Alternatives*: Identify specific land parcels, training ranges, and other assets that would feasibly accommodate, with or without modification, each of the functional requirements identified in Step 1. Screening criteria were used to identify both DoD and non-DoD parcels that would feasibly accommodate either aggregated or disaggregated Marine Corps functions. No one contiguous area on Guam was identified that could support all the land use and operational requirements of the action, and the amount of available DoD land was insufficient to satisfy the requirements exclusively. Some project components, such as airfields and waterfront facilities, could be sited in Step 2 independent of other proposed land uses or requirements, as they could be accommodated at existing military facilities designed for those functions. Other project components, such as individual elements of the main cantonment area, required further analysis to evaluate various site plan characteristics that might enable feasible project alternatives within identified development sites.
- Step 3. *Identify Site-Specific Planning Alternatives*: Evaluate specific sites or groupings of available sites identified in Step 2 to determine if alternative combinations of functional elements (e.g., individual main cantonment or training functions) could be feasibly planned to satisfy defined criteria and the purpose and need for the action.
- Step 4. *Select Alternatives for Analysis*: In situations where multiple alternatives would be feasible for a particular function apply criteria to identify the alternatives that best satisfy the requirements identified in Step 1.

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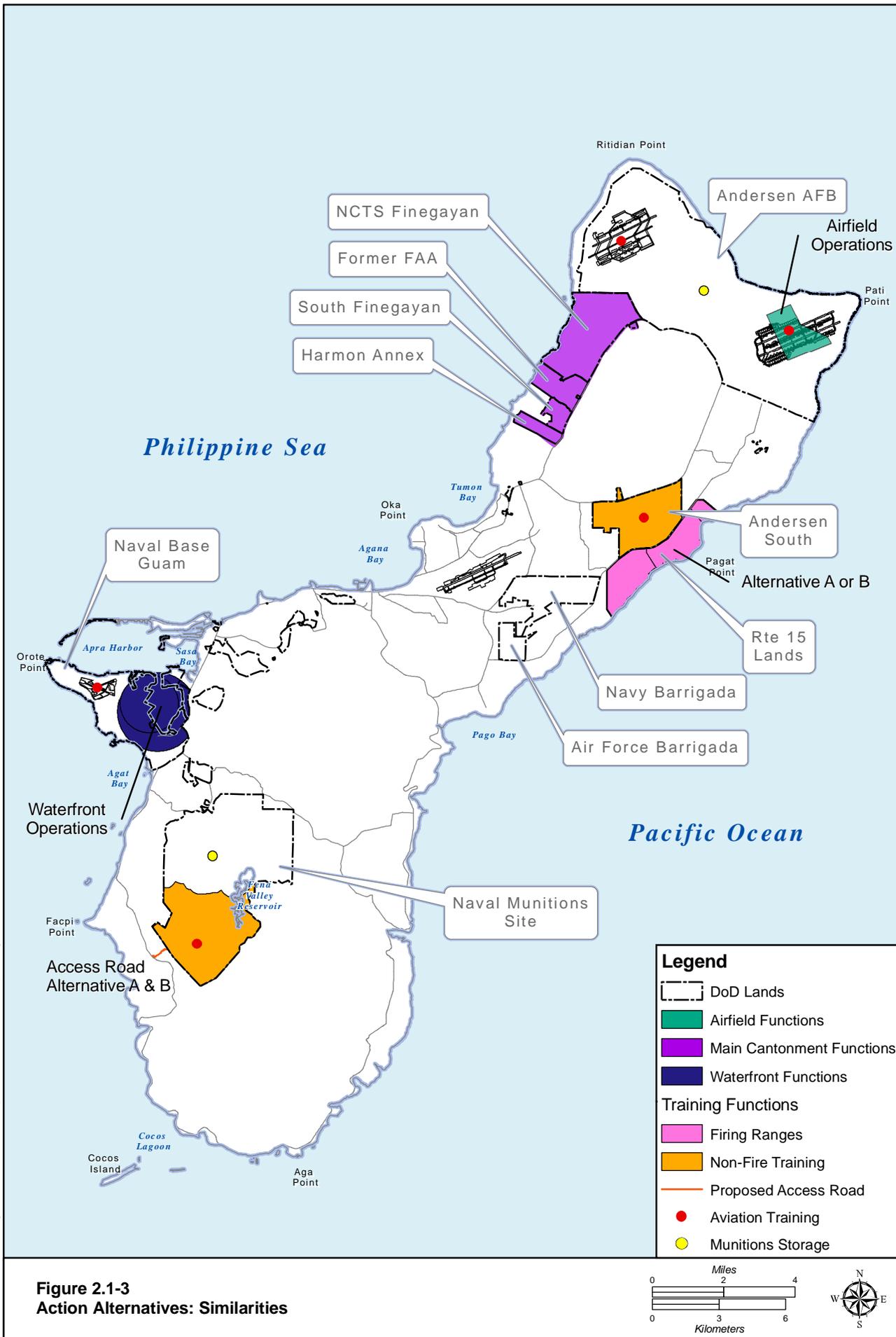
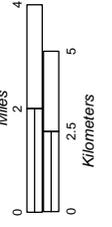


Figure 2.1-3
Action Alternatives: Similarities

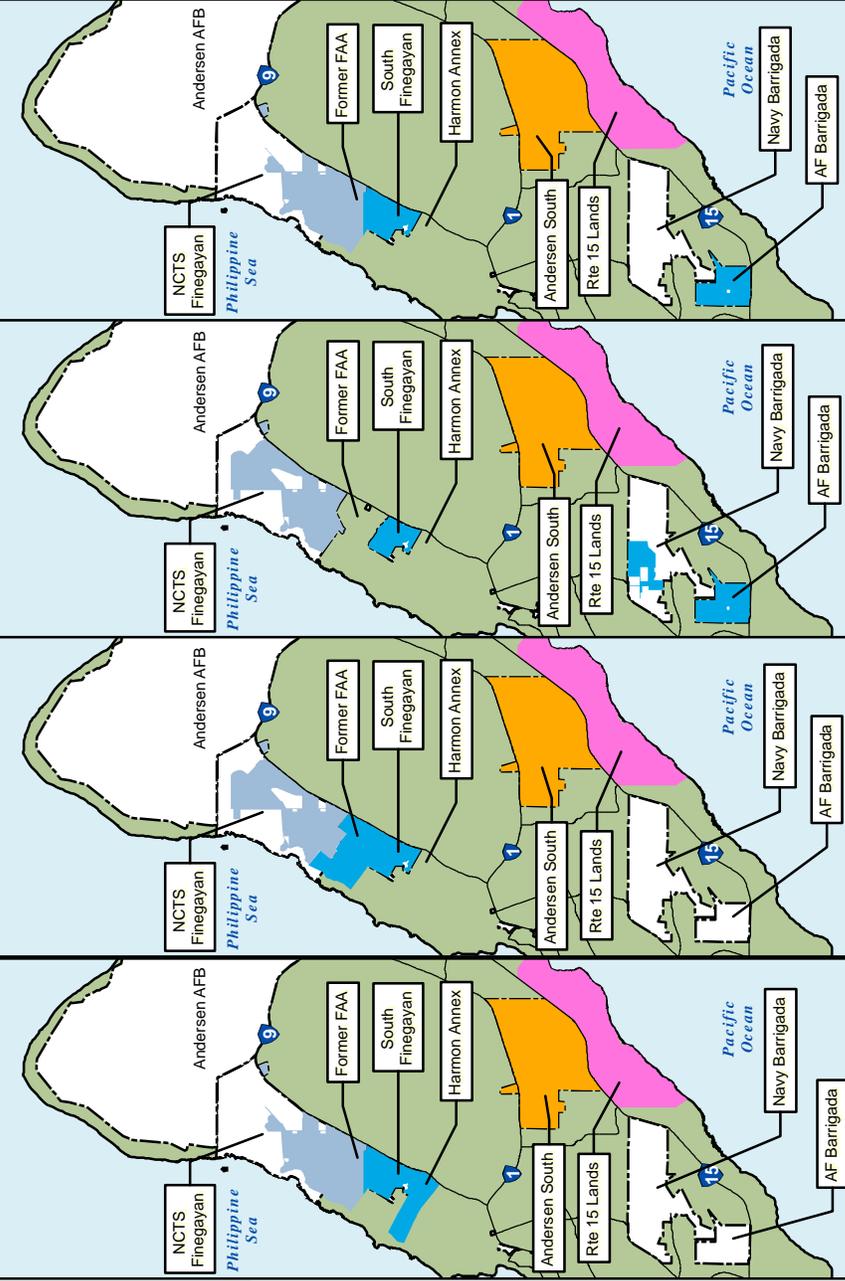
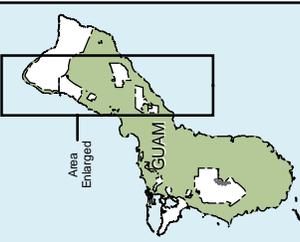
Figure 2.1-4
Comparison of Main
Cantonment Area
Alternatives

Legend

-  DoD-No Planned Landuse
-  Non-DoD Lands
-  Main Cantonment
-  Family Housing/Community Support
-  Firing Range Alternative (A, B)
-  Non-Fire Training



Characteristics	Alternative			
	1	2	3	8
Percent of Overlay Refuge lost at NCTS Finegayan	29	53	53	29
Former FAA	680	680	0	680
Former Harmon Annex	326	0	0	0



This four-step process was applied independently for individual projects comprising each of the four functional components of the action: main cantonment, training, airfield, and waterfront. Sections 2.2 through 2.5 describe in detail, for each functional component of the action, the specific infrastructure projects and operations that comprise the proposed action, as well as the project alternatives that were identified. Section 2.6 summarizes the set of all reasonable alternatives for the proposed action, as well as the no-action alternative.

Alternatives associated with utility infrastructure requirements for the proposed action components (e.g., power, wastewater, potable water and solid waste management) are discussed in Volume 6. Utility planning requires technological alternatives analysis as well as siting alternatives analysis. The utilities planning would follow the overall master planning evolution.

2.1.2.1 Step 1 Requirements Analysis

Land use and operational requirements associated with the proposed Marine Corps relocation to Guam were based on intensive, multi-phased planning efforts conducted by the United States (U.S.) Navy and Marine Corps. Ongoing master planning efforts would continue throughout design and construction phases of the action. Details of the identified requirements for each functional component of the action are provided in Sections 2.2.1, 2.3.1, 2.4.1, and 2.5.1, respectively.

2.1.2.2 Step 2 Site Alternatives

In accordance with federal requirements on land usage, including Title 42 U.S. Code (USC) and applicable rules and regulations, the master planning effort identified the Marine Corps' specific facility and space requirements on Guam based upon unit mission, functions, and required capabilities. The total acreage of land required was estimated based on planning assumptions and planning guidance codified in Unified Facility Criteria (UFC) codes. The Guam Joint Military Master Plan (NAVFAC Pacific 2009) lists planning assumptions and criteria for the development plans (e.g., family housing density is based on 4-6 units per acre (ac) and maximum building height is four floors). Some of the assumptions were driven by operational requirements and others by military standards or existing on-island military construction. These assumptions were used for gross assessment of acreage required and are subject to change as the master planning is refined. The available DoD land was compared with the total facility requirements and evaluated against the potential loss of military mission capability. The results indicate that potential loss of mission capability was unacceptable when only DoD land was considered for development. Non-U.S. controlled property was considered in the analysis of the alternatives.

Initially, a key assumption was that most of NCTS Finegayan, excluding existing communications facilities and the Haputo Ecological Reserve, was developable. However, through subsequent informal agency consultations, agency review of a preliminary Description of Proposed Action and Alternatives (DOPAA) (April 2008), and subsequent partnering meetings, the Navy recognized the importance of keeping the Overlay Refuge as intact as possible. The Overlay Refuge was created to support the recovery efforts of four endangered species and is included in the recovery plans for certain species. The Overlay Refuge boundaries encumber 87% of NCTS Finegayan and 98% of Andersen AFB NWF as all operational areas were excluded from the original Overlay Refuge designation. The result of this consideration was a range of alternatives that differ from the DOPAA (April 2008) action alternatives and generally these new alternatives require more land acquisition and/or long term leasing than was initially estimated when assuming the majority of NCTS Finegayan was developable.

The Step 2 site selection process matched land parcels with required land use functions. The candidate parcels were NCTS and South Finegayan, Andersen South, Barrigada (Navy and Air Force), Naval Base

Guam, NMS; and specific non-DoD lands. The candidate DoD lands were selected because they had adequate areas of contiguous open space and had large areas of contiguous developable land.

Before acquiring real property by purchase or lease, a DoD Component shall determine that the requirement cannot be satisfied by: excess, under-utilized, or otherwise, available property held by other Military Departments or Federal Agencies (DoD Instruction 4165.71, Real Property Acquisition, January 2005). This instruction is aimed at maximizing the use of existing DoD land prior to acquiring non-DoD land. During Step 2, it became apparent that not all of the mission critical functions and requirements would fit on DoD land on Guam. Navy direction was to then consider non-DoD land for mission critical functions. Limiting non-DoD land use to mission critical functions did not provide sufficient land use flexibility and was an inefficient method to determine maximum and best land use. Ultimately, the main cantonment facilities were sited on non-DoD land. The preference was to consider for use non-DoD lands that were adjacent to DoD lands, thus maximizing best land use practices and formation of contiguous DoD property, affording both Guam planners and DoD planner's efficiencies in urban planning for community development. In addition, there were lands that were proposed for consideration by special interest groups or private parties (e.g., Leo Palace) or lands that were unique in function such as the Won Pat International airport. These lands are summarized in Table 2.1-2 and Table 2.1-3 and identified on Figure 2.1-5.

All DoD candidate parcels were considered suitable and feasible for at least one land use function. Of the non-DoD parcels, Won Pat International Airport, Guam Land Use Plan (GLUP) of 1977 (GLUP 77), and Leo Palace were eliminated from further consideration. The rationale for eliminating the Won Pat International Airport for airfield operations and Leo Palace for family housing is described below. GLUP 77 identified multiple DoD parcels for release. The Guam Excess Land Act of 1994 (Public Law 103–339; 108 Stat. 3116) addresses the release of these parcels. Throughout this EIS/OEIS the one parcel near NCTS Finegayan is referred to as the GLUP 77 parcel because it is the name that is familiar to most area residents. The elimination of GLUP 77 for any Marine Corps land use was based solely on the anticipated duration of the land acquisition or long term leasing process (10 years) relative to other non-DoD parcels (2 to 3 years). With an anticipated relocation in 2014, GLUP 77 land acquisition or long-term leasing would not meet the project purpose and need.

Table 2.1-2. DoD Parcels Considered

<i>Location</i>	<i>Current Uses</i>	<i>Total ac/hectare [ha] (approximate)</i>
Naval Base Guam	Industrial waterfront (includes ship repair), headquarters, administrative, bachelor and family housing, community support, ship	6,200/2,509
NMS	Munitions storage, breacher house (shell of building for practicing forced entry)	8,645/3,498
NCTS Finegayan	Communications facilities, housing, small arms range	2,700/1,093
South Finegayan	Family housing	290/117
Barrigada (Navy)	Communications facilities	1,417/573
Andersen AFB (includes NWF)	Airfield operations, headquarters, administrative, housing, community support, munitions storage	15,423/6,241
Barrigada (Air Force)	Weather tower (Next Generation Weather Radar [NEXRAD])	432/175
Andersen South	Urban warfare training	2,060/834

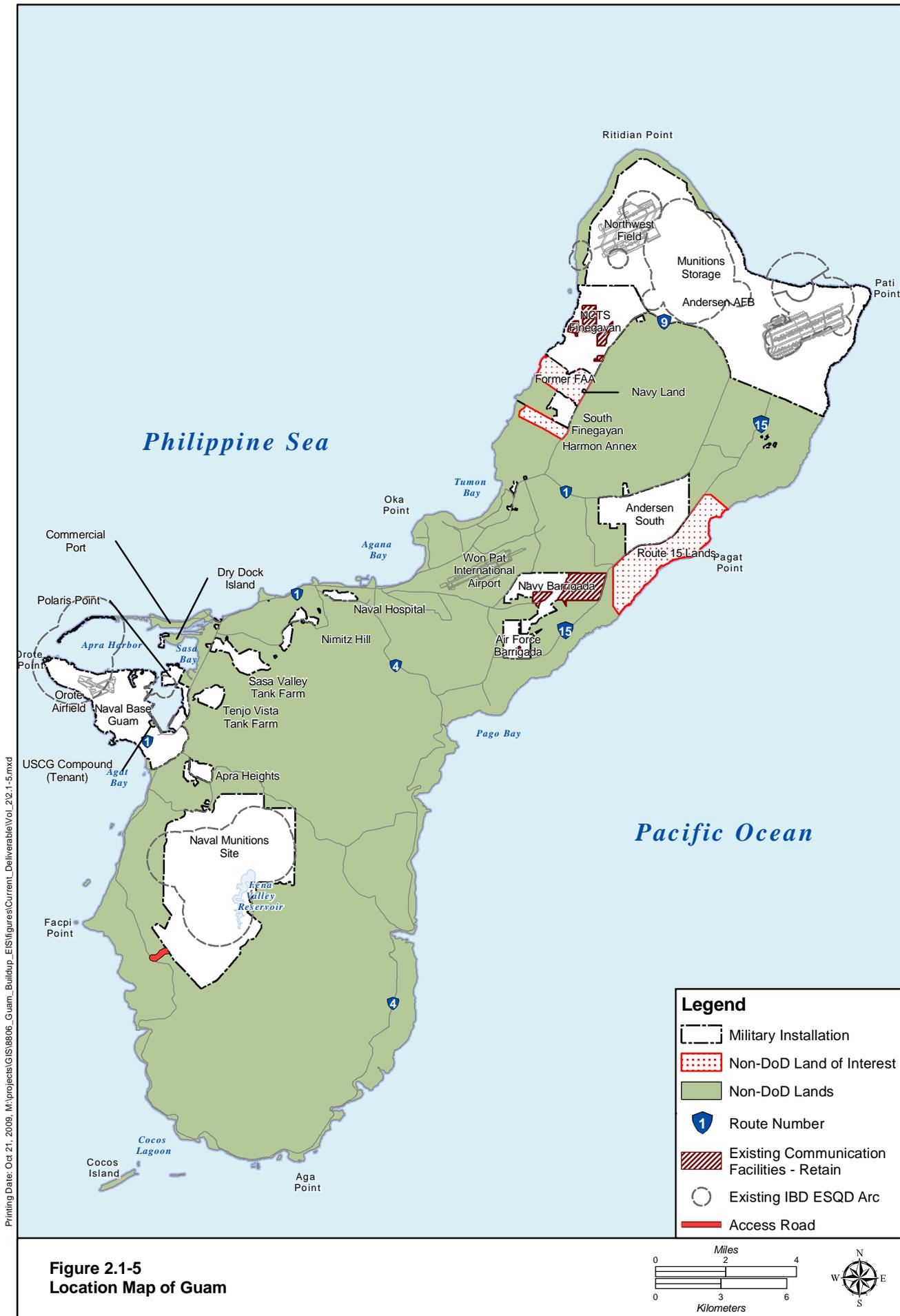
Source: NAVFAC Pacific 2009.

Table 2.1-3. Non-DoD Land Parcels Considered

<i>Parcel Name</i>	<i>Owner</i>	<i>Current Use</i>	<i>Total ac/ha (approximate)</i>
Won Pat International Airport, Former Naval Air Station Airfield located at Tiyan Guam	Government of Guam (GovGuam) Former DoD airfield. Some portions conveyed to private owners	Won Pat International airport, GovGuam offices, private commercial and residential parcels and economic development conveyance properties	undetermined
√ Former FAA housing parcel	Private owners and GovGuam	Mostly undeveloped with the exception of some apparent temporary use	681/276
GLUP 77 (Finegayan)	In process of transfer from federal to GovGuam	Undeveloped	450/182
Leo Palace	Private	Hotel/resort + golf course	1,310/530
√ Route 15 lands, located east of Andersen South	Private owners and GovGuam	Northern plateau mostly undeveloped with exception of Guam Raceway Park facility. Southern valley portion mostly undeveloped with the exception of a stone quarry operation and a few residences	1,100 to 1,800/ 455 to 728
√ Harmon Properties	Private owners and GovGuam	Mostly undeveloped with the exception of some apparent temporary structures and a few abandoned buildings	330 to 1,000/ 134 to 405
√ NMS Access (two alternatives)	Private owners and GovGuam	Alternative A and B location is an existing unimproved trail.	Alternative A: 1.9

Legend: √ = Parcels retained in EIS/OEIS action alternatives.

Source: TEC 2009.



Step 3 Site-Specific Planning Alternatives

In Step 2, proposed development sites were identified for waterfront, airfield, and some training functions; there were no reasonable alternative locations for these functions based on consistency and compatibility with existing land uses. Step 2 identified more than one area on Guam that would be suitable for main cantonment and selected training functions, so Step 3 planning analysis was applied to these areas to identify alternative ways to distribute and orient required facilities and functions within the candidate parcels identified in Step 2. Applying this process to cantonment area functions, for example, led to the identification of eight different alternatives representing variations in placement and orientation of the proposed facilities within the candidate parcels. Similarly, this process revealed two reasonable alternatives for positioning the various component ranges of the live-fire Training Range Complex.

2.1.2.3 Step 4 Selection of Alternatives Carried Forward for Analysis

Steps 2 and 3 of the alternatives analysis process were designed to yield project alternatives that are feasible strictly from a planning and project design perspective. In Step 4 of the process, other important factors were considered in order to eliminate alternatives that did not satisfy other defined (non-planning) criteria.

Three criteria were identified as necessary to make an alternative reasonable: (1) environmental, (2) political/public concerns, and (3) mission compatibility. Each alternative was classified as “meets” or “does not meet” for each of the criteria (JGPO Main Cantonment Info Brief Inputs v3 [draft] 2008 [JGPO 2008]):

1. Environmental. Alternative does not meet criteria if there are overwhelming negative environmental impacts, particularly in relationship to essential habitat as determined by informal consultations with environmental regulatory agencies. In this case, the alternative would be modified to reduce these impacts as much as possible.
2. Political/public concerns. Alternative does not meet criteria if there are issues that would cause overwhelming and inescapable lack of public support that would prevent program execution and harmonious relations between DoD and the community, as determined through ongoing discussions with representatives from the GovGuam and/or with Congresswoman Madeline Bordallo and her senior staff and other members of the Guam community.
3. Mission compatibility. Alternative does not meet criteria if it would be significantly detrimental to Marine Corps operations, readiness and mission. This evaluation was based on a Marine Corps evaluation of effects of the alternative on Marine Corps readiness as evaluated by leadership and operational commanders’ professional judgment.

This step eliminates the alternatives that do not meet all of these criteria. An alternative does not meet the service criteria if it would be so challenging to the military commands that military mission, readiness and operations would be compromised and would not meet the purpose and need for the project.

2.1.3 No-Action Alternative

Under the no-action alternative, Marine Corps units would remain in Japan and would not relocate to Guam, though they may continue to train on Guam as is the present practice. No additional training capabilities (beyond what is proposed in the MIRC EIS/OEIS) would be implemented for Guam to support the proposed action. There would be no land acquisition or long term leasing, dredging, new construction or infrastructure upgrades associated with Marine Corps forces stationed on Guam. The no-action alternative would fail to satisfy the purpose and need for the proposed action; however, as required by NEPA, the no-action alternative is carried forward for analysis in this EIS/OEIS.

2.2 PROPOSED ACTION: MAIN CANTONMENT AREA FUNCTIONS

The proposed action includes construction and operation of required facilities that would comprise the Main Cantonment Area for the proposed Marine Corps Base on Guam.

2.2.1 Requirements

Facility requirements for the Main Cantonment Area include a full range of facility types, not unlike a small city: various types of housing, workplaces, recreation areas, education facilities, and health and safety-related functions. The workplace facilities are typical of a military base and include headquarters, maintenance facilities, warehouses, training areas (field and classroom), equipment/vehicle storage, and hazardous materials management and storage areas. Facilities in support of waterfront and aviation operations are not included under the description of the Main Cantonment Area because it is not essential that the associated functions be located in close proximity to or contiguous with each other. Family housing and associated community support facilities may be included in a cantonment area but they can also be located separate from cantonment workplace facilities. A contiguous Main Cantonment provides operational efficiency, minimizes travel and traffic impacts, averts potential future encroachment, reduces operational costs, and decreases other potential impacts that could result from forces and facilities being decentralized throughout the island. When contiguous land is not available for Main Cantonment and family housing/community support facilities, neighborhoods of housing and community support are planned on non-contiguous parcels. Operationally, mission workplace functions need to be co-located with like functions to effectively support the military mission.

Cantonment area facility requirements are grouped into the following categories based on commonality of purpose and function:

Headquarter (HQ) and Administrative Support Functions

- Administrative offices
- Vehicle Maintenance
- Electronic/Communications Support and Maintenance
- Security
- Warehousing
- Armory
- Fuel Storage
- Recycling Center

Base Operations

- Administrative offices
- Military Police functions: brig/confinement, police offices, rehabilitation facilities, military dog kennels
- Fire station and alert force facilities
- Base access: gate house, pass and identification, photographic facilities

Chapter 2:

2.1 Overview

2.2 Main Cantonment Area Functions

2.3 Training Functions

2.4 Airfield Functions

2.5 Waterfront Functions

2.6 Summary of Alternatives

- Warehousing
- Legal services, dental services, family services, and Morale, Welfare, and Recreation (MWR) support
- Defense Reutilization and Marketing Office
- Hazardous Materials (HAZMAT) Management and Storage/Corrosion Control

Bachelor's Quarters and Temporary Lodging

- Bachelor enlisted quarters, club, dining, indoor fitness, and swimming pool
- Bachelor officer quarters, Officer's Club
- Temporary Lodging facilities

Family Housing

- Single-family and attached housing facilities of various sizes and types

Educational Facilities

- Child Development/daycare facilities
- Elementary schools
- Middle schools
- High School

Quality of Life (QOL) Functions

- Main Community Center: commissary, exchange, post office, theater, bowling alley, vehicle maintenance, hobby shop, medical clinic, religious ministry facilities
- Applied instruction and auditorium facilities
- Fitness centers, swimming pool, youth centers
- Services: restaurant, location exchange, bank, gas station, gate house

These are the facilities that would be constructed as part of the proposed action. Additional training support facilities, such as tactical trainers, obstacle courses, gas chamber, and indoor pistol range are discussed in Section 2.3. All of the proposed facilities would incorporate varying degrees of energy, locational, and water use efficiencies consistent with legal requirements and official Marine Corps policy. Various tools and design features would be used to achieve Leadership in Energy and Environmental Design (LEED) Silver certification for various development areas of the base and/or for specific buildings.

Table 2.2-1 provides specific details about the proposed facilities of each type listed above. The facility sizing and type was determined by the planned size of the base population, the UFCs, and completion of the Basic Facility Requirements sheets for each building.

Table 2.2-1. Details of Main Cantonment Facility Requirements

<i>Facility Description</i>	<i>Number of Facilities</i>	<i>Number of Personnel</i>	<i>Hours of Operation</i>	<i>Facility Square Footage</i>	<i>Max # Floors</i>	<i>Max Building Height (ft)</i>	<i>Building Footprint</i>	<i>Site acreage</i>	<i>Assumed Site Coverage (%)</i>	<i>Assumed Site Coverage (ac)</i>	<i>Potential Disturbance (ac)</i>
MEF Command Element, 12th Marine Regiment, and 3d Marine Division HQ: administrative functions	7	1,500	0600-1900	164,915	3	40	103,269	28.0	70	19.6	28.0
III MEF Administration and Operations: administrative, vehicle maintenance, HAZMAT storage, electronic/ communication maintenance, armory, and warehousing functions	10	1,250	0600-1900	300,212	2	45	267,006	43.1	80	34.5	43.1
3d Marine Division Administration and Operations functions: vehicle maintenance, HAZMAT, administrative, armory, warehousing, and Army facilities	18	1,500	0600-1900	291,715	2	45	283,515	90.8	90	81.7	90.8
3d Marine Logistics Group Administration and Operations Areas: vehicle maintenance, HAZMAT, HAZMIN® administrative functions, an armory, an operational trainer, warehousing, and open storage	27	1,750	0600-1900	412,119	3	45	351,336	126.3	80	101.0	126.3
3d Marine Logistics Group and Base Industrial Area: recycling center, fuel storage area, warehousing, maintenance, HAZMAT, Defense Reutilization and Marketing Office, security gate house, and corrosion control	33	1,500	0600-1900	1,045,071	1	45	1,045,071	203.5	85	173.0	203.5
BEQ campus: enlisted quarters, enlisted club, enlisted dining, indoor fitness, and swimming pool facilities	13	3,800	24/7	3,174,711	4	50	909,261	209.5	60	125.7	209.5
Provost Marshall's Office and associated security area; brig/confinement, police, kennel, and rehabilitation center facilities	4	200	24/7	94,712	1	15	94,712	47.2	70	33.0	47.2
Main Gate and Base Operations Area: administrative, pass and ID, and photographic facilities	4	200	0600-1900	47,366	2	25	29,511	26.3	70	18.4	26.3
Bachelor Officer Quarters (BOQ) Campus: BOQ facilities and officer's club	7	1,600	24/7	244,706	4	50	67,852	30.5	60	18.3	30.5
Administrative, legal services, family services, and MWR support facilities	5	650	0600-1900	123,716	3	40	61,874	14.2	70	9.9	14.2
Temporary lodging facilities	1	150	24/7	140,558	3	40	46,853	13.4	60	8.0	13.4

<i>Facility Description</i>	<i>Number of Facilities</i>	<i>Number of Personnel¹</i>	<i>Hours of Operation</i>	<i>Facility Square Footage</i>	<i>Max # Floors</i>	<i>Max Building Height (ft)</i>	<i>Building Footprint</i>	<i>Site acreage</i>	<i>Assumed Site Coverage (%)</i>	<i>Assumed Site Coverage (ac)</i>	<i>Potential Disturbance (ac)</i>
Main Community Center: religious facilities, vehicle maintenance, hobby shop, indoor fitness facilities, commissary, exchange, post office, theater, bowling alley, medical clinic, swimming pool, and other QOL facilities	13	1,000	0600-1900	510,921	2	25	485,546	92.4	75	69.3	92.4
Fire station and alert force facilities	2	45	0600-1900	29,031	1	25	29,031	5.3	70	3.7	5.3
Applied instruction and auditorium facilities	2	100	0600-1900	47,737	1	25	47,737	4.9	70	3.4	4.9
(MAW Administration and Operations facilities: administrative, vehicle/communication/electronic maintenance, armory, and warehousing facilities)	11	800	0600-1900	294,889	3	45	208,837	48.3	80	38.6	48.3
Administrative areas, warehousing, dental clinic with dental equipment maintenance shop, and gate house facilities	4	100	0600-1900	125,452	2	45	98,981	29.6	70	20.7	29.6
Religious ministry facility, youth center, and swimming pool	3	50	0600-1900	67,121	1	25	67,121	16.6	60	10.0	16.6
Child Development Center	1	15	0700-1900	26,667	1	15	26,667	6.0	40	2.4	6.0
Elementary School	1	150	0700-1600	134,909	1	25	134,909	12.6	40	5.0	12.6
Middle School, High School	2	300	0700-1600	292,486	1	25	292,486	30.3	40	12.1	30.3
Child Development Center	1	15	0700-1900	26,667	1	15	26,667	6.7	40	2.7	6.7
Elementary School	1	150	0700-1600	135,387	1	25	135,387	24.7	40	9.9	24.7
Indoor fitness, swimming pool, and youth center facilities	2	30	0600-1900	55,628	1	25	55,628	16.5	60	9.9	16.5
Child Development Center	1	15	0700-1900	26,667	1	15	26,667	6.8	40	2.7	6.8
Elementary School, Middle School	2	300	0700-1600	247,313	1	25	247,313	30.4	40	12.2	30.4
Restaurant, location exchange, bank, gas station, and gate house facilities	5	30	0600-1900	39,390	1	15	39,390	14.3	70	10.0	14.3

Note: ¹Personnel numbers are estimates that may include on island residents.

2.2.2 Alternatives Analysis: Main Cantonment Area

2.2.2.1 Site Alternatives for Main Cantonment Area Functions

As with Andersen AFB and Naval Base Guam, the main cantonment area would ideally be constructed on contiguous parcels. Family housing would ideally be within the same installation. This facilitates land use efficiency, and organizational integrity. It minimizes traffic exterior to the base; reduces redundancy in infrastructure; increases the opportunities for walkable and energy efficient development; facilitates achievement of LEED and sustainability goals and requirements; and provides for cost savings on construction, maintenance and operation. It is important that the barracks population be able to walk to amenities and work without relying on personal vehicles in order to reduce traffic flows. The site-specific planning analysis described in Section 2.2.2.2 carries this ideal land use model further when addressing the distances between main cantonment, training ranges and family housing.

In Step 2 family housing and main cantonment were considered as separate functional areas because there were non-contiguous parcels that could potentially accommodate one functional use and not both.

Candidate Land Parcels

The following parcels were considered in the alternative site selection process for the main cantonment facilities (not including family housing/community services):

- NCTS and South Finegayan
- Andersen AFB South
- Andersen AFB
- Navy Barrigada
- Air Force Barrigada
- Former FAA parcels
- Harmon Annex
- GLUP 77

Figure 2.2-1 shows the location of each area, and Table 2.2-2 describes specific limitations that apply at each site. Single parcels that cannot accommodate the entire main cantonment requirement were only retained as candidate sites if adjacent parcels were also candidate sites.

Feasibility and Suitability Criteria

A qualitative assessment of the feasibility of using specific land areas for siting of Main Cantonment facilities was based on the following criteria: compatibility with future missions, environmental considerations (including cultural and historical significance), and anticipated public concerns. Suitability criteria included: land availability, proximity to ranges and the aviation complex (described in Section 2.4), operational capability, training capability, encroachment, and anti-terrorism/force protection (AT/FP). The basis of analysis is presented in a brief entitled *Guam Alternatives Basing Analysis, Guam Stakeholders Working Group*, dated August 21, 2007 and prepared by Naval Facilities Engineering Command (NAVFAC) Pacific.

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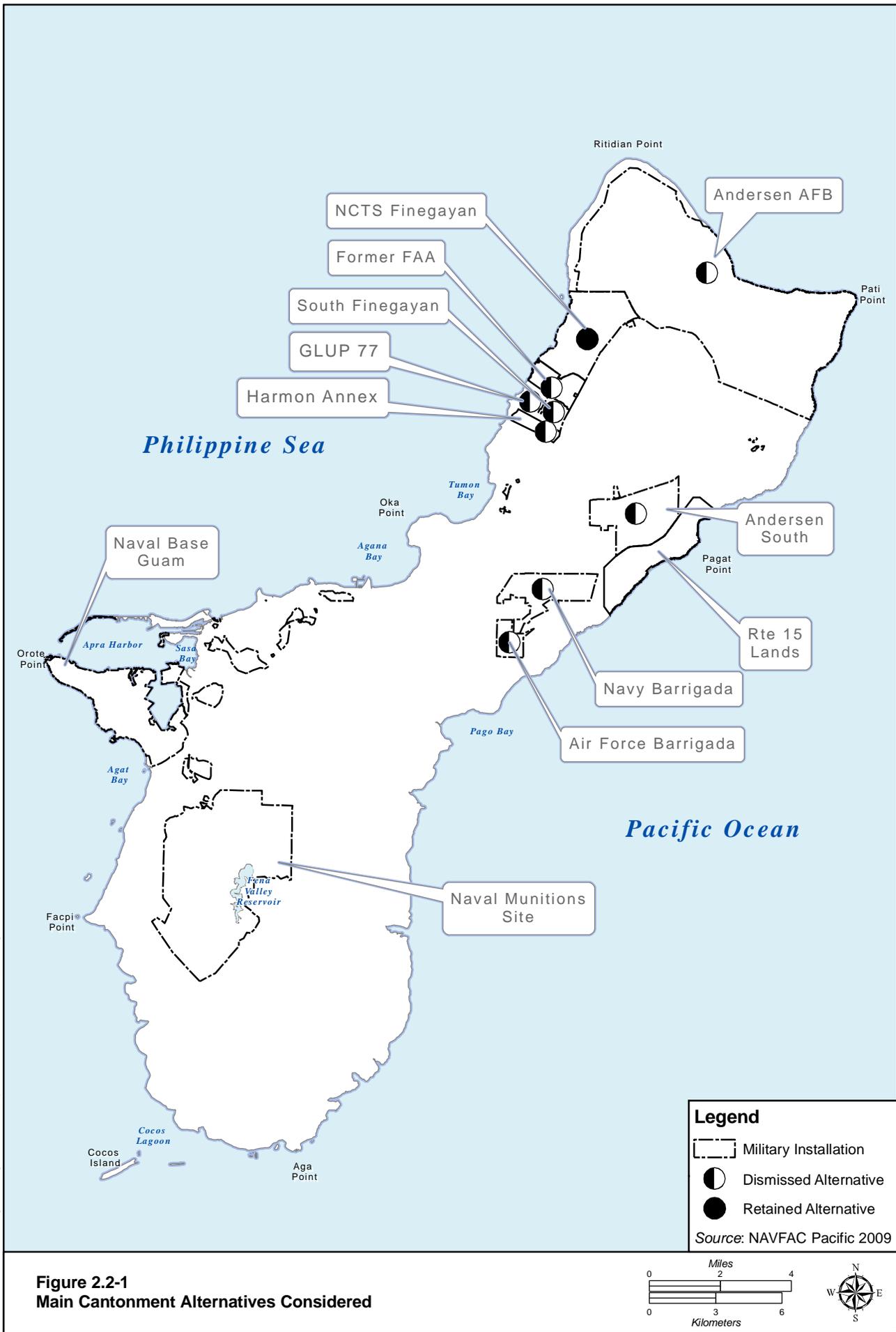


Figure 2.2-1
Main Cantonment Alternatives Considered

Table 2.2-2. Considered and Dismissed Main Cantonment Sites

<i>Candidate Sites</i>	<i>Carried Forward for Analysis</i>	<i>Compatibility with Major Criteria</i>
NCTS Finegayan	Yes	Feasibility criteria <ul style="list-style-type: none"> • Meets criteria Suitability criteria <ul style="list-style-type: none"> • Meets criteria
Andersen South	No	Feasibility criteria <ul style="list-style-type: none"> • Incompatible with future missions • Anticipated public concerns Suitability criteria <ul style="list-style-type: none"> • Limited potential for expansion
Navy and Air Force Barrigada	No	Feasibility criteria <ul style="list-style-type: none"> • Incompatible with future missions Suitability criteria <ul style="list-style-type: none"> • Land availability
South Finegayan	No	Suitability criteria <ul style="list-style-type: none"> • Land availability
Former FAA (non DoD)	No	Suitability criteria <ul style="list-style-type: none"> • Land availability
Harmon Annex (non DoD)	No	Suitability criteria <ul style="list-style-type: none"> • Land availability
Leo Palace* (non-DoD)	No	Suitability criteria <ul style="list-style-type: none"> • Proximity to ranges and the aviation complex • Encroachment potential • Does not meet operational capability Feasibility criteria <ul style="list-style-type: none"> • Incompatible with future missions
Guam Land Use Plan (GLUP) 77 (non DoD)	No	Suitability criteria <ul style="list-style-type: none"> • Land availability

* = Combined family housing with main cantonment

Source: NAVFAC Pacific 2007.

Sites Eliminated from Further Consideration

Based on the suitability criteria listed, the Barrigadas (Navy and Air Force) were eliminated from further consideration primarily because there is insufficient developable land at the parcels and no other parcels were identified adjacent to these DoD parcels. Andersen AFB provides bachelor quarters for the Navy helicopter squadron and was considered as a candidate site for housing the air combat element of the Marine Corps. However, Andersen AFB was eliminated from further consideration due to insufficient unencumbered land. GLUP 77 had insufficient land and the use of Andersen South would conflict with current and future training needs. NCTS Finegayan was the only candidate site (Figure 2.2-1) retained for further consideration.

Site Selection for Family Housing/Community Support Functions

Main cantonment areas often include family housing/community support facilities, but since none of the candidate land parcels is large enough to accommodate the entire facility requirement for family housing/community support and main cantonment, parcels were evaluated for suitability for family housing/community support alone.

Eleven sites (Figure 2.2-2) were evaluated for suitability and feasibility using the criteria described above for family housing and community support functions. The sites and their limitations are listed in Table 2.2-3. There is insufficient unencumbered land for all needed housing on Naval Base Guam and Andersen

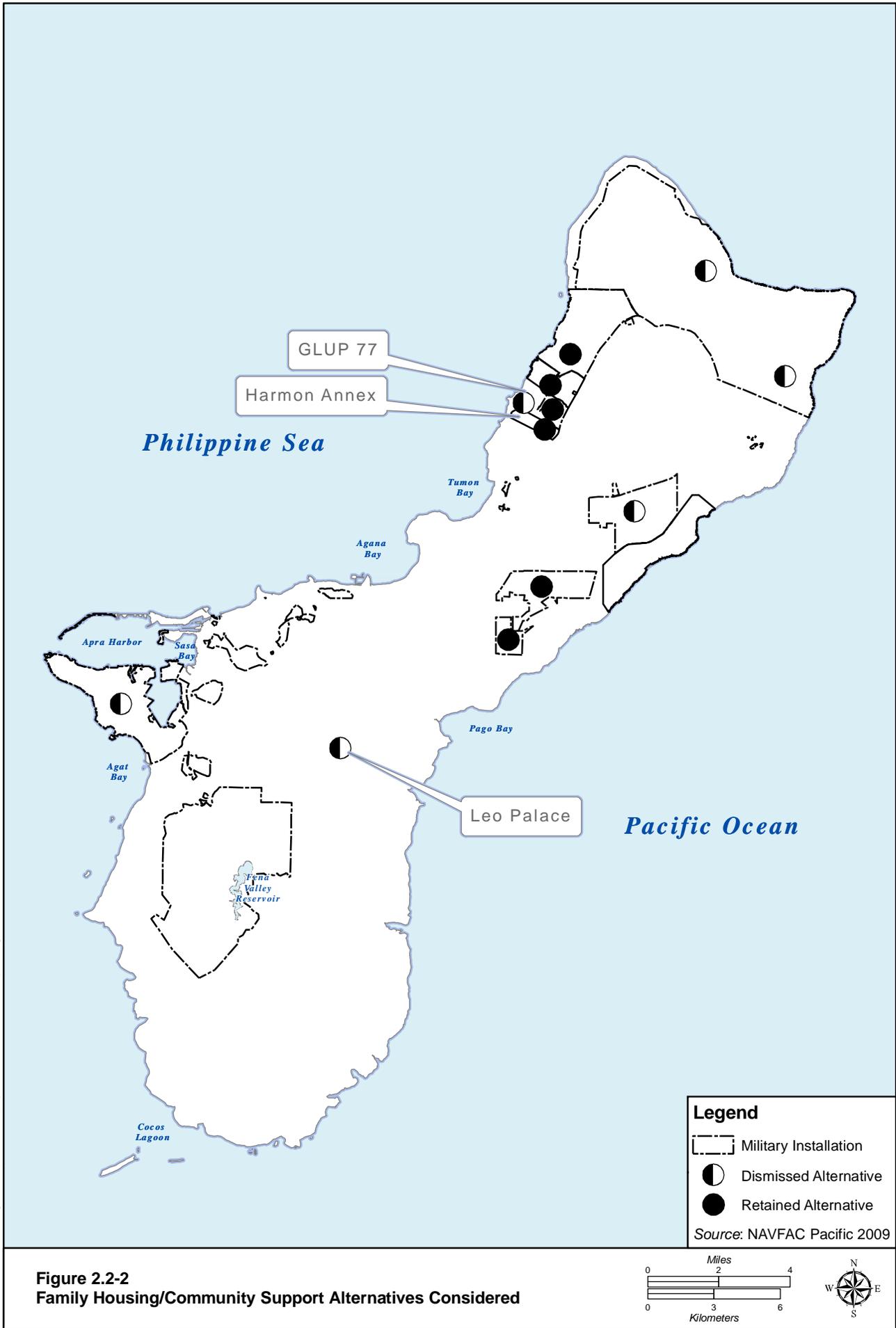


Figure 2.2-2
Family Housing/Community Support Alternatives Considered

Table 2.2-3. Considered and Dismissed Family Housing/Community Support Sites

<i>Candidate Sites</i>	<i>Carried Forward for Analysis</i>	<i>Compatibility with Major Criteria</i>
NCTS Finegayan	Yes	Feasibility criteria <ul style="list-style-type: none"> • Meets criteria Suitability criteria <ul style="list-style-type: none"> • Meets criteria
South Finegayan**	Yes	Feasibility criteria <ul style="list-style-type: none"> • Meets criteria Suitability criteria <ul style="list-style-type: none"> • Limited land availability • Encroachment potential
Barrigada (Navy) **	Yes	Feasibility criteria <ul style="list-style-type: none"> • Meets criteria Suitability criteria <ul style="list-style-type: none"> • Limited land availability • Encroachment potential
Barrigada (Air Force) **	Yes	Feasibility criteria <ul style="list-style-type: none"> • Meets criteria Suitability criteria <ul style="list-style-type: none"> • Limited land availability • Encroachment potential
Andersen AFB	No	Feasibility criteria <ul style="list-style-type: none"> • Incompatible with future missions Suitability criteria <ul style="list-style-type: none"> • Limited land availability (Insufficient unencumbered land)
Andersen South	No	Feasibility criteria <ul style="list-style-type: none"> • Incompatible with future missions Suitability criteria <ul style="list-style-type: none"> • Impacts training capability
Naval Base Guam	No	Feasibility criteria <ul style="list-style-type: none"> • Incompatible with future missions Suitability criteria <ul style="list-style-type: none"> • Limited land availability (insufficient unencumbered land) • Proximity to ranges and the aviation complex
Leo Palace* (non-DoD)	No	Feasibility criteria <ul style="list-style-type: none"> • Incompatible with future mission Suitability criteria <ul style="list-style-type: none"> • Proximity to ranges and the aviation complex • Encroachment potential
Former FAA (non-DoD)**	Yes	Feasibility criteria <ul style="list-style-type: none"> • Meets criteria Suitability criteria <ul style="list-style-type: none"> • Limited land availability • Encroachment potential
Harmon Annex (non-DoD) **	Yes	Feasibility criteria <ul style="list-style-type: none"> • Meets criteria Suitability criteria <ul style="list-style-type: none"> • Limited land availability • Encroachment potential

Candidate Sites	Carried Forward for Analysis	Compatibility with Major Criteria
GLUP 77 (non-DoD)	No	Feasibility criteria <ul style="list-style-type: none"> • Anticipated public concerns • Incompatible with future missions Suitability criteria <ul style="list-style-type: none"> • Limited land availability • Encroachment potential

* = Combined main cantonment with family housing.

** = Existing land area not adequate for full complement of family housing; combined with adjacent parcels.

Source: Guam Alternatives Basing Analysis, Guam Stakeholders Working Group, dated August 21, 2007 and prepared by NAVFAC Pacific 2007.

AFB. The Navy uses five non-contiguous housing areas, but this is not an ideal situation. There is insufficient space at any or all of these housing areas to accommodate the Marine Corps population; therefore, these distinct housing areas, including Apra Heights and Nimitz Hill, were dismissed early in the alternatives analysis. Leo Palace was also examined as a location for military housing. The building requirements, including space allowances, for military housing are standardized and the existing Leo Palace units would not meet military standards and maximize the number of units per acre. Leo Palace was eliminated based on this reason and its incompatibility with future missions.

It is not practical from a land use or operational efficiency perspective to divide up the family housing and community support into multiple non-contiguous parcels. This step of the alternatives analysis focused on identifying property that could accommodate all or most of the housing requirement. Maximum efficiency is achieved with one contiguous parcel so redundancy in retail, recreation and other community support facilities is reduced. If a parcel can support a portion of the requirement, it is paired with other adjacent or nearby parcels to meet the total requirement as indicated in Table 2.3-3.

2.2.2.2 Site-Specific Planning Alternatives for Main Cantonment Area Functions

Based on Step 2 of the alternatives development analysis, there are several parcels that would accommodate some combination of main cantonment and family housing/community support functions. In Step 3 of the process, project planners identified alternative ways of arranging project facility requirements within the candidate parcels. Three planning alternatives were initially developed by project planners and were reviewed by agencies in the Spring 2008 DOPAA. In response to comments received on the document, and subsequent informal consultations held May through September 2008, a new range of feasible alternatives was later developed.

The primary driver for the next stage of selecting or eliminating alternatives was compatibility with surrounding land uses and the importance of the Guam National Wildlife Refuge Overlay Units (Overlay Refuge) as essential habitat for endangered species. The Overlay Refuge encumbers most (2,095 of 3,000 acres [ac] [848 hectares {ha} of 1,214]) of NCTS Finegayan, which was proposed as a prime development area in preliminary planning efforts. Subsequent planning indicated that maintaining the essential habitat intact would decrease the amount of developable DoD land and increase the acres of non-DoD land acquisition or long term leasing. Land being considered for development was further reduced by the elimination of Guam Excess Land Act 1994 parcels, also known as GLUP 77 lands, because this area would not meet the operational criteria based on time.

Eight alternatives resulted from the Step 3 site-specific planning analysis. The alternatives varied in their use of Overlay Refuge lands, the quantity of non-DoD land required, distances between the various land uses, and facility planning factors.

2.2.3 Alternatives Carried Forward for Analysis: Main Cantonment Area

A series of workshops was held between June 2007 and November 2008 to evaluate the 8 interim planning alternatives in Step 4 of the alternatives analysis process (see Section 1.2). Participants included local and federal representatives; master planners, biologists, legal counsel, and real estate personnel, operational experts; and service representatives. The Joint Guam Program Office issued a summary of the results of the session in November that was presented in various formats to DoD leadership for approval. The screening analysis served to narrow down the alternatives from eight to four through analysis of each alternative independent of the others. All of these alternatives included the contiguous location of Marine Corps administrative and operations.

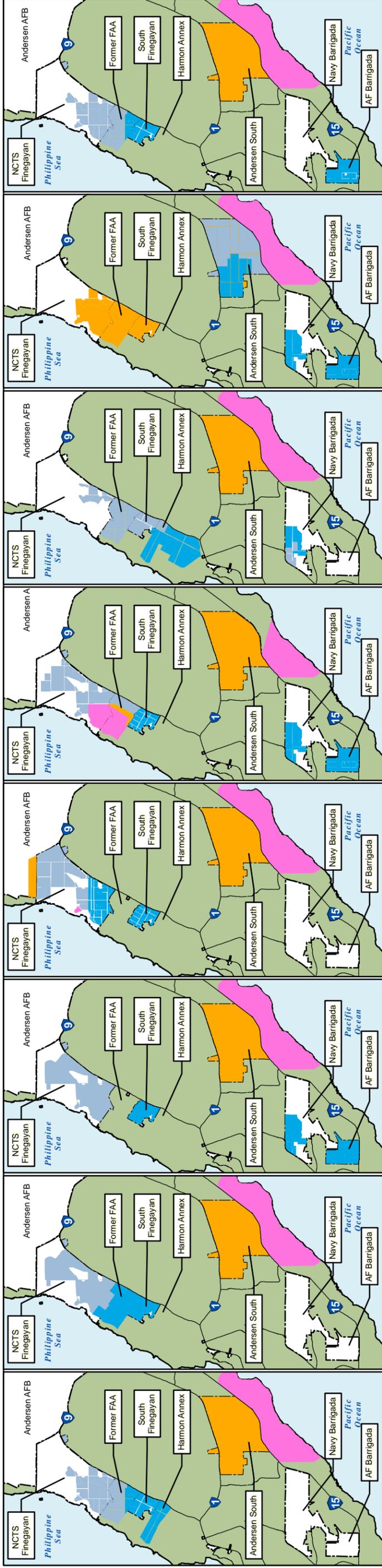
Section 1.2 described the three screening criteria used in Step 4 of the alternatives analysis process to evaluate the viability of site-specific planning alternatives when other factors were considered: (1) environmental, (2) public concerns, and (3) service. Each of the 8 alternatives was classified as “meets” or “does not meet” each of the criteria. If an alternative was classified as “does not meet” in any one of the three criteria, it was eliminated from further consideration in this EIS/OEIS (Environmental Impact Statement/Overseas Environmental Impact Statement). The criteria and a brief explanation of “does not meet” for each of the criteria are described in Section 1.2.

This screening process eliminated the alternatives that did not meet the selection criteria. An alternative does not meet the service criteria if it would be so challenging to the military commands that military mission, readiness and operations would be compromised and would not meet the purpose and need for the project. Maps were compiled from natural and cultural resource agencies and specialists to examine conflicts between siting of facilities and resource locations. This “constraints mapping” provided information to reduce effects to the resources by eliminating or revising alternatives. Figure 2.2-3 presents the eight alternatives side by side with a summary of the Step 4 site-specific planning analysis. Alternatives 4, 5, 6 and 7 were eliminated from further consideration. Alternative 4 did not meet the environmental criteria because it had an overwhelming impact on areas of essential habitat. Alternative 5 did not meet the public or the service criteria because of impacts to recreational and commercial ocean uses and the separation of live-fire and non-firing training does not support the Marine Corps requirements for operational efficiency. Alternative 6 was eliminated because the complexity of land acquisition or long term leasing would likely require more than 10 years, which would not meet the purpose and need. Alternative 7, similar to Alternative 5, did not meet the service criteria but in this alternative it was the separation of the firing range complex from the non-fire training that was the key operational deficiency.

As described in the following subsections, there are four alternatives for development of the Main Cantonment Area that would be carried forward for analysis in this EIS/OEIS.

2.2.3.1 Main Cantonment Alternative 1

Implementation of Alternative 1 would require a total of 2,386 ac (966 ha) for the Main Cantonment and family housing areas. The Main Cantonment would include portions of NCTS Finegayan (1,090 ac [441 ha]), portions of South Finegayan (290 ac [117 ha]), the Former FAA parcel (680 ac [275 ha]), and a portion of the Harmon lands (326 ac [132 ha]) (Table 2.2-4). A total of 1,006 ac (407 ha) of privately held lands would be acquired under Alternative 1. Of the total acreage for this alternative, 599 ac (242 ha), or



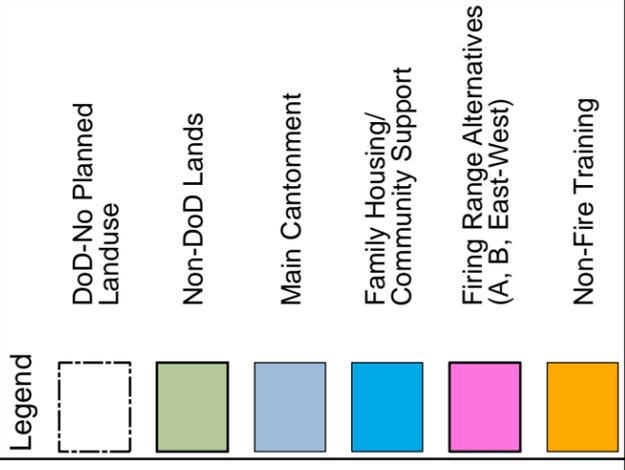
	Alternative 1	Alternative 2	Alternative 3	Alternative 4	Alternative 5	Alternative 6	Alternative 7	Alternative 8
Characteristics								
Overlay Refuge Loss (percent)	29	53	53	75	53	0	26	29
Former FAA (acres)	680	680	0	0	680	680	680	680
Former Harmon Annex	326	0	0	0	0	1014	0	0
Firing Range Complex	RTE 15 A or B Andersen S.	RTE 15 A or B Andersen S.	RTE 15 A or B Andersen S., NMS	RTE 15 A or B Andersen S., Andersen AFB	West & East coast Andersen S., FAA	RTE 15 A or B Andersen S.	RTE 15 B NCTS Fin., FAA, S. Fin.	RTE 15 A or B Andersen S.
Non-firing range								
Family Housing/Community Support	S. Fin., FAA, Harmon	FAA, S. Fin	S. Fin., Barrigada (Navy & AF)	S. Fin., NCTS Fin.	S. Fin., Barrigada (Navy & AF)	Hammon, Navy Barrigada	Barrigada (Navy & AF)	FAA, S. Fin, Barrigada (AF)
Main Cantonment	NCTS Fin. & FAA	NCTS Fin.	NCTS Fin.	NCTS Fin.	NCTS Fin. & FAA	FAA, S. Fin. (Army AMD @ Barrigada -Navy)	Andersen S.	NCTS Fin. & FAA

shaded cells = alternatives not carried forward through EIS analysis.

S. = south

Fin. = Finegayan

NMS = Naval Munitions Site



Source: NAVFAC Pacific 2009

Figure 2.2-3

Main Cantonment Area Alternatives Analysis

approximately 25% of the Main Cantonment would be developed in the Overlay Refuge, that is managed pursuant to a Memorandum of Agreement (MOA) with the United States Fish and Wildlife Service (USFWS) (DoD 1994). The term “Overlay Refuge” refers to specific areas of DoD properties on Guam that were established through a cooperative program with GDAWR. The Overlay Refuge is centered on the protection of endangered and threatened species and other native flora and fauna, maintenance of native ecosystems, and the conservation of native biological diversity.

Table 2.2-4. Summary of Parcels for Each Main Cantonment Alternative

Alternative	Total Land (ac/ha)	DoD Lands				Private Lands		Overlay Refuge ¹ (ac/ha)
		NCTS Finegayan ^{1,2} (ac/ha)	South Finegayan ³ (ac/ha)	Navy Barrigada ² (ac/ha)	Air Force Barrigada ⁴ (ac/ha)	Former FAA ⁵ (ac/ha)	Harmon Land ⁶ (ac/ha)	
1	2,386/966	1,090/441	290/117			680/275	326/132	599/242
2	2,580/1,044	1,610/652	290/117			680/275		1,106/448
3	2,707/1,096	1,610/652	290/117	377/153	430/174			1,106/448
8	2,490/1,008	1,090/441	290/117		430/174	680/275		599/242

Notes:

¹Based on calculations for vegetation cover in chapter 10. ²Proposed developed area only. ³Assumes entire parcel is developed.

⁴Excludes NEXRAD. ⁵Total acquisition area, including planned open space. ⁶Total acquisition area.

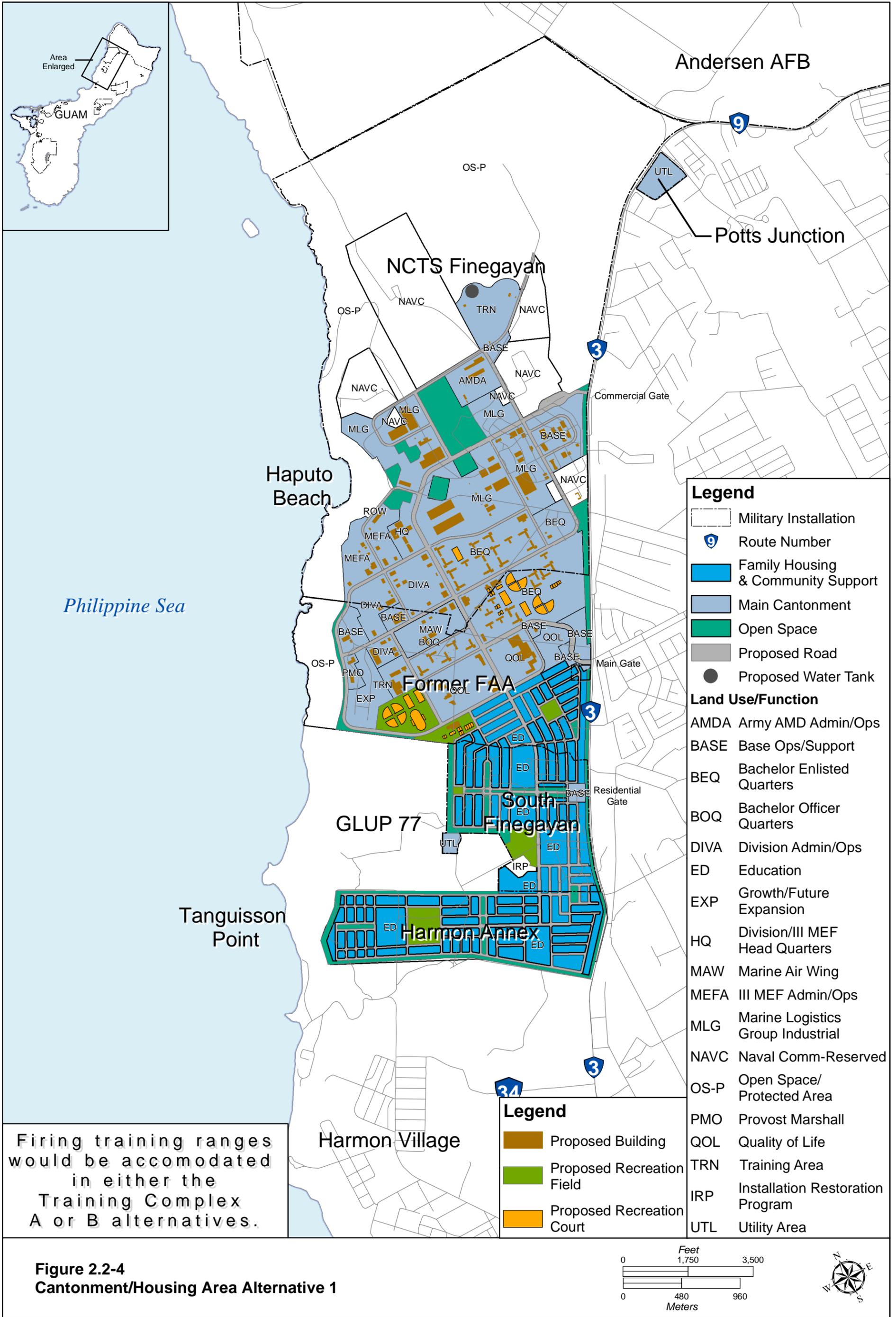
The Main Cantonment area would be configured such that all facilities would be on one contiguous parcel of land, including the family housing areas under Alternative 1 (Figure 2.2-4). This alternative is bounded on the north by Andersen AFB NWF, and by Route 3; on the west by a cliff line (within DoD property) and the Philippine Sea. To the east the site is bounded by limited residential development and to the south by the Harmon Village residential area (non-DoD property). Although DoD property goes down to the waterline, the Main Cantonment area would be situated on the upper area of NCTS Finegayan and would not encroach on the cliff line leading to the ocean.

NCTS Finegayan is an operating communications station of 2,415 total ac (978 ha), of that, 857 ac (752 ha) are estimated to be usable for establishment of a new Main Cantonment area. The remaining 558 ac (226 ha) of the Finegayan site are dedicated to current and future communications activities. Just south of this site is the former FAA parcel that is owned by private individuals and GovGuam; and the South Finegayan Housing Area that is a Navy housing area of 290 ac (117 ha). There are approximately 60 Navy families now living in the housing units. It is possible the Marine Corps family housing could be developed around these existing units and the Navy housing units would not be relocated. The EIS/OEIS conservatively assumes the entire site would be redeveloped with family housing and community support facilities. The Navy housing could be included in the South Finegayan redevelopment. There is no Navy housing relocation project at this time. Bordering Finegayan to the north is Andersen AFB NWF, that has approximately 750 ac (304 ha) of contiguous land.

The NCTS Finegayan site is considered the most suitable site for development of the Main Cantonment area.

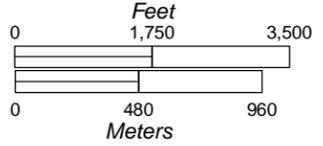
2.2.3.2 Main Cantonment Alternative 2

Alternative 2 would require a total of 2,580 ac (1,044 ha) for the Main Cantonment and family housing areas. The Main Cantonment would include portions of NCTS Finegayan (1,610 ac [652 ha]), portions of South Finegayan (290 ac [117 ha]), and the Former FAA parcel (680 ac [275 ha]) (Figure 2.2-5 and refer to Table 2.2-4). A total of 680 ac (275 ha) of privately held lands would be acquired under Alternative 2.



Firing training ranges would be accommodated in either the Training Complex A or B alternatives.

**Figure 2.2-4
Cantonment/Housing Area Alternative 1**



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Of the total acreage for this alternative, 1,106 ac (448 ha), or approximately 41% of the Main Cantonment would be developed in the Overlay Refuge. Under Alternative 2, the Main Cantonment area would also be configured such that all facilities would be on one contiguous parcel of land, including the family housing area.

The site of Alternative 2 is also bounded on the north by Andersen AFB NWF, and by Route 3; on the west by a cliff line (within DoD property) and the Philippine Sea. To the east the site is bounded by limited residential development and to the south by the Harmon Village residential area (non-DoD property).

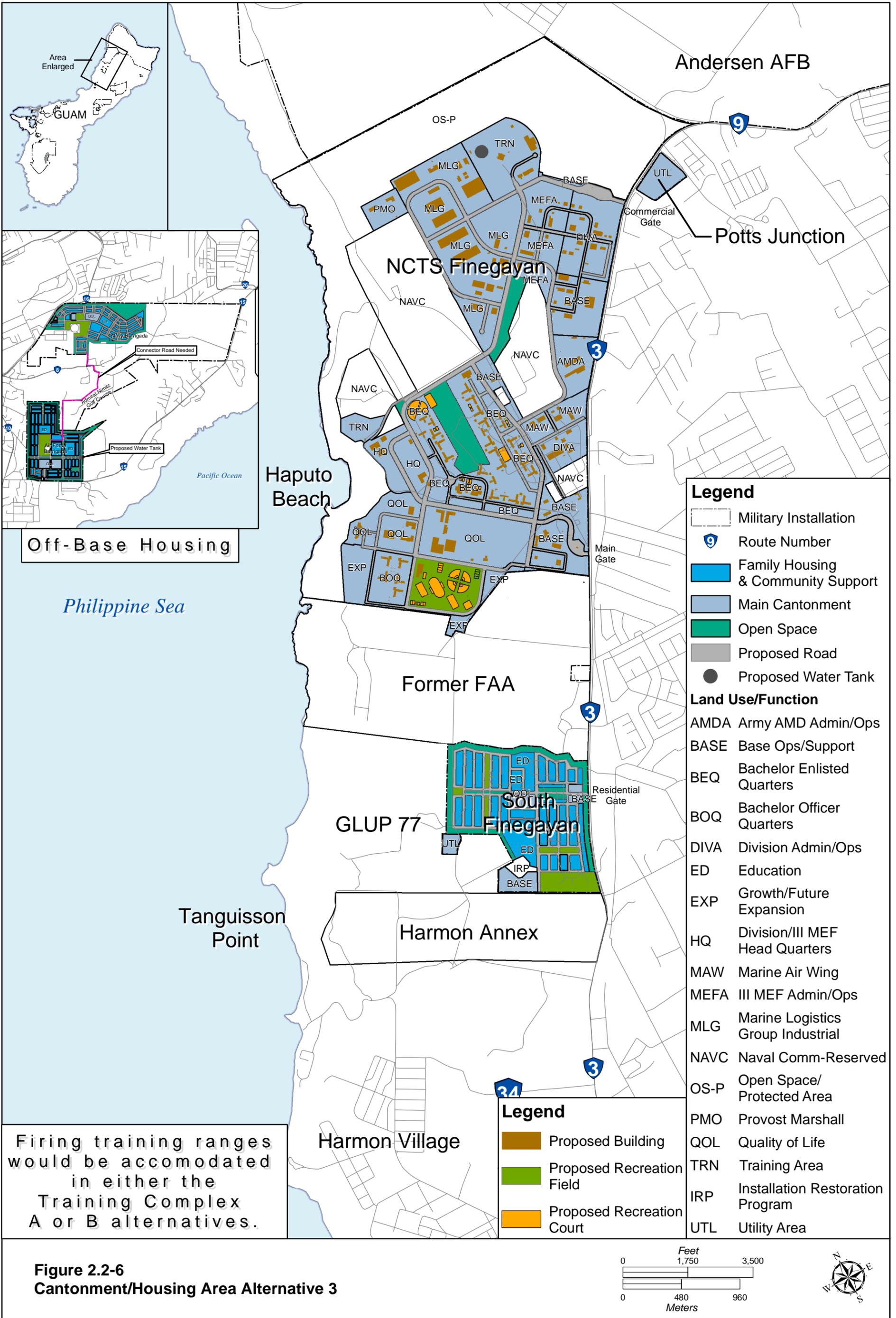
2.2.3.3 Main Cantonment Alternative 3

Alternative 3 would require a total of 2,707 ac (1,096 ha) for the Main Cantonment and family housing areas. The Main Cantonment would include portions of NCTS Finegayan (1,090 ac [441 ha]), and housing would be located on three geographically separated DoD parcels, including South Finegayan (290 ac [117 ha]), Air Force Barrigada (430 ac [174 ha]), and Navy Barrigada 377 ac [153 ha]) (Figure 2.2-6 and refer to Table 2.2-4). No privately held lands would be acquired under Alternative 3. Of the total acreage for this alternative, 1,106 ac (448 ha), or approximately 41% of the Main Cantonment would be developed in the Overlay Refuge. Under this alternative, the Main Cantonment area would be configured such that the housing would be located non-contiguous to the Main Cantonment.

This configuration of the Main Cantonment area is bounded on the north by Andersen AFB, on the west by a cliff line and the Philippine Sea, by Route 3 and limited residential development to the east, and by the former FAA area to the south. South Finegayan would be used for housing; it is located south of the former FAA area. Navy and Air Force Barrigada are located approximately 9 miles (mi) (14 kilometers [km]) from the proposed Main Cantonment, on the eastern side of Guam. Navy and Air Force Barrigada have Route 15 bordering the site to the east, and Routes 10 and 16 bordering the site to the west. Navy Barrigada is largely used to support DoD communication high frequency transmitting activities. Headquarter facilities for the Guam Army National Guard is located adjacent to Navy land at Barrigada. Navy Barrigada is 1,418 ac (574 ha), of that 250 ac (101 ha) are available for development. The Air Force Barrigada property is a 433-ac (175-ha) parcel that is used by the Air Force to accommodate the NEXRAD weather satellite receiver. It has been estimated that 400 ac (162 ha) of this parcel is available for development. Navy Barrigada and Air Force Barrigada are currently connected by the existing Navy Golf Course. The golf course may need to be removed if it was determined that the two parcels should be connected.

2.2.3.4 Main Cantonment Alternative 8

Alternative 8 would require a total of 2,490 ac (1,008 ha) for the Main Cantonment and family housing areas. Alternative 8 would include portions of NCTS Finegayan (1,090 ac [441 ha]), a portion of South Finegayan (290 ac [117 ha]), the former FAA parcel (680 ac [275 ha]), and a portion of the housing would be located on the geographically separated Air Force Barrigada parcel (430 ac [174 ha]) (Figure 2.2-7 and refer to Table 2.2-4). A total of 680 ac (275 ha) of privately held lands would be acquired under Alternative 8. Of the total acreage for this alternative, 599 ac (242 ha), or approximately 24% of the Main Cantonment would be developed in the Overlay Refuge. In Alternative 8, as with Alternative 3, the Main Cantonment area would be configured such that a portion of the housing would be located non-contiguous to the Main Cantonment.



2.3 PROPOSED ACTION: TRAINING FUNCTIONS

2.3.1 Requirements

Training requirements associated with relocating Marines from Okinawa to Guam were derived from the statement of operational requirements prepared by the Commander, U.S. Pacific Command as required by the Agreed Implementation Plan (AIP). This guidance was further developed in an operational concept for MAGTF operations and training by the Commander, Marine Forces Pacific. Together, these documents outline a concept for force movement, command and staff interaction, operations and training up to the MAGTF level.

The essence of this concept is to accomplish frequent, individual and small unit training close to home, and move farther away as needed for larger, more complex but less frequent training. The overarching goals are:

- Individual and military occupational skill (MOS) training on Guam.
- Small unit training up to company level on Guam.
- Re-qualification and sustainment training on Guam with individual weapons, machine guns and other infantry crew-served weapons.
- Enhanced battle staff planning and coordination among disparate III MEF command headquarters
- Optimized use of simulation and training devices.
- All infantry weapons and ground supporting arms training on existing DoD land assets in the Marianas including maneuver to the extent allowed by space and terrain.
- MAGTF multi-dimensional fire and maneuver.
- Aviation operations throughout the Marianas.

Table 2.3-1 lists the elements of the proposed action associated with Marine Corps training requirements on Guam (see Volume 1 Figure ES-2a for a graphical depiction of training locations).

The individual training facilities and projects have been organized into the following six training types or categories, and are discussed further in the corresponding subsections that follow the table:

- Ammunition Storage
- Command, Control, and Simulation
- Non-Firing General Military Skills Training
- Firing General Military Skills Training
- Aviation Training
- Airspace

Chapter 2:

2.1 Overview

2.2 Main Cantonment Area Functions

2.3 Training Functions

2.4 Airfield Functions

2.4 Waterfront Functions

2.6 Summary of Alternatives

Table 2.3-1. Proposed Training Projects on Guam

<i>Type of Training</i>	<i>Facility/Project Title</i>	<i>Location</i>
Ammunition Storage	11 new munitions storage magazines	NMS
	12 new munitions storage magazines and support facilities	Andersen AFB Munitions Storage Area (MSA) 1
Command, Control and Simulation	Battle Staff Training Facility (BSTF)	Main Cantonment, near MEF HQ
	Combined Arms Staff Trainer (CAST) and MAGTF Integrated Systems Training Center	Main Cantonment, near GCE
	Audio-visual and Simulation Training Support Facility	Main Cantonment, near billeting and administrative areas
Non-Firing: General Military Skills	Obstacle Courses	Main Cantonment
	Confidence Course	Main Cantonment
	Hand-to-Hand Combat Pit	Main Cantonment
	Rappelling Tower	Main Cantonment
	Gas Chamber	Main Cantonment
	Combat Training Tank	Main Cantonment
	General Purpose Auditorium	Main Cantonment
	Maneuver Training Areas	Andersen South and NMS
	Military Operations in Urban Terrain Complexes	Andersen South
	Advanced Motor Vehicle Operators Course	Andersen South
Engineer Equipment and Decontamination Training Facility	Main Cantonment	
Firing: General Military Skills	<u>Training Range Complex</u> – a combination of: <ul style="list-style-type: none"> • Range Control and Range Maintenance Buildings • Known Distance (KD) Range • Pistol Range • Square-Bay Range • Unknown Distance (UD) Range • Machine Gun Range • Hand Grenade Range • Grenade House 	Alternative A: East Coast (with relocation of Route 15) or Alternative B: East Coast (with no relocation of Route 15)
	Demolition Range	
	Breacher and Shooting House	Andersen South
	Indoor Small Arms Range	Main Cantonment
Aviation Training	Marine Air Control Group (MACG) Training	North Ramp Andersen AFB, NWF
	Improved Airfield	North Ramp Andersen AFB, NWF
	Any Designated Airspace	Over Guam and surrounding waters
	Military Flight Corridors, Routes, or Navigation Area	Over Guam and surrounding waters
	Landing Zones	NWF, Orote Airfield, Andersen South, and NMS
Airspace	New SUA	Andersen South and off east coast Guam

A Training Concept Plan was prepared for Marine Forces Pacific in 2008 and it is the basis for project descriptions. Subsequent to completion of that report, land use alternatives continued to evolve and proposed siting of these facilities may have changed. Although projects are listed individually in Table 2.3-1, there is likely to be a bundling of projects and/or reassignment of project numbers during the funding/construction process. The projects are presented in order of the subsections that follow.

The description of each project is organized to provide information on the proposed facilities and operations (including relevant information regarding existing facilities and operations). The identification of alternative locations for each project is discussed in Section 2.3.2.

2.3.1.1 Ammunition Storage

The Marine Corps requires munitions storage to support wartime and training missions. Naval Munitions Command Detachment Guam (NMC DET) serves as the munitions logistics hub for all military services and conducts most of the munitions transport on Guam. Under the proposed action, NMC DET would continue in its existing capacity and support the munitions logistics associated with the Marine Corps move from Okinawa to Guam. Under the existing protocol, NMC DET serves all branches of the Armed Services by responding to a munitions request for a particular mission or handling arriving shipments. NMC DET receives or stages munitions for ship replenishment on Kilo Wharf. The airfield at Andersen AFB is another point of munitions receipt or shipment. The munitions are transported by truck on public roads to either the NMS or Andersen AFB Munitions Storage Area (MSA). At the MSA, the munitions are stored in facilities that reduce the explosive risk hazard, such as earth-covered magazines (ECMs).

Under the proposed action, Marine Corps munitions would arrive at Kilo Wharf and be transported to NMS by NMC DET. Long-term storage and storage for training not occurring on Guam would be at NMS. As needed, munitions would be trucked to Andersen AFB MSAs to support operations in the northern part of the island. The Andersen AFB MSA would support the Marine Corps ACE and the ground training that would occur in the northern part of Guam.

The *Military Munitions Annex to the Joint Guam Master Plan* was prepared for DoD Explosive Safety Board (DDESB) by NAVFAC Pacific (2009) to assess the Marine Corps munitions operations requirements, and recommends improvements and projects to meet those requirements. The proposed action elements related to munitions storage are based on this planning document.

Proposed Facilities

Under the proposed action, the following facilities would be constructed at the existing NMS:

Eleven ECMs are proposed at NMS to support the need for additional munitions movement and storage requirements on Guam. The ECMs would be constructed based on a standard design that provides required structural components, humidity control, and fire and lightning protection systems.

Under the proposed action, the following facilities would be constructed at the existing Andersen AFB MSA:

These facilities would consist of:

- Two concrete pads: both 150 by 150 ft (46 by 46 m) with a 50 by 100 ft (15 by 30 m) overhang. One of these would be an operational pad and the other would be a “stuff and unstuff” pad for ordnance buildup.
- Two-story reinforced concrete structure to provide approximately 4,000 ft² (372 m²) of administrative space, plus 15,000 ft² (1,394 m²) of inert warehouse space and maintenance areas.

Proposed Operations

The NMS currently has 132 magazines capable of storing munitions ranging from Class/Division 1.1 to 1.4. Most of the existing magazines at NMS are ECMs that were constructed during the 1950s and 1960s, and are generally in substandard condition according to Navy planning standards. At Andersen AFB,

munitions storage operations fall under the mission of the Air Force 36th Munitions Squadron and are located at an area northwest of the Andersen AFB main airfield and southeast of NWF. Under the proposed action, approximately 10 logistics support personnel would provide site management, roving security, munitions management, munitions technical support, and access control for the proposed Marine Corps munitions storage facilities.

2.3.1.2 Command, Control, and Simulation

Proposed Facilities

Under the proposed action, three Command, Control, and Simulation facilities would be constructed on Guam:

- BSTF complex, that includes:
 - 3-story, 80,000 ft² (7,432 m²) facility with rooftop deck
 - Parking lot support approximately 200 vehicles
 - 640-person capacity auditorium
 - Sensitive Compartmental Information Facility capability
 - Defense Information Systems and Global Command and Control Systems services
 - Uninterruptible power sources, including stand-alone and back-up generator
- CAST and MAGTF Integrated Systems Training Center (MISTC). Construction would include:
 - A single 21,900 ft² (2,035 m²) structure, with 5,000 ft² (465 m²) for the basic CAST
 - 4,500 ft² (418 m²) for upgrades/add-ons to the CAST
 - 2,400 ft² (223 m²) of classroom and instructor space; and 10,000 ft² (929 m²) for storage
- Audio-Visual and Simulation Training Support Facility, that would include a 46,580 ft² (4,327 m²) facility, with space for storage, operational trainers, and classrooms

Proposed Operations

The BSTF is a dual purpose facility used by the III MEF Command Element for exercises and as a Combat Operations Center for carrying out the command functions during operational contingencies. The proposed BSTF would be suitable for 400 exercise personnel and 100 controllers and exercise support personnel.

The CAST is a simulation device for training Marines at various levels in the use of combined arms. The facility would be operated by a staff of approximately 9 persons. The Audio-Visual and Simulation Training Support Facility would have classroom space for a company (200 persons) and office space for approximately 17 training and training systems support personnel.

2.3.1.3 Non-Firing General Military Skills Training Facilities

The general classes of non-firing general military skills training relevant to all Marines for survival on the battlefield include the following:

- Physical Fitness
- Individual Combat Skills
- Crew, Unit, and MOS Combat Skills
- Driving and Equipment Operations

Proposed Facilities and Operations

Brief project descriptions for each type of proposed facility and training activity are provided below. Issues related to the proposed siting of these facilities and any project alternatives are described in Section 2.3.2. For more information on all the training elements needed and proposed for Guam, see Appendix K.

Obstacle and Confidence Courses

Two proposed obstacle courses and one confidence course would be constructed in the same location. Components of these courses are standard throughout the Marine Corps. Each obstacle course would include a two-lane outdoor complex of wooden obstacles for Marines to hop, climb, crawl, and pull over. The confidence course would include additional obstacles and challenges added within the same footprint as the obstacle courses. Figure 2.3-1 depicts a typical Marine Corps training obstacle course. The three courses would be located together on a 2-ac (.8-ha) site.

The courses would be used daily and accommodate approximately 25 to 60 personnel at a given time.

Hand-to-Hand Combat Pit

A hand-to-hand combat pit is needed for training in hand-to-hand combat techniques. Under the proposed action, a sand-filled area with padded retaining wall would be constructed to provide a safe area for training Marines in hand-to-hand combat techniques.

Rappelling Tower

Under the proposed action, a 60-ft (18-m) tower of four floors, approximately 26 ft (8 m) on a side with a rappelling wall, overhang, and climbing wall would be constructed. Figure 2.3-2 provides a photograph of a sample Marine Corps rappelling tower.

Gas Chamber

Under the proposed action, a 4,000 ft² (372 m²) single building would be constructed, consisting of a 600-ft² (56-m²) gas chamber, 1,500 ft² (139 m²) of classroom and associated office space, a mechanical room for ventilation/filtration, and storage of training devices.

During training events in this type of facility, participants are exposed to a non-lethal “tear gas” that is typically used as a riot control agent. The training is designed to teach individual confidence in the application of a field protective mask in the presence of gas.

Combat Training Tank

Under the proposed action, one 13,000- ft² (1,208-m²) swimming pool would be constructed to meet the training requirement for water survival and amphibious vehicle egress.

General Purpose Auditorium

Under the proposed action, an approximately 72,000-ft² (6,690-m²) auditorium would be constructed to provide capacity to simultaneously brief 6,000 military personnel.

Maneuver Training Areas and MOUT

Maneuver training areas are used for training Marines in the variety of skills specified in the Infantry Training and Requirements Manual (NAVMC DIR 3500.87), as defined in the Required Capabilities Document. In general, for company-level (200 Marines) training, a 12 square mi (3,108 ha) maneuver space is optimal. This type of space is not available on Guam, but maneuver training can be conducted in smaller areas. The size requirement depends on the size of the Marine units and the size and complexity



Figure 2.3-1. Typical Marine Corps Obstacle Course



Figure 2.3-2. Example of Marine Corps Rappelling Tower

of a training event. Proximity is an important characteristic for efficient-to-use training areas, as cost and difficulty of transportation directly diminish the amount of training that can be accomplished within a given budget.

Based on the loading of Marines per the requirements of the AIP, an estimated 8,600 Marines transferred from Okinawa to Guam would require company-level maneuver training on Guam biannually. There is a shortage of open space for company-level maneuver training on Guam, and a hierarchy of maneuver training spaces in multiple areas would be needed to meet the unit training objective for Guam. Small areas within Main Cantonment would provide maneuver area training to include crew, fire team, and squad training such as gun drills, formations, and camouflage. It would primarily consist of foot maneuvers and would not include live-fire training, but would include firing of blanks in weapons and use of smoke (i.e., pyrotechnics) for marking. The use of smoke and flares would be limited seasonally. Air-ground operations would include Helicopter Support Team training for ground units. Personnel train in rappelling from the helicopter on ropes (sometimes called fast roping) and procedures that would be used in inserting and extracting troops via helicopter at combat locations. The maneuver area aviation training operations would be a component of training to meet the aviation training requirements further described in Section 2.3.1.5.

Proposed development at the two maneuver sites would be minimal. In addition to the required open space, there is also a requirement for a division-sized LZ and roads to support maneuver training. The two proposed large-scale maneuver training areas on Guam, located at Andersen South and NMS are depicted in Figure 2.3-3.

In these two maneuver training areas, operations would be as follows:

- *NMS*: Company-level patrolling, jungle training, land navigation, and air-ground operations to occur on 5-7 consecutive days, 12 weeks per year, day and night. Access to the NMS site would potentially occur via helicopter transport operations. Although improvements to an access road would be needed (and is further discussed below), no roads would be established within this training site. When the existing Explosive Ordnance Disposal (EOD) demolition range at NMS is operational, an Explosive Safety Quantity Distance (ESQD) arc is generated at the proposed site for maneuver training. LZ NMS4 (Figure 2.3-4) would support maneuver training operations at NMS. This area would also be used for aviation training and include additional LZs. As shown in Figure 2.3-4, the maneuver area would require an access road.
- *Andersen South*: Convoy operations, Military Operations in Urban Terrain (MOUT)-related maneuver training, and general maneuver and air-ground operations to vary from small unit to company-level exercises to occur 5 days a week, 45 weeks per year, day and night. This area of Andersen South is currently used by the Air Force for expeditionary airfield training that has similarities to the proposed maneuver area training. The area would be scheduled to continue to support this Air Force training, while also accommodating the Marine Corps training requirements.
An approximately 2,000 ac (809 ha) area at Andersen South near the proposed MOUT complex has been identified for maneuver training to include the convoy course (see Figure 2.3-3).

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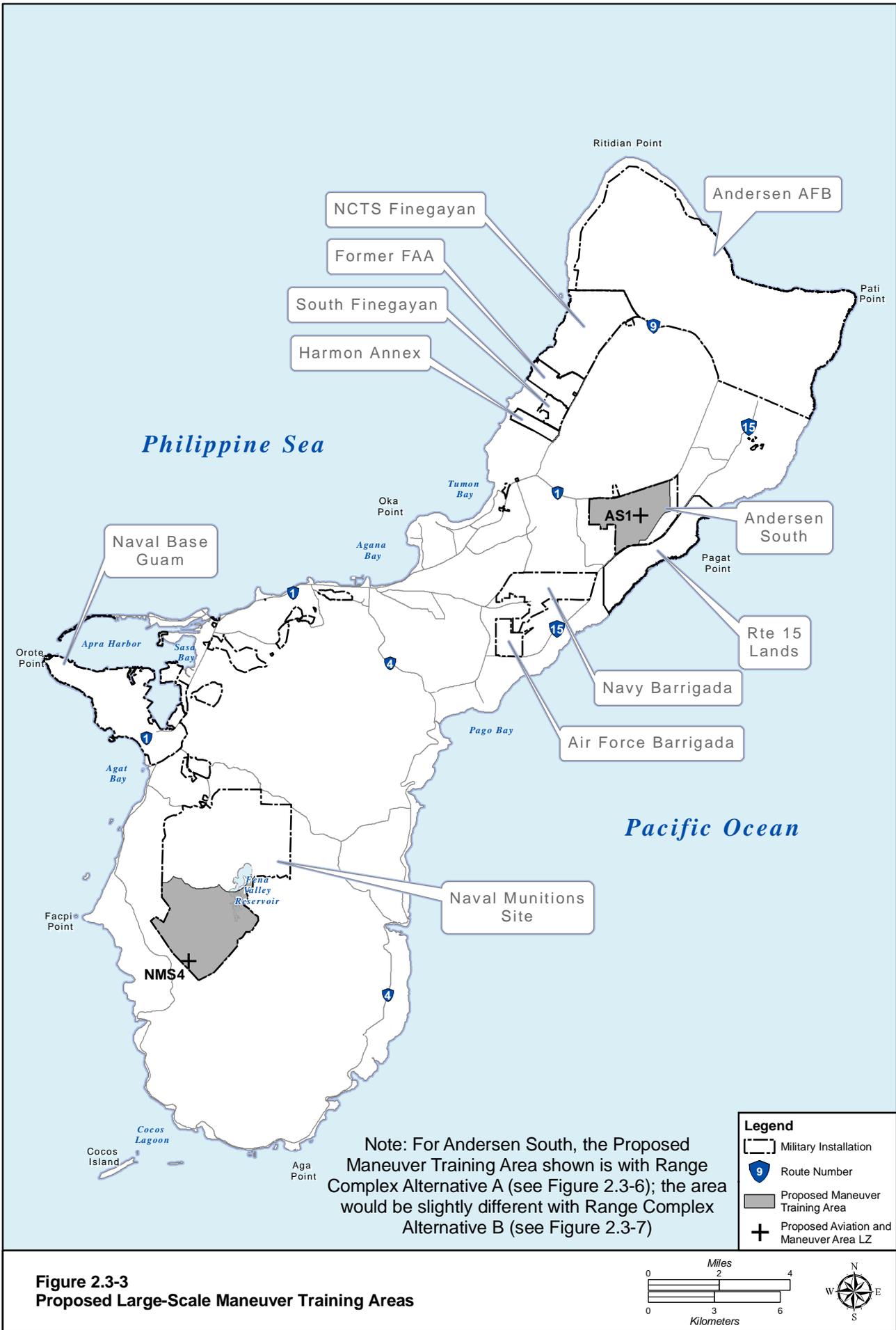
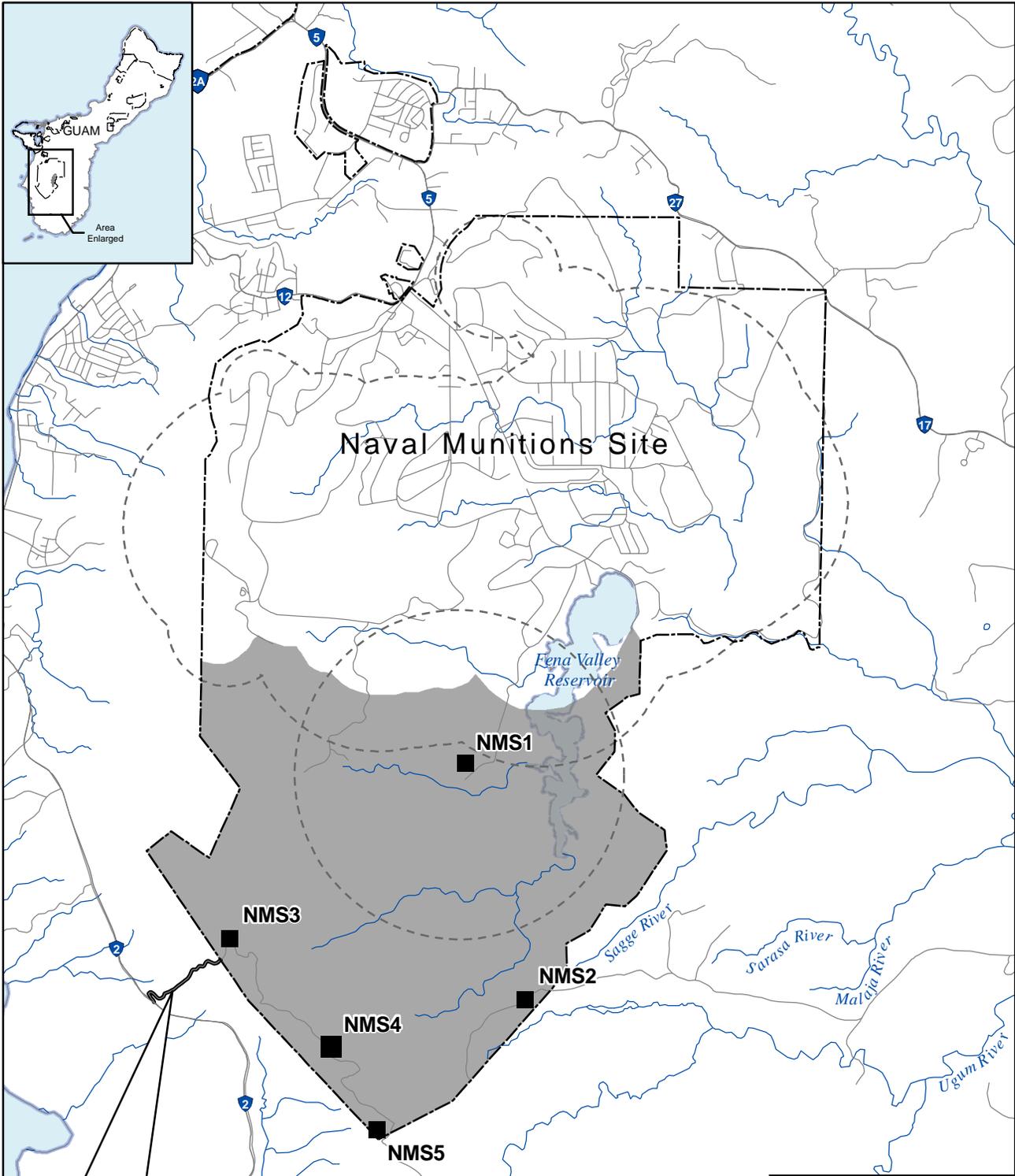


Figure 2.3-3
Proposed Large-Scale Maneuver Training Areas



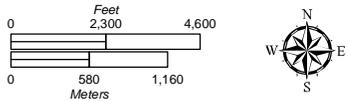
South Access Roadway
Alternative A & B
Current Hiking Trail

Note: Access road Alternative A would include a 16-ft roadbed, 50-ft width disturbance area, and establishment of a 60-ft right-of-way.

Legend

- Military Installation
- Route Number
- Landing Zone & ID
- Access Road
- Stream
- Potential Non-Firing Maneuver Training Area
- IBD ESQD Arc

Figure 2.3-4
Naval Munitions Site Maneuver Area Access



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LZ AS1 (described in Section 2.3.1.5) would support maneuver training operations at Andersen South (Figure 2.3-5). The convoy training course would use existing roadways and abandoned rights of way in the northwestern portion of Andersen South within areas identified for maneuver training use. The site plans depicted in Figure 2.3-6 and Figure 2.3-7 provide the location of the proposed convoy training course.

- MOUT training would be conducted in a complex of structures that would simulate urban rural and embassy environments. The MOUT at Andersen South would be suitable for units/organizations up to 800 Marines at a time, and would be used on a daily basis by 40 to 750 personnel. The MOUT may operate during daylight hours and at night. Night operations would comprise an estimated 15% of all operations. The MOUT would be used by III MEF units and organizations based on Guam, transients, and visiting regional allied forces. Units using the MOUT may bivouac in the vicinity, or arrive and depart daily. Forklifts or cranes would be used to reconfigure the modules of the MOUT to add variety and diversity to training (e.g., simulate a rural village or more complex setting). The MOUT facility requires surrounding maneuver space to provide room for tactical engagement.
- A fire management plan, currently being prepared by NAVFAC Pacific, would address the fire conditions under which use of pyrotechnics at Andersen South and NMS would be authorized and best management practices (BMPs) for use of those pyrotechnics. This plan would also address broad fire management and fire response at the Andersen South and NMS proposed maneuver areas.

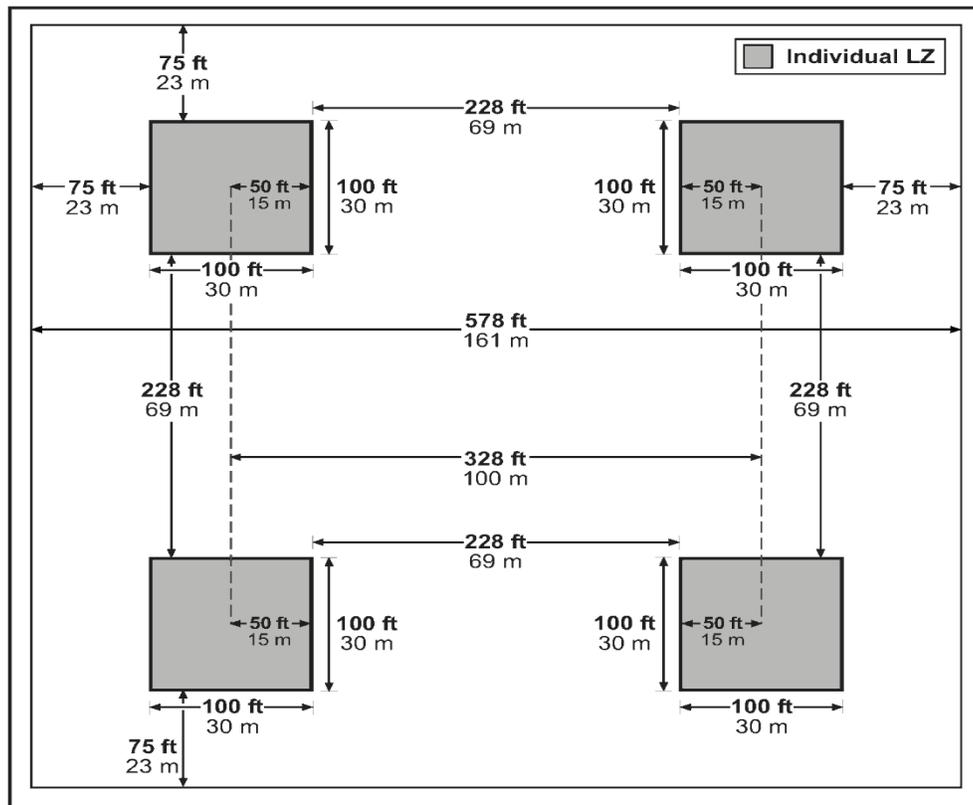
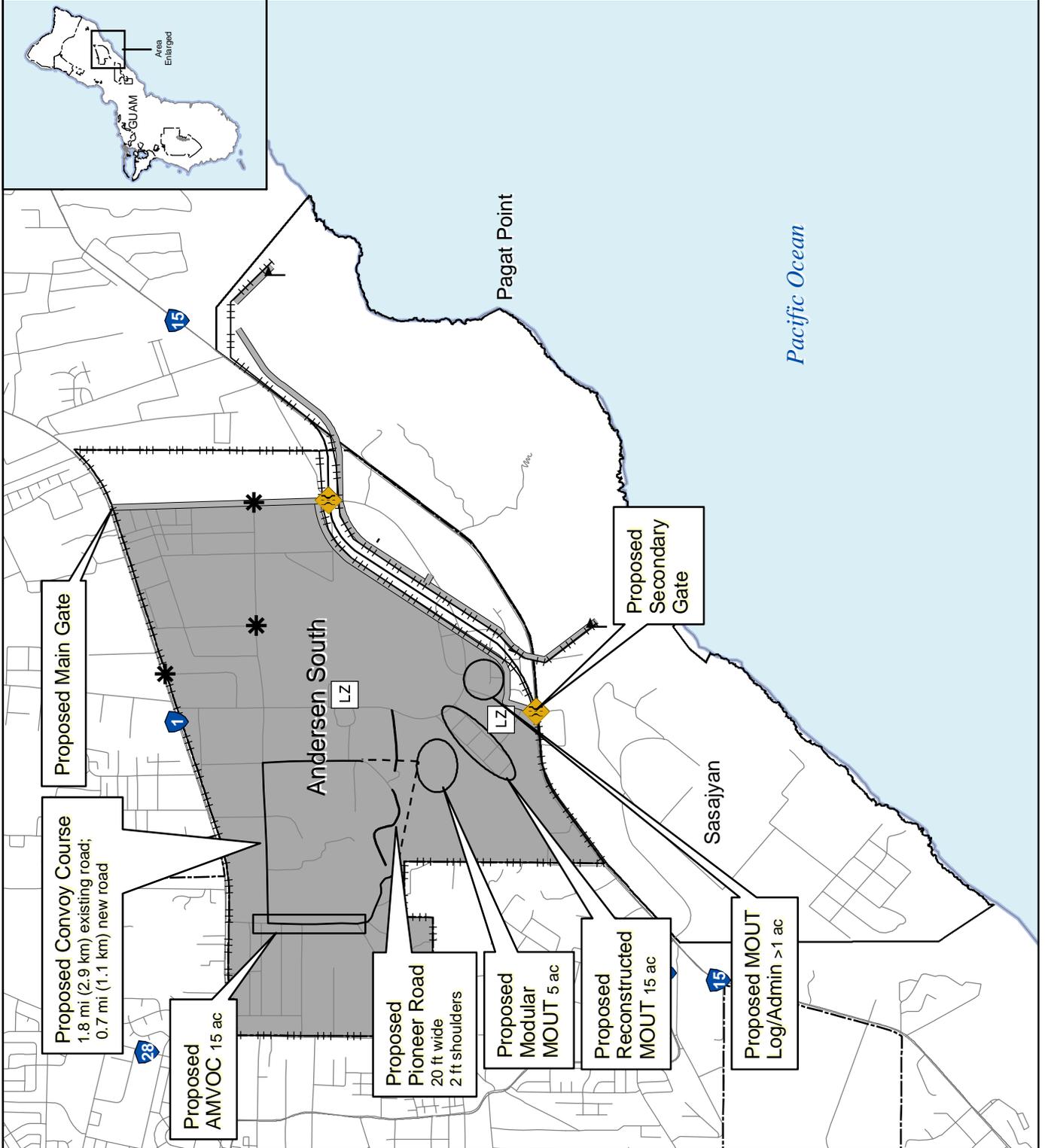
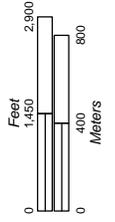


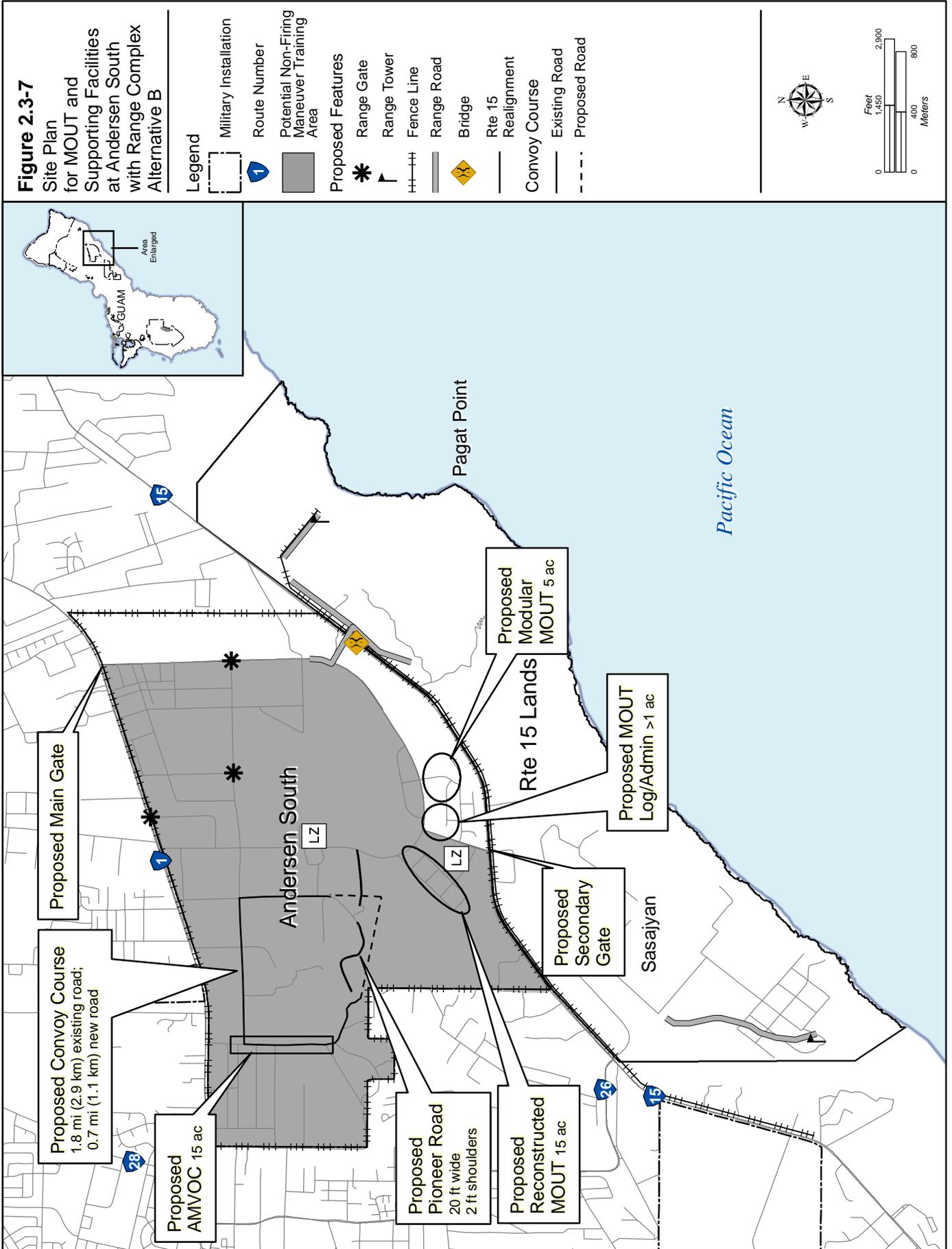
Figure 2.3-5. Standard Maneuver Area LZ Dimensions

Figure 2.3-6

Site Plan for MOUT and Supporting Facilities at Andersen South with Range Complex Alternative A

- Legend**
- Military Installation
 - Route Number
 - Potential Non-Firing Maneuver Training Area
 - Proposed Features**
 - Range Gate
 - Range Tower
 - Fence Line
 - Range Road
 - Bridge
 - Rte 15
 - Realignment
 - Convoy Course
 - Existing Road
 - Proposed Road





MOUT Alternatives

The facilities and location information are presented together for the MOUT complex, as facilities requirements have been developed concurrently. Two site plans have been developed for the MOUT and supporting facilities at Andersen South, reflecting slight differences in configuration that would occur with the Range Complex Alternative A (see Figure 2.3-6). and Range Complex Alternative B (see Figure 2.3-7). The overall site plans for Andersen South also include the AMVOC, maneuver area, and convoy course.

If Route 15 is realigned under Alternative A for the Firing Range Complex (see Section 2.3.1.4), access roads and gates would be needed for the portion of Andersen South north of the route realignment. The plan assumes two bridges would be constructed across Route 15. If only one bridge is constructed, then a parallel road would be needed for the road segment north of the Route 15 realignment, between the proposed secondary gate and the intersection with the proposed north-south road that would lead to the proposed main gate, in order to provide adequate traffic circulation. The proposed secondary gate is an existing gate that would be upgraded. If Route 15 is not realigned as would be the case under Alternative B for the Firing Range Complex (see Section 2.3.2.4), the existing gate would be upgraded and the bridge would not be constructed at that location (see Figure 2.3-7). Under both alternatives a perimeter security fence and gravel parking area would be constructed to serve the complex.

Advanced Motor Vehicle Operators Course (AMVOC)

Tactical motor vehicle operator training is a continuous requirement for MEF units. The proposed AMVOC would consist of a route along where a series of obstacles would be placed for driver trainees to negotiate (Figure 2.3-8).



Figure 2.3-8. Sample AMVOC Course

The AMVOC course would be constructed on the western side of Andersen South (see Figure 2.3-6 and Figure 2.3-7).

The capacity of the AMVOC facility would range from 25 to 60 personnel and would be used for individual, section, squad, or platoon training. An estimated 20 drivers per week would train at the AMVOC, primarily with High Mobility Multi Wheeled Vehicles (HMMWVs).

Engineer Equipment and Decontamination Training

The engineer equipment training site or “engineering pit” would be similar to a permanent construction site and would be located at the Main Cantonment. The engineer equipment site would be designed to support all three engineer units (approximately 750 Marines) to be stationed on Guam. Types of vehicles that would operate at the “engineering pit” include bulldozers, graders, material handling equipment, and Armored Combat Engineer vehicles. Decontamination training involves using wash-down equipment to simulate decontamination of equipment exposed to a chemical or biological agent. The decontamination site would be used on a weekly basis with equipment and personnel throughput to vary based on the training scenario.

2.3.1.4 Firing General Military Skills Training

Overview

General military skills training involving the firing of munitions includes the following categories:

- Individual Weapons Training
- Individual Combat Skills

Live-fire weapons ranges proposed for Guam include four small arms qualification ranges and a machine gun operational range. Four explosive ranges are also proposed:

- A hand grenade range that would be used to fulfill an integral part of Individual Combat Skills Training
- A hand grenade house that would supplement the hand grenade range to provide hand grenade training in an urban environment
- A demolition range that would be used for sustainment training in preparing and priming various military explosives
- A breacher/shooting house that would be used for training in forced entry in an urban environment using small breacher charges

Volume 9, Appendix D provides a summary of the munitions and munitions constituents to be used at the proposed ranges.

Criteria from Marine Corps Order 3570.1B define the SDZs for individual weapons systems based on the weapon and munitions characteristics. For planning purposes in this EIS/OEIS, SDZs have been developed based on the placement of ranges. As the planning process progresses, and range designs mature, the SDZs would be certified in accordance with Marine Corps Order 3550.9, Marine Corps Ground Range Certification and Recertification Program. Limitations to use of land, water and airspace affected by SDZs are subject to regulation by the DoD, U.S. Coast Guard (USCG), U.S. Army Corps of Engineers (USACE), and the FAA, as appropriate.

Proposed Facilities and Operations

The proposed action would include construction of the following live-firing training facilities:

- Training Range Complex that would include five individual small arms ranges of various types and a range control facility
- Hand Grenade Range and Hand Grenade House
- Breacher and Shooting House
- Indoor Small Arms Range

2.3.1.5 Aviation Training

The types of aviation training and facility requirements associated with Marine Corps units that would relocate to Guam are listed in Table 2.3-2. Marine Corps aviation training requirements on Guam have been evaluated based on the aircraft and aircrew loading presented in Table 2.3-3. A total of 25 aircraft and 50 aircrews would be based in Guam under the proposed action.

Table 2.3-2. Aviation Training Types

Training Type		Facility/Airspace Requirements
FAM	Familiarization and Instrument Flight	Improved airfield with air rescue available. FAM is a daylight operation. Instrument flight is day and night.
FORM	Formation Flights	Flying in formation, often in Air Traffic Controlled Assigned Airspace (ATCAA) assigned by FAA. Also includes helicopter flying Visual Flight Rules (VFR) in formation. Day and night use.
CAL	Confined Area Landing	Ground space, helicopter landing zones in approx. 10 locations. Day and night.
TERF	Terrain Flights	1 or more routes in ATCAA assigned by FAA over varying terrain for day and night flights at 50 to 200 ft (15 to 61 m) above ground level.
EXT	External Loads	Both unimproved and improved LZs for day and night use. Unimproved LZs at remote sites. Ground access needed to pre-position external loads that cannot be carried across public roads or populated areas.
GTR	Ground Threat Reaction	Tactical flight maneuver area or route where ground based threat simulators can be placed. Air routes similar to TERF. Day and night. Includes training on Tinian that is addressed in Volume 3.
FCLP	Field Carrier Landing Practice	Simulated ship deck paved area. Day and night.
TAC	Tactics	Routes over water or land of at least 50 nm (93 km), for chaff, flares, and .50 cal machine gun engagement. Day and night. Includes training in CNMI that is addressed in the MIRC EIS/OEIS.
AG	Aerial Gunnery	Air-to-Ground gun munitions against ground targets. Day and night. Includes training in CNMI that is addressed in the MIRC EIS/OEIS.
HIE	Helicopter Insertion and Extraction	Fast rope, rappelling, helo-casting, and parachute operations in improved fields, drop zones, and water operating areas. Day and night.
DM	Defensive Maneuvers	Airspace routes similar to TERF, but at higher altitude. Day and night.

Source: NAVFAC Pacific 2009.

Table 2.3-3. Aircraft and Aircrew Loading under the Proposed Action

Number and Type of Aircraft	Number of Aircrews	Aircraft Range (nm)	Aircraft Endurance (hours)
12 MV-22	24	879	4
3 UH-1	6	225	approximately 2
6 AH-1	12	350	3
4 CH-53E	8	360	3 (with regular tanks)

Aviation training would generate a minimum of 1,552 training sorties annually. A sortie consists of one aircraft performing a take-off, a training event, and a landing; an operation consists of the performance of a military training mission that may involve the use of one or more individual military training airspace components in order to accomplish that mission.

The aircraft squadrons are proposed for basing at Andersen AFB North Ramp, in a separately constructed air facility (see Section 2.4). Andersen AFB North Ramp currently has two parallel runways: one 11,185 ft (3,411 m) and one 10,558 ft (3,220 m) long. Currently, 29,542 sorties are generated at North

Ramp and under the 2014 no-action alternative, 68,139 sorties would be generated at Andersen AFB (Czech and Kester 2008). Typical training missions can occur both day and night.

In addition, aviation training would occur along proposed flight corridors and SUA within and offshore Guam and integrated with MIRC training operations. Specific aviation training proposals for Guam and surrounding airspace are discussed below.

Marine Air Control Group (MACG) Training

The MACG is part of the ACE of the MAGTF. MACG training involves coordination of air command and control and air defense within the Marine Aircraft Wing. Tactical Air Operations Center (TAOC) training involves establishment of operating air traffic control radar and radar frequency emitters and facilities consisting of shelters, a portable tower, and electrical power sources in about 48 hours, and dismantling them in approximately the same time.

For the TAOC, facilities to be constructed would consist of a 150 ft by 150 ft (46m by 46 m) or 0.5-ac (0.20 ha) concrete pad that would provide a permanent operational location to be used for placement of vans and shelters during routine training events. Equipment operated at the site would include AN/TPS 59 and AN/TPS-63 radars.

Improved Airfield Training

FCLP training requires a lighted pad sized for a large amphibious deck ship for day/night use and with night vision goggles. FAM requires an improved airfield with Aircraft Rescue and Fire Fighting for autorotation and simulated engine-out approaches. FCLP and FAM training would occur at an improved airfield. FCLP training involves landing on a simulated aircraft carrier. Approximately 3 training operations are conducted with each FAM sortie and five training operations with each FCLP sortie. Both are conducted during both day and night.

On Guam, aviation training would occur at an existing improved airfield at North Ramp and NWF, both at Andersen AFB. Table 2.3-4 provides an estimate of aviation training that would occur at each of these sites under the proposed action based on the minimum bi-annual training requirement for FAM and monthly training requirement for FCLP for aircrews associated with the proposed action.

Table 2.3-4. Estimated Annual Training Sortie Activities at Improved Airfields

Location and Training Type	Sortie-Ops by Aircraft Type				Total Annual Sortie-Ops	Duration/Sortie-Op (Minutes)	Duration of Sortie-Ops by Aircraft Type (Minutes)				Total Annual Sortie-Op Minutes	% Night	% Below 3,000 ft AGL	Annual Freq. Training/Location (Days)
	CH-53	MV-22	AH-1	UH-1			CH-53	MV-22	AH-1	UH-1				
Andersen AFB North Ramp														
FCLP	20	120	30	15	185	2	40	240	60	30	370	50%	100%	12-18
FAM	11	48	16	4	79	3	33	144	48	12	237	10%	100%	4-6
NWF														
FCLP	80	240	60	30	370	2	160	480	120	60	740	50%	100%	12-18
FAM	11	48	16	4	79	3	33	144	48	12	237	10%	100%	4-6
Interfacility Operations	131	212	542	184	1069	1	131	212	542	184	1069	10%	100%	16-24

Agreements with FAA, GovGuam, COMNAV Marianas, and Andersen AFB agreements would be needed to establish a military flight corridor, route, or tactical navigation area. Potential routes include southern Guam with mountainous areas and low population density associated with NMS.

Table 2.3-5 provides an estimate of aviation training that would occur in designated airspace in Guam based on the minimum bi-annual training requirement for TERF, GTR, and DM for aircrews associated with the proposed action. In addition, sorties associated with the transport personnel from Andersen South North Ramp to NMS or Andersen South for maneuver training is also estimated in Table 2.3-5 (as MAN-LFT).

Table 2.3-5. Estimated Annual Training Sortie Activity in Military Flight Corridors, Routes, or Tactical Navigation Area in Guam Based on Minimum Training Requirements

Location and Training Type	Sortie-Ops by Aircraft Type				Total Annual Sortie-Ops	Duration/Sortie-Op (Minutes)	Duration of Sortie-Ops by Aircraft Type (Minutes)				Total Annual Sortie-Op Minutes	% Night	% Below 3,000 ft AGL
	CH-53	MV-22	AH-1	UH-1			CH-53	MV-22	AH-1	UH-1			
TERF	16	48	24	12	100	90	1,440	4,320	2,160	1,080	9,000	10%	90%
GTR	16	48	24	6	94	90	1,440	4,320	2,160	540	8,460	10%	80%
DM	16	48	24	6	94	90	1,440	4,320	2,160	540	8,460	10%	80%
MAN-LFT	912	0	0	0	912	10	9,120	0	0	0	9,120	10%	80%

Landing Zones (LZs)

Figure 2.3-9 depicts proposed LZ locations at Andersen South, NWF, NMS, and Orote Airfield. Aviation training at NWF and Orote Airfield LZ locations would not involve any LZ construction or clearance of approach-departure clearance zones as the existing infrastructure would support the proposed aviation training at these sites. However, new LZs would be developed to support proposed aviation training at Andersen South and NMS.

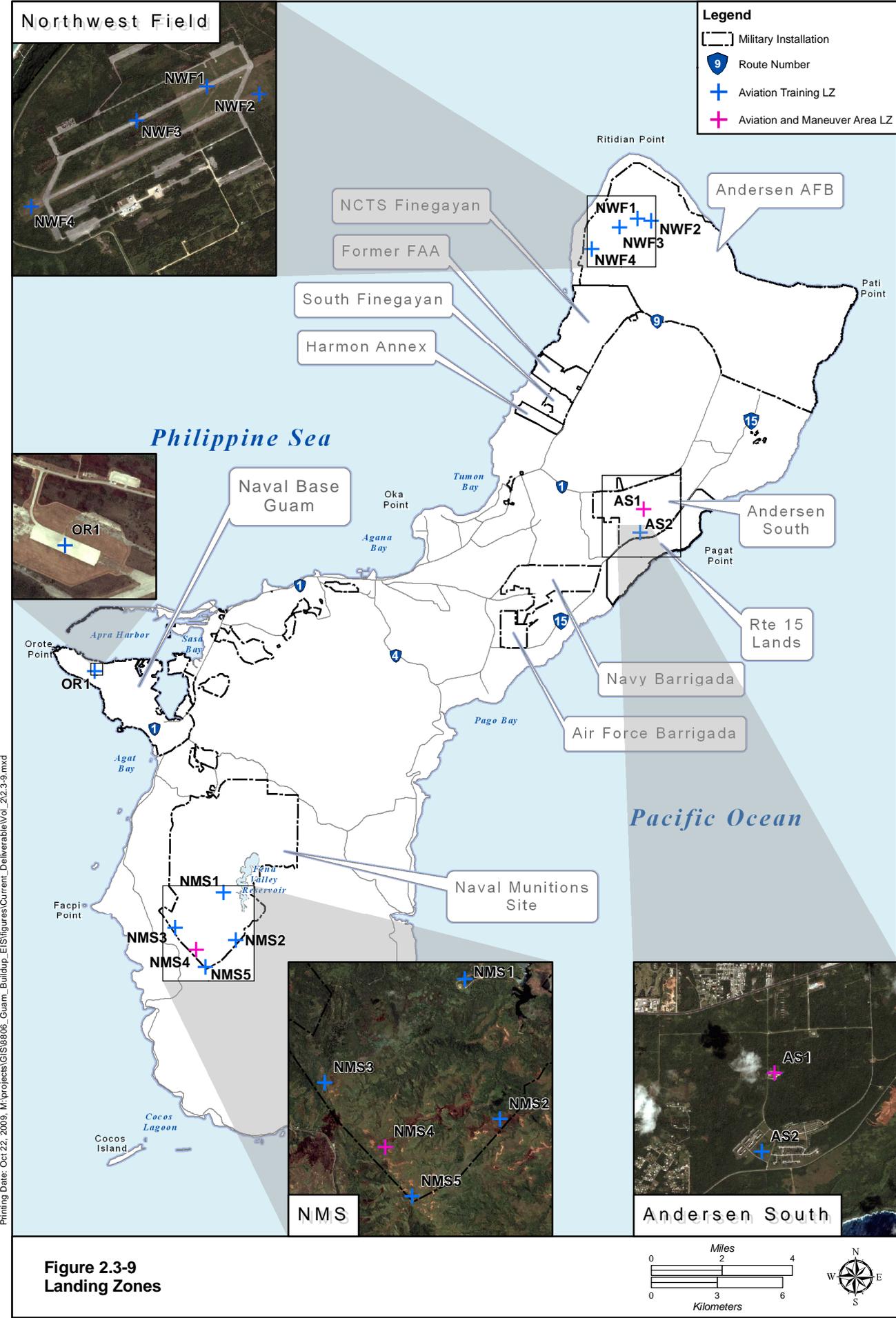
2.3.1.6 Airspace

Overview

The FAA has overall responsibility to manage and control U.S. airspace, including that used by commercial, civil, and military aircraft. To ensure safe and efficient airspace use, the FAA defines the types of airspace and the nature of activities that each type can accommodate. Within this system, military services identify specific needs for airspace (the horizontal and vertical boundaries) and request that the FAA designate SUA to meet those needs. Although the FAA retains overall management of SUA, individual military units schedule and coordinate airspace use with other units using Letters of Agreement with the FAA to formalize and delineate areas of responsibility.

There are two types of SUA airspace requirements associated with the proposed action on Guam. The first is the need for designation of airspace related to the vertical ricochet hazard associated with the proposed firing ranges (discussed further below). The second is use of existing SUA and Air Traffic Controlled Assigned Airspace (ATCAA) to accommodate proposed Marine Corps aviation training. Such training would involve the use of training sites at NWF and North Ramp at Andersen AFB, Orote Airfield, Andersen South, and NMS, as well as training along flight routes, corridors, operating areas, or other designated airspace over Guam and adjacent waters. No additional SUA over Guam would be needed to support the aviation training requirements.

It is assumed that a formal joint military airspace proposal will be made to the FAA in the future; at that time a separate determination would be made as to further environmental documentation requirements.



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Figure 2.3-9
Landing Zones

Airspace Requirements: Firing Range Safety

Figure 2.3-10 depicts the proposed SUA associated with the machine gun range component under the firing range complex Alternatives A and B. SUA would be needed to accommodate the associated vertical hazard area. Exact coordinates are pending environmental, safety and other analysis, and are based upon proposed general range layouts and associated coordinates. Proposed R-7202 Guam boundaries for the Anderson South/Plateau Alternative would start at lat.13°26'48"N., long.144°54'30"E.; to lat.13°29'28"N., long.144°51'08"E.; to lat.13°31'15"N., long.144°53'22"E.; to lat.13°28'31"N., long.144°56'53"E.; to the point of beginning.

Proposed R-7202 Guam boundaries for the Anderson South/Valley Alternative would start at lat.13°25'20"N., long.144°52'47"E.;to lat.13°29'03"N., long.144°50'27"E.;to lat 13°31'29"N., long.144°52'58"E.;to lat 13°27'36"N., long.144°55'34"E.; to the point of beginning. Altitudes would be from the surface to 3,000 feet AGL. Times of use would be Monday-Sunday 0600-2300 local, other times by NOTAM. Activation of proposed R-7202 would be for those periods when live fire includes larger caliber weapons such as 7.62 caliber rifles to accommodate higher vertical hazard values.

2.3.2 Alternatives Analysis: Training Functions

2.3.2.1 Feasibility and Suitability Criteria

A qualitative assessment of the feasibility of using specific DoD land areas for siting of training facilities was based on the following criteria:

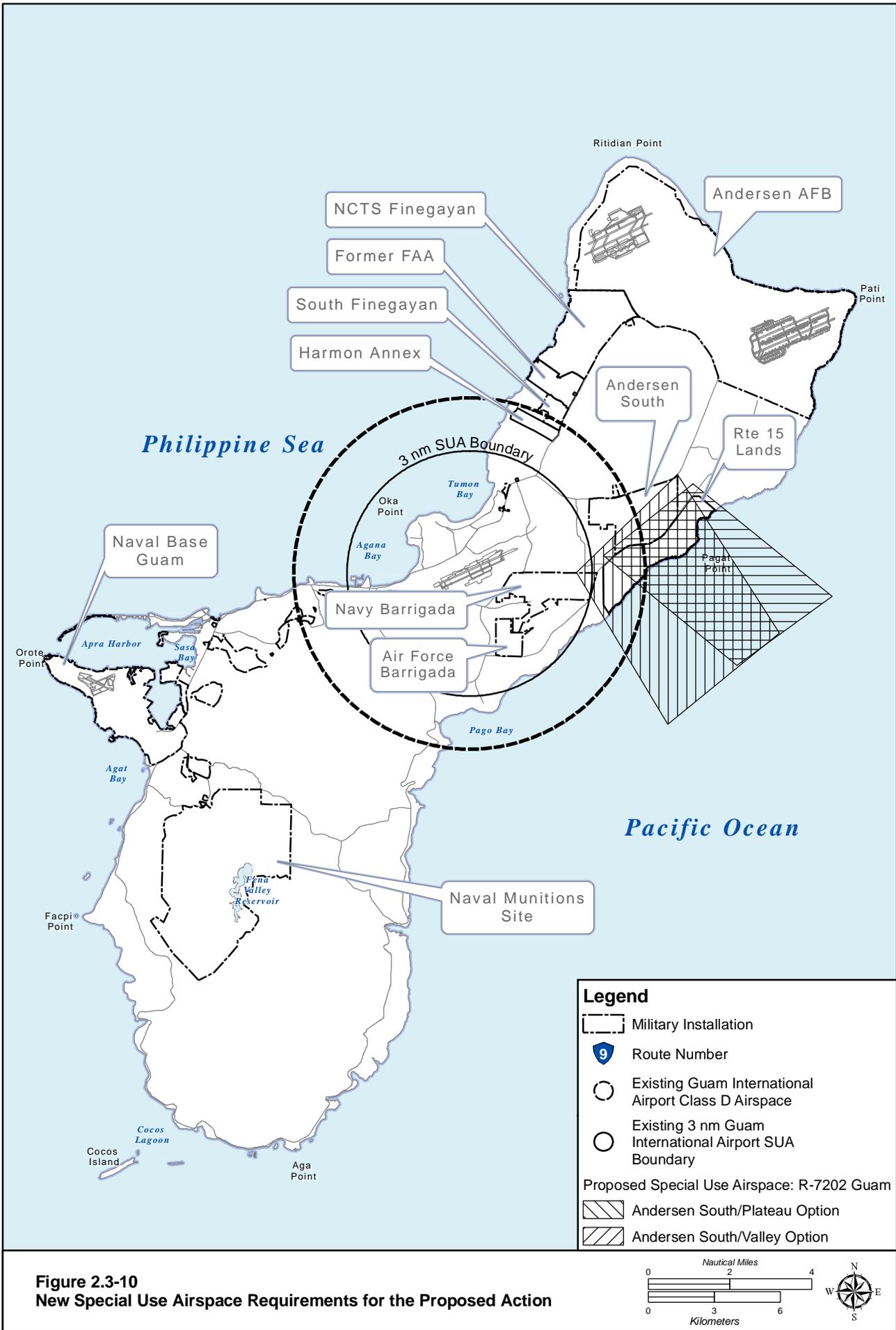
- compatibility with future missions,
- environmental considerations (including cultural and historical resource constraints and terrain),
- anticipated public concerns.

Suitability criteria included:

- land availability for facility including associated safety or clearance zones,
- supports operational requirements,
- supports training requirements,
- minimizes encroachment,
- consistent with AT/FP requirements, and
- compliance with military vision.

The basis of analysis is presented in a brief entitled *Guam Alternatives Basing Analysis, Guam Stakeholders Working Group*, dated August 21, 2007 and prepared by NAVFAC Pacific.

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2.3.2.2 Ammunition Storage Alternatives

Only existing munitions storage areas were considered to be candidate sites for the proposed munitions storage facilities under the proposed action. This narrowed the candidate sites to NMS and the Andersen AFB MSAs. Within these two areas, the primary factors in selecting alternative munitions storage configurations were as follows:

- **Operational:** the ECMs should be sited as close together as safety setback distances allow to minimize logistical and maintenance requirements and total area encumbered by ESQD arcs.
- **Biological:** the amount of habitat disturbed should be minimized (e.g., siting ECMs on previously cleared or paved areas or areas of lesser habitat value, and avoiding removal of mature trees) and the ECMs should be sited to avoid sensitive essential habitat for T&E species.
- **Safety:** ECMs must be sited in accordance with all regulatory guidance to ensure the safe working environment for munitions and other base personnel (i.e., the direction that the igloos are oriented in relation to each other, safety setback distances between ECMs, and explosive safety arcs within and outside of munitions storage area).

As shown on Figure 2.3-11, two locations at NMS were considered as potential sites for these 10 ECMs: the Parson's Road Area and the High Road Area. In the Parson's Road Area, there are two alternatives for layout of the 10 ECMs in a configuration that would allow for a combined 360,000 lb NEW capacity. In the High Road area, there is one site that could accommodate the 10 ECMs in a configuration that would allow for a combined capacity of 500,000 lb NEW.

The EIS/OEIS evaluates the development of munitions storage facilities in currently undeveloped areas. This does not preclude replacement or upgrade alternatives within implementation, but rather conservatively estimates potential impacts for the purposes of this EIS/OEIS.

Within MSA1, there was one alternative identified for the placement of ECMs, work areas, administrative/inert warehouse building, and storage for munitions, chaff, and flares (Figure 3.2-12). All proposed munitions facilities would be sited within existing munitions area boundaries and would not alter the existing ESQD arcs. Land use constraints at each site include natural resources and proximity to other munitions storage facilities and infrastructure.

2.3.2.3 Command, Control, and Simulation Alternatives

All three proposed Command, Control and Simulation facilities would be located within the Main Cantonment area to capitalize on functional support relationships with headquarters and administrative functions; the specific sites are being determined through the Main Cantonment master planning process.

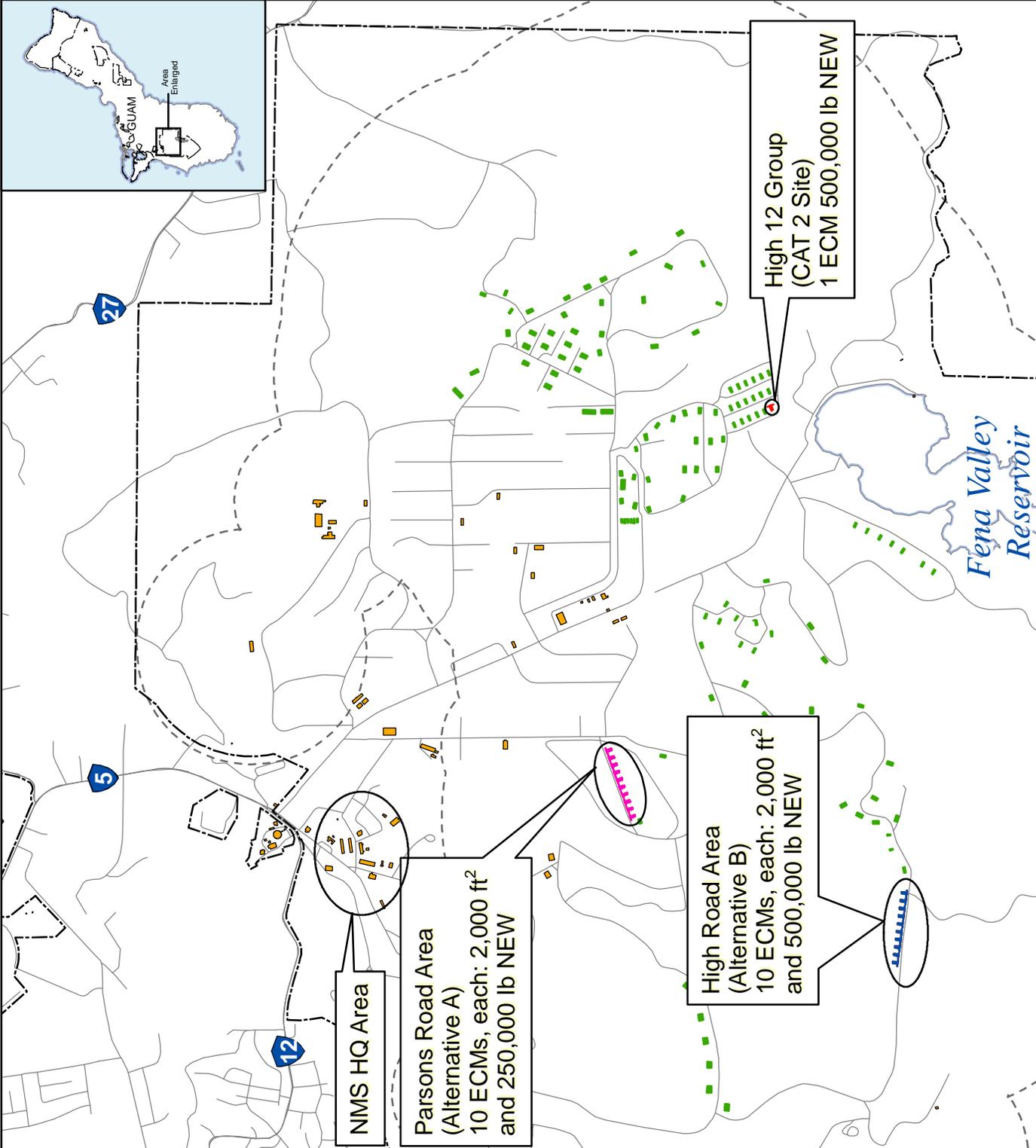
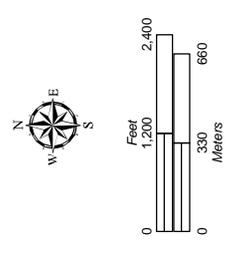
2.3.2.4 Non-Firing General Military Skills Training Alternatives

The non-fire training elements of the proposed action are described in Section 2.3.1 To ensure operational efficiency, it is important all or as many as possible of these training requirements be collocated. Candidate site locations are shown in Figure 2.3-13 (for both non-firing and firing ranges).

Table 2.3-6 lists the parcels considered as potential sites for some or all of the required non-firing range facilities, along with the limitations of each site.

Figure 2.3-11
Naval Munitions Site
Ammunition Storage
Improvements

- Legend**
- Military Installation
 - Route Number
 - IBD ESQD Arc
 - Existing Building
 - Munitions Storage
 - Existing Munitions Storage Magazines
 - USMC - Proposed ECM Locations
 - USMC - Proposed Alternative A ECM Locations
 - USMC - Proposed Alternative B ECM Locations



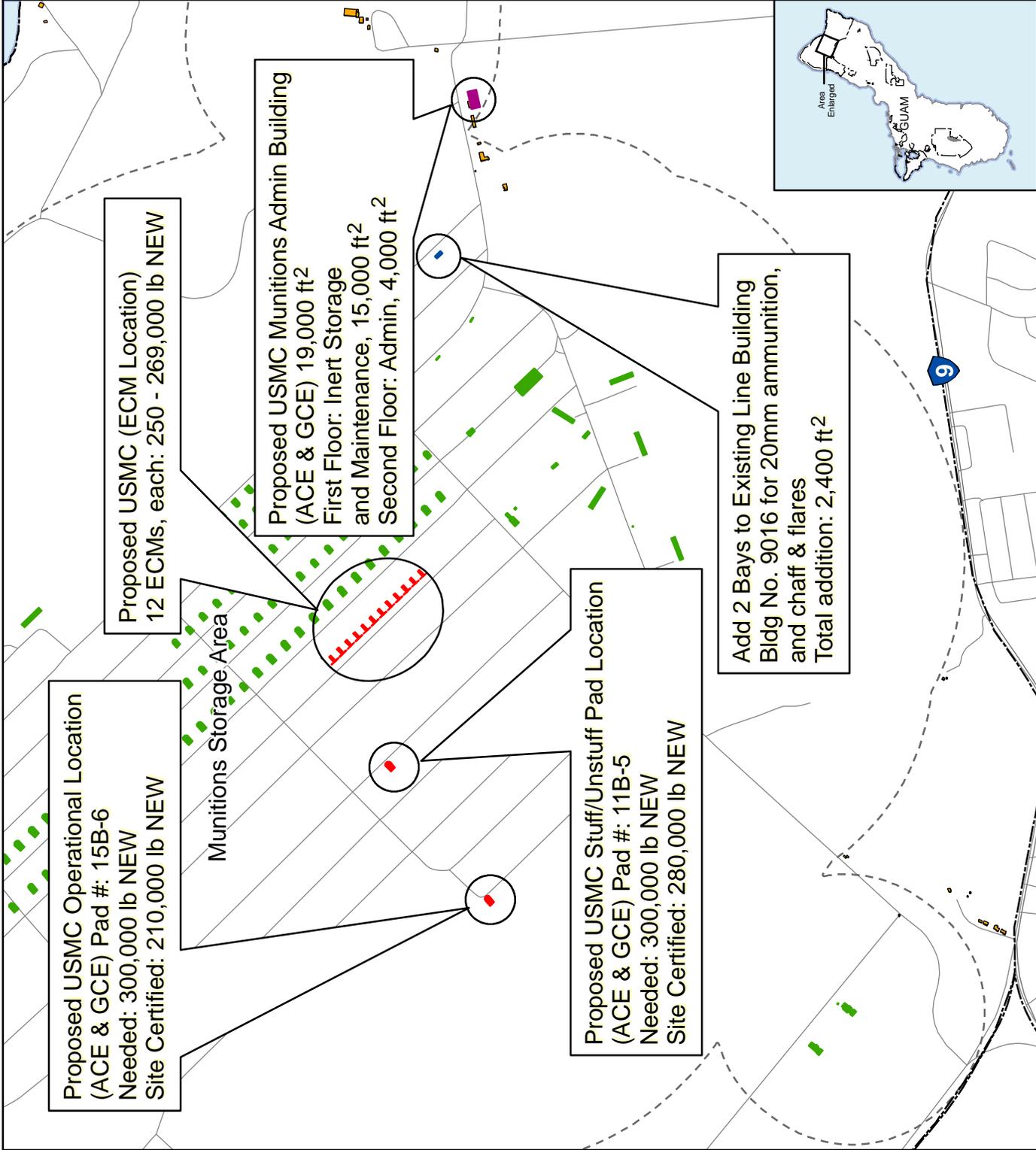
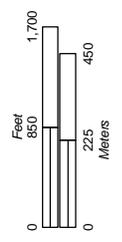
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Figure 2.3-12

Andersen AFB
MSA Improvements

Legend

-  Military Installation
-  Route Number
-  IBD ESQD Arc
-  Existing Building
-  Munitions Storage
-  Existing Munitions Storage Magazines
-  USMC - Proposed ECM Locations
-  USMC - Proposed Bay Addition
-  USMC - Proposed Munitions Admin



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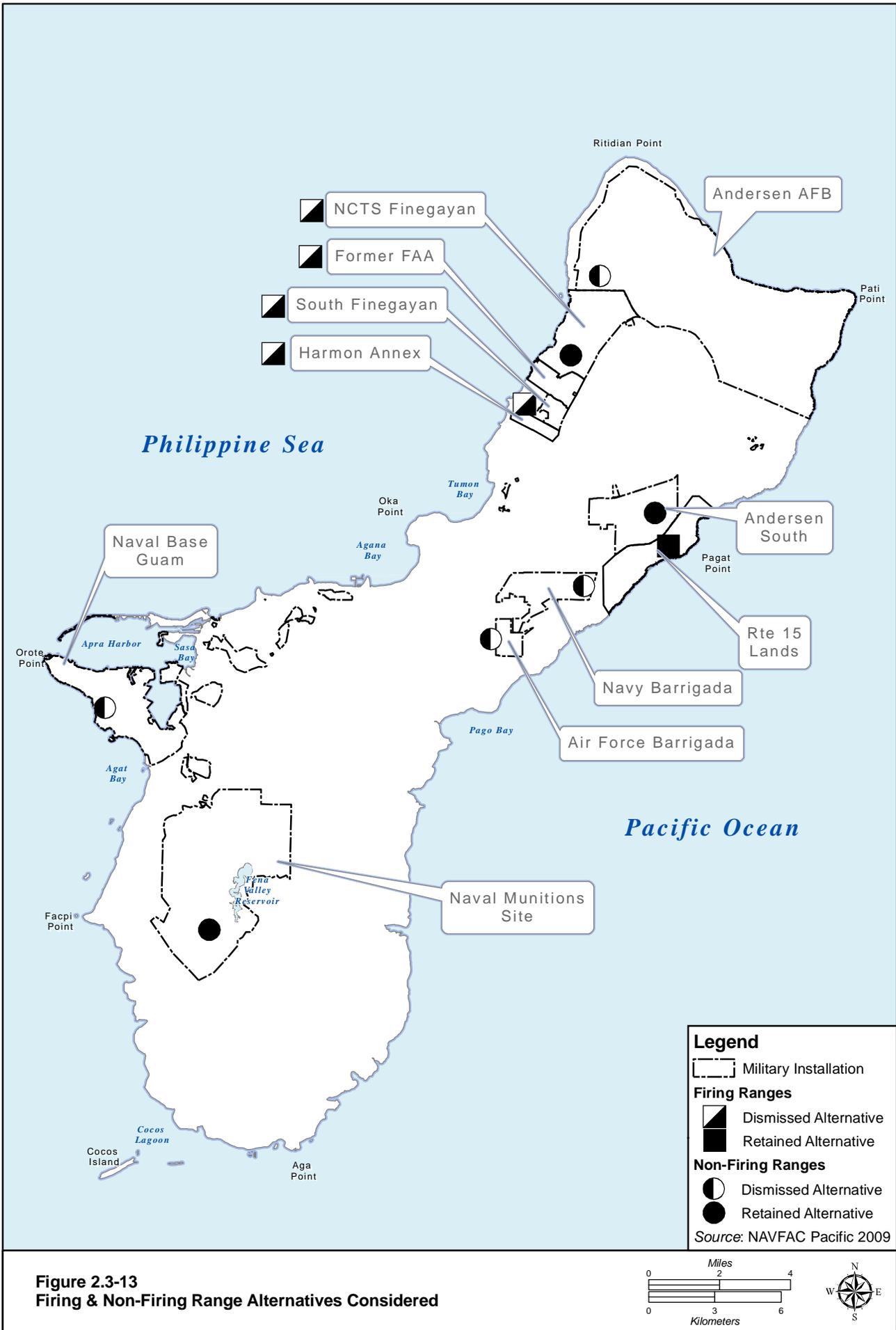


Table 2.3-6. Maneuver and Non-Fire General Skills Training Sites

<i>Candidate Sites</i>	<i>Carried Forward for Analysis</i>	<i>Compatibility with Major Criteria</i>
Barrigada (Navy)	No	Feasibility criteria <ul style="list-style-type: none"> • Incompatible with future missions Suitability criteria <ul style="list-style-type: none"> • Limited land availability
Barrigada (Air Force)	No	Feasibility criteria <ul style="list-style-type: none"> • Incompatible with future missions Suitability criteria <ul style="list-style-type: none"> • Limited land availability
Orote Peninsula	No	Feasibility criteria <ul style="list-style-type: none"> • Incompatible with future missions • Environmental considerations (Historical area conflict) Suitability criteria <ul style="list-style-type: none"> • Limited land availability
Andersen AFB NWF	No	Feasibility criteria <ul style="list-style-type: none"> • Incompatible with future missions • Environmental considerations Suitability criteria <ul style="list-style-type: none"> • Limited land availability
Area north of NCTS Finegayan	No	Feasibility criteria <ul style="list-style-type: none"> • Incompatible with future missions • Environmental considerations (Overlay Refuge)
NMS (company-sized units only)	Yes	Feasibility criteria <ul style="list-style-type: none"> • Meets criteria Suitability criteria <ul style="list-style-type: none"> • Limited land availability • Limited proximity to ranges and the aviation complex • Limited training capability
NCTS Finegayan	Yes	Feasibility criteria <ul style="list-style-type: none"> • Meets criteria Suitability criteria <ul style="list-style-type: none"> • Limited land availability
Andersen South	Yes	Feasibility criteria <ul style="list-style-type: none"> • Meets criteria Suitability criteria <ul style="list-style-type: none"> • Meets all criteria

Source: NAVFAC Pacific 2007.

Andersen South is the largest existing MOUT facility on Guam and the only existing MOUT facility large enough to support the required company level training. It is the only location identified for the required MOUT improvements. Two site plans have been developed for the MOUT and supporting facilities at Andersen South, reflecting slight differences in configuration that would occur with the Training Range Complex Alternatives A and B (refer to Section 2.3.1.3). The overall site plans for Andersen South also include the AMVOC, a maneuver area, and a convoy course.

The maneuver requirements were described in Section 2.3.1. Large-scale maneuver requirements would be met using two separate areas at Andersen South and NMS, since there is no single area on Guam that provides sufficient space for large-scale maneuvers. The proposed action includes development and use of both areas, and no reasonable alternatives have been identified on Guam for either area. Development and

use of the maneuver area at NMS would also require construction of an access road, for which two reasonable alternatives have been identified.

The purpose of the proposed access road is to allow military re-supply and transport vehicles to access the southern portion of NMS where proposed large-scale maneuvers would occur. The access road would allow HMMWVs and 7-ton trucks to bring supplies and Marines to the NMS.

The road would begin at Route 2 and end at the top of the ridgeline just inside the NMS boundary. There would be a turn around and drop off area at that point, but it would not connect into any existing roads. This is the approximate location where a bivouac area (i.e., encampment) would be established in support of large-scale maneuvers. The road would be 0.4 mi (0.6 km) long, 16 ft (5 m) wide; construction disturbance width, including vegetation clearing, is assumed to be up to 50 ft (15 m). The proposed access road is on non-DoD land, so a 60-ft (10-m) wide right-of-way would be acquired to grant control of the road to DoD. Locked, unmanned gates would be placed at the beginning of the access road and at the entrance to the NMS. Also, lockable vehicle barriers would be established at the top and bottom of the proposed access road. The road would be used on average one week per month, up to 10 vehicles per day (HMMWVs and 7-ton trucks).

The DoD would control use of the access road. Public access would be allowed when the military is not conducting training. This access would be limited to foot traffic to access public hiking trails and sites. Vehicle traffic would not be allowed due to concerns over encroachment in the NMS by hunters/poachers. The road would be controlled by DoD; use of the road by the general public would need to be coordinated with DoD.

There are two action alternatives for the proposed NMS access road (see Figure 2.3-4 in Section 2.3.1.3):

1. NMS Access Road Alternative A: Roadway improvements would occur along an existing hiking trail 0.4 mi (0.6 km) in length, covering approximately 0.8 ac (0.3 ha) at a 16-ft (5-m) width, and includes no stream crossings.
2. NMS Access Road Alternative B: Under this alternative, the road would be the same length but would not be improved. It would be used by foot traffic and by 4-wheeled all-terrain vehicles (ATVs).

2.3.2.5 Firing General Military Skills Training Alternatives

Live-Fire Training Range Complex

Depending on the configuration and siting, the total area required for the range complex could be as large as 1,680 ac (680 ha).

These target firing ranges would use live-fire munitions and would generate fan-shaped SDZs that extend well beyond, above, and to the side of the targets. Access to the SDZ is restricted. No development can be within the SDZs and none is proposed, except for perimeter security fencing, but the area may be amenable to adaptive management strategies that improve the environment. The number of firing points and the assignment of multiple types of training to a specific range would impact the size of the SDZ. If extending over water, these areas would be set aside through announcements in the Federal Register by the Corps of Engineers. The SDZs can overlap to minimize the amount of land or water encumbered. The alternatives analysis considered the feasibility and suitability of various land areas for one or more of the ranges. The Step 2 site selection candidates for live-fire training ranges were initially limited to DoD lands and included NCTS Finegayan, expansion of Andersen AFB Tarague Beach Rifle Range to the west, Andersen South, NWF (Andersen AFB), Air Force Barrigada, Orote Peninsula, and NMS. All of

these individual DoD candidate sites were dismissed due to not meeting feasibility criteria for compatibility with future missions. After the initial review of individual DoD parcels' capability for meeting firing range requirements, the analysis was expanded to include non-DoD lands on the west coast, east coast and a combination of east and west coasts.

The East-West and the west coast alternatives described in Table 2.3-7 were eliminated following advice of the office of the Governor. The amount of submerged land that would be encumbered by the SDZs generated by the ranges on the west coast would have an unacceptable impact on recreational activities and traditional fishing areas, which are prevalent on the west coast. Step 2 site selection therefore identified only one feasible site for the live-fire Training Range Complex.

Table 2.3-7. Considered and Dismissed Live-Fire Range Complex Alternatives

<i>Candidate Sites</i>	<i>Carried Forward for Analysis</i>	<i>Compatibility with Major Criteria</i>
West Coast: Some or all of the following: <ul style="list-style-type: none"> • NCTS Finegayan • South Finegayan • GLUP 77 • Former FAA • Harmon Properties 	No	Feasibility <ul style="list-style-type: none"> • Anticipated public concerns
East Coast: Lands east of Andersen South and Route 15	Yes	Feasibility <ul style="list-style-type: none"> • Meets all criteria Suitability <ul style="list-style-type: none"> • Meets most criteria
East-west combination. Former FAA only	No	Feasibility <ul style="list-style-type: none"> • Anticipated public concerns

Legend: ✓ = Site retained as a reasonable alternative for analysis.

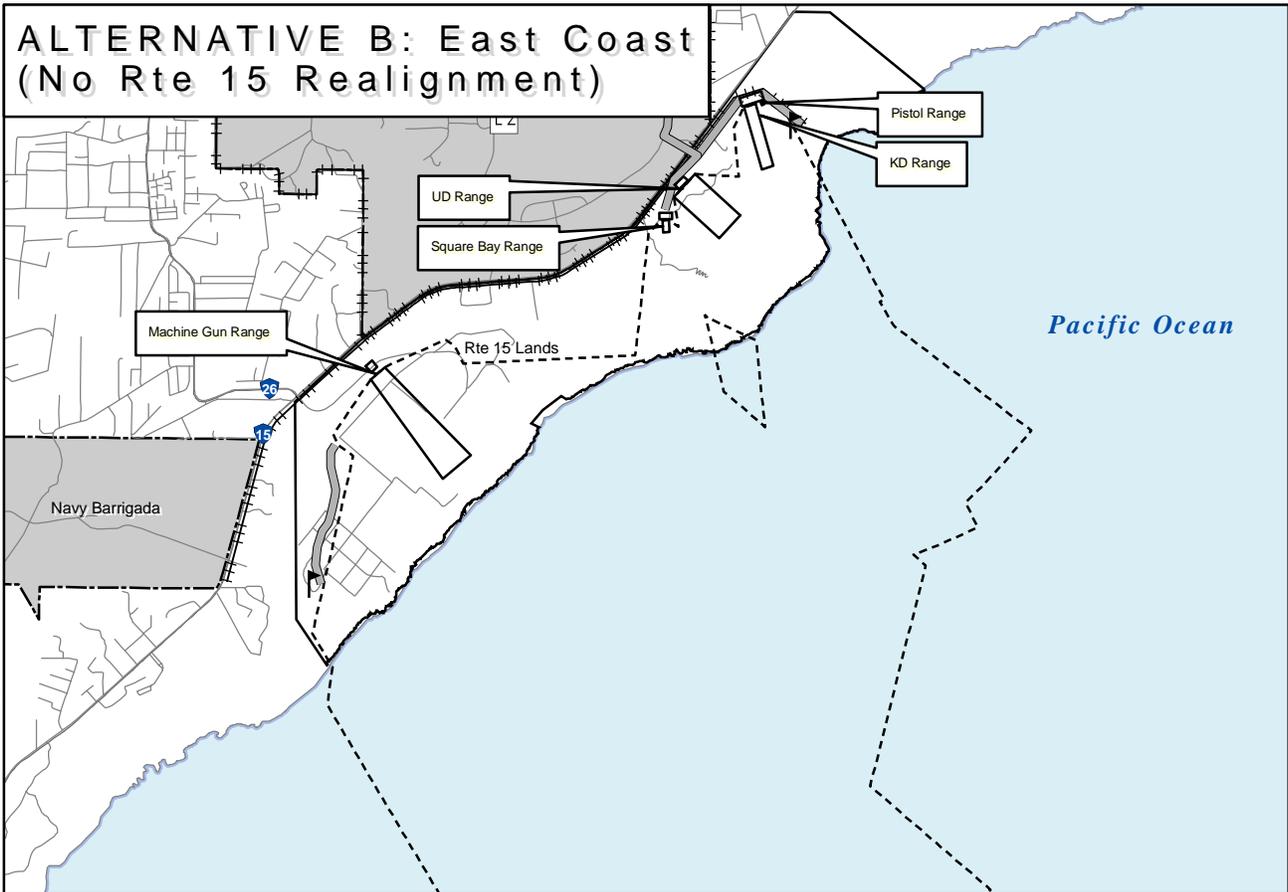
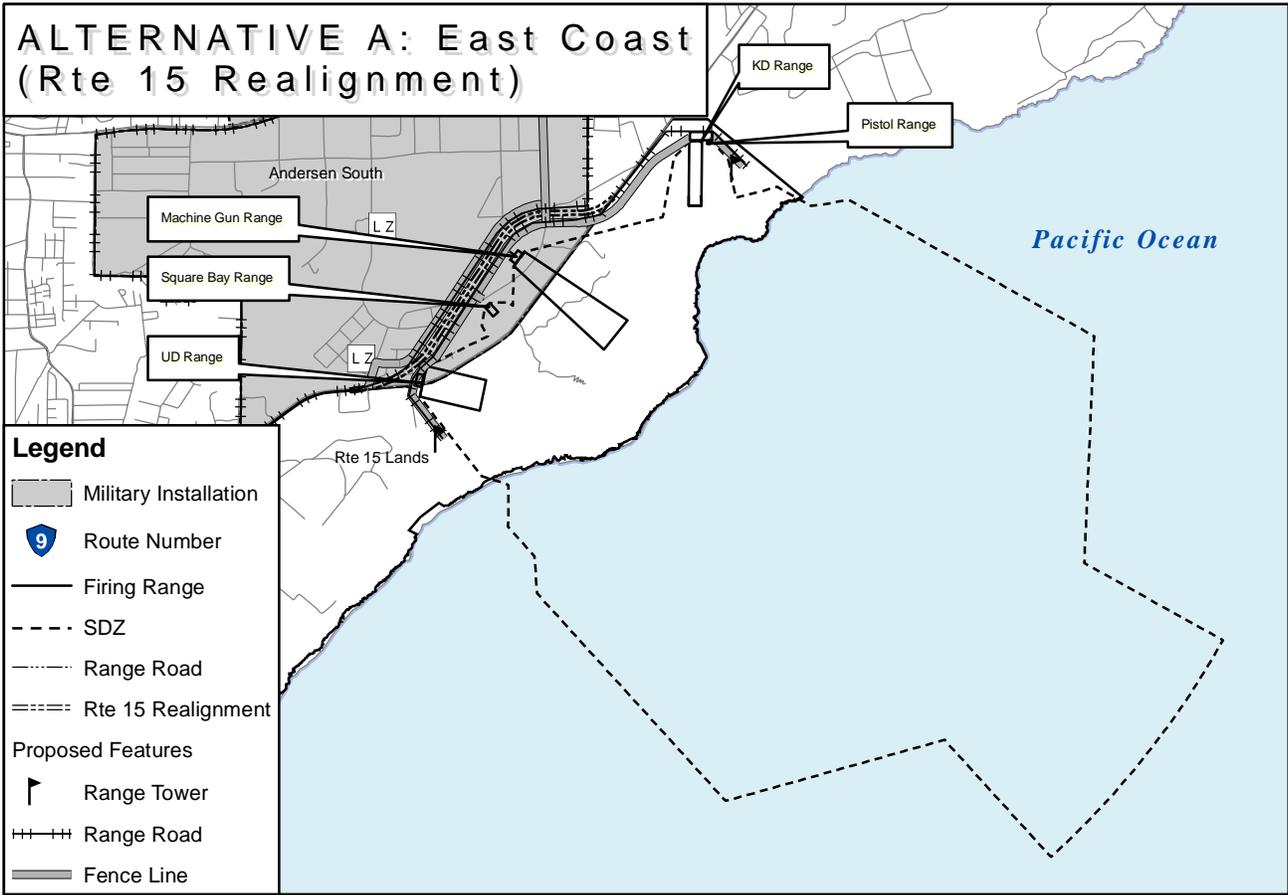
Source: NAVFAC Pacific 2007.

Step 3 of the alternatives analysis (site-specific planning) was then applied to identify reasonable alternatives at the east coast site. The Step 3 analysis identified two alternatives to accommodate all live-fire ranges on non-DoD lands on the east coast of Guam. Alternatives A and B are shown in Figure 2.3-14. Both alternatives would require land acquisition or long term leasing, but less land would be required with Alternative A (921 ac [373 ha]) than with Alternative B (1,129 ac [456 ha]). Under Alternative A, there would be more land area in the SDZ as compared to Alternative B; however, the full extent of the SDZ would be primarily located over water under both options. Additionally, Alternative A provides more land area in close proximity to the target, where a majority of the used ammunition collects. All SDZs over water would be established through a Federal Register announcement by the USACE.

Both alternatives are carried forward in this EIS/OEIS impact analyses.

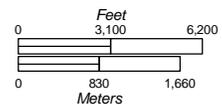
Hand Grenade, Demolition, and Pistol Firing Ranges

Live-fire training ranges include hand grenade, demolition, and pistol ranges. All hand grenade and pistol firing ranges are considered part of the training range and would be co-located there. The Demolition training would occur at an existing range on NWF.



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Figure 2.3-14
Training Range Alternatives



Aviation Training Alternatives

The candidate sites for the Guam proposed aviation training include: Andersen AFB, NWF, Orote Airfield, Andersen South, NMS, and Barrigada (Navy and Air Force). The training requires both improved (paved) and unimproved landing sites. Table 2.3-8 summarizes the sites and limitations. The criteria applied to these sites are the same as those described above for airfield functions.

Table 2.3-8. Considered and Dismissed Aviation Training Sites

<i>Candidate Sites</i>	<i>Carried Forward for Analysis</i>	<i>Compatibility with Major Criteria</i>
Active runways, Andersen AFB	Yes	Feasibility <ul style="list-style-type: none"> • Meets criteria
NWF	Yes	Feasibility <ul style="list-style-type: none"> • Meets criteria Suitability <ul style="list-style-type: none"> • Limited land availability/insufficient unencumbered land • Encroachment potential • Limited operational capability
Orote Airfield	Yes	Feasibility <ul style="list-style-type: none"> • Meets criteria Suitability <ul style="list-style-type: none"> • Limited land availability/insufficient unencumbered land • Encroachment potential • Limited operational capability
Andersen South	Yes	Feasibility <ul style="list-style-type: none"> • Meets criteria Suitability <ul style="list-style-type: none"> • Encroachment potential
NMS	Yes	Feasibility <ul style="list-style-type: none"> • Meets criteria Suitability <ul style="list-style-type: none"> • Limited land availability/insufficient unencumbered land
Barrigada (Navy and AF)	No	Feasibility <ul style="list-style-type: none"> • Incompatible with future missions

Legend: √ = Sites retained as a reasonable alternative for analysis.

Source: NAVFAC Pacific 2007.

Because of the mix of requirements and the need for diversity in training locations, no single aviation training site would fulfill the requirements. Five of the sites that were proposed and described above would be used for aviation training.

Two locations for TAOC training and facilities have been identified on Guam: one at NWF and one near the North Ramp at Andersen AFB.

2.3.2.6 Airspace Alternatives

As described in Section 2.3.1.6, the proposed action with regard to airspace requirements includes: (1) the use of existing SUA in the vicinity of Guam to support aviation training requirements; and (2) the establishment of a Restricted Area (or SUA) to correspond to the vertical hazard area associated with a proposed machine gun range. Since existing airspace designations meet the Marine Corps requirements, the establishment of new SUA is not necessary. Any alternative associated with the establishment of a Restricted Area (or SUA) for the machine gun range would be a function of the location of that range.

2.3.3 Alternatives Carried Forward for Analysis: Training Functions

2.3.3.1 Ammunition Storage Facilities

As summarized in Table 2.3-9, the alternatives analysis identified one action alternative for the high explosive ECM at the existing NMS, two alternative sites for the standard ECMs at the NMS, and one action alternative for the 12 standard ECMs and associated support facilities at the existing Andersen AFB MSA 1. All of these alternatives are carried forward for analysis in this EIS/OEIS. Details of the construction and operation of each of the proposed facilities were described in Section 2.3.1.1.

Table 2.3-9. Alternatives Carried Forward for Analysis: Ammunition Storage Facilities

<i>Facility</i>	<i>Alternatives Carried Forward</i>	<i>Figure Reference</i>
High Explosive ECM	NMS: High 12 Group Area	2.3-11
10 standard ECMs	NMS: Parson's Road Area Alternative A	2.3-11
	NMS: High Road Area Alternative B	
12 standard ECMs and related support facilities	Andersen AFB MSA1	2.3-12

2.3.3.2 Command, Control, and Simulation Facilities

To support and sustain functional relationships with headquarters and administrative functions in the Marine Corps Main Cantonment Area, all three proposed Command, Control, and Simulation facilities would be sited as a function of the master planning conducted for the Main Cantonment Area, as discussed in Section 2.2. Accordingly, action alternatives for Command, Control, and Simulation facilities that are carried forward for analysis in this EIS/OEIS are incorporated within Alternatives 1, 2, 3, and 8 for the Main Cantonment Area (see also Section 2.6.1).

2.3.3.3 Non-Firing General Military Skills Training

Table 2.3-10 summarizes the alternatives carried forward for analysis with regard to non-fire general military skills training. Under the proposed action, the smaller non-fire range facilities that support physical fitness and unit-level training would be constructed in conjunction with the Main Cantonment Area facilities in order to encourage frequency and efficiency of use. No other alternative sites for such facilities and training activities were identified based on operational requirements.

Table 2.3-10. Alternatives Carried Forward for Analysis: Non-Fire General Skills Training

<i>Facility/Type of Training</i>	<i>Alternatives Carried Forward</i>	<i>Figure Reference</i>
Obstacle Courses	Incorporated in Main Cantonment Alternatives 1, 2, 3, and 8	Figures 2.2-4 to 2.2-7
Confidence Course	Incorporated in Main Cantonment Alternatives 1, 2, 3, and 8	Figures 2.2-4 to 2.2-7
Hand-to-Hand Combat Pit	Incorporated in Main Cantonment Alternatives 1, 2, 3, and 8	Figures 2.2-4 to 2.2-7
Rappelling Tower	Incorporated in Main Cantonment Alternatives 1, 2, 3, and 8	Figures 2.2-4 to 2.2-7
Gas Chamber	Incorporated in Main Cantonment Alternatives 1, 2, 3, and 8	Figures 2.2-4 to 2.2-7
Combat Training Tank	Incorporated in Main Cantonment Alternatives 1, 2, 3, and 8	Figures 2.2-4 to 2.2-7
General Purpose Auditorium	Incorporated in Main Cantonment Alternatives 1, 2, 3, and 8	Figures 2.2-4 to 2.2-7
Engineer Equipment and Decontamination Training	Incorporated in Main Cantonment Alternatives 1, 2, 3, and 8	Figures 2.2-4 to 2.2-7
Maneuver Training Area 1	Andersen South	Figures 2.3-6 and 2.3-7
Maneuver Training Area 2	Southern half of NMS with Access Road Alternative A	Figure 2.3-4
	Southern half of NMS with Access Road Alternative B	
MOUT Complexes	Andersen South: incorporated in Training Range Complex Alternative A	Figure 2.3-6
	Andersen South: incorporated in Training Range Complex Alternative B	Figure 2.3-7
AMVOC	Andersen South	Figure 2.3-5 and 2.3-6

The two MOUT complexes and the tactical vehicle course would be developed at Andersen South. Two alternative site plans have been developed for the MOUT and supporting facilities at Andersen South, reflecting slight differences in configuration that would occur with the Training Range Complex Alternatives A and B (refer to Section 2.3.1.3). The overall site plans for Andersen South also include the AMVOC, a maneuver area, and a convoy course.

Large-scale maneuver areas would be developed under the proposed action at Andersen South and NMS, since there is no single area on Guam that provides sufficient space for large-scale maneuvers. No other reasonable alternatives have been identified on Guam. Development and use of the maneuver area at NMS would also require construction of an access road, for which two reasonable alternatives have been identified.

2.3.3.4 Firing General Military Skills Training Facilities

Marine Corps requirements for live-fire training facilities include a composite Training Range Complex (consisting of eight distinct training facilities and range control/maintenance facilities), a breacher and shooting house, and an indoor small arms range. As depicted in Figures 2.3-6 and 2.3-7, there are two potential action alternatives for the range complex. The overarching elements of the two alternatives are discussed below.

Alternative A: Realignment of Route 15

Alternative A includes all required ranges at a location east of Andersen South on non-DoD land to the east of Route 15 and would require the realignment of a portion of Route 15. The ranges would be tightly configured and overlap SDZs would result in a smaller combined SDZ area. Land acquisition or long term leasing (921 ac [373 ha]) would be required for development of the ranges and control of lands associated with the SDZs. This area is largely devoid of modern manmade structures and overgrown with vegetation with the exception of Route 15, abandoned housing at Andersen South, and Guam International Raceway (which is located where the KD and pistol range would be located under this alternative).

The associated SDZs would encompass approximately 921 ac (373 ha) of land and 4,439 ac (1,796 ha) of the Pacific Ocean.

An approximately 1.7 mi (2.8 km) segment of Route 15 that passes along the boundary of Andersen South would be relocated to the north. A new range access road would be constructed parallel to and south of Route 15 for access to the range complex. Access road, gate, and bridge alternatives remain under development.

Alternative B: No Realignment of Route 15

Alternative B is at the same location as Alternative A, and varies from Alternative A only in that 1) the Machine Gun Range (which contains the largest SDZ) would be located in non-DoD land in the valley area farther to the south and 2) relocation of Route 15 would not be required. Land acquisition or long term leasing (1,129 ac [456 ha]) would be required for development of the ranges and control of lands associated with the SDZs. Table 2.3-11 compares the area of land and ocean that would be encumbered by the SDZs for each of the Firing Range Complex alternatives.

Table 2.3-11. Areas Encumbered by SDZs for Each

<i>Range Complex Configuration</i>	<i>SDZ Encumbered Area (ac)</i>		
	<i>Land</i>	<i>Ocean</i>	<i>Total</i>
Alternative A	921	4,439	5,360
Alternative B	1,129	6,003	7,132

Note: areas estimated using GIS analysis of SDZs.

2.3.3.5 Aviation Training

Under the proposed action, improved airfield training would take place at NWF and North Ramp on Andersen AFB, but would also involve flight activity in any existing designated military airspace, including military flight corridors, routes, and tactical navigation areas (Table 2.3-12).

Table 2.3-12. Alternatives Carried Forward for Analysis: Aviation Training

<i>Facility/Type of Training</i>	<i>Alternatives Carried Forward</i>	<i>Figure Reference</i>
Improved Airfield Training	North Ramp Andersen AFB and NWF	Figure 2.1-4
ATC Detachment Training	North Ramp Andersen AFB and NWF	Figure 2.1-4
TAOC Training and Facilities	North Ramp Andersen AFB and NWF	Figure 2.1-4
12 New Landing Zones (Improved and Unimproved)	Proposed sites at NWF, Orote Airfield, Andersen South, and NMS	Figure 2.3-9

2.3.3.6 Airspace

Since no additional SUA is needed over Guam to support aviation training requirements, the only action alternative associated with aviation training is the use of existing airspace. The establishment of a Restricted Area (or SUA) above the machine gun range would necessarily be integrated in each of those range alternatives.

2.4 PROPOSED ACTION: AIRFIELD FUNCTIONS

2.4.1 Requirements

Key project components associated with airfield operations include the beddown of ACE facilities, air embarkation facilities, and development of a gate and access road to the airfield. All of these components would be sited at Andersen AFB airfield. A new access road onto Andersen AFB is proposed to improve traffic from the Main Cantonment at NCTS Finegayan to the airfield.

2.4.1.1 ACE Beddown

Proposed Facilities

The ACE beddown would require operational, maintenance, and administrative facilities to support the presence of permanently assigned or visiting Marine Corps aircraft on Guam. All facilities would be sized in accordance with Navy criteria for airfield and heliport planning and design. The North Ramp of Andersen AFB airfield is the proposed site for the operations. Table 2.4-1 describes the facilities required. This site constitutes an infill development at the already developed North Ramp area of Andersen AFB. The majority of the ACE Beddown project area is an inactive, previously disturbed area north of the existing Andersen AFB airfield. This proposed project would be used for vertical lift aircraft operations, maintenance, and related training and support functions. Airspace and biosecurity requirements must also be met and are currently being researched. A biosecurity plan (invasive species plan) is being developed in conjunction with the National Invasive Species Council, USFWS, U.S. Department of the Agriculture (USDA), Guam Division of Aquatic and Wildlife Resources (GDAWR), and other interested parties to facilitate a comprehensive approach to control invasive species' export, import, and spread. An outcome from the Biosecurity Plan may include actions associated with integrated pest management such as those used for brown treesnake (BTS). The plan would be comprehensive for all DoD actions on Guam, including those being proposed in this EIS/OEIS.

Land use constraints in the vicinity of the ACE beddown site include a large sinkhole (IRP Site 66), approximately 700 ft by 900 ft (213 m by 274 m), located just east of the project site. Intact native forests and Overlay Refuge are located north of the site.

Layouts for the air operations at North Ramp have been proposed (Figure 2.4-1). This plan is subject to change.

Proposed Operations

The ACE beddown facilities would operate 24 hours per day and 7 days per week. Approximately 2,000 people would occupy this space during the day shift and 400 people would be present at night. Traffic would include government owned vehicles, personal vehicles, and shuttle buses from the Main Cantonment area. Air traffic would include helicopter, vertical lift aircraft, fixed wing, and unmanned aircraft arrivals and departures. Air traffic rates are contingent on surge and operational requirements.

Chapter 2:

2.1 Overview

2.2 Main Cantonment Area Functions

2.3 Training Functions

2.4 Airfield Functions

2.5 Waterfront Functions

2.6 Summary of Alternatives

Table 2.4-1. Proposed ACE Beddown Facilities and Dimensions

<i>List of Structures (Assumed)</i>	<i>Total Floor Area (square feet [ft²])</i>	<i>Total Floor Area (square meters [m²])</i>
1: Battalion/Squadron HQ, MWSS-172	20,775	1,930
3: Auto Organizational Shop and Hazard/Flam, MWSS-172	20,599	1,914
4: Electronic/Communication Maintenance Shop and Battery Shop, MWSS-172	4,109	381
5: Organic Unit Storage, MWSS-172	30,327	2,817
6: Aircraft Operations Building	9,759	906
7: Aircraft Fire and Rescue Station	7,239	672
8: Fire and Rescue Vehicle Alert Pad	2,708	251
9: Corrosion Control Hangar	19,402	1,803
10. HMLA (AH-1Z and UH-1N), Maintenance Hangar and HMH (CH-53E), Maintenance Hangar	40,489	3,762
12: VMM (CH-53D/MV-22), Maintenance Hangar	799,908	7,424
13: MALS, Maintenance Hangar	40,489	3,762
14: Operation Haz/Flam Material Storage	1,757	163
15: Organic Unit Storage - DSSC Functions	35,810	3,327
16: Engine Test Cell	1,209	112
17: Tactical Support Van Pad	29,979	2,785
18: Aircraft Washrack-Pavement	13,799	1,282
19: Aircraft Rinse Facility	9,809	911
20: Armory Small Arms Ammo	880	82
21: Aviation Armaments Shop	3,849	357
22: Parachute Survival Equipment Shop	4,200	390
23: Aviation GSE Maintenance Shop	6,250	581
24: Aviation GSE Holding Shed	8,749	812
25: Open Storage Area - General Supply	28,800	2,676
26: Aircraft Compass-Calibration Pad	14,400	1,338
27: Liquid Oxygen Pad	6,274	583
28: Fire Suppression Water Tanks	5,841 x 2	542 x 2
29: Taxiway	1,060,154	98,492
30: Aircraft Parking Apron	148,872	13,831
31: Aircraft Access Apron	12,000	1,115
32: Line Vehicle Parking	1,819	169
33: Organizational Vehicle Parking ^b	502,396	46,674
34: Helicopter Landing Pad ^c	39,600	3,679
35: MCCA Facility (Fitness Center/Mess Hall)	24,688	2,294
36: Explosive Ordnance Division Facility ^d	8,370	778

Legend: MCCA = Marine Corps Community Services; TBD = to be determined.

Notes: ^a Based on information from the Military Munitions Annex Annex.

^b Current Plan is to provide this parking requirement as a parking lot.

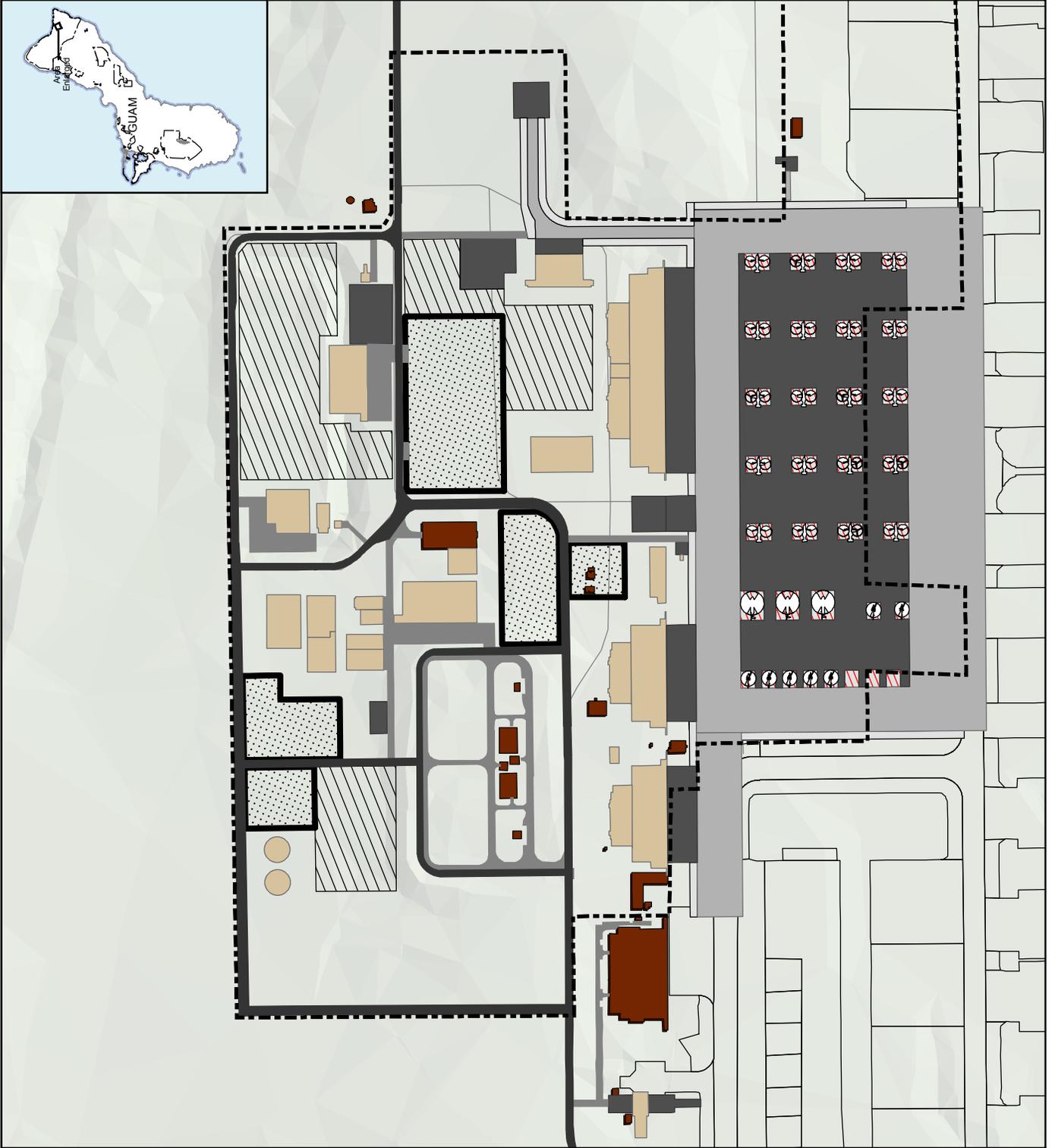
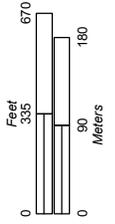
^c Current Plan is to site this (4–5 spots) on the Andersen AFB North Runway, some improvements (pavement, and paint may be required).

^d Current Plan is to make improvements to existing AF EOD building (located on site – Bldg #), which is only 50 % utilized, to accommodate Marine Corps EOD staff.

Source: NAVFAC Pacific 2009.

Figure 2.4-1
North Ramp
Airfield Operations

- Legend**
- Military Installation
 - Route Number
 - Proposed USMC ACE Perimeter
 - Retained Existing Building
 - Proposed Building Footprint
 - Proposed Pad Parking
 - Proposed Pad Footprint
 - Proposed Taxiway Footprint
 - Proposed Roads
 - Proposed Vehicle Parking - ORG
 - Proposed Vehicle Parking - Non-ORG



The anticipated aircraft loading is as shown in Table 2.4-2.

Table 2.4-2. Proposed Aircraft Loading

<i>Element</i>	<i>Number</i>	<i>Type</i>
Permanent stationed: Rotary wing (helicopters)	12	PCS (12) MV-22 (Assault Transport)
Transients: Rotary wing	12	MV-22 Transport (Osprey)
	3	UH-1 Multipurpose Utility (Huey)
	6	AH-1 Attack (Super Cobra)
	4	CH53E
Fixed wing (airplanes)	2	KC-130
	24	F/A-18
	4-6	F-4 (visiting Allied Forces)

The baseline scenario and proposed aircraft operations at Andersen AFB are shown in Table 2.4-3. Rotary wing aircraft operations may occur at the airfield, in various proposed training areas on Guam, and on Tinian (see Volume 3). Fixed wing aircraft operations would occur only in the immediate airfield environment of Andersen AFB. Aircraft would then leave this area to conduct activities within established training areas of the MIRC or in other locations.

Table 2.4-3. Proposed Flight Operation Increases at Andersen AFB

<i>Mission Group</i>	<i>Aircraft Type</i>	<i>No-Action Alternative (2014)</i>	<i>Proposed Action (2014)</i>	<i>Total</i>
Based	Helicopter	18,951	19,255	38,206
	Jet	0	4,564	4,564
Visiting Aircraft Carrier Wing	Jet	602	1,704	2,306
	Propeller	52	156	208
	Helicopter	78	234	312
Transient ISR/Strike	Jet	25,043	0	25,043
Other local and transient operations	Mix	23,413	5,291	28,704
Total		68,139	31,204	99,343

Source: Czech and Kester 2008.

2.4.1.2 Air Embarkation

Proposed Facilities

Andersen AFB planners identified a suitable new air embarkation site for an Air Mobility Campus (AMC) on an infill area at the eastern end of South Ramp (Figure 2.4-2). The Air Embarkation Project includes the AMC, Organic Marine Corps Cargo, and passenger operations. The proposed facilities are listed in Table 2.4-4. The total project area is 28 ac (11.33 ha). The proposed project site is adjacent to the southeast boundary of the installation where there is land available for expansion and redevelopment (see Figure 2.4-2). The site currently includes paved airfield parking and disturbed, unused land adjacent to the airfield. This site would serve as the passenger terminal for Andersen AFB and temporary cargo storage (Figure 2.4-3).



Figure 2.4-2. Location of Proposed AMC at South Ramp

Table 2.4-4. Proposed AMC Campus Facilities and Dimensions

<i>List of Structures (Assumed):</i>	<i>Total Floor Area (ft²)</i>	<i>Total Floor Area (m²)</i>
1: Water Tower	Size: TBD	Size: TBD
2: New passenger terminal & 734 Air Mobility Squadron HQ	45,600	4,236
3: New Freight Terminal/ Marine Office	55,000	5,110
4: Military Message Handling System	6,250	581
5: Hazardous Waste Storage Facility	3,275	304
6: Material Handling Equipment Washrack	15,163	1409
7: Airfield Pavement: Loading Area	539,660	50,136
8: Airfield Pavement: Facilities	143,986	13,377
9: Undefined Air Mobility Command Building	6,594	613
10: Air Mobility Campus Parking	129,887	12,067
11: New passenger 734 AMS Staff Parking	64,054	5,951
12: Passenger area	1,364	127
13: New Roads/Access Driveways	48,351	4,492

Source: NAVFAC Pacific 2009.

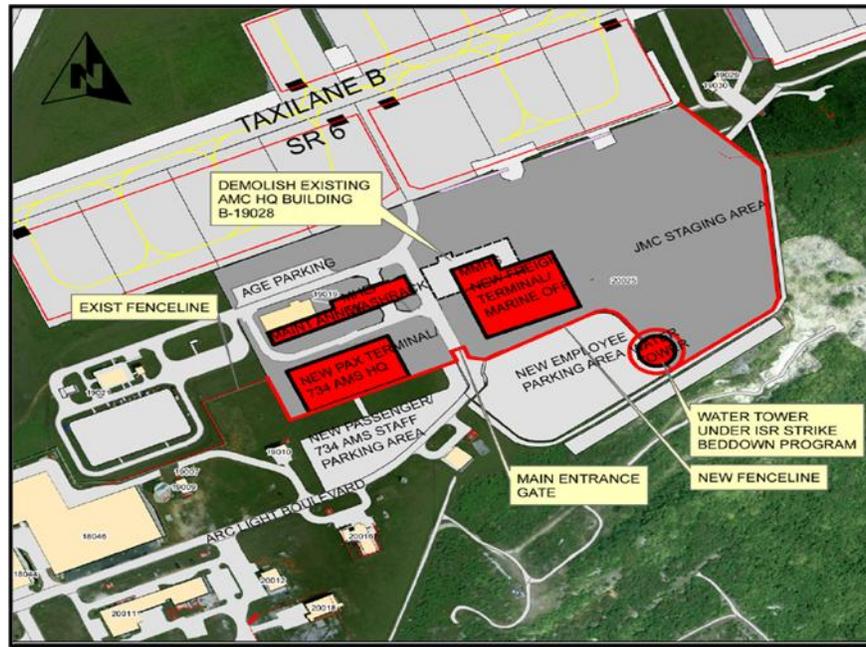


Figure 2.4-3. Proposed Joint AMC/Marine Corps Campus

Proposed Operations

Air Embarkation/Disembarkation refers to the loading and unloading of passengers or cargo to aircraft. The passenger facilities are comparable to those of a small airport: luggage handling, wait area, and ticket/documentation area. Cargo is staged in the area awaiting loading to aircraft or disbursement to warehouses or individual commands. There are searches of cargo and baggage. The Air Force has Air Embarkation facilities at South Ramp of the airfield. A new joint-use Air Embarkation site is proposed and the Air Force is taking the lead on design. The site would operate 24 hours per day and 7 days per week. Staffing levels are to be determined and would be contingent upon surge and operational requirements.

2.4.1.3 North Gate and Access Road

Proposed Facilities

New facilities associated with the proposed north gate include the following:

- One-story entry control point (ECP) (204.4 ft²) (18.99 m²) with restrooms, telecommunications, four parking stalls, and installation fencing.
- One-story Pass and Identification Office (783.6 ft²) (72.8 m²) with 12 parking stalls, restrooms, and telecommunications to be located approximately 4,058.8 ft (1,235 m) from the ECP.
- Vehicle Inspection Facility (VIF), including a one-story Vehicle Queuing Control Facility (26.21 ft²) (7.99 m²) with two parking stalls and an exit lane.
- A high bay, open VIF with two open, concrete-lined, underground pits (7.5 ft by 2.3 ft and 5.9 ft deep) (2.3 m by 0.7 m and 1.8 m deep) for viewing the undercarriage of trucks; overhead remote video monitoring of the tops of vehicles; and a one-story inspection administration building (3,440.3 ft²) (319.61 m²) with waiting room, office space, military working dog holding room, two restrooms, 12 parking stalls, and telecommunications.

- A one-story, one-room overwatch station (26.2 ft²) (7.99 m²) with one parking stall.

AT/FP security measures (UFC 4-010-01) would be incorporated into project design and construction. Cable reinforced fencing 6.9-ft (2.1-m) high with six strands of barbed wire (total height of 7.9 ft [2.4 m]) would be installed near the landfill and at the entrance where it would connect with existing perimeter fencing. Rolling crash-proof gates at the entrance would be used during non-operating hours. Active barrier controls are proposed at the ECP (tire shredder at exit), VIF, and overwatch building. A low protective concrete wall would be constructed in front of the overwatch building.

Exterior site work would include grading and grubbing; demolition of existing road pavement (portion of proposed road); earthwork; 31 parking spaces; landscaping (grass at buildings and base entrance only, no irrigation); exterior security lighting at buildings; traffic signage and markings; installation entrance signage; and roadway and building lighting. Street lighting would be incorporated within the project areas, including the Route 9 portion. Construction would meet UFC 4-022-01 criteria and consist of high pressure sodium fixtures mounted on steel poles rated for 170 miles per hour (mph) winds. Demolition of pavement remnants would be required, and would be recycled/reused where possible to reduce construction waste, but no buildings would be demolished. No relocation of utilities would be required.

The ECP would connect to GovGuam utilities in Route 9. The other facilities would tap into existing Andersen AFB utilities at 5th Avenue, except for wastewater. A septic/leach field system would be constructed for the VIF and Pass and ID Office. There would be two emergency generators: one at the ECP and the other at the VIF. No underground storage tanks are required.

Per Navy and Marine Corps policy, LEED certification would be pursued for this development. Other sustainability features would be incorporated where appropriate and feasible.

New construction associated with the access road would include the following:

- A new traffic signal is proposed, subject to GovGuam approval.
- Two new lanes would be constructed on Route 9
- The pavement along the road and at the built-up areas (not including the truck inspection lanes) would consist of 3.9 inches (in) (100 mm) of asphalt concrete surface, 5.9 in (150 mm) of aggregate base, and 5.9 in (150 mm) of aggregate sub-base. The truck inspection lanes would be jointed and unreinforced and consist of 10.5 in (267 mm) of Portland cement concrete, 5.9 in (150 mm) of untreated aggregate base, and 5.9 in (150 mm) of aggregate sub-base.
- Vehicle barrier controls would be installed at the ECP, overwatch, Vehicle Queuing Control Facility, and VIF. The final denial barrier would be at the overwatch building. The project includes a 12-ft (3.7- m) wide access road to intersect Route 9 approximately 10,561 ft (3,219 m) north of the existing Andersen AFB ECP and extend into Andersen AFB approximately 6,561.66 ft (2,000 m) until it terminates at 5th Avenue.
- Roadway paving, street lighting, and drainage would be constructed for the entire length of the alignment. Figure 2.4-4 and Figure 2.4-5 illustrate the North Gate and Access Road location map and site plan.

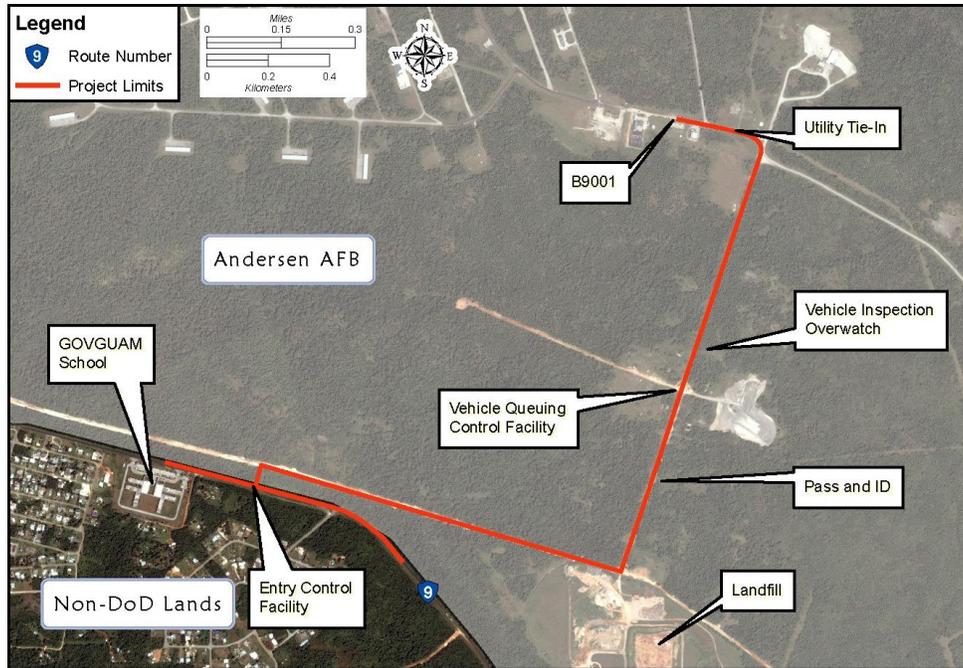


Figure 2.4-4. North Gate & Access Road: Location Map

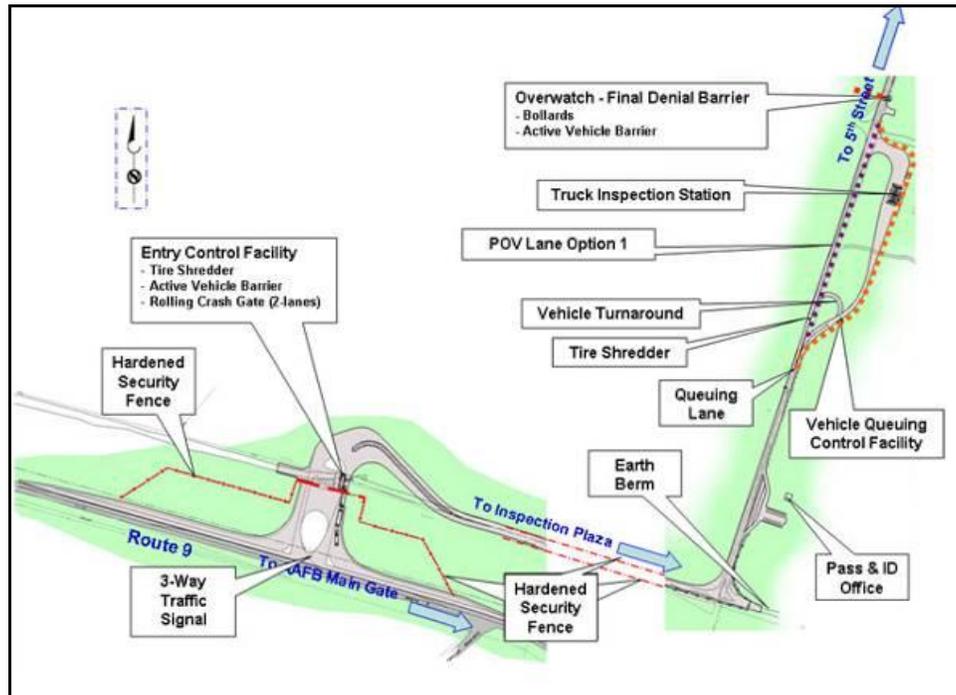


Figure 2.4-5. North Gate & Access Road: Site Plan

Proposed Operations

The North Gate and Access Road project is intended to improve the traffic flow and the physical security of vehicles traveling to and from Andersen AFB. The ECP would be a commercial and personal vehicle access gate for the ACE Ramp and Air Force Guam Forward Loading Operation Ramp. It is anticipated

that the gate would operate 24 hours per day and 7 days per week. The existing South Gate averages 11,000 vehicle movements per day. Similar traffic loads are assumed for the proposed North Gate based on personnel working at Intelligence, Surveillance, and Reconnaissance Strike, Marine Corps North Ramp, and overflow from the already congested South Gate of Andersen AFB. It is assumed that the traffic load would include 200+ trucks and construction vehicles per day.

2.4.2 Alternatives Analysis: Airfield Functions

Four sites on Guam were considered for airfield functions: North Ramp Andersen AFB, Won Pat International Airport, Orote Airfield at Naval Base Guam, and NWF at Andersen AFB. Feasibility was a qualitative assessment of compatibility with future missions, environmental considerations (including cultural and historical significance), and anticipated public concerns. Suitability criteria included: land availability, operational capability, training capability, encroachment, AT/FP, and compliance with military vision. The basis of analysis is presented in a brief entitled *Guam Alternatives Basing Analysis, Guam Stakeholders Working Group*, dated August 21, 2007 and prepared by NAVFAC Pacific.

Although there are site limitations, Andersen AFB met all of the suitability and feasibility criteria and is the only reasonable alternative. It is an existing DoD airfield that has sufficient space to accommodate the aircraft proposed for relocation from Okinawa. The criteria that were not met are listed as limitations in Table 2.4-5.

Table 2.4-5. Considered and Dismissed Alternatives: Airfield Operations

<i>Candidate Sites</i>	<i>Carried Forward for Analysis</i>	<i>Compatibility with Major Criteria</i>
Active runways, Andersen AFB	Yes	Feasibility <ul style="list-style-type: none"> Meets all criteria
Won Pat International Airport, Tiyan	No	Feasibility <ul style="list-style-type: none"> Anticipated public concerns Incompatible with future missions Suitability <ul style="list-style-type: none"> Limited land availability/insufficient unencumbered land Limited anti-terrorism/force protection (AT/FP)
Orote Airfield	No	Feasibility <ul style="list-style-type: none"> Incompatible with future missions Suitability <ul style="list-style-type: none"> Limited land availability/insufficient unencumbered land Encroachment potential
NWF	No	Feasibility <ul style="list-style-type: none"> Incompatible with future mission Overwhelming environmental considerations Suitability <ul style="list-style-type: none"> Limited land availability/insufficient unencumbered land

There are two distinct types of airfield facilities needed to support the proposed Marine Corps relocation to Guam: (1) support for the aircraft (fixed and rotary wing) that would be relocating, and (2) air embarkation for processing cargo and personnel in and out of Andersen AFB. The first type of facility could only be sited at the North Ramp of Andersen AFB because space is available to house the aircraft relocating to Guam. In addition, there are other rotary aircraft facilities (Navy) in the area, resulting in consistent land use planning. Andersen AFB's North Ramp is the only proposed site for construction and operation of airfield functions and would be included in any proposed action selected for implementation.

Andersen AFB also has a requirement for air embarkation facilities for the Air Force's AMC. The Air Force plans to consolidate its embarkation facilities and relocate to an area at the east end of South Ramp. Marine Corps embarkation facilities would be collocated with AMC's to achieve maximum land use and operational efficiency. No other reasonable alternatives for air embarkation facilities were identified.

2.4.3 Alternatives Carried Forward for Analysis: Airfield Functions

The Marine Corps requirements for airfield functions would be accommodated at the existing airfield at Andersen AFB. Other airfields on Guam were eliminated in Step 2 of the alternatives analysis.

2.5 PROPOSED ACTION: WATERFRONT FUNCTIONS

2.5.1 Requirements

2.5.1.1 General Overview

Relocation of Marine Corps forces to Guam would result in frequent embarkation operations to support amphibious transportation of Guam-based Marines and transiting amphibious forces for potential contingency, humanitarian, and exercise operations in the Pacific Theater. The Navy's amphibious task forces and the Marine Expeditionary Unit (MEU) are transient forces that have traditionally come to Guam for port visits and training. Frequency of visits is highly variable based upon operational commitments; however, transient training events occur approximately twice annually.

Under the proposed action, transient port calls would increase, amphibious task force visits are dependent on operational requirements but it is anticipated that the task force visits would increase between 2 to 4 annually with the relocation. The composition of the amphibious task force would be dependent on the specific mission. Typically, there are three ships carrying amphibious vehicles, equipment and personnel designed to support amphibious operations and an additional four surface combatant ships that escort the amphibious ships. In addition, naval anti-submarine and strike force surface and subsurface assets may accompany the task force. Local transport of Marines and supplies between Guam and Tinian not connected to the visiting MEU would most likely be via airlift (see Volume 3 for more information).

Under the proposed action, MEU training would increase to occur regularly at a minimum of two additional times per year (for a total of four times per year) for three weeks duration each visit on Guam. Depending on the mission requirements and training activities planned for the Marianas, the MEU would travel from Okinawa or California to Guam, and continue on to Tinian; or, alternatively, the MEU would go directly to Tinian for tactical ship to objective maneuver training. For training on Guam, the aircraft would beddown at North Ramp Andersen AFB, the amphibious ships would offload personnel and amphibious craft at Apra Harbor, and troops and equipment would travel administratively to and bivouac (camp) at proposed training/maneuver areas on Guam. The escort combatant ships may or may not accompany the amphibious task force.

Existing general purpose Navy wharves in Inner Apra Harbor are currently used by the amphibious task force during visits by MEUs. In order to accommodate the proposed increase in the number of amphibious task force visits and use of recent model (class) ships, upgrades to these wharf structures and utilities, an embarkation area for loading and unloading of ships, and an amphibious vehicle/small boat laydown area would be required and are proposed.

All training would be a continuation of existing training capabilities within Apra Harbor complex. Hence amphibious training is not part of the proposed action, but would occur as described in the MIRC EIS/OEIS.

When in port, the amphibious ships and escort ships listed in Table 2.5-1 would be berthed in Inner Apra Harbor. In addition, 12 AAVs, two Rigid Hull Inflatable Boats (RHIB), and eight Combat Rubber Raiding Craft (CRRC) would be permanently based at the proposed Landing Craft Air Cushion/Amphibious Assault Vehicle (LCAC/AAV) laydown area as part of the proposed action.

Chapter 2:

2.1 Overview

2.2 Main Cantonment Area Functions

2.3 Training Functions

2.4 Airfield Functions

2.5 Waterfront Functions

2.6 Summary of Composite Alternatives

Table 2.5-1. Amphibious Task Force Ships and Based Amphibious Vehicles and Boats

<i>Proposed Vessel</i>	<i>Quantity</i>	<i>Permanent/ Visiting</i>	<i>Total Wharf Length/ Requirement (ft)</i>	<i>Draft (ft)</i>
Ships Carrying Amphibious Vehicles				
LHD	1	Visiting	1,044	28
LSD	1	Visiting	710	20
LPD	1	Visiting	669	23
Amphibious Vehicles				
LCAC	4	Visiting (transported on ships)	Not applicable	2.8 ft (full stop, no cushion) 0 ft (navigation) 1-20 inches of water depression @ 18 knots
LCU	4	Visiting (transported on ships)	Not applicable	7 (fully loaded)
AAV- predominantly a land vehicle	Varies	Visiting (transported on ships)	Not applicable	6
AAV	14	Permanent	Not applicable	6
Reconnaissance Boats				
RHIB/CRRC	2/8	Permanent	Not applicable	Nominal
Escort Combatants				
Guided Missile Cruiser (CG-47)	2	Visiting	1,335	34
Guided Missile Destroyer (DDG)	2	Visiting	1,210	33

Legend: CRRC = combat rubber raiding craft; LCU = landing craft utility; RHIB = rigid hull inflatable boat.

Although a quantity of ships is specified in Table 2.5-1, the actual number and types of ships would vary with the amphibious task force mission. The types of ships presented in the table do not differ from those associated with visiting amphibious task forces that currently berth in Apra Harbor with the existing approximately two MEUs annually; however, with the relocation of Marine Corps forces to Guam, amphibious task force mission ships would be berthed in Inner Apra Harbor two additional times annually (for a total of four annual visits). When the amphibious task force is not in port, the general purpose wharves would be used by other ships at Port Operations discretion.

The amphibious craft would be deployed from the “big deck” amphibious ships (Amphibious Assault Ship [LHD], Dock Landing Ship [LSD], and Amphibious Transport Dock [LPD]) either in Inner Apra Harbor or Outer Apra Harbor, then travel to the proposed amphibious laydown area in Apra Harbor. These smaller amphibious landing craft would typically include LCAC, and AAVs. The Landing Craft Utility (LCU) is also currently used in lieu of the LCAC, but is being phased out and, therefore, the assessment in this EIS/OEIS is focused on the LCAC. General operational features of these vessels are described in this section and photos are shown on Figure 2.5-1 and Figure 2.5-2.

LCACs are the largest landing craft. They are pre-loaded from ramps (fore and aft) with land vehicles, cargo and personnel to deploy within 25 nm (46 km). The LCAC can transport one tank, four AAVs, or 250 personnel. Personnel ride within a prefabricated shell that protects them against spray and noise. The LCACs are released from the well decks of the amphibious ships. Maximum speed is approximately 50



Figure 2.5-1
Ships

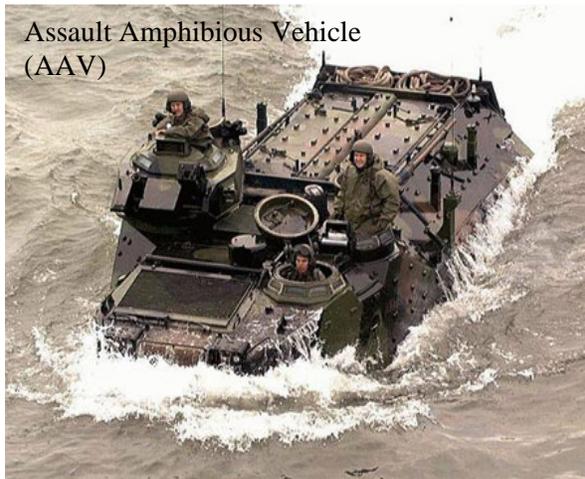
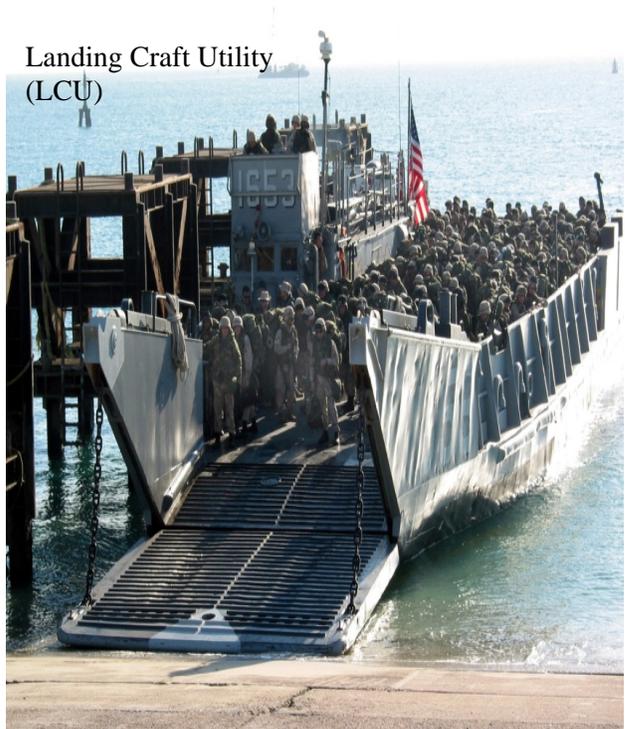


Figure 2.5-2
Amphibious Ships

knots in smooth seas. They ride above the water on a cushion of air captured under an inflatable skirt surrounding the craft. Lift fans create the cushion of air between the hull and the water surface or hard substrate (i.e., coral). LCAC operations depress the surface of the water 12-18 in (309 - 457 mm) and can create a bow wave. They are designed to cross the high water line and remain on cushion to move inland before decreasing lift and landing on the ground where cargo is offloaded. When returning to the water, the lift fans raise the craft 1 to 3 in (25 to 76 mm) and the skirt permits air to escape around the edges. The LCACs then return to the amphibious ship to be re-loaded.

LCU is a displacement hulled craft with a large open center bay and ramps fore and aft. It can operate in approximately 8 ft (2.4 m) of water prior to lowering its ramp to the shoreline or pier. An anchor may be set in rough ocean conditions for added stability. It does not land at beaches protected by offshore shallow reefs that may damage the hull. It can transport 200 tons of cargo or 200 persons.

AAVs are lightly armored personnel carriers propelled by water jets in the ocean and tracked suspension in shallow water and on land. The speeds of newer models (Advanced AAV) are capable of about 25 knots. The tracks engage land at about water depth of approximately 6 ft (1.8 m). It may be launched directly from the ship or carried by one of the larger landing craft. Each AAV can carry approximately 23 combat-equipped Marines or five tons of cargo. The Marines may debark on beach landing or remain on the AAV for inland travel. On land, the AAV is capable of traveling 25 mph. Each track block is rubber – padded that in turn minimizes damage to paved roads.

RHIB is a light-weight, high performance and high capacity boat constructed with a solid, shaped hull and flexible tubes at the gunwale. The inflatable collar allows the vessel to maintain buoyancy if a large quantity of water is shipped aboard.

CRRCs are used for inserting lightly-armed raiding parties or reconnaissance teams onto beaches, piers, offshore facilities and larger vessels. The CRRC can be inflated in minutes by foot pump, compressor or carbon dioxide tank and can be deployed from shore and a variety of vessels. Its chief advantages are stealth, versatility, lightweight, compact size when stowed, and the safety imparted by its hyper-buoyant nature, which gives it the ability to operate in relatively high seas for a craft of its size.

When in Apra Harbor, the vehicles and equipment unloaded or being loaded on the ship are subject to inspection and washdown on arrival and departure to prevent introduction of foreign agricultural and public health threats. All washdowns are conducted and supervised by trained personnel in accordance with Armed Forces Technical Guide 31 (Defense Pest Management Information Analysis Center 2004). USDA personnel participate in inspections. These activities are conducted in a designated paved area with a washdown area and sufficient space for segregating clean from dirty equipment/vehicles. The brown treesnake (BTS) is of particular concern and there is a MOA signed by DoD, USDA, GovGuam, and State of Hawaii that states these agencies would cooperate with BTS research, control and inspections, and eradication. The COMNAV Marianas Instruction 5090.10A, Brown Treesnake Control and Interdiction Plan (February 14, 2005) implements this MOA. Special BTS perimeter barriers 4.5 ft (1.4 m) tall pre-cast concrete with a 1 ft (0.3 m) outward projecting lip to deter snakes from scaling the barrier) and sliding chain-link fence gates with fabric barriers to block all vehicle access points are standard protective measures. All waste onboard the ship is steam sterilized prior to disposal in regulated landfills in accordance with BMPs and base operating procedures.

A biosecurity plan (invasive species plan) would be developed in conjunction with the National Invasive Species Council, USFWS, USDA, GDAWR, and other interested parties to facilitate a comprehensive approach to control invasive species export, import, and spread. The plan would be comprehensive for all

Air Force, Marine Corps and Navy actions on Guam, including those being proposed in this EIS/OEIS for Marine Corps actions on Guam and Tinian (see Volume 1, Section 1.6).

2.5.1.2 Proposed Waterfront Embarkation Projects

There are five waterfront facility projects included in the proposed action, the first two of which are directly related to amphibious task forces as follows (Figure 2.5-3, projects shaded black):

- Ship berthing and embarkation/staging area. Includes ships that carry amphibious craft, and combatant escorts
- Amphibious craft (LCAC/AAV) laydown area (i.e., location for storing, maintaining and deploying amphibious craft)
- USCG berthing and crew support building relocation
- Military working dog kennel relocation
- Apra Medical/Dental Clinic

The USCG and Military Working Dog Kennel (MWDK) relocation projects are required to accommodate the Marine Corps waterfront project requirements. The fifth project, Apra Medical/Dental Clinic, is also described in this section. It is not directly related to the amphibious task force waterfront requirements, but is the only other proposed Marine Corps action requiring construction at Naval Base Guam. Some of these projects may begin construction as early as 2010. The anticipated duration of construction for the projects is 18-20 months, but that could be accelerated.

Each of these five projects is described in subsequent sections. The sections are organized as follows:

- Proposed Facilities and Construction
- Proposed Operations

An analysis of alternatives for each project is described in Section 2.5.2.

Waterfront Project: Amphibious Task Force Ship Berthing and Embarkation

Proposed Facilities and Construction

The facilities required to support an amphibious task force include general purpose wharves, a new cargo staging area/new washdown area, a waterfront operations support facility, and a small maintenance/equipment storage facility.

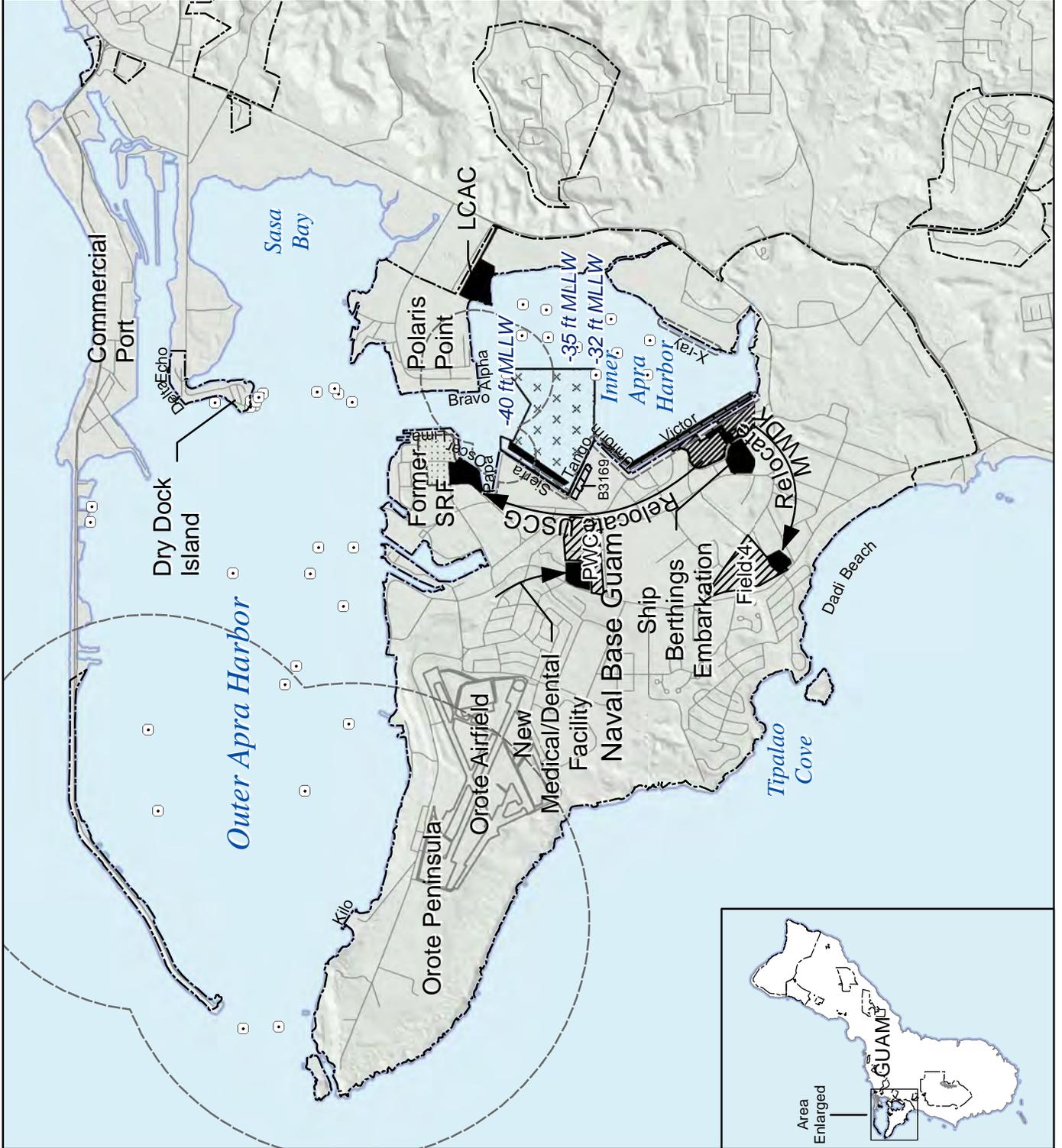
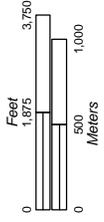
The Navy's general purpose wharves are on the western side of Inner Apra Harbor. Other wharves are not general purpose and have specific uses, such as submarine berthing or supply ship berthing. General purpose berths are used at the discretion of Port Operations based on ship size, requirements (draft of ship and utility requirements) and wharf availability at the time of arrival; however, ships that are homeported in Guam are generally assigned a particular wharf that would provide the ship-specific requirements. Master planning for general purpose wharves requires development of a berthing plan to ensure that there is enough wharf length to accommodate foreseeable ship arrivals, including the visiting or transient ships if the majority were in port at one time. In planning, specific ship types are mapped to specific wharves. In Navy planning the berthing plan is used to justify specific improvement or construction projects. In reality, once the planning effort is over and wharves are improved to meet the foreseeable range of ships, Port Operations would assign berths to ships on arrival. The assigned berth may not match the berthing plan but would meet the wharf and infrastructure requirements of the ship.

Figure 2.5-3

Apra Harbor Projects

Legend

-  Military Installation
-  IBID ESQD Arc
-  Project Footprint
-  Proposed Dredging Area (~38 ft MLLW)
-  Building
-  Potential GEDCA - Ship Repair Footprint (Future)
-  Existing Mooring Buoy
-  Upland Placement Site



The berthing plan developed for Inner Apra Harbor to address Marine Corps training requirements also addresses the other anticipated ships visiting Guam. Should a new or unanticipated type of ship visit Apra Harbor, they too would be able to use the general purpose wharves as long as the minimum draft and shore side requirements of the specific ship are met. This EIS/OEIS describes the improvements required specifically to meet Marine Corps requirements with the understanding that these wharves are available for use by other ships.

The siting of ships at the general purpose berths was based on Marine Corps requirements for embarkation operational efficiency while maintaining the operational efficiency of existing waterfront operations. The Navy Regional Commander made the ultimate determination of where new facilities would be sited -including where improvements could be made, maximizing use of underutilized wharves and adjacent areas. Although Inner Apra Harbor has the total wharf length to support the amphibious task force ship berthing, all of the general purpose wharves of Inner Apra Harbor require repair and utility upgrades/improvements to meet ship specifications and seismic building codes.

To achieve amphibious task force operational efficiency, the ships that carry amphibious vehicles would be at contiguous berths and the supporting embarkation facilities would be adjacent to these wharves. Standard practice is for all ships entering Inner Apra Harbor to be assisted by two tug boats (COMNAV Marianas 2009).

Victor Wharf is used for transient vessels and USCG owns 200 ft (61 m) of berthing, but the wharf is generally underutilized. There is adequate area adjacent to Victor Wharf for the port operations building, and the cargo staging/vehicle wash area can be located a reasonable walking distance (600 ft [183 m]) from the wharf. Victor Wharf met the embarkation requirements for contiguous berthing of the amphibious task force ship composition. These ships would require the entire length of Victor Wharf (3,620 ft [1103.4 m]) including the USCG berthing. Relocation of USCG berthing and support facilities is described as a separate project later in this section. No dredging would be required to accommodate the amphibious task force ships as the required draft of 28 ft (8.5 m) is accommodated at Victor and Uniform Wharves, which have a 32 ft (9.7 m) mean lower low water (MLLW) depth. Victor Wharf was determined to be the operational preference and is underutilized.

This planning process considered the potential berthing of inter-island intermodal passenger/ferry vessels, including High Speed Vessels (HSVs). An HSV is a high speed catamaran used to ferry cargo and personnel, which may be used in the future for regional CNMI exercises. Once the amphibious task force ships were assigned general purpose wharves, Uniform Wharf remained for the berthing of HSVs and other intermodal ferry or support vessels of limited draft. This would provide operational efficiencies because the HSV would be berthed in proximity to the embarkation activities at Victor Wharf.

The MWDK is located in the security compound that is adjacent to Victor Wharf and the proposed embarkation area. The noise generated by the embarkation activities would be disruptive to the dogs; therefore, the MWDK would be relocated.

Figure 2.5-4 shows the proposed Victor Wharf embarkation facility site plan. The specific facilities and improvements required are listed in Table 2.5-2. There would likely be phasing or grouping of the project components under multiple contracts to facilitate continued base operations and continued support for visiting ships during reconstruction. The reconstruction is estimated to require 26 months. Table 2.5-2 lists the key components of the embarkation waterfront facilities. It is assumed that the construction would occur from 0600—1700, Monday through Friday and that the construction staging area would be within the project footprint or nearby on paved or previously developed land.

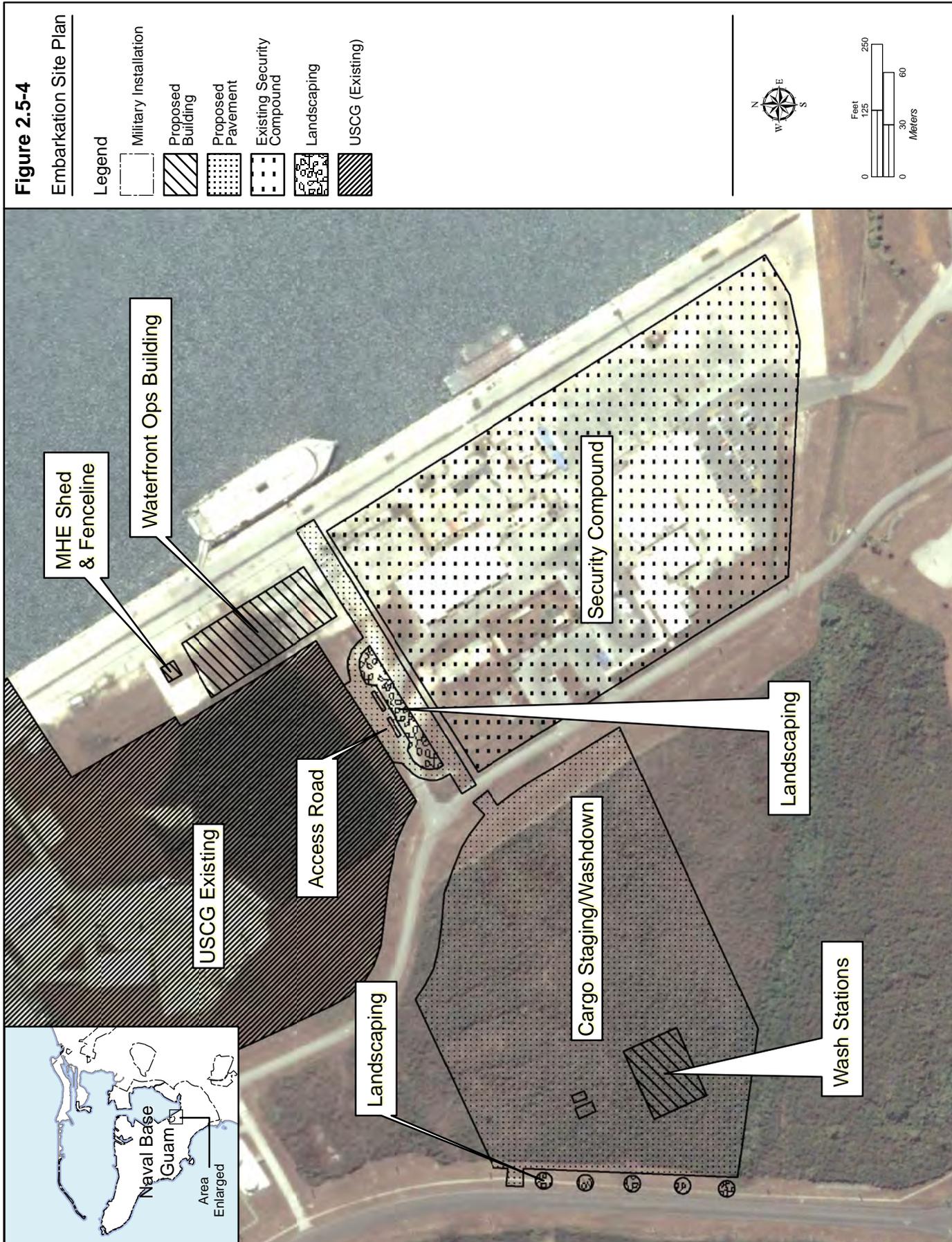


Table 2.5-2. Embarkation Waterfront Facilities

<i>Location</i>	<i>Purpose</i>	<i>Construction/Improvement Details</i>
Victor/Uniform Wharf	Victor: Ships carrying amphibious vehicles Uniform: HSVs	<ul style="list-style-type: none"> • No dredging • Victor/Uniform- repair concrete wharf deck surface, and replace mooring hardware, fenders • Strengthen/reconstruct Uniform to meet seismic and typhoon design standards: • Replace sheetpile bulkhead wharf structure at Uniform to match Victor • Repair voids in soil beneath Uniform wharf • Upgrade/install shoreside electrical, water , wastewater telecommunications infrastructure at Victor and Uniform: • Replace Bilge Oily Waste Treatment with new: generator, processing tank, storage tank, load equalization tank, manifolds with ship connection risers; gravity Bilge Oily Waste Treatment System lines; manholes; force mains; and lift station • Replace sewer collection system: ship connection risers, gravity sewer lines, and manholes • New steam plant: concrete building with boilers, fuel storage, demineralized water production. Replace steam distribution lines • Replace potable water system and fire hydrants • New low pressure compressed air plant • Communications: replace ductlines and include four 4-in (10-cm) ducts for copper and fiber optic cables, and a 2-in (5-cm) duct for cable television cables • Power: ductlines from the Orote Substation to 1 new shore power substation at Uniform and 4 at Victor • Security lighting allowing visual surveillance 100 ft (30.5 m) from wharf face. • Manual fire alarm system for new buildings and sprinkler system for cable hut • Welcome arrival area: kiosks and telephones • Stormwater system upgrades would include new trench drains, storm drain lines, and treatment tanks to prevent surface runoff into the harbor

Location	Purpose	Construction/Improvement Details
Sierra/Tango Wharves (Note: Tango Wharf included because it must be strengthened to meet new Sierra Wharf dredge depth.	Escort combatants' berthing	<p>Improvements proposed for Sierra Wharf would be implemented for Tango Wharf:</p> <ul style="list-style-type: none"> • Dredge from -35 to -38 ft MLLW (-10.7 to -11.6 m), approximately 508,877 cubic yards (CY) (389,064 cubic meters (m³)) of dredged material, including 2 feet of overdredge • Wharf strengthening to meet new depth, and seismic and typhoon criteria: repair sheetpile, and tiebacks, and cathodic protection • New concrete deck • Utility/Infrastructure Improvements: <ul style="list-style-type: none"> • Remove BOWTS system and install a new BOWTS collection and transfer to connect with new BOWTS at Victor • Replace sewer collection system: ship connection risers, gravity sewer lines, and manholes; and connect to existing wastewater system • Replace steam plant with concrete walls • Replace potable water system in existing trenches and fire hydrants. Future planned projects would upgrade offsite supply and pressure deficiencies • New low pressure compressed air plant • Communications: new ductlines would contain four 4-in (10-cm) ducts for copper and fiber optic cables, and a 2-in (5-cm) duct for cable television cables. A new cable hut at Uniform Wharf for distribution of the system • Construct new ductlines for power feeders from the new Orote Substation to the new Ship Repair Facility Substation • 2 new substations • New trench drains, storm drain lines, and treatment tanks to prevent surface runoff into the Harbor • New 6 by 12-ft (1.8 by 3.7-m) foam filled fenders and mooring hardware • New Welcome Arrival Center in Sierra/Tango area and one at Victor/Uniform • Security lighting • Manual fire alarm system for new buildings and sprinkler system for cable hut
Southwest of Victor Wharf	New cargo staging area for 230 vehicles and 500 pieces of cargo	<ul style="list-style-type: none"> • 270,000 ft² (25,084 m²) open paved areas • security perimeter fence • BTS barrier on perimeter
	New wash down area where all equipment and vehicles are rinsed prior to proceeding to cargo staging area	<ul style="list-style-type: none"> • collocated with cargo staging • 270,000 ft² (25,084 m²) paved area • Vehicle wash area* • BTS barrier on perimeter *

Location	Purpose	Construction/Improvement Details
Adjacent to Victor Wharf	Waterfront Operations Support Facility	<ul style="list-style-type: none"> • 34,860ft² (3,239 m²) building footprint • no demolition of existing buildings • single story (plus control tower), concrete construction • administrative space for 6 (975 ft²) (90.6 m²) • open-bay billeting for 40 people (2,880 ft²) (268 m²) • dining facility (1,840 ft²) (171 m²) • restrooms • classrooms • open warehouse for customs and mustering 2,000 troops with gear (20,000 ft²) (1,858 m²) • control tower (600 ft²) (55.7 m²) • multi-channel public address system • radon barriers • archaeological monitoring during construction • shielded exterior security lighting • new storm water system to prevent surface water from entering the Harbor • new lines and meters for electrical and water utilities (including an electrical transformer), for telephone, fiber optics, and sanitary sewer.
	Material Handling Equipment Storage	<ul style="list-style-type: none"> • 2,000 ft (610 m) temporary storage for material handling equipment (weather protection) • 1,000 gallon (3,785 liter) de-fueling tank to hold excess fuel removed from trucks prior to loading onto ships

Note: COMNAV Marianas 2001.

The port operations building would be constructed of reinforced concrete with pile foundations. The Material Handling Equipment Storage facility would be reinforced concrete with slab on grade. No subgrade floors are proposed.

The entire cargo staging/vehicle wash area would be paved. There would be BTS perimeter fencing and two gates, providing one-way flow of traffic through the site. There would be a wash-water waste management system that would pre-treat the waste water prior to discharging it to the sanitary sewer. The design would be developed during the design phase.

No demolition of existing buildings would be required but utility structures and boxes along the wharves would be replaced. The entire project area has been paved or landscaped. Trees and shrubs within the cargo staging/wash down area perimeter would be removed.

All utility distribution lines and ductwork would be located underground, generally within existing utility corridors. The storm water management system(s) would have underground pre-treatment components.

Asbestos, lead or polychlorinated biphenyl (PCB) containing material may be present at the wharves and inspections would be conducted prior to construction. Work would comply with applicable regulations for the survey/inspection and management of these materials. Radon mitigation would be incorporated in the building design. There are ESQD arcs at Victor and Sierra (and Romeo), which would not be modified. The port operations building is outside of the ESQD arc. Table 2.5-2 lists the wharf and utility improvements required at the wharf.

Victor, Sierra, and Tango Wharves. Existing wharves are steel sheet pile bulkhead constructed of MZ-38 section steel sheet piles that are laterally supported by 2-3/8 in-diameter (6 cm) tie rods. The bulkhead has a concrete cap/seawall, which extends 2 ft (0.6 m) below the MLLW elevation and encases the internal wale. There is a utility trench in the asphalt. The condition of these wharves is similar. There are sinkholes/depressions in the wharf deck that would be repaired. The sinkholes in the deck would be back filled and paved with asphalt as a safety consideration. Concrete spalling and cracks in the concrete seawall would be repaired. The spalls in the concrete cap could be repaired by removing any loose concrete, installing forms over the spalls, and pumping them with concrete to ensure the long-term durability of the structure. Where there is no cathodic protection the sheet pile is subject to corrosion. Cathodic protection would be installed where it is missing and depleted sacrificial nodes replaced. Steel plates would be welded over holes in the sheet pile grout. The term tremie concrete refers to the pipe used to transfer concrete underwater, in this case, to fill voids near piers and/or abutments. The tremie typically consists of a vertical steel pipe, the lower end of which is designed to remain immersed in the concrete or grout (a mixture of cementitious material and water, with or without aggregate, proportioned to produce a pourable consistency) that is being pumped into the void so that a minimum amount of material comes in contact with the surrounding water. The repair methodology has not been determined, but this is one option for repairing the voids. Mooring hardware, fenders and utility covers would be replaced.

Wharf Repairs. All of the wharves in Apra Harbor have sustained earthquake damage in the past (e.g., the 1993 earthquake) and Uniform Wharf is in the worst condition compared to Victor, Sierra and Tango Wharves. The top of the deck is generally in poor condition, with two areas of continuous depressions and one large sinkhole, up to several feet deep, located along the entire top of the deck. There are vertical stress cracks and the north end of the bulkhead is displaced. There are holes in the sheet pile bulkhead. Further investigations of the tie-back system are required to determine the extent of the repair. The repairs to Victor and Sierra (and Tango) are listed in Table 2.5-2. The proposed action does not require the additional wharf length of Tango Wharf; however, structural improvements are required to avoid structural failure when the adjacent area fronting Sierra Wharf is dredged. Utility upgrades and other improvements would be implemented concurrently with Sierra Wharf improvements for maximum cost effectiveness. These improvements are addressed in this EIS/OEIS.

Wharf improvement contractors would ensure that construction debris does not enter or impact navigable waters. All applicable local, state and federal certifications and permits would be obtained prior to construction, including: Department of Army permit under Section 10 of the Rivers and Harbors Act, Section 404 of the Clean Water Act and Guam Environmental Protection Agency Section 401 Water Quality Certification.

Wharf restoration would likely be conducted using a barge. Demolition waste would consist primarily of concrete or asphalt. Metal would be segregated from the waste for recycling. Demolition debris would be retained on the construction platform and prevented from dropping into the bay. The debris would be offloaded by crane at Romeo or Uniform Wharf into trucks. To the extent possible, and consistent with Navy guidance, construction debris would be recycled.

Dredging. The proposed dredging footprint at Sierra Wharf is shown on Figure 2.5-3. The dredge volume is in Table 2.5-2. Appendix D in Volume 9 of this EIS/OEIS has additional information on dredging. The inverted angular shape of the dredge area shown on the northern boundary is the delineation of the recently completed (2008) Alpha/Bravo dredging to a new construction depth of -40 ft (-12.2 m). There are two general types of dredging operations that could be implemented: mechanical dredging operations and hydraulic dredging operations. The operations vary by the method used to loosen the material from its

in situ state and transport the material from the seafloor to the water surface. The type of dredging equipment that is used would affect the characteristics of the dredged material. Differences in dredged material characteristics resulting from dredging methods as well as logistical considerations relevant to the use of mechanical and hydraulic dredges are described in Appendix D in Volume 9 of this EIS/OEIS. The dredging method historically used in Guam is mechanical dredging with a barge-mounted crane attached to clamshell buckets to retrieve the sediment and deposit it on a scow (barge). It is likely that this method would be used for the proposed dredging; however, the decision would not be made until the final design. The project would likely be a design/build contract that would not be awarded until this EIS/OEIS process has been completed with an approved, signed and published Record of Decision. Mechanical dredging is assessed as the environmentally conservative method of dredging in this EIS/OEIS. Should the contractor choose to use an alternative method, informal consultation with agencies and approval by USACE would be required. The construction tempo is assumed to be 24 hours per day for dredging activity for a construction duration of 8 to 12 months.

A Rivers and Harbors Act, Section 10 (33 USC 403), Clean Water Act, Section 404 (33 USC 1344), and Marine Protection Research and Sanctuaries Act Section 103 (USC 1413) permit application would be submitted to the USACE for approval and would be reviewed by other regulatory agencies. USACE Section 10/404/103 permit is the abbreviated reference for the three permits that are reviewed under one application. Site-specific Best Management Practices would also be developed in coordination with federal agencies and incorporated in this EIS/OEIS as they become available and included in the USACE permit application.

Sediment Characterization. Sediment characterization data for the Sierra Wharf (and the two alternative aircraft carrier wharf locations described in Volume 4) site suggest most, if not all, of the material would meet the testing criteria and be suitable for upland placement, or ODMDS disposal (NAVFAC Pacific 2006). Chapter 4, Water Resources, summarizes the sediment characterization data. No Navy dredging project on Guam has required designation of an upland site for the treatment or remediation of sediment. None is anticipated for this proposed action. This EIS/OEIS relies on the existing sediment characterization results to assess impacts. Laboratory data are generally considered valid for a three-year period and additional analysis per 40 Code of Federal Regulations Part 227 would be the basis of a dredged material management plan that would be included in the USACE Section 404/10/103 permit application. It is possible that multiple disposal methods would be appropriate for the project.

Dredged Material Disposal. The EIS/OEIS considers four potential disposal scenarios: 100% ODMDS disposal, 100% upland placement, 100% beneficial reuse, and 20-25% beneficial reuse/75-80% ocean disposal, which are discussed further below.

Under the 100% upland placement scenario, five upland placement sites on Navy land have been identified for potential use in support of the proposed dredging action. These sites are referred to as Field 3, Field 4, Field 5, PWC Compound and Polaris Point and are described in Appendix D (Volume 9). Fields 3 and 5 and Polaris Point have been proposed for other dredging projects and have been addressed in other NEPA documents. Field 4 and PWC Compound sites are addressed in this EIS/OEIS. Two of the alternative sites, Polaris Point and Field 5, would have sufficient capacity to accommodate all of the anticipated dredged material from the proposed action with modification of existing berms at the sites. Thus, used in combination with ODMDS and beneficial reuse, only a portion of the candidate sites would be required to accommodate the dredged material.

Beneficial reuse is the preferred disposal option for clean dredged material when practical. The material must meet engineering specifications for the specific beneficial reuse. A number of opportunities for

beneficial use have been identified, including beach re-nourishment, backfill for a commercial port expansion, construction material for roads, or daily landfill cover. Prior to beneficial use, the dredged material must be tested to ensure it meets the engineering specifications for the proposed reuse. If a beneficial reuse is not identified for this dry material it would occupy valuable space that could otherwise be available for more dredged material.

Between 1 to 1.1 million cubic yards (cy) of dredged material would be excavated from the Inner and Outer Apra Harbor for the proposed Marine Corps and Navy actions. The dredged material is expected to consist of a mixture of sediments including sand from the outer harbor and silts/clays from the inner harbor. Additionally, there will be coral fragments and other submerged rubble that would be included in the volume of dredged material from the outer harbor dredging.

Beneficial reuse of portions of this total volume would be possible and several local projects have been identified. These local projects include:

- *Support shoreline stabilization below Aircraft Carrier Wharf:* As part of the construction process, some fill would be used with the rip rap stone that would be placed along the shoreline and under the wharf to support the piles. Approximately 40,000 cy of quarry stone in addition to an estimated 20,000 cy of rip rap stone is envisioned for this stabilization purpose. It is possible that some of the rubble or some other suitable material from the dredged material could be used and mixed in below the quarry stone layer. Therefore, it is estimated that approximately 50% of the quarry stone amount or 20,000 cy of the dredged material could be used.
- *Fill of berms and backstops at proposed military firing ranges on Guam:* There are a number of berms and backstops that would be constructed as part of the development of new military firing ranges on Guam. The berms range in length from 35 to 255 ft (11 to 78 m); 7 to 56 ft (2 to 17m) in width; and 3 to 7 ft (1 to 2 m) in height. Fill would be used to create these earthen mound structures. The volume within these berms and backstops has been calculated and equals an estimated 160,000 cy.
- *Port Authority of Guam (PAG) expansion program:* The PAG has prepared a Master Plan that includes a proposed eighteen acre area for expansion of fast land to support new commercial port cargo handling in Apra Harbor. The potential in-water expansion project is an ambitious endeavor that may be confronted with cost, feasibility and ecological concerns and also requires full environmental documentation by the USACE and subsequent permit approval before implementation. Up to 1.5 million cy of fill would be needed to create this new land if this PAG expansion program comes to fruition. The Navy has a memorandum of agreement with PAG to provide fill from proposed dredging projects should the material be deemed suitable and the timing and logistics of both projects work out.

Given the potential availability of these upland beneficial use projects on Guam, the following four scenarios are possible for the disposal or placement of the proposed dredging projects in the inner and outer Apra Harbor:

- 100% beneficial use with all dredged material being used as artificial fill for the PAG expansion program (either direct waterfront placement or following placement at PAG upland placement site)
- 20-25% beneficial use of dredged material in berm construction and under wharf for shore and pile stabilization (assumes no PAG need and/or logistics/approval problems for use of fill) and 75 to 80% ODMDS placement;

- 100% upland placement on existing Navy confined disposal facilities on base on Apra Harbor; and
- 100% placement in the Guam ODMDS.

The U.S. Environmental Protection Agency (USEPA) is pursuing the designation of an ODMDS approximately 11 to 14 nm (20 to 26 km) from the west coast of Apra Harbor. The designation is anticipated in 2010 and an ODMDS EIS is being prepared concurrent with this EIS/OEIS. Ocean disposal is regulated under Title 1 of the Marine Protection, Research, and Sanctuaries Act (33 USC 1401 et seq). Formal designation of an ODMDS does not constitute approval of dredged material for ocean disposal.

Results from additional analysis and testing would be required to develop a dredged material management plan and the USACE Section 404/10/103 permit application. Ocean disposal is only allowed when USEPA and USACE determine that the project dredged material: 1) is environmentally suitable according to testing criteria, as determined from the results of physical, chemical, and bioassay/ bioaccumulation testing that is briefly described in Section 2.7 (USEPA and USACE 1991); 2) does not have a viable beneficial reuse; and 3) there are no practical land placement options available. Any dredged material deemed not suitable for ocean disposal would need to be placed on land as the method of disposal.

Volume 9, Appendix D contains additional detail about dredging issues related to the proposed action, including potential dredging methods that could be used, Alternatives for reusing or disposing of dredged material, and specific assumptions made in the EIS/OEIS analysis.

Proposed Operations

This section provides more detail on the specific proposed projects on the western side of Inner Apra Harbor. The duration of each amphibious task force visit would range between 6 and 21 days. A typical schedule on Guam is shown in Table 2.5-3. Distribution throughout the year may vary, due to the subjective and mission-dependent nature of MEU-level events. Inclement weather may also impact event schedules.

Table 2.5-3. Approximate MEU Administrative/Non-Tactical Event Schedule

<i>2–3 Days</i>	<i>2 Days</i>	<i>5 Days</i>	<i>2 Days</i>	<i>2–3</i>
Agricultural Inspections	Debarcation/Set-up	Active Firing Range Use	Clean-Up	Agricultural Inspections

The MEU training would bring approximately 2,000 additional military personnel to Guam as a transient (i.e., visiting) population. They would not be provided housing or be using on- or off-base amenities (except during periods of leave and liberty). They would be camping and training 24-hours per day. The MEU may train on Guam or continue to Tinian after a Guam port call. The amphibious task force ships would continue to occupy a majority of the wharves in western Inner Apra Harbor. The ships carrying amphibious vessels would berth near the embarkation facilities. The combatant escort ships would berth at other Inner Harbor Wharves. Specific wharf assignments are determined by operational requirements by Naval Base Port Operations.

The Port Operations Group is part of the on-island Marine Logistics Group (CLR-37). They work closely with Base Operations to provide logistics support at the waterfront before, during and after amphibious task force visits. They are provided administrative space and a port control tower in a stand-alone building at the waterfront. They would support other training events when the amphibious task force is not in port.

Cargo arrives in Guam preloaded on trucks (or LCACs) that are transported by the amphibious task force ships. If there is a training mission on Guam, the trucks drive off the ships' stern ramps. Other cargo may be offloaded by mobile crane. Large 50,000-pound-capable forklifts, assigned to the CLR-37, would be used to move the cargo and would be stored temporarily in a material handling equipment building at the waterfront.

No maintenance of equipment or vehicles is anticipated in the support buildings.

Biennial Reporting System inspections would be conducted with significant involvement of USDA personnel based on procedures developed in the Biosecurity Plan. Wash racks are raised platforms with ramps at either end that facilitate cleaning of undercarriages. The design system assumptions are based on a description of a similar facility on Guam that was never built (COMNAV Marianas 2001). Vacuum, high pressure water and steam would be provided in addition to a wash water waste treatment system. The facility would include sedimentation, oil/water separation/filter pressure booster pumps and pressure, and filters. The filtered water would be stored on site and fresh water would be added to make up losses from recycling. When washing is complete, wastewater from the systems would drain to the sanitary sewer. Final design of wash system is pending.

Shipboard solid waste would be steam-cleaned prior to disposal in the Navy landfill or other on-island landfill, such as the GovGuam proposed landfill in Dandan. Any regulated or hazardous waste would be managed in accordance with base standard operating procedures.

Personnel, cargo, and equipment would travel in trucks, buses, and HMMWV or Humvee on civilian roads to a bivouac/expeditionary camp site at Andersen South or other training venue. It is anticipated that these transport events would occur during evening hours or other non-peak travel hours to avoid peak traffic periods. Approximately 15 trucks would travel as a group, with distance and time between caravans to minimize interruptions to civilian traffic flow. The number of trips varies with the mission. On return to the wharf, the vehicles and equipment would be inspected and washed prior to being loaded onto the ships carrying amphibious vehicles. The amphibious task force would arrive fully supplied to meet all training requirements or would be replenished, as needed, prior to training on Tinian.

Prior to being loaded on the ships, trucks may be required to offload fuel and there would be a 1,000 gallon above ground storage tank at the wharf for holding this fuel.

During embarkation events, the amount of noise generated would be typical of large congregations of people, buses, and trucks. There would be diesel equipment (i.e., forklifts) to move cargo.

When there are no Marine Corps operations at the site, other transient ships would be berthed at Victor Wharf at Port Operations Department discretion. Transient vessels may be permitted to use port operations facilities.

All facilities would have security lights mounted on either buildings or steel poles. Lighting along the wharves would consist of 1,000 watt high pressure sodium floodlights mounted on new or existing poles. The lighting would be shielded and aimed such that the majority of the illumination would be directed towards the wharf deck and extend over water about 100 ft (30.5 m) to satisfy security requirements. No other aerial structures are proposed.

Due to the frequency and duration of the amphibious task force visits, the ships require more shoreside utility support than is currently provided. The requirement for transient ship support, as described in Volume 4, is that ships should be provided full service utility infrastructure support to enable them to turn off their shipboard systems and rely on shoreside utilities for maintenance and repair activities. Under the

proposed action, there would be utility, infrastructure and wharf improvements at Victor, Uniform and Sierra Wharves to allow the ships to turn-off all onboard utility systems and rely entirely on shoreside systems for communications, cable, wastewater, water, bilge oily waste treatment system (BOWTS), fire protection, compressed air and steam. The specific improvements are listed in Table 2.5-2. The new BOWTS facility would be constructed at Victor Wharf but serve other wharves including Sierra and Uniform Wharves.

Stormwater would be pre-treated to remove contaminants prior to discharge into the Harbor. The design would be developed during the design phase. There would likely be multiple systems to cover the entire project area. The system would be designed to a typical Guam storm event, not a 100-year storm.

The wharves were constructed in 1946 and all sustained damage in a severe earthquake in 1993. Uniform Wharf is not in use because of the extent of the damage. It would be reconstructed to accommodate a depth of -32 ft (-10 m) to match Victor Wharf's structure. Cathodic protection would be provided and the design would meet seismic and typhoon resistance standards. Soil voids beneath the deck would be repaired.

Waterfront Project: LCAC/AAV Laydown Area

Proposed Facilities and Construction

The LCAC/AAV laydown needs to be remote from other operations because of the noise and spray associated with the LCACs. An alternatives analysis was conducted as described below. The only site that is retained for this EIS/OEIS analysis is in the northeast corner of Inner Apra Harbor southeast of Alpha Wharf. The site plan is shown on Figure 2.5-5.

The proposed site is on DoD land, vacant, within a man-made fill area. No land use constraints were identified. A new asphalt access road is required that connects with Marine Drive. No traffic signal is proposed, but standard traffic management practices would be followed. Utilities (wastewater, potable water, communications, and power) would be extended to the site from Marine Drive.

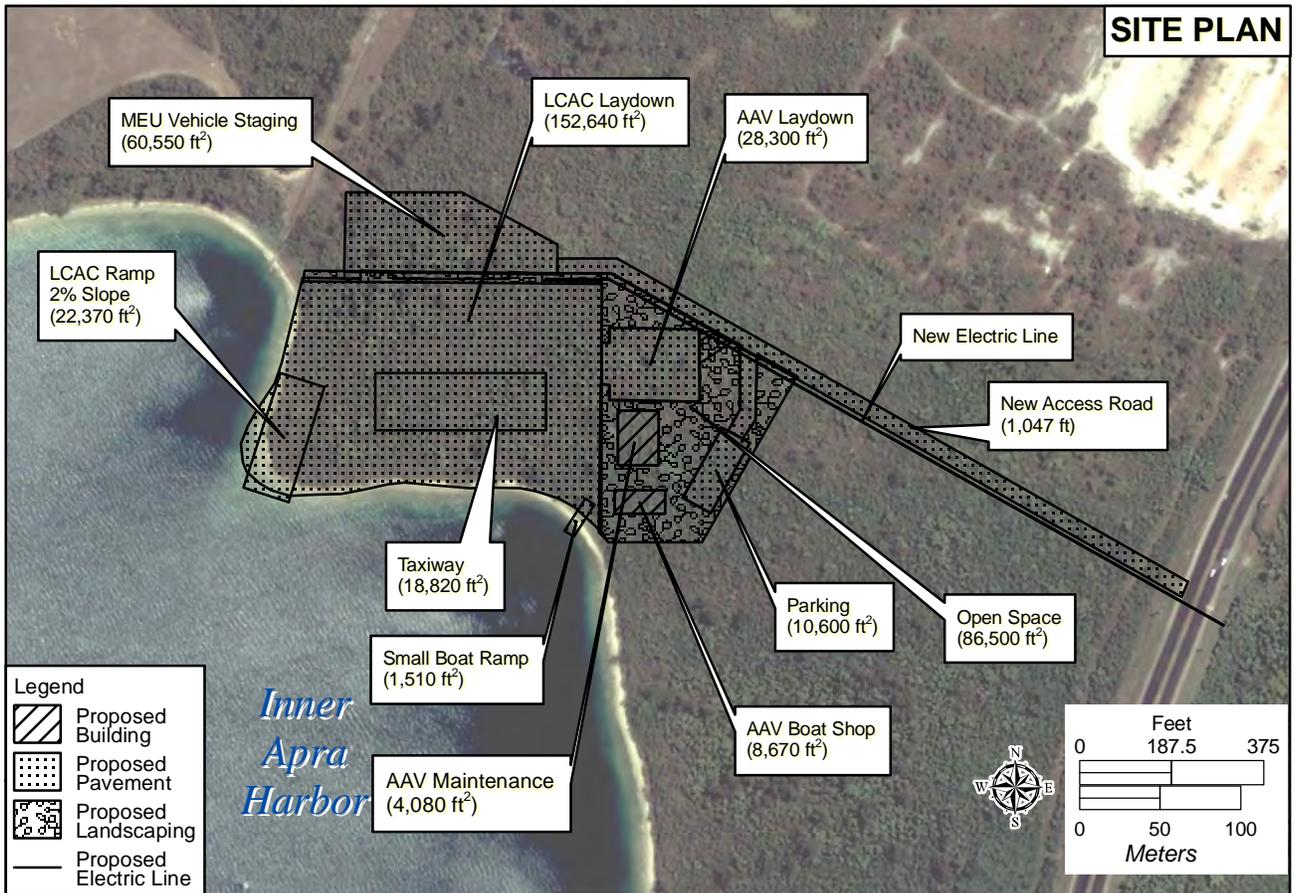
The entire site (468,000 ft² [43478.6 m²]) would be developed. Four buildings proposed at the site are listed in Table 2.5-4.

Table 2.5-4. LCAC/AAV Laydown Area Buildings

<i>Facility</i>	<i>Area ft²/m²</i>
AAV Maintenance Shop	2,131/198
AAV Communications/Electrical Shop	4,080/379
Hazardous materials/flammables Storage	40/3.7
Reconnaissance Boat Shop	8,670/805

Source: NAVFAC Pacific 2009.

The majority of the site would be paved for use as an LCAC parking apron, taxiway and landing ramp, and AAV ramp and parking area. There would also be parking (10,600 ft² [984.8 m²]) provided for personal vehicles and a MEU vehicle staging area (60,550 ft² [5,625.3 m²]). A vehicle wash facility, which has not yet been sited, would be provided to rinse the salt water from the vessels. A 2,500 gallon tank for fresh water would be at the site and the washrack design may include recycling and pre-treatment. Washwater runoff treatment and reuse would be incorporated into the final design. The design of this wash facility would be smaller and less complex than the wash facility proposed at the cargo laydown area near Victor Wharf.



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Figure 2.5-5
LCAC/AAV Laydown

The facility perimeter would be a concrete BTS barrier except the 30 ft (9.1 m) gate, which would have BTS deterrent mesh fabric. The fence would be dual purpose: BTS deterrent and security.

The buildings would be reinforced concrete slab on grade and designed to resist 170 mph winds and meet Guam seismic standards. The design would meet LEED silver criteria. Stormwater would be pre-treated prior to discharge into the harbor.

The site is undeveloped and no demolition is required. Vegetation including trees and shrubs would be removed from the site. The entire project area (468,000 ft² [43478.7 m²]) would be graded and grubbed. The construction staging area would be located within the development area. The area is within the wildlife Overlay Refuge. There are no mangroves/wetlands identified at the laydown site or access road area.

In-water work would consist of two new concrete ramps, which are similar to recreational boat ramps observed at marinas. The slope of the AAV ramp would range between 12 and 15%. Ramp surface would be paved down to an elevation of 3 ft (0.91 m) below extreme low water. The top would be rounded over on a 20 ft (6.1 m) vertical curve until it becomes nearly level at about 2 ft (0.6 m) above extreme high water. The single lane AAV ramp would be approximately 15-ft (4.57-m) wide. Any part of the ramp that must be placed underwater would be of precast sections. The LCAC ramp has a 2% slope requirement and construction would be similar to the AAV ramp. Construction would likely be during daylight hours only, Monday through Friday, but there is potential for a 7-day work week.

Proposed Operations

On average, four LCACs and 12 to 15 AAVs would participate in the MEU activities on Guam. In Apra Harbor, the LCACs and AAVs would launch from the ship in Inner or Outer Apra Harbor and travel to a proposed laydown area near Alpha Wharf at Polaris Point.

The AAV and LCAC could be berthed at a wharf but it is easier to unload cargo and vehicles from the vessels on land. With the proposed project, the LCAC and the AAV would each have a dedicated ramp to access their respective laydown areas, which are adjacent to each other in the same BTS “safe” zone. The ramps are designed for one vessel at a time. Each vehicle would be rinsed on arrival to remove sand and salt spray. The vehicles may be carrying cargo to the laydown area and conversely cargo might be loaded onto the vehicles at the laydown area. With each MEU event, an estimated 15-20 LCAC loads (including personnel, equipment, and cargo) would be transited sea to shore from the LHD, LSD, and/or LPDs in Outer Apra Harbor to the proposed LCAC/AAV laydown area upon the arrival and departure and of the visiting amphibious task force ships. These transits would occur in tandem between the hours of 0700 and 1900 and would adhere to speeds consistent with the Inner Apra Harbor no wake zone. If cargo is loaded or unloaded at the LCAC/AAV laydown area, agricultural inspection is required as described for the embarkation cargo staging area at Victor Wharf.

Each vehicle would be rinsed on arrival to remove sand and salt spray, which deters corrosion and increases vessel efficiency.

AAVs produce noise comparable to a diesel powered boat on water. On land, the AAV tracks generate noise when moving on hard surfaces.

LCACs are powered by gas turbines using two large shrouded propellers at the stern for forward propulsion. The thrust from the propellers is up to 32,000 lb in forward mode. Two bow thrusters are rotated as a pair with 360 degree capability. During forward movement the thrusters are pointed aft. The bow thrusters are fed by the lift system; therefore, sand, gravel or other debris on the ground that gets

sucked into the intake points would be thrust out of the bow thrusters at high velocity (5,050 lb is the maximum thrust in forward motion). Impacts 100 yards (yd) (91.44 m) away have been noted (anecdotal observation). LCACs generate a significant amount of noise that is generated primarily by the fans and propellers, not the engines that power these systems. The number of personnel on the laydown area during LCAC operations is restricted to minimum number of trained personnel to maximize safety. The following assumptions are made regarding LCAC operations in Apra Harbor:

- *Departure:* LCACs would be at idle power for 4 minutes in the parking stall, depart the stall and taxi at 5 knots to the ramp, and accelerate at the ramp hitting the ocean at 20 knots before decelerating and operating at a speed that does not impact berthing at Polaris Point or on the main side.
- *Arrival:* LCACs would decelerate to ramp approach power, then taxi to the washdown area. LCACs would be at the wash rack for 5 minutes at idle power and then taxi to the parking stall and idle for 2 minutes before shutting down.

Although no amphibious training or maneuvers conducted in Inner Apra Harbor are analyzed in this EIS/OEIS, any amphibious training or maneuvers that would be conducted in Apra Harbor are described in the MIRC EIS/OEIS (e.g., at Reserve Craft Beach).

Waterfront Project: USCG Berthing and Crew Support Building Relocation (MILCON P-1002)

Proposed Facilities and Construction

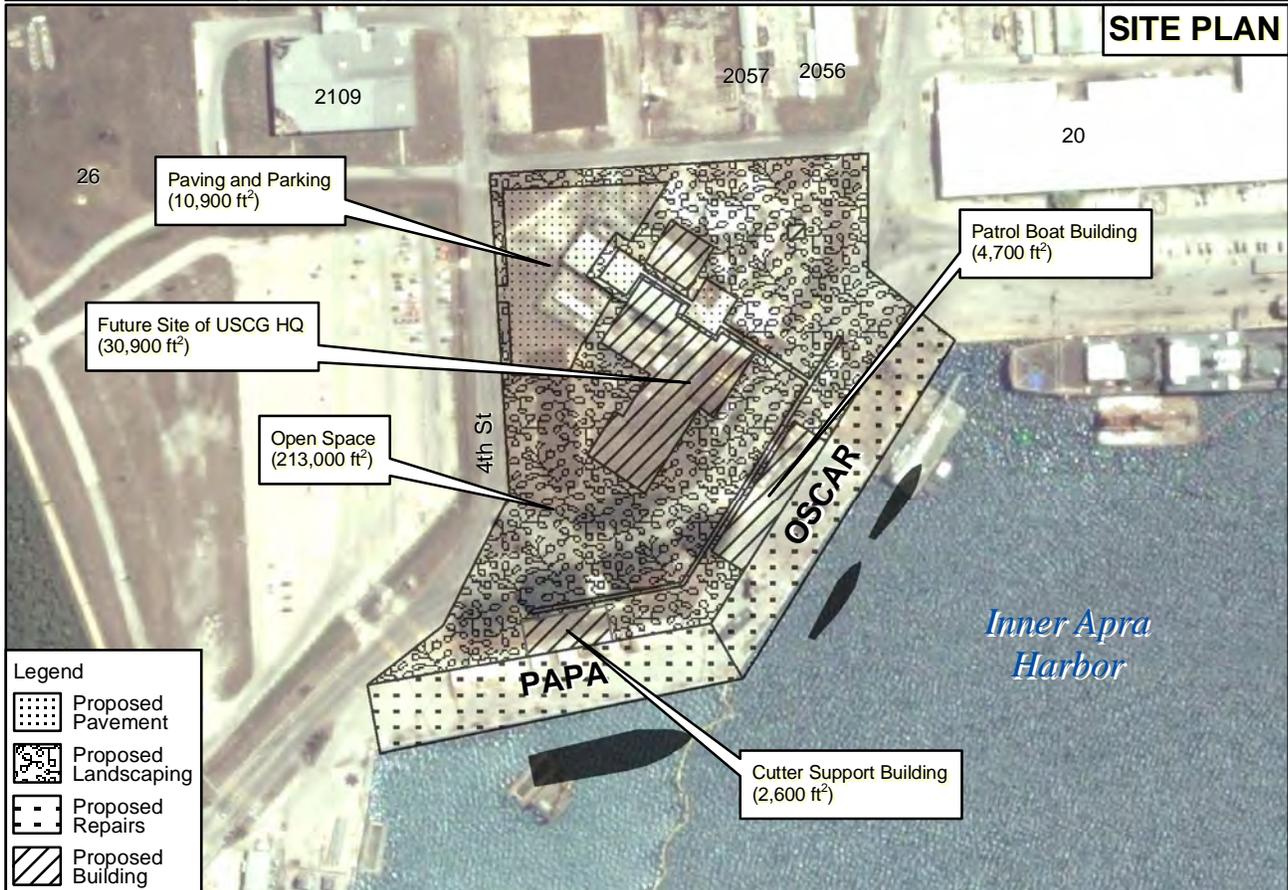
A site plan is shown on Figure 2.5-6. The entire length of Oscar and Papa Wharves (1,079 ft [328.88 m]) are required to berth the USCG vessels (Table 2.5-5). The rescue boats (small inflatable's) are kept on the cutter unless they are deployed for operations or undergoing maintenance.

Table 2.5-5. USCG Ships

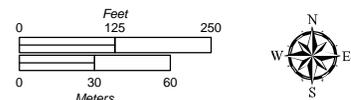
<i>Vessel</i>	<i>Vessel Length (ft)/m</i>	<i>Feet of Berthing per Vessel (includes tie down) (ft)/m</i>	<i>Number of Vessels</i>
Cutter	110/34	320/98	2
Buoy tender (WPB, WLB)	225/69	270/82	2 -WPB, 1- WLB
Response Boat-S (RB-S)	25/8	90/27	3

The primary facilities required are as follows:

- 2 single-story Fleet Landing Support Buildings for:
 - Patrol boats (5,576 ft² [518.02 m²])
 - Cutter (9,558 ft² [888 m²])
- Hazardous material storage locker (215 ft² [20 m²])
- Utilities/infrastructure:
 - Pole mounted lights security lights
 - Power: emergency generator, electrical substation, underground secondary power distribution and manhole duct system and utility mounds to support the wharf use
 - Storm water management: a new system would provide pre-treatment prior to discharge into the Harbor
 - Water and wastewater systems
 - BOWTS
 - Fire protection water supply
 - Communications
- Parking: personal vehicles and bicycles
- Perimeter security fencing/gate



**Figure 2.5-6
USCG Site Plan**



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The Fleet Landing Support Buildings contain administrative spaces, male/female bathrooms, laundry facilities, shop spaces, storage, mechanical and janitorial spaces. Munitions and weapons are stored on the cutter. The armory would be an existing facility off site.

There are existing access roads (4th Street) to the site as shown on the aerial (refer to Figure 2.5-6). There may be a need to redirect non-USCG traffic that currently goes through the site to another existing route for security reasons. Traffic in the area is primarily ship repair workers and Navy personnel.

Wharf upgrades include repair of the concrete bulkhead, a new fender system, and mooring hardware. No dredging is required. There would be repairs to the concrete bulkhead, but the repairs would not require demolition or replacement of the support structure. Portions of the work may have to be conducted from the water on a barge moored at the wharf. Precautions would be required to prevent construction material or waste from entering the harbor. Conditions imposed at the recently completed Alpha /Bravo Wharves Improvement project would be similar to those for the USCG project and include:

- The Contractor would install a moveable containment shield/platform mounted along the face of the existing wharves during concrete chipping, roughening, and core drilling work to prevent debris from falling into the water during work at the existing and new concrete bulkheads.
- No contamination from trash, debris disposal, and alien species introductions would be permitted. Equipment operated at the wharves would be adequately maintained and periodically checked to ensure no leakage of fuel, hydraulic fluids, or other lubrication product into the water.

The site has been extensively developed, and there are seven buildings (Buildings 24, 27, 29, 40, 42, 43, and 2078) (refer to Figure 2.5-6), as well as utility structures at the site. All facilities would be demolished. Some of these structures are in use by the civilian shipyard and those operations would have to be relocated to the proposed consolidated ship repair compound, pending lease renegotiation. The construction staging area would likely be within the site boundary or possibly in adjacent graded areas.

There is documentation of environmental contamination at the former shipyard repair facility (Building 27, near Oscar wharf) and soil remediation may be required prior to construction, pending soil analysis. The existing cluster of trees would be retained in the area designated for open space. Assume the remainder of the site would be re-graded.

All buildings would be reinforced concrete slab on grade. No basements or subfloors are proposed. There would likely be excavation for soil remediation and there would be subgrade ducts for utilities and stormwater control components. Any contaminated soil would be managed in accordance with the project environmental management plan. Stormwater runoff control would be implemented in accordance with the NPDES permit and the Stormwater Pollution Prevention Plan.

Grading may require approximately 9,809 CY (7,500 m³) of fill. Grading and grubbing is required over approximately 80,700 ft² (7,500 m²). Facility design would meet LEED Silver criteria and comply with Energy Policy Act 2005.

Proposed Operations

The USCG conducted a relocation feasibility study in anticipation of Marine Corps embarkation requirements at Victor Wharf. Three candidate sites were identified and the preferred site is 9.2 ac (3.72 ha) in the vicinity of Oscar and Papa Wharves, which are located in the northwest corner of Inner Apra Harbor (refer to Figure 2.5-6). The land is Navy-owned and has historically been used as a Navy Ship

repair facility until it was closed as a result of the 1995 DoD Base Realignment and Closure Commission decisions. The area was requested for civilian reuse by GovGuam following closure. Use of the facility assets was transferred through leasehold to the private sector through the Guam Economic Development and Commerce Authority (GEDCA), although the Navy retains title to the property. The term of the lease ends in 2012 and there is an opportunity to reduce the footprint of the ship repair facilities, which are dispersed through the lease area, during contract renegotiation.

The relocation and consolidation would occur in phases as funding becomes available. The first phase addresses the Marine Corps requirement for the use of Victor Wharf, in its entirety, to berth the amphibious task force ships. USCG owns a 200 ft (61 m) length of Victor Wharf and holds a license agreement on an additional 250 ft (76 m). USCG floating assets and support facilities are a priority for relocation to the Oscar/Papa Wharves site and are covered in this EIS/OEIS. The existing USCG HQ facility would remain in the vicinity of Victor Wharf, pending funding for Phase 2 of the relocation.

Approximately 110 personnel would drive their own vehicles to work at the Oscar/Papa Wharves during the standard Monday through Friday work week. Twenty of these personnel are administrative and remain at the site during the day. The presence of the other personnel is mission-dependent. Weekend personnel (approximately 16–20) work on the ships. There is no shift or evening work; however, emergency response and ships returning from missions would occur during evening hours.

Supplies for the cutter are delivered to the wharves from Navy supply warehouses. No agricultural inspection is anticipated. Supplies would not be delivered to the wharf from other locations by USCG ships.

No land use constraints were identified at the site that would interfere with USCG operations. The proximity of commercial ship repair facilities requires a anti-terrorism force protection stand-off distance from access routes and non-Navy buildings.

The units relocating during the first phase of relocation would include:

- Electronic Support Detachment, which provides electronic, telephone, and computer support to Sector Guam, Coast Guard Cutter (CGC) Galveston Island, Far East Activities Japan, Far East Activities Detachment Singapore, Marine Safety Detachment Saipan, and secondary support for CGC Sequoia.
- CGC Galveston Island and CGC Sequoia. CGC Galveston Island performs law enforcement, search and rescue and military readiness missions, while CGC Sequoia primarily is responsible for maintaining the fixed and floating aids to navigation for the territorial waters of Guam and the CNMI.

The use of the site would be typical of other working wharves and access to buildings and wharf areas would be restricted by perimeter fencing and gates with locks and traffic bollards. Trucks would arrive regularly at the site to deliver supplies for the cutters and there would be equipment such as forklifts on site to load supplies on the ship. Minor equipment maintenance and repair would occur in the support structures. The site would not generate noise or light that is different from other Navy wharves.

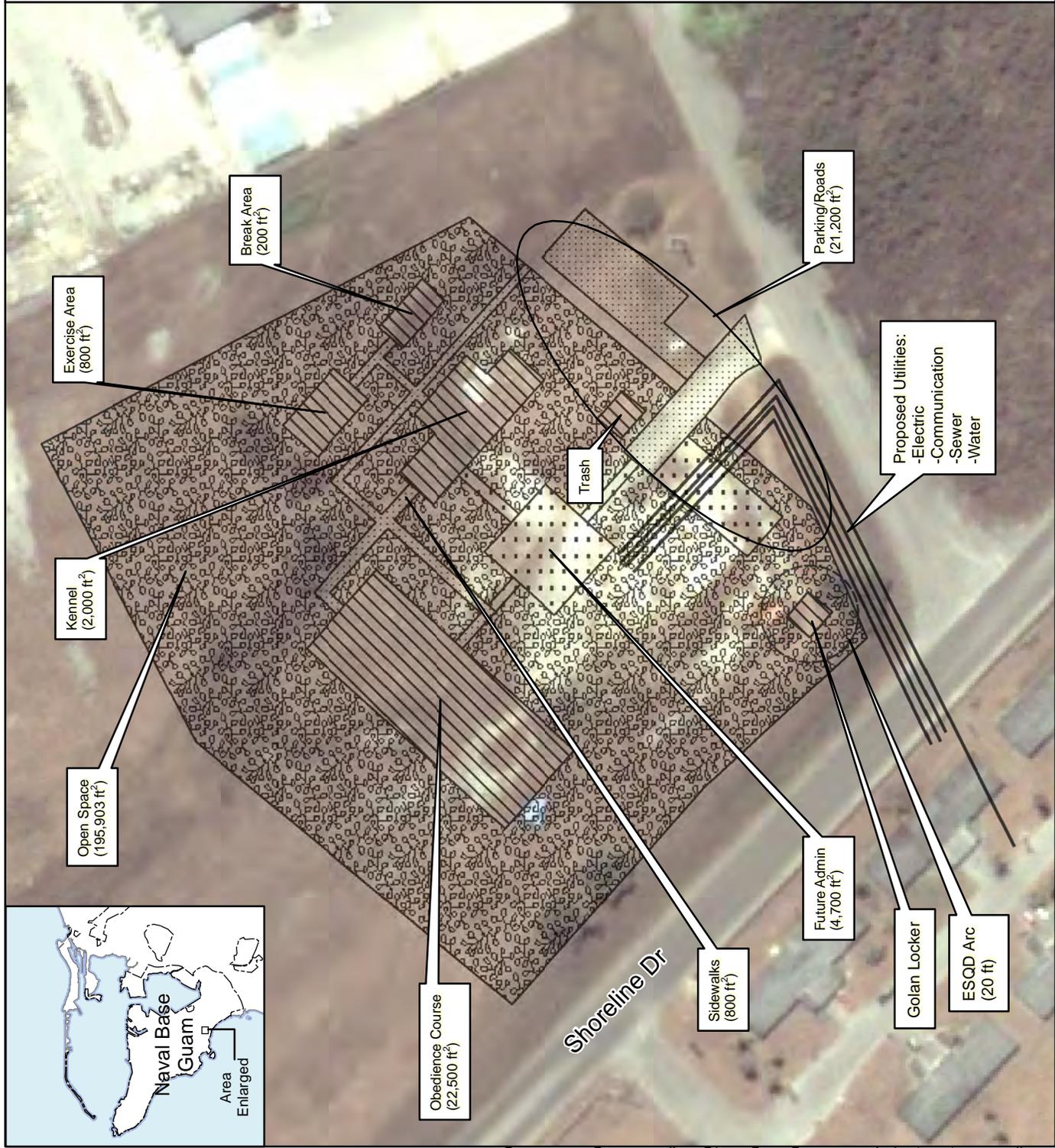
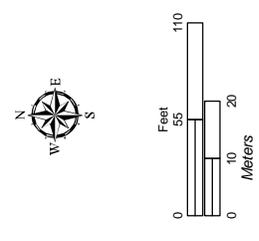
Waterfront-Related Project: Military Working Dog Kennel Relocation

Proposed Facilities and Construction

The MWDK facility (Figure 2.5-7) would include a 2,040 ft² (190 m²) single-story building that provides space for dog kennels for 10 military working dogs (includes both indoor and outdoor runs), four quarantine runs, two tack rooms, bulk storage area, food storage area, food preparation area,

Figure 2.5-7
Military Working Dog
Kennel Site Plan

- Legend**
-  Military Installation
 -  Proposed Building
 -  Proposed Pavement
 -  Future Construction
 -  Landscaping
 -  Proposed Utilities
 -  IBD ESQD Arc



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administration space for 13 personnel, bathroom, locker room, veterinary exam area, multi-purpose conference/break area, outdoor dog wash, circulation space, and a mechanical equipment room and exterior enclosure for dehumidification equipment, and relocating the existing explosive/hazardous material locker (Golan 10 locker). The locker would generate a 20-ft (1.9-m) radius ESQD arc. There would be an outdoor obedience/training course (22,500 ft² [2,090 m²]), exercise area (800 ft² [74 m²]) and break area (200 ft² [19 m²]), all with self closing/self-latching gates. The project would provide Intrusion Detection System at gate entrance and at building door entrance.

Site improvements include an 8-ft (2-m) high chain link fence with 3 strands of straight wire along the perimeter of the working dog site with a 20-ft (6.1-m) wide service gate for vehicular access for food deliveries to the kennels and other access requirements into the working dog compound. Project includes a perimeter fence for the Golan 10 hazardous material area at the 20-ft (6.1-m) arc setback with a gate for vehicular access, and fencing around the obedience training course, exercise and break areas. Hedges would be used as a visual screen to minimize distractions from other dogs while training. Parking would be provided for personal vehicles and organizational vehicles.

There would be security lighting and lighting specifically for the obedience training course, which would be mounted on poles and the building. A central dehumidification system would provide a controlled environment for the dogs in the building. Fire sprinklers systems and air conditioning would be throughout the building. Utilities provided to the site would be underground and include water, wastewater, and telecommunications.

The existing facilities at Victor Wharf are not scheduled for demolition as part of new site construction. The proposed site is currently used for a temporary laydown area for base maintenance contractors. There are conex containers on site that would be relocated by maintenance contractor. No demolition at the site is required.

No land use constraints were identified at the site except radon. Radon mitigation is included in the inhabited building design. Low levels of PCB contaminants have been identified approximately 400 ft (121.92 m) north of the site. Soil testing would be conducted prior to construction. No trees would be cleared. Access to the site would be from existing roads and utilities would tie into the utilities along the roadways. Area of grading/grubbing is approximately 85,301.84 ft² (26,000 m²) and landscaping would be required for 65,617 ft² (20,000 m²).

The single story buildings would be constructed of reinforced concrete and/or concrete masonry unit with seismic upgrades, pile foundation, and with all components such as exterior walls, windows, roofing, mechanical and electrical systems compatible with the Guam environment and COMNAV Marianas design standards.

The project provides for electrical and mechanical systems including fire alarm and fire monitoring/control panels, information systems, telephone, Energy Management Control Systems, plumbing, fire protection systems, and heating, ventilation, and air conditioning systems. Information systems include telephone and data. Utilities at the site would include power, emergency generator, water, and wastewater. Utility tie-in would be at Shoreline Drive. There is a trash enclosure on site.

The kennels would have a central dehumidification system that controls indoor environment to meet 9 Code of Federal Regulations Chapter 1 Part 3 “Animal and Animal Products Standards” regarding temperature and humidity.

Project includes AT/FP building and site measures in compliance with UFC 4-010-01, dated October 8, 2003, including Change 1, January 22, 2007. AT/FP protection measures include the required standoff distances from parking, roadways, and existing inhabited buildings in the area. Physical security equipment includes intrusion detection system for the GOLAN 10 hazardous material locker and the drug storage area.

The total area of ground disturbance during construction would be 209,100 ft² (19,426 m³) The building would be constructed of reinforced concrete with slab on grade foundations, meet current design seismic standards, and be able to withstand 170 mph winds. The facility would meet LEED silver standards and comply with Energy Policy Act 2005 requirements. The specific LEED design features would be developed with final design but would include battery storage photovoltaic systems, high efficiency windows (low-e coated glazing), and water conserving plumbing fixtures with electronic controls where possible.

Construction duration is estimated at 1 year, with a Monday through Friday work week during daylight hours. Construction skills and equipment are typical of Navy base construction. Solid waste would be transported to the Navy Landfill.

Proposed Operations

A new MWDK is proposed to replace the one within the Security Compound at Victor Wharf (refer to Figure 2.5-7). The noise generated by the Marine Corps during embarkation operations at Victor Wharf and at the proposed adjacent cargo staging area would likely disturb and distract the military working dogs. Relocation of the facility is proposed.

The military dogs are required for explosive/narcotic detection, antiterrorism force protection, and are deployed. The dogs live and train at the kennel. There is one handler assigned to each dog. They train and deploy as a team. There are typically nine teams in residence at the kennel, but the schedule is mission driven and unpredictable. The dogs are provided indoor and outdoor runs.

The facility is staffed by a kennel master and a kennel support person. There are frequent visits by organized groups of students and youth groups. Access to the site is generally by car. Training is done on site during the day and at night in outdoor obedience training courses. Working hours for the staff are generally 8:00 a.m. to 5:00 p.m.; however, evening missions would require staff. Evening training is a routine event. The dogs also train at other training facilities on-island and the frequency is dependent on the use of the other facilities. There are six patrol cars on site for transporting the dogs. Training aids include narcotics and explosives which are stored and handled in accordance with DoD regulations.

The proposed facility does not provide for USDA inspection dogs. The missions, characteristics, and needs of the USDA BTS dogs are different from the Military Working Dogs; therefore, separate areas are required for the agency-unique management and specialized training requirements of the two types of dogs and their handlers.

There is room for expansion at the proposed site to accommodate future expansion. No heavy equipment is used at the site. There are minor amounts of hazardous materials (oxidizers) stored in a suitable cabinet. Explosives (1.1 CD) are kept in a hazardous material locker (Golan Locker) that generates an ESQD arc (20-ft [6.1-m] radius) on the premises.

The dog wastes would be washed into the sanitary sewer system.

Waterfront-Related Project: Apra Harbor Medical Clinic (MCH-006)

Proposed Facilities and Construction

The proposed site is centrally located on the installation on Marine Drive, near existing family and bachelor housing areas. The clinic (Figure 2.5-8) would include administrative spaces, medical, mental health and dental clinic spaces, urgent care clinic, preventive medicine, ancillary services, and parking for personal and emergency vehicles (approximately 290 spaces) (see Figure 2.5-8). The space allocation and designs are provided by Bureau of Medicine and Surgery (BUMED). Apra Branch Health Clinic (medical and dental) would be a single-story concrete facility of 43,091 ft² (4,003.28 m²).

The total project area within the perimeter of the facility equals 334,000 ft² (31,029.62 m²). Security lighting would be mounted to the building and poles in the parking area. Assume an emergency generator would be provided to provide back-up power.

The site is vacant. A portion of the area was used for base maintenance activities and there are remnants of large paving areas where buildings were previously located. There are no known land use constraints in the vicinity, except radon is a concern in Guam soils. Radon mitigation is proposed in the floor design. No tree removal or wetland disturbance is expected.

The project consists of constructing one single-level outpatient facility. Assume the entire site (334,000 ft² [31029.62 m²]) would be graded during construction. The facility would be constructed of reinforced concrete with slab on grade foundations, and with all components such as exterior walls, windows, roofing, mechanical and electrical systems compatible with the Guam environment and COMNAV Marianas design standards.

Facilities include administrative spaces, medical, mental health and dental clinic space, urgent care clinic, preventive medicine, ancillary services, and required support spaces. There would be parking for an approximately 36 staff vehicles. Site improvements include landscaping, sidewalks (with nonslip surface), curbs, and gutters. Subgrade construction would include utility lines and possible storm water management systems (not designed yet). Project costs would include new lines and meters for electrical, water and gas utilities. Facilities would be fully equipped with sprinkler and air conditioning systems.

Facilities would be designed to Zone 4 seismic requirements, to withstand 170 mph winds, and to include appropriate AT/FP distance setbacks. All design and construction would comply with the Energy Policy Act 2005 (106th Congress 2005) requirements and UFC 4-510-01, Design: Medical Military Facilities. Various tools and design features would be used to achieve LEED Silver certification for various development areas of the base and/or for specific buildings.

The construction staging area would be within the site boundaries. Construction waste would be disposed of at the Navy landfill. The duration of construction is estimated at 18 months and the work would occur in daylight hours Monday through Friday. Typical construction equipment would be used including bulldozers, backhoes and cement trucks.

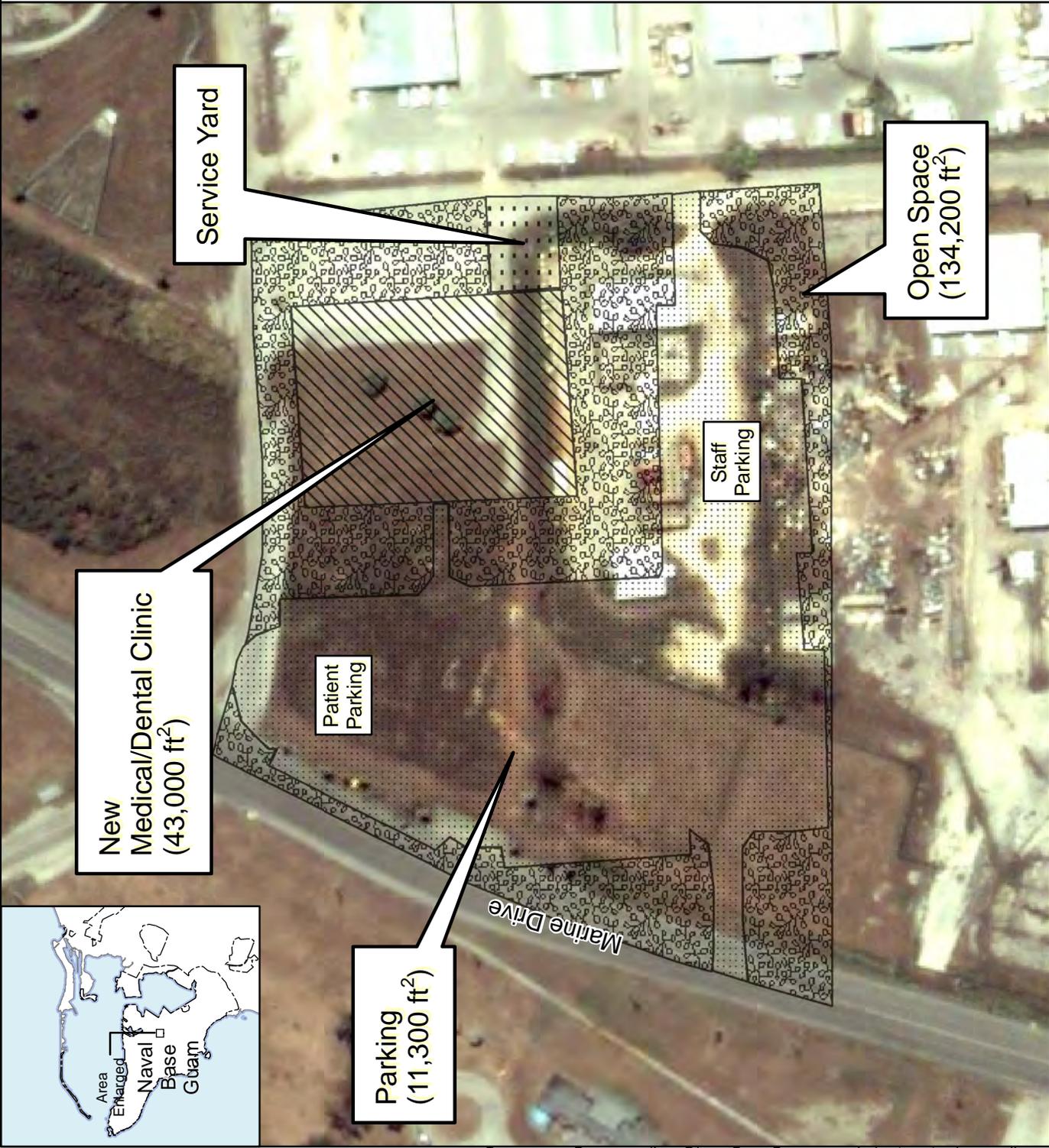
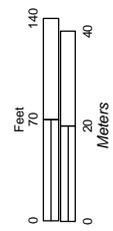
Proposed Operations and Existing Conditions

Medical services on Guam are managed under the Navy BUMED. A “Medical Facilities Master Planning Study Update for the DoD Healthcare Beneficiaries, Guam, and Mariana Islands” was prepared in April 2007 by NAVFAC Pacific and most of the information in this section was derived from that study. The purpose was to revisit the planned new Naval Hospital construction plans with consideration of the Marine Corps relocation requirements.

Figure 2.5-8
Medical/Dental Clinic
Site Plan

Legend

	Military Installation
	Proposed Building
	Proposed Pavement
	Service Yard
	Landscaping



**New
 Medical/Dental Clinic
 (43,000 ft²)**

Service Yard

**Open Space
 (134,200 ft²)**

**Staff
 Parking**

**Patient
 Parking**

**Parking
 (11,300 ft²)**

Marine Drive



Two similarly sized new clinics are proposed to meet the Marine Corps relocation requirements, one at Naval Base Guam and the other at the main cantonment. In an effort to maintain the footprint of the programmed new hospital (inpatient and outpatient facilities) on the Naval Hospital site and to place primary care/dental services proximate to Navy beneficiaries, the majority of the primary care, preventive medicine and occupational medicine was moved from the hospital construction project and placed in the two separate and similar medical clinic projects with Dental Services. The new Naval Base Guam clinic would replace an existing clinic that is in poor physical condition, and does not meet the future medical service requirement of the proposed increased population on Guam. The second medical clinic is proposed in the Main Cantonment area and described under that section of this EIS/OEIS.

The current Naval Hospital provides outpatient services in addition to emergency and critical care services. If outpatient services are relocated to medical clinics, sufficient space would be available at the new Naval Hospital to expand critical care medical specialties and meet the military population requirements on island. Specialty clinics and a limited family practice clinic would remain in the new Naval Hospital.

The existing Navy Branch Medical Clinic is located in a two story facility designed and built for use as a dormitory (barracks). The size and shape of the building is not conducive to the operation of an efficient and functional medical clinic, and are inadequate for the required medical activities. The projected population increases would add more stress on the ability of these facilities to function effectively. For example, the x-ray room is much smaller than that required by current DoD space planning criteria, and it also serves as the x-ray film files room. The treatment room is smaller than that required by criteria, and the narrow width of the room severely restricts functionality. Building access and circulation on the first floor for handicapped persons is adequate; however, the lack of an elevator in this building does not allow compliant access to the second floor. The overall condition of the roof requires near term replacement.

The existing Branch Dental Clinic was built in 1955 and is significantly “out-of-date” with current Dental Clinic procedures and design criteria. The main corridor is used as a return air plenum, which is a violation of codes and criteria. With no urgent care capability, patients must be transported to the Naval Hospital (approximately 30 minutes), and there are no intervening accredited civilian medical facilities available on the island in the event a patient's condition worsens during transit. The Dental Clinic is not handicap accessible; however, there is an accessible entrance in one end of the facility. There are smoke detectors in the corridor, but the building is not equipped with a sprinkler system.

The proposed Apra Medical/Dental Clinic would be an outpatient medical facility. The preferred project location at Apra Main Base is a vacant 13-ac (5.26 ha) site on Marine Drive (see Figure 2.5-8), near existing family and bachelor housing areas. The medical facility would be open 7 days a week, and it is assumed that it would operate during normal business hours. The clinic would be staffed by 32 individuals, with 345 visitors expected per day. Clinic staff and patients would be transported to and from the facility by personal or government vehicle, bus, or walking. It is expected that human sensitive receptors would be present on site during operating hours including children, infirm, and elderly persons.

No heavy equipment, vehicles, or machinery would be used during facility operations. It is assumed that outdoor lighting of the facility would consist of security lighting. It is also assumed that the facility would produce human biowaste, typical of any medical facility, which would be treated and disposed of in accordance with BUMED requirements. The fire risks associated with the medical clinic would be typical of concrete buildings. It would be equipped with a fire protection system, including a sprinkler system.

2.5.2 Alternatives Analysis: Waterfront Functions

2.5.2.1 Waterfront Project: Amphibious Task Force Ship Berthing and Embarkation

The rationale for siting all proposed waterfront facilities at Apra Harbor is it is the only on-island DoD harbor. The Navy's general purpose wharves that are suitable for meeting amphibious task force requirements are on the western side of Inner Apra Harbor (see Figure 2.5-3). Victor, Uniform, Romeo, and Sierra were the candidate wharves for berthing the ships. They have been used before by the amphibious task force. There are other general purpose wharves that are not suitable. Tango Wharf's availability for general ship berthing is limited by the space reserved for the Navy dive locker and access to the decompression facilities in Building 3169. Alpha/Bravo Wharves at Polaris Point east of the channel entrance are designated for the nuclear submarines and the submarine tender. X-Ray Wharf, in the southern portion of the Harbor, is designated as the supply wharf with large warehouses, including frozen and cold storage, conveniently located adjacent to the wharf to support these operations. The northwest area and associated wharves (Lima, Mike, Oscar, and Papa) are leased to GEDCA for ship repair.

The combatant escort ships are more difficult to site than the amphibious ships, because of their water depth requirement (referred to as draft), the largest being 34 ft (10 m). An additional 4 ft (1.2 m) of water depth is required by Navy specifications, resulting in a total dredge depth required of -38 ft MLLW (-12 m). The water depth in Inner Apra Harbor is -32 ft MLLW (-10 m) in the south, -35 ft MLLW (-11 m) in the area of Sierra/Tango Wharves and -42 ft MLLW (-13 m) in the area of Alpha/Bravo Wharves. Berthing the combatant escort ships in the deeper water near Sierra and Romeo Wharves would result in less dredging and was the logical choice for the combatant ships. Maintenance dredging for the entire Inner Apra Harbor was recently (within the last 5 years) completed; therefore, the original construction depths are restored. This provided adequate depth for amphibious shipping at Victor and Uniform wharves.

The alternatives analysis was a systematic, flexible and iterative process focusing on the most efficient and cost effective way to berth all the ships while minimizing the impact on existing operations. The other facilities were sited based on proximity to the ships that carry amphibious vehicles.

There were no existing buildings that were underutilized and that could meet the requirements for the Port Operations building. That building needed to be sited on the waterfront and in proximity to the ships carrying amphibious vehicles (Victor Wharf). The site selected was the only space available. The nearest available land for staging was selected for cargo staging/wash area. No reasonable alternative sites for these functions were identified.

The Navy planned to improve the structure and utilities at the general purpose wharves. Ships that arrive in port are berthed at the general purpose wharves, except Uniform Wharf is too degraded for use. Although berthing plans are developed for planning purposes, the fact is that ships are assigned berths based on availability and water depth. Alternative berthing plans were developed but they have less to do with wharf improvements than with wharf shoreside requirements, such as lay down area. The land available for embarkation and cargo staging was generally in the area of Victor Wharf. Based on operational considerations the site presented above was selected.

2.5.2.2 Amphibious Craft Laydown Area

Siting facilities at a busy waterfront is largely a function of space availability. In the case of the LCAC/AAV laydown area, there is the additional consideration of noise impacts and water spray damage to adjacent land uses. Base planners identified two available areas for the facilities that would be

consistent with waterfront land use plans and operations. Construction of LCAC and amphibious operations facilities on Polaris Point provides the best solution for reducing impacts from noise on surrounding operations. The area is a sufficient distance from the Alpha/Bravo Wharves and CSS-15 personnel do not anticipate any impacts on submarine berthing operations around the Tender. Construction of a new road from Marine Drive directly to the compound on Polaris Point would mitigate potential congestion with Navy traffic on the peninsula.

The other alternative considered is located in the inlet where the Dry Dock is moored (see Figure 2.5-5). The AAV laydown would be located adjacent to EOD facilities on Navy land and the LCAC laydown area would be on land currently leased by GEDCA. The reasons for dismissal of this site alternative were noise interference with EOD operations and the need for dredging at the entrance to the inlet. In addition, proximity to Big Blue Reef and the desire to avoid any potential impacts to coral ecosystems was a consideration for dismissal.

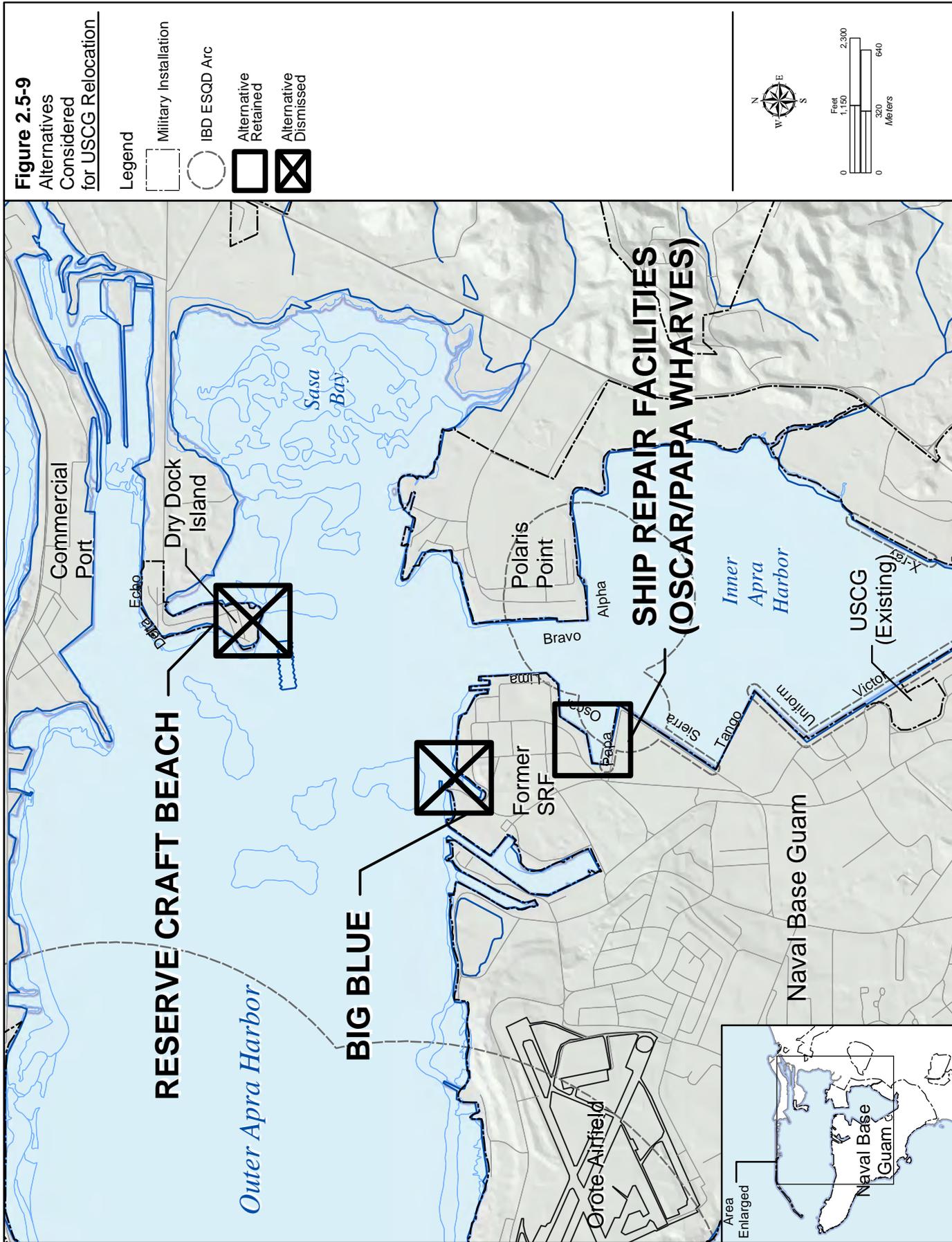
2.5.2.3 USCG Berthing and Crew Support Buildings

The USCG Maintenance and Logistics Command Pacific prepared the Sector Guam – Relocation Feasibility Study (June 2007) to assess the feasibility and potential for relocating Sector Guam facilities from their current location on Victor Wharf to other suitable waterfront property controlled by the Navy. This EIS/OEIS addresses the relocation of only a portion of the total USCG facilities and personnel that were addressed in the feasibility study. The portion that is addressed herein is that directly related to the Marine Corps Victor wharf requirements, namely wharf frontage and crew support facilities. The assumption is that the remaining facilities and personnel would relocate when funding became available.

Three sites were considered in the Step 2 site selection process (Figure 2.5-9): Big Blue, Reserve Craft Beach on Dry Dock Island, and the Oscar and Papa Wharves (Ship Repair Facility). The first two of these were dismissed from further consideration in this EIS/OEIS due to a number of functional concerns. These included such mission requirements as AT/FP capability; quality of access; existence of waterfront facilities or capability to develop such facilities; relationship to Apra Harbor; environmental concerns, particularly site contamination concerns; physical size and layout; and others.

Each of the three sites reviewed in this study appears to be a feasible relocation site candidate. Evaluation criteria were as follows:

- Least total development cost
- Anticipated lower cost utility servicing
- Fewest unknowns in terms of potential development costs
- Optimal relationship to on-base community support facilities
- Good visual relationship to Outer Harbor
- Good functional relationship / boat access to Outer Harbor
- Provides adequate cutter berthing and tie-up facilities
- May require dredging to ensure sufficient hull clearance
- Adequate site development area
- Adequate site expansion area
- Good on-base site access
- Secured within base perimeter
- Allows for public access during disaster / emergency response
- Secure neighboring facilities
- Minimal environmental problems



- Potential access to small boat launch location (new build required)
- Potential exposure to typhoon storm surge
- Potential to satisfy USCG Mission in co-located facility for all branches

Each site has advantages that the others do not have, and there is no obvious preferred site. The disadvantages of each are summarized in Table 2.5-6. The ultimate decision to choose the Ship Repair Facility was made jointly between the USCG and the Navy Command based on siting of other planned and programmed projects.

Table 2.5-6. Key Disadvantages of the Alternatives

<i>Dry Dock Island</i>	<i>Big Blue</i>	<i>Ship Repair Facility (Oscar/Papa Wharves)</i>
AT/FP inefficient	New pier construction	Ship Repair Facility lease renegotiation
Increased Cost Based on the Need for Increased Support Facilities	Dredging may be required	No Outer Apra Harbor visibility
Lengthy Utility Runs lead to Increase costs	Must relocate Big Blue (the drydock)	May best be reserved for Navy ships with deeper draft
Separation from Naval Base may limit JHOC port command possibilities	Cutters cannot turn in basin	Major utility infrastructure improvements required
Outside Naval Base Perimeter	Utility costs unknown	N/A
Requires All New Pier Facilities	Being considered for a new aircraft carrier berth	N/A

Notes: N/A = not applicable
Source: USCG 2007.

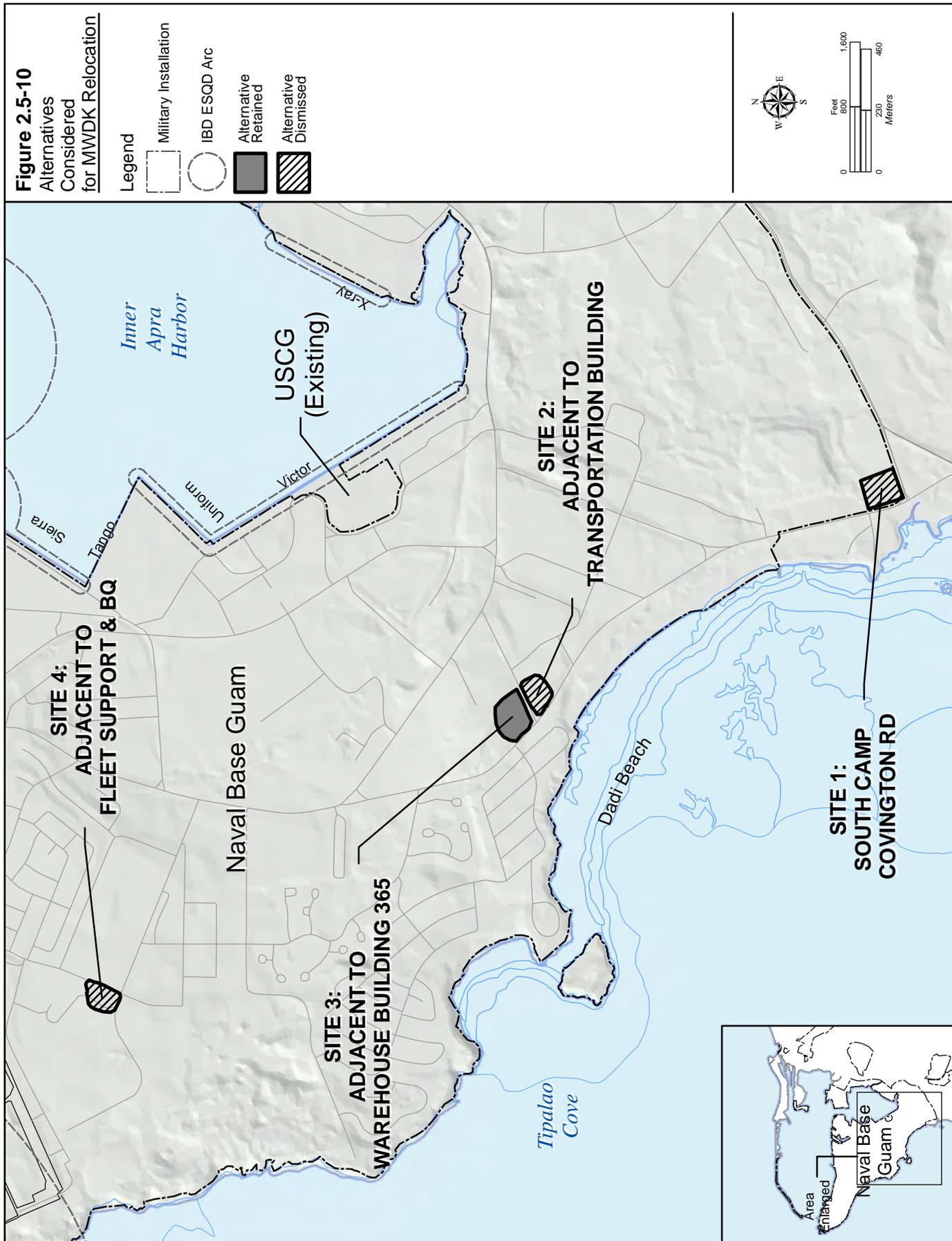
2.5.2.4 Military Working Dog Kennel

Four MWDK sites were evaluated by Navy base development planners in conjunction with the Military Working Dog Command, and three were dismissed from further consideration in this EIS/OEIS (Figure 2.5-10). The criteria and results are summarized in Table 2.5-7. Though not ranked highest, Site 3 was selected over Site 2, as vehicle noise from the transportation complex near Site 2 may affect Military Working Dogs training. Also, nearby PCB contamination was assessed as a minor issue (see Figure 2.5-10).

Table 2.5-7. Military Working Dog Kennel Alternative Site Evaluation

<i>Criteria</i>	<i>Site 1: South Camp Covington (4.4 ac) (1.8 ha)</i>	<i>Site 2: Adjacent to Warehouse Behind Transportation Building (4.2 ac)(1.7 ha)</i>	<i>Site 3: Adjacent to Warehouse (4.3 ac) (1.7 ha)</i>	<i>Site 4: Adjacent to Fleet Support Services, and Barracks Complex (3.0 ac) (1.2 ha)</i>
Located away from busy areas of the base (heavy traffic, high pedestrian volume)?	Yes	Yes	Yes	No
Located away from noisy areas (small arms ranges, taxiways, runways)?	Yes	Yes	Yes	No
Located away from recreational areas or gathering places?	Yes	Yes	Yes	No
Located proximate to base security?	No	Yes	Yes	No
Located away from environment/cultural sensitive areas?	Yes	Yes	No ¹	Yes

Note: ¹Discussions with NAVFAC Pacific Environmental indicate the presence of low-level PCB contaminants located roughly 400 ft (122 m) north of Site 3.

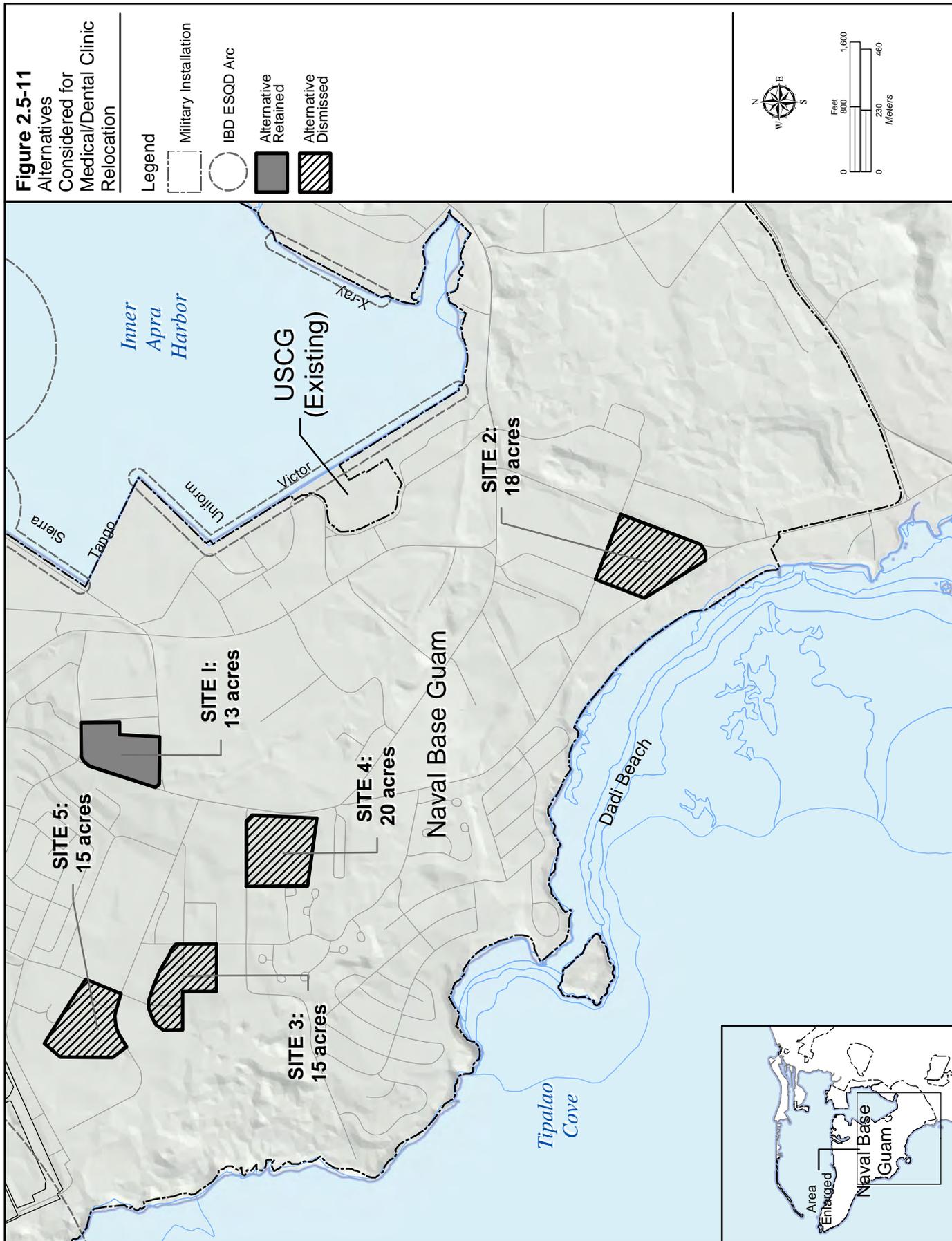


2.5.2.5 Apra Medical/Dental Clinic

An alternatives analysis was conducted and is described in detail in the *Medical Facilities Master Planning Study Update (2007)*, Volume II. Five alternatives were considered and Site 1, Former Public Works Center site, is the one site that is being carried through for impact assessment in this EIS/OEIS. The site provides convenient access for on-base personnel from Marine Drive and for beneficiaries living in the southern portion of Guam. It is also located in close proximity to the barracks and family housing areas.

Four other Naval Base Guam candidate sites for the medical/dental clinic that were considered and dismissed are shown on Figure 2.5-11. These are described below.

- Site 2. This 18-ac (7.3-ha) site is located near the back entrance to the base in proximity to the existing Exchange and Commissary. The site is vacant with only remnants of past use.
- Site 3. This 15-ac (6.07-ha) site is located between the barracks and family housing units and adjacent to MWR activities. The site is vacant, but a portion of the area is impacted by the ESQD from Navy Construction Battalion quarry operations to the west.
- Site 4. This 20-ac (8.09-ha) site is centrally located along Marine Drive. The area is largely vacant, although a portion is used as a DoD ball field. The base wastewater treatment facility is located across Marine Drive. Two alternatives were considered at this site.
- Site 5. This 15-ac (6.07-ha) site is located to the west of the barracks housing area, and south of the furniture storage warehouse. The area is vacant, but ESQD from Kilo Wharf and the quarry area impact the site.



These four sites were dismissed by COMNAV Marianas based on existing land use constraints and planned future development on base. The pros and cons of each alternative are shown in Table 2.5-8.

Table 2.5-8. Medical/Dental Clinic Alternatives Assessment Summary

<i>Site</i>	<i>Pros</i>	<i>Cons</i>
1	<ul style="list-style-type: none"> • Site is adequate in size and can accommodate future expansion • Gently sloping site • Utilities readily available • Relatively convenient access for on-base active duty/active duty family member • No known environmental wetlands, flora/fauna concerns • No Electromagnetic Radiation constraints • No ESQD constraints 	<ul style="list-style-type: none"> • Possible archaeological/historical concerns on the north end of the site since it is adjacent to Japanese POW amphitheatre • Would require demolition of some on site structures and pavement areas • Located adjacent to an industrial area on the east side of the site and industrial/storage area to the south • Potential soil contamination concerns based on its previous and current uses even though it has been remediated to an acceptable “industrial level of contamination” • Storm water drainage concerns on the south end of the site • Potential chlordane-containing soils • Hazardous waste temporary collection point would need to be relocated.
2	<ul style="list-style-type: none"> • Site is adequate in size • Relatively flat open area • Utilities readily available • No onsite buildings to demolish • Located in the “community” area of the Base near the Navy Exchange and Commissary • No known environmental concerns (wetlands, flora/fauna or soil contamination) • No activities to be relocated • No EMR constraints • No ESQD constraints 	<ul style="list-style-type: none"> • AT/FP concerns (site is near coastal area and there is no perimeter fence between the Base and coastline) • Less convenient access for AD/ADFM living on-base than other sites • Near Base landfill • Adjacent to archaeological/historical site • Portions of the site may be archaeologically sensitive • Would require demolition of foundations and pavements • Potential chlordane-containing soils
3	<ul style="list-style-type: none"> • Site is adequate in size • Gently sloping site • Utilities readily available • Located between on-base family and barracks housing areas • Convenient access for on-base AD/ADFM • No known environmental concerns (wetlands, flora/fauna or soil contamination) • No EMR constraints • No ESQD constraints 	<ul style="list-style-type: none"> • Future BQs are being planned for this site. Not a viable alternative for the clinic at this time • Relatively remote and circuitous route from the Base Main Gate via Marine Drive, Chappell Road and Market Street • Rock Quarry adjacent to southwest portion of site • Possible congestion with bowling alley, child care center and other proposed activities, (Bachelor Quarters, fitness center and swimming pool) in the immediate vicinity

<i>Site</i>	<i>Pros</i>	<i>Cons</i>
4	<ul style="list-style-type: none"> • Site is marginally adequate in size for the Medical/Dental Clinic • Relatively flat, clean/open area • Utilities readily available • No onsite buildings to demolish • Close to on-base family and barracks housing area • No known environmental concerns (wetlands, archaeological, flora/fauna or soil contamination) • No EMR constraints • No ESQD constraints • Good access from anywhere on-base via Marine Drive 	<ul style="list-style-type: none"> • “One stop support center” would not fit on site with the Medical/Dental Clinic • Small site size limits expansion capability of the Medical/Dental Clinic • Relatively close (986 ft) (301 m) to Waste Water Treatment Plant (potential odor problem)
5	<ul style="list-style-type: none"> • Site is adequate in size • Relatively flat, open area • Utilities readily available • Located near family and barracks housing areas • Convenient access for on-base AD/ADFM • No known environmental concerns (wetlands, flora/fauna or soil contamination) • No activities to be relocated • No EMR constraints • Only one small “temporary” type structure to be removed 	<ul style="list-style-type: none"> • ESQD restraints limit building location on the site and limit building expansion • Parking inside the ESQD Arc • The “buildable” portion of the site is not large enough for the “one stop support center” and the clinic

2.5.3 Alternatives Carried Forward for Analysis: Waterfront Functions

Table 2.5-9 summarizes the action alternatives carried forward in the EIS/OEIS for proposed waterfront facilities and operations.

Table 2.5-9. Waterfront Action Alternatives Carried Forward

<i>Project</i>	<i>Action Alternatives Carried Forward</i>
Amphibious task force ship berthing/embarkation	Victor/Uniform Wharves
Amphibious task force escort ship berthing	Sierra/Tango Wharves
Cargo staging and wash down areas	Southwest of Victor Wharf
Waterfront Operations Support Facility and Material Handling Equipment Storage	Adjacent to Victor Wharf
LCAC/AAV laydown	East of Alpha Wharf at Polaris Point
USCG berthing and crew support building relocation	Oscar/Papa Wharves (Ship Repair Facility)
Military Working Dog Kennel relocation	Site 3: Adjacent to warehouse on Shoreline Drive, Naval Base Guam
Apra Harbor Medical/Dental Clinic	Site 1: Former Public Works Center Site on Naval Base Guam
Dredging	Mechanical (see Appendix D, Volume 9)
Disposal of dredge spoils	3 Alternatives, individually or in combination: beneficial reuse, upland placement, and ocean disposal. 5 site Alternatives for upland placement. (see Appendix D, Volume 9)

2.6 SUMMARY OF ALTERNATIVES

2.6.1 Proposed Action Alternatives

As described in previous subsections of this chapter, the Marine Corps conducted a comprehensive screening and planning process to identify reasonable alternatives for the proposed development of a Marine Corps base of operations on Guam. The proposed action was organized into four categories of requirements (main cantonment/housing, training functions, airfield functions, and waterfront functions) and a four-step process was implemented to evaluate the facility and operational requirements of each category (see Section 2.1). Screening criteria were developed to identify alternative sites for specific functions and site-specific planning considerations were applied to identify alternative alignments within particular candidate sites.

In some cases, several alternatives were carried forward for analysis in this EIS/OEIS, and in other cases only one reasonable alternative was identified. Each set of alternatives carried forward (e.g., an munitions storage facility or a particular training range) represents a choice that would need to be made by decision-makers in the Record of Decision, provided that the action proceeds to implementation (see Figure 2.1-2).

The remainder of this subsection summarizes the major project elements that comprise the proposed action, including all alternatives carried forward for analysis in this EIS/OEIS. Figure 2.1-2 illustrates the set of choices that would need to be made in the Record of Decision to yield a selected alternative for the proposed action should the action be implemented. The proposed action would also include the relocation of 8,600 Marines, 1,700 civilian personnel, 2,000 transient Marines, and an estimated 9,000 dependents to Guam. An alternative to the proposed action is the no-action alternative, which is also described below in Section 2.6.2. Per the requirements of the NEPA, the no-action alternative is also carried forward for analysis in this EIS/OEIS.

2.6.1.1 Least Environmentally Damaging Practicable Alternative (LEDPA)

Chapter 4 of this volume contains an analysis of the least environmentally damaging practicable alternative (LEDPA), which is required under the Section 404(b)(1) guidelines of the Clean Water Act (CWA). Specifically, Section 404(b)(1) of the CWA stipulates that no discharge of dredged or fill material into waters of the United States, which include wetlands, shall be permitted if there is a practicable alternative (LEDPA) which would have less adverse impact on the aquatic ecosystem, so long as the alternative does not have other significant environmental consequences. Furthermore, an alternative is considered practicable if it is available and capable of being implemented after taking into consideration cost, existing technology, and logistics in light of overall project purposes. The Section 404 (b)(1) guidelines are applicable to proposed action that is analyzed in this volume.

2.6.1.2 Alternatives Carried Forward for Cantonment Area/Housing Functions

As was described in more detail in Section 2.2.3, four action alternatives (out of eight initially considered in detail) were carried forward for the proposed development of Marine Corps Main Cantonment Area. All four of these alternatives also include areas to accommodate certain selected training functions

Chapter 2:

2.1 Overview

2.2 Main Cantonment Area
Functions

2.3 Training Functions

2.4 Airfield Functions

2.5 Waterfront Functions

2.6 Summary of Alternatives

(Section 2.3.1) that present mission advantages when collocated with the cantonment and housing functions.

Alternative 1

Alternative 1 represents one contiguous location (total of 2,386 ac [966 ha]) for cantonment area functions and family housing/community support functions. It would include portions of NCTS Finegayan (1,090 ac [441 ha]) and South Finegayan (290 ac [117 ha]), as well as acquisition or long term leasing of non-DoD lands at the Former FAA parcel (680 ac [275 ha]) and the Harmon Annex parcel (326 ac [132 ha]). Of the total Overlay Refuge (2,095 ac [848 ha]) in the Finegayan area, this alternative would develop approximately 29% (599 ac [242 ha]). Details of the proposed Alternative 1 layout are shown in Figure 2.2-4 in Section 2.2.

Alternative 2

Alternative 2 also represents one contiguous land area (a total of 2,580 ac [1,044 ha]) for the cantonment and family housing/community support functions. It would include portions of NCTS Finegayan (1,610 ac [652 ha]), portions of South Finegayan (290 ac [117 ha]), and the acquisition or long term leasing of 680 ac (275 ha) of privately-held lands in the Former FAA parcel. Of the total Overlay Refuge (2,095 ac [848 ha]) in the Finegayan area, this alternative would develop approximately 53% (1,106 ac [448 ha]). Details of the proposed Alternative 2 layout are shown in Figure 2.2-5 in Section 2.2. Alternative 2 is the preferred alternative for development of the cantonment area and housing proposed action.

Alternative 3

Alternative 3 would require a total of 2,707 ac (1,096 ha) for the main cantonment and family housing/community support areas. The main cantonment would include portions of NCTS Finegayan (1,610 ac [652 ha]), and housing would be located on three geographically separated DoD parcels, including South Finegayan (290 ac [117 ha]), Air Force Barrigada (430 ac [174 ha]), and Navy Barrigada 377 ac [153 ha]). No privately held lands would be acquired under Alternative 3. Of the total Overlay Refuge (2,095 ac [848 ha]) in the Finegayan area, this alternative would develop approximately 53% (1,106 ac [448 ha]). Details of the proposed Alternative 3 layout are shown in Figure 2.2-6 in Section 2.2.

Under this alternative, the housing would be located non-contiguous to the main cantonment. The proposed housing area at South Finegayan is located south of the former FAA area. Navy and Air Force Barrigada are located approximately 9 m (14 km) from the proposed Main Cantonment Area, on the eastern side of Guam. Navy Barrigada and Air Force Barrigada are currently connected by the existing Navy Golf Course. The golf course would need to be removed if it was determined that the two parcels should be connected.

Alternative 8

Alternative 8 would require a total of 2,409 ac (1,008 ha) for the main cantonment and family housing/community support areas. Alternative 8 would include portions of NCTS Finegayan (1,090 ac [441 ha]), a portion of South Finegayan (290 ac [117 ha]), the former FAA parcel (680 ac [275 ha]), and a portion of the housing would be located on the geographically separated Air Force Barrigada parcel (430 ac [174 ha]). A total of 680 ac (275 ha) of privately held lands would be acquired by purchase or long term lease under Alternative 8. Of the total Overlay Refuge (2,095 ac [848 ha]) in the Finegayan area, this alternative would develop approximately 29% (599 ac [242 ha]). Under Alternative 8, a portion of the

required housing would be non-contiguous to the Main Cantonment Area. Details of the proposed Alternative 8 layout are shown in Figure 2.2-7 in Section 2.2.

2.6.1.3 Alternatives Carried Forward for Training Functions

Training requirements associated with relocating Marines from Okinawa to Guam are described in detail in Section 2.3. Individual training facilities, ranges, and areas that comprise the required training functions on Guam have been organized into the following six training types or categories:

- Ammunition Storage
- Command, Control, and Simulation
- Non-Firing General Military Skills Training
- Firing General Military Skills Training
- Aviation Training
- Airspace

Ammunition Storage

As summarized in Table 2.6-1, the alternatives analysis identified one alternative for the high explosive ECM at the existing NMS, two alternatives at NMS for construction of 10 standard ECMs, and one alternative for 12 standard ECMs and associated support facilities at the existing Andersen AFB MSA1. All of these alternatives are carried forward for analysis in this EIS/OEIS. Details of the construction and operation of each of the proposed facilities were described in Section 2.3.1.

Table 2.6-1. Alternatives Carried Forward for Analysis: Ammunition Storage Facilities

<i>Requirement</i>	<i>Alternatives Carried Forward</i>	<i>Figure Reference</i>
High Explosive ECM	NMS: High 12 Group Area	Figure 2.3-11
10 standard ECMs	NMS Alternative 1: Parson's Road Area	Figure 2.3-11
	NMS Alternative 2: High Road Area	
12 standard ECMs and related support facilities	Andersen AFB MSA1	Figure 2.3-12

Command, Control, and Simulation

All three of the proposed Command, Control, and Simulation facilities would be sited as a function of the master planning conducted for the Main Cantonment Area. Accordingly, action alternatives for Command, Control, and Simulation facilities that are carried forward for analysis in this EIS/OEIS are incorporated within Alternatives 1, 2, 3, and 8 for the Main Cantonment Area.

Non-Firing General Military Skills Training

Table 2.6-2 summarizes the alternatives carried forward for analysis with regard to non-fire general military skills training. Under this proposed action, the smaller non-fire range facilities that support physical fitness and unit-level training would be constructed in conjunction with the Main Cantonment Area facilities in order to encourage frequency and efficiency of use. Specific placement and orientation of such facilities within the Main Cantonment Area is a function of master planning efforts for those functions (see Figures 2.2-4 to 2.2-7 in Section 2.2). No other alternative sites for such facilities and training activities were identified.

Table 2.6-2. Alternatives Carried Forward for Analysis: Non-Fire General Skills Training

<i>Facility/Type of Training</i>	<i>Alternatives Carried Forward</i>	<i>Figure Reference</i>
Obstacle Courses	Part of Main Cantonment Alternatives 1, 2, 3, and 8	Figures 2.2-4 to 2.2-7
Confidence Course	Part of Main Cantonment Alternatives 1, 2, 3, and 8	Figures 2.2-4 to 2.2-7
Hand-to-Hand Combat Pit	Part of Main Cantonment Alternatives 1, 2, 3, and 8	Figures 2.2-4 to 2.2-7
Rappelling Tower	Part of Main Cantonment Alternatives 1, 2, 3, and 8	Figures 2.2-4 to 2.2-7
Gas Chamber	Part of Main Cantonment Alternatives 1, 2, 3, and 8	Figures 2.2-4 to 2.2-7
Combat Training Tank	Part of Main Cantonment Alternatives 1, 2, 3, and 8	Figures 2.2-4 to 2.2-7
General Purpose Auditorium	Part of Main Cantonment Alternatives 1, 2, 3, and 8	Figures 2.2-4 to 2.2-7
Maneuver Training Area 1	Andersen South	Figures 2.3-6 and 2.3-7
Maneuver Training Area 2	Southern half of NMS with Access Road Alternative A	Figure 2.3-4
	Southern half of NMS with Access Road Alternative B	
MOUT Complexes	Andersen South: part of Training Range Complex Alternative A	Figure 2.3-6
	Andersen South: part of Training Range Complex Alternative B	Figure 2.3-7
AMVOC	Andersen South	Figure 2.3-6 and 2.3-7
Engineer Equipment and Decontamination Training	Part of Main Cantonment Alternatives 1, 2, 3, and 8	Figures 2.2-4 to 2.2-7

The two MOUT complexes and the tactical vehicle course would be developed at Andersen South. Andersen South is the largest existing MOUT facility on Guam and the only existing MOUT facility large enough to support the required company level training. It is the only location identified for the required MOUT improvements. Two alternative site plans have been developed for the MOUT and supporting facilities at Andersen South, reflecting slight differences in configuration that would occur with the Training Range Complex Alternatives A and B (discussed below). The overall site plans for Andersen South also include the AMVOC, a maneuver area, and a convoy course.

Large-scale maneuver areas would be developed under the proposed action at Andersen South and NMS, since there is no single area on Guam that provides sufficient space for large-scale maneuvers. No other reasonable alternatives have been identified on Guam for either area. Development and use of the maneuver area at NMS would also require construction of an access road, for which three reasonable alternative alignments have been identified.

Firing General Military Skills Training

Marine Corps requirements for live-fire training facilities include a composite Training Range Complex (consisting of eight distinct training facilities and range control/maintenance facilities), a breacher and shooting house, and an indoor small arms range. There are two potential action alternatives for the range complex:

- *Training Range Complex Alternative A* includes all required ranges at a location east of Andersen South on non-DoD land to the east of Route 15 and would require the realignment of a portion of Route 15. The ranges would be tightly configured and overlapping SDZs would result in a smaller combined SDZ area. Land acquisition or long term leasing would be required for development of the ranges and control of lands associated with the SDZs.
- *Training Range Complex Alternative B* is at the same general location as Alternative A, and varies from Alternative A only in that 1) the Machine Gun Range (which contains the largest SDZ) would be located in non-DoD land in the valley area farther to the south and 2) relocation of Route 15 would not be required. This range configuration would be more

dispersed as compared to Alternative A and, as a result, there is less overlap and a larger area encompassed in the composite SDZ.

The proposed breacher and shooting house operations would be integrated into the MOUT facility, the alternatives for which include Alternatives A and B associated with the Training Range Complex. The proposed indoor small arms range would be integrated into the Main Cantonment Area. Accordingly, alternatives associated with the potential location of this facility would be a function of master planning for the Main Cantonment Area, as reflected in Alternatives 1, 2, 3, and 8.

The requirement for a demolition range could be met by the use of the existing demolition range on NWF that supports Air Force Rapid Engineer Deployable Heavy Operations (REDHORSE).

Aviation Training

Aviation training requirements of the proposed Marine Corps relocation would include improved airfield training at NWF and North Ramp at Andersen AFB along with ATC Detachment Training and TAOC training and facilities at the same locations (see Figure 2.1-4). Twelve new LZs (improved and unimproved) would be established at Orote Field (1), NWF (4), Andersen South (2), and NMS (5) (see Figure 2.3-9). Under the proposed action, such training would also involve flight activity in any existing designated military airspace, including military flight corridors, routes, and tactical navigation areas.

Airspace

Since no additional SUA is needed over Guam to support aviation training requirements, the only action alternative associated with aviation training is the use of existing airspace.

Under the proposed action a CFA or Restricted Area would be established to satisfy range safety requirements associated with the machine gun range component of the proposed Training Range Complex; the alternatives for this type of airspace are therefore integrated into Alternatives A and B for the Training Range Complex.

2.6.1.4 Alternatives Carried Forward for Airfield Functions

The Marine Corps requirements for airfield functions would be accommodated at the existing airfield at Andersen AFB. Other airfields on Guam were eliminated in Step 2 of the alternatives analysis.

2.6.1.5 Alternatives Carried Forward for Waterfront Functions

Table 2.6-3 summarizes the action alternatives carried forward in the EIS/OEIS for proposed waterfront facilities and operations.

Table 2.6-3. Waterfront Action Alternatives Carried Forward

<i>Project</i>	<i>Action Alternatives Carried Forward</i>
Amphibious task force ship berthing/embarkation	Victor/Uniform Wharves
Amphibious task force escort ship berthing	Sierra/Tango Wharves
Cargo staging and wash down areas	Southwest of Victor Wharf
Waterfront Operations Support Facility and Material Handling Equipment Storage	Adjacent to Victor Wharf
LCAC/AAV laydown	East of Alpha Wharf at Polaris Point
USCG berthing and crew support building relocation	Oscar/Papa Wharves (Ship Repair Facility)
Military Working Dog Kennel relocation	Site 3: Adjacent to warehouse on Shoreline Drive, Naval Base Guam
Apra Harbor Medical/Dental Clinic	Site 1: Former Public Works Center Site on Naval Base Guam

<i>Project</i>	<i>Action Alternatives Carried Forward</i>
Dredging	Mechanical (see Appendix D, Volume 9)
Disposal of dredge spoils	3 alternatives, individually or in combination: beneficial reuse, upland placement, and ocean disposal. 5 site Alternatives for upland placement. (see Appendix D, Volume 9)

2.6.2 No-Action Alternative

Under the no-action alternative, Marine Corps units would remain in Japan and would not relocate to Guam, though they may continue to train on Guam as they currently do. No additional training capabilities (beyond what is proposed in the MIRC EIS/OEIS [Navy 2009]) would be implemented for Guam to support the proposed action. The project objectives, including U.S.- Government of Japan agreements, would not be met. There would be no land acquisition or long term leasing, dredging, new construction or infrastructure upgrades associated with Marine Corps forces stationed on Guam. There would be no construction costs associated with this alternative.

2.6.2.1 Main Cantonment/Family Housing

Without the Main Cantonment facilities, NCTS Finegayan would continue to be used for critical communications facilities and possibly proposed air and missile defense facilities. There would be a large area with no specified use and buildings proposed for demolition would be demolished. South Finegayan would continue to be used for Navy family housing and projects would be proposed to upgrade these units. No land would be acquired for Main Cantonment.

All the areas proposed for family housing would continue current operations. Guam Army National Guard would construct new facilities at Navy Barrigada. The communications facilities and golf course in the area would remain in operation. These activities would occur with the Marine Corps build-up. Air Force Barrigada would continue to be used as a NEXRAD site.

2.6.2.2 Training Functions

Training activities to support all military services, including transient Marine Corps forces, would continue as described in the MIRC EIS/OEIS (Navy 2009). Projects proposed in the MIRC EIS/OEIS would be completed pending funding. There would be no land acquisition or long term leasing to support training. The firing range complex would not be constructed. The MOUT facility at Andersen South would likely be improved, pending funding. No construction would occur at NWF except to support other military service mission requirements.

2.6.2.3 Airfield Functions

Under the no-action alternative, no new facilities to support the Marine Corps would be constructed at North or South Ramp. The project area at North Ramp would likely be developed with future Air Force mission facilities. The South Ramp embarkation facility would be constructed to meet Air Force requirements only. The North Gate and Access Road project would likely be constructed by the Air Force depending on funding.

2.6.2.4 Waterfront Functions

Though the Navy has identified these projects for funding, the capitalization schedule for these projects is being established as a result of the proposed actions analyzed in this EIS/OEIS. The Carrier Vessel Nuclear (CVN) is accompanied by a group of escort vessels and collectively they form the Carrier Strike Group (CSG). The CSG escort vessels are similar to the amphibious task force escort vessels and the

wharf requirements are the same. The fact that these projects had already been identified partially explains why only one alternative set of wharf improvements is proposed. Under the no-action alternative, assuming no Navy or Marine Corps funding, the CSG escort vessels and the visiting amphibious task force vessels would continue to be accommodated at Apra Harbor at inadequate wharf facilities. Uniform Wharf would not be used because it is not structurally sound, but the other wharves in Apra Harbor could be used.

Under the no-action alternative, the embarkation areas and the LCAC/AAV laydown area would not be constructed. The USCG would not relocate facilities from Victor to Oscar and Papa Wharves, and the MWDC would not be relocated.

Development of the new clinic under the proposed action was largely stimulated by the need to expand hospital services at the Navy Hospital to meet increased populations, which meant that outpatient services would need to be provided at the installations. The Apra Medical/Dental Clinic under the proposed action would not be built at the same size with the same services; however, the existing medical and dental clinics are substandard facilities and eventually a new clinic would be built.

The Air Force military population would grow as projected for Intelligence, Surveillance, and Reconnaissance Strike (see cumulative projects). The Army population would increase by 630 soldiers and an additional 950 dependents and the Navy by 1,250 active duty and 50 dependents.

2.6.2.5 Summary

The no-action alternative does not meet the purpose and need of the proposed action. U.S. military forces would not be relocated to meet international agreement and treaty requirements and fulfill U.S. national security policy requirements in the Western Pacific Region. For purposes of this EIS/OEIS, the no-action alternative serves as a baseline, representative of the “status quo,” against which the action alternatives can be compared when assessing potential environmental impacts.

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